

SECTION **STC**

STEERING CONTROL SYSTEM

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

CONTENTS

<p>HYDRAULIC PUMP ELECTRIC P/S</p> <p>PRECAUTION12</p> <p>PRECAUTIONS12</p> <p style="padding-left: 20px;">Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" 12</p> <p style="padding-left: 20px;">Precautions for Performing 2-wheel Drive Test 12</p> <p style="padding-left: 20px;">Precautions for Removing Battery Terminal 12</p> <p style="padding-left: 20px;">Service Notice and Precautions for Hydraulic Pump Electric Power Steering System 13</p> <p>SYSTEM DESCRIPTION14</p> <p>COMPONENT PARTS14</p> <p style="padding-left: 20px;">Component Parts Location 14</p> <p style="padding-left: 20px;">Power Steering Oil Pump Assembly 16</p> <p>SYSTEM17</p> <p>HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM 17</p> <p style="padding-left: 20px;">HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM : System Description 17</p> <p style="padding-left: 20px;">HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM : Circuit Diagram 20</p> <p style="padding-left: 20px;">HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM : Fail-safe 20</p> <p style="padding-left: 20px;">HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM : Protection Function 20</p> <p>WARNING/INDICATOR/CHIME LIST21</p> <p style="padding-left: 20px;">WARNING/INDICATOR/CHIME LIST : Warning Lamp/Indicator Lamp 21</p> <p>DIAGNOSIS SYSTEM (POWER STEERING CONTROL MODULE)22</p> <p style="padding-left: 20px;">CONSULT Function 22</p> <p>ECU DIAGNOSIS INFORMATION23</p>	<p>POWER STEERING CONTROL MODULE23</p> <p style="padding-left: 20px;">Reference Value23</p> <p style="padding-left: 20px;">Fail-safe24</p> <p style="padding-left: 20px;">Protection Function25</p> <p style="padding-left: 20px;">DTC Inspection Priority Chart25</p> <p style="padding-left: 20px;">DTC Index25</p> <p>WIRING DIAGRAM27</p> <p>HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITHOUT CAN GATEWAY)27</p> <p style="padding-left: 20px;">Wiring Diagram27</p> <p>HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITH CAN GATEWAY)30</p> <p style="padding-left: 20px;">Wiring Diagram30</p> <p>BASIC INSPECTION35</p> <p>DIAGNOSIS AND REPAIR WORK FLOW35</p> <p style="padding-left: 20px;">Work Flow35</p> <p style="padding-left: 20px;">Diagnostic Work Sheet36</p> <p>DTC/CIRCUIT DIAGNOSIS38</p> <p>C1143 STEERING ANGLE SENSOR38</p> <p style="padding-left: 20px;">DTC Description38</p> <p style="padding-left: 20px;">Diagnosis Procedure38</p> <p>C1601 BATTERY POWER SUPPLY39</p> <p style="padding-left: 20px;">DTC Description39</p> <p style="padding-left: 20px;">Diagnosis Procedure39</p> <p>C1602 NO TUNING SET42</p> <p style="padding-left: 20px;">DTC Description42</p> <p style="padding-left: 20px;">Diagnosis Procedure42</p> <p>C1606 EPS MOTOR45</p> <p style="padding-left: 20px;">DTC Description45</p> <p style="padding-left: 20px;">Diagnosis Procedure45</p>
--	---

C1607, C1608 POWER STEERING CONTROL MODULE	46	Precautions for Harness Repair	63
DTC Description	46	Service Notice and Precautions for EPS System ...	63
Diagnosis Procedure	46	SYSTEM DESCRIPTION	65
C1609 VEHICLE SPEED SIGNAL	47	COMPONENT PARTS	65
DTC Description	47	Component Parts Location	65
Diagnosis Procedure	47	Steering Gear Assembly	66
C160A HEAT PROTECTION	49	SYSTEM	68
DTC Description	49	EPS SYSTEM	68
U1000 CAN COMM CIRCUIT	50	EPS SYSTEM : System Description	68
DTC Description	50	EPS SYSTEM : Circuit Diagram	70
Diagnosis Procedure	50	EPS SYSTEM : Fail-safe	70
POWER SUPPLY AND GROUND CIRCUIT	51	EPS SYSTEM : Protection Function	70
Diagnosis Procedure	51	WARNING/INDICATOR/CHIME LIST	70
POWER STEERING WARNING LAMP	53	WARNING/INDICATOR/CHIME LIST : Warning	
Component Function Check	53	Lamp/Indicator Lamp	71
Diagnosis Procedure	53	DIAGNOSIS SYSTEM (POWER STEERING	
SYMPTOM DIAGNOSIS	54	CONTROL MODULE)	72
POWER STEERING WARNING LAMP DOSE		CONSULT Function	72
NOT TURN ON	54	ECU DIAGNOSIS INFORMATION	74
Description	54	POWER STEERING CONTROL MODULE	74
Diagnosis Procedure	54	Reference Value	74
POWER STEERING WARNING LAMP DOSE		Fail-safe	75
NOT TURN OFF	55	Protection Function	76
Description	55	DTC Inspection Priority Chart	76
Diagnosis Procedure	55	DTC Index	76
STEERING WHEEL TURNING FORCE IS		WIRING DIAGRAM	77
HEAVY OR LIGHT	56	EPS SYSTEM	77
Diagnosis Procedure	56	Wiring Diagram	77
UNBALANCE STEERING WHEEL TURNING		BASIC INSPECTION	83
FORCE AND RETURN BETWEEN RIGHT		DIAGNOSIS AND REPAIR WORK FLOW	83
AND LEFT	58	Work Flow	83
Diagnosis Procedure	58	Diagnostic Work Sheet	84
UNBALANCE STEERING WHEEL TURNING		DTC/CIRCUIT DIAGNOSIS	86
FORCE (TORQUE VARIATION)	59	C1143 STEERING ANGLE SENSOR	86
Diagnosis Procedure	59	DTC Description	86
REMOVAL AND INSTALLATION	61	Diagnosis Procedure	86
POWER STEERING CONTROL MODULE	61	C1601 BATTERY POWER SUPPLY	87
Removal and Installation	61	DTC Description	87
ELECTRIC POWER STEERING		Diagnosis Procedure	87
PRECAUTION	62	C1604 TORQUE SENSOR	89
PRECAUTIONS	62	DTC Description	89
Precaution for Supplemental Restraint System		Diagnosis Procedure	89
(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-		C1606 EPS MOTOR	90
SIONER"	62	DTC Description	90
Precautions for Removing Battery Terminal	62	Diagnosis Procedure	90

C1607, C1608 POWER STEERING CONTROL MODULE	91	Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"	110	A
DTC Description	91	Precautions for Removing Battery Terminal	110	
Diagnosis Procedure	91	Precautions for Harness Repair	111	B
C1609 VEHICLE SPEED SIGNAL	93	Service Notice and Precautions for Direct Adaptive Steering	111	
DTC Description	93			
Diagnosis Procedure	93			
U1000 CAN COMM CIRCUIT	95	SYSTEM DESCRIPTION	113	C
DTC Description	95	COMPONENT PARTS	113	
Diagnosis Procedure	95	Component Parts Location	113	D
U1010 CONTROL UNIT (CAN)	96	Steering Force Control Module	115	
DTC Description	96	Steering Angle Main Control Module	115	E
Diagnosis Procedure	96	Steering Angle Sub Control Module	116	
U140E CHASSIS CONTROL MODULE	97	Steering Force Actuator	116	F
DTC Description	97	Steering Angle Actuator	116	
Diagnosis Procedure	97	Steering Clutch	117	
POWER SUPPLY AND GROUND CIRCUIT	99	SYSTEM	118	
Diagnosis Procedure	99	DIRECT ADAPTIVE STEERING	118	STC
POWER STEERING WARNING LAMP	101	DIRECT ADAPTIVE STEERING : System Description	118	
Component Function Check	101	DIRECT ADAPTIVE STEERING : Circuit Diagram	123	H
Diagnosis Procedure	101	DIRECT ADAPTIVE STEERING : Fail-safe	125	
SYMPTOM DIAGNOSIS	102	DIRECT ADAPTIVE STEERING : Protection Function	128	I
POWER STEERING WARNING LAMP DOSE NOT TURN ON	102	WARNING/INDICATOR/CHIME LIST	129	J
Description	102	WARNING/INDICATOR/CHIME LIST : Warning Lamp/Indicator Lamp	129	
Diagnosis Procedure	102	HANDLING PRECAUTION	130	K
POWER STEERING WARNING LAMP DOSE NOT TURN OFF	103	Handling Precautions for Direct Adaptive Steering	130	
Description	103	DIAGNOSIS SYSTEM (STEERING FORCE CONTROL MODULE)	131	L
Diagnosis Procedure	103	CONSULT Function	131	
STEERING WHEEL TURNING FORCE IS HEAVY OR LIGHT	104	DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)	136	M
Diagnosis Procedure	104	CONSULT Function	136	
UNBALANCE STEERING WHEEL TURNING FORCE AND RETURN BETWEEN RIGHT AND LEFT	106	DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE)	141	N
Diagnosis Procedure	106	CONSULT Function	141	
UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)	107	ECU DIAGNOSIS INFORMATION	146	O
Diagnosis Procedure	107	STEERING FORCE CONTROL MODULE	146	
REMOVAL AND INSTALLATION	109	Reference Value	146	P
POWER STEERING CONTROL MODULE	109	Fail-safe	150	
Removal and Installation	109	Protection Function	153	
DIRECT ADAPTIVE STEERING		DTC Inspection Priority Chart	154	
PRECAUTION	110	DTC Index	156	
PRECAUTIONS	110	STEERING ANGLE MAIN CONTROL MODULE	159	
		Reference Value	159	

Fail-safe	163	EPS/DAST 3	218
Protection Function	166	EPS/DAST 3 : DTC Description	218
DTC Inspection Priority Chart	167	EPS/DAST 3 : Diagnosis Procedure	218
DTC Index	169	DAST 1	218
STEERING ANGLE SUB CONTROL MOD- ULE	172	DAST 1 : DTC Description	219
Reference Value	172	DAST 1 : Diagnosis Procedure	219
Fail-safe	176	DAST 2	219
Protection Function	179	DAST 2 : DTC Description	219
DTC Inspection Priority Chart	180	DAST 2 : Diagnosis Procedure	220
DTC Index	182	C13A1-00 CONTROL MODULE	221
WIRING DIAGRAM	185	EPS/DAST 3	221
DIRECT ADAPTIVE STEERING	185	EPS/DAST 3 : DTC Description	221
Wiring Diagram	185	EPS/DAST 3 : Diagnosis Procedure	221
BASIC INSPECTION	198	DAST 1	221
DIAGNOSIS AND REPAIR WORK FLOW	198	DAST 1 : DTC Description	221
Work Flow	198	DAST 1 : Diagnosis Procedure	222
Diagnostic Work Sheet	199	DAST 2	222
ADDITIONAL SERVICE WHEN REMOVING 12V BATTERY NEGATIVE TERMINAL	201	DAST 2 : DTC Description	222
Description	201	DAST 2 : Diagnosis Procedure	223
Work Procedure	201	C13A2-00 CONTROL MODULE	224
ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS	202	EPS/DAST 3	224
Special Repair Requirement	202	EPS/DAST 3 : DTC Description	224
Work Procedure	203	EPS/DAST 3 : Diagnosis Procedure	224
ADDITIONAL SERVICE WHEN REPLACING CONTROL MODULE	206	DAST 1	225
Description	206	DAST 1 : DTC Description	225
Work Procedure	206	DAST 1 : Diagnosis Procedure	225
DAST CALIBRATION (MODE1)	209	DAST 2	225
Description	209	DAST 2 : DTC Description	226
Work Procedure	209	DAST 2 : Diagnosis Procedure	226
DAST CALIBRATION (MODE2)	211	C13A3-00 CONTROL MODULE	227
Description	211	EPS/DAST 3	227
Work Procedure	211	EPS/DAST 3 : DTC Description	227
CONFIGURATION (STEERING FORCE CON- TROL MODULE)	212	EPS/DAST 3 : Diagnosis Procedure	227
Work Procedure	212	DAST 1	228
CONFIGURATION (STEERING ANGLE MAIN CONTROL MODULE)	214	DAST 1 : DTC Description	228
Work Procedure	214	DAST 1 : Diagnosis Procedure	228
CONFIGURATION (STEERING ANGLE SUB CONTROL MODULE)	216	DAST 2	228
Work Procedure	216	DAST 2 : DTC Description	229
DTC/CIRCUIT DIAGNOSIS	218	DAST 2 : Diagnosis Procedure	229
C13A0-00 CONTROL MODULE	218	C13A4-00 CONTROL MODULE	230
		DAST 1	230
		DAST 1 : DTC Description	230
		DAST 1 : Diagnosis Procedure	230
		DAST 2	231
		DAST 2 : DTC Description	231
		DAST 2 : Diagnosis Procedure	231

C13A5-00 CONTROL MODULE	232	EPS/DAST 3 : Diagnosis Procedure	251	
DAST 2	232	DAST 1	251	A
DAST 2 : DTC Description	232	DAST 1 : DTC Description	251	
DAST 2 : Diagnosis Procedure	232	DAST 1 : Diagnosis Procedure	252	B
C13A6-00 CONTROL MODULE	234	DAST 2	252	
DAST 1	234	DAST 2 : DTC Description	252	C
DAST 1 : DTC Description	234	DAST 2 : Diagnosis Procedure	253	
DAST 1 : Diagnosis Procedure	234	C13AC-00 CONTROL MODULE	254	
C13A7-00 CONTROL MODULE	235	DAST 1	254	D
DAST 1	235	DAST 1 : DTC Description	254	
DAST 1 : DTC Description	235	DAST 1 : Diagnosis Procedure	254	
DAST 1 : Diagnosis Procedure	235	C13AD-00 CONTROL MODULE	256	E
C13A8-00 BACK UP CIRCUIT	236	EPS/DAST 3	256	
EPS/DAST 3	236	EPS/DAST 3 : DTC Description	256	F
EPS/DAST 3 : DTC Description	236	EPS/DAST 3 : Diagnosis Procedure	256	
EPS/DAST 3 : Diagnosis Procedure	236	EPS/DAST 3 : Component Inspection	257	
DAST 1	237	DAST 1	257	STC
DAST 1 : DTC Description	237	DAST 1 : DTC Description	257	
DAST 1 : Diagnosis Procedure	238	DAST 1 : Diagnosis Procedure	258	
DAST 2	239	DAST 1 : Component Inspection	259	H
DAST 2 : DTC Description	239	DAST 2	259	
DAST 2 : Diagnosis Procedure	240	DAST 2 : DTC Description	259	I
C13A9-00 BACK UP CIRCUIT	241	DAST 2 : Diagnosis Procedure	260	
EPS/DAST 3	241	DAST 2 : Component Inspection	261	J
EPS/DAST 3 : DTC Description	241	C13AE-00 CONTROL MODULE	262	
EPS/DAST 3 : Diagnosis Procedure	241	EPS/DAST 3	262	
DAST 1	242	EPS/DAST 3 : DTC Description	262	K
DAST 1 : DTC Description	242	EPS/DAST 3 : Diagnosis Procedure	262	
DAST 1 : Diagnosis Procedure	243	DAST 1	262	
DAST 2	244	DAST 1 : DTC Description	263	L
DAST 2 : DTC Description	244	DAST 1 : Diagnosis Procedure	263	
DAST 2 : Diagnosis Procedure	245	DAST 2	263	M
C13AA-00 CONTROL MODULE	246	DAST 2 : DTC Description	263	
EPS/DAST 3	246	DAST 2 : Diagnosis Procedure	264	
EPS/DAST 3 : DTC Description	246	C13AF-00 CONTROL MODULE	265	N
EPS/DAST 3 : Diagnosis Procedure	246	EPS/DAST 3	265	
DAST 1	247	EPS/DAST 3 : DTC Description	265	O
DAST 1 : DTC Description	247	EPS/DAST 3 : Diagnosis Procedure	265	
DAST 1 : Diagnosis Procedure	248	DAST 1	265	
DAST 2	248	DAST 1 : DTC Description	266	P
DAST 2 : DTC Description	248	DAST 1 : Diagnosis Procedure	266	
DAST 2 : Diagnosis Procedure	249	DAST 2	266	
C13AB-00 CONTROL MODULE	250	DAST 2 : DTC Description	266	
EPS/DAST 3	250	DAST 2 : Diagnosis Procedure	267	
EPS/DAST 3 : DTC Description	250	C13B0-00 CONTROL MODULE	268	
		EPS/DAST 3	268	

EPS/DAST 3 : DTC Description	268	DAST 1	286
EPS/DAST 3 : Diagnosis Procedure	268	DAST 1 : DTC Description	287
DAST 1	268	DAST 1 : Diagnosis Procedure	287
DAST 1 : DTC Description	269	DAST 2	287
DAST 1 : Diagnosis Procedure	269	DAST 2 : DTC Description	287
DAST 2	269	DAST 2 : Diagnosis Procedure	288
DAST 2 : DTC Description	269	C13B5-00 CONTROL MODULE	289
DAST 2 : Diagnosis Procedure	270	EPS/DAST 3	289
C13B1-00 CONTROL MODULE	271	EPS/DAST 3 : DTC Description	289
EPS/DAST 3	271	EPS/DAST 3 : Diagnosis Procedure	289
EPS/DAST 3 : DTC Description	271	EPS/DAST 3 : Component Inspection	290
EPS/DAST 3 : Diagnosis Procedure	271	DAST 1	290
DAST 1	271	DAST 1 : DTC Description	290
DAST 1 : DTC Description	272	DAST 1 : Diagnosis Procedure	291
DAST 1 : Diagnosis Procedure	272	DAST 1 : Component Inspection	292
DAST 2	272	DAST 2	292
DAST 2 : DTC Description	272	DAST 2 : DTC Description	292
DAST 2 : Diagnosis Procedure	273	DAST 2 : Diagnosis Procedure	293
C13B2-00 CONTROL MODULE	274	DAST 2 : Component Inspection	294
EPS/DAST 3	274	C13B6-00 MOTOR CIRCUIT	295
EPS/DAST 3 : DTC Description	274	EPS/DAST 3	295
EPS/DAST 3 : Diagnosis Procedure	274	EPS/DAST 3 : DTC Description	295
EPS/DAST 3 : Component Inspection	275	EPS/DAST 3 : Diagnosis Procedure	295
DAST 1	275	EPS/DAST 3 : Component Inspection	297
DAST 1 : DTC Description	275	DAST 1	297
DAST 1 : Diagnosis Procedure	276	DAST 1 : DTC Description	297
DAST 1 : Component Inspection	277	DAST 1 : Diagnosis Procedure	298
DAST 2	277	DAST 1 : Component Inspection	299
DAST 2 : DTC Description	277	DAST 2	299
DAST 2 : Diagnosis Procedure	278	DAST 2 : DTC Description	300
DAST 2 : Component Inspection	279	DAST 2 : Diagnosis Procedure	300
C13B3-00 CONTROL MODULE	280	DAST 2 : Component Inspection	302
EPS/DAST 3	280	C13B7-00 CONTROL MODULE	303
EPS/DAST 3 : DTC Description	280	EPS/DAST 3	303
EPS/DAST 3 : Diagnosis Procedure	280	EPS/DAST 3 : DTC Description	303
EPS/DAST 3 : Component Inspection	281	EPS/DAST 3 : Diagnosis Procedure	303
DAST 1	281	EPS/DAST 3 : Component Inspection	304
DAST 1 : DTC Description	281	DAST 1	304
DAST 1 : Diagnosis Procedure	282	DAST 1 : DTC Description	304
DAST 1 : Component Inspection	283	DAST 1 : Diagnosis Procedure	305
DAST 2	283	DAST 1 : Component Inspection	306
DAST 2 : DTC Description	283	DAST 2	306
DAST 2 : Diagnosis Procedure	284	DAST 2 : DTC Description	306
DAST 2 : Component Inspection	285	DAST 2 : Diagnosis Procedure	307
C13B4-00 CONTROL MODULE	286	DAST 2 : Component Inspection	308
EPS/DAST 3	286	C13B8-00 CONTROL MODULE	309
EPS/DAST 3 : DTC Description	286	EPS/DAST 3	309
EPS/DAST 3 : Diagnosis Procedure	286	EPS/DAST 3 : DTC Description	309

EPS/DAST 3 : Diagnosis Procedure	309	C13BD-00 CONTROL MODULE IGN POWER SUP	332	A
DAST 1	309	DAST 1	332	B
DAST 1 : DTC Description	310	DAST 1 : DTC Description	332	
DAST 1 : Diagnosis Procedure	310	DAST 1 : Diagnosis Procedure	332	
DAST 2	310	C13BE-00 - C13C4-00 FLEXRAY COMMUNI-		C
DAST 2 : DTC Description	310	CATION	334	
DAST 2 : Diagnosis Procedure	311	DTC Description	334	
C13B9-00 CONTROL MODULE	312	Diagnosis Procedure	335	D
EPS/DAST 3	312	C13C5-00 STEERING ANGLE SENSOR SIG-		E
EPS/DAST 3 : DTC Description	312	NAL	338	
EPS/DAST 3 : Diagnosis Procedure	312	EPS/DAST 3	338	F
EPS/DAST 3 : Component Inspection	313	EPS/DAST 3 : DTC Description	338	
DAST 1	313	EPS/DAST 3 : Diagnosis Procedure	338	
DAST 1 : DTC Description	313	C13C6-00 G SENSOR SIGNAL	340	
DAST 1 : Diagnosis Procedure	314	EPS/DAST 3	340	STC
DAST 1 : Component Inspection	315	EPS/DAST 3 : DTC Description	340	
DAST 2	315	EPS/DAST 3 : Diagnosis Procedure	340	
DAST 2 : DTC Description	315	C13C7-00 VEHICLE SPEED SIGNAL	342	H
DAST 2 : Diagnosis Procedure	316	EPS/DAST 3	342	
DAST 2 : Component Inspection	317	EPS/DAST 3 : DTC Description	342	
C13BA-00 CONTROL MODULE POWER SUPPLY	318	EPS/DAST 3 : Diagnosis Procedure	342	I
EPS/DAST 3	318	C13C9-00 DRIVE MODE SIGNAL	344	
EPS/DAST 3 : DTC Description	318	EPS/DAST 3	344	J
EPS/DAST 3 : Diagnosis Procedure	318	EPS/DAST 3 : DTC Description	344	
DAST 1	319	EPS/DAST 3 : Diagnosis Procedure	344	
DAST 1 : DTC Description	319	C13CA-00 ENGINE STATUS SIGNAL	346	K
DAST 1 : Diagnosis Procedure	320	EPS/DAST 3	346	
DAST 2	321	EPS/DAST 3 : DTC Description	346	
DAST 2 : DTC Description	321	EPS/DAST 3 : Diagnosis Procedure	346	L
DAST 2 : Diagnosis Procedure	321	C13CC-00 T/M GEAR POSI SIGNAL	348	
C13BB-00 CONTROL MODULE POWER SUPPLY	323	EPS/DAST 3	348	M
EPS/DAST 3	323	EPS/DAST 3 : DTC Description	348	
EPS/DAST 3 : DTC Description	323	EPS/DAST 3 : Diagnosis Procedure	348	
EPS/DAST 3 : Diagnosis Procedure	323	C13CD-00 ENGINE SPEED SIGNAL	350	N
DAST 1	324	EPS/DAST 3	350	
DAST 1 : DTC Description	324	EPS/DAST 3 : DTC Description	350	O
DAST 1 : Diagnosis Procedure	325	EPS/DAST 3 : Diagnosis Procedure	350	
DAST 2	326	C13CE-00 SLEEP/WAKE SIGNAL	352	P
DAST 2 : DTC Description	326	EPS/DAST 3	352	
DAST 2 : Diagnosis Procedure	326	EPS/DAST 3 : DTC Description	352	
C13BC-00 CONTROL MODULE IGN POWER SUP	328	EPS/DAST 3 : Diagnosis Procedure	352	
DTC Description	328	C13CF-00 ALC FUNCTION REQUEST SIG-		
Diagnosis Procedure	328	NAL	354	

DAST 1	354	EPS/DAST 3	373
DAST 1 : DTC Description	354	EPS/DAST 3 : DTC Description	373
DAST 1 : Diagnosis Procedure	354	EPS/DAST 3 : Diagnosis Procedure	373
C13D0-00 ALC FUNCTION REQUEST SIGNAL	356	DAST 1	373
DAST 1	356	DAST 1 : DTC Description	374
DAST 1 : DTC Description	356	DAST 1 : Diagnosis Procedure	374
DAST 1 : Diagnosis Procedure	356	DAST 2	374
C13D1-00 STEERING ANGLE SIGNAL	358	DAST 2 : DTC Description	374
DAST 1	358	DAST 2 : Diagnosis Procedure	375
DAST 1 : DTC Description	358	C13D6-00 CONTROL MODULE	376
DAST 1 : Diagnosis Procedure	358	EPS/DAST 3	376
C13D2-00 CONTROL MODULE	360	EPS/DAST 3 : DTC Description	376
EPS/DAST 3	360	EPS/DAST 3 : Diagnosis Procedure	376
EPS/DAST 3 : DTC Description	360	EPS/DAST 3 : Component Inspection	377
EPS/DAST 3 : Diagnosis Procedure	360	DAST 1	378
DAST 1	360	DAST 1 : DTC Description	378
DAST 1 : DTC Description	361	DAST 1 : Diagnosis Procedure	378
DAST 1 : Diagnosis Procedure	361	DAST 1 : Component Inspection	379
DAST 2	361	DAST 2	380
DAST 2 : DTC Description	361	DAST 2 : DTC Description	380
DAST 2 : Diagnosis Procedure	362	DAST 2 : Diagnosis Procedure	381
C13D3-00 CONTROL MODULE	363	DAST 2 : Component Inspection	381
EPS/DAST 3	363	C13D7-00 CONTROL MODULE	383
EPS/DAST 3 : DTC Description	363	EPS/DAST 3	383
EPS/DAST 3 : Diagnosis Procedure	363	EPS/DAST 3 : DTC Description	383
DAST 1	363	EPS/DAST 3 : Diagnosis Procedure	383
DAST 1 : DTC Description	364	DAST 1	383
DAST 1 : Diagnosis Procedure	364	DAST 1 : DTC Description	384
DAST 2	364	DAST 1 : Diagnosis Procedure	384
DAST 2 : DTC Description	364	DAST 2	384
DAST 2 : Diagnosis Procedure	365	DAST 2 : DTC Description	384
C13D4-00 CONTROL MODULE	366	DAST 2 : Diagnosis Procedure	385
EPS/DAST 3	366	C13D8-00 CONTROL MODULE	386
EPS/DAST 3 : DTC Description	366	EPS/DAST 3	386
EPS/DAST 3 : Diagnosis Procedure	366	EPS/DAST 3 : DTC Description	386
EPS/DAST 3 : Component Inspection	367	EPS/DAST 3 : Diagnosis Procedure	386
DAST 1	368	EPS/DAST 3 : Component Inspection	387
DAST 1 : DTC Description	368	DAST 1	387
DAST 1 : Diagnosis Procedure	368	DAST 1 : DTC Description	388
DAST 1 : Component Inspection	369	DAST 1 : Diagnosis Procedure	388
DAST 2	370	DAST 1 : Component Inspection	389
DAST 2 : DTC Description	370	C13D9-00 CONTROL MODULE	390
DAST 2 : Diagnosis Procedure	371	EPS/DAST 3	390
DAST 2 : Component Inspection	371	EPS/DAST 3 : DTC Description	390
C13D5-00 CONTROL MODULE	373	EPS/DAST 3 : Diagnosis Procedure	390
		DAST 1	390
		DAST 1 : DTC Description	390
		DAST 1 : Diagnosis Procedure	391

C13DB-00 STEERING TORQUE SENSOR	392	C13E4-00 ST CLUTCH RELEASE PROTECTION	415	A
DAST 1	392	EPS/DAST 3	415	B
DAST 1 : DTC Description	392	EPS/DAST 3 : DTC Description	415	
DAST 1 : Diagnosis Procedure	392	EPS/DAST 3 : Diagnosis Procedure	415	
C13DC-00 STEERING TORQUE SENSOR	395	EPS/DAST 3 : Component Inspection	416	
DAST 1	395	C13E5-00 ST CLUTCH RELEASE PROTECTION	418	C
DAST 1 : DTC Description	395	EPS/DAST 3	418	D
DAST 1 : Diagnosis Procedure	395	EPS/DAST 3 : DTC Description	418	
C13DD-00 STEERING TORQUE SENSOR	398	EPS/DAST 3 : Diagnosis Procedure	418	
DAST 1	398	EPS/DAST 3 : Component Inspection	419	E
DAST 1 : DTC Description	398	C13E6-00 HEAT PROTECTION	421	
DAST 1 : Diagnosis Procedure	398	EPS/DAST 3	421	F
C13DE-00 TEMPERATURE SENSOR	401	EPS/DAST 3 : DTC Description	421	
EPS/DAST 3	401	EPS/DAST 3 : Diagnosis Procedure	421	
EPS/DAST 3 : DTC Description	401	EPS/DAST 3 : Component Inspection	423	
EPS/DAST 3 : Diagnosis Procedure	401	DAST 1	424	STC
EPS/DAST 3 : Component Inspection	403	DAST 1 : DTC Description	424	
DAST 1	403	DAST 1 : Diagnosis Procedure	425	H
DAST 1 : DTC Description	403	DAST 2	425	
DAST 1 : Diagnosis Procedure	404	DAST 2 : DTC Description	425	I
DAST 2	404	DAST 2 : Diagnosis Procedure	426	
DAST 2 : DTC Description	404	C13E7-00 LOW VOLTAGE PROTECTION	427	J
DAST 2 : Diagnosis Procedure	405	EPS/DAST 3	427	
C13DF-00 CONTROL MODULE	407	EPS/DAST 3 : DTC Description	427	
DAST 1	407	EPS/DAST 3 : Diagnosis Procedure	427	K
DAST 1 : DTC Description	407	DAST 1	428	
DAST 1 : Diagnosis Procedure	407	DAST 1 : DTC Description	428	L
C13E0-00 ST CLUTCH COMMAND CIRCUIT. 408		DAST 1 : Diagnosis Procedure	429	
EPS/DAST 3	408	DAST 2	429	M
EPS/DAST 3 : DTC Description	408	DAST 2 : DTC Description	430	
EPS/DAST 3 : Diagnosis Procedure	408	DAST 2 : Diagnosis Procedure	430	
EPS/DAST 3 : Component Inspection	409	C13E8-00 CURB STONE PROTECTION	432	N
C13E1-00 STEERING CLUTCH	410	EPS/DAST 3	432	
EPS/DAST 3	410	EPS/DAST 3 : DTC Description	432	
EPS/DAST 3 : DTC Description	410	EPS/DAST 3 : Diagnosis Procedure	432	O
EPS/DAST 3 : Diagnosis Procedure	410	DAST 1	433	
EPS/DAST 3 : Component Inspection	411	DAST 1 : DTC Description	433	
C13E2-00 FRONT WHEEL SENSOR SIGNAL. 413		DAST 1 : Diagnosis Procedure	434	P
EPS/DAST 3	413	DAST 2	434	
EPS/DAST 3 : DTC Description	413	DAST 2 : DTC Description	434	
EPS/DAST 3 : Diagnosis Procedure	413	DAST 2 : Diagnosis Procedure	435	
C13E3-00 SPIRAL CABLE PROTECTION	414	C13E9-00 BOOTING ANGLE PROCESSING .	436	
EPS/DAST 3	414	DAST 1	436	
EPS/DAST 3 : DTC Description	414	DAST 1 : DTC Description	436	
EPS/DAST 3 : Diagnosis Procedure	414	DAST 1 : Diagnosis Procedure	436	

C13EA-00 BOOTING ANGLE PROCESSING	439	C13F2-00 MISMATCHED SOFTWARE VER-	460
EPS/DAST 3	439	SION	460
EPS/DAST 3 : DTC Description	439	EPS/DAST 3	460
EPS/DAST 3 : Diagnosis Procedure	439	EPS/DAST 3 : DTC Description	460
C13EB-00 BOOTING ANGLE PROCESSING	441	EPS/DAST 3 : Diagnosis Procedure	460
DAST 1	441	DAST 1	460
DAST 1 : DTC Description	441	DAST 1 : DTC Description	460
DAST 1 : Diagnosis Procedure	441	DAST 1 : Diagnosis Procedure	461
DAST 2	443	DAST 2	461
DAST 2 : DTC Description	443	DAST 2 : DTC Description	461
DAST 2 : Diagnosis Procedure	444	DAST 2 : Diagnosis Procedure	462
C13EE-00 INCOMP CONFIG	447	U1000-01 CAN COMM CIRCUIT	463
EPS/DAST 3	447	EPS/DAST 3	463
EPS/DAST 3 : DTC Description	447	EPS/DAST 3 : DTC Description	463
EPS/DAST 3 : Diagnosis Procedure	447	EPS/DAST 3 : Diagnosis Procedure	463
DAST 1	448	DAST 1	463
DAST 1 : DTC Description	448	DAST 1 : DTC Description	463
DAST 1 : Diagnosis Procedure	448	DAST 1 : Diagnosis Procedure	464
DAST 2	449	U1010-49 CONTROL UNIT (CAN)	465
DAST 2 : DTC Description	449	EPS/DAST 3	465
DAST 2 : Diagnosis Procedure	449	EPS/DAST 3 : DTC Description	465
C13EF-00 CONFIG CHECK RESULT	451	EPS/DAST 3 : Diagnosis Procedure	465
EPS/DAST 3	451	DAST 1	465
EPS/DAST 3 : DTC Description	451	DAST 1 : DTC Description	466
EPS/DAST 3 : Diagnosis Procedure	451	DAST 1 : Diagnosis Procedure	466
DAST 1	452	POWER SUPPLY AND GROUND CIRCUIT ...	467
DAST 1 : DTC Description	452	Diagnosis Procedure	467
DAST 1 : Diagnosis Procedure	452	POWER STEERING WARNING LAMP	472
DAST 2	453	Component Function Check	472
DAST 2 : DTC Description	453	Diagnosis Procedure	472
DAST 2 : Diagnosis Procedure	453	SYMPTOM DIAGNOSIS	473
C13F0-00 INCOMP DAST CALIBRATION	455	SYSTEM SYMPTOM	473
EPS/DAST 3	455	Symptom Table	473
EPS/DAST 3 : DTC Description	455	THE VEHICLE PULLS TO ONE SIDE	476
EPS/DAST 3 : Diagnosis Procedure	455	Description	476
DAST 1	455	Diagnosis Procedure	476
DAST 1 : DTC Description	456	BIG OFF-CENTER OCCURS	478
DAST 1 : Diagnosis Procedure	456	Description	478
DAST 2	456	Diagnosis Procedure	478
DAST 2 : DTC Description	456	POWER STEERING WARNING LAMP DOSE	
DAST 2 : Diagnosis Procedure	457	NOT TURN ON	481
C13F1-00 INCOMP ST ANG SEN ADJUST	458	Description	481
EPS/DAST 3	458	Diagnosis Procedure	481
EPS/DAST 3 : DTC Description	458	POWER STEERING WARNING LAMP DOSE	
EPS/DAST 3 : Diagnosis Procedure	458	NOT TURN OFF	482
		Description	482

Diagnosis Procedure	482	TYPE 7	489	
SYSTEM IS NOT DISPLAYED ON CONSULT. 483		TYPE 7 : Diagnosis Procedure	489	A
Description	483	TYPE 8	490	
TYPE 1	483	TYPE 8 : Diagnosis Procedure	490	B
TYPE 1 : Diagnosis Procedure	483	REMOVAL AND INSTALLATION	491	
TYPE 2	485	STEERING FORCE CONTROL MODULE	491	C
TYPE 2 : Diagnosis Procedure	485	Exploded View	491	
TYPE 3	485	Removal and Installation	492	
TYPE 3 : Diagnosis Procedure	485	STEERING ANGLE MAIN CONTROL MOD- ULE	493	D
TYPE 4	486	Exploded View	493	
TYPE 4 : Diagnosis Procedure	486	Removal and Installation	493	E
TYPE 5	487	STEERING ANGLE SUB CONTROL MOD- ULE	494	F
TYPE 5 : Diagnosis Procedure	487	Exploded View	494	
TYPE 6	488	Removal and Installation	494	
TYPE 6 : Diagnosis Procedure	488			
				STC
				H
				I
				J
				K
				L
				M
				N
				O
				P

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:000000013509513

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery or batteries, and wait at least 3 minutes before performing any service.

Precautions for Performing 2-wheel Drive Test

INFOID:000000013509514

A vehicle with 2.2L diesel engine or 2.0L turbo gasoline engine of this model limits torque when a difference occurs in each wheel speed. For this reason, it is necessary to use Chassis Dynamometer Mode when performing the 2-wheel drive test (e.g. with 2-wheel chassis dynamometer, speedometer tester).

For Chassis Dynamometer Mode, refer to ENGINE >> ENGINE CONTROL SYSTEM >> BASIC INSPECTION >> CHASSIS DYNAMOMETER MODE >> Description.

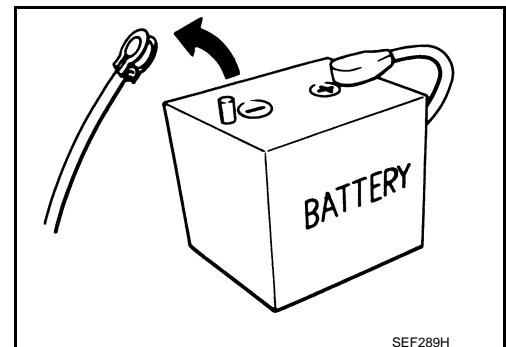
Precautions for Removing Battery Terminal

INFOID:000000013509512

When disconnecting the battery terminal, pay attention to the following.

- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.
- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

BR08DE	: 4 minutes	V9X engine	: 4 minutes
D4D engine	: 20 minutes	YD25DDTi	: 2 minutes
HR09DET	: 12 minutes	YS23DDT	: 4 minutes
HRA2DDT	: 12 minutes	YS23DDTT	: 4 minutes
K9K engine	: 4 minutes	ZD30DDTi	: 60 seconds



PRECAUTIONS

< PRECAUTION >

[HYDRAULIC PUMP ELECTRIC P/S]

M9R engine : 4 minutes ZD30DDTT : 60 seconds
R9M engine : 4 minutes

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

- After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:

- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
 - Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
 - Driving for 30 minutes or more on a steep slope.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:

The removal of 12V battery may cause a DTC detection error.

Service Notice and Precautions for Hydraulic Pump Electric Power Steering System

INFOID:0000000013355690

STC

- Check if air pressure and size of tires are proper, the specified part is used for the steering wheel is genuine part.
- Check if the connection of steering column assembly and steering gear assembly is proper (there is not looseness of mounting bolts, damage of rods, boots or sealants, and leakage of grease, etc.).
- Check if the wheel alignment is adjusted properly.
- Check if there is any damage or modification to suspension or body resulting in increased weight or altered ground clearance.
- Check if installation conditions of each link and suspension are proper.
- Check if the battery voltage is proper.
- Check connection conditions of each connector are proper.
- Check that NISSAN genuine power steering fluid (E-PSF) is used. If power steering fluid other than genuine fluid is used, steering may become extremely hard.
- You may hear a high pitch noise from the front of the vehicle when the steering wheel is operated, especially at low speed such as a parking lot. However this is not a malfunction. Steer at low speed condition makes higher load for steering rack, so pump works higher rotation to provide more hydraulic flow to create more power assistance for lighter steering effort. This pump rotation is electrically controlled based on rotation map in ECU.
- Before connecting or disconnecting the power steering control module harness connector, turn ignition switch "OFF" and disconnect battery ground cable. Because battery voltage is applied to power steering control module even if ignition switch is turned "OFF".

COMPONENT PARTS

< SYSTEM DESCRIPTION >

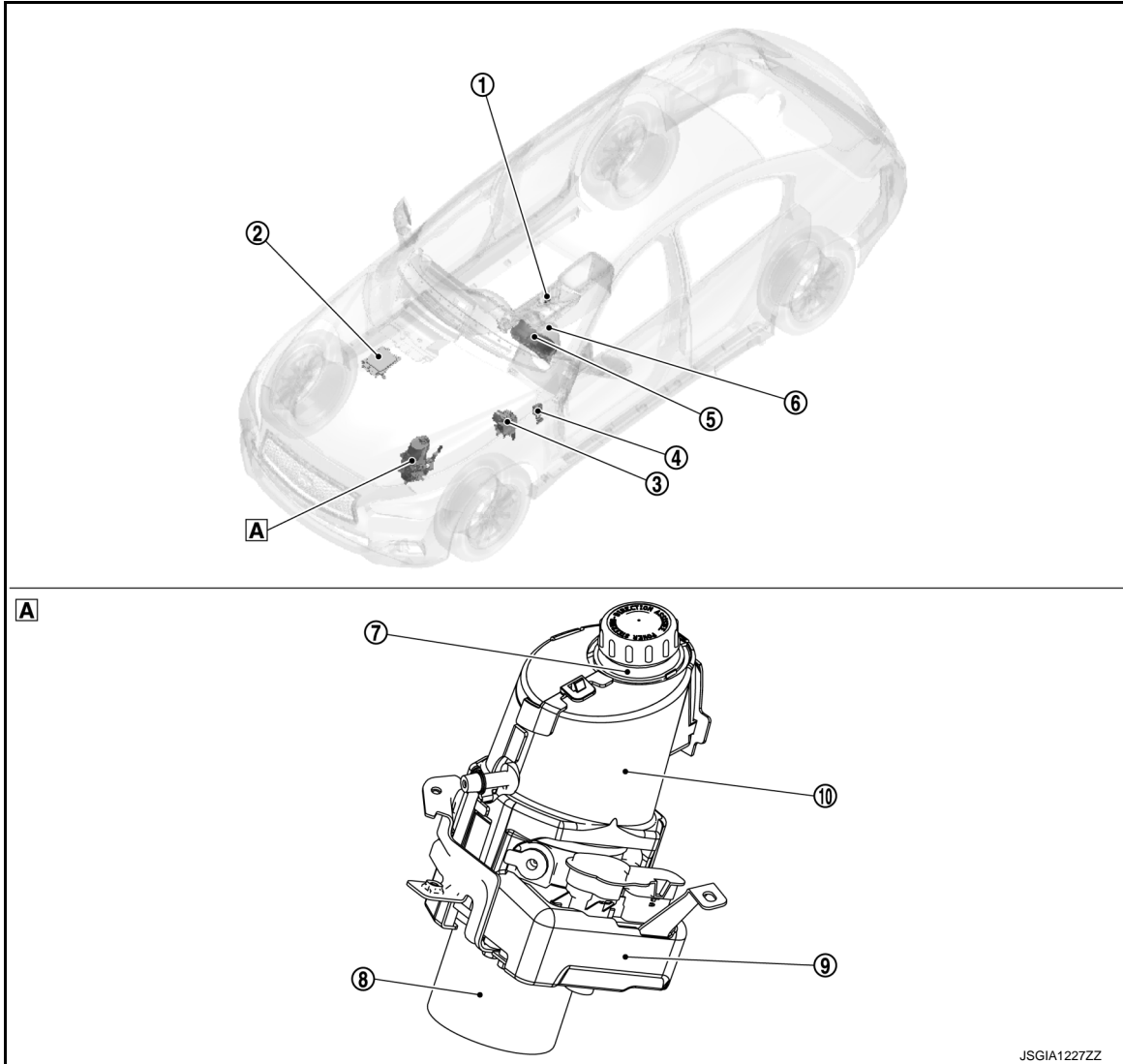
[HYDRAULIC PUMP ELECTRIC P/S]

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:000000013355691



A Engine room left side

JSGIA1227ZZ

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[HYDRAULIC PUMP ELECTRIC P/S]

No.	Component	Function	
①	Drive mode select switch	<ul style="list-style-type: none"> • Drive mode is selectable among PERSONAL, SPORT, and STANDARD by the operating the switch. • Output the status of drive mode to the chassis control module. • For detailed installation location, refer to DMS-4, "Component Parts Location". 	A B
②	ECM	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Engine status signal - Stop/Start status signal • Receives mainly the following signals from steering force control module via CAN communication. <ul style="list-style-type: none"> - Steering torque signal • For detailed installation location, refer to EC4-25, "ENGINE CONTROL SYSTEM : Component Parts Location". 	C D E
③	ABS actuator and electric unit (control unit)	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Vehicle speed signal (ABS) • For detailed installation location, refer to BRC-10, "Component Parts Location". 	F
④	Chassis control module	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Drive mode signal • For detailed installation location, refer to DAS-516, "Component Parts Location". 	STC
⑤	Combination meter (Power steering warning lamp)	<ul style="list-style-type: none"> • Transmits mainly the following signals to power steering control module via CAN communication. <ul style="list-style-type: none"> - Vehicle speed signal (Meter) • For detailed installation location, refer to MWI-8, "METER SYSTEM : Component Parts Location". • Turns ON the power steering warning lamp according to the signal from the power steering control module via CAN communication. • For power steering warning lamp, refer to STC-21, "WARNING/INDICATOR/CHIME LIST : Warning Lamp/Indicator Lamp". 	H I J
⑥	Steering angle sensor	<ul style="list-style-type: none"> • Transmits mainly the following signals to power steering control module via CAN communication. <ul style="list-style-type: none"> - Steering angle sensor signal - Steering angle speed signal - Steering angle sensor malfunction signal • For detailed installation location, refer to BRC-10, "Component Parts Location". 	K L
⑦	Power steering oil pump assembly	Reservoir tank	M
⑧		Power steering motor	
⑨		Power steering control module	
⑩		Power steering oil pump	
		STC-16, "Power Steering Oil Pump Assembly"	N

COMPONENT PARTS

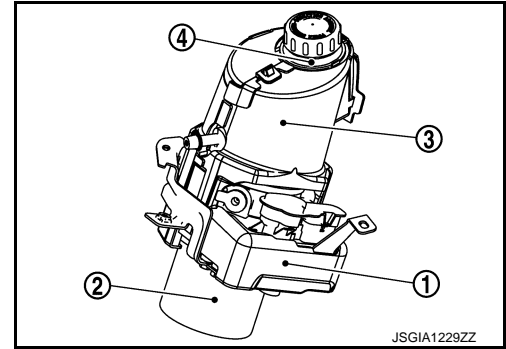
< SYSTEM DESCRIPTION >

[HYDRAULIC PUMP ELECTRIC P/S]

Power Steering Oil Pump Assembly

INFOID:000000013355692

The power steering oil pump assembly is primarily composed of power steering control module ①, power steering motor ②, power steering oil pump ③, and reservoir tank ④.



POWER STEERING CONTROL MODULE

By receiving steering angle sensor signal and vehicle speed signal, the power steering control module calculates hydraulic pressure of the hydraulic pump electric power steering system according to the driving conditions. The power steering control module controls the power steering motor.

POWER STEERING MOTOR

The power steering motor is controlled by the power steering control module and drives the power steering oil pump.

POWER STEERING OIL PUMP

The power steering oil pump is driven by the power steering motor and generates hydraulic oil pressure in the system.

RESERVOIR TANK

Fluid is filled from the reservoir tank.

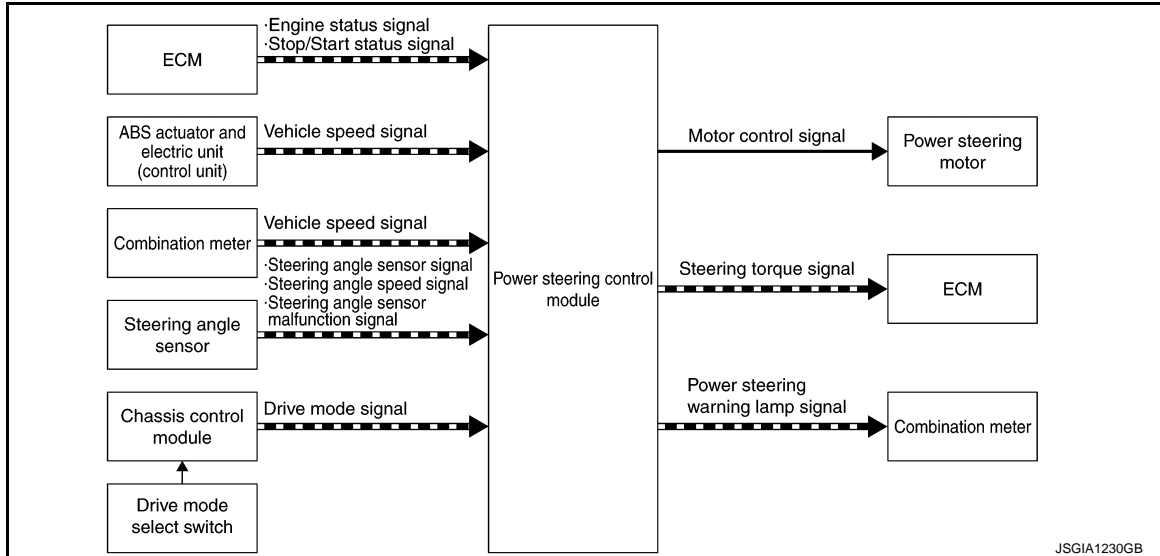
SYSTEM

HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM

HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM : System Description

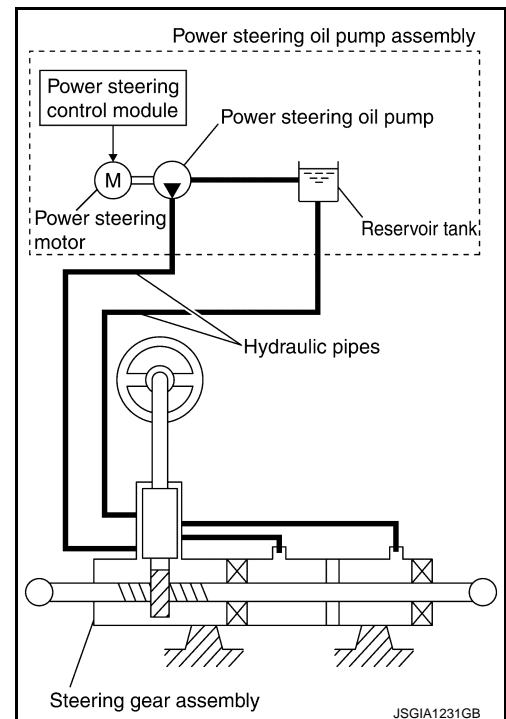
INFOID:0000000113355693

SYSTEM DIAGRAM



DESCRIPTION

- The system is composed primarily of the power steering oil pump assembly (power steering control module, power steering motor, power steering oil pump, and reservoir tank), hydraulic pipes, and steering gear assembly.
- The power steering control module controls the speed of the power steering motor according to the vehicle speed and steering angle speed. By changing the power steering oil pump flow, the power steering control module controls the steering assist force.
- According to the power steering motor control, the system hydraulic pressure is transmitted from the power steering motor to power steering oil pump. The power steering oil pump is driven by the system hydraulic pressure.
- After engine start, the hydraulic pump electric power steering system performs control.
- When a malfunction occurs in the system, the fail-safe function stops the hydraulic pump electric power steering system (manual steering state) or restricts its operation (Constant steering assist level state). Refer to [STC-20. "HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM : Fail-safe"](#).
- When the power steering function is used continuously in an extreme manner, the protective function reduces the output to the power steering motor. Refer to [STC-20. "HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM : Protection Function"](#).
- When the driver turns the steering wheel (torque application exceeding the specified torque) during stop/start, the power steering control module restarts the engine (disables stop/start system) and immediately brings the assist control in its ready-to-start state.
- If power steering system becomes out of order, the power steering warning lamp blinks and the Stop/Start System brings about such conditions as follows:
 - Stop/start mode is not enabled under non stop/start state.
 - The engine is restarted during stop/start, regardless of steering wheel operation.



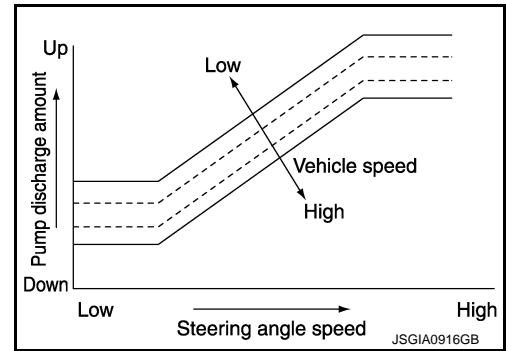
OPERATION CHARACTERISTICS

SYSTEM

< SYSTEM DESCRIPTION >

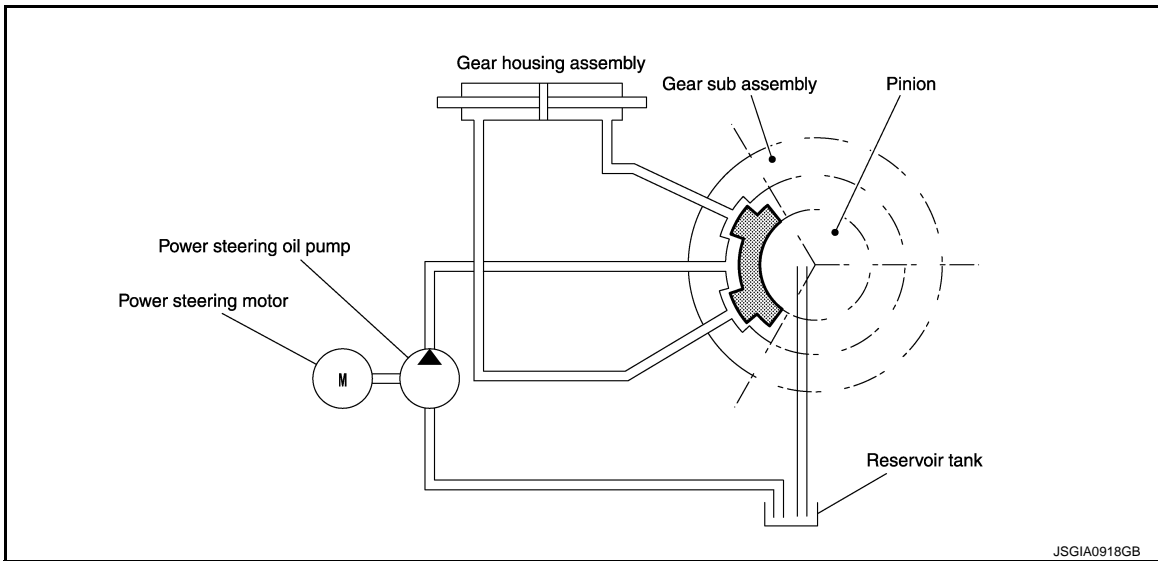
[HYDRAULIC PUMP ELECTRIC P/S]

- When the steering angle speed is high or the vehicle speed is low, force is generated by increasing discharge amount from the power steering oil pump and by raising system hydraulic pressure.
- With Infiniti Drive Mode Selector, the steering characteristics can be set corresponding to the preference of the driver. For details, refer to [DMS-13. "Infiniti Drive Mode Selector : System Description \(For 2.0L Turbo Gasoline Engine Models\)"](#).



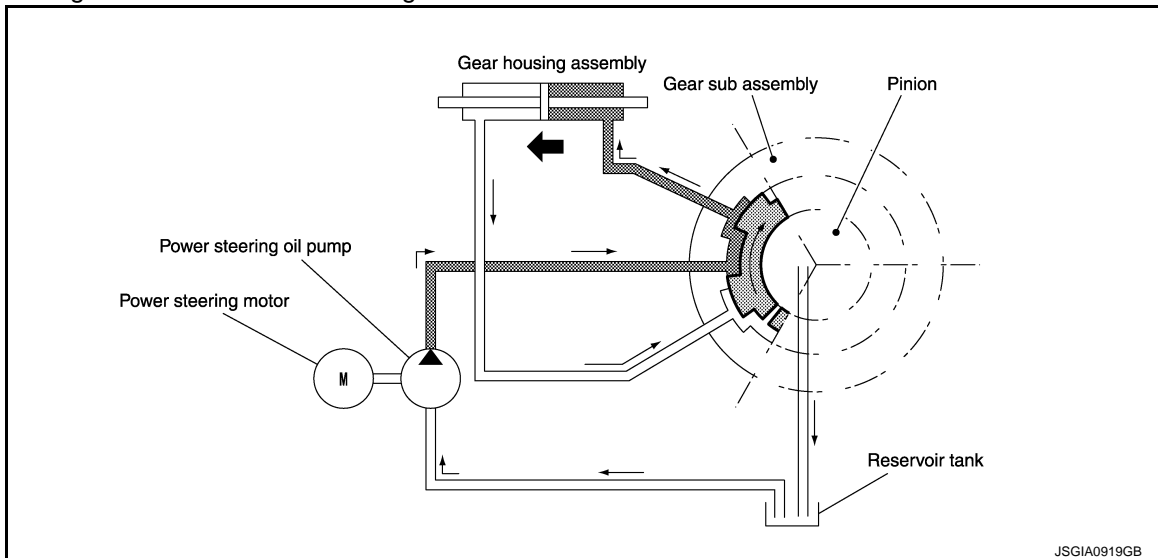
OPERATION PRINCIPLE

When Steering Wheel is in the Neutral Position



Because the hydraulic routes open at the power steering pump, gear housing right side, gear housing left side, and reservoir tank, the hydraulic pressure applied to the right side and left side of the gear housing is equal and no steering assist force is generated.

When Steering Wheel is Rotated to the Right



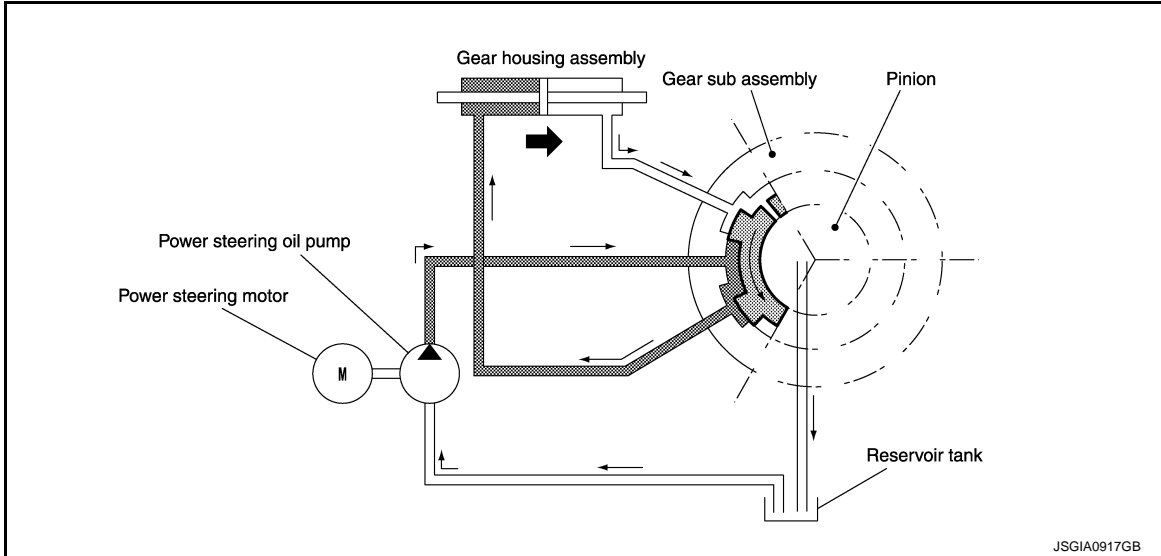
The hydraulic routes open from power steering pump to gear housing right side and from gear housing left side to reservoir tank, providing left direction assist force to the rack.

SYSTEM

< SYSTEM DESCRIPTION >

[HYDRAULIC PUMP ELECTRIC P/S]

When Steering Wheel is Rotated to the Left



The hydraulic routes open from power steering pump to gear housing left side and from gear housing right side to reservoir tank, providing right direction assist force to the rack.

CONDITIONS FOR POWER STEERING WARNING LAMP ON

- When the hydraulic pump electric power steering system is operating and steering assist force is being generated, the power steering warning lamp is OFF.
- When the hydraulic pump electric power steering system is stopped by the fail-safe or protective function and steering assist force is not being generated, the power steering warning lamp turns ON to inform the driver that the system is in the manual steering state.

NOTE:

When the hydraulic pump electric power steering system turns ON according to the protection system, the cause is internal high temperature state of the hydraulic pump electric power steering system. By stopping the engine, internal temperature of the system decreases. After starting the engine, the system returns to the normal state and the power steering warning lamp turns OFF. (The system is not malfunctioning.) For information about the protective function, refer to [STC-20. "HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM : Protection Function"](#).

- When the ignition switch is turned ON, this lamp turns ON for lamp check (system check). When the system is operating normally, the lamp turns OFF after the engine starts.

Condition	Power steering warning lamp
Ignition switch ON. (Lamp check)	ON
After engine start (steering assist force is generated)	OFF
When steering assist is stopped	ON

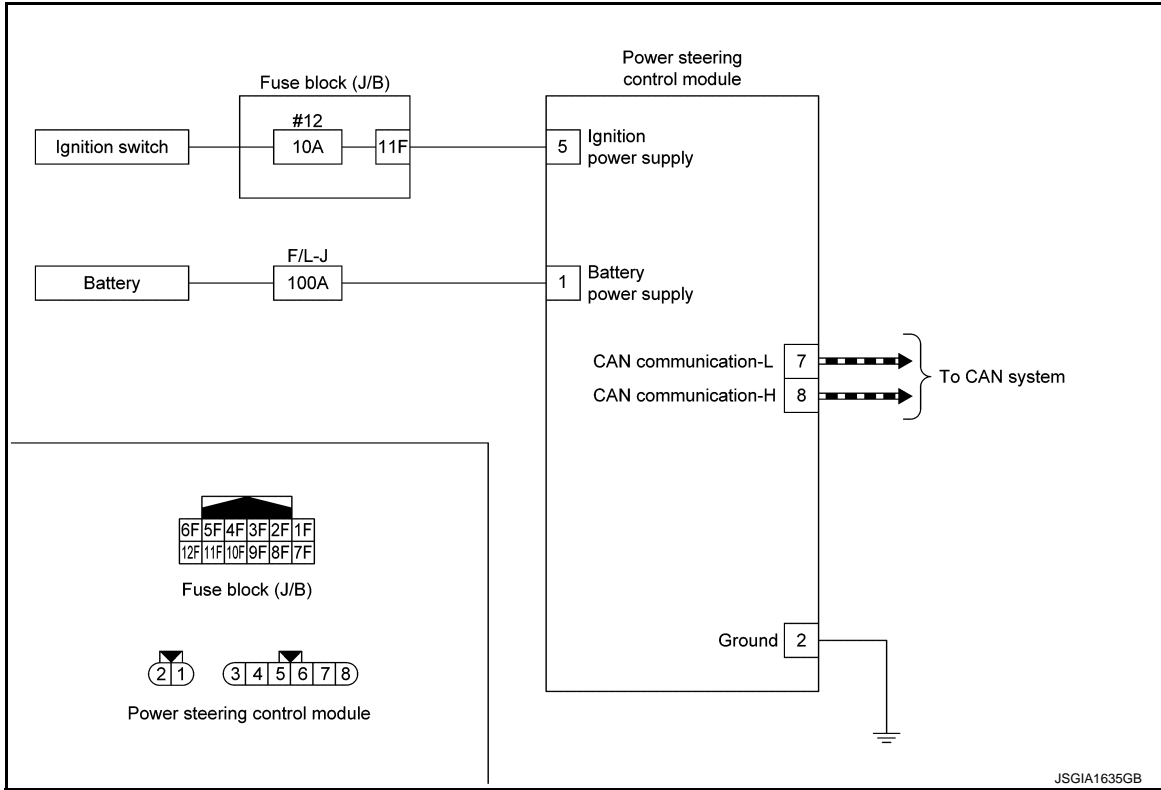
SYSTEM

< SYSTEM DESCRIPTION >

[HYDRAULIC PUMP ELECTRIC P/S]

HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM : Circuit Diagram

INFOID:000000013355694



HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM : Fail-safe

INFOID:000000013355695

When an error occurs in the hydraulic pump electric power steering system, fail-safe brings the system to a halt (manual steering) or restricted (constant steering assist level) state. When the system is in a halt state, fail-safe turns ON the power steering warning lamp to warn the driver that the hydraulic pump electric power steering system is in the manual steering state.

DTC	Fail-safe condition
C1143	Constant steering assist level state
C1601	Manual steering state
C1602	Constant steering assist level state
C1606	Manual steering state
C1607	Constant steering assist level state
C1608	Manual steering state
C1609	Constant steering assist level state
U1000	Normal control NOTE: If the cause is in a different ECU, the state changes to fixed steering assist force.

HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM : Protection Function

INFOID:000000013355696

- When the steering wheel is operated repeatedly or turned all the way for a long period during parking or low speed driving, the function of the hydraulic pump electric power steering system becomes limited to prevent the system from overheating. If the steering wheel is operated further more, the hydraulic pump electric power steering system stops and the power steering warning lamp may be turned ON. In this case, the steering wheel operation temporarily becomes hard. This is not a malfunction. When the engine is turned OFF (ignition switch OFF) and steering operation is stopped for a while, the temperature of the hydraulic pump electric power steering system decreases and the steering operation returns to normal after restarting the engine.

SYSTEM

< SYSTEM DESCRIPTION >

[HYDRAULIC PUMP ELECTRIC P/S]


- Then, the power steering warning lamp turns OFF. If the system is OFF under the protection state, the power steering warning lamp turns ON to warn that the system is in the manual steering state. (This is not a system malfunction.) In addition, the following DTC remains to distinguish from malfunction.

DTC	vehicle condition
C160A	The system temporarily enters the manual steering state. (This is not a hydraulic pump electric power steering system malfunction.)

WARNING/INDICATOR/CHIME LIST

WARNING/INDICATOR/CHIME LIST : Warning Lamp/Indicator Lamp

INFOID:0000000013355697

Name	Design	Layout/Function
Power steering warning lamp		<p>For layout, refer to MWI-9, "METER SYSTEM : Design".</p> <p>For function, refer to MWI-40, "WARNING LAMPS/INDICATOR LAMPS : Power Steering Warning Lamp (Except Direct Adaptive Steering)".</p>

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

DIAGNOSIS SYSTEM (POWER STEERING CONTROL MODULE)

< SYSTEM DESCRIPTION >

[HYDRAULIC PUMP ELECTRIC P/S]

DIAGNOSIS SYSTEM (POWER STEERING CONTROL MODULE)

CONSULT Function

INFOID:000000013355698

APPLICATION ITEMS

CONSULT can display each diagnostic item using the diagnostic test modes shown as per the following.

Diagnostic test mode	Function
ECU identification	The part number stored in the control unit can be read.
Self Diagnostic Results	Self-diagnostic results and freeze frame data can be read and erased quickly*
Data monitor	Input/Output data in the power steering control module can be read.

*: The following diagnosis information is erased by erasing.

ECU IDENTIFICATION

Displays the part number stored in the control unit.

SELF-DIAG RESULTS MODE

Refer to [STC-25, "DTC Index"](#).

When "CRNT" is displayed on self-diagnosis result.

- The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result.

- System malfunction in the past is detected, but the system is presently normal.

DATA MONITOR MODE

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Monitor item (Unit)	Remarks
BATTERY VOLT (V)	Displays the power supply voltage for power steering control module.
AUTO STOP START FLAG (OK/NG)	Displays a stop/start permission state of the EPS control unit.
AUTO STOP START STATUS (On/CRANK/Off)	Displays a stop/start state received via CAN communication.
Idle Stop Act (On/Off)	Displays a stop/start system activation received via CAN communication.
STEERING MODE (NORML/SPORT)	Displays a steering mode received via CAN communication.
STEERING ANGLE (deg)	Displays the steering angle based on steering angle signal transmitted by CAN communications.
STR ANG SPD (deg/s)	Displays the steering angle speed based on the steering angle signal transmitted by CAN communications.
MOTOR CURRENT (A)	Displays the current value consumed by power steering control module.
MTR REV SPD COMM (rpm)	Displays the power steering motor speed command value.
MTR REV SPD (rpm)	Displays the power steering motor speed.
C/U TEMP (°C or °F)	Displays the temperature of the power steering control module.
C/U TEMP A (°C or °F)	Displays the temperature of the power steering control module.
MTR ASSIST (%)	Displays the current percentage of the allowable assist ratio power steering motor.
ESTM VHCL SPD (km/h or mph)	Displays the vehicle speed calculated by the power steering control module.
WARNING LAMP (On/Off)	Power steering warning lamp control status is displayed.
ENGINE STATUS (STOP/RUN/CRANK)	Engine speed is displayed from engine condition signal with CAN communication
VHCL SPD JUDGE (OK/NG)	Displays the receiving status of the vehicle speed signal transmitted by CAN communications.

POWER STEERING CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[HYDRAULIC PUMP ELECTRIC P/S]

ECU DIAGNOSIS INFORMATION

POWER STEERING CONTROL MODULE

Reference Value

INFOID:0000000013355699

VALUES ON THE DIAGNOSIS TOOL

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Monitor item	Data monitor		
	Condition	Display value	
BATTERY VOLT	Engine running	Battery voltage (V)	
AUTO STOP START FLAG	Engine running	No steering wheel operation	OK
		Steering wheel operation	NG
AUTO STOP START STA-TUS	During stop/start system operation		On
	Restart (engine cranking)		CRANK
	Engine running		Off
Idle Stop Act	Stop/start system is active		On
	Stop/start system is not active		Off
STEERING MODE	Steering mode: Standard		NORML
	Steering mode: Sport		SPORT
STEERING ANGLE	The steering wheel is not steered.		Approx. 0.0 deg
	The steering wheel is steered.		Displays steering angle speed (deg)
STR ANG SPD	The steering wheel is not steered.		Approx. 0.0 deg/s
	The steering wheel is steered.		Displays steering angle speed (deg/s)
MOTOR CURRENT	Engine running	Steering wheel: Not steering (There is no steering force)	MAX approx. 10 A ^{*1}
		Steering wheel: Right or left turn	Displays consumption current of power steering control module (A)
MTR REV SPD COMM	Engine running	Steering wheel: Not steering (There is no steering force)	Shows an almost constant value (rpm)
		Steering wheel: Right or left turn	The value changes as a steering speed (rpm)
MTR REV SPD	Engine running	Steering wheel: Not steering (There is no steering force)	Shows an almost constant value (rpm) ^{*2}
		Steering wheel: Right or left turn	The value changes as a steering speed (rpm) ^{*2}
C/U TEMP	Engine running	Displays temperature of inside of power steering control module (°C or °F)	
C/U TEMP A	Engine running	Displays temperature of inside of power steering control module (°C or °F)	
MTR ASSIST	Engine running	100% ^{*3}	
ESTM VHCL SPD	Vehicle stopped	0.00 km/h or mph	
	While driving	Approximately equal to the indication on speedometer ^{*4} (inside of ±10%)	

POWER STEERING CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[HYDRAULIC PUMP ELECTRIC P/S]

Monitor item	Data monitor	
	Condition	Display value
WARNING LAMP	Power steering warning lamp: ON	On
	Power steering warning lamp: OFF	Off
ENGINE STATUS	Engine not running	STOP
	Engine running	RUN
	Engine cranking	CRANK
VHCL SPD JUDGE	Vehicle speed signal can be received via CAN communication	OK
	Vehicle speed signal cannot be received via CAN communication	NG

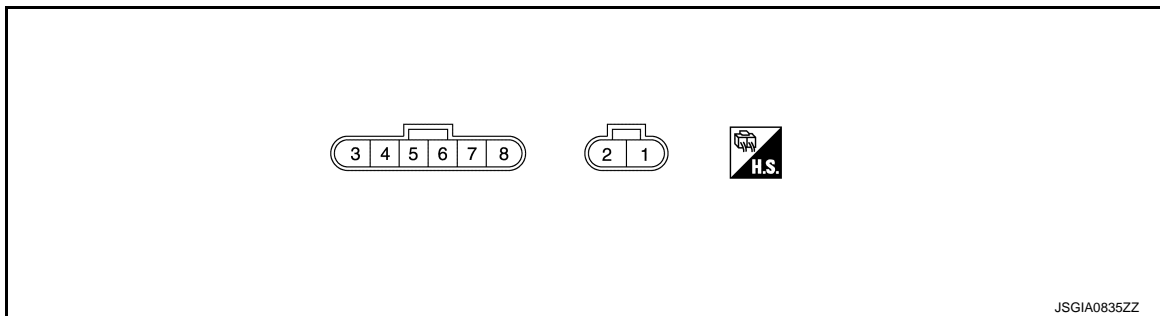
*1: The value changes according to load of power steering motor.

*2: This is in close agreement with a motor speed command value. Although a quick steering operation may cause disagreement, this is not a malfunction.

*3: Usually, 100% is displayed. An excessive steering operation gradually lowers the percentage. When left standing, the percentage returns to 100%.

*4: This may not agree with the speedometer indication immediately after the ignition switch is turned ON. This is not a malfunction.

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire Color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/Output		
1 (BR)	Ground	Battery power supply	Input	Always	8.5 – 18.5 V
2 (B)	Ground	Ground	—	Always	0 V
5 (V)	Ground	Ignition power supply	Input	Ignition switch: ON	8.5 – 18.5 V
				Ignition switch: OFF	0 V
7 (P)	—	CAN-L	Input/Output	—	—
8 (L)	—	CAN-H	Input/Output	—	—

Fail-safe

INFOID:000000013355700

When an error occurs in the hydraulic pump electric power steering system, fail-safe brings the system to a halt (manual steering) or restricted (constant steering assist level) state. When the system is in a halt state, fail-safe turns ON the power steering warning lamp to warn the driver that the hydraulic pump electric power steering system is in the manual steering state.

POWER STEERING CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[HYDRAULIC PUMP ELECTRIC P/S]

DTC	Fail-safe condition
C1143	Constant steering assist level state
C1601	Manual steering state
C1602	Constant steering assist level state
C1606	Manual steering state
C1607	Constant steering assist level state
C1608	Manual steering state
C1609	Constant steering assist level state
U1000	Normal control NOTE: If the cause is in a different ECU, the state changes to fixed steering assist force.

Protection Function

INFOID:0000000013355701

- When the steering wheel is operated repeatedly or turned all the way for a long period during parking or low speed driving, the function of the hydraulic pump electric power steering system becomes limited to prevent the system from overheating. If the steering wheel is operated further more, the hydraulic pump electric power steering system stops and the power steering warning lamp may be turned ON. In this case, the steering wheel operation temporarily becomes hard. This is not a malfunction. When the engine is turned OFF (ignition switch OFF) and steering operation is stopped for a while, the temperature of the hydraulic pump electric power steering system decreases and the steering operation returns to normal after restarting the engine.
- Then, the power steering warning lamp turns OFF. If the system is OFF under the protection state, the power steering warning lamp turns ON to warn that the system is in the manual steering state. (This is not a system malfunction.) In addition, the following DTC remains to distinguish from malfunction.

DTC	vehicle condition
C160A	The system temporarily enters the manual steering state. (This is not a hydraulic pump electric power steering system malfunction.)

DTC Inspection Priority Chart

INFOID:0000000013355702

When multiple DTCs are detected simultaneously, check one by one depending on the following priority list.

Priority	Priority order item (DTC)
1	• C1602 NO TURNING SET
2	• C1601 BATTERY VOLT • C1606 EPS MOTOR • C1608 CONTROL UNIT
3	• C1607 EEPROM
4	• C160A HEAT PROTECTION
5	• C1143 ST ANG SEN CIRCUIT • U1000 CAN COMM CIRCUIT • C1609 CAN VHCL SPEED

DTC Index

INFOID:0000000013355703

DTC	Items	Power steering warning lamp	Reference
C1143	ST ANG SEN CIRCUIT	OFF	STC-38. "DTC Description"
C1601	BATTERY VOLT	ON	STC-39. "DTC Description"
C1602	NO TURNING SET	ON / OFF*1	STC-42. "DTC Description"
C1606	EPS MOTOR	ON	STC-45. "DTC Description"
C1607	EEPROM	ON / OFF*2	STC-46. "DTC Description"

POWER STEERING CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[HYDRAULIC PUMP ELECTRIC P/S]

DTC	Items	Power steering warning lamp	Reference
C1608	CONTROL UNIT	ON / OFF*2	STC-46, "DTC Description"
C1609	CAN VHCL SPEED	OFF	STC-47, "DTC Description"
C160A	HEAT PROTECTION	ON	STC-49, "DTC Description"
U1000	CAN COMM CIRCUIT	OFF	STC-50, "DTC Description"

*1: Power steering warning lamp turns ON/OFF according to a condition when DTC is detected.

*2: Even if DTC is detected, power steering warning lamp does not turns ON when assist torque is generated.

NOTE:

If two or more DTCs are detected, refer to [STC-25, "DTC Inspection Priority Chart"](#).

HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITHOUT CAN GATEWAY)

< WIRING DIAGRAM >

[HYDRAULIC PUMP ELECTRIC P/S]

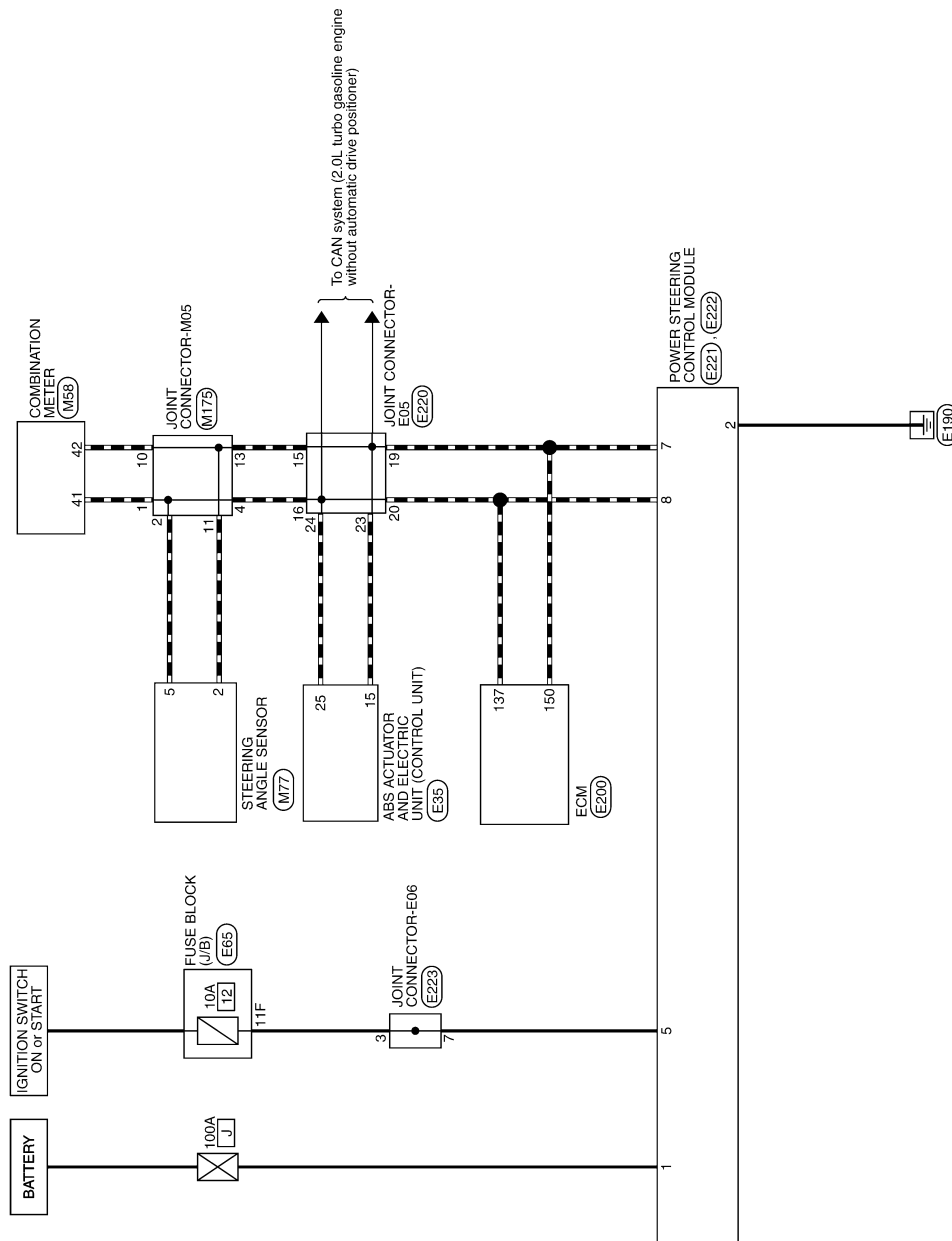
WIRING DIAGRAM

HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITHOUT CAN GATEWAY)

Wiring Diagram

INFOID:0000000013355704

HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITHOUT CAN GATEWAY)



2015/11/27

JRGWC2991GB

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

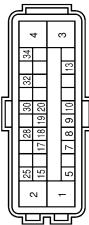
HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITHOUT CAN GATEWAY)

< WIRING DIAGRAM >

[HYDRAULIC PUMP ELECTRIC P/S]

HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITHOUT CAN GATEWAY)

Connector No.	E35
Connector Name	ABS MOTOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Type	SAZ20FB-S124-U



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GND
2	B	GND
3	G	VALVE BATTERY [With VR30 engine]
3	P	VALVE BATTERY [With 2.0L turbo gasoline engine]
4	Y	MOTOR BATTERY
5	LG	STOP LAMP SW SIGNAL [With ADAS]
5	V	STOP LAMP SW SIGNAL [With ASCD]
7	GR	RR LH WHEEL SENSOR SIGNAL
8	G	RR LH WHEEL SENSOR POWER SUPPLY
9	BR	FR RH WHEEL SENSOR SIGNAL
10	GR	FR RH WHEEL SENSOR POWER SUPPLY
13	R	VACUUM SENSOR SIGNAL
15	P	CAN-L [Without Gateway]
15	R	CAN-L [With Gateway]
17	Y	RR RH WHEEL SENSOR SIGNAL
18	LG	RR RH WHEEL SENSOR POWER SUPPLY [With 2.0L turbo gasoline engine]
18	V	RR RH WHEEL SENSOR POWER SUPPLY [With VR30 engine]
19	S8	FR LH WHEEL SENSOR SIGNAL
20	BG	FR LH WHEEL SENSOR POWER SUPPLY
25	L	CAN-H
28	G	VACUUM SENSOR POWER SUPPLY
30	R	WDC OFF SW SIGNAL
32	SHIELD	VACUUM SENSOR GROUND
34	G	IGN



Connector No.	E65
Connector Name	FUSE BLOCK (J/B)
Connector Type	TH12FW-AH

Terminal No.	Color Of Wire	Signal Name [Specification]
10F	W	-
11F	G	- [Color of wire differs depending on production]
11F	R	- [Color of wire differs depending on production]
12F	W	- [With VR30 engine]
12F	Y	- [With 2.0L turbo gasoline engine]
1F	R	-
2F	BR	-
3F	P	-
5F	P	-
6F	L	-
7F	R	-
8F	L	-
9F	L	-



Connector No.	E200
Connector Name	ECM
Connector Type	ADA52FB-AH26

Terminal No.	Color Of Wire	Signal Name [Specification]
97	G	POWER SUPPLY (MAIN)
98	B	ECM GROUND
99	B	POWER SUPPLY (MAIN)
100	B	ECM GROUND
101	G	POWER SUPPLY (MAIN)
102	B	ECM GROUND

Terminal No.	Color Of Wire	Signal Name [Specification]
103	V	COOLING FAN CONTROL SIGNAL (PWM)
104	Y	SENSOR POWER SUPPLY
105	R	SENSOR POWER SUPPLY
106	W	SENSOR GROUND
109	P	ENGINE SPEED SIGNAL
111	G	POWER SUPPLY
116	LG	STARTER RELAY-L
119	BR	SENSOR GROUND
120	BG	SENSOR GROUND
123	BR	MAIN RELAY CONTROL SIGNAL
127	V	FUEL PUMP ON SIGNAL
132	G	ACCELERATOR PEDAL POSITION SENSOR 1
137	L	CAN-H
138	L	DRIVE TRAIN CAN-H
142	GR	BACK-UP LAMP SWITCH
143	LG	REFRIGERANT PRESSURE SENSOR
145	L	ACCELERATOR PEDAL POSITION SENSOR 2
146	L	FUEL TANK PRESSURE SENSOR
148	L	STARTER RELAY-H
150	P	CAN-L
151	P	DRIVETRAIT CAN-L
152	B	EVAP CANISTER VENT CONTROL VALVE
153	G	EVAP PURGE CONTROL VALVE



Connector No.	E220
Connector Name	JOINT CONNECTOR-E05
Connector Type	NH24FB-J

Terminal No.	Color Of Wire	Signal Name [Specification]
3	W	-
4	L	-
7	W	-
8	L	-
11	W	-
12	L	-
15	P	- [Without Gateway]
15	R	- [With Gateway]
16	L	-
19	P	- [Without Gateway]

Terminal No.	Color Of Wire	Signal Name [Specification]
19	R	- [With Gateway]
20	L	-
23	P	- [Without Gateway]
23	R	- [With Gateway]
24	L	-

Connector No.	E221
Connector Name	POWER STEERING CONTROL MODULE
Connector Type	FEAD01#FH42-LC



Terminal No.	Color Of Wire	Signal Name [Specification]
5	V	IGNITION POWER SUPPLY
7	P	CAN-L
8	L	CAN-H



Connector No.	E222
Connector Name	POWER STEERING CONTROL MODULE
Connector Type	renault_8200500194

Terminal No.	Color Of Wire	Signal Name [Specification]
1	BR	BATTERY POWER SUPPLY
2	B	GROUND

JRGWC3171GB

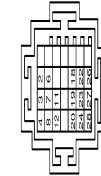
HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITHOUT CAN GATEWAY)

< WIRING DIAGRAM >

[HYDRAULIC PUMP ELECTRIC P/S]

HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITHOUT CAN GATEWAY)

Connector No.	E223
Connector Name	JOINT CONNECTOR-E06
Connector Type	SGA28FB-J



Terminal No.	Color Of Wire	Signal Name [Specification]
2	GR	-
3	G	-
4	BR	-
6	BG	-
7	G	-
8	BR	-
11	G	-
12	L	-
18	V	-
19	W	-
20	BG	-
22	GR	-
23	P	-
24	BR	-
26	V	-
27	W	-
28	BG	-



Connector No.	M58
Connector Name	COMBINATION METER
Connector Type	TH121W-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
41	L	CAN-H
42	P	CAN-L
43	B	ILLUMINATION CONTROL SIGNAL

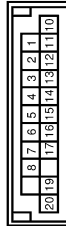
44	Y	FUEL LEVEL SENSOR GROUND
45	W	BATTERY POWER SUPPLY
46	BG	IGNITION SIGNAL [Except with V630 engine and without ISS]
46	R	IGNITION SIGNAL [With V630 engine and without ISS]
47	SB	AV COMMUNICATION SIGNAL (H)
48	LG	AV COMMUNICATION SIGNAL (L)
53	BR	FUEL LEVEL SENSOR SIGNAL
52	B	GROUND

Connector No.	R777
Connector Name	STEERING ANGLE SENSOR
Connector Type	TH087W-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GROUND
2	P	CAN-L [Without Gateway]
2	R	CAN-L [With Gateway]
4	G	IGN
5	L	CAN-H

Connector No.	M175
Connector Name	JOINT CONNECTOR-M05
Connector Type	NH20EL-DC



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	L	-
4	L	-
5	L	-

6	L	-
7	L	-
8	L	-
10	P	-
11	P	-
12	P	-
13	P	-
14	P	-
15	P	-
16	P	- [With V630 engine]
17	P	- [With 2.0L turbo gasoline engine]
17	P	- [With V630 engine]
19	R	- [With 2.0L turbo gasoline engine]
19	R	- [With V630 engine and with ISS]
19	W	- [Except with V630 engine and with ISS]
20	R	- [With V630 engine and with ISS]
20	W	- [Except with V630 engine and with ISS]

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITH CAN GATEWAY)

< WIRING DIAGRAM >

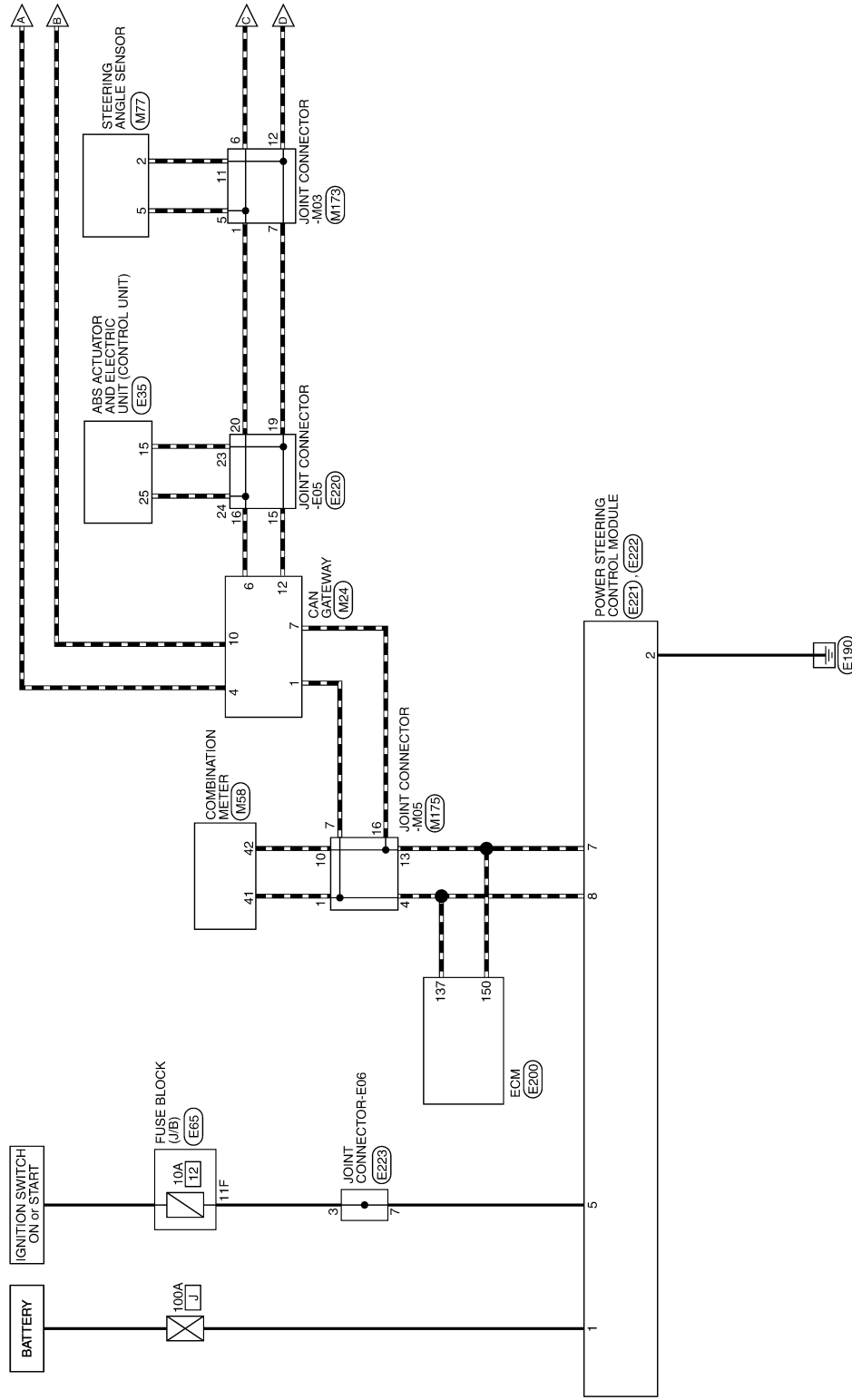
[HYDRAULIC PUMP ELECTRIC P/S]

HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITH CAN GATEWAY)

Wiring Diagram

INFOID:000000013524465

HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITH CAN GATEWAY)



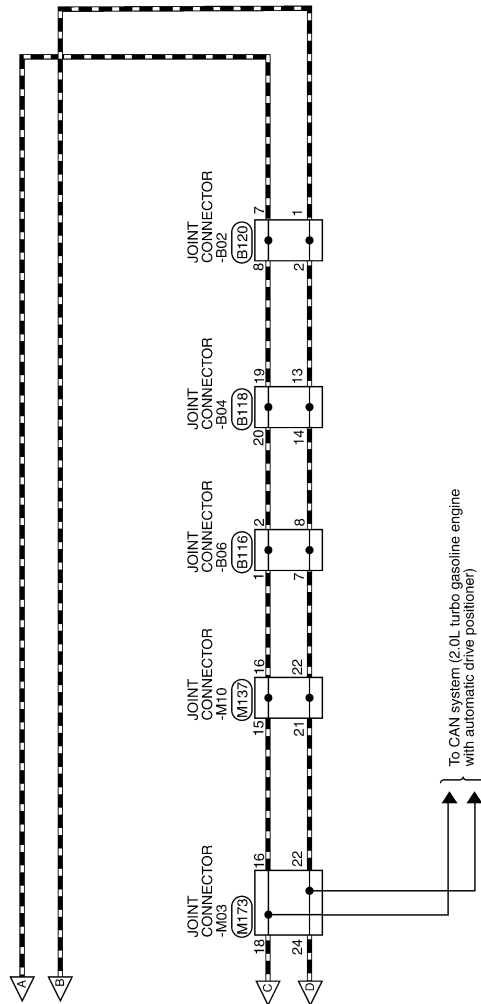
2015/11/27

JRGWC3173GB

HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITH CAN GATEWAY)

< WIRING DIAGRAM >

[HYDRAULIC PUMP ELECTRIC P/S]



JRGWC3174GB

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITH CAN GATEWAY)

< WIRING DIAGRAM >

[HYDRAULIC PUMP ELECTRIC P/S]

HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITH CAN GATEWAY)

Connector No.	B116
Connector Name	JOINT CONNECTOR-B06
Connector Type	24342_4GAZA



6	5	4	3	2	1
12	11	10	9	8	7
18	17	16	15	14	13
24	23	22	21	20	19

Connector No.	B118
Connector Name	JOINT CONNECTOR-B04
Connector Type	24342_4GAZA



8	5	4	3	2	1
12	11	10	9	8	7
18	17	16	15	14	13
24	23	22	21	20	19

18	L	-	-
19	L	- [With 2.0L turbo gasoline engine]	-
19	SHIELD	- [With VR30 engine]	-
20	L	- [With 2.0L turbo gasoline engine]	-
20	SHIELD	- [With VR30 engine]	-
21	L	- [With 2.0L turbo gasoline engine]	-
21	SHIELD	- [With VR30 engine]	-
22	R	-	-
23	R	-	-
24	R	-	-

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	L	-
4	L	-
5	L	-
6	L	-
7	R	- [With Gateway]
8	R	- [With Gateway]
9	R	- [Without Gateway]
9	V	- [Without Gateway]
10	R	- [With VR30 engine]
10	V	- [With 2.0L turbo gasoline engine]
11	V	-
12	P	- [With Gateway]
12	R	- [Without Gateway]
13	SHIELD	-
14	SHIELD	-
15	B	- [With 2.0L turbo gasoline engine]
15	SHIELD	- [With VR30 engine]
16	L	- [With 2.0L turbo gasoline engine]
16	SHIELD	- [With VR30 engine]
17	L	- [With 2.0L turbo gasoline engine]
17	SHIELD	- [With VR30 engine]
18	L	- [With 2.0L turbo gasoline engine]
18	SHIELD	- [With VR30 engine]
19	SHIELD	- [With 2.0L turbo gasoline engine]
19	SHIELD	- [With VR30 engine]
20	L	- [With 2.0L turbo gasoline engine]
20	SHIELD	- [With VR30 engine]
21	L	-
22	P	-
23	P	-
24	P	- [With VR30 engine]

Terminal No.	Color Of Wire	Signal Name [Specification]
1	LG	- [With VR30 engine]
1	SHIELD	- [With 2.0L turbo gasoline engine]
2	LG	- [With VR30 engine]
2	SHIELD	- [With 2.0L turbo gasoline engine]
3	SHIELD	-
4	LG	- [With VR30 engine]
4	SHIELD	- [With 2.0L turbo gasoline engine]
5	LG	- [With VR30 engine]
5	SHIELD	- [With 2.0L turbo gasoline engine]
6	LG	- [With VR30 engine]
6	SHIELD	- [With 2.0L turbo gasoline engine]
7	R	- [Color of wire differs depending on production]
7	V	- [Color of wire differs depending on production]
8	LG	- [With 2.0L turbo gasoline engine]
8	R	- [With VR30 engine and without paddle shift]
8	V	- [With VR30 engine and with paddle shift]
9	LG	- [With 2.0L turbo gasoline engine]
9	R	- [With VR30 engine and without paddle shift]
9	V	- [With VR30 engine and with paddle shift]
10	LG	- [With 2.0L turbo gasoline engine]
10	SHIELD	- [With VR30 engine]
11	LG	- [With 2.0L turbo gasoline engine]
11	SHIELD	- [With VR30 engine]
12	LG	- [With 2.0L turbo gasoline engine]
12	SHIELD	- [With VR30 engine]
13	P	- [With 2.0L turbo gasoline engine and without gateway]
13	P	- [With 2.0L turbo gasoline engine and with gateway]
14	L	- [With 2.0L turbo gasoline engine and without gateway]
14	P	- [With VR30 engine]
14	R	- [With 2.0L turbo gasoline engine and without gateway]
15	L	- [With 2.0L turbo gasoline engine and with gateway]
15	R	- [With VR30 engine]
16	L	-
17	L	-

20	GR	- [With VR30 engine]
20	SHIELD	- [With 2.0L turbo gasoline engine]
21	B	- [With 2.0L turbo gasoline engine]
21	GR	- [With VR30 engine]
22	W	-
23	W	-
24	W	-

Connector No.	E35
Connector Name	REFLECTOR AND ELECTRIC M/T CONTROL UNIT
Connector Type	54230P-B-S124-U



25	26	28	30	32	34
1	5	7	8	9	13
15	17	18	19	20	24

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GND
2	B	GND
3	G	VALVE BATTERY [With VR30 engine]
3	P	VALVE BATTERY [With 2.0L turbo gasoline engine]
4	Y	MOTOR BATTERY
5	LG	STOP LAMP SW SIGNAL [With ADAS]
5	V	STOP LAMP SW SIGNAL [With ASCD]
7	GR	RR LH WHEEL SENSOR SIGNAL
8	G	RR RH WHEEL SENSOR POWER SUPPLY
9	BR	FR RH WHEEL SENSOR SIGNAL
10	GR	FR RH WHEEL SENSOR POWER SUPPLY
13	R	VACUUM SENSOR SIGNAL
15	P	CAN-L [Without Gateway]
15	R	CAN-L [With Gateway]
17	Y	RR RH WHEEL SENSOR SIGNAL
18	LG	RR RH WHEEL SENSOR POWER SUPPLY [With VR30 engine]
18	V	RR RH WHEEL SENSOR POWER SUPPLY [With 2.0L turbo gasoline engine]
19	SB	FR LH WHEEL SENSOR SIGNAL
20	BG	FR LH WHEEL SENSOR POWER SUPPLY
25	L	CAN-H
28	G	VACUUM SENSOR POWER SUPPLY
30	R	VDC OFF SW SIGNAL
32	SHIELD	VACUUM SENSOR GROUND
34	G	IGN

Connector No.	B120
Connector Name	JOINT CONNECTOR-B02
Connector Type	24342_4GAZA



6	5	4	3	2	1
12	11	10	9	8	7
18	17	16	15	14	13
24	23	22	21	20	19

Terminal No.	Color Of Wire	Signal Name [Specification]
1	R	-
2	R	-
3	L	- [With VR30 engine]
3	R	- [With 2.0L turbo gasoline engine]
4	L	- [With 2.0L turbo gasoline engine]
5	L	-
6	L	-
7	L	-
8	L	-
9	R	- [With 2.0L turbo gasoline engine]
9	R	- [With VR30 engine]
10	L	- [With 2.0L turbo gasoline engine]
10	R	- [With VR30 engine]
11	R	-
12	R	-
13	W	-
14	W	-
15	W	-
17	SHIELD	-
18	B	-
19	B	-
19	GR	- [With 2.0L turbo gasoline engine]

JRGWC3175GB

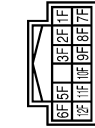
HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITH CAN GATEWAY)

< WIRING DIAGRAM >

[HYDRAULIC PUMP ELECTRIC P/S]

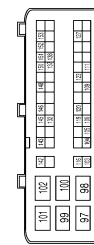
HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITH CAN GATEWAY)

Connector No.	E65
Connector Name	FUSE BLOCK (J/B)
Connector Type	TH12FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
10F	W	-
11F	G	- [Color of wire differs depending on production]
12F	R	- [Color of wire differs depending on production]
13F	W	- [With VR30 engine]
14F	Y	- [With 2.0L turbo gasoline engine]
15F	R	-
2F	BR	-
3F	P	-
5F	P	-
6F	L	-
7F	R	-
8F	L	-
9F	L	-

Connector No.	E200
Connector Name	ECM
Connector Type	ADAS2FB-AH26



Terminal No.	Color Of Wire	Signal Name [Specification]
97	G	POWER SUPPLY (MAIN)
98	B	ECM GROUND
99	G	POWER SUPPLY (MAIN)
100	B	ECM GROUND
101	G	POWER SUPPLY (MAIN)
102	B	ECM GROUND
103	V	COOLING FAN CONTROL SIGNAL (PWM)

104	Y	SENSOR POWER SUPPLY
105	R	SENSOR POWER SUPPLY
106	W	SENSOR GROUND
109	P	ENGINE SPEED SIGNAL
111	G	POWER SUPPLY
116	LG	STARTER RELAY-L
119	BR	SENSOR GROUND
120	BG	SENSOR GROUND
123	BR	MAIN RELAY CONTROL SIGNAL
127	V	FUEL PUMP COIL SIGNAL
132	G	ACCELERATOR PEDAL POSITION SENSOR 1
137	L	CAN-H
138	L	DRIVETRAIN CAN-H
142	GR	BACK-UP LAMP SWITCH
143	LG	REFRIGERANT PRESSURE SENSOR
145	L	ACCELERATOR PEDAL POSITION SENSOR 2
146	L	FUEL TANK PRESSURE SENSOR
148	L	STARTER RELAY-H
150	P	CAN-L
151	P	DRIVETRAIN CAN-L
152	B	EVAP CANISTER VENT CONTROL VALVE
153	G	EVAP PURGE CONTROL VALVE

Connector No.	E220
Connector Name	JOINT CONNECTOR-E05
Connector Type	NH24FB-J



HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITH CAN GATEWAY)

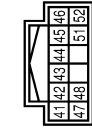
< WIRING DIAGRAM >

[HYDRAULIC PUMP ELECTRIC P/S]

HYDRAULIC PUMP ELECTRIC POWER STEERING SYSTEM (WITH CAN GATEWAY)

5	B	GROUND
6	L	CAN-H (CAN COMMUNICATION CIRCUIT 2)
7	P	CAN-L (CAN COMMUNICATION CIRCUIT 1)
9	R	IGNITION POWER SUPPLY (With VR30 engine and without ISS)
9	W	IGNITION POWER SUPPLY (Except with VR30 engine and without ISS)
10	R	CAN-L (CAN COMMUNICATION CIRCUIT 2)
11	B	GROUND
12	R	CAN-L (CAN COMMUNICATION CIRCUIT 2)

Connector No.	M158
Connector Name	COMBINATION METER
Connector Type	TH12PW/NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GROUND
2	P	CAN-L [Without Gateway]
2	R	CAN-L [With Gateway]
4	G	IGN
5	L	CAN-H

Connector No.	M137
Connector Name	JOINT CONNECTOR-M10
Connector Type	24342-4GAZA



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	B	-
3	B	-
4	B	-
5	B	-
7	B	-
8	B	-
9	B	-
10	B	-
11	B	-
13	B	-
14	B	-
15	B	-
16	B	-
17	B	-
18	B	-
19	B	-
20	B	-
21	B	-
22	B	-
23	B	-
24	B	-
25	B	-
26	B	-
27	B	-
28	B	-
29	B	-
30	B	-
31	B	-
32	B	-
33	B	-
34	B	-
35	B	-
36	B	-
37	B	-
38	B	-
39	B	-
40	B	-
41	B	-
42	B	-
43	B	-
44	B	-
45	B	-
46	B	-
47	B	-
48	B	-
49	B	-
50	B	-
51	B	-
52	B	-

20	R	-
21	R	-
22	R	-

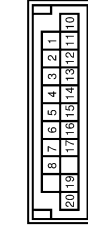
Connector No.	M173
Connector Name	JOINT CONNECTOR-M03
Connector Type	24342-4GAZA



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	L	-
4	L	-
5	L	-
6	L	-
7	R	-
8	R	-
9	R	-
10	R	-
11	R	-
12	R	-
13	S8	-
14	S8	-
15	S8	-
16	L	- [With 2.0L turbo gasoline engine]
17	L	- [With 2.0L turbo gasoline engine]
18	L	- [With 2.0L turbo gasoline engine]
19	L	- [With 2.0L turbo gasoline engine]
20	L	- [With 2.0L turbo gasoline engine]
21	BR	- [With VR30 engine]
22	LG	- [With VR30 engine]
23	BR	- [With VR30 engine]
24	LG	- [With VR30 engine]
25	BR	- [With VR30 engine]
26	LG	- [With VR30 engine]
27	BR	- [With VR30 engine]
28	LG	- [With VR30 engine]
29	BR	- [With VR30 engine]
30	LG	- [With VR30 engine]
31	BR	- [With VR30 engine]
32	LG	- [With VR30 engine]
33	BR	- [With VR30 engine]
34	LG	- [With VR30 engine]
35	BR	- [With VR30 engine]
36	LG	- [With VR30 engine]
37	BR	- [With VR30 engine]
38	LG	- [With VR30 engine]
39	BR	- [With VR30 engine]
40	LG	- [With VR30 engine]
41	BR	- [With VR30 engine]
42	LG	- [With VR30 engine]
43	BR	- [With VR30 engine]
44	LG	- [With VR30 engine]
45	BR	- [With VR30 engine]
46	LG	- [With VR30 engine]
47	BR	- [With VR30 engine]
48	LG	- [With VR30 engine]
49	BR	- [With VR30 engine]
50	LG	- [With VR30 engine]
51	BR	- [With VR30 engine]
52	LG	- [With VR30 engine]
53	BR	- [With VR30 engine]
54	LG	- [With VR30 engine]
55	BR	- [With VR30 engine]
56	LG	- [With VR30 engine]
57	BR	- [With VR30 engine]
58	LG	- [With VR30 engine]
59	BR	- [With VR30 engine]
60	LG	- [With VR30 engine]
61	BR	- [With VR30 engine]
62	LG	- [With VR30 engine]
63	BR	- [With VR30 engine]
64	LG	- [With VR30 engine]
65	BR	- [With VR30 engine]
66	LG	- [With VR30 engine]
67	BR	- [With VR30 engine]
68	LG	- [With VR30 engine]
69	BR	- [With VR30 engine]
70	LG	- [With VR30 engine]
71	BR	- [With VR30 engine]
72	LG	- [With VR30 engine]
73	BR	- [With VR30 engine]
74	LG	- [With VR30 engine]
75	BR	- [With VR30 engine]
76	LG	- [With VR30 engine]
77	BR	- [With VR30 engine]
78	LG	- [With VR30 engine]
79	BR	- [With VR30 engine]
80	LG	- [With VR30 engine]
81	BR	- [With VR30 engine]
82	LG	- [With VR30 engine]
83	BR	- [With VR30 engine]
84	LG	- [With VR30 engine]
85	BR	- [With VR30 engine]
86	LG	- [With VR30 engine]
87	BR	- [With VR30 engine]
88	LG	- [With VR30 engine]
89	BR	- [With VR30 engine]
90	LG	- [With VR30 engine]
91	BR	- [With VR30 engine]
92	LG	- [With VR30 engine]
93	BR	- [With VR30 engine]
94	LG	- [With VR30 engine]
95	BR	- [With VR30 engine]
96	LG	- [With VR30 engine]
97	BR	- [With VR30 engine]
98	LG	- [With VR30 engine]
99	BR	- [With VR30 engine]
100	LG	- [With VR30 engine]

23	S8	- [With VR30 engine and without ISS]
24	V	- [With VR30 engine and with ISS]
24	R	- [With 2.0L turbo gasoline engine]
24	SR	- [With VR30 engine and without ISS]
24	V	- [With VR30 engine and with ISS]

Connector No.	M175
Connector Name	JOINT CONNECTOR-M05
Connector Type	NH2DF-0C



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	L	-
4	L	-
5	L	-
6	L	-
7	L	-
8	L	-
10	P	-
11	P	-
12	P	-
13	P	-
14	P	-
15	P	-
16	P	-
17	P	-
18	R	- [With VR30 engine]
19	R	- [With VR30 engine]
20	R	- [With VR30 engine and with ISS]
20	R	- [With VR30 engine and with ISS]
20	W	- [With VR30 engine and with ISS]
20	W	- [With VR30 engine and with ISS]

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[HYDRAULIC PUMP ELECTRIC P/S]

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000013355706

DETAILED FLOW

1. INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing reproduce symptoms as well as fully understand it. Ask customer about his/her complaints carefully. Check symptoms by driving vehicle with customer, if necessary.

CAUTION:

Customers are not professional. Never guess easily like “maybe the customer means that...,” or “maybe the customer mentions this symptom”.

>> GO TO 2.

2. CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained by interview. Also check that the symptom is not caused by protection function. Refer to [STC-25. "Protection Function"](#).

CAUTION:

When the symptom is caused by normal operation, fully inspect each portion and obtain the understanding of customer that the symptom is not caused by a malfunction.

>> GO TO 3.

3. CHECK VEHICLE CONDITION

With CONSULT

1. Turn ignition switch ON.
2. Check “C/U TEMP” and “C/U TEMP A” in “DATA MONITOR” in “EPS/DAST 3”.

Monitor item	Values
C/U TEMP	90°C (194°F) or less
C/U TEMP A	90°C (194°F) or less

Is the inspection result normal?

YES >> GO TO 4.

NO >> Wait with the ignition switch OFF until the data monitor indication becomes 90 °C (194 °F) or less. After the temperature drops to 90 °C (194 °F) or less, GO TO 4.

4. PERFORM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis.

Is any DTC detected?

YES >> Record or print DTC and freeze frame data (FFD). GO TO 5.

NO >> GO TO 7.

5. RECHECK SYMPTOM

With CONSULT

1. Erase self-diagnostic results for “EPS/DAST 3”.
2. Perform DTC confirmation procedures for the error detected system.

NOTE:

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on [STC-25. "DTC Inspection Priority Chart"](#).

Is any DTC detected?

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[HYDRAULIC PUMP ELECTRIC P/S]

Interview sheet

Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Engine		Mileage	km (Mile)
Operation conditions, etc.		<input type="checkbox"/> Irrelevant <input type="checkbox"/> When engine starts <input type="checkbox"/> During idling <input type="checkbox"/> During driving <input type="checkbox"/> During acceleration <input type="checkbox"/> At constant speed driving <input type="checkbox"/> During deceleration <input type="checkbox"/> During cornering (right curve or left curve) <input type="checkbox"/> During steering			
Other conditions					

Memo

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[HYDRAULIC PUMP ELECTRIC P/S]

DTC/CIRCUIT DIAGNOSIS

C1143 STEERING ANGLE SENSOR

DTC Description

INFOID:000000013355708

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C1143	ST ANG SEN CIRCUIT (Steering angle sensor circuit)	When a malfunction is detected in steering angle sensor.

POSSIBLE CAUSE

- Harness or connector
- Steering angle sensor
- Power steering control module

FAIL-SAFE

System enters into a constant steering assist level state.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is DTC "C1143" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-38, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000013355709

1. CHECK STEERING ANGLE SENSOR CIRCUIT

Check steering angle sensor circuit. Refer to [BRC-142, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair or replace error-detected parts.

2. CHECK TERMINALS AND HARNESS CONNECTORS

Check the power steering control module pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> Power steering control module is malfunctioning. Replace power steering oil pump assembly. Refer to [ST-50, "Removal and Installation"](#).
NO >> Repair or replace error-detected parts.

C1601 BATTERY POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[HYDRAULIC PUMP ELECTRIC P/S]

C1601 BATTERY POWER SUPPLY

DTC Description

INFOID:000000013355710

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C1601	BATTERY VOLT (Battery voltage)	When a power supply voltage to the power steering control module is maintained at 18.5 V or more or at less than 8.5 V continuously for 0.5 seconds or more.

POSSIBLE CAUSE

- Harness or connector
- Power steering control module
- Fuse
- Battery power supply circuit
- Battery

FAIL-SAFE

System enters into a manual steering state.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is DTC "C1601" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-39, "Diagnosis Procedure"](#)
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000013355711

1. CHECK POWER STEERING CONTROL MODULE GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect power steering control module harness connector.
3. Check continuity between power steering control module harness connector terminal and ground.

Power steering control module		—	Continuity
Connector	Terminal		
E222	2	Ground	Existed

Is the inspection result normal?

- YES >> GO TO 2.
 NO >> Repair open circuit or short to ground or short to power in harness or connectors, and repair or replace error-detected parts.

2. CHECK POWER STEERING CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Check voltage between power steering control module harness connector terminals and ground.

C1601 BATTERY POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[HYDRAULIC PUMP ELECTRIC P/S]

Power steering control module		—	Voltage (Approx.)
Connector	Terminal		
E222	1	Ground	8.5 – 18.5 V

2. Turn ignition switch ON.

CAUTION:

Never start the engine.

3. Check voltage between power steering control module harness connector terminals and ground.

Power steering control module		—	Voltage (Approx.)
Connector	Terminal		
E222	1	Ground	8.5 – 18.5 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK POWER STEERING CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn ignition switch OFF.

2. Check the 100A fusible link (#J).

3. Check the harness for open or short between power steering control module harness connector No.1 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-94, "2.0L TURBO GASOLINE ENGINE : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4. CHECK POWER STEERING CONTROL MODULE POWER SUPPLY CIRCUIT (3)

1. Check voltage between power steering control module harness connector terminals and ground.

Power steering control module		—	Voltage (Approx.)
Connector	Terminal		
E221	5	Ground	0 V

2. Turn ignition switch ON.

CAUTION:

Never start the engine.

3. Check voltage between power steering control module harness connector terminals and ground.

Power steering control module		—	Voltage (Approx.)
Connector	Terminal		
E221	5	Ground	8.5 – 18.5 V

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5. CHECK POWER STEERING CONTROL MODULE POWER SUPPLY CIRCUIT (4)

1. Turn ignition switch OFF.

2. Check the 10A fuse (#12).

3. Check continuity and short between power steering control module harness connector terminal and fuse block (J/B) harness connector terminal.

Power steering control module		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
E221	5	E65	11F	Existed

C1601 BATTERY POWER SUPPLY

[HYDRAULIC PUMP ELECTRIC P/S]

< DTC/CIRCUIT DIAGNOSIS >

4. Check continuity between power steering control module harness connector terminal and ground.

Power steering control module		—	Continuity
Connector	Terminal		
E221	5	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-144, "2.0L TURBO GASOLINE ENGINE : Wiring Diagram - IGNITION POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

6. CHECK TERMINALS AND HARNESS CONNECTORS

Check the power steering control module pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Power steering control module is malfunctioning. Replace steering oil pump assembly. Refer to [ST-50, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C1602 NO TUNING SET

< DTC/CIRCUIT DIAGNOSIS >

[HYDRAULIC PUMP ELECTRIC P/S]

C1602 NO TUNING SET

DTC Description

INFOID:000000013355712

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1602	NO TURNING SET (No turning set)	When the information in power steering control module is not the same.

POSSIBLE CAUSE

- Harness or connector
- Power steering control module
- Battery power supply circuit
- Ignition power supply circuit
- Battery
- Fuse
- Ground circuit

FAIL-SAFE

Constant steering assist level state

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is DTC "C1602" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-42, "Diagnosis Procedure"](#)
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000013355713

1. CHECK TERMINALS AND HARNESS CONNECTORS

1. Turn ignition switch OFF.
2. Check the power steering control module harness connector for disconnection or looseness.
3. Disconnect power steering control module harness connector and then check the power steering control module pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair or replace error-detected parts. GO TO 2.

2. CHECK POWER STEERING CONTROL MODULE GROUND CIRCUIT

Check continuity between power steering control module harness connector terminal and ground.

Power steering control module		—	Continuity
Connector	Terminal		
E222	2	Ground	Existed

C1602 NO TUNING SET

[HYDRAULIC PUMP ELECTRIC P/S]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors, and repair or replace error-detected parts.

3.CHECK POWER STEERING CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Check voltage between power steering control module harness connector terminals and ground.

Power steering control module		—	Voltage (Approx.)
Connector	Terminal		
E222	1	Ground	8.5 – 18.5 V

2. Turn ignition switch ON.

CAUTION:

Never start the engine.

3. Check voltage between power steering control module harness connector terminals and ground.

Power steering control module		—	Voltage (Approx.)
Connector	Terminal		
E222	1	Ground	8.5 – 18.5 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK POWER STEERING CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn ignition switch OFF.
2. Check the 100A fusible link (#J).
3. Check the harness for open or short between power steering control module harness connector No.1 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-94. "2.0L TURBO GASOLINE ENGINE : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

5.CHECK POWER STEERING CONTROL MODULE POWER SUPPLY CIRCUIT (3)

1. Check voltage between power steering control module harness connector terminals and ground.

Power steering control module		—	Voltage (Approx.)
Connector	Terminal		
E221	5	Ground	0 V

2. Turn ignition switch ON.

CAUTION:

Never start the engine.

3. Check voltage between power steering control module harness connector terminals and ground.

Power steering control module		—	Voltage (Approx.)
Connector	Terminal		
E221	5	Ground	8.5 – 18.5 V

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6.CHECK POWER STEERING CONTROL MODULE POWER SUPPLY CIRCUIT (4)

1. Turn ignition switch OFF.
2. Check the 10A fuse (#12).

C1602 NO TUNING SET

[HYDRAULIC PUMP ELECTRIC P/S]

< DTC/CIRCUIT DIAGNOSIS >

3. Check continuity and short between power steering control module harness connector terminal and fuse block (J/B) harness connector terminal.

Power steering control module		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
E221	5	E65	11F	Existed

4. Check continuity between power steering control module harness connector terminal and ground.

Power steering control module		—	Continuity
Connector	Terminal		
E221	5	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-144, "2.0L TURBO GASOLINE ENGINE : Wiring Diagram - IGNITION POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

7. CHECK SELF-DIAGNOSIS RESULTS

Ⓟ With CONSULT

Perform "EPS/DAST 3" self-diagnosis.

Is DTC "C1602" detected?

YES >> Power steering control module is malfunctioning. Replace steering oil pump assembly. Refer to [ST-50, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

C1606 EPS MOTOR

DTC Description

INFOID:000000013355714

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C1606	EPS MOTOR (EPS motor)	When the motor driver malfunction of power steering control module or power steering control module motor driver malfunction is detected.

POSSIBLE CAUSE

- Harness or connector
- Power steering motor
- Power steering control module

FAIL-SAFE

System enters into a manual steering.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

 With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is DTC "C1606" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-45, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000013355715

1. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the ignition switch OFF to ON.
2. Erase self-diagnostic results for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C1606" detected?

- YES >> Power steering motor is malfunctioning. Replace power steering oil pump assembly. Refer to [ST-50, "Removal and Installation"](#).
- NO >> Check pin terminal and connection of each harness connector for malfunctioning conditions.

C1607, C1608 POWER STEERING CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[HYDRAULIC PUMP ELECTRIC P/S]

C1607, C1608 POWER STEERING CONTROL MODULE

DTC Description

INFOID:000000013355716

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C1607	EEPROM (EEPROM)	When the memory (EEPROM) system malfunction is detected in power steering control module.
C1608	CONTROL UNIT (Control unit)	When the internal malfunction is detected in power steering control module.

POSSIBLE CAUSE

- Power steering control module

FAIL-SAFE

DTC	Fail-safe condition
C1607	System enters into a constant steering assist level state.
C1608	System enters into a manual steering state.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓜ With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is DTC "C1607" or "C1608" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-46, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000013355717

1. PERFORM SELF-DIAGNOSIS

Ⓜ With CONSULT

1. Turn the ignition switch OFF to ON.
2. Erase self-diagnostic results for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C1607" or "C1608" detected?

- YES >> Power steering control module is malfunctioning. Replace power steering oil pump assembly. Refer to [ST-50, "Removal and Installation"](#).
NO >> Check pin terminal and connection of each harness connector for malfunctioning conditions.

C1609 VEHICLE SPEED SIGNAL

[HYDRAULIC PUMP ELECTRIC P/S]

< DTC/CIRCUIT DIAGNOSIS >

C1609 VEHICLE SPEED SIGNAL

DTC Description

INFOID:000000013355718

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C1609	CAN VHCL SPEED (CAN vehicle speed signal)	<ul style="list-style-type: none">Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) via CAN communication.ABS actuator and electric unit (control unit) input signal error is detected.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Power steering control module
- ABS malfunction
- Vehicle speed signal error

FAIL-SAFE

System enters into a constant steering assist level state.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is DTC "C1609" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-47, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000013355719

1. PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "ABS" self-diagnosis. Refer to [BRC-61, "CONSULT Function"](#).

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-72, "DTC Index"](#).
NO >> GO TO 2.

2. CHECK TERMINALS AND HARNESS CONNECTORS

Check power steering control module pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair or replace error-detected parts.

3. PERFORM SELF-DIAGNOSIS

With CONSULT

Perform "EPS/DAST 3" self-diagnosis.

C1609 VEHICLE SPEED SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[HYDRAULIC PUMP ELECTRIC P/S]

Is DTC "C1609" detected?

- YES >> Power steering control module is malfunctioning. Replace power steering oil pump assembly.
Refer to [ST-50. "Removal and Installation"](#).
- NO >> Check pin terminal and connection of each harness connector for malfunctioning conditions.

C160A HEAT PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[HYDRAULIC PUMP ELECTRIC P/S]

C160A HEAT PROTECTION

DTC Description

INFOID:000000013355720

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C160A	HEAT PROTECTION (Heat protection)	When the steering wheel is operated excessively and the interior temperature of the power steering system reaches 118°C (244.4°F) or more. (Protection function) NOTE: Although the power steering warning lamp turns ON, this is not a system malfunction. The state returns to normal after stopping steering operation and waiting until the system interior temperature drops to 90°C (194°F) or less.

POSSIBLE CAUSE

- The protection of the hydraulic pump electric power steering system

PROTECTION FUNCTION

The system temporarily enters the manual steering state. (This is not a system malfunction.)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is DTC "C160A" detected?

YES >> Go to [STC-35. "Work Flow"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

U1000 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[HYDRAULIC PUMP ELECTRIC P/S]

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:000000013355721

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit communicate data but selectively reads required data only.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
U1000	CAN COMM CIRCUIT (CAN communication circuit)	Power steering control module is not transmitting/receiving CAN communication signal for 2 seconds or more.

POSSIBLE CAUSE

- CAN communication error

FAIL-SAFE

System continue normal control.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is DTC "U1000" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-50, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000013355722

Proceed to [LAN-41, "Trouble Diagnosis Flow Chart"](#).

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[HYDRAULIC PUMP ELECTRIC P/S]

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000013482201

1. CHECK THE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect power steering control module harness connector.
3. Check the continuity between power steering control module harness connector and ground.

Power steering control module		—	Continuity
Connector	Terminal		
E222	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit in harness or connectors.

2. CHECK THE BATTERY POWER SUPPLY CIRCUIT (1)

Check the voltage between power steering control module harness connector and ground.

Power steering control module		—	Voltage (Approx.)
Connector	Terminal		
E222	1	Ground	8.5 – 18.5 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK THE BATTERY POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#J).
2. Check the harness for open or short between power steering control module harness connector No.1 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-94, "2.0L TURBO GASOLINE ENGINE : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4. CHECK THE IGNITION POWER SUPPLY CIRCUIT (1)

1. Check the voltage between power steering control module harness connector and ground.

Power steering control module		—	Voltage (Approx.)
Connector	Terminal		
E221	5	Ground	0 V

2. Turn the ignition switch ON.

3. Check the voltage between power steering control module harness connector and ground.

Power steering control module		—	Voltage (Approx.)
Connector	Terminal		
E221	5	Ground	8.5 – 18.5 V

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5. CHECK THE IGNITION POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#12).

POWER SUPPLY AND GROUND CIRCUIT

[HYDRAULIC PUMP ELECTRIC P/S]

< DTC/CIRCUIT DIAGNOSIS >

3. Check the continuity between power steering control module harness connector and fuse block (J/B) harness connector.

Power steering control module		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
E221	5	E65	11F	Existed

4. Check the continuity between power steering control module harness connector and ground.

Power steering control module		—	Continuity
Connector	Terminal		
E221	5	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-144. "2.0L TURBO GASOLINE ENGINE : Wiring Diagram - IGNITION POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

6. CHECK TERMINAL

1. Check the power steering control module pin terminals for damage or loose connection with harness connector.

2. Check the fuse block (J/B) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Power steering control module is malfunctioning. Replace steering oil pump assembly. Refer to [ST-50. "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

POWER STEERING WARNING LAMP

[HYDRAULIC PUMP ELECTRIC P/S]

< DTC/CIRCUIT DIAGNOSIS >

POWER STEERING WARNING LAMP

Component Function Check

INFOID:000000013355723

1. CHECK THE ILLUMINATION OF THE POWER STEERING WARNING LAMP

Check that the power steering warning lamp turns ON when ignition switch turns ON. Then, power steering warning lamp turns OFF after the engine is started.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Perform trouble diagnosis. Refer to [STC-53. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000013355724

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is any DTC detected?

YES >> Check the DTC. Refer to [STC-25. "DTC Index"](#).

NO >> GO TO 2.

2. CHECK POWER STEERING WARNING LAMP SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. Select in "WARNING LAMP" in "DATA MONITOR" in "EPS/DAST 3".
3. Check that the item in "DATA MONITOR" is "On".

CAUTION:

Never start the engine.

4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Check that the item in "DATA MONITOR" is "Off".

Is the inspection result normal?

YES >> Perform the trouble diagnosis for combination meter power supply circuit. Refer to [MWI-120. "COMBINATION METER : Diagnosis Procedure"](#).

NO >> GO TO 3.

3. CHECK TERMINALS AND HARNESS CONNECTORS

Check the power steering control module pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Power steering control module is malfunctioning. Replace power steering oil pump assembly. Refer to [ST-50. "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

POWER STEERING WARNING LAMP DOES NOT TURN ON

< SYMPTOM DIAGNOSIS >

[HYDRAULIC PUMP ELECTRIC P/S]

SYMPTOM DIAGNOSIS

POWER STEERING WARNING LAMP DOES NOT TURN ON

Description

INFOID:0000000013355725

The power steering warning lamp does not illuminate when the ignition switch is turned ON (lamp check).

Diagnosis Procedure

INFOID:0000000013355726

1. CHECK THE POWER STEERING WARNING LAMP

Perform trouble diagnosis for the power steering warning lamp system. Refer to [STC-53. "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> Check that the pin terminals and the connection of each connector are normal.
- NO >> Repair or replace error-detected parts.

POWER STEERING WARNING LAMP DOES NOT TURN OFF

< SYMPTOM DIAGNOSIS >

[HYDRAULIC PUMP ELECTRIC P/S]

POWER STEERING WARNING LAMP DOES NOT TURN OFF

Description

INFOID:000000013355727

Power steering warning lamp does not turn OFF several seconds after engine started

Diagnosis Procedure

INFOID:000000013355728

1. PERFORM SELF-DIAGNOSIS

With CONSULT

Perform "EPS/DAST 3" self-diagnosis.

Is any DTC detected?

YES >> Check the DTC. Refer to [STC-25, "DTC Index"](#).

NO >> GO TO 2.

2. CHECK POWER STEERING WARNING LAMP

Perform the trouble diagnosis of power steering warning lamp. Refer to [STC-53, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3. POWER STEERING CONTROL MODULE POWER SUPPLY AND GROUND CIRCUIT

Perform the trouble diagnosis of power steering control module power supply and ground. Refer to [STC-39, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> Check that the pin terminals and the connection of each connector are normal.

NO >> Repair or replace error-detected parts.

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

STEERING WHEEL TURNING FORCE IS HEAVY OR LIGHT

< SYMPTOM DIAGNOSIS >

[HYDRAULIC PUMP ELECTRIC P/S]

STEERING WHEEL TURNING FORCE IS HEAVY OR LIGHT

Diagnosis Procedure

INFOID:000000013355729

1. PERFORM SELF-DIAGNOSIS

With CONSULT

Perform "EPS/DAST 3" self-diagnosis.

Is a malfunctioning system displayed?

YES >> Check malfunctioning system. Refer to [STC-25, "DTC Index"](#).

NO >> GO TO 2.

2. CHECK THE POWER STEERING CONTROL MODULE SIGNAL (1)

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel until it stops.

3. Select "MTR ASSIST" in "DATA MONITOR" in "EPS/DAST 3".

Is the display value "100%"?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK THE POWER STEERING CONTROL MODULE SIGNAL (2)

With CONSULT

1. Select "C/U TEMP" and "C/U TEMP A" in "DATA MONITOR" in "EPS/DAST 3".

2. Stop the system until the DATA MONITOR display value drops to "90°C (194°F)" or less.

3. Check whether symptom continues.

Did symptom continue?

YES >> GO TO 4.

NO >> This occurs because the protection function lowers the assist force. It is not a system malfunction.

INSPECTION END

4. CHECK THE POWER STEERING CONTROL MODULE SIGNAL (3)

With CONSULT

1. Turn the steering wheel to the straight-ahead position. (There is no steering force)

2. Select "BATTERY VOLT" in "DATA MONITOR" in "EPS/DAST 3".

Is the display value "10.5 V" or more?

YES >> GO TO 5.

NO >> Check the battery power system. Refer to [STC-39, "Diagnosis Procedure"](#).

5. CHECK THE POWER STEERING CONTROL MODULE SIGNAL (4)

With CONSULT

Select "ESTM VHCL SPD" in "DATA MONITOR" in "EPS/DAST 3".

Monitor item	Test condition	Display value
ESTM VHCL SPD	When stopped	0.00 km/h or mph
	While driving	Approximately equal to the indication on speedometer* (Inside of ±10%)

*: This may not agree with the speedometer indication immediately after the ignition switch is turned ON. This is not a malfunction.

Is the check result normal?

YES >> GO TO 6.

NO >> Check the combination meter, ABS actuator and electric unit (control unit).

- Combination meter: Refer to [MWI-70, "CONSULT Function"](#).

STEERING WHEEL TURNING FORCE IS HEAVY OR LIGHT

< SYMPTOM DIAGNOSIS >

[HYDRAULIC PUMP ELECTRIC P/S]

- ABS actuator and electric unit (control unit): Refer to [BRC-61, "CONSULT Function"](#).

6. CHECK THE POWER STEERING CONTROL MODULE SIGNAL (5)

With CONSULT

Select "STR ANG SPD" in "DATA MONITOR" in "EPS/DAST 3".

Monitor item	Test condition	Display value
STR ANG SPD	The steering wheel is not steered.	Approx. 0.0 deg/s
	The steering wheel is steered.	Displays steering angle speed (deg/s)

Is the check result normal?

YES >> GO TO 7.

NO >> Check the steering angle sensor. Refer to [STC-38, "Diagnosis Procedure"](#).

7. CHECK THE POWER STEERING CONTROL MODULE SIGNAL (6)

With CONSULT

Select "ENGINE STATUS" in "DATA MONITOR" in "EPS/DAST 3".

Is the display value "RUN"?

YES >> GO TO 8.

NO >> Check the ECM. Refer to [EC4-101, "CONSULT Function"](#).

8. CHECK STOP/START SYSTEM

With CONSULT

1. Start the engine.
2. Select "AUTO STOP ST FLG" and "AUTO STOP ST STAT" in "DATA MONITOR" in "EPS/DAST 3".
3. Operate stop/start system. Refer to [EC4-78, "STOP/START SYSTEM : System Description"](#).
4. Turn the steering wheel.

Monitor item	Test condition	Display value
AUTO STOP ST FLG	The steering wheel is steered.	NG
AUTO STOP ST STAT	Engine is running.	Off

Is the check result normal?

YES >> GO TO 9.

NO >> Check the ECM. Refer to [EC4-101, "CONSULT Function"](#).

9. CHECK THE STEERING FORCE

Check the steering force. Refer to [ST-18, "Inspection"](#).

Is the check result normal?

YES >> INSPECTION END

NO >> It is possible that there is a mechanical malfunction. Check the steering system. Refer to [ST-48, "Inspection"](#).

UNBALANCE STEERING WHEEL TURNING FORCE AND RETURN BETWEEN RIGHT AND LEFT

< SYMPTOM DIAGNOSIS >

[HYDRAULIC PUMP ELECTRIC P/S]

UNBALANCE STEERING WHEEL TURNING FORCE AND RETURN BETWEEN RIGHT AND LEFT

Diagnosis Procedure

INFOID:000000013355730

1. CHECK THE ILLUMINATION OF THE POWER STEERING WARNING LAMP

Check the power steering warning lamp while engine is running.

Does the power steering warning lamp turn OFF?

YES >> GO TO 2.

NO >> Refer to [STC-55, "Diagnosis Procedure"](#).

2. CHECK WHEEL ALIGNMENT

Check the wheel alignment.

• 2WD models: Refer to [FSU-9, "Inspection"](#).

• AWD models: Refer to [FSU-54, "EXCEPT DIRECT ADAPTIVE STEERING : Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Adjustment of wheel alignment.

• 2WD models: Refer to [FSU-9, "Adjustment"](#).

• AWD models: Refer to [FSU-55, "EXCEPT DIRECT ADAPTIVE STEERING : Adjustment"](#).

3. CHECK STEERING WHEEL TURNING FORCE

Check the steering wheel turning force. Refer to [ST-18, "Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check the steering wheel turning force for mechanical malfunction. Refer to [ST-48, "Inspection"](#).

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)

< SYMPTOM DIAGNOSIS >

[HYDRAULIC PUMP ELECTRIC P/S]

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)

Diagnosis Procedure

INFOID:0000000013355731

1. PERFORM SELF-DIAGNOSIS

With CONSULT

Perform "EPS/DAST 3" self-diagnosis.

Is a malfunctioning system displayed?

YES >> Check malfunctioning system. Refer to [STC-25. "DTC Index"](#).

NO >> GO TO 2.

2. CHECK THE POWER STEERING CONTROL MODULE SIGNAL (1)

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel until it stops.

3. Select "MTR ASSIST" in "DATA MONITOR" in "EPS/DAST 3".

Is the display value "100%"?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK THE POWER STEERING CONTROL MODULE SIGNAL (2)

With CONSULT

1. Select "C/U TEMP" and "C/U TEMP A" in "DATA MONITOR" in "EPS/DAST 3".

2. Stop the system until the DATA MONITOR display value drops to "90°C (194°F)" or less.

3. Check whether symptom continues.

Did symptom continue?

YES >> GO TO 4.

NO >> This occurs because the protection function lowers the assist force. It is not a system malfunction.
INSPECTION END

4. CHECK THE POWER STEERING CONTROL MODULE SIGNAL (3)

With CONSULT

1. Turn the steering wheel to the straight-ahead position. (There is no steering force)

2. Select "BATTERY VOLT" in "DATA MONITOR" in "EPS/DAST 3".

Is the display value "10.5 V" or more?

YES >> GO TO 5.

NO >> Check the battery power system. Refer to [STC-39. "Diagnosis Procedure"](#).

5. CHECK THE POWER STEERING CONTROL MODULE SIGNAL (4)

With CONSULT

Select in "ESTM VHCL SPD" in "DATA MONITOR" in "EPS/DAST 3".

Monitor item	Test condition	Display value
ESTM VHCL SPD	When stopped	0.00 km/h or mph
	While driving	Approximately equal to the indication on speedometer* (Inside of ±10%)

*: This may not agree with the speedometer indication immediately after the ignition switch is turned ON. This is not a malfunction.

Is the check result normal?

YES >> GO TO 6.

NO >> Check the combination meter, ABS actuator and electric unit (control unit).

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)

< SYMPTOM DIAGNOSIS >

[HYDRAULIC PUMP ELECTRIC P/S]

- Combination meter: Refer to [MWI-70, "CONSULT Function"](#).
- ABS actuator and electric unit (control unit): Refer to [BRC-61, "CONSULT Function"](#).

6. CHECK THE POWER STEERING CONTROL MODULE SIGNAL (5)

With CONSULT

Select "STR ANG SPD" in "DATA MONITOR" in "EPS/DAST 3".

Monitor item	Test condition	Display value
STR ANG SPD	The steering wheel is not steered.	Approx. 0.0 deg/s
	The steering wheel is steered.	Displays steering angle speed (deg/s)

Is the check result normal?

YES >> GO TO 7.

NO >> Check the steering angle sensor. Refer to [STC-38, "Diagnosis Procedure"](#).

7. CHECK THE POWER STEERING CONTROL MODULE SIGNAL (6)

With CONSULT

Select "ENGINE STATUS" in "DATA MONITOR" in "EPS/DAST 3".

Is the display value "RUN"?

YES >> GO TO 8.

NO >> Check the ECM. Refer to [EC4-101, "CONSULT Function"](#).

8. CHECK STEERING COLUMN AND STEERING GEAR

Check the steering column assembly and steering gear assembly.

- Steering column assembly. Refer to [ST-33, "WITHOUT ELECTRIC MOTOR : Exploded View"](#) (Without electric motor), [ST-36, "WITH ELECTRIC MOTOR : Exploded View"](#) (With electric motor).
- Steering gear assembly. Refer to [ST-44, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

9. CHECK STEERING WHEEL TURNING FORCE

Check the steering wheel turning force. Refer to [ST-18, "Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check the steering wheel turning force for mechanical malfunction. Refer to [ST-48, "Inspection"](#).

POWER STEERING CONTROL MODULE

< REMOVAL AND INSTALLATION >

[HYDRAULIC PUMP ELECTRIC P/S]

REMOVAL AND INSTALLATION

POWER STEERING CONTROL MODULE

Removal and Installation

INFOID:0000000013355732

CAUTION:

Disconnect battery negative terminal before starting operations.

Never remove power steering control module from steering oil pump assembly. When replacing power steering control module, replace steering oil pump assembly. Refer to [ST-50, "Removal and Installation"](#).

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

< PRECAUTION >

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:000000013509515

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery or batteries, and wait at least 3 minutes before performing any service.

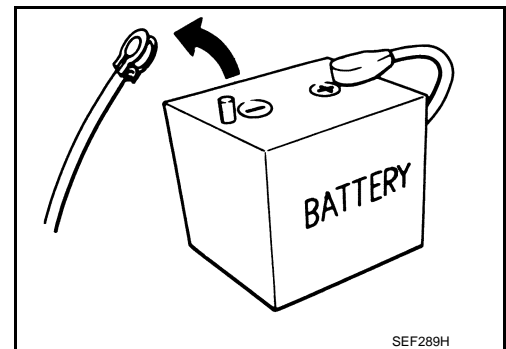
Precautions for Removing Battery Terminal

INFOID:000000013509517

When disconnecting the battery terminal, pay attention to the following.

- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.
- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

BR08DE	: 4 minutes	V9X engine	: 4 minutes
D4D engine	: 20 minutes	YD25DDTi	: 2 minutes
HR09DET	: 12 minutes	YS23DDT	: 4 minutes
HRA2DDT	: 12 minutes	YS23DDTT	: 4 minutes
K9K engine	: 4 minutes	ZD30DDTi	: 60 seconds
M9R engine	: 4 minutes	ZD30DDTT	: 60 seconds
R9M engine	: 4 minutes		



NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

- After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:

PRECAUTIONS

[ELECTRIC POWER STEERING]

< PRECAUTION >

- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
 - Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
 - Driving for 30 minutes or more on a steep slope.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:

The removal of 12V battery may cause a DTC detection error.

Precautions for Harness Repair

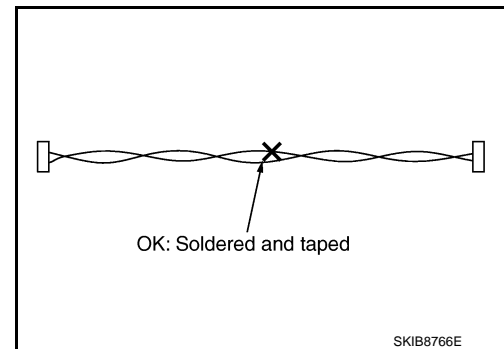
INFOID:000000013509521

FLEXRAY AND CAN COMMUNICATION LINE

- Solder the repaired area and wrap tape around the soldered area.

NOTE:

A fray of twisted lines must be within 110 mm (4.33 in).

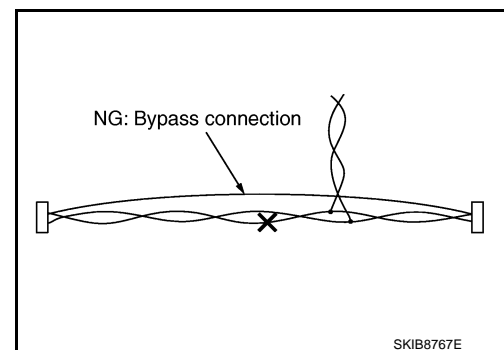


- Bypass connection is never allowed at the repaired area.

NOTE:

Bypass connection may cause FlexRay communication error as spliced wires that are separate from the main line or twisted lines lose noise immunity.

- Replace the applicable harness as an assembly if error is detected on the shield lines of FlexRay communication line.



Service Notice and Precautions for EPS System

INFOID:000000013482233

- Check the following item when performing the trouble diagnosis.
 - Check any possible causes by interviewing the symptom and it's condition from the customer if any malfunction, such as power steering warning lamp is turned ON, occurs.
 - Check if air pressure and size of tires are proper, the specified part is used for the steering wheel, and control unit is genuine part.
 - Check if the connection of steering column assembly and steering gear assembly is proper (there is not looseness of mounting bolts, damage of rods, boots or sealants, and leakage of grease, etc).
 - Check if the wheel alignment is adjusted properly.
 - Check if there is any damage or modification to suspension or body resulting in increased weight or altered ground clearance.
 - Check if installation conditions of each link and suspension are proper.
 - Check if the battery voltage is proper.
 - Check connection conditions of each connector are proper.
 - Before connecting or disconnecting the power steering control module harness connector, turn ignition switch "OFF" and disconnect battery ground cable. Because battery voltage is applied to power steering control module even if ignition switch is turned "OFF".
 - When connecting or disconnecting pin connectors into or from power steering control module, take care not to damage pin terminals (bend or break).

PRECAUTIONS

< PRECAUTION >

[ELECTRIC POWER STEERING]

- During quick steering, rasping noise may be heard from under the vehicle. This is not a malfunction. The noise is an operating noise of the EPS system under normal conditions. If the rasping noise occurs during slow steering, this may not be an operating noise of the system. In this case, it is necessary to find out the location of the noise and repair, if necessary.

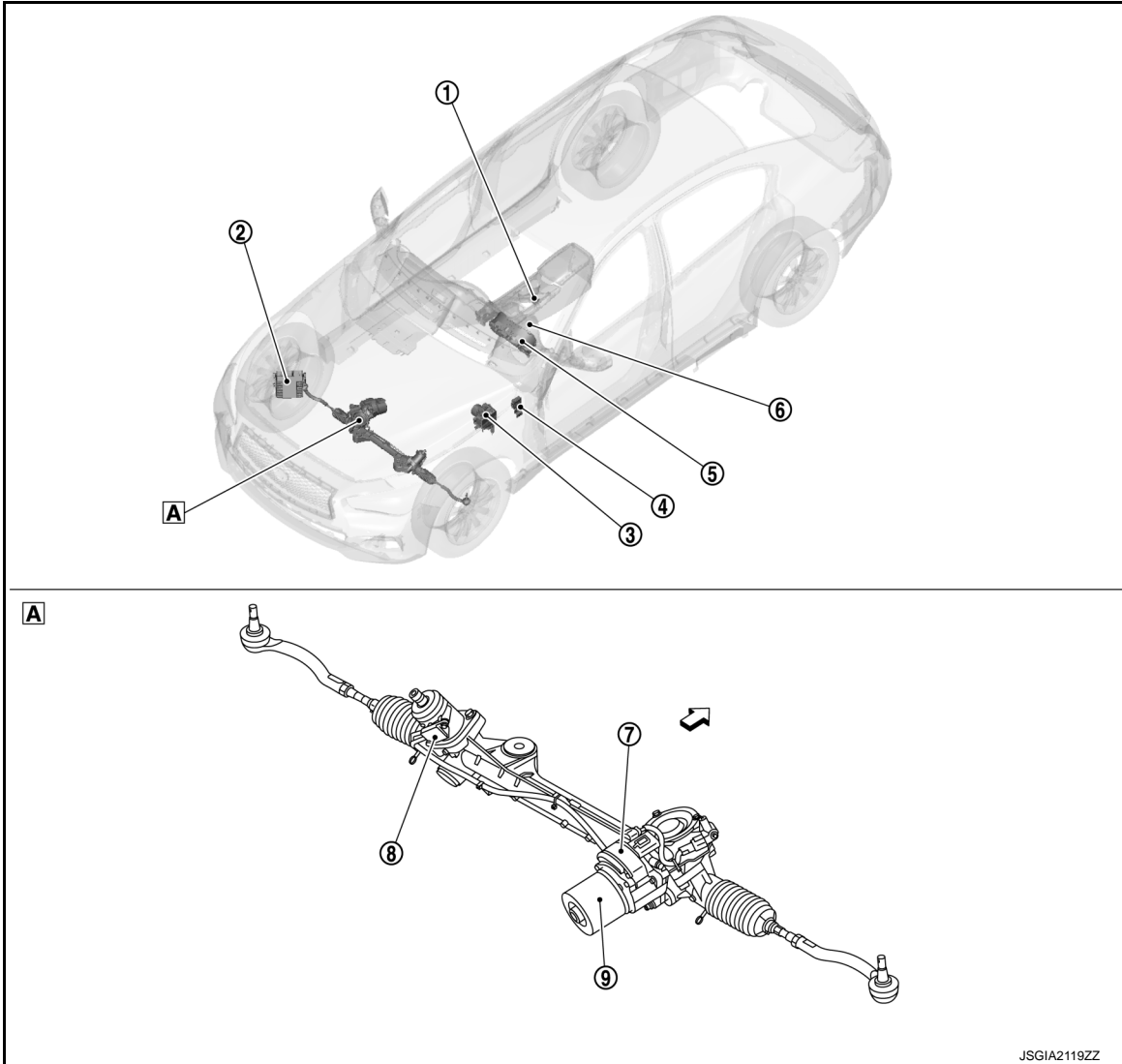
< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000013482234



A Steering gear assembly

⇨: Vehicle front

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[ELECTRIC POWER STEERING]

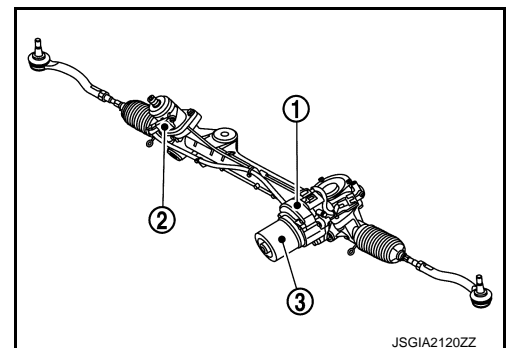
No.	Component	Function
①	Drive mode select switch	<ul style="list-style-type: none"> • Drive mode is selectable among PERSONAL, SPORT, and STANDARD by the operating the switch. • Output the status of drive mode to the chassis control module. • For detailed installation location, refer to DMS-4, "Component Parts Location".
②	ECM	<ul style="list-style-type: none"> • Transmits mainly the following signals to power steering control module via CAN communication. <ul style="list-style-type: none"> - Engine status signal • Receives mainly the following signals from power steering control module via CAN communication. <ul style="list-style-type: none"> - Battery supply current signal • For detailed installation location, refer to EC6-33, "ENGINE CONTROL SYSTEM : Component Parts Location".
③	ABS actuator and electric unit (control unit)	<ul style="list-style-type: none"> • Transmits mainly the following signals to power steering control module via CAN communication. <ul style="list-style-type: none"> - Vehicle speed signal (ABS) • For detailed installation location, refer to BRC-10, "Component Parts Location".
④	Chassis control module	<ul style="list-style-type: none"> • Transmits mainly the following signals to power steering control module via CAN communication. <ul style="list-style-type: none"> - Drive mode signal • For detailed installation location, refer to DAS-516, "Component Parts Location".
⑤	Combination meter (Power steering warning lamp)	<ul style="list-style-type: none"> • Transmits mainly the following signals to power steering control module via CAN communication. <ul style="list-style-type: none"> - Vehicle speed signal (Meter) • For detailed installation location, refer to MWI-8, "METER SYSTEM : Component Parts Location". • Turns ON the power steering warning lamp according to the signal from the power steering control module via CAN communication. • For power steering warning lamp, refer to STC-71, "WARNING/INDICATOR/CHIME LIST : Warning Lamp/Indicator Lamp".
⑥	Steering angle sensor	<ul style="list-style-type: none"> • Transmits mainly the following signals to power steering control module via CAN communication. <ul style="list-style-type: none"> - Steering angle sensor signal • For detailed installation location, refer to BRC-10, "Component Parts Location".
⑦		Power steering control module
⑧	Steering gear assembly	Power steering torque sensor
⑨		EPS motor

Steering Gear Assembly

INFOID:000000013482235

The steering gear assembly is primarily composed of power steering control module ①, power steering torque sensor ② and EPS motor ③.

- 2WD

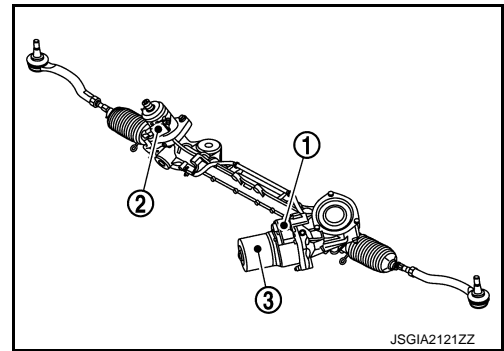


COMPONENT PARTS

< SYSTEM DESCRIPTION >

[ELECTRIC POWER STEERING]

- AWD



POWER STEERING CONTROL MODULE

By receiving steering angle sensor signal, vehicle speed signal and torque sensor signal, the power steering control module calculates the current of motor drive according to the driving conditions. The power steering control module controls the EPS motor.

POWER STEERING TORQUE SENSOR

Power steering torque sensor detects the steering torque, and transmit the signal to power steering control module.

EPS MOTOR

The EPS motor provides the assist torque by the signal from power steering control module.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

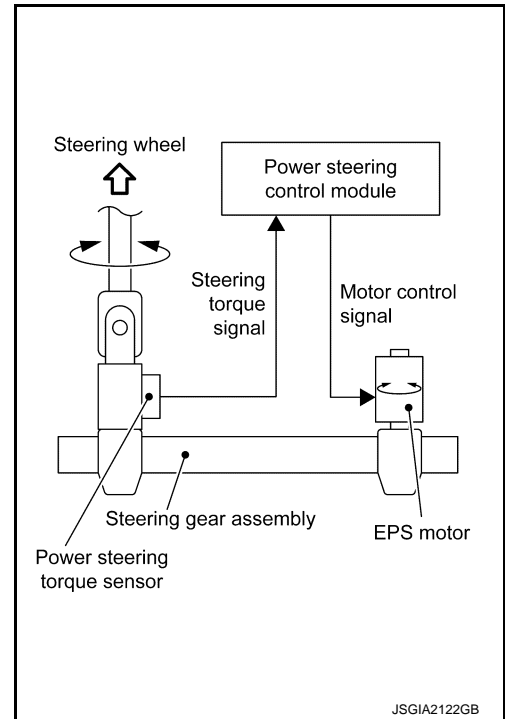
SYSTEM

EPS SYSTEM

EPS SYSTEM : System Description

INFOID:000000013482236

- EPS system consists mainly of power steering control module, EPS motor, power steering torque sensor.
- EPS system calculates a control signal to transmit to the EPS motor based on information received from ECM, ABS actuator and electric unit (control unit), steering angle sensor, chassis control module, and combination meter via CAN communication and information received from torque sensor.
- Power steering control module performs an arithmetical operation on data, such as steering wheel turning force (sensor signal) from the torque sensor, vehicle speed signal, etc. Then it generates an optimum assist torque signal to the EPS motor according to the driving condition.
- After engine start, the EPS system performs control.
- When a malfunction occurs in the system, the fail-safe function stops the EPS system (manual steering state) or restricts its operation (Constant steering assist level state). Refer to [STC-70, "EPS SYSTEM : Fail-safe"](#).
- Power steering control module decreases the output signal to EPS motor while extremely using the power steering function (e.g., full steering) consecutively for protecting EPS motor and power steering control module (Overload protection control). Refer to [STC-70, "EPS SYSTEM : Protection Function"](#).
- Infiniti drive mode selector which can change the steering characteristic corresponding to the preference of the driver was adopted. For details, refer to [DMS-15, "Infiniti Drive Mode Selector : System Description \(For VR30DDTT Engine Models\)"](#).

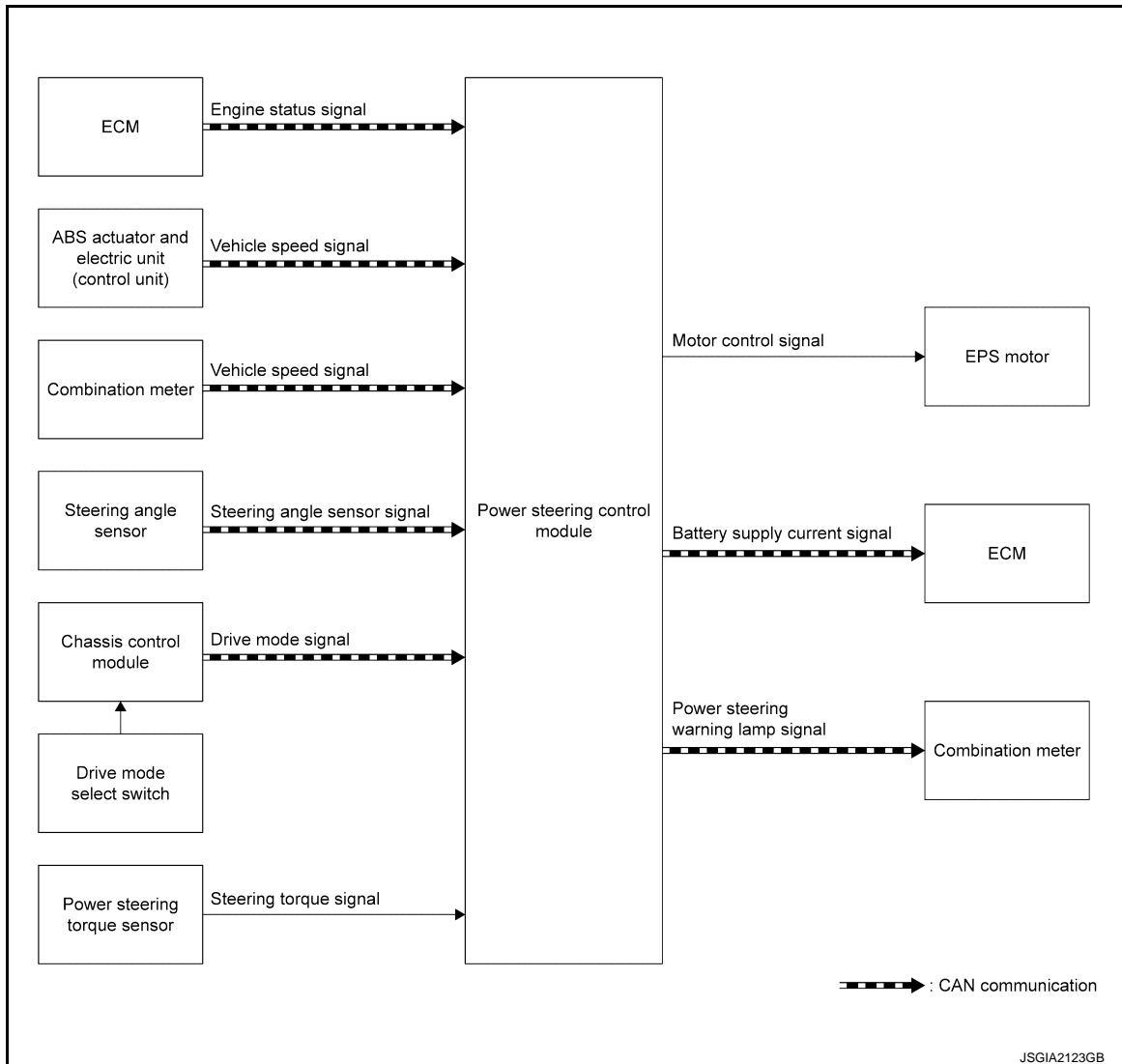


SYSTEM

< SYSTEM DESCRIPTION >

[ELECTRIC POWER STEERING]

SYSTEM DIAGRAM



A

B

C

D

E

F

STC

H

I

J

K

CONDITIONS FOR POWER STEERING WARNING LAMP ON

- Turn ON when there is a malfunction in EPS system. If indicates that fail-safe mode is engaged and enters a manual steering state (Control turning force steering wheel becomes heavy).
- Also turns ON when ignition switch is turned ON, for purpose of lamp check. Turns OFF after the engine starts, if system is normal.

L

M

Condition	Power steering warning lamp
Ignition switch ON. (Lamp check)	ON
After engine start (steering assist force is generated)	OFF
When steering assist is stopped	ON

N

O

P

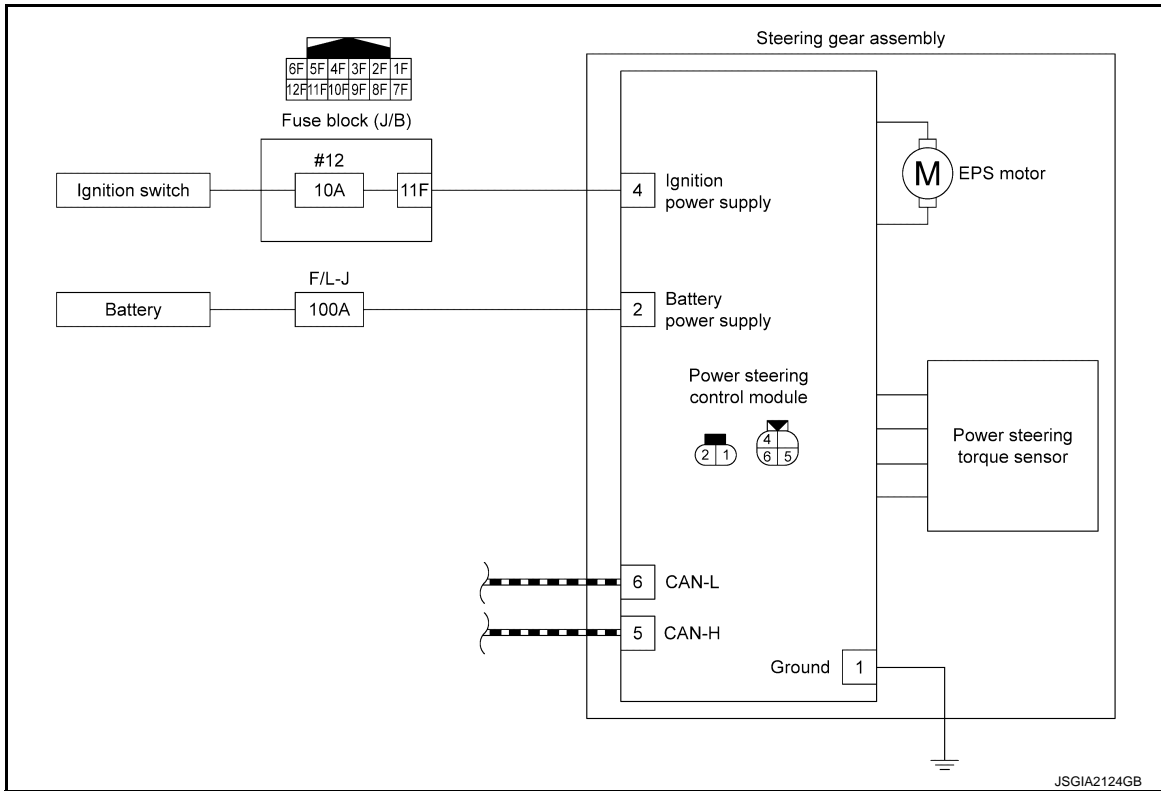
SYSTEM

< SYSTEM DESCRIPTION >

[ELECTRIC POWER STEERING]

EPS SYSTEM : Circuit Diagram

INFOID:000000013482237



EPS SYSTEM : Fail-safe

INFOID:000000013482297

- If any malfunction occurs in the system and control module detects the malfunction, power steering warning lamp on combination meter turns ON to indicate system malfunction.
- When power steering warning lamp is ON, the system enters into a manual steering state. (Control turning force steering wheel becomes heavy.)

DTC	Fail-safe condition
C1143	Normal steering state
C1601	Manual steering state
C1604	Manual steering state
C1606	Manual steering state
C1607	Constant steering state
C1608	Manual steering state
C1609	Constant steering state
U1000	Constant steering state
U1010	Constant steering state
U140E	Normal steering state

EPS SYSTEM : Protection Function

INFOID:000000013482298

Power steering control module decreases the output signal to EPS motor while extremely using the power steering function (e.g., full steering) consecutively for protecting EPS motor and power steering control module (Overload protection control). While activating overload protection control, the assist torque gradually decreases, and the steering wheel turning force becomes heavy. The normal assist torque is recovered if the steering wheel is not turned for a while.

WARNING/INDICATOR/CHIME LIST


SYSTEM

< SYSTEM DESCRIPTION >

[ELECTRIC POWER STEERING]

WARNING/INDICATOR/CHIME LIST : Warning Lamp/Indicator Lamp

INFOID:000000013482240

Name	Design	Layout/Function
Power steering warning lamp		For layout, refer to MWI-9. "METER SYSTEM : Design" . For function, refer to MWI-40. "WARNING LAMPS/INDICATOR LAMPS : Power Steering Warning Lamp (Except Direct Adaptive Steering)" .

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

DIAGNOSIS SYSTEM (POWER STEERING CONTROL MODULE)

< SYSTEM DESCRIPTION >

[ELECTRIC POWER STEERING]

DIAGNOSIS SYSTEM (POWER STEERING CONTROL MODULE)

CONSULT Function

INFOID:000000013482241

APPLICATION ITEMS

CONSULT can display each diagnostic item using the diagnostic test modes shown as per the following.

Diagnostic test mode	Function
ECU identification	The part number stored in the control unit can be read.
Self Diagnostic Results	Self-diagnostic results and freeze frame data can be read and erased quickly*
Data monitor	Input/Output data in the power steering control module can be read.

*: The following diagnosis information is erased by erasing.

- DTC
- Freeze frame data (FFD)

ECU IDENTIFICATION

Displays the part number stored in the control unit.

SELF-DIAG RESULTS MODE

Refer to [STC-76, "DTC Index"](#).

When "CRNT" is displayed on self-diagnosis result.

- The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result.

- System malfunction in the past is detected, but the system is presently normal.

Freeze Frame Data (FFD)

The following vehicle status is recorded when DTC is detected and is displayed.

Freeze Frame Data Item	Unit	Description
ODO/TRIP METER	Km	Display the odometer value from combination meter via CAN communication.
BATTERY VOLT	V	Displays the power supply voltage for power steering control module.
IGN SW	OFF/ON	Display the status of ignition switch.
ENGINE STATUS	STOP/RUN/ CRANK	Displays the engine status based on the engine status signal transmitted by CAN communications.
Steering mode status	Standard/ Sports/Touring	Displays the status of steering mode based on the steering mode status signal transmitted by CAN communications.
VEHICLE SPEED	km/h	Display the vehicle speed from vehicle speed signal via CAN communication.
STEERING ANGLE SIGNAL	deg	Displays the steering angle based on steering angle signal transmitted by CAN communications.
STEERING ANGLE SPEED	deg/s	Displays the steering angle speed based on the steering angle signal transmitted by CAN communications.
STEERING TORQUE	Nm	Displays steering torque detected by torque sensor.
MOTOR CURRENT	A	Display the current value consumed by EPS motor.
Target motor current	A	Displays the target motor current value.
C/U TEMP	°C	Displays the temperature of the power steering control module.

DATA MONITOR MODE

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Monitor item	Unit	Remarks
BATTERY VOLT	V	Displays the power supply voltage for power steering control module.
STEERING TORQUE	Nm	Displays steering torque detected by torque sensor.

DIAGNOSIS SYSTEM (POWER STEERING CONTROL MODULE)

< SYSTEM DESCRIPTION >

[ELECTRIC POWER STEERING]

Monitor item	Unit	Remarks
STEERING ANGLE SIGNAL	deg	Displays the steering angle based on steering angle signal transmitted by CAN communications.
STEERING ANGLE SPEED	deg/s	Displays the steering angle speed based on the steering angle signal transmitted by CAN communications.
MOTOR CURRENT	A	Display the current value consumed by EPS motor.
Target motor current	A	Displays the target motor current value.
C/U TEMP	°C	Displays the temperature of the power steering control module.
Assist level	%	Displays the current percentage of the allowable assist ratio EPS motor.
VEHICLE SPEED	km/h	Display the vehicle speed from vehicle speed signal via CAN communication.
WARNING LAMP	OFF/On	Displays the control status of power steering warning lamp.
STEERING ANGLE SENSOR STATUS	ABNORMAL/ NORMAL	Displays the status of steering angle based on the steering angle status signal transmitted by CAN communications.
ENGINE STATUS	STOP/RUN/ CRANK	Displays the engine status based on the engine status signal transmitted by CAN communications.
HEAT PROTCT STATUS	NORMAL/PR- TECT	Displays the status of overheat protection.
MOTOR REVOLUTION SPEED	rpm	Displays the EPS motor speed.
CONTROL MODULE ESTM TEMP	°C	Displays the estimated temperature of power steering control module.
Steering mode status	Standard/ Sports/Touring	Displays the status of steering mode based on the steering mode status signal transmitted by CAN communications.

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

POWER STEERING CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[ELECTRIC POWER STEERING]

ECU DIAGNOSIS INFORMATION

POWER STEERING CONTROL MODULE

Reference Value

INFOID:0000000013482242

VALUES ON THE DIAGNOSIS TOOL

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Monitor item	Data monitor		
	Condition	Display value	
BATTERY VOLT	Engine running	10.5 V – 16 V	
STEERING TORQUE	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0.0 Nm
		Steering wheel: Right turn	Positive value (Nm)
		Steering wheel: Left turn	Negative value (Nm)
STEERING ANGLE SIGNAL	Steering wheel: Not steering (There is no steering force)		Approx. 0 deg
	Steering wheel: Right turn		Positive value (deg)
	Steering wheel: Left turn		Negative value (deg)
STEERING ANGLE SPEED	Steering wheel: Not steering (There is no steering force)		Approx. 0 deg/s
	Steering wheel: Right turn		Positive value (deg/s)
	Steering wheel: Left turn		Negative value (deg/s)
MOTOR CURRENT	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 A
		Steering wheel: Right or left turn	Displays consumption current of EPS motor (A) ^{*1}
Target motor current	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 A
		Steering wheel: Right turn	Positive value (A)
		Steering wheel: Left turn	Negative value (A)
C/U TEMP	Engine running	Displays temperature of inside of power steering control module [°C]	
Assist level	Engine running	100% ^{*2}	
VEHICLE SPEED	Vehicle stopped	0.00 km/h	
	While driving	Approximately equal to the indication on speedometer ^{*3} (inside of ±10%)	
WARNING LAMP	Power steering warning lamp: ON	On	
	Power steering warning lamp: OFF	OFF	
STEERING ANGLE SENSOR STATUS	Malfunction in steering angle sensor.	ABNORMAL	
	No Malfunction in steering angle sensor.	NORMAL	
ENGINE STATUS	Engine not running	STOP	
	Engine running	RUN	
	Engine cranking	CRANK	
HEAT PROTCT STATUS	Ignition switch ON or Engine running	No over heat.	NORMAL
		Over heat.	PRTECT

POWER STEERING CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[ELECTRIC POWER STEERING]

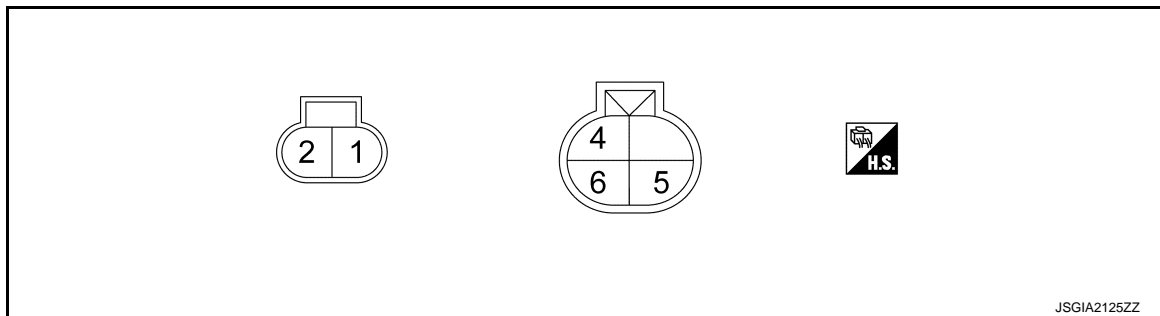
Monitor item	Data monitor		
	Condition	Display value	
MOTOR REVOLUTION SPEED	Engine running	Steering wheel: Not steering (There is no steering force)	Displays an almost constant value (rpm)
		Steering wheel: Right turn	The positive value changes as a steering speed (rpm)
		Steering wheel: Left turn	The negative value changes as a steering speed (rpm)
CONTROL MODULE ESTM TEMP	Engine running	Displays temperature of inside of power steering control module [°C]	
Steering mode status	Steering mode: Standard	Standard	
	Steering mode: Sport	Sport	
	Steering mode: Touring	Touring	

*1: Almost in accordance with the value of "Target motor current". It is not a malfunction though these values are not accorded when steering quickly

*2: Normally displays 100%. In case of an excessive stationary steering, the assist curvature gradually falls. However, it returns to 100% when left standing.

*3: It is not a malfunction, though it might not be corresponding just after ignition switch in turned ON.

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire Color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/Output		
1 (B)	Ground	Ground	—	Always	0 V
2 (W)	Ground	Battery power supply	Input	Always	10.5 – 16 V
4 (R)	Ground	Ignition power supply	Input	Ignition switch: ON	10.5 – 16 V
				Ignition switch: OFF	0 V
5 (L)	—	CAN-H	Input/Output	—	—
6 (P)	—	CAN-L	Input/Output	—	—

Fail-safe

INFOID:000000013482243

- If any malfunction occurs in the system and control module detects the malfunction, power steering warning lamp on combination meter turns ON to indicate system malfunction.
- When power steering warning lamp is ON, the system enters into a manual steering state. (Control turning force steering wheel becomes heavy.)

POWER STEERING CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[ELECTRIC POWER STEERING]

DTC	Fail-safe condition
C1143	Normal steering state
C1601	Manual steering state
C1604	Manual steering state
C1606	Manual steering state
C1607	Constant steering state
C1608	Manual steering state
C1609	Constant steering state
U1000	Constant steering state
U1010	Constant steering state
U140E	Normal steering state

Protection Function

INFOID:000000013482244

Power steering control module decreases the output signal to EPS motor while extremely using the power steering function (e.g., full steering) consecutively for protecting EPS motor and power steering control module (Overload protection control). While activating overload protection control, the assist torque gradually decreases, and the steering wheel turning force becomes heavy. The normal assist torque is recovered if the steering wheel is not turned for a while.

DTC Inspection Priority Chart

INFOID:000000013482245

When multiple DTCs are detected simultaneously, check one by one depending on the following priority list.

Priority	Priority order item (DTC)
1	<ul style="list-style-type: none"> • C1601 BATTERY VOLT
2	<ul style="list-style-type: none"> • C1604 TORQUE SENSOR • C1606 EPS MOTOR • C1607 EEPROM • C1608 CONTROL UNIT
3	<ul style="list-style-type: none"> • C1143 ST ANG SEN CIRCUIT • C1609 CAN VHCL SPEED • U140E Chassis control module
4	<ul style="list-style-type: none"> • U1000 CAN COMM CIRCUIT • U1010 CONTROL UNIT(CAN)

DTC Index

INFOID:000000013482246

DTC	Items	Power steering warning lamp	Reference
C1143	ST ANG SEN CIRCUIT	OFF	STC-86, "DTC Description"
C1601	BATTERY VOLT	ON	STC-87, "DTC Description"
C1604	TORQUE SENSOR	ON	STC-89, "DTC Description"
C1606	EPS MOTOR	ON	STC-90, "DTC Description"
C1607	EEPROM	OFF	STC-91, "DTC Description"
C1608	CONTROL UNIT	ON	STC-91, "DTC Description"
C1609	CAN VHCL SPEED	OFF	STC-93, "DTC Description"
U1000	CAN COMM CIRCUIT	OFF	STC-95, "DTC Description"
U1010	CONTROL UNIT(CAN)	ON	STC-96, "DTC Description"
U140E	Chassis control module	OFF	STC-97, "DTC Description"

NOTE:

If two or more DTCs are detected, refer to [STC-76, "DTC Inspection Priority Chart"](#).

EPS SYSTEM

< WIRING DIAGRAM >

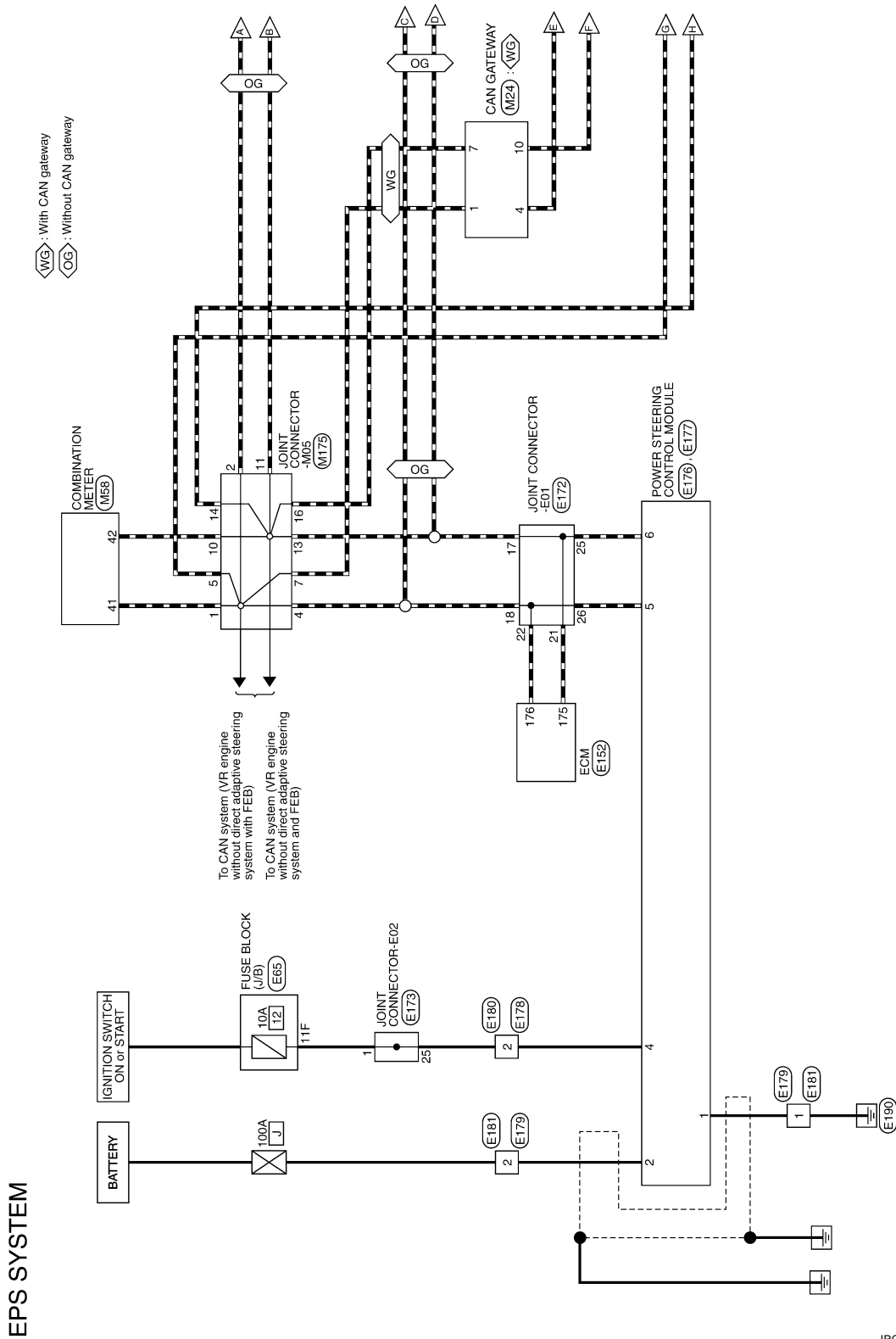
[ELECTRIC POWER STEERING]

WIRING DIAGRAM

EPS SYSTEM

Wiring Diagram

INFOID:000000013482247



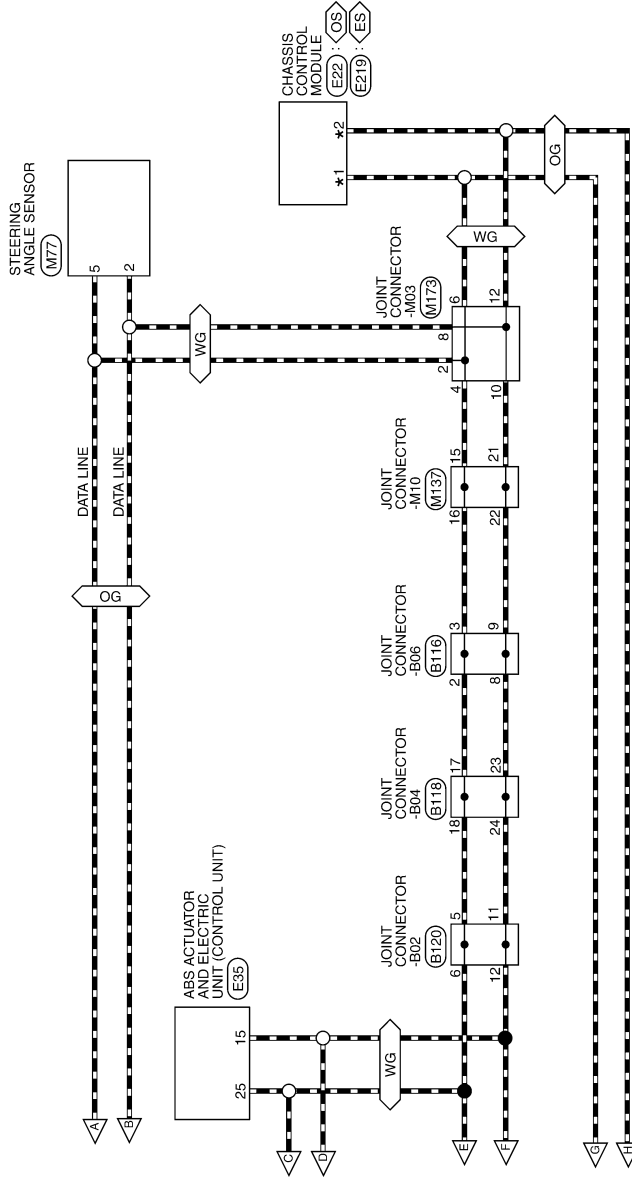
A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

EPS SYSTEM

[ELECTRIC POWER STEERING]

< WIRING DIAGRAM >

- *1 4: <OS> : Without digital motion control
10: <ES> : With digital motion control
- *2 3: <OS> : Without digital motion control
24: <ES> : With digital motion control


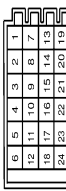


JRGWC3179GB


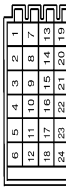
A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

EPS SYSTEM



Connector No.	B116
Connector Name	JOINT CONNECTOR-606
Connector Type	24342_4GAZA

Connector No.	B118
Connector Name	JOINT CONNECTOR-604
Connector Type	24342_4GAZA

18	L	-
19	L	- [With 2.0L turbo gasoline engine]
20	SHIELD	- [With VR30 engine]
21	L	- [With 2.0L turbo gasoline engine]
22	SHIELD	- [With VR30 engine]
23	R	- [With 2.0L turbo gasoline engine]
24	R	-


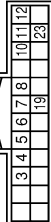
Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	L	-
4	L	-
5	L	-
6	L	-
7	R	- [With Gateway]
8	V	- [Without Gateway]
9	V	- [Without Gateway]
10	R	- [With VR30 engine]
11	V	- [With 2.0L turbo gasoline engine]
12	P	- [With Gateway]
13	SHIELD	- [Without Gateway]
14	B	- [With 2.0L turbo gasoline engine]
15	B	- [With VR30 engine]
16	L	- [With 2.0L turbo gasoline engine]
17	L	- [With VR30 engine]
18	SHIELD	- [With 2.0L turbo gasoline engine]
19	L	- [With VR30 engine]
20	L	- [With 2.0L turbo gasoline engine]
21	L	- [With VR30 engine]
22	P	-
23	P	-
24	P	- [With VR30 engine]

Terminal No.	Color Of Wire	Signal Name [Specification]
1	LG	- [With VR30 engine]
2	LG	- [With 2.0L turbo gasoline engine]
3	SHIELD	- [With VR30 engine]
4	LG	- [With VR30 engine]
5	LG	- [With 2.0L turbo gasoline engine]
6	SHIELD	- [With 2.0L turbo gasoline engine]
7	R	- [Color of wire differs depending on production]
8	R	- [With VR30 engine and without paddle shift]
9	LG	- [With VR30 engine and with paddle shift]
10	LG	- [With VR30 engine and without paddle shift]
11	SHIELD	- [With 2.0L turbo gasoline engine]
12	LG	- [With 2.0L turbo gasoline engine]
13	SHIELD	- [With VR30 engine]
14	P	- [With 2.0L turbo gasoline engine and without gateway]
15	R	- [With 2.0L turbo gasoline engine and with gateway]
16	L	- [With VR30 engine]
17	L	- [With 2.0L turbo gasoline engine]

Terminal No.	Color Of Wire	Signal Name [Specification]
1	R	-
2	R	-
3	R	- [With VR30 engine]
4	L	- [With VR30 engine]
5	L	- [With 2.0L turbo gasoline engine]
6	L	-
7	L	-
8	L	-
9	L	- [With 2.0L turbo gasoline engine]
10	L	- [With 2.0L turbo gasoline engine]
11	R	- [With VR30 engine]
12	W	-
13	W	-
14	W	-
15	W	-
16	B	-
17	SHIELD	-
18	B	-
19	B	- [With 2.0L turbo gasoline engine]
20	GR	- [With VR30 engine]

20	GR	- [With VR30 engine]
21	SHIELD	- [With 2.0L turbo gasoline engine]
22	B	- [With 2.0L turbo gasoline engine]
23	GR	- [With VR30 engine]
24	W	-

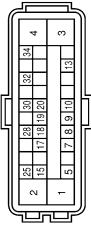
Connector No.	E22
Connector Name	CHASSIS CONTROL MODULE
Connector Type	7H24FW-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
3	P	CAN-L [Without Gateway]
3	R	CAN-L [With Gateway]
4	L	CAN-H
5	V	DRIVE MODE SELECT SWITCH (UP) [With VR30 engine]
6	G	DRIVE MODE SELECT SW (DOWN) [With 2.0L turbo gasoline engine]
7	Y	DRIVE MODE SELECT SW (DOWN) [With VR30 engine]
8	W	CHASSIS COMMA-L
10	BG	IGN [With 2.0L turbo gasoline engine]
11	L	IGN [With VR30 engine]
12	B	GROUND [With VR30 engine]
12	B/W	GROUND [With 2.0L turbo gasoline engine]
19	BR	CHASSIS COMMA-H [With VR30 engine]
19	L	CHASSIS COMMA-H [With 2.0L turbo gasoline engine]
23	G	ESS RELAY [With VR30 engine]
23	R	ESS RELAY [With 2.0L turbo gasoline engine]

EPS SYSTEM

Connector No.	E135
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Type	SAZ20FB-S124-U



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GND
2	B	GND
3	G	VALVE BATTERY [With VR30 engine]
3	P	VALVE BATTERY [With 2.0L turbo gasoline engine]
4	Y	MOTOR BATTERY
5	LG	STOP LAMP SW SIGNAL [With ADAS]
5	V	STOP LAMP SW SIGNAL [With ASCD]
7	GR	RR LH WHEEL SENSOR SIGNAL
8	G	RR LH WHEEL SENSOR POWER SUPPLY
9	BR	FR RH WHEEL SENSOR SIGNAL
10	GR	FR RH WHEEL SENSOR POWER SUPPLY
13	R	VACUUM SENSOR SIGNAL
15	P	CAN-L [Without Gateway]
15	R	CAN-L [With Gateway]
17	Y	RR RH WHEEL SENSOR SIGNAL
18	LG	RR RH WHEEL SENSOR POWER SUPPLY [With 2.0L turbo gasoline engine]
18	V	RR RH WHEEL SENSOR POWER SUPPLY [With VR30 engine]
19	SB	FR LH WHEEL SENSOR SIGNAL
20	BG	FR LH WHEEL SENSOR POWER SUPPLY
25	L	CAN-H
28	G	VACUUM SENSOR POWER SUPPLY
30	R	WDC OFF SW SIGNAL
32	SHIELD	VACUUM SENSOR GROUND
34	G	IGN

Connector No.	E165
Connector Name	FUSE BLOCK (J/B)
Connector Type	TH12FW-AH



Terminal No.	Color Of Wire	Signal Name [Specification]
10F	W	-
11F	G	- [Color of wire differs depending on production]
11F	R	- [Color of wire differs depending on production]
12F	W	- [With VR30 engine]
12F	Y	- [With 2.0L turbo gasoline engine]
1F	R	-
2F	BR	-
3F	P	-
5F	P	-
6F	L	-
7F	R	-
8F	L	-
9F	L	-

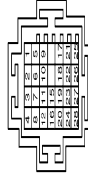
Connector No.	E152
Connector Name	ECM
Connector Type	RH24FB-R28-L-RH



Terminal No.	Color Of Wire	Signal Name [Specification]
173	SB	FUEL TANK PRESSURE SENSOR
175	P	CAN-L
176	L	CAN-H
177	G	SENSOR POWER SUPPLY (FUEL TANK PRESSURE SENSOR)
178	V	TACHO METER SIGNAL
180	P	FUEL TANK TEMPERATURE SENSOR
182	W	FUEL PUMP CONTROL MODULE (FPCM) CHECK

185	SB	IGNITION SWITCH
186	SB	ASCO STEERING SWITCH
187	BG	SENSOR GROUND [ASCO STEERING SWITCH]
188	Y	FUEL PUMP CONTROL MODULE (FPCM)
189	W	ENGINE COMMUNICATION LINE-L
190	L	ENGINE COMMUNICATION LINE-H
191	P	STOP LAMP SWITCH
192	BG	BRAKE PEDAL POSITION SWITCH
193	GR	LEFT POWER WINDOW SWITCH (With 2.0L turbo gasoline engine)
193	LG	RIGHT POWER WINDOW SWITCH (With 2.0L turbo gasoline engine)
194	W	SENSOR POWER SUPPLY
195	BR	ACCELERATOR PEDAL POSITION SENSOR 2
196	R	SENSOR GROUND [ACCELERATOR PEDAL POSITION SENSOR 2]
197	R	ECM POWER SUPPLY
198	L	SENSOR POWER SUPPLY
199	B	ECM GROUND
200	V	SENSOR GROUND
201	B	ECM GROUND
202	Y	ACCELERATOR PEDAL POSITION SENSOR 1
203	G	SENSOR GROUND
204	B	ECM GROUND

Connector No.	E172
Connector Name	JOINT CONNECTOR-E01
Connector Type	SGA28FLBR-J



Terminal No.	Color Of Wire	Signal Name [Specification]
1	GR	-
2	V	-
3	W	-
4	L	-
5	GR	-
6	Y	-
7	W	-
8	L	-
9	GR	-
10	Y	-
11	W	-
12	L	-
15	W	-

15	BG	-
17	P	-
18	L	-
19	W	-
20	BG	-
21	P	-
22	L	-
23	SR	- [Color of wire differs depending on production]
23	W	- [Color of wire differs depending on production]
24	BG	- [Color of wire differs depending on production]
24	LG	- [Color of wire differs depending on production]
25	P	-
26	L	-
27	Y	-
28	L	-



Connector No.	E173
Connector Name	JOINT CONNECTOR-E02
Connector Type	SGA28FDGV-J





Terminal No.	Color Of Wire	Signal Name [Specification]
1	G	- [Color of wire differs depending on production]
1	R	- [Color of wire differs depending on production]
3	B	-
4	B	-
5	G	-
6	BR	-
7	B	-
8	B	-
9	G	-
10	L	-
12	B	-
13	G	-
14	BR	-
17	G	-
21	G	-
25	R	-
26	L	-

EPS SYSTEM



Connector No.	E176
Connector Name	POWER STEERING CONTROL MODULE
Connector Type	RS04FB-PR



Connector No.	E178
Connector Name	WIRE TO WIRE
Connector Type	RS04FB-PR

Connector No.	E180
Connector Name	WIRE TO WIRE
Connector Type	RS04MB






Connector No.	E177
Connector Name	POWER STEERING CONTROL MODULE
Connector Type	Y02FB-1V






Terminal No.	Color Of Wire	Signal Name [Specification]
1	LG	ACTUATOR (FL-L)
3	BR	ACTUATOR (RR-H)
4	BG	IGN
5	W	CHASSIS COMM-L
6	B	GROUND
8	BR	CHASSIS COMM-H (Color of wire differs depending on production)
8	L	CHASSIS COMM-H (Color of wire differs depending on production)
9	G	CHASSIS COMM-L (Color of wire differs depending on production)
9	Y	CHASSIS COMM-L (Color of wire differs depending on production)
10	L	CAN-H
12	G	ACTUATOR (FR-H)
13	G	ESS RELAY
14	L	ACTUATOR (RL-L)
15	Y	ACTUATOR (RR-L)
17	V	ACTUATOR (FL-H)
19	L	CHASSIS COMM-H
21	W	CHASSIS COMM-L
22	V	DRIVE MODE SELECT SWITCH (UP)
23	B	GROUND
24	P	CAN-L (Without Gateway)
24	R	CAN-L (With Gateway)
25	G	IGN
26	V	ACTUATOR (RL-H)
28	R	ACTUATOR (RR-L)



Connector No.	E181
Connector Name	WIRE TO WIRE
Connector Type	Y02MGY



Connector No.	E179
Connector Name	WIRE TO WIRE
Connector Type	Y02FGY



Connector No.	E175
Connector Name	POWER STEERING CONTROL MODULE
Connector Type	RS04FB-PR



Connector No.	E182
Connector Name	WIRE TO WIRE
Connector Type	Y02FGY

Connector No.	E183
Connector Name	WIRE TO WIRE
Connector Type	Y02MGY

Connector No.	E174
Connector Name	POWER STEERING CONTROL MODULE
Connector Type	RS04FB-PR

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

JRGWC3182GB

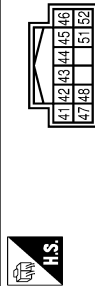
EPS SYSTEM

Connector No.	M24
Connector Name	CAN GATEWAY
Connector Type	TH12FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	CAN-H (CAN COMMUNICATION CIRCUIT 1)
3	W	BATTERY POWER SUPPLY
4	L	CAN-H (CAN COMMUNICATION CIRCUIT 2)
5	B	GROUND
6	L	CAN-H (CAN COMMUNICATION CIRCUIT 1)
7	P	CAN-H (CAN COMMUNICATION CIRCUIT 2)
9	R	IGNITION POWER SUPPLY (Except with VR30 engine and without ISS)
10	R	IGNITION POWER SUPPLY (Except with VR30 engine and without ISS)
11	B	CAN-L (CAN COMMUNICATION CIRCUIT 2)
12	R	CAN-L (CAN COMMUNICATION CIRCUIT 2)

Connector No.	M58
Connector Name	COMBINATION METER
Connector Type	TH12FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
41	L	CAN-H
42	P	CAN-L
43	B	ILLUMINATION CONTROL SIGNAL
44	Y	FUEL LEVEL SENSOR GROUND
45	W	BATTERY POWER SUPPLY
46	BG	IGNITION SIGNAL (Except with VR30 engine and without ISS)
47	SB	AV COMMUNICATION SIGNAL (H)
48	LG	AV COMMUNICATION SIGNAL (L)

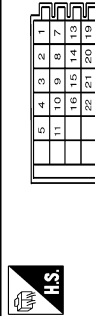
51	BR	FUEL LEVEL SENSOR SIGNAL
52	B	GROUND

Connector No.	M77
Connector Name	STEERING ANGLE SENSOR
Connector Type	TH08FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GROUND
2	P	CAN-L (Without Gateway)
4	G	IGN
5	L	CAN-H

Connector No.	M137
Connector Name	JOINT CONNECTOR-M10
Connector Type	24342_4GAZA



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	B	-
3	B	-
4	B	-
5	B	-
7	B	-
8	B	-
9	B	-
10	B	-
11	B	-
13	L	-

14	L	-
15	L	-
16	L	-
19	R	-
20	R	-
21	R	-
22	R	-

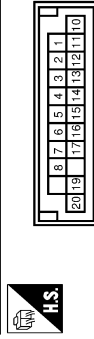
Connector No.	M173
Connector Name	JOINT CONNECTOR-M03
Connector Type	24342_4GAZA



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	L	-
4	L	-
5	L	-
6	L	-
7	R	-
8	R	-
9	R	-
10	R	-
11	R	-
12	R	-
13	SA	-
14	SA	-
15	SA	-
16	L	-
17	L	-
18	L	-
19	BR	-
20	BR	-
21	BR	-
22	BR	-
23	BR	-
24	BR	-

22	R	-
22	SB	-
23	V	-
23	R	-
23	SB	-
24	R	-
24	SB	-
24	V	-

Connector No.	M175
Connector Name	JOINT CONNECTOR-M05
Connector Type	NP20F-DC



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	L	-
4	L	-
5	L	-
6	L	-
7	L	-
8	L	-
10	P	-
11	P	-
12	P	-
13	P	-
14	P	-
15	P	-
16	P	-
17	P	-
18	P	-
19	R	-
19	R	-
19	W	-
20	R	-
20	W	-

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000013482249

DETAILED FLOW

1. INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing reproduce symptoms as well as fully understand it. Ask customer about his/her complaints carefully. Check symptoms by driving vehicle with customer, if necessary.

CAUTION:

Customers are not professional. Never guess easily like “maybe the customer means that...,” or “maybe the customer mentions this symptom”.

>> GO TO 2.

2. CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained by interview. Also check that the symptom is not caused by protection function. Refer to [STC-76, "Protection Function"](#).

CAUTION:

When the symptom is caused by normal operation, fully inspect each portion and obtain the understanding of customer that the symptom is not caused by a malfunction.

>> GO TO 3.

3. CHECK VEHICLE CONDITION

With CONSULT

1. Turn ignition switch ON.
2. Check “HEAT PROTCT STATUS“ in “DATA MONITOR“ in “EPS/DAST 3“.

Monitor item	Values
HEAT PROTCT STATUS	NORMAL

Is the inspection result normal?

YES >> GO TO 4.

NO >> Wait with the ignition switch OFF until the data monitor indication becomes “NORMAL”. And then GO TO 4.

4. PERFORM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis.

Is any DTC detected?

YES >> Record or print DTC and freeze frame data (FFD). GO TO 5.

NO >> GO TO 7.

5. RECHECK SYMPTOM

With CONSULT

1. Erase self-diagnostic results for “EPS/DAST 3“.
2. Perform DTC confirmation procedures for the error detected system.

NOTE:

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on [STC-76, "DTC Inspection Priority Chart"](#).

Is any DTC detected?

YES >> GO TO 6.

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[ELECTRIC POWER STEERING]

Interview sheet

Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Engine		Mileage	km (Mile)
Operation conditions, etc.		<input type="checkbox"/> Irrelevant <input type="checkbox"/> When engine starts <input type="checkbox"/> During idling <input type="checkbox"/> During driving <input type="checkbox"/> During acceleration <input type="checkbox"/> At constant speed driving <input type="checkbox"/> During deceleration <input type="checkbox"/> During cornering (right curve or left curve) <input type="checkbox"/> During steering			
Other conditions					

Memo

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[ELECTRIC POWER STEERING]

DTC/CIRCUIT DIAGNOSIS

C1143 STEERING ANGLE SENSOR

DTC Description

INFOID:0000000013482251

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detected condition	
C1143	ST ANG SEN CIRCUIT (Steering angle sensor circuit)	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	Steering angle sensor signal
		Threshold	Malfunction of steering angle sensor signal
		Diagnosis delay time	2 seconds or more

POSSIBLE CAUSE

- Harness or connector
- Steering angle sensor
- Power steering control module

FAIL-SAFE

Normal steering state

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is DTC "C1143" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-86, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013482252

1. CHECK STEERING ANGLE SENSOR CIRCUIT

Check steering angle sensor circuit. Refer to [BRC-142, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair or replace error-detected parts.

2. CHECK TERMINALS AND HARNESS CONNECTORS

Check the power steering control module pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> Power steering control module is malfunctioning. Replace steering gear assembly. Refer to [ST-95, "Removal and Installation"](#).
NO >> Repair or replace error-detected parts.

C1601 BATTERY POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[ELECTRIC POWER STEERING]

C1601 BATTERY POWER SUPPLY

DTC Description

INFOID:000000013482253

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detected condition	
C1601	BATTERY VOLT (Battery voltage)	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	Power steering control module supply voltage (terminals 1 and 2)
		Threshold	Less than 7 V or more than 18.2 V
		Diagnosis delay time	5 seconds or more

POSSIBLE CAUSE

- Harness or connector
- Power steering control module
- Fuse
- Battery power supply circuit
- Battery

FAIL-SAFE

Manual steering state

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is DTC "C1601" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-87, "Diagnosis Procedure"](#)
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000013482254

1. CHECK POWER STEERING CONTROL MODULE POWER SUPPLY AND GROUND CIRCUIT

Check the power steering control module power supply and ground circuit. Refer to [STC-99, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair open circuit or short to ground or short to power in harness or connectors, and repair or replace error-detected parts.

2. CHECK TERMINAL

1. Check the power steering control module pin terminals for damage or loose connection with harness connector.
2. Check the fuse block (J/B) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

C1601 BATTERY POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[ELECTRIC POWER STEERING]

-
- YES >> Power steering control module is malfunctioning. Replace steering gear assembly. Refer to [ST-95, "Removal and Installation"](#).
- NO >> Repair or replace error-detected parts.

C1604 TORQUE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[ELECTRIC POWER STEERING]

C1604 TORQUE SENSOR

DTC Description

INFOID:0000000013493630

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detected condition	
		Diagnosis condition	When engine running.
C1604	TORQUE SENSOR (Torque sensor)	Signal (terminal)	—
		Threshold	Malfunction of power steering torque sensor
		Diagnosis delay time	Less than 1 second

POSSIBLE CAUSE

- Harness or connector
- Power steering torque sensor
- Power steering control module

FAIL-SAFE

Manual steering state

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Perform "EPS/DAST 3" self-diagnosis.

Is DTC "C1604" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-89, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013493631

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Erase self-diagnostic results for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.
CAUTION:
Never drive the vehicle.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C1604" detected?

- YES >> Power steering torque sensor is malfunctioning. Replace steering gear assembly. Refer to [ST-95, "Removal and Installation"](#).
NO >> Check pin terminal and connection of each harness connector for malfunctioning conditions.

C1606 EPS MOTOR

DTC Description

INFOID:000000013482257

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detected condition	
C1606	EPS MOTOR (EPS motor)	Diagnosis condition	When engine running.
		Signal (terminal)	—
		Threshold	Malfunction of EPS motor or power steering control module motor driver
		Diagnosis delay time	Less than 1 second

POSSIBLE CAUSE

- Harness or connector
- EPS motor
- Power steering control module

FAIL-SAFE

Manual steering state

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform “EPS/DAST 3” self-diagnosis.

Is DTC “C1606” detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-90, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000013482258

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Erase self-diagnostic results for “EPS/DAST 3”.
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for “EPS/DAST 3”.

Is DTC “C1606” detected?

YES >> EPS motor is malfunctioning. Replace steering gear assembly. Refer to [ST-95, "Removal and Installation"](#).

NO >> Check pin terminal and connection of each harness connector for malfunctioning conditions.

C1607, C1608 POWER STEERING CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[ELECTRIC POWER STEERING]

C1607, C1608 POWER STEERING CONTROL MODULE

DTC Description

INFOID:0000000013482259

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detected condition	
C1607	EEPROM (EEPROM)	Diagnosis condition	When engine running.
		Signal (terminal)	—
		Threshold	Malfunction of power steering control module memory (EEPROM) function
		Diagnosis delay time	Less than 1 second
C1608	CONTROL UNIT (Control unit)	Diagnosis condition	When engine running.
		Signal (terminal)	—
		Threshold	Internal malfunction of power steering control module
		Diagnosis delay time	1 seconds or more

POSSIBLE CAUSE

Power steering control module

FAIL-SAFE

DTC	Fail-safe condition
C1607	Constant steering state
C1608	Manual steering state

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.
CAUTION:
Never drive the vehicle.
- Perform "EPS/DAST 3" self-diagnosis.

Is DTC "C1607" or "C1608" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-91, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013482260

1. PERFORM SELF-DIAGNOSIS

With CONSULT

- Turn the ignition switch OFF to ON.
- Erase self-diagnostic results for "EPS/DAST 3".
- Turn the ignition switch OFF and wait for at least 10 seconds.
- Start the engine.

CAUTION:

C1607, C1608 POWER STEERING CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[ELECTRIC POWER STEERING]

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C1607" or "C1608" detected?

YES >> Power steering control module is malfunctioning. Replace steering gear assembly. Refer to [ST-95, "Removal and Installation"](#).

NO >> Check pin terminal and connection of each harness connector for malfunctioning conditions.

C1609 VEHICLE SPEED SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[ELECTRIC POWER STEERING]

C1609 VEHICLE SPEED SIGNAL

DTC Description

INFOID:000000013482261

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detected condition	
C1609	CAN VHCL SPEED (CAN vehicle speed signal)	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	Vehicle speed signal (ABS)
		Threshold	Malfunction of vehicle speed signal
		Diagnosis delay time	2 seconds or more

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Power steering control module
- ABS malfunction
- Vehicle speed signal error

FAIL-SAFE

Constant steering state

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is DTC "C1609" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-93, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000013482262

1. PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "ABS" self-diagnosis. Refer to [BRC-61, "CONSULT Function"](#).

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-72, "DTC Index"](#).

NO >> GO TO 2.

2. CHECK CONNECTOR AND TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Disconnect power steering control module harness connector.
4. Check the connector for disconnection or looseness.
5. Check the pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 3.

C1609 VEHICLE SPEED SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[ELECTRIC POWER STEERING]

NO >> Repair or replace harness, connector, or terminal, securely lock the connector.

3.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect power steering control module harness connector.
3. Turn the ignition switch OFF to ON.
4. Erase self-diagnostic results for "EPS/DAST 3".
5. Turn the ignition switch OFF and wait for at least 10 seconds.
6. Turn the ignition switch OFF to ON.
7. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C1609" detected?

YES >> Power steering control module is malfunctioning. Replace steering gear assembly. Refer to [ST-95, "Removal and Installation"](#).

NO >> Check pin terminal and connection of each harness connector for malfunctioning conditions.

U1000 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[ELECTRIC POWER STEERING]

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:000000013482264

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit communicate data but selectively reads required data only.

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detected condition	
U1000	CAN COMM CIRCUIT (CAN communication circuit)	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	CAN communication signal
		Threshold	Malfunction of CAN communication signal
		Diagnosis delay time	2 seconds or more

POSSIBLE CAUSE

CAN communication error

FAIL-SAFE

Constant steering state

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is DTC "U1000" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-95, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000013482265

Proceed to [LAN-41, "Trouble Diagnosis Flow Chart"](#).

U1010 CONTROL UNIT (CAN)

< DTC/CIRCUIT DIAGNOSIS >

[ELECTRIC POWER STEERING]

U1010 CONTROL UNIT (CAN)

DTC Description

INFOID:000000013482699

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit communicate data but selectively reads required data only.

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detected condition	
U1010	CONTROL UNIT(CAN) [Cotrol unit (CAN)]	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	—
		Threshold	Malfunction of power steering control module during initial diagnosis
		Diagnosis delay time	3 times after malfunction is detected.

POSSIBLE CAUSE

Power steering control module

FAIL-SAFE

Constant steering state.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is DTC "U1010" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-96, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000013482700

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch OFF to ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "U1010" detected?

- YES >> Power steering control module is malfunctioning. Replace steering gear assembly. Refer to [ST-95, "Removal and Installation"](#).
NO >> Check pin terminal and connection of each harness connector for malfunctioning conditions.

U140E CHASSIS CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[ELECTRIC POWER STEERING]

U140E CHASSIS CONTROL MODULE

DTC Description

INFOID:000000013482695

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detected condition	
U140E	Chassis control module (Chassis control module)	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	Drive mode signal (Steering mode signal)
		Threshold	Malfunction of drive mode signal (steering mode signal)
		Diagnosis delay time	2 seconds or more

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Power steering control module
- Chassis control module malfunction
 - Steering mode signal error

FAIL-SAFE

Normal steering state

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is DTC "U140E" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-97, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000013482696

1. PERFORM CHASSIS CONTROL MODULE SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "CHASSIS CONTROL" self-diagnosis. Refer to [DAS-526, "CONSULT Function"](#).

Is any DTC detected?

- YES >> Check the DTC. Refer to [DAS-550, "DTC Index"](#).
NO >> GO TO 2.

2. CHECK CONNECTOR AND TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect chassis control module harness connector.
3. Disconnect power steering control module harness connector.
4. Check the connector for disconnection or looseness.
5. Check the pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

U140E CHASSIS CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[ELECTRIC POWER STEERING]

YES >> GO TO 3.

NO >> Repair or replace harness, connector, or terminal, securely lock the connector.

3. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Connect chassis control module harness connector.
2. Connect power steering control module harness connector.
3. Turn the ignition switch OFF to ON.
4. Erase self-diagnostic results for "EPS/DAST 3".
5. Turn the ignition switch OFF and wait for at least 10 seconds.
6. Turn the ignition switch OFF to ON.
7. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "U140E" detected?

YES >> Power steering control module is malfunctioning. Replace steering gear assembly. Refer to [ST-95. "Removal and Installation"](#).

NO >> Check pin terminal and connection of each harness connector for malfunctioning conditions.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[ELECTRIC POWER STEERING]

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000013482267

1. CHECK THE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect power steering control module harness connector.
3. Check the continuity between power steering control module harness connector and ground.

Power steering control module		—	Continuity
Connector	Terminal		
E177	1	Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit in harness or connectors.

2. CHECK THE BATTERY POWER SUPPLY CIRCUIT (1)

Check the voltage between power steering control module harness connector and ground.

Power steering control module		—	Voltage (Approx.)
Connector	Terminal		
E177	2	Ground	10.5 – 16 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK THE BATTERY POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#J).
2. Check the harness for open or short between power steering control module harness connector No.2 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4. CHECK THE IGNITION POWER SUPPLY CIRCUIT (1)

1. Check the voltage between power steering control module harness connector and ground.

Power steering control module		—	Voltage (Approx.)
Connector	Terminal		
E176	4	Ground	0 V

2. Turn the ignition switch ON.

3. Check the voltage between power steering control module harness connector and ground.

Power steering control module		—	Voltage (Approx.)
Connector	Terminal		
E176	4	Ground	10.5 – 16 V

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5. CHECK THE IGNITION POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#12).

POWER SUPPLY AND GROUND CIRCUIT

[ELECTRIC POWER STEERING]

< DTC/CIRCUIT DIAGNOSIS >

3. Check the continuity between power steering control module harness connector and fuse block (J/B) harness connector.

Power steering control module		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
E176	4	E65	11F	Existed

4. Check the continuity between power steering control module harness connector and ground.

Power steering control module		—	Continuity
Connector	Terminal		
E176	4	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-65, "VR30DDTT : Wiring Diagram - IGNITION POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

6. CHECK TERMINAL

1. Check the power steering control module pin terminals for damage or loose connection with harness connector.

2. Check the fuse block (J/B) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Power steering control module is malfunctioning. Replace steering gear assembly. Refer to [ST-95, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

POWER STEERING WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

[ELECTRIC POWER STEERING]

POWER STEERING WARNING LAMP

Component Function Check

INFOID:000000013482268

1. CHECK THE ILLUMINATION OF THE POWER STEERING WARNING LAMP

Check that the power steering warning lamp turns ON when ignition switch turns ON. Then, power steering warning lamp turns OFF after the engine is started.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Perform trouble diagnosis. Refer to [STC-101, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000013482269

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is any DTC detected?

YES >> Check the DTC. Refer to [STC-76, "DTC Index"](#).

NO >> GO TO 2.

2. CHECK POWER STEERING WARNING LAMP SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. Select in "WARNING LAMP" in "DATA MONITOR" in "EPS/DAST 3".
3. Check that the item in "DATA MONITOR" is "On".

CAUTION:

Never start the engine.

4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Check that the item in "DATA MONITOR" is "OFF".

Is the inspection result normal?

YES >> Perform the trouble diagnosis for combination meter power supply circuit. Refer to [MWI-120, "COMBINATION METER : Diagnosis Procedure"](#).

NO >> GO TO 3.

3. CHECK TERMINALS AND HARNESS CONNECTORS

Check the power steering control module pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Power steering control module is malfunctioning. Replace steering gear assembly. Refer to [ST-95, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

POWER STEERING WARNING LAMP DOES NOT TURN ON

< SYMPTOM DIAGNOSIS >

[ELECTRIC POWER STEERING]

SYMPTOM DIAGNOSIS

POWER STEERING WARNING LAMP DOES NOT TURN ON

Description

INFOID:0000000013482270

The power steering warning lamp does not illuminate when the ignition switch is turned ON (lamp check).

Diagnosis Procedure

INFOID:0000000013482271

1. CHECK THE POWER STEERING WARNING LAMP

Perform trouble diagnosis for the power steering warning lamp system. Refer to [STC-101, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> Check that the pin terminals and the connection of each connector are normal.
- NO >> Repair or replace error-detected parts.

POWER STEERING WARNING LAMP DOES NOT TURN OFF

< SYMPTOM DIAGNOSIS >

[ELECTRIC POWER STEERING]

POWER STEERING WARNING LAMP DOES NOT TURN OFF

Description

INFOID:000000013482272

Power steering warning lamp does not turn OFF several seconds after engine started

Diagnosis Procedure

INFOID:000000013482273

1. PERFORM SELF-DIAGNOSIS

With CONSULT

Perform "EPS/DAST 3" self-diagnosis.

Is any DTC detected?

YES >> Check the DTC. Refer to [STC-76, "DTC Index"](#).

NO >> GO TO 2.

2. CHECK POWER STEERING WARNING LAMP

Perform the trouble diagnosis of power steering warning lamp. Refer to [STC-101, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3. POWER STEERING CONTROL MODULE POWER SUPPLY AND GROUND CIRCUIT

Perform the trouble diagnosis of power steering control module power supply and ground. Refer to [STC-87, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> Check that the pin terminals and the connection of each connector are normal.

NO >> Repair or replace error-detected parts.

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

STEERING WHEEL TURNING FORCE IS HEAVY OR LIGHT

< SYMPTOM DIAGNOSIS >

[ELECTRIC POWER STEERING]

STEERING WHEEL TURNING FORCE IS HEAVY OR LIGHT

Diagnosis Procedure

INFOID:000000013482274

1. PERFORM SELF-DIAGNOSIS

④ With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is a malfunctioning system displayed?

- YES >> Check the DTC. Refer to [STC-76, "DTC Index"](#).
NO >> GO TO 2.

2. CHECK THE ILLUMINATION OF THE POWER STEERING WARNING LAMP

Check that the power steering warning lamp turns ON when ignition switch turns ON. Then, power steering warning lamp turns OFF after the engine is started.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Perform trouble diagnosis of power steering warning lamp. Refer to [STC-101, "Diagnosis Procedure"](#).

3. CHECK THE POWER STEERING CONTROL MODULE SIGNAL (1)

④ With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn steering wheel from full left stop to full right stop.
3. Select "Assist level" in "DATA MONITOR" in "EPS/DAST 3".

Is the display value "100%"?

- YES >> GO TO 6.
NO >> GO TO 4.

4. CHECK THE POWER STEERING CONTROL MODULE SIGNAL (2)

④ With CONSULT

Select "BATTERY VOLT" in "DATA MONITOR" in "EPS/DAST 3".

Is the display value "10.5 V" or more?

- YES >> GO TO 5.
NO >> Perform trouble diagnosis of power steering control module power supply and ground. Refer to [STC-87, "Diagnosis Procedure"](#).

5. CHECK POWER STEERING CONTROL MODULE SIGNAL (3)

④ With CONSULT

1. Select "Assist level" in "DATA MONITOR" in "EPS/DAST 3".
2. Stop the EPS system until the item in "DATA MONITOR" becomes "100%".

NOTE:

While stopping the EPS system, do not turn steering wheel.

3. Check that the symptom continues.

Does the symptom continue?

- YES >> GO TO 6.
NO >> The assist torque decreases because of protection function. This is not malfunction. INSPECTION END

6. CHECK POWER STEERING CONTROL MODULE SIGNAL (4)

④ With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn steering wheel from full left stop to full right stop.

STEERING WHEEL TURNING FORCE IS HEAVY OR LIGHT

< SYMPTOM DIAGNOSIS >

[ELECTRIC POWER STEERING]

3. Select "STEERING TORQUE" in "DATA MONITOR" in "EPS/DAST 3".
4. Perform the torque sensor inspection.

Monitor item	Condition	Display value
STEERING TORQUE	Steering wheel: Not steering (There is no steering force)	Approx. 0 Nm
	Steering wheel: Right turn	Positive value (Nm)
	Steering wheel: Left turn	Negative value (Nm)

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 7.

7.CHECK EPS MOTOR

Perform the trouble diagnosis of EPS motor. Refer to [STC-90, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace the specific malfunctioning part.

8.CHECK THE STEERING FORCE

Check the steering wheel turning force. Refer to [ST-69, "Inspection"](#).

Is the check result normal?

YES >> INSPECTION END

NO >> It is possible that there is a mechanical malfunction. Check the steering system. Refer to [ST-98, "Inspection"](#).

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

UNBALANCE STEERING WHEEL TURNING FORCE AND RETURN BETWEEN RIGHT AND LEFT

< SYMPTOM DIAGNOSIS >

[ELECTRIC POWER STEERING]

UNBALANCE STEERING WHEEL TURNING FORCE AND RETURN BETWEEN RIGHT AND LEFT

Diagnosis Procedure

INFOID:000000013482275

1. CHECK THE ILLUMINATION OF THE POWER STEERING WARNING LAMP

Check the power steering warning lamp while engine is running.

Does the power steering warning lamp turn OFF?

YES >> GO TO 2.

NO >> Refer to [STC-103, "Diagnosis Procedure"](#).

2. CHECK WHEEL ALIGNMENT

Check the wheel alignment.

- 2WD models: Refer to [FSU-28, "EXCEPT DIRECT ADAPTIVE STEERING : Inspection"](#).
- AWD models: Refer to [FSU-54, "EXCEPT DIRECT ADAPTIVE STEERING : Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Adjustment of wheel alignment.

- 2WD models: Refer to [FSU-29, "EXCEPT DIRECT ADAPTIVE STEERING : Adjustment"](#).
- AWD models: Refer to [FSU-55, "EXCEPT DIRECT ADAPTIVE STEERING : Adjustment"](#).

3. CHECK POWER STEERING CONTROL MODULE SIGNAL

Ⓟ **With CONSULT**

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn steering wheel from full left stop to full right stop.
3. Select "STEERING TORQUE" in "DATA MONITOR" in "EPS/DAST 3".
4. Perform the torque sensor inspection.

Monitor item	Condition	Display value
STEERING TORQUE	Steering wheel: Not steering (There is no steering force)	Approx. 0 Nm
	Steering wheel: Right turn	Positive value (Nm)
	Steering wheel: Left turn	Negative value (Nm)

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. CHECK EPS MOTOR

Perform the trouble diagnosis of EPS motor. Refer to [STC-90, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace the specific malfunctioning part.

5. CHECK STEERING WHEEL TURNING FORCE

Check the steering wheel turning force. Refer to [ST-69, "Inspection"](#).

Is the check result normal?

YES >> INSPECTION END

NO >> It is possible that there is a mechanical malfunction. Check the steering system. Refer to [ST-98, "Inspection"](#).

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)

< SYMPTOM DIAGNOSIS >

[ELECTRIC POWER STEERING]

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)

Diagnosis Procedure

INFOID:000000013482276

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform "EPS/DAST 3" self-diagnosis.

Is a malfunctioning system displayed?

- YES >> Check the DTC. Refer to [STC-76, "DTC Index"](#).
NO >> GO TO 2.

2. CHECK THE ILLUMINATION OF THE POWER STEERING WARNING LAMP

Check that the power steering warning lamp turns ON when ignition switch turns ON. Then, power steering warning lamp turns OFF after the engine is started.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Perform trouble diagnosis of power steering warning lamp. Refer to [STC-101, "Diagnosis Procedure"](#).

3. CHECK STEERING COLUMN AND STEERING GEAR

Check the steering column assembly and steering gear assembly.

- Steering column assembly. Refer to [ST-85, "WITH ELECTRIC MOTOR : Exploded View"](#).
- Steering gear assembly. Refer to [ST-93, "Exploded View"](#).

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

4. CHECK THE POWER STEERING CONTROL MODULE SIGNAL (1)

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn steering wheel from full left stop to full right stop.
3. Select "Assist level" in "DATA MONITOR" in "EPS/DAST 3".

Is the display value "100%"?

- YES >> GO TO 7.
NO >> GO TO 5.

5. CHECK THE POWER STEERING CONTROL MODULE SIGNAL (2)

With CONSULT

Select "BATTERY VOLT" in "DATA MONITOR" in "EPS/DAST 3".

Is the display value "10.5 V" or more?

- YES >> GO TO 6.
NO >> Perform trouble diagnosis of power steering control module power supply and ground. Refer to [STC-87, "Diagnosis Procedure"](#).

6. CHECK POWER STEERING CONTROL MODULE SIGNAL (3)

With CONSULT

1. Select "Assist level" in "DATA MONITOR" in "EPS/DAST 3".
2. Stop the EPS system until the item in "DATA MONITOR" becomes "100%".

NOTE:

While stopping the EPS system, do not turn steering wheel.

3. Check that the symptom continues.

Does the symptom continue?

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)

< SYMPTOM DIAGNOSIS >

[ELECTRIC POWER STEERING]

YES >> GO TO 7.

NO >> The assist torque decreases because of protection function. This is not malfunction. INSPECTION END

7. CHECK POWER STEERING CONTROL MODULE SIGNAL (4)

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn steering wheel from full left stop to full right stop.

3. Select "STEERING TORQUE" in "DATA MONITOR" in "EPS/DAST 3".

4. Perform the torque sensor inspection.

Monitor item	Condition	Display value
STEERING TORQUE	Steering wheel: Not steering (There is no steering force)	Approx. 0 Nm
	Steering wheel: Right turn	Positive value (Nm)
	Steering wheel: Left turn	Negative value (Nm)

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 8.

8. CHECK EPS MOTOR

Perform the trouble diagnosis of EPS motor. Refer to [STC-90, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace the specific malfunctioning part.

9. CHECK THE STEERING FORCE

Check the steering wheel turning force. Refer to [ST-69, "Inspection"](#).

Is the check result normal?

YES >> INSPECTION END

NO >> It is possible that there is a mechanical malfunction. Check the steering system. Refer to [ST-98, "Inspection"](#).

POWER STEERING CONTROL MODULE

< REMOVAL AND INSTALLATION >

[ELECTRIC POWER STEERING]

REMOVAL AND INSTALLATION

POWER STEERING CONTROL MODULE

Removal and Installation

INFOID:0000000013482277

CAUTION:

Disconnect battery negative terminal before starting operations.

Never remove power steering control module from steering gear assembly. When replacing power steering control module, replace steering gear assembly. Refer to [ST-95, "Removal and Installation"](#).

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:000000013356534

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery or batteries, and wait at least 3 minutes before performing any service.

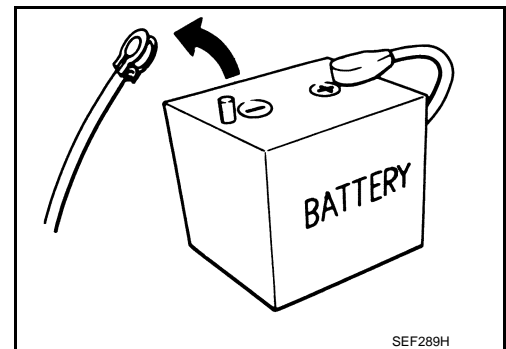
Precautions for Removing Battery Terminal

INFOID:000000013509518

When disconnecting the battery terminal, pay attention to the following.

- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.
- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

BR08DE	: 4 minutes	V9X engine	: 4 minutes
D4D engine	: 20 minutes	YD25DDTi	: 2 minutes
HR09DET	: 12 minutes	YS23DDT	: 4 minutes
HRA2DDT	: 12 minutes	YS23DDTT	: 4 minutes
K9K engine	: 4 minutes	ZD30DDTi	: 60 seconds
M9R engine	: 4 minutes	ZD30DDTT	: 60 seconds
R9M engine	: 4 minutes		



NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

- After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:

PRECAUTIONS

[DIRECT ADAPTIVE STEERING]

< PRECAUTION >

- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
 - Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
 - Driving for 30 minutes or more on a steep slope.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:

The removal of 12V battery may cause a DTC detection error.

Precautions for Harness Repair

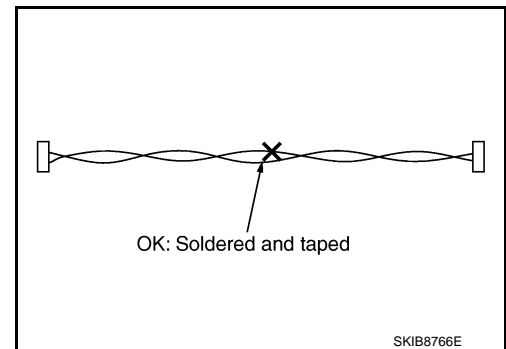
INFOID:000000013356536

FLEXRAY AND CAN COMMUNICATION LINE

- Solder the repaired area and wrap tape around the soldered area.

NOTE:

A fray of twisted lines must be within 110 mm (4.33 in).

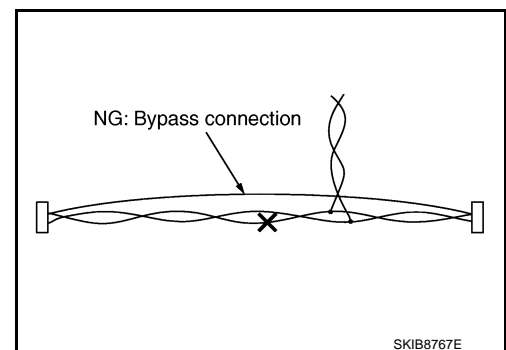


- Bypass connection is never allowed at the repaired area.

NOTE:

Bypass connection may cause FlexRay communication error as spliced wires that are separate from the main line or twisted lines lose noise immunity.

- Replace the applicable harness as an assembly if error is detected on the shield lines of FlexRay communication line.



Service Notice and Precautions for Direct Adaptive Steering

INFOID:000000013356537

- Set the vehicle to the straight-ahead position when checking direct adaptive steering and removing each component.
- Check the following item when performing the trouble diagnosis.
 - Check if air pressure and size of tires are proper, the specified part is used for the steering wheel is genuine part.
 - Check if the connection of steering column assembly and steering gear assembly is proper (there is not looseness of mounting bolts, damage of rods, and boots or sealants, etc.).
 - Check if the wheel alignment is adjusted properly.
 - Check if there is any damage or modification to suspension or body resulting in increased weight or altered ground clearance.
 - Check if installation conditions of each link and suspension are proper.
 - Check if the battery voltage is proper.
 - Check connection conditions of each connector are proper.
- A machine sound may be heard near the driver's seat when the system is starting. This is an operating sound in normal condition of system and the sound is not.
- Before connecting or disconnecting each component harness connector, turn ignition switch "OFF" and disconnect battery ground cable. Because battery voltage is applied to power steering control module even if ignition switch is turned "OFF".

PRECAUTIONS

[DIRECT ADAPTIVE STEERING]

< PRECAUTION >

- When removing the 12V battery negative terminal, initialize is required for operating the direct adaptive steering normally. Refer to [STC-201, "Description"](#).
- Refer to [STC-202, "Special Repair Requirement"](#) for the replacement of each component.

COMPONENT PARTS

< SYSTEM DESCRIPTION >

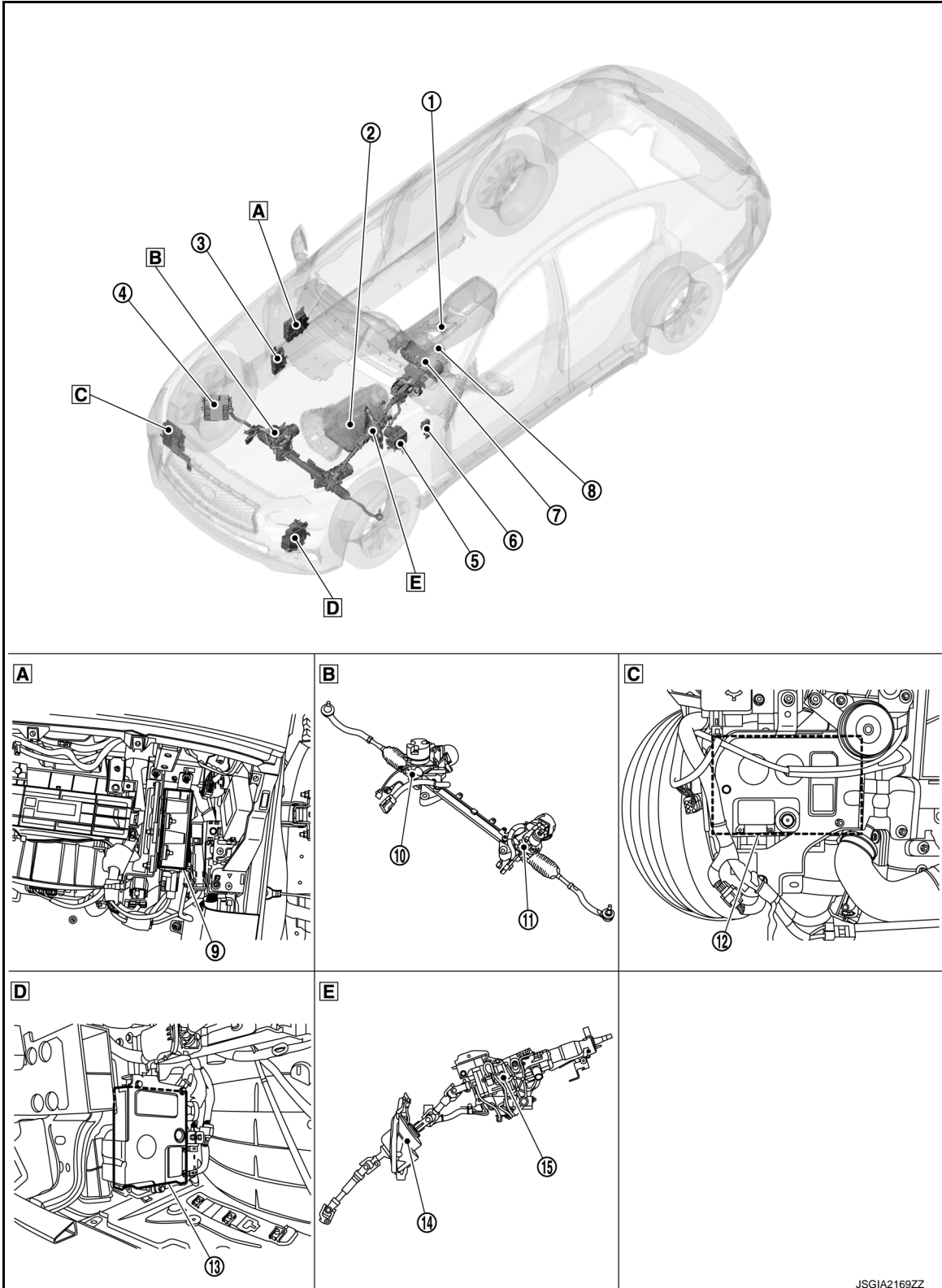
[DIRECT ADAPTE STEERING]

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000013356538



A

B

C

D

E

F

STC

H

I

J

K

L

M

N

O

P

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

- | | | |
|--|---|---|
| <p>A Behind of glove box</p> <p>D Behind of front bumper (left side)</p> | <p>B Steering gear assembly</p> <p>E Steering column assembly and steering shaft assembly</p> | <p>C Behind of front bumper (right side)</p> |
|--|---|---|

No.	Component	Function
①	Drive mode select switch	<ul style="list-style-type: none"> • Drive mode is selectable among PERSONAL, SPORT, and STANDARD by the operating the switch. • Output the status of drive mode to the chassis control module. • For detailed installation location, refer to DMS-4, "Component Parts Location".
②	TCM	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. - Shift position signal • For detailed installation location, refer to TM-13, "A/T CONTROL SYSTEM : Component Parts Location".
③	BCM	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. - Sleep/wake up signal • For detailed installation location, refer to BCS-5, "BODY CONTROL SYSTEM : Component Parts Location".
④	ECM	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. - Engine status signal - Engine speed signal • For detailed installation location, refer to EC6-33, "ENGINE CONTROL SYSTEM : Component Parts Location" (For USA and CANADA), EC6-1024, "ENGINE CONTROL SYSTEM : Component Parts Location" (For MEXICO).
⑤	ABS actuator and electric unit (control unit)	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. - Front LH wheel sensor signal - Front RH wheel sensor signal - Vehicle speed signal - Side G signal - Yaw rate signal • For detailed installation location, refer to BRC-10, "Component Parts Location".
⑥	Chassis control module	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. - Drive mode signal - Steering angle sensor signal • Transmits mainly the following signals to steering angle main control module via Chassis communication. - Active lane control signal • For detailed installation location, refer to DAS-516, "Component Parts Location".
⑦	Combination meter (Steering warning lamp)	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. - Odometer signal • For detailed installation location, refer to MWI-8, "METER SYSTEM : Component Parts Location". • Turns ON the power steering warning lamp according to the signal from steering force control module via CAN communication. • For steering warning lamp, refer to STC-129, "WARNING/INDICATOR/CHIME LIST : Warning Lamp/Indicator Lamp".
⑧	Steering angle sensor	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. - Steering angle sensor signal - Steering angle sensor malfunction signal • For detailed installation location, refer to BRC-10, "Component Parts Location".

COMPONENT PARTS

< SYSTEM DESCRIPTION >

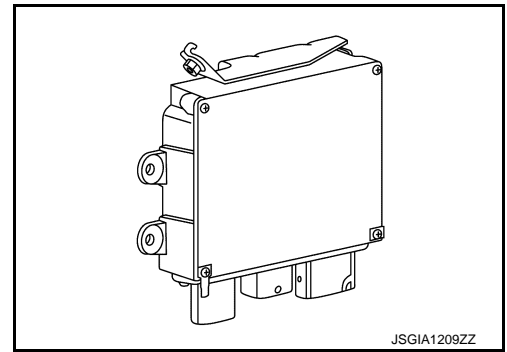
[DIRECT ADAPTIVE STEERING]

No.	Component	Function
⑨	Steering force control module	STC-115, "Steering Force Control Module"
⑩	Steering angle sub actuator	Steering angle sub motor
		Sub motor angle sensor
		Sub reduction gear
⑪	Steering angle main actuator	Steering angle main motor
		Main motor angle sensor
		Main reduction gear
		Steering torque sensor
⑫	Steering angle sub control module	STC-116, "Steering Angle Sub Control Module"
⑬	Steering angle main control module	STC-115, "Steering Angle Main Control Module"
⑭	Steering clutch	STC-117, "Steering Clutch"
⑮	Steering force actuator	STC-116, "Steering Force Actuator"

Steering Force Control Module

INFOID:000000013356539

- Calculates the optimum control variable for the steering force motor from the input values of force motor angle sensor and vehicle speed signal to controlling the steering force motor.
- Steering force control module changes steering reaction force based on the drive mode select signal from chassis control module.
- Performs the release and engagement control of the steering clutch.
- If a malfunction occurs in the system, the fail-safe function activates to perform state transition, and the power steering warning lamp in the combination meter illuminates.
- The malfunctioning portion is displayed by the electronic system diagnosis tester (CONSULT) according to the self-diagnosis function.
- Quickly switches the control after a malfunction occurs according to synchronous control using FlexRay communication.

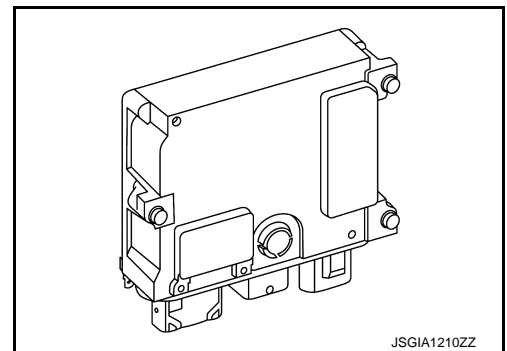


STC

Steering Angle Main Control Module

INFOID:000000013356540

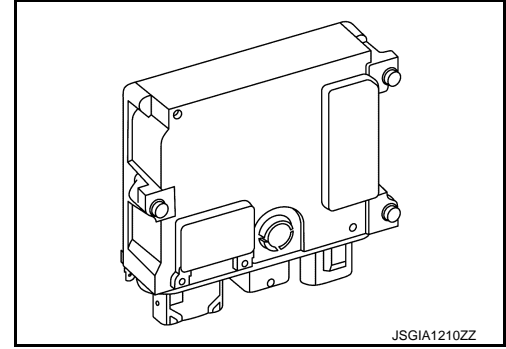
- Calculates the optimum control variable for steering angle main motor from input values of force motor angle sensor, main motor angle sensor, and vehicle speed signal for controlling the steering angle main motor.
- Steering angle main control module changes the steering gear ratio based on the drive mode select signal from chassis control module.
- Quickly switches the control after a malfunction occurs according to synchronous control using FlexRay communication.
- When transferring to EPS mode, this calculates the optimum control variable for steering angle sub motor from input values of steering torque sensor to control steering angle sub motor (Torque assist control).



Steering Angle Sub Control Module

INFOID:0000000113356541

- Calculates the optimum control variable for the steering angle sub motor from input values of force motor angle sensor, sub motor angle sensor, and vehicle speed signal for controlling the steering angle sub motor.
- Quickly switches the control after a malfunction occurs, according to synchronous control using FlexRay communication.

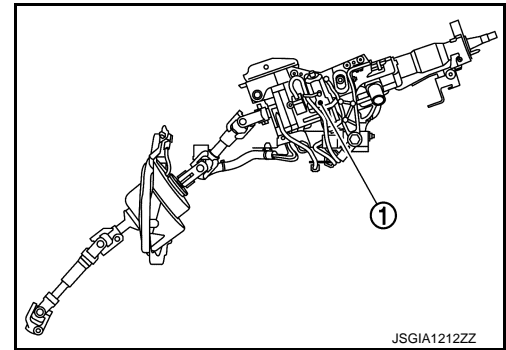


JSGIA1210ZZ

Steering Force Actuator

INFOID:0000000113356542

Steering force actuator ① mainly consists of the steering force motor, the force motor angle sensor, and the force motor temperature sensor.



JSGIA1212ZZ

Steering Force Motor

Steering force motor generates a torque equivalent to the reaction force from the road surface by the traction current from the steering force control module.

Force Motor Angle Sensor

Force motor angle sensor detects the angle of the steering force motor and outputs to the steering force control module by converting into voltage.

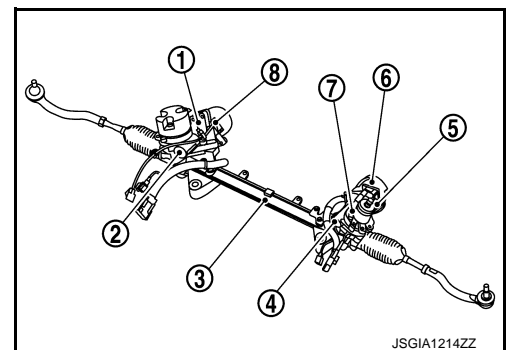
Force Motor Temperature Sensor

Force motor temperature sensor detects the temperature of the steering force motor and outputs to the steering force control module by converting into voltage.

Steering Angle Actuator

INFOID:0000000113356543

Steering angle actuator mainly consists of the sub motor angle sensor ①, the sub reduction gear ②, the steering gear ③, main reduction gear ④, the main motor angle sensor ⑤, the steering angle main motor ⑥, the steering torque sensor ⑦, and the steering angle sub motor ⑧.



JSGIA1214ZZ

STEERING GEAR

Steering gear converts the pinion torque into rack axial force and changes the direction of the tires by rotating the knuckle arms.

STEERING TORQUE SENSOR

Steering torque sensor detects the pinion torque and outputs the torque signal to the steering angle main control module by converting into voltage.

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

STEERING ANGLE MAIN MOTOR

Steering angle main motor generates a steering torque by the traction current from the steering angle main control module.

MAIN REDUCTION GEAR

Main reduction gear increases the steering torque provided from steering angle main motor with worm gears, and outputs to the pinion.

MAIN MOTOR ANGLE SENSOR

Main motor angle sensor detects the angular velocity of the steering angle main motor and outputs to the steering angle main control module by converting into voltage.

STEERING ANGLE SUB MOTOR

Steering angle sub motor generates an assist torque by the traction current from the steering angle sub control module.

SUB REDUCTION GEAR

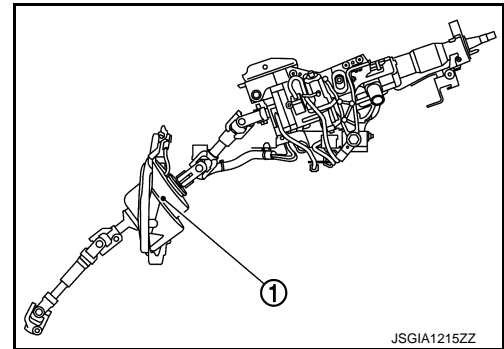
Sub reduction gear increases the steering assist torque provided from steering angle sub motor with worm gears, and outputs to the steering rack.

MAIN MOTOR ANGLE SENSOR

Main motor angle sensor detects the angular velocity of the steering angle sub motor and outputs to the steering angle sub control module by converting into voltage.

Steering Clutch

- Once electrified from the steering force control module, the steering clutch ① is released and the upper and lower steering shafts are separated.
- When a system malfunction occurs, when system is in protection mode, or when the steering wheel is turned with a force stronger than the butting reaction force generated by the steering force motor, the clutch is engaged while the electric from the steering force control module is shut out, and the upper and lower steering shafts are engaged.



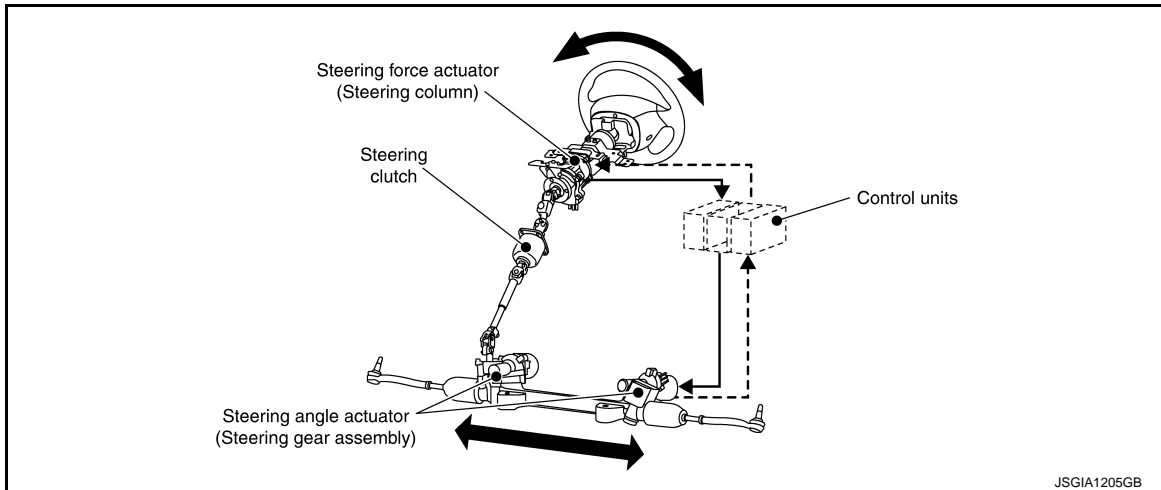
A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

SYSTEM

DIRECT ADAPTIVE STEERING

DIRECT ADAPTIVE STEERING : System Description

INFOID:000000013356545



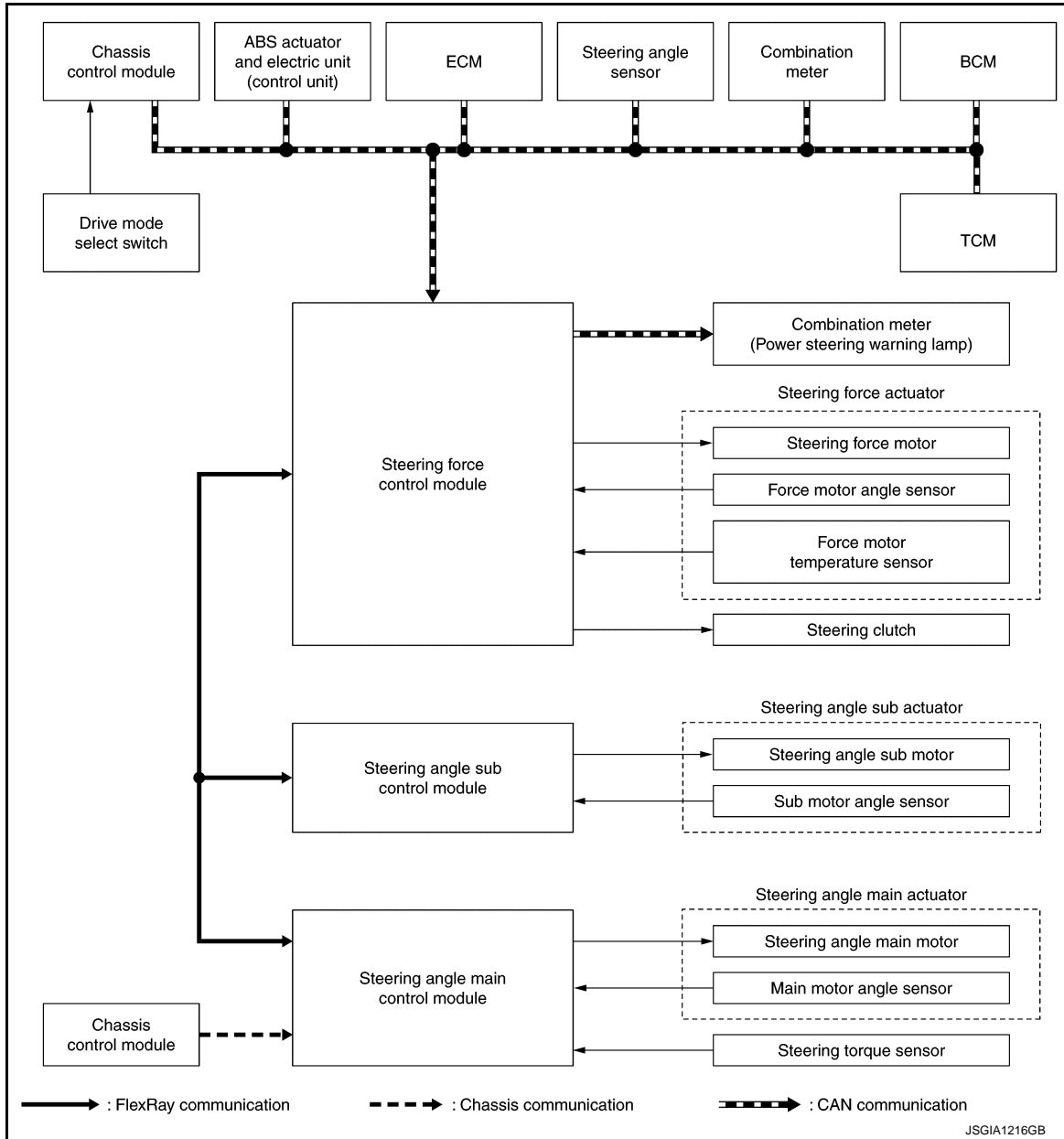
- Instead of the conventional mechanical steering system, the direct adaptive steering that conveys the steering wheel operating to the tires by converting into an electrical signal was adopted.
- By converting the steering wheel operation into an electrical signal, the steering wheel operation is conveyed to the tires without delay.
- Even on a rough road surface, the direction of tires is controlled by the steering angle actuator control to prevent the unpleasant vibration from being conveyed to the steering wheel due to the rough road surface (the necessary information for driving, such as slipperiness of the road, is conveyed to the steering wheel).
- When the system is stopped or abnormal, the portions from the steering wheel to the steering gear assembly are connected mechanically while the steering clutch is engaged, and the steering wheel becomes operative.
- The steering angle actuator (steering gear assembly) and the steering force actuator (steering column) are controlled by 3 control modules. The 3 control modules share the computed result of each data and monitor each other.
- This system is linked with active lane control and applies a slight correction to the steering angle and the steering reaction force to improve the vehicle stability when the vehicle direction is shifted by a cross wind or other forces. For details, refer to [DAS-718. "ACTIVE LANE CONTROL : System Description"](#).
- Infiniti drive mode selector which can change the steering characteristic corresponding to the preference of the driver was adopted. For details, refer to [DMS-15. "Infiniti Drive Mode Selector : System Description \(For VR30DDTT Engine Models\)"](#).
- This enables trouble diagnosis with CONSULT.

SYSTEM

< SYSTEM DESCRIPTION >

[DIRECT ADAPIVE STEERING]

System Diagram



A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

INPUT/OUTPUT SIGNAL

Communicates the signal from each control unit via CAN communication, Chassis communication or FlexRay communication.

SYSTEM

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Control unit	Signal status
Chassis control module	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Drive mode signal - Steering angle sensor signal • Transmits mainly the following signals to steering angle main control module via Chassis communication. <ul style="list-style-type: none"> - Active lane control signal - Steering angle sensor signal*¹ - Steering angle sensor malfunction signal*¹
ABS actuator and electric unit (control unit)	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Front LH wheel sensor signal - Front RH wheel sensor signal - Vehicle speed signal - Side G signal - Yaw rate signal
ECM	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Engine status signal - Engine speed signal • Receives mainly the following signals from steering force control module via CAN communication. <ul style="list-style-type: none"> - Steering torque signal
TCM	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Shift position signal
Combination meter	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Odometer signal • Receives mainly the following signals from steering force control module via CAN communication. <ul style="list-style-type: none"> - Power steering warning lamp signal
Steering angle sensor	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Steering angle sensor signal - Steering angle sensor malfunction signal
BCM	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Sleep wake up signal
Steering force control module Steering angle main control module Steering angle sub control module	<ul style="list-style-type: none"> • Interactively transmits and receives mainly the following signals via FlexRay communication*². <ul style="list-style-type: none"> - Direct adaptive steering control signal

*1: Chassis control module transmits the signal (received from steering angle sensor) via Chassis communication

*2: Communication line between the steering force control module, the steering angle main control module, and the steering angle sub control module

Front Wheel Control Mechanism

- Front wheel control mechanism is equipped with a function for calculating steering command angle and for controlling steering angle servo according to the command steering angle.

Steering Command Angle Calculation Function

- Steering force control module calculates steering command angle from the steering angle sensor signal, vehicle speed signal, yaw rate signal, and steering angle speed signal and transmits to the steering angle main control module.
- Steering angle main control module adds the steering angle command from chassis control module to the steering command angle.
- Steering angle main control module changes the steering gear ratio according to the mode change command from the chassis control module.

< SYSTEM DESCRIPTION >

Steering Angle Servo Control Function

- Steering angle main control module drives the steering angle main motor according to the servo command current calculated from the steering command angle and main motor angle, and transmits the command current for assist to the steering angle sub control module.
- Steering angle sub control module drives the steering angle sub motor from the transmitted servo command current and operates assist.

Steering Reaction Force Control Mechanism

- Steering force control module calculates a steering reaction force equivalent to the tire reaction force from steering angle sensor signal, steering angle motor angle, steering angle motor current, and vehicle speed signal to drive steering force motor.
- Steering force control module adds steering reaction force command from chassis control module to steering reaction force.
- Steering force control module changes steering reaction force according to the mode change command from chassis control module.

Back Up Mechanism

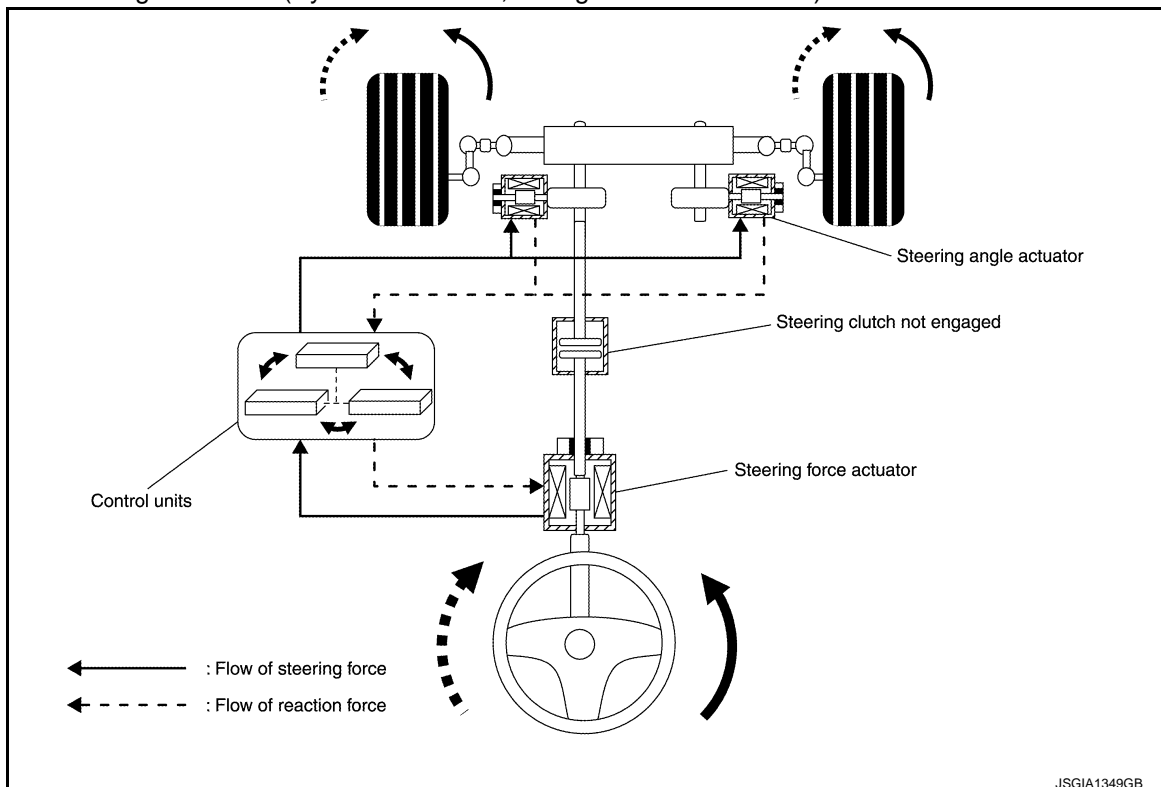
- Steering clutch is released while the system is operating normally. Engages the clutch when the system is stopped, when a malfunction occurs, or when the steering wheel is turned with a force stronger than the reaction force generated by the steering force motor.
- Steering force control module, steering angle main control module, and steering angle sub-control module mutually monitor calculations.

Infiniti Drive Mode Selector

- With Infiniti Drive Mode Selector, the steering characteristics can be set corresponding to the preference of the driver. For details, refer to [DMS-15. "Infiniti Drive Mode Selector : System Description \(For VR30DDTT Engine Models\)"](#).

OPERATION PRINCIPLE

Turning the Steering to the Left (System is Normal, and Ignition Switch is ON)



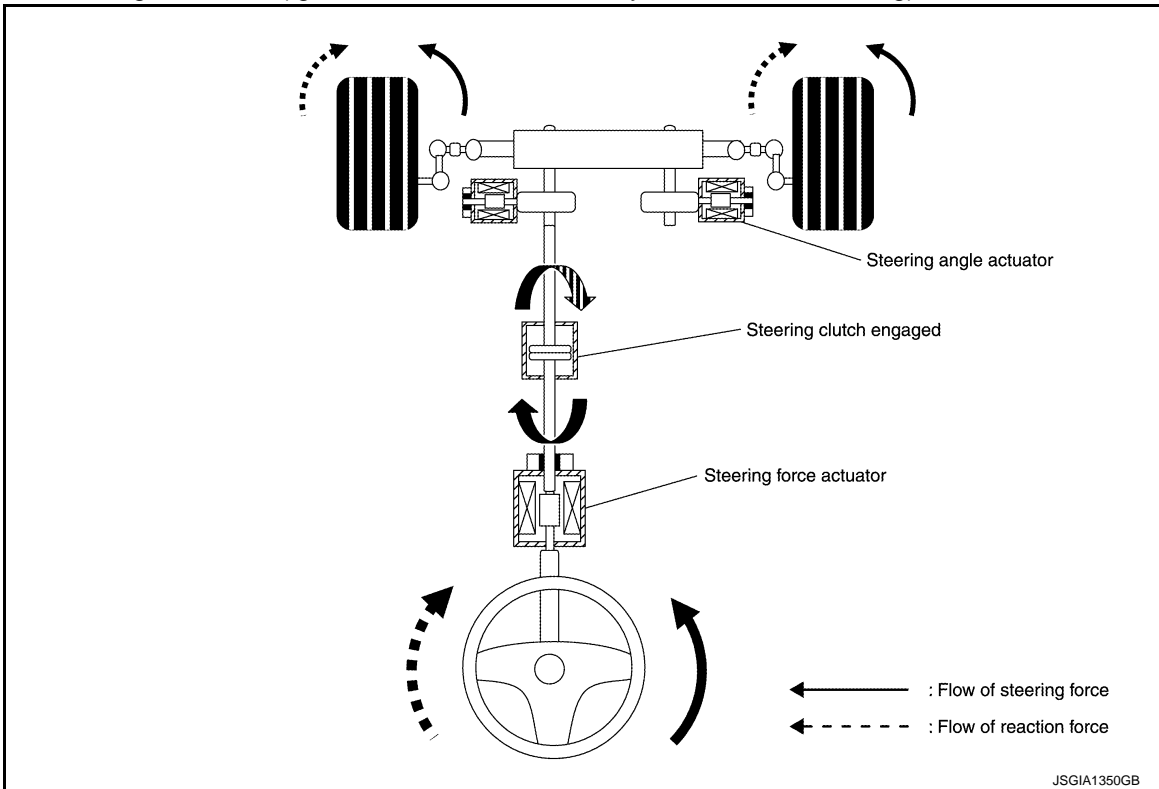
- In the normal state, the steering clutch is not engaged, and the steering wheel is separated from the steering gear assembly.
- If turning the steering wheel to the left, the steering angle actuator is driven, and the tire is turned to the left direction.
- The reaction force from the tires is conveyed from the steering gear assembly to the steering force control module and conveyed to the steering wheel by driving the steering force motor.

SYSTEM

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Turning the Steering to the Left (Ignition Switch is OFF, and System is Malfunctioning)



- The steering clutch is engaged, and the system changes to EPS mode, protection mode, or manual steering status.
- No electrical control is performed in manual steering mode.

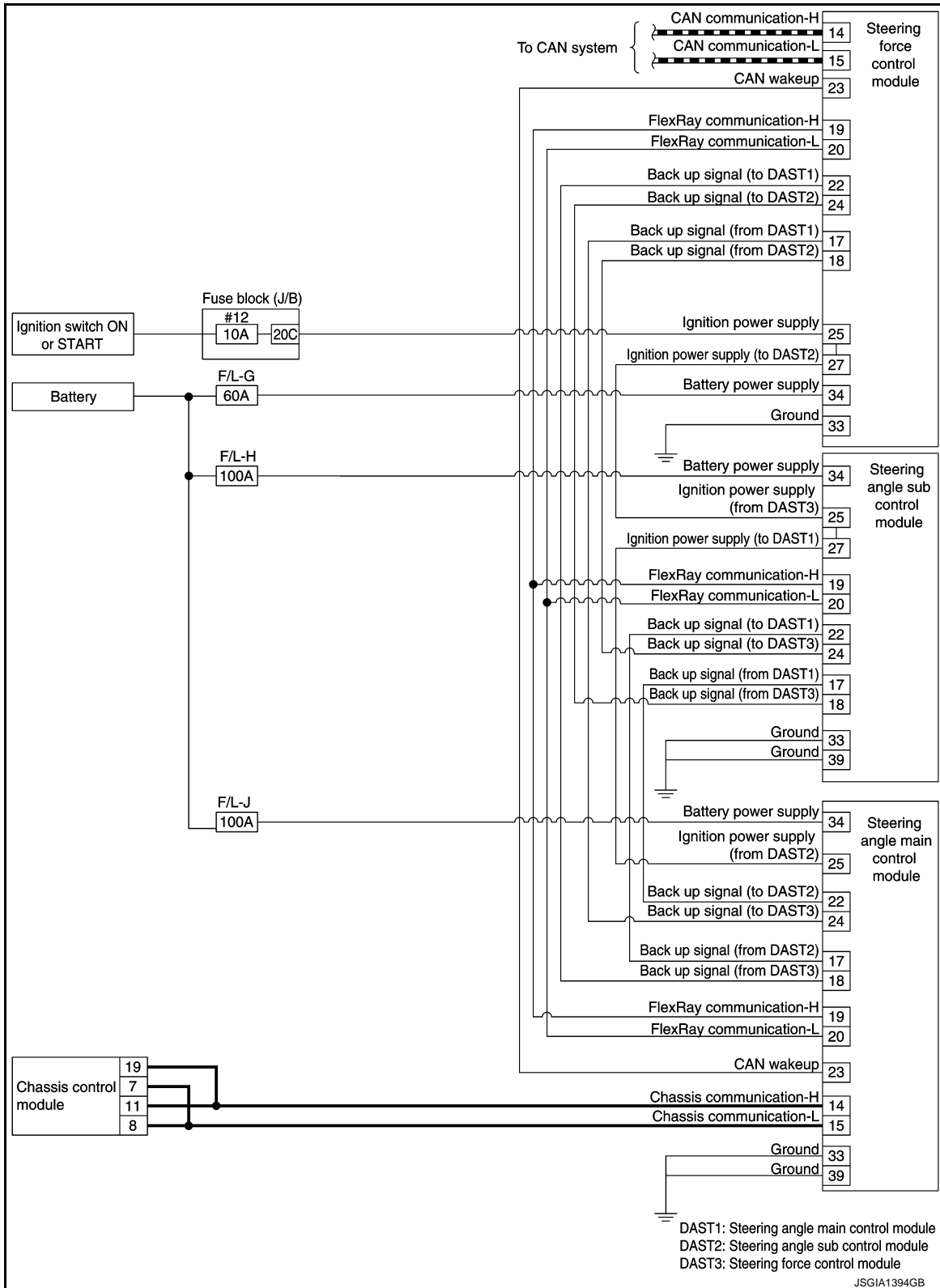
SYSTEM

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

DIRECT ADAPTIVE STEERING : Circuit Diagram

INFOID:000000013356546

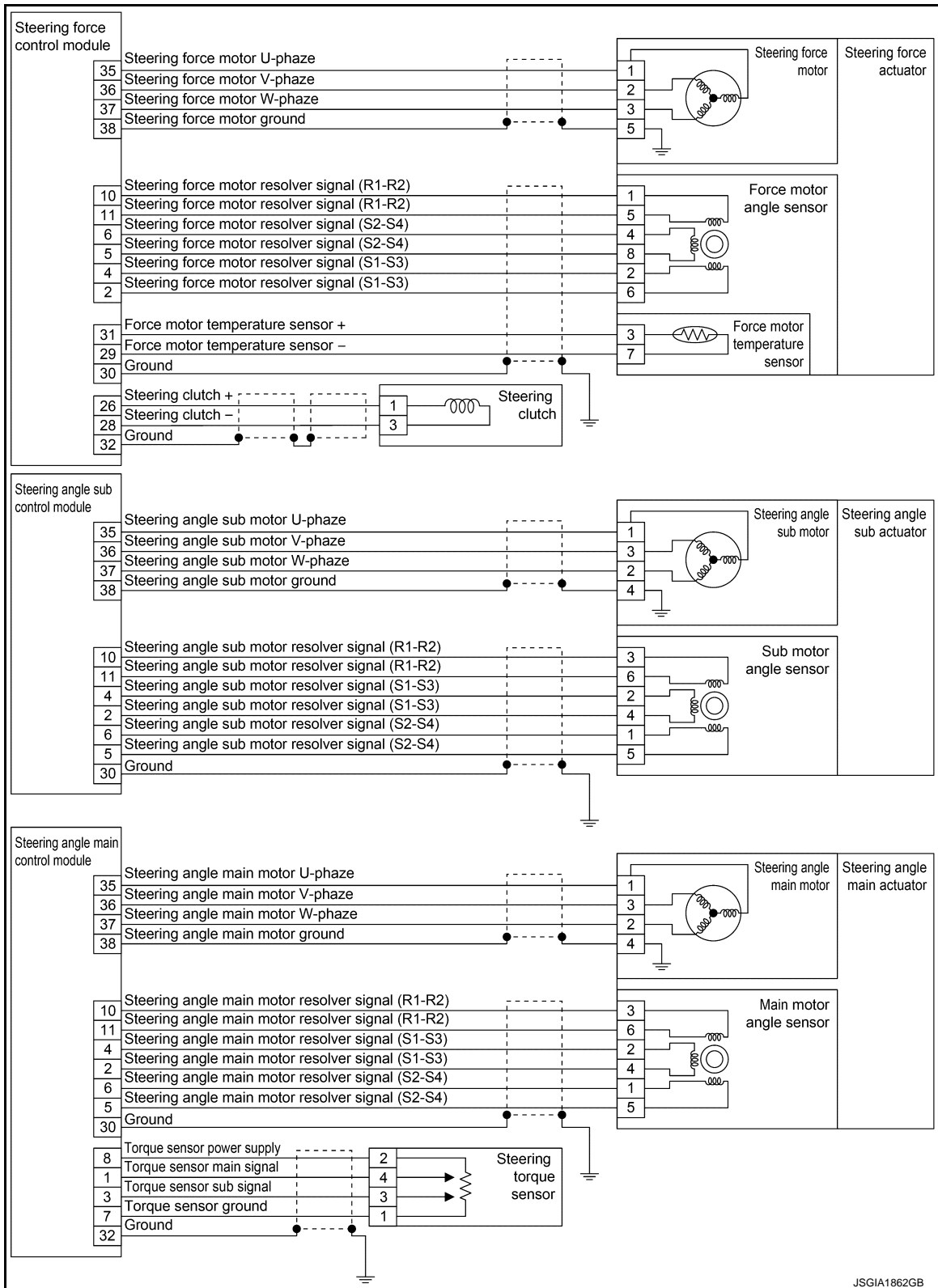


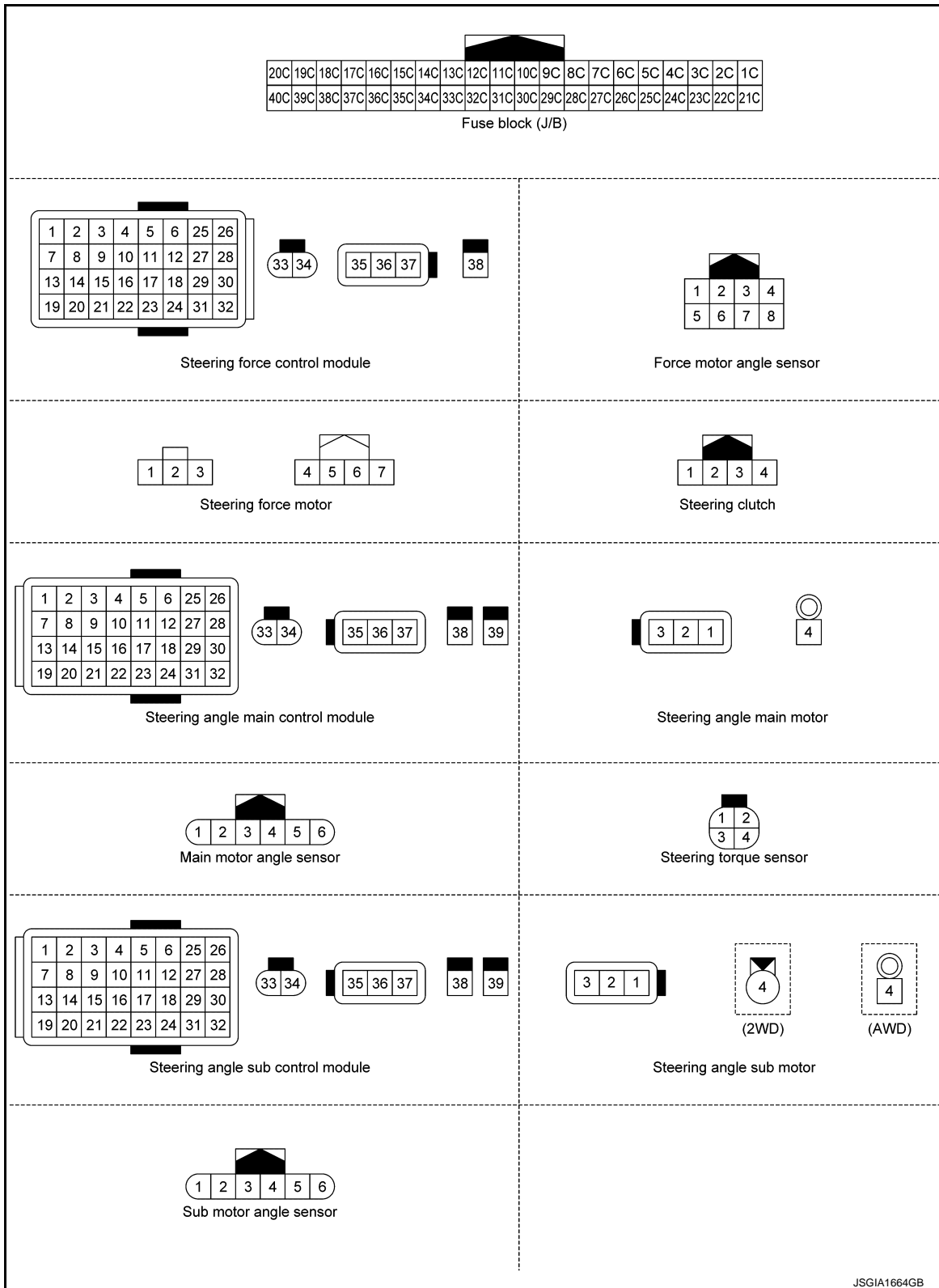
A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

SYSTEM

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]





DIRECT ADAPIVE STEERING : Fail-safe

INFOID:000000013356547

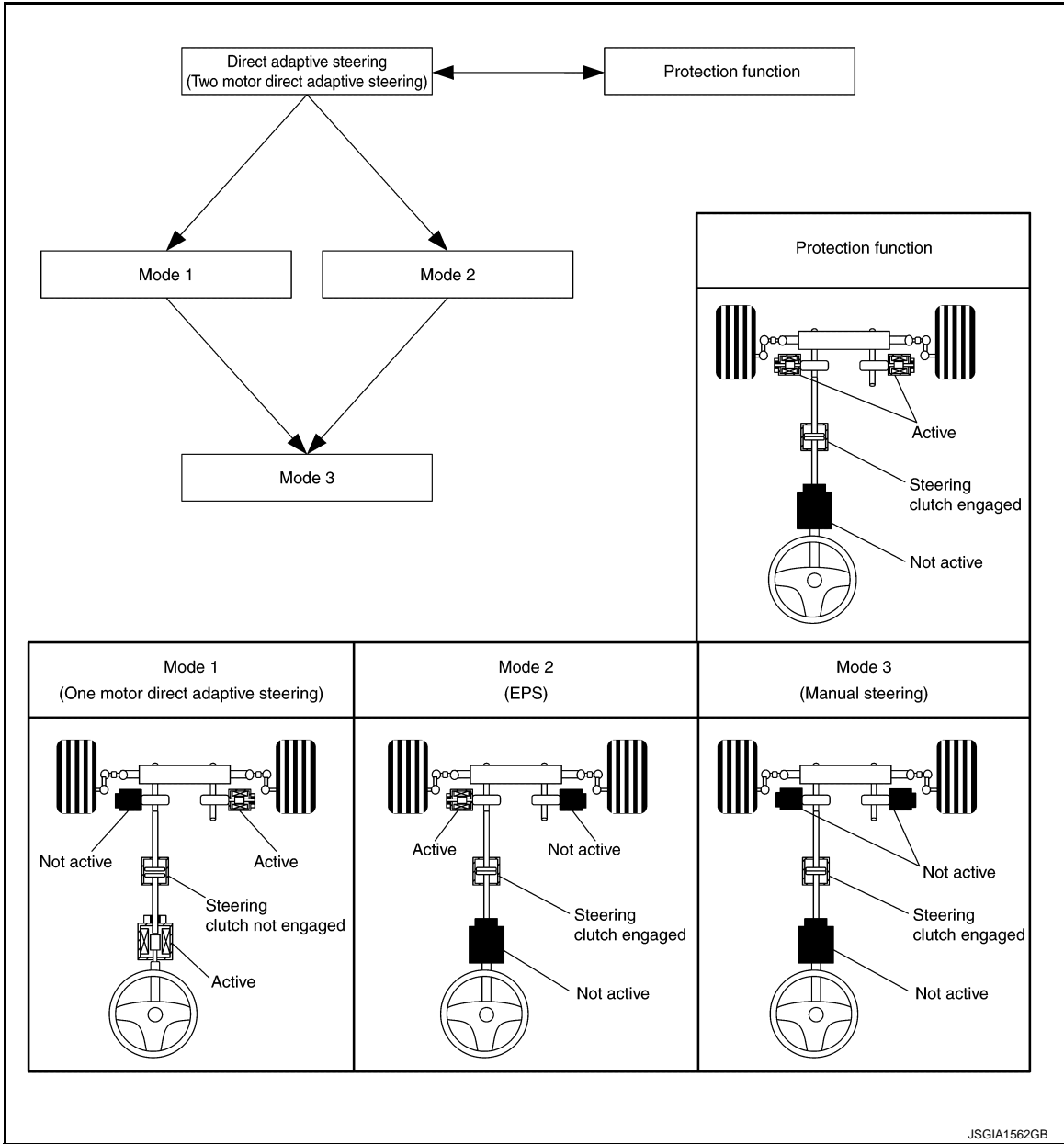
- If a malfunction occurs in the system, the fail-safe function stops the system (mode 3), activates the fail-safe mode (mode 1 or mode 2) or activates the protection mode. When the system enters mode 1, mode 2 or mode 3, the power steering warning lamp illuminates to inform the driver that the turning force is heavy in effect.
- Since three control modules monitor malfunctions mutually, DTC code varies from control module to control module.

SYSTEM

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

- For details of protection function, refer to [STC-128. "DIRECT ADAPTIVE STEERING : Protection Function"](#).



DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13A0-00	Variable	Variable	Variable
C13A1-00	—	Mode 2	Mode 2
C13A2-00	Mode 1 or Mode 3	Mode 1 or Mode 3	Mode 1 or Mode 3
C13A3-00	Mode 2	Mode 2	Mode 2
C13A4-00	—	Mode 2	Mode 2
C13A5-00	—	—	Mode 2
C13A6-00	—	Mode 3	—
C13A7-00	—	Mode 3	—
C13A8-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13A9-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13AA-00	Mode 2	Mode 3	Mode 2

SYSTEM

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

DTC	Relation between control module detecting DTC and system status			
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC	
C13AB-00	Mode 2	Mode 3	Mode 2	A
C13AC-00	—	Mode 3	—	B
C13AD-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13AE-00	Mode 2	Mode 3	Mode 2	C
C13AF-00	Mode 2	Mode 3	Mode 2	
C13B0-00	Mode 2	Mode 3	Mode 2	D
C13B1-00	Mode 2	Mode 3	Mode 2	
C13B2-00	Mode 2	Mode 1 or Mode 3	Mode 2	E
C13B3-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13B4-00	Mode 2	Mode 3	Mode 2	F
C13B5-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13B6-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13B7-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13B8-00	Mode 2	Mode 1 or Mode 3	Mode 2	STC
C13B9-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13BA-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13BB-00	—	—	—	H
C13BC-00	—	—	—	
C13BD-00	—	Mode 2	—	I
C13BE-00	Mode 2	Mode 2	Mode 2	
C13BF-00	Variable	Variable	Variable	
C13C0-00	Mode 2 or Mode 3	Mode 2 or Mode 3	Mode 2 or Mode 3	J
C13C1-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3	
C13C2-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3	K
C13C3-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3	
C13C4-00	Mode 2	Mode 1 or Mode 3	Mode 2	L
C13C5-00	Mode 2	—	—	
C13C6-00	Mode 2	—	—	
C13C7-00	Mode 2	—	—	M
C13C8-00	—	—	—	
C13C9-00	—	—	—	
C13CA-00	—	—	—	N
C13CB-00	—	—	—	
C13CC-00	—	—	—	
C13CD-00	—	—	—	O
C13CE-00	—	—	—	
C13CF-00	—	—	—	P
C13D0-00	—	—	—	
C13D1-00	—	—	—	
C13D2-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13D3-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13D4-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13D5-00	Mode 2	Mode 1 or Mode 3	Mode 2	

SYSTEM

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13D6-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D7-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D8-00	—	—	—
C13D9-00	—	—	—
C13DA-00	—	—	—
C13DB-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DC-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DD-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DE-00	Protection function mode	Protection function mode	Protection function mode
C13DF-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13E0-00	Mode 2	—	—
C13E1-00	Mode 2	—	—
C13E2-00	—	—	—
C13E3-00	Protection function mode	—	—
C13E4-00	Protection function mode	—	—
C13E5-00	Mode 2	—	—
C13E6-00	Protection function mode	Protection function mode	Protection function mode
C13E7-00	Protection function mode	Protection function mode	Protection function mode
C13E8-00	Protection function mode	Protection function mode	Protection function mode
C13E9-00	—	Mode 2	—
C13EA-00	Mode 2	—	—
C13EB-00	—	Mode 2	Mode 2
C13EE-00	Mode 3	Mode 3	Mode 3
C13EF-00	Mode 3	Mode 3	Mode 3
C13F0-00	Mode 2	Mode 2	Mode 2
C13F1-00	Mode 2	—	—
C13F2-00	Mode 2 or Mode 3	Mode 2 or Mode 3	Mode 2 or Mode 3
U1000-01	—	—	—
U1010-49	—	—	—

- *1: When control module detects a malfunction at startup.
- *2: When control module detects a malfunction except during startup.

DIRECT ADAPTIVE STEERING : Protection Function

INFOID:000000013356548

- When battery voltage malfunctions temporarily, system overheats continuously and system is overloaded continuously, system is in protection mode temporarily. This is not malfunction.
- When a causative condition is cleared, the system returns to normal control automatically. (Except C13E5-00)
- Since the protection function condition is not malfunction, power steering warning lamp does not turn ON. (Except C13E5-00) The following DTCs remain to distinguish from malfunction.

SYSTEM

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]


DTC	Condition	Vehicle condition
C13E3-00	The steering wheel is steered over the limit angle.	System changes to the protection mode temporarily. (Steering operation may become heavy temporarily, however steering wheel can be operated without interference. This is not a system malfunction.)
C13E4-00	When steering clutch is released, steering clutch is not released within regular time with overloading steering wheel.	
C13E5-00	When steering clutch is released, steering clutch is not released in spite of trying to release it many times with overloading steering wheel.	
C13E6-00	EPS/DAST 3: Internal temperature of steering force motor is 150°C (302°F) or more. DAST 1, DAST 2: Internal temperature of control module is 90°C (194°F) or more.	
C13E7-00	Power supply voltage of control module is low temporarily.	
C13E8-00	<ul style="list-style-type: none"> • Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. • Steering gear is out of neutral position. (Large) 	

A
B
C
D
E
F
STC

WARNING/INDICATOR/CHIME LIST

WARNING/INDICATOR/CHIME LIST : Warning Lamp/Indicator Lamp

INFOID:000000013356549

Name	Design	Layout/Function
Steering warning lamp		<p>For layout, refer to MWI-9, "METER SYSTEM : Design".</p> <p>For function, refer to MWI-41, "WARNING LAMPS/INDICATOR LAMPS : Power Steering Warning Lamp (Direct Adaptive Steering)".</p>

H
I
J
K
L
M
N
O
P

HANDLING PRECAUTION

Handling Precautions for Direct Adaptive Steering

INFOID:000000013356550

WARNING:

When the power steering warning lamp illuminates with the engine running, the power assist for the steering will cease operation. Driver will still have control of the vehicle, but the steering will be harder to operate.

CAUTION:

- If wheels or tires other than the recommended ones are used, the direct adaptive steering system may not operate properly and the power steering warning lamp may illuminate.
- Do not modify the vehicle's suspension. If suspension parts such as shock absorbers, struts, springs, stabilizer bars, bushings and wheels are not recommended for the vehicle or are extremely deteriorated, the direct adaptive steering system may not operate properly and the power steering warning lamp may illuminate.
- Do not modify the vehicle's steering. If steering parts are not recommended for the vehicle or are extremely deteriorated, the direct adaptive steering system may not operate properly and the power steering warning lamp may illuminate.
- If the VDC warning lamp illuminates, the power steering warning lamp may also illuminate at the same time. Stop the vehicle in a safe location, turn the engine off and restart the engine. If the power steering warning lamp continues to illuminate, have the system checked.
- Do not place the ignition switch in the ON position while the steering wheel or a tire is removed.
- Do not turn the steering wheel as much as possible while the ignition switch is in any position other than the ON position.
- Installing an accessory on the steering wheel, or changing the steering wheel, may reduce the steering performance.
- When the steering wheel is operated repeatedly or continuously while parking or driving at a very low speed, the power assist for the steering wheel will be reduced and the steering wheel may be off-center or feeling in turning steering wheel may change. This is to prevent overheating of the direct adaptive steering system and protect it from getting damaged. When the temperature of the direct adaptive steering system cools down, the power assist level will return to normal. Avoid repeating steering wheel operations that could cause the direct adaptive steering system to overheat.
- When the power steering warning lamp illuminates with the engine running, the power assist for the steering will cease operation. Driver will still have control of the vehicle. However, greater steering effort will be needed, especially in sharp turns, at low speeds, and at vehicle stopped.
- If the direct adaptive steering system is malfunctioning, the steering wheel may be off-center or feeling in turning steering wheel may change.
- Under the followings, the steering wheel may be off-center or feeling in turning steering wheel may change. This is due to a protection mechanism for the direct adaptive steering system.
 - When the battery is discharged.
 - When the engine is stalled.
 - After the vehicle is tested on the fourwheel dynamometer.
 - When driver turns steering wheel in the front tire side face touching an obstruction like curb stone.
- The steering wheel will return to the normal position after the protection mechanism deactivates. To return to normal condition from protection mode, leave the vehicle or restart the engine. When the steering wheel is off-center, turn the steering wheel to right and left to return the normal position after returning to the normal condition.
- When the vehicle is tested on the 2-wheel dynamometer, the power steering warning light may illuminate. To turn off the power steering warning lamp, stop the vehicle in a safe location, turn the engine off, restart the engine, and then drive the vehicle for a period of time.
- The following conditions do not indicate a malfunction of the direct adaptive steering system.
 - Driver may notice wider steering play when the ignition switch is in the OFF or ACC position compared to when it is in the ON position.
 - After the engine is started, the steering wheel may be off-center or feeling in turning steering wheel may change. To return to the normal position, drive the vehicle on a straight road for a period of time.
- Driver may hear a noise under the following conditions. However, this is not a malfunction.
 - When the engine is started or stopped.
 - When the steering wheel is turned in the full lock position.

DIAGNOSIS SYSTEM (STEERING FORCE CONTROL MODULE)

[DIRECT ADAPTIVE STEERING]

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (STEERING FORCE CONTROL MODULE)

CONSULT Function

INFOID:0000000013356551

APPLICATION ITEMS

CONSULT can display each diagnostic item using the diagnostic test modes as follows.

Diagnostic test mode	Function
ECU Identification	Steering force control module part number can be read.
Self Diagnostic Result	Self-diagnostic results and freeze frame data can be read and erased quickly.*
Data Monitor	Input/Output data in the steering force control module can be read.
Work support	This mode enable a technician to adjust some devices faster and more accurately by following the indication on the CONSULT.
Re/programming. Configuration	<ul style="list-style-type: none">• Read and save the vehicle specification (TYPE ID).• Write the vehicle specification (TYPE ID) when replacing steering force control module.

*: The following diagnosis information is erased by erasing.

- DTC
- Freeze frame data (FFD)

ECU IDENTIFICATION

Steering force control module part number can be read.

SELF DIAGNOSTIC RESULT

Refer to [STC-156. "DTC Index"](#).

When "PRCNT" is displayed on self-diagnosis result.

- The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result.

- System malfunction in the past is detected, but the system is presently normal.

FREEZE FRAME DATA (FFD)

The following vehicle status is recorded when DTC is detected and is displayed.

Freeze Frame Data Item	Description
TOTAL DISTANCE	Display the odometer value from combination meter via CAN communication.
OWN ECU SYS STATUS	Display the status of steering force control module.
ST ANG MAIN SYS STATUS	Display the status of steering angle main control module.
ST ANG SUB SYS STATUS	Display the status of steering angle sub control module.
ST FORCE SYS STATUS	Display the status of steering force control module.
BACK UP CIRCUIT STATUS	Display the status of buck up circuit.
CONTROL MODULE CRNT	Display the electric current value of steering force control module.
DETAILED CODE 1	This is displayed, but it is not used.
DETAILED CODE 2	This is displayed, but it is not used.
DETAILED CODE 3	This is displayed, but it is not used.
FLESRAY COMM SYNC STATS	Display the sync status of FlexRay communication.
STEERING MODE	Display the steering mode.
ST CLUTCH PRTCT STATUS	Display the status of steering clutch.
ST CLUTCH CON RQEST	Display the control request status steering clutch.
SHIFT POSITION	Display the shift position from TCM via CAN communication.
FLEXRAY COMM DIAG (OWN)	Display the diagnosis status of FlexRay communication. (steering force control module)
FLEXRAY COMM DIAG (OTH1)	Display the diagnosis status of FlexRay communication. (steering angle main control module)

DIAGNOSIS SYSTEM (STEERING FORCE CONTROL MODULE)

[DIRECT ADAPTIVE STEERING]

< SYSTEM DESCRIPTION >

Freeze Frame Data Item	Description
FLEXRAY COMM DIAG (OTH2)	Display the diagnosis status of FlexRay communication. (steering angle sub control module)
POWER TRAIN STATUS	Display the status of power train.
IGN SW STATUS (OWN ECU)	Display the ignition voltage status recognized by steering force control module.
IGN SW STATUS (SYSTEM)	Display the status of ignition voltage for direct adaptive steering.
STOP/START STATUS	Display the status of stop/start system from ECM via CAN communication.
INSTANT VLT DROP DETECT	Display the status of instantaneous voltage drop detection.
CURB STONE DETECT STATS	Display the status of curb stone detection.
BACK UP CIRCUIT A STATUS	Display the status of buck up circuit A.
BACK UP CIRCUIT B STATUS	Display the status of buck up circuit B.
FREE ROLLER MODE	Display the status of free roller mode.
CHASSIS DYNAMO MODE	Display the status of chassis dynamometer mode.
WRITING STATUS	Display the status the recorded angle information in steering force control module.
BACK UP SIG 1 VOLT	Display the voltage of buck up signal 1.
BACK UP SIG 2 VOLT	Display the voltage of buck up signal 2.
INVERTER RELAY ACT VOLT	Display the activation voltage of inverter relay.
CONT MODULE INSIDE VOLT	Display the inside voltage of steering force control module.
BATTERY VOLTAGE	Display the power supply voltage for steering force control module.
IGN VOLTAGE	Display the ignition power supply voltage for steering force control module.
C/M TEMPERATURE	Display the temperature of steering force motor.
VEHICLE SPEED	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN communication.
YAW RATE	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN communication.
SIDE G	Display side G value from ABS actuator and electric unit (control unit) via CAN communication.
ST CLUTCH ACT CURRENT	Display the activation current of steering clutch.
MOTOR U ACT CURRENT	Display the activation current of steering force motor U phase.
MOTOR W ACT CURRENT	Display the activation current of steering force motor W phase.
TORQUE SEN MAIN 1	Display the steering torque sensor (main 1) value recognized by direct adaptive steering.
TEMPERATURE SENSOR	Display the temperature of steering force motor.
ENGINE SPEED	Display the engine speed from ECM via CAN communication.
ANGLE SENSOR SIGNAL 1	Display the voltage of angle sensor signal.
ANGLE SENSOR SIGNAL 2	Display the voltage of angle sensor signal.
ANGLE 1	Display the accuracy of calibration.
ANGLE 2	Display the command angle for steering angle main motor and steering angle sub motor.
F/B ANGLE 1	Display the feedback angle for steering angle main motor and steering angle sub motor.
F/B ANGLE 2	Display the feedback angle for steering angle main motor and steering angle sub motor.
ST ANGLE SENSOR	Display the steering angle from steering angle sensor via CAN communication.
ANGLE DIFFERENCE	Display the difference angle between steering wheel and steering pinion.
STEERING PINION ANGLE	Display the steering pinion angle.
STEERING PINION ANGLE 2	Display the steering pinion angle.
ANGLE 3	Display the angle information used for system control.

DATA MONITOR

NOTE:

DIAGNOSIS SYSTEM (STEERING FORCE CONTROL MODULE)

[DIRECT ADAPTIVE STEERING]

< SYSTEM DESCRIPTION >

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

X: Applicable

Monitor item [Unit]	Remarks
OWN ECU SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering force control module.
ST ANG MAIN SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering angle main control module.
ST ANG SUB SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering angle sub control module.
ST FORCE SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering force control module.
BACK UP CIRCUIT STATUS [0 – 255]	Display the status of buck up circuit.
CONTROL MODULE CRNT [A]	Display the electric current value of steering force control module.
DETAILED CODE 1 [0 – 255]	This is displayed, but it is not used.
DETAILED CODE 2 [0 – 255]	This is displayed, but it is not used.
DETAILED CODE 3 [0 – 255]	This is displayed, but it is not used.
FLESRAY COMM SYNC STATS [STAT1/STAT2/STAT3/STAT4/STAT5/ STAT6/STAT7/STAT8/STAT9/STAT10]	Display the sync status of FlexRay communication.
STEERING MODE [CHARA A/CHARA B/CHARA C/CHARA D/ CHARA E/CHARA F/CHARA G/CHARA H/ CHARA I]	Display the steering mode.
ST CLUTCH PRTCT STATUS [STAT0/STAT1/STAT2/STAT3/STAT4/ STAT5/STAT6/STAT7/STAT8/STAT9/ STAT10/STAT11/STAT12/STAT20]	Display the status of steering clutch.
ST CLUTCH CON RQEST [STAT0/STAT1/STAT2/STAT3/STAT4/ STAT5]	Display the control request status steering clutch.
SHIFT POSITION [IDLE/1ST/2ND/3RD/4TH/5TH/6TH/7TH/ 8TH/R/N/P/CVT/UKNWN]	Display the shift position from ECM via CAN communication.

A

B

C

D

E

F

STC

H

I

J

K

L

M

N

O

P

DIAGNOSIS SYSTEM (STEERING FORCE CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Monitor item [Unit]	Remarks
FLEXRAY COMM DIAG (OWN) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering force control module)
FLEXRAY COMM DIAG (OTH1) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering angle main control module)
FLEXRAY COMM DIAG (OTH2) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering angle sub control module)
POWER TRAIN STATUS [STOP/RUN]	Display the status of power train.
IGN SW STATUS (OWN ECU) [ON/OFF]	Display the ignition voltage status recognized by steering force control module.
IGN SW STATUS (SYSTEM) [ON/OFF]	Display the status of ignition voltage for direct adaptive steering.
STOP/START STATUS [ON/OFF]	Display the status of stop/start system from ECM via CAN communication.
INSTANT VLT DROP DETECT [UNDTCT/DETECT]	Display the status of instantaneous voltage drop detection.
CURB STONE DETECT STATS [UNDTCT/DETECT]	Display the status of curb stone detection.
BACK UP CIRCUIT A STATUS [STAT1/STAT2]	Display the status of buck up circuit A.
BACK UP CIRCUIT B STATUS [STAT1/STAT2]	Display the status of buck up circuit B.
FREE ROLLER MODE [ON/OFF]	Display the status of free roller mode.
CHASSIS DYNAMO MODE [PERMIT/ PROHBT]	Display the status of chassis dynamometer mode.
WRITING STATUS [OK/NG]	Display the status the recorded angle information in steering force control module.
BACK UP SIG 1 VOLT [V]	Display the voltage of buck up signal 1.
BACK UP SIG 2 VOLT [V]	Display the voltage of buck up signal 2.
INVERTER RELAY ACT VOLT [V]	Display the activation voltage of inverter relay.
CONT MODULE INSIDE VOLT [V]	Display the inside voltage of steering force control module.
BATTERY VOLTAGE [V]	Display the power supply voltage for steering force control module.
IGN VOLTAGE [V]	Display the ignition power supply voltage for steering force control module.
C/M TEMPERATURE [°C] or [°F]	Display the temperature of steering force motor.
VEHICLE SPEED [km/h] or [MPH]	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN communication.
YAW RATE [deg/s]	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN communication.
SIDE G [m/s ²]	Display side G value from ABS actuator and electric unit (control unit) via CAN communication.
ST CLUTCH ACT CURRENT [A]	Display the activation current of steering clutch.
MOTOR U ACT CURRENT [A]	Display the activation current of steering force motor U phase.
MOTOR W ACT CURRENT [A]	Display the activation current of steering force motor W phase.
TORQUE SEN MAIN 1 [N·m]	Display the steering torque sensor (main 1) value recognized by direct adaptive steering.
TEMPERATURE SENSOR [°C] or [°F]	Display the temperature of steering force motor.
ENGINE SPEED [Tr/min]	Display the engine speed from ECM via CAN communication.
ANGLE SENSOR SIGNAL 1 [V]	Display the voltage of force motor angle sensor signal.
ANGLE SENSOR SIGNAL 2 [V]	Display the voltage of force motor angle sensor signal.
ANGLE 1 [deg]	Display the accuracy of calibration.
ANGLE 2 [deg]	Display the command angle for steering angle main motor and steering angle sub motor.
F/B ANGLE 1 [deg]	Display the feedback angle for steering angle main motor and steering angle sub motor.
F/B ANGLE 2 [deg]	Display the feedback angle for steering angle main motor and steering angle sub motor.
ST ANGLE SENSOR [deg]	Display the steering angle from steering angle sensor via CAN communication.

DIAGNOSIS SYSTEM (STEERING FORCE CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Monitor item [Unit]	Remarks
ANGLE DIFFERENCE [deg]	Display the difference angle between steering wheel and steering pinion.
STEERING PINION ANGLE [deg]	Display the steering pinion angle.
STEERING PINION ANGLE 2 [deg]	Display the steering pinion angle.
ANGLE 3 [deg]	Display the angle information used for system control.

WORK SUPPORT

Item	Description
DAST CALIBRATION (MODE1)	Perform direct adaptive steering calibration. (with alignment tester)
DAST CALIBRATION (MODE2)	Perform direct adaptive steering calibration. (without alignment tester)

CAUTION:

Never use “DAST CALIBRATION (MODE 1)” and “DAST CALIBRATION (MODE 2)” alone. When removing/installing/replacing the component parts or adjusting wheel alignment, refer to [STC-202. "Special Repair Requirement"](#).

RE/PROGRAMMING, CONFIGURATION

Configuration includes the following functions.

Item	Description
Read/Write Configuration	Before replacing ECU Allows the reading of vehicle specification (Type ID) written in steering force control module to store the specification in CONSULT.
	After replacing ECU Allows the writing of vehicle information (Type ID) stored in CONSULT into the steering force control module.
Manual Configuration	Allows the writing of vehicle specification (Type ID) into the steering force control module by hand.

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)

CONSULT Function

INFOID:000000013356552

APPLICATION ITEMS

CONSULT can display each diagnostic item using the diagnostic test modes as follows.

Diagnostic test mode	Function
ECU Identification	Steering angle main control module part number can be read.
Self Diagnostic Result	Self-diagnostic results and freeze frame data can be read and erased quickly.*
Data Monitor	Input/Output data in the steering angle main control module can be read.
Re/programming. Configuration	<ul style="list-style-type: none">• Read and save the vehicle specification (TYPE ID).• Write the vehicle specification (TYPE ID) when replacing steering angle main control module.

*: The following diagnosis information is erased by erasing.

- DTC
- Freeze frame data (FFD)

ECU IDENTIFICATION

Steering angle main control module part number can be read.

SELF DIAGNOSTIC RESULT

Refer to [STC-169, "DTC Index"](#).

When "PRNT" is displayed on self-diagnosis result.

- The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result.

- System malfunction in the past is detected, but the system is presently normal.

FREEZE FRAME DATA (FFD)

The following vehicle status is recorded when DTC is detected and is displayed.

Freeze Frame Data Item	Description
TOTAL DISTANCE	Display the odometer value from combination meter via CAN communication.
OWN ECU SYS STATUS	Display the status of steering angle main control module.
ST ANG MAIN SYS STATUS	Display the status of steering angle main control module.
ST ANG SUB SYS STATUS	Display the status of steering angle sub control module.
ST FORCE SYS STATUS	Display the status of steering force control module.
BACK UP CIRCUIT STATUS	Display the status of buck up circuit.
CONTROL MODULE CRNT	Display the electric current value of steering angle main control module.
DETAILED CODE 1	This is displayed, but it is not used.
DETAILED CODE 2	This is displayed, but it is not used.
DETAILED CODE 3	This is displayed, but it is not used.
FLESRAY COMM SYNC STATS	Display the sync status of FlexRay communication.
STEERING MODE	Display the steering mode.
ST CLUTCH PRTCT STATUS	Display the status of steering clutch.
ST CLUTCH CON RQEST	Display the control request status steering clutch.
FLEXRAY COMM DIAG (OWN)	Display the diagnosis status of FlexRay communication. (steering angle main control module)
FLEXRAY COMM DIAG (OTH1)	Display the diagnosis status of FlexRay communication. (steering angle sub control module)
FLEXRAY COMM DIAG (OTH2)	Display the diagnosis status of FlexRay communication. (steering force control module)
POWER TRAIN STATUS	Display the status of power train.

DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Freeze Frame Data Item	Description
IGN SW STATUS (OWN ECU)	Display the ignition voltage status recognized by steering angle main control module.
IGN SW STATUS (SYSTEM)	Display the status of ignition voltage for direct adaptive steering.
STOP/START STATUS	Display the status of stop/start system from ECM via CAN communication.
INSTANT VLT DROP DETECT	Display the status of instantaneous voltage drop detection.
CURB STONE DETECT STATS	Display the status of curb stone detection.
BACK UP CIRCUIT A STATUS	Display the status of buck up circuit A.
BACK UP CIRCUIT B STATUS	Display the status of buck up circuit B.
FREE ROLLER MODE	Display the status of free roller mode.
CHASSIS DYNAMO MODE	Display the status of chassis dynamometer mode.
WRITING STATUS	Display the status the recorded angle information in steering angle main control module.
BACK UP SIG 1 VOLT	Display the voltage of buck up signal 1.
BACK UP SIG 2 VOLT	Display the voltage of buck up signal 2.
INVERTER RELAY ACT VOLT	Display the activation voltage of inverter relay.
CONT MODULE INSIDE VOLT	Display the inside voltage of steering angle main control module.
BATTERY VOLTAGE	Display the power supply voltage for steering angle main control module.
IGN VOLTAGE	Display the ignition power supply voltage for steering angle main control module.
C/M TEMPERATURE	Display the internal temperature of steering angle main control module.
VEHICLE SPEED	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN communication.
YAW RATE	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN communication.
SIDE G	Display side G value from ABS actuator and electric unit (control unit) via CAN communication.
ST CLUTCH ACT CURRENT	Display the activation current of steering clutch.
MOTOR U ACT CURRENT	Display the activation current of steering angle main motor U phase.
MOTOR W ACT CURRENT	Display the activation current of steering angle main motor W phase.
TORQUE SEN MAIN 2	Display the steering torque sensor (main 2) value.
TORQUE SEN MAIN 1	Display the steering torque sensor (main 1) value recognized by direct adaptive steering.
TORQUE SEN SUB	Display the steering torque sensor (sub) value.
TORQUE SEN VOLTAGE	Display the power supply voltage for steering torque sensor.
TEMPERATURE SENSOR	Display the temperature of steering angle main control module.
SUB IGN VOLTAGE	Display the sub ignition power supply voltage for steering angle main control module.
ANGLE SENSOR SIGNAL 1	Display the voltage of angle sensor signal.
ANGLE SENSOR SIGNAL 2	Display the voltage of angle sensor signal.
ANGLE 1	Display the accuracy of calibration.
ANGLE 2	Display the command angle for steering angle main motor and steering angle sub motor.
F/B ANGLE 1	Display the feedback angle for steering angle main motor and steering angle sub motor.
F/B ANGLE 2	Display the feedback angle for steering angle main motor and steering angle sub motor.
ST ANGLE SENSOR	Display the steering angle from steering angle sensor via CAN communication.
ANGLE DIFFERENCE	Display the difference angle between steering wheel and steering pinion.
STEERING PINION ANGLE	Display the steering pinion angle.
STEERING PINION ANGLE 2	Display the steering pinion angle.
ANGLE 3	Display the angle information used for system control.

A

B

C

D

E

F

STC

H

I

J

K

L

M

N

O

P

DATA MONITOR

NOTE:

DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)

[DIRECT ADAPTIVE STEERING]

< SYSTEM DESCRIPTION >

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

X: Applicable

Monitor item [Unit]	Remarks
OWN ECU SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering angle main control module.
ST ANG MAIN SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering angle main control module.
ST ANG SUB SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering angle sub control module.
ST FORCE SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering force control module.
BACK UP CIRCUIT STATUS [0 – 255]	Display the status of buck up circuit.
CONTROL MODULE CRNT [A]	Display the electric current value of steering angle main control module.
DETAILED CODE 1 [0 – 255]	This is displayed, but it is not used.
DETAILED CODE 2 [0 – 255]	This is displayed, but it is not used.
DETAILED CODE 3 [0 – 255]	This is displayed, but it is not used.
FLESRAY COMM SYNC STATS [STAT1/STAT2/STAT3/STAT4/STAT5/ STAT6/STAT7/STAT8/STAT9/STAT10]	Display the sync status of FlexRay communication.
STEERING MODE [CHARA A/CHARA B/CHARA C/CHARA D/ CHARA E/CHARA F/CHARA G/CHARA H/ CHARA I]	Display the steering mode.
ST CLUTCH PRTCT STATUS [STAT0/STAT1/STAT2/STAT3/STAT4/ STAT5/STAT6/STAT7/STAT8/STAT9/ STAT10/STAT11/STAT12/STAT20]	Display the status of steering clutch.
ST CLUTCH CON RQEST [STAT0/STAT1/STAT2/STAT3/STAT4/ STAT5]	Display the control request status steering clutch.
FLEXRAY COMM DIAG (OWN) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering angle main control module)
FLEXRAY COMM DIAG (OTH1) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering angle sub control module)

DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Monitor item [Unit]	Remarks	
FLEXRAY COMM DIAG (OTH2) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering angle force control module)	A
POWER TRAIN STATUS [STOP/RUN]	Display the status of power train.	B
IGN SW STATUS (OWN ECU) [ON/OFF]	Display the ignition voltage status recognized by steering angle main control module.	C
IGN SW STATUS (SYSTEM) [ON/OFF]	Display the status of ignition voltage for direct adaptive steering.	D
STOP/START STATUS [ON/OFF]	Display the status of stop/start system from ECM via CAN communication.	E
INSTANT VLT DROP DETECT [UNDTCT/DETECT]	Display the status of instantaneous voltage drop detection.	F
CURB STONE DETECT STATS [UNDTCT/DETECT]	Display the status of curb stone detection.	F
BACK UP CIRCUIT A STATUS [STAT1/STAT2]	Display the status of buck up circuit A.	F
BACK UP CIRCUIT B STATUS [STAT1/STAT2]	Display the status of buck up circuit B.	F
FREE ROLLER MODE [ON/OFF]	Display the status of free roller mode.	F
CHASSIS DYNAMO MODE [PERMIT/ PROHBT]	Display the status of chassis dynamometer mode.	F
WRITING STATUS [OK/NG]	Display the status the recorded angle information in steering angle main control module.	STC
BACK UP SIG 1 VOLT [V]	Display the voltage of buck up signal 1.	H
BACK UP SIG 2 VOLT [V]	Display the voltage of buck up signal 2.	H
INVERTER RELAY ACT VOLT [V]	Display the activation voltage of inverter relay.	H
CONT MODULE INSIDE VOLT [V]	Display the inside voltage of steering angle main control module.	I
BATTERY VOLTAGE [V]	Display the power supply voltage for steering angle main control module.	I
IGN VOLTAGE [V]	Display the ignition power supply voltage for steering angle main control module.	J
C/M TEMPERATURE [°C] or [°F]	Display the internal temperature of steering angle main control module.	J
VEHICLE SPEED [km/h] or [MPH]	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN communication.	K
YAW RATE [deg/s]	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN communication.	K
SIDE G [m/s ²]	Display side G value from ABS actuator and electric unit (control unit) via CAN communication.	L
ST CLUTCH ACT CURRENT [A]	Display the activation current of steering clutch.	L
MOTOR U ACT CURRENT [A]	Display the activation current of steering angle main motor U phase.	M
MOTOR W ACT CURRENT [A]	Display the activation current of steering angle main motor W phase.	M
TORQUE SEN MAIN 2 [V]	Display the steering torque sensor (main 2) value.	N
TORQUE SEN MAIN 1 [N·m]	Display the steering torque sensor (main 1) value recognized by direct adaptive steering.	N
TORQUE SEN SUB [V]	Display the steering torque sensor (sub) value.	N
TORQUE SEN VOLTAGE [V]	Display the power supply voltage for steering torque sensor.	O
TEMPERATURE SENSOR [°C] or [°F]	Display the temperature of steering angle main control module.	O
SUB IGN VOLTAGE [V]	Display the sub ignition power supply voltage for steering angle main control module.	P
ANGLE SENSOR SIGNAL 1 [V]	Display the voltage of angle main motor angle sensor signal.	P
ANGLE SENSOR SIGNAL 2 [V]	Display the voltage of angle main motor angle sensor signal.	P
ANGLE 1 [deg]	Display the accuracy of calibration.	
ANGLE 2 [deg]	Display the command angle for steering angle main motor and steering angle sub motor.	
F/B ANGLE 1 [deg]	Display the feedback angle for steering angle main motor and steering angle sub motor.	
F/B ANGLE 2 [deg]	Display the feedback angle for steering angle main motor and steering angle sub motor.	
ST ANGLE SENSOR [deg]	Display the steering angle from steering angle sensor via CAN communication.	

DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Monitor item [Unit]	Remarks
ANGLE DIFFERENCE [deg]	Display the difference angle between steering wheel and steering pinion.
STEERING PINION ANGLE [deg]	Display the steering pinion angle.
STEERING PINION ANGLE 2 [deg]	Display the steering pinion angle.
ANGLE 3 [deg]	Display the angle information used for system control.

RE/PROGRAMMING, CONFIGURATION

Configuration includes the following functions.

Item	Description
Read/Write Configuration	Before replacing ECU Allows the reading of vehicle specification (Type ID) written in steering angle main control module to store the specification in CONSULT.
	After replacing ECU Allows the writing of vehicle information (Type ID) stored in CONSULT into the steering angle main control module.
Manual Configuration	Allows the writing of vehicle specification (Type ID) into the steering angle main control module by hand.

DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE)

CONSULT Function

INFOID:0000000013356553

APPLICATION ITEMS

CONSULT can display each diagnostic item using the diagnostic test modes as follows.

Diagnostic test mode	Function
ECU Identification	Steering angle sub control module part number can be read.
Self Diagnostic Result	Self-diagnostic results and freeze frame data can be read and erased quickly.*
Data Monitor	Input/Output data in the steering angle sub control module can be read.
Re/programming. Configuration	<ul style="list-style-type: none">• Read and save the vehicle specification (TYPE ID).• Write the vehicle specification (TYPE ID) when replacing steering angle sub control module.

*: The following diagnosis information is erased by erasing.

- DTC
- Freeze frame data (FFD)

ECU IDENTIFICATION

Steering angle sub control module part number can be read.

SELF DIAGNOSTIC RESULT

Refer to [STC-182, "DTC Index"](#).

When "PRCNT" is displayed on self-diagnosis result.

- The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result.

- System malfunction in the past is detected, but the system is presently normal.

FREEZE FRAME DATA (FFD)

The following vehicle status is recorded when DTC is detected and is displayed.

Freeze Frame Data Item	Description
TOTAL DISTANCE	Display the odometer value from combination meter via CAN communication.
OWN ECU SYS STATUS	Display the status of steering angle sub control module.
ST ANG MAIN SYS STATUS	Display the status of steering angle main control module.
ST ANG SUB SYS STATUS	Display the status of steering angle sub control module.
ST FORCE SYS STATUS	Display the status of steering force control module.
BACK UP CIRCUIT STATUS	Display the status of buck up circuit.
CONTROL MODULE CRNT	Display the electric current value of steering angle sub control module.
DETAILED CODE 1	This is displayed, but it is not used.
DETAILED CODE 2	This is displayed, but it is not used.
DETAILED CODE 3	This is displayed, but it is not used.
FLESRAY COMM SYNC STATS	Display the sync status of FlexRay communication.
STEERING MODE	Display the steering mode.
ST CLUTCH PRTCT STATUS	Display the status of steering clutch.
ST CLUTCH CON RQUEST	Display the control request status steering clutch.
FLEXRAY COMM DIAG (OWN)	Display the diagnosis status of FlexRay communication. (steering angle sub control module)
FLEXRAY COMM DIAG (OTH1)	Display the diagnosis status of FlexRay communication. (steering angle main control module)
FLEXRAY COMM DIAG (OTH2)	Display the diagnosis status of FlexRay communication. (steering force control module)
POWER TRAIN STATUS	Display the status of power train.

DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Freeze Frame Data Item	Description
IGN SW STATUS (OWN ECU)	Display the ignition voltage status recognized by steering angle sub control module.
IGN SW STATUS (SYSTEM)	Display the status of ignition voltage for direct adaptive steering.
STOP/START STATUS	Display the status of stop/start system from ECM via CAN communication.
INSTANT VLT DROP DETECT	Display the status of instantaneous voltage drop detection.
CURB STONE DETECT STATS	Display the status of curb stone detection.
BACK UP CIRCUIT A STATUS	Display the status of buck up circuit A.
BACK UP CIRCUIT B STATUS	Display the status of buck up circuit B.
FREE ROLLER MODE	Display the status of free roller mode.
CHASSIS DYNAMO MODE	Display the status of chassis dynamometer mode.
WRITING STATUS	Display the status the recorded angle information in steering angle sub control module.
BACK UP SIG 1 VOLT	Display the voltage of buck up signal 1.
BACK UP SIG 2 VOLT	Display the voltage of buck up signal 2.
INVERTER RELAY ACT VOLT	Display the activation voltage of inverter relay.
CONT MODULE INSIDE VOLT	Display the inside voltage of steering angle sub control module.
BATTERY VOLTAGE	Display the power supply voltage for steering angle sub control module.
IGN VOLTAGE	Display the ignition power supply voltage for steering angle sub control module.
C/M TEMPERATURE	Display the internal temperature of steering angle sub control module.
VEHICLE SPEED	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN communication.
YAW RATE	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN communication.
SIDE G	Display side G value from ABS actuator and electric unit (control unit) via CAN communication.
ST CLUTCH ACT CURRENT	Display the activation current of steering clutch.
MOTOR U ACT CURRENT	Display the activation current of steering angle sub motor U phase.
MOTOR W ACT CURRENT	Display the activation current of steering angle sub motor W phase.
TORQUE SEN MAIN 1	Display the steering torque sensor (main 1) value recognized by direct adaptive steering.
TEMPERATURE SENSOR	Display the temperature of steering angle sub control module.
ANGLE SENSOR SIGNAL 1	Display the voltage of angle sensor signal.
ANGLE SENSOR SIGNAL 2	Display the voltage of angle sensor signal.
ANGLE 1	Display the accuracy of calibration.
ANGLE 2	Display the command angle for steering angle main motor and steering angle sub motor.
F/B ANGLE 1	Display the feedback angle for steering angle main motor and steering angle sub motor.
F/B ANGLE 2	Display the feedback angle for steering angle main motor and steering angle sub motor.
ST ANGLE SENSOR	Display the steering angle from steering angle sensor via CAN communication.
ANGLE DIFFERENCE	Display the difference angle between steering wheel and steering pinion.
STEERING PINION ANGLE	Display the steering pinion angle.
STEERING PINION ANGLE 2	Display the steering pinion angle.
ANGLE 3	Display the angle information used for system control.

DATA MONITOR

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE)

[DIRECT ADAPTIVE STEERING]

< SYSTEM DESCRIPTION >

X: Applicable

Monitor item [Unit]	Remarks	A
OWN ECU SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering angle sub control module.	B
ST ANG MAIN SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering angle main control module.	C
ST ANG SUB SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering angle sub control module.	D
ST FORCE SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering force control module.	E
BACK UP CIRCUIT STATUS [0 – 255]	Display the status of buck up circuit.	F
CONTROL MODULE CRNT [A]	Display the electric current value of steering angle sub control module.	G
DETAILED CODE 1 [0 – 255]	This is displayed, but it is not used.	H
DETAILED CODE 2 [0 – 255]	This is displayed, but it is not used.	I
DETAILED CODE 3 [0 – 255]	This is displayed, but it is not used.	J
FLESRAY COMM SYNC STATS [STAT1/STAT2/STAT3/STAT4/STAT5/ STAT6/STAT7/STAT8/STAT9/STAT10]	Display the sync status of FlexRay communication.	K
STEERING MODE [CHARA A/CHARA B/CHARA C/CHARA D/ CHARA E/CHARA F/CHARA G/CHARA H/ CHARA I]	Display the steering mode.	L
ST CLUTCH PRTCT STATUS [STAT0/STAT1/STAT2/STAT3/STAT4/ STAT5/STAT6/STAT7/STAT8/STAT9/ STAT10/STAT11/STAT12/STAT20]	Display the status of steering clutch.	M
ST CLUTCH CON RQEST [STAT0/STAT1/STAT2/STAT3/STAT4/ STAT5]	Display the control request status steering clutch.	N
FLEXRAY COMM DIAG (OWN) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering angle sub control module)	O
FLEXRAY COMM DIAG (OTH1) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering angle main control module)	P
FLEXRAY COMM DIAG (OTH2) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering force control module)	

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P

STC

DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Monitor item [Unit]	Remarks
POWER TRAIN STATUS [STOP/RUN]	Display the status of power train.
IGN SW STATUS (OWN ECU) [ON/OFF]	Display the ignition voltage status recognized by steering angle sub control module.
IGN SW STATUS (SYSTEM) [ON/OFF]	Display the status of ignition voltage for direct adaptive steering.
STOP/START STATUS [ON/OFF]	Display the status of stop/start system from ECM via CAN communication.
INSTANT VLT DROP DETECT [UNDTCT/DETECT]	Display the status of instantaneous voltage drop detection.
CURB STONE DETECT STATS [UNDTCT/DETECT]	Display the status of curb stone detection.
BACK UP CIRCUIT A STATUS [STAT1/STAT2]	Display the status of buck up circuit A.
BACK UP CIRCUIT B STATUS [STAT1/STAT2]	Display the status of buck up circuit B.
FREE ROLLER MODE [ON/OFF]	Display the status of free roller mode.
CHASSIS DYNAMO MODE [PERMIT/PROHBT]	Display the status of chassis dynamometer mode.
WRITING STATUS [OK/NG]	Display the status the recorded angle information in steering angle sub control module.
BACK UP SIG 1 VOLT [V]	Display the voltage of buck up signal 1.
BACK UP SIG 2 VOLT [V]	Display the voltage of buck up signal 2.
INVERTER RELAY ACT VOLT [V]	Display the activation voltage of inverter relay.
CONT MODULE INSIDE VOLT [V]	Display the inside voltage of steering angle sub control module.
BATTERY VOLTAGE [V]	Display the power supply voltage for steering angle sub control module.
IGN VOLTAGE [V]	Display the ignition power supply voltage for steering angle sub control module.
C/M TEMPERATURE [°C] or [°F]	Display the internal temperature of steering angle sub control module.
VEHICLE SPEED [km/h] or [MPH]	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN communication.
YAW RATE [deg/s]	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN communication.
SIDE G [m/s ²]	Display side G value from ABS actuator and electric unit (control unit) via CAN communication.
ST CLUTCH ACT CURRENT [A]	Display the activation current of steering clutch.
MOTOR U ACT CURRENT [A]	Display the activation current of steering angle sub motor U phase.
MOTOR W ACT CURRENT [A]	Display the activation current of steering angle sub motor W phase.
TORQUE SEN MAIN 1 [N·m]	Display the steering torque sensor (main 1) value recognized by direct adaptive steering.
TEMPERATURE SENSOR [°C] or [°F]	Display the temperature of steering angle sub control module.
ANGLE SENSOR SIGNAL 1 [V]	Display the voltage of angle sub motor angle sensor signal.
ANGLE SENSOR SIGNAL 2 [V]	Display the voltage of angle sub motor angle sensor signal.
ANGLE 1 [deg]	Display the accuracy of calibration.
ANGLE 2 [deg]	Display the command angle for steering angle main motor and steering angle sub motor.
F/B ANGLE 1 [deg]	Display the feedback angle for steering angle main motor and steering angle sub motor.
F/B ANGLE 2 [deg]	Display the feedback angle for steering angle main motor and steering angle sub motor.
ST ANGLE SENSOR [deg]	Display the steering angle from steering angle sensor via CAN communication.
ANGLE DIFFERENCE [deg]	Display the difference angle between steering wheel and steering pinion.
STEERING PINION ANGLE [deg]	Display the steering pinion angle.
STEERING PINION ANGLE 2 [deg]	Display the steering pinion angle.
ANGLE 3 [deg]	Display the angle information used for system control.

RE/PROGRAMMING, CONFIGURATION

Configuration includes the following functions.

DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Item		Description
Read/Write Configuration	Before replacing ECU	Allows the reading of vehicle specification (Type ID) written in steering angle sub control module to store the specification in CONSULT.
	After replacing ECU	Allows the writing of vehicle information (Type ID) stored in CONSULT into the steering angle sub control module.
Manual Configuration		Allows the writing of vehicle specification (Type ID) into the steering angle sub control module by hand.

A

B

C

D

E

F

STC

H

I

J

K

L

M

N

O

P

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

ECU DIAGNOSIS INFORMATION

STEERING FORCE CONTROL MODULE

Reference Value

INFOID:0000000013356554

VALUES ON THE DIAGNOSIS TOOL

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Monitor item	Condition	Display value
OWN ECU SYS STATUS	Judging system starting	BOOT
	System is diagnosing	DIAG1 – DIAG10
	Processing system shutdown	FIN1 – FIN12
	Finish the system control	DOWN1
	Wait for shutdown	DOWN2
	System is shutdown	DOWN3
	System is in fail-safe mode 1	MALF1
	System is in fail-safe mode 2	MALF2
	System is in fail-safe mode 3	MALF3
	Performing initial setting	SETTING
	System is in normal control	STD1 STD2
	System is in protection mode	STD3
	System is synchronizing	SYNC
ST ANG MAIN SYS STATUS	Judging system starting	BOOT
		DIAG1 – DIAG10
	Processing system shutdown	FIN1 – FIN12
	Finish the system control	DOWN1
	Wait for shutdown	DOWN2
	System is shutdown	DOWN3
	System is in fail-safe mode 1	MALF1
	System is in fail-safe mode 2	MALF2
	System is in fail-safe mode 3	MALF3
	Performing initial setting	SETTING
	System is in normal control	STD1 STD2
	System is in protection mode	STD3
	System is synchronizing	SYNC

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition	Display value	
ST ANG SUB SYS STATUS	Judging system starting	BOOT	A
	System is diagnosing	DIAG1 – DIAG10	
	Processing system shutdown	FIN1 – FIN12	B
	Finish the system control	DOWN1	
	Wait for shutdown	DOWN2	
	System is shutdown	DOWN3	C
	System is in fail-safe mode 1	MALF1	
	System is in fail-safe mode 2	MALF2	D
	System is in fail-safe mode 3	MALF3	
	Performing initial setting	SETTING	
	System is in normal control	STD1 STD2	E
	System is in protection mode	STD3	
	System is synchronizing	SYNC	F
	ST FORCE SYS STATUS	Judging system starting	BOOT
System is diagnosing		DIAG1 – DIAG10	STC
Processing system shutdown		FIN1 – FIN12	
Finish the system control		DOWN1	
Wait for shutdown		DOWN2	H
System is shutdown		DOWN3	
System is in fail-safe mode 1		MALF1	
System is in fail-safe mode 2		MALF2	I
System is in fail-safe mode 3		MALF3	
Performing initial setting		SETTING	J
System is in normal control		STD1 STD2	
System is in protection mode		STD3	K
System is synchronizing		SYNC	
BACK UP CIRCUIT STATUS		Always	0 – 255
CONTROL MODULE CRNT	Always	0 – 255 A	
DETAILED CODE 1	This is displayed, but it is not used.	0 – 255	
DETAILED CODE 2	This is displayed, but it is not used.	0 – 255	M
DETAILED CODE 3	This is displayed, but it is not used.	0 – 255	
FLEXRAY COMM SYNC STATS	Always	STAT1 – 10	N
STEERING MODE	Always	CHARA – CHARA I	
ST CLUTCH PRTCT STATUS	Always	STAT0 – STAT12, STAT20	O
ST CLUTCH CON RQUEST	Always	STAT0 – STAT5	

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value
SHIFT POSITION	Engine running	Idle neutral is active	IDLE
		Shift selector: Manual mode	1ST
			2ND
			3RD
			4TH
			5TH
			6TH
			7TH
8TH			
		Shift selector: R	R
		Shift selector: N	N
		Shift selector: P	P
		CVT mode	CVT
		Range is unknown	UKNWN
FLEXRAY COMM DIAG (OWN)	FlexRay communication of steering force control module is normal.		NORMAL
	FlexRay communication of steering force control module is being diagnosed.		DIAG
	FlexRay communication of steering force control module is malfunction.		MALF
FLEXRAY COMM DIAG (OTH1)	FlexRay communication of steering angle main control module is normal.		NORMAL
	FlexRay communication of steering angle main control module is being diagnosed.		DIAG
	FlexRay communication of steering angle main control module is malfunction.		MALF
FLEXRAY COMM DIAG (OTH2)	FlexRay communication of steering angle sub control module is normal.		NORMAL
	FlexRay communication of steering angle sub control module is being diagnosed.		DIAG
	FlexRay communication of steering angle sub control module is malfunction.		MALF
POWER TRAIN STATUS	Power train stops.		STOP
	Power train starts.		RUN
IGN SW STATUS (OWN ECU)	Ignition switch: ON	Control module detects ignition voltage.	ON
		Control module does not detect ignition voltage.	OFF
IGN SW STATUS (SYSTEM)	Ignition switch: ON	Control module detects ignition voltage.	ON
		Control module does not detect ignition voltage.	OFF
STOP/START STATUS	Stop/start system is operating.		ON
	Stop/start system is not operating.		OFF
INSTANT VLT DROP DETECT	Instantaneous voltage drop status is not detected.		UNDTCT
	Instantaneous voltage drop status is detected.		DETECT
CURB STONE DETECT STATS	The state of hitting curb stone is not detected.		UNDTCT
	The state of hitting curb stone is detected.		DETECT
BACK UP CIRCUIT A STATUS	System is abnormal.		STAT1
	System is normal.		STAT2

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value
BACK UP CIRCUIT B STATUS	System is abnormal.		STAT1
	System is normal.		STAT2
FREE ROLLER MODE	Free roller mode: ON		ON
	Free roller mode: OFF		OFF
CHASSIS DYNAMO MODE	Engine running	System is normal mode (Driving is OK)	PERMIT
		System is chassis dynamometer mode (Driving is NG)	PROHBT
WRITING STATUS	When system is starting, the required angle information is recorded in control module.		OK
	When system is starting, the required angle information is not recorded in control module.		NG
BACK UP SIG 1 VOLT	Ignition switch ON	When steering force control module is normal.	Approx. 0.5 – 4.75 V
BACK UP SIG 2 VOLT	Ignition switch ON	When steering force control module is normal.	Approx. 0.5 – 4.75 V
INVERTER RELAY ACT VOLT	Engine running		Battery voltage
CONT MODULE INSIDE VOLT	Engine running		Battery voltage – Approx. 0.6 V
BATTERY VOLTAGE	Ignition switch ON		Battery voltage
IGN VOLTAGE	Ignition switch ON		Battery voltage
C/M TEMPERATURE	Engine running		Display temperature of inside of steering force motor [°C °F]
VEHICLE SPEED	Vehicle stopped		0.00 km/h or 0.00 MPH
	Start the engine. Wait a minute. Drive the vehicle. CAUTION: Check air pressure of tire under standard conditions.		Approximately equal to the indication on speedometer (Inside of ±10%)
YAW RATE	Vehicle stopped		Approx. 0 deg/s
	Vehicle turning		Approx. 0 - ±201 deg/s
SIDE G	Vehicle stopped		Approx. 0 m/s ²
	Vehicle turning		Approx. 0 - ±2 m/s ²
ST CLUTCH ACT CURRENT	Engine running		Approx. 0 – 5 A
MOTOR U ACT CURRENT	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 A
		Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)
		Steering wheel: Left turn	Negative vale [Approx. (-70) - (0) A]
MOTOR W ACT CURRENT	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 A
		Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)
		Steering wheel: Left turn	Negative vale [Approx. (-70) - (0) A]
TORQUE SEN MAIN 1	Engine running		Approx. (-8.5) – 8.5 N·m
TEMPERATURE SENSOR	Ignition switch ON or Engine running		Approx. [-40°C (-40°F) – 160°F (320°F)]
ENGINE SPEED	Engine stopped		0 Tr/min
	Engine running		Display the engine speed (Tr/min)
ANGLE SENSOR SIGNAL 1	Engine running		Approx. 1.0 - 3.5 V

A

B

C

D

E

F

STC

H

I

J

K

L

M

N

O

P

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value
ANGLE SENSOR SIGNAL 2	Engine running		Approx. 1.0 - 3.5 V
ANGLE 1	Engine running		Approx. (-4.4) – 4.4 deg
ANGLE 2	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
F/B ANGLE 1	Engine running		Approx. (-20) – 20 deg
F/B ANGLE 2	Engine running		Approx. (-6) – 6 deg
ST ANGLE SENSOR	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 900 deg)
		Steering wheel: Left turn	Negative vale [Approx. (-900) – 0 deg]
ANGLE DIFFERENCE	Engine running		Approx. 0 – 300 deg
STEERING PINION ANGLE	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 550 deg)
		Steering wheel: Left turn	Negative vale [Approx. (-550) – 0 deg]
STEERING PINION ANGLE 2	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 550 deg)
		Steering wheel: Left turn	Negative vale [Approx. (-550) – 0 deg]
ANGLE 3	Engine running		Approx. (-7425) – 7425 deg

Fail-safe

INFOID:000000013356555

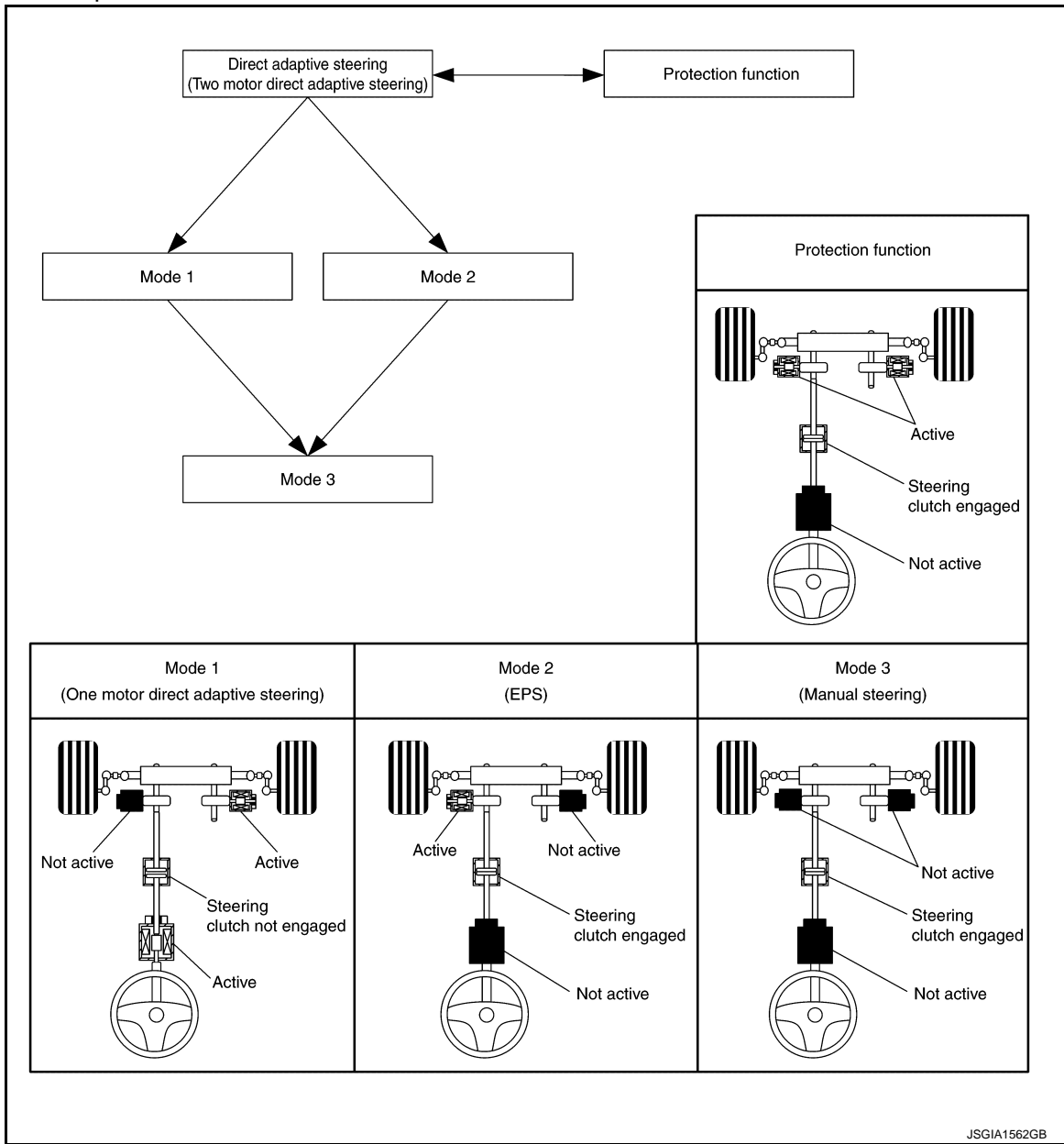
- If a malfunction occurs in the system, the fail-safe function stops the system (mode 3), activates the fail-safe mode (mode 1 or mode 2) or activates the protection mode. When the system enters mode 1, mode 2 or mode 3, the power steering warning lamp illuminates to inform the driver that the turning force is heavy in effect.
- Since three control modules monitor malfunctions mutually, DTC code varies from control module to control module.

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

- For details of protection function, refer to [STC-153. "Protection Function"](#).



DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13A0-00	Variable	Variable	Variable
C13A1-00	—	Mode 2	Mode 2
C13A2-00	Mode 1 or Mode 3	Mode 1 or Mode 3	Mode 1 or Mode 3
C13A3-00	Mode 2	Mode 2	Mode 2
C13A4-00	—	Mode 2	Mode 2
C13A5-00	—	—	Mode 2
C13A6-00	—	Mode 3	—
C13A7-00	—	Mode 3	—
C13A8-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13A9-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13AA-00	Mode 2	Mode 3	Mode 2

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13AB-00	Mode 2	Mode 3	Mode 2
C13AC-00	—	Mode 3	—
C13AD-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13AE-00	Mode 2	Mode 3	Mode 2
C13AF-00	Mode 2	Mode 3	Mode 2
C13B0-00	Mode 2	Mode 3	Mode 2
C13B1-00	Mode 2	Mode 3	Mode 2
C13B2-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B3-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B4-00	Mode 2	Mode 3	Mode 2
C13B5-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B6-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B7-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B8-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B9-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13BA-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13BB-00	—	—	—
C13BC-00	—	—	—
C13BD-00	—	Mode 2	—
C13BE-00	Mode 2	Mode 2	Mode 2
C13BF-00	Variable	Variable	Variable
C13C0-00	Mode 2 or Mode 3	Mode 2 or Mode 3	Mode 2 or Mode 3
C13C1-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3
C13C2-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3
C13C3-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3
C13C4-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13C5-00	Mode 2	—	—
C13C6-00	Mode 2	—	—
C13C7-00	Mode 2	—	—
C13C8-00	—	—	—
C13C9-00	—	—	—
C13CA-00	—	—	—
C13CB-00	—	—	—
C13CC-00	—	—	—
C13CD-00	—	—	—
C13CE-00	—	—	—
C13CF-00	—	—	—
C13D0-00	—	—	—
C13D1-00	—	—	—
C13D2-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D3-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D4-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D5-00	Mode 2	Mode 1 or Mode 3	Mode 2

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13D6-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D7-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D8-00	—	—	—
C13D9-00	—	—	—
C13DA-00	—	—	—
C13DB-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DC-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DD-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DE-00	Protection function mode	Protection function mode	Protection function mode
C13DF-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13E0-00	Mode 2	—	—
C13E1-00	Mode 2	—	—
C13E2-00	—	—	—
C13E3-00	Protection function mode	—	—
C13E4-00	Protection function mode	—	—
C13E5-00	Mode 2	—	—
C13E6-00	Protection function mode	Protection function mode	Protection function mode
C13E7-00	Protection function mode	Protection function mode	Protection function mode
C13E8-00	Protection function mode	Protection function mode	Protection function mode
C13E9-00	—	Mode 2	—
C13EA-00	Mode 2	—	—
C13EB-00	—	Mode 2	Mode 2
C13EE-00	Mode 3	Mode 3	Mode 3
C13EF-00	Mode 3	Mode 3	Mode 3
C13F0-00	Mode 2	Mode 2	Mode 2
C13F1-00	Mode 2	—	—
C13F2-00	Mode 2 or Mode 3	Mode 2 or Mode 3	Mode 2 or Mode 3
U1000-01	—	—	—
U1010-49	—	—	—

- *1: When control module detects a malfunction at startup.
- *2: When control module detects a malfunction except during startup.

Protection Function

INFOID:0000000013356556

- When battery voltage malfunctions temporarily, system overheats continuously and system is overloaded continuously, system is in protection mode temporarily. This is not malfunction.
- When a causative condition is cleared, the system returns to normal control automatically. (Except C13E5-00)
- Since the protection function condition is not malfunction, power steering warning lamp does not turn ON. (Except C13E5-00) The following DTCs remain to distinguish from malfunction.

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Condition	Vehicle condition
C13E3-00	The steering wheel is steered over the limit angle.	System changes to the protection mode temporarily. (Steering operation may become heavy temporarily, however steering wheel can be operated without interference. This is not a system malfunction.)
C13E4-00	When steering clutch is released, steering clutch is not released within regular time with overloading steering wheel.	
C13E5-00	When steering clutch is released, steering clutch is not released in spite of trying to release it many times with overloading steering wheel.	
C13E6-00	EPS/DAST 3: Internal temperature of steering force motor is 150°C (302°F) or more. DAST 1, DAST 2: Internal temperature of control module is 90°C (194°F) or more.	
C13E7-00	Power supply voltage of control module is low temporarily.	
C13E8-00	<ul style="list-style-type: none"> • Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. • Steering gear is out of neutral position. (Large) 	System changes to fail-safe mode (mode 2). For fail-safe, refer to STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe" .

DTC Inspection Priority Chart

INFOID:0000000113356557

When multiple DTCs are detected simultaneously, check one by one depending on the following priority list.

Priority	Priority order item (DTC)
1	<ul style="list-style-type: none"> • U1000-01 CAN COMM CIRCUIT • U1010-49 CONTROL UNIT (CAN)
2	<ul style="list-style-type: none"> • C13C5-00 STEERING ANGLE SENSOR SIGNAL • C13C6-00 G SENSOR SIGNAL • C13C7-00 VEHICL SPEED SIGNAL • C13C9-00 DRIVE MODE SIGNAL • C13CA-00 ENGINE STATUS SIGNAL • C13CC-00 T/M GEAR POSI SIGNAL • C13CD-00 ENGINE SPEED SIGNAL • C13CE-00 SLEEP/WAKEUP SIGNAL • C13CF-00 ALC FUNCTION REQUEST SIGNAL • C13D0-00 ALC FUNCTION REQUEST SIGNAL • C13D1-00 STEERING ANGLE SENSOR SIGNAL
3	<ul style="list-style-type: none"> • C13E9-00 BOOTING ANGLE PROCESSING • C13EA-00 BOOTING ANGLE PROCESSING • C13EB-00 BOOTING ANGLE PROCESSING • C13EE-00 INCOMP CONFIG • C13EF-00 CONFIG CHECK RESULT • C13F0-00 IMCOMP DAST CALIBRATION • C13F1-00 INCOMP ST ANG SEN ADJST • C13F2-00 DIFFERENT SOFTWARE VERSION

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Priority	Priority order item (DTC)				
4	<ul style="list-style-type: none"> • C13A8-00 BACK UP CIRCUIT • C13A9-00 BACK UP CIRCUIT • C13AB-00 CONTROL MODULE • C13AC-00 CONTROL MODULE • C13B6-00 MOTOR CIRCUIT • C13B9-00 CONTROL MODULE • C13BB-00 CONTROL MODULE POWER SUPPLY • C13BC-00 CONTROL MODULE IGN POWER SUP • C13BD-00 CONTROL MODULE IGN POWER SUP • C13D4-00 CONTROL MODULE • C13D8-00 CONTROL MODULE • C13DB-00 STEERING TORQUE SENSOR • C13DC-00 STEERING TORQUE SENSOR • C13DD-00 STEERING TORQUE SENSOR • C13DE-00 TEMPERATURE SENSOR • C13E0-00 ST CLUTCH COMMAND CIRCUIT • C13E1-00 STEERING CLUTCH • C13E2-00 FRONT WHEEL SENSOR SIGNAL 	A B C D E			
	5	<ul style="list-style-type: none"> • C13BE-00 FLEXRAY COMMUNICATION • C13BF-00 FLEXRAY COMMUNICATION • C13C0-00 FLEXRAY COMMUNICATION • C13C1-00 FLEXRAY COMMUNICATION • C13C2-00 FLEXRAY COMMUNICATION • C13C3-00 FLEXRAY COMMUNICATION • C13C4-00 FLEXRAY COMMUNICATION 	F STC		
		6	<ul style="list-style-type: none"> • C13A0-00 CONTROL MODULE • C13A1-00 CONTROL MODULE • C13A2-00 CONTROL MODULE • C13A3-00 CONTROL MODULE • C13A4-00 CONTROL MODULE • C13A5-00 CONTROL MODULE • C13A6-00 CONTROL MODULE • C13A7-00 CONTROL MODULE • C13AA-00 CONTROL MODULE • C13AD-00 CONTROL MODULE • C13AE-00 CONTROL MODULE • C13AF-00 CONTROL MODULE • C13B0-00 CONTROL MODULE • C13B1-00 CONTROL MODULE • C13B2-00 CONTROL MODULE • C13B3-00 CONTROL MODULE • C13B4-00 CONTROL MODULE • C13B5-00 CONTROL MODULE • C13B7-00 CONTROL MODULE • C13B8-00 CONTROL MODULE • C13BA-00 CONTROL MODULE POWER SUPPLY • C13D2-00 CONTROL MODULE • C13D3-00 CONTROL MODULE • C13D5-00 CONTROL MODULE • C13D6-00 CONTROL MODULE • C13D7-00 CONTROL MODULE • C13D9-00 CONTROL MODULE • C13DF-00 CONTROL MODULE 	H I J K L M N O	
			7	<ul style="list-style-type: none"> • C13E3-00 SPIRAL CABLE PROTECTION • C13E4-00 ST CLUTCH RELEASE PROTECTION • C13E5-00 ST CLUTCH RELEASE PROTECTION • C13E6-00 HEAT PROTECTION • C13E7-00 LOW VOLTAGE PROTECTION • C13E8-00 CURB STONE PROTECTION 	P

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC Index

INFOID:000000013356558

×: Applicable

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13A0-00	CONTROL MODULE	×	×	×	ON	STC-218
C13A1-00	CONTROL MODULE	×	×	×	OFF	STC-221
C13A2-00	CONTROL MODULE	×	×	×	ON	STC-224
C13A3-00	CONTROL MODULE	×	×	×	ON	STC-227
C13A4-00	CONTROL MODULE		×	×	OFF	—
C13A5-00	CONTROL MODULE			×	OFF	—
C13A6-00	CONTROL MODULE		×		OFF	—
C13A7-00	CONTROL MODULE		×		OFF	—
C13A8-00	BACK UP CIRCUIT	×	×	×	ON	STC-236
C13A9-00	BACK UP CIRCUIT	×	×	×	ON	STC-241
C13AA-00	CONTROL MODULE	×	×	×	ON	STC-246
C13AB-00	CONTROL MODULE	×	×	×	ON	STC-250
C13AC-00	CONTROL MODULE		×		OFF	—
C13AD-00	CONTROL MODULE	×	×	×	ON	STC-256
C13AE-00	CONTROL MODULE	×	×	×	ON	STC-262
C13AF-00	CONTROL MODULE	×	×	×	ON	STC-265
C13B0-00	CONTROL MODULE	×	×	×	ON	STC-268
C13B1-00	CONTROL MODULE	×	×	×	ON	STC-271
C13B2-00	CONTROL MODULE	×	×	×	ON	STC-274
C13B3-00	CONTROL MODULE	×	×	×	ON	STC-280
C13B4-00	CONTROL MODULE	×	×	×	ON	STC-286
C13B5-00	CONTROL MODULE	×	×	×	ON	STC-289
C13B6-00	MOTOR CIRCUIT	×	×	×	ON	STC-295
C13B7-00	CONTROL MODULE	×	×	×	ON	STC-303
C13B8-00	CONTROL MODULE	×	×	×	ON	STC-309
C13B9-00	CONTROL MODULE	×	×	×	ON	STC-312
C13BA-00	CONTROL MODULE POWER SUPPLY	×	×	×	ON	STC-318
C13BB-00	CONTROL MODULE POWER SUPPLY	×	×	×	OFF	STC-323
C13BC-00	CONTROL MODULE IGN POWER SUP	×	×	×	OFF	STC-328
C13BD-00	CONTROL MODULE IGN POWER SUP		×		OFF	—
C13BE-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13BF-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13C0-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13C1-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13C2-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13C3-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13C4-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13C5-00	STEERING ANGLE SENSOR SIGNAL	×			ON	STC-338
C13C6-00	G SENSOR SIGNAL	×			ON	STC-340
C13C7-00	VEHICL SPEED SIGNAL	×			ON	STC-342
C13C9-00	DRIVE MODE SIGNAL	×			OFF	STC-344
C13CA-00	ENGINE STATUS SIGNAL	×			OFF	STC-346
C13CC-00	T/M GEAR POSI SIGNAL	×			OFF	STC-348
C13CD-00	ENGINE SPEED SIGNAL	×			OFF	STC-350
C13CE-00	SLEEP/WAKE UP SIGNAL	×			OFF	STC-352
C13CF-00	ALC FUNCTION REQUEST SIGNAL		×		OFF	—
C13D0-00	ALC FUNCTION REQUEST SIGNAL		×		OFF	—
C13D1-00	STEERING ANGLE SENSOR SIGNAL		×		ON	—
C13D2-00	CONTROL MODULE	×	×	×	ON	STC-360
C13D3-00	CONTROL MODULE	×	×	×	ON	STC-363
C13D4-00	CONTROL MODULE	×	×	×	ON	STC-366
C13D5-00	CONTROL MODULE	×	×	×	ON	STC-373
C13D6-00	CONTROL MODULE	×	×	×	ON	STC-376
C13D7-00	CONTROL MODULE	×	×	×	ON	STC-383
C13D8-00	CONTROL MODULE	×	×		OFF	STC-386
C13D9-00	CONTROL MODULE	×	×		OFF	STC-390
C13DB-00	STEERING TORQUE SENSOR		×		OFF	—
C13DC-00	STEERING TORQUE SENSOR		×		OFF	—
C13DD-00	STEERING TORQUE SENSOR		×		OFF	—
C13DE-00	TEMPERATURE SENSOR	×	×	×	OFF	STC-401
C13DF-00	CONTROL MODULE		×		OFF	—
C13E0-00	ST CLUTCH COMMAND CIRCUIT	×			ON	STC-408
C13E1-00	STEERING CLUTCH	×			ON	STC-410
C13E2-00	FRONT WHEEL SENSOR SIGNAL	×			OFF	STC-413
C13E3-00	SPIRAL CABLE PROTECTION	×			OFF	STC-414
C13E4-00	ST CLUTCH RELEASE PROTECTION	×			OFF	STC-415
C13E5-00	ST CLUTCH RELEASE PROTECTION	×			ON	STC-418
C13E6-00	HEAT PROTECTION	×	×	×	OFF	STC-421

A

B

C

D

E

F

STC

H

I

J

K

L

M

N

O

P

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13E7-00	LOW VOLTAGE PROTECTION	×	×	×	OFF	STC-427
C13E8-00	CURB STONE PROTECTION	×	×	×	OFF	STC-432
C13E9-00	BOOTING ANGLE PROCESSING		×		OFF	—
C13EA-00	BOOTING ANGLE PROCESSING	×			ON	STC-439
C13EB-00	BOOTING ANGLE PROCESSING		×	×	OFF	—
C13EE-00	INCOMP CONFIG	×	×	×	ON	STC-447
C13EF-00	CONFIG CHECK RESULT	×	×	×	ON	STC-451
C13F0-00	INCOMP DAST CALIBRATION	×	×	×	ON	STC-455
C13F1-00	INCOMP ST ANG SEN ADJST	×			ON	STC-458
C13F2-00	DIFFERENT SOFTWARE VERSION	×	×	×	ON	STC-460
U1000-01	CAN COMM CIRCUIT	×	×		OFF	STC-463
U1010-49	CONTROL UNIT (CAN)	×	×		OFF	STC-465

NOTE:

If two or more DTCs are detected, refer to [STC-154, "DTC Inspection Priority Chart"](#).

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

STEERING ANGLE MAIN CONTROL MODULE

Reference Value

INFOID:0000000013356559

VALUES ON THE DIAGNOSIS TOOL

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Monitor item	Condition	Display value
OWN ECU SYS STATUS	Judging system starting	BOOT
	System is diagnosing	DIAG1 – DIAG10
	Processing system shutdown	FIN1 – FIN12
	Finish the system control	DOWN1
	Wait for shutdown	DOWN2
	System is shutdown	DOWN3
	System is in fail-safe mode 1	MALF1
	System is in fail-safe mode 2	MALF2
	System is in fail-safe mode 3	MALF3
	Performing initial setting	SETTING
	System is in normal control	STD1 STD2
	System is in protection mode	STD3
	System is synchronizing	SYNC
	ST ANG MAIN SYS STATUS	Judging system starting
System is diagnosing		DIAG1 – DIAG10
Processing system shutdown		FIN1 – FIN12
Finish the system control		DOWN1
Wait for shutdown		DOWN2
System is shutdown		DOWN3
System is in fail-safe mode 1		MALF1
System is in fail-safe mode 2		MALF2
System is in fail-safe mode 3		MALF3
Performing initial setting		SETTING
System is in normal control		STD1 STD2
System is in protection mode		STD3
System is synchronizing		SYNC

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition	Display value
ST ANG SUB SYS STATUS	Judging system starting	BOOT
	System is diagnosing	DIAG1 – DIAG10
	Processing system shutdown	FIN1 – FIN12
	Finish the system control	DOWN1
	Wait for shutdown	DOWN2
	System is shutdown	DOWN3
	System is in fail-safe mode 1	MALF1
	System is in fail-safe mode 2	MALF2
	System is in fail-safe mode 3	MALF3
	Performing initial setting	SETTING
	System is in normal control	STD1 STD2
	System is in protection mode	STD3
	System is synchronizing	SYNC
ST FORCE SYS STATUS	Judging system starting	BOOT
	System is diagnosing	DIAG1 – DIAG10
	Processing system shutdown	FIN1 – FIN12
	Finish the system control	DOWN1
	Wait for shutdown	DOWN2
	System is shutdown	DOWN3
	System is in fail-safe mode 1	MALF1
	System is in fail-safe mode 2	MALF2
	System is in fail-safe mode 3	MALF3
	Performing initial setting	SETTING
	System is in normal control	STD1 STD2
	System is in protection mode	STD3
	System is synchronizing	SYNC
BACK UP CIRCUIT STATUS	Always	0 – 255
CONTROL MODULE CRNT	Always	0 – 255 A
DETAILED CODE 1	This is displayed, but it is not used.	0 – 255
DETAILED CODE 2	This is displayed, but it is not used.	0 – 255
DETAILED CODE 3	This is displayed, but it is not used.	0 – 255
FLEXRAY COMM SYNC STATS	Always	STAT1 – 10
STEERING MODE	Always	CHARA – CHARA I
ST CLUTCH PRTCT STATUS	Always	STAT0 – STAT12, STAT20
ST CLUTCH CON RQEST	Always	STAT0 – STAT5
FLEXRAY COMM DIAG (OWN)	FlexRay communication of steering angle main control module is normal.	NORMAL
	FlexRay communication of steering angle main control module is being diagnosed.	DIAG
	FlexRay communication of steering angle main control module is malfunction.	MALF

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value	
FLEXRAY COMM DIAG (OTH1)	FlexRay communication of steering angle sub control module is normal.		NORMAL	A
	FlexRay communication of steering angle sub control module is being diagnosed.		DIAG	B
	FlexRay communication of steering angle sub control module is malfunction.		MALF	
FLEXRAY COMM DIAG (OTH2)	FlexRay communication of steering force control module is normal.		NORMAL	C
	FlexRay communication of steering force control module is being diagnosed.		DIAG	D
	FlexRay communication of steering force control module is malfunction.		MALF	
POWER TRAIN STATUS	Power train stops.		STOP	E
	Power train starts.		RUN	
IGN SW STATUS (OWN ECU)	Ignition switch: ON	Control module detects ignition voltage.	ON	F
		Control module does not detect ignition voltage.	OFF	
IGN SW STATUS (SYSTEM)	Ignition switch: ON	Control module detects ignition voltage.	ON	STC
		Control module does not detect ignition voltage.	OFF	H
STOP/START STATUS	Stop/start system is operating.		ON	
	Stop/start system is not operating.		OFF	I
INSTANT VLT DROP DETECT	Instantaneous voltage drop status is not detected.		UNDTCT	
	Instantaneous voltage drop status is detected.		DETECT	
CURB STONE DETECT STATS	The state of hitting curb stone is not detected.		UNDTCT	J
	The state of hitting curb stone is detected.		DETECT	
BACK UP CIRCUIT A STATUS	System is abnormal.		STAT1	K
	System is normal.		STAT2	
BACK UP CIRCUIT B STATUS	System is abnormal.		STAT1	
	System is normal.		STAT2	L
FREE ROLLER MODE	Free roller mode: ON		ON	
	Free roller mode: OFF		OFF	
CHASSIS DYNAMO MODE	Engine running	System is normal mode (Driving is OK)	PERMIT	M
		System is chassis dynamometer mode (Driving is NG)	PROHBT	N
WRITING STATUS	When system is starting, the required angle information is recorded in control module.		OK	
	When system is starting, the required angle information is not recorded in control module.		NG	O
BACK UP SIG 1 VOLT	Ignition switch ON	When steering angle main control module is normal.	Approx. 0.5 – 4.75 V	P
BACK UP SIG 2 VOLT	Ignition switch ON	When steering angle main control module is normal.	Approx. 0.5 – 4.75 V	
INVERTER RELAY ACT VOLT	Engine running		Battery voltage	
CONT MODULE INSIDE VOLT	Engine running		Battery voltage – Approx. 0.6 V	
BATTERY VOLTAGE	Ignition switch ON		Battery voltage	

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value
IGN VOLTAGE	Ignition switch ON		Battery voltage
C/M TEMPERATURE	Engine running		Display temperature of inside of steering angle main control module [°C °F]
VEHICLE SPEED	Vehicle stopped		0.00 km/h or 0.00 MPH
	Start the engine. Wait a minute. Drive the vehicle. CAUTION: Check air pressure of tire under standard conditions.		Approximately equal to the indication on speedometer (Inside of ±10%)
YAW RATE	Vehicle stopped		Approx. 0 deg/s
	Vehicle turning		Approx. 0 - ±201 deg/s
SIDE G	Vehicle stopped		Approx. 0 m/s ²
	Vehicle turning		Approx. 0 - ±2 m/s ²
ST CLUTCH ACT CURRENT	Engine running		Approx. 0 – 5 A
MOTOR U ACT CURRENT	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 A
		Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)
		Steering wheel: Left turn	Negative vale [Approx. (-70) - (0) A]
MOTOR W ACT CURRENT	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 A
		Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)
		Steering wheel: Left turn	Negative vale [Approx. (-70) - (0) A]
TORQUE SEN MAIN 2	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
		Steering wheel: Right turn	Approx. 1.4 - 2.5 V
		Steering wheel: Left turn	Approx. 2.5 - 3.6 V
TORQUE SEN MAIN 1	Engine running		Approx. (-8.5) – 8.5 N·m
TORQUE SEN SUB	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
		Steering wheel: Right turn	Approx. 1.4 - 2.5 V
		Steering wheel: Left turn	Approx. 2.5 - 3.6 V
TORQUE SEN VOLTAGE	Ignition switch ON		Approx. 4.5 – 5.5 V
TEMPERATURE SENSOR	Ignition switch ON or Engine running		Display temperature of inside of steering angle main control module [°C °F]
SUB IGN VOLTAGE	Ignition switch ON		Battery voltage
ANGLE SENSOR SIGNAL 1	Engine running		Approx. 1.0 - 3.5 V
ANGLE SENSOR SIGNAL 2	Engine running		Approx. 1.0 - 3.5 V
ANGLE 1	Engine running		Approx. (-4.4) – 4.4 deg
ANGLE 2	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
F/B ANGLE 1	Engine running		Approx. (-20) – 20 deg
F/B ANGLE 2	Engine running		Approx. (-6) – 6 deg

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value
ST ANGLE SENSOR	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 900 deg)
		Steering wheel: Left turn	Negative vale [Approx. (–900) – 0 deg]
ANGLE DIFFERENCE	Engine running		Approx. 0 – 300 deg
STEERING PINION ANGLE	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 550 deg)
		Steering wheel: Left turn	Negative vale [Approx. (–550) – 0 deg]
STEERING PINION ANGLE 2	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 550 deg)
		Steering wheel: Left turn	Negative vale [Approx. (–550) – 0 deg]
ANGLE 3	Engine running		Approx. (–7425) – 7425 deg

Fail-safe

INFOID:0000000013356560

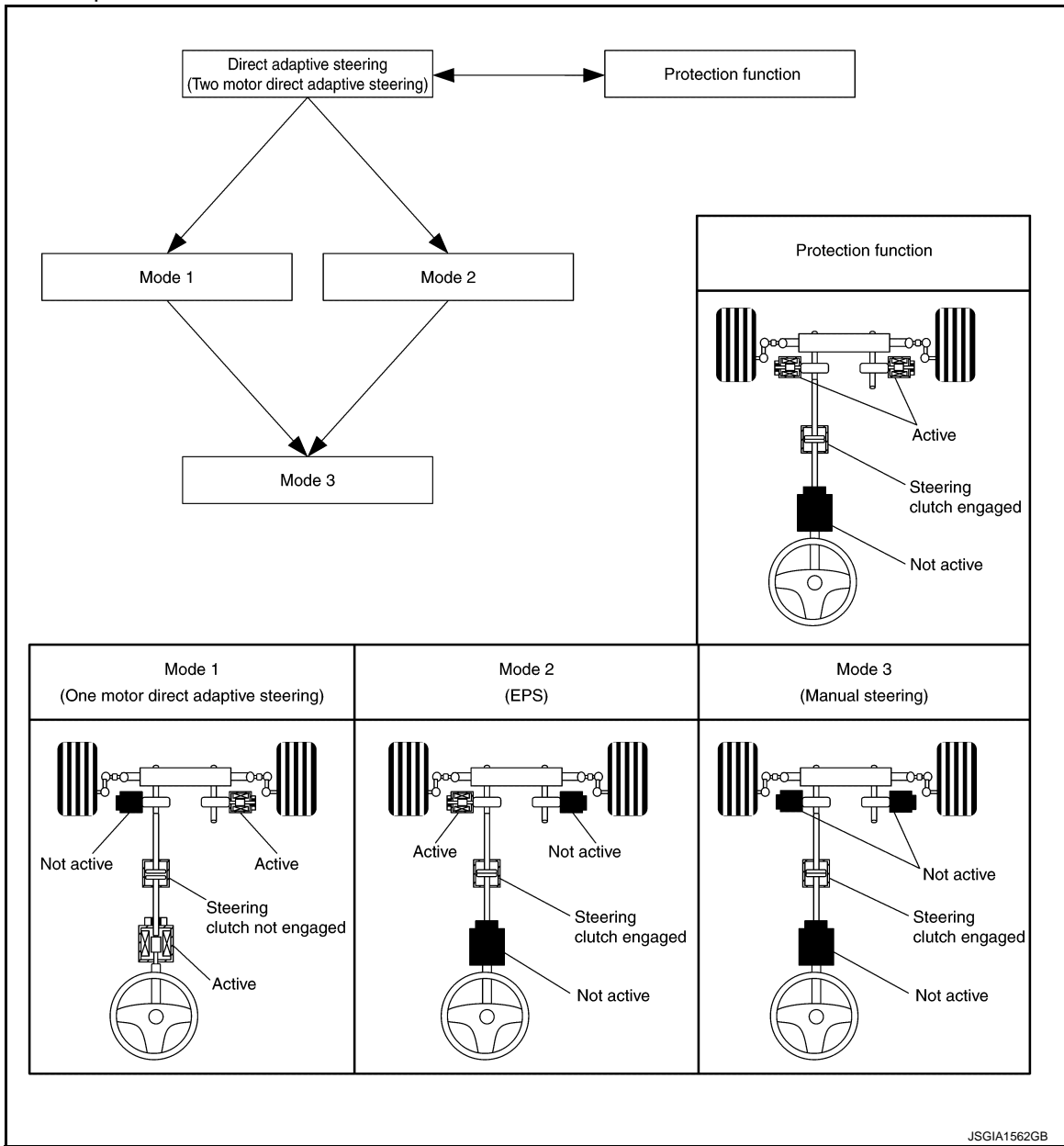
- If a malfunction occurs in the system, the fail-safe function stops the system (mode 3), activates the fail-safe mode (mode 1 or mode 2) or activates the protection mode. When the system enters mode 1, mode 2 or mode 3, the power steering warning lamp illuminates to inform the driver that the turning force is heavy in effect.
- Since three control modules monitor malfunctions mutually, DTC code varies from control module to control module.

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

- For details of protection function, refer to [STC-166. "Protection Function"](#).



DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13A0-00	Variable	Variable	Variable
C13A1-00	—	Mode 2	Mode 2
C13A2-00	Mode 1 or Mode 3	Mode 1 or Mode 3	Mode 1 or Mode 3
C13A3-00	Mode 2	Mode 2	Mode 2
C13A4-00	—	Mode 2	Mode 2
C13A5-00	—	—	Mode 2
C13A6-00	—	Mode 3	—
C13A7-00	—	Mode 3	—
C13A8-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13A9-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13AA-00	Mode 2	Mode 3	Mode 2

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13AB-00	Mode 2	Mode 3	Mode 2
C13AC-00	—	Mode 3	—
C13AD-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13AE-00	Mode 2	Mode 3	Mode 2
C13AF-00	Mode 2	Mode 3	Mode 2
C13B0-00	Mode 2	Mode 3	Mode 2
C13B1-00	Mode 2	Mode 3	Mode 2
C13B2-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B3-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B4-00	Mode 2	Mode 3	Mode 2
C13B5-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B6-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B7-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B8-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B9-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13BA-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13BB-00	—	—	—
C13BC-00	—	—	—
C13BD-00	—	Mode 2	—
C13BE-00	Mode 2	Mode 2	Mode 2
C13BF-00	Variable	Variable	Variable
C13C0-00	Mode 2 or Mode 3	Mode 2 or Mode 3	Mode 2 or Mode 3
C13C1-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3
C13C2-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3
C13C3-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3
C13C4-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13C5-00	Mode 2	—	—
C13C6-00	Mode 2	—	—
C13C7-00	Mode 2	—	—
C13C8-00	—	—	—
C13C9-00	—	—	—
C13CA-00	—	—	—
C13CB-00	—	—	—
C13CC-00	—	—	—
C13CD-00	—	—	—
C13CE-00	—	—	—
C13CF-00	—	—	—
C13D0-00	—	—	—
C13D1-00	—	—	—
C13D2-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D3-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D4-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D5-00	Mode 2	Mode 1 or Mode 3	Mode 2

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13D6-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D7-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D8-00	—	—	—
C13D9-00	—	—	—
C13DA-00	—	—	—
C13DB-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DC-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DD-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DE-00	Protection function mode	Protection function mode	Protection function mode
C13DF-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13E0-00	Mode 2	—	—
C13E1-00	Mode 2	—	—
C13E2-00	—	—	—
C13E3-00	Protection function mode	—	—
C13E4-00	Protection function mode	—	—
C13E5-00	Mode 2	—	—
C13E6-00	Protection function mode	Protection function mode	Protection function mode
C13E7-00	Protection function mode	Protection function mode	Protection function mode
C13E8-00	Protection function mode	Protection function mode	Protection function mode
C13E9-00	—	Mode 2	—
C13EA-00	Mode 2	—	—
C13EB-00	—	Mode 2	Mode 2
C13EE-00	Mode 3	Mode 3	Mode 3
C13EF-00	Mode 3	Mode 3	Mode 3
C13F0-00	Mode 2	Mode 2	Mode 2
C13F1-00	Mode 2	—	—
C13F2-00	Mode 2 or Mode 3	Mode 2 or Mode 3	Mode 2 or Mode 3
U1000-01	—	—	—
U1010-49	—	—	—

- *1: When control module detects a malfunction at startup.
- *2: When control module detects a malfunction except during startup.

Protection Function

INFOID:000000013356561

- When battery voltage malfunctions temporarily, system overheats continuously and system is overloaded continuously, system is in protection mode temporarily. This is not malfunction.
- When a causative condition is cleared, the system returns to normal control automatically. (Except C13E5-00)
- Since the protection function condition is not malfunction, power steering warning lamp does not turn ON. (Except C13E5-00) The following DTCs remain to distinguish from malfunction.

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Condition	Vehicle condition	
C13E3-00	The steering wheel is steered over the limit angle.	System changes to the protection mode temporarily. (Steering operation may become heavy temporarily, however steering wheel can be operated without interference. This is not a system malfunction.)	A
C13E4-00	When steering clutch is released, steering clutch is not released within regular time with overloading steering wheel.		B
C13E5-00	When steering clutch is released, steering clutch is not released in spite of trying to release it many times with overloading steering wheel.	System changes to fail-safe mode (mode 2). For fail-safe, refer to STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe" .	C
C13E6-00	EPS/DAST 3: Internal temperature of steering force motor is 150°C (302°F) or more.		D
	DAST 1, DAST 2: Internal temperature of control module is 90°C (194°F) or more.		E
C13E7-00	Power supply voltage of control module is low temporarily.		F
C13E8-00	<ul style="list-style-type: none"> Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. Steering gear is out of neutral position. (Large) 		STC

DTC Inspection Priority Chart

INFOID:0000000013356562

When multiple DTCs are detected simultaneously, check one by one depending on the following priority list.

Priority	Priority order item (DTC)	
1	<ul style="list-style-type: none"> U1000-01 CAN COMM CIRCUIT U1010-49 CONTROL UNIT (CAN) 	I
2	<ul style="list-style-type: none"> C13C5-00 STEERING ANGLE SENSOR SIGNAL C13C6-00 G SENSOR SIGNAL C13C7-00 VEHICL SPEED SIGNAL C13C9-00 DRIVE MODE SIGNAL C13CA-00 ENGINE STATUS SIGNAL C13CC-00 T/M GEAR POSI SIGNAL C13CD-00 ENGINE SPEED SIGNAL C13CE-00 SLEEP/WAKEUP SIGNAL C13CF-00 ALC FUNCTION REQUEST SIGNAL C13D0-00 ALC FUNCTION REQUEST SIGNAL C13D1-00 STEERING ANGLE SENSOR SIGNAL 	J K L
3	<ul style="list-style-type: none"> C13E9-00 BOOTING ANGLE PROCESSING C13EA-00 BOOTING ANGLE PROCESSING C13EB-00 BOOTING ANGLE PROCESSING C13EE-00 INCOMP CONFIG C13EF-00 CONFIG CHECK RESULT C13F0-00 IMCOMP DAST CALIBRATION C13F1-00 INCOMP ST ANG SEN ADJST C13F2-00 DIFFERENT SOFTWARE VERSION 	M N O

P

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Priority	Priority order item (DTC)
4	<ul style="list-style-type: none"> • C13A8-00 BACK UP CIRCUIT • C13A9-00 BACK UP CIRCUIT • C13AB-00 CONTROL MODULE • C13AC-00 CONTROL MODULE • C13B6-00 MOTOR CIRCUIT • C13B9-00 CONTROL MODULE • C13BB-00 CONTROL MODULE POWER SUPPLY • C13BC-00 CONTROL MODULE IGN POWER SUP • C13BD-00 CONTROL MODULE IGN POWER SUP • C13D4-00 CONTROL MODULE • C13D8-00 CONTROL MODULE • C13DB-00 STEERING TORQUE SENSOR • C13DC-00 STEERING TORQUE SENSOR • C13DD-00 STEERING TORQUE SENSOR • C13DE-00 TEMPERATURE SENSOR • C13E0-00 ST CLUTCH COMMAND CIRCUIT • C13E1-00 STEERING CLUTCH • C13E2-00 FRONT WHEEL SENSOR SIGNAL
5	<ul style="list-style-type: none"> • C13BE-00 FLEXRAY COMMUNICATION • C13BF-00 FLEXRAY COMMUNICATION • C13C0-00 FLEXRAY COMMUNICATION • C13C1-00 FLEXRAY COMMUNICATION • C13C2-00 FLEXRAY COMMUNICATION • C13C3-00 FLEXRAY COMMUNICATION • C13C4-00 FLEXRAY COMMUNICATION
6	<ul style="list-style-type: none"> • C13A0-00 CONTROL MODULE • C13A1-00 CONTROL MODULE • C13A2-00 CONTROL MODULE • C13A3-00 CONTROL MODULE • C13A4-00 CONTROL MODULE • C13A5-00 CONTROL MODULE • C13A6-00 CONTROL MODULE • C13A7-00 CONTROL MODULE • C13AA-00 CONTROL MODULE • C13AD-00 CONTROL MODULE • C13AE-00 CONTROL MODULE • C13AF-00 CONTROL MODULE • C13B0-00 CONTROL MODULE • C13B1-00 CONTROL MODULE • C13B2-00 CONTROL MODULE • C13B3-00 CONTROL MODULE • C13B4-00 CONTROL MODULE • C13B5-00 CONTROL MODULE • C13B7-00 CONTROL MODULE • C13B8-00 CONTROL MODULE • C13BA-00 CONTROL MODULE POWER SUPPLY • C13D2-00 CONTROL MODULE • C13D3-00 CONTROL MODULE • C13D5-00 CONTROL MODULE • C13D6-00 CONTROL MODULE • C13D7-00 CONTROL MODULE • C13D9-00 CONTROL MODULE • C13DF-00 CONTROL MODULE
7	<ul style="list-style-type: none"> • C13E3-00 SPIRAL CABLE PROTECTION • C13E4-00 ST CLUTCH RELEASE PROTECTION • C13E5-00 ST CLUTCH RELEASE PROTECTION • C13E6-00 HEAT PROTECTION • C13E7-00 LOW VOLTAGE PROTECTION • C13E8-00 CURB STONE PROTECTION

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC Index

INFOID:000000013356563

×: Applicable

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13A0-00	CONTROL MODULE	×	×	×	ON	STC-219
C13A1-00	CONTROL MODULE	×	×	×	ON	STC-221
C13A2-00	CONTROL MODULE	×	×	×	ON	STC-225
C13A3-00	CONTROL MODULE	×	×	×	ON	STC-228
C13A4-00	CONTROL MODULE		×	×	ON	STC-230
C13A5-00	CONTROL MODULE			×	OFF	—
C13A6-00	CONTROL MODULE		×		ON	STC-234
C13A7-00	CONTROL MODULE		×		ON	STC-235
C13A8-00	BACK UP CIRCUIT	×	×	×	ON	STC-237
C13A9-00	BACK UP CIRCUIT	×	×	×	ON	STC-242
C13AA-00	CONTROL MODULE	×	×	×	ON	STC-247
C13AB-00	CONTROL MODULE	×	×	×	ON	STC-251
C13AC-00	CONTROL MODULE		×		ON	STC-254
C13AD-00	CONTROL MODULE	×	×	×	ON	STC-257
C13AE-00	CONTROL MODULE	×	×	×	ON	STC-263
C13AF-00	CONTROL MODULE	×	×	×	ON	STC-266
C13B0-00	CONTROL MODULE	×	×	×	ON	STC-269
C13B1-00	CONTROL MODULE	×	×	×	ON	STC-272
C13B2-00	CONTROL MODULE	×	×	×	ON	STC-275
C13B3-00	CONTROL MODULE	×	×	×	ON	STC-281
C13B4-00	CONTROL MODULE	×	×	×	ON	STC-287
C13B5-00	CONTROL MODULE	×	×	×	ON	STC-290
C13B6-00	MOTOR CIRCUIT	×	×	×	ON	STC-297
C13B7-00	CONTROL MODULE	×	×	×	ON	STC-304
C13B8-00	CONTROL MODULE	×	×	×	ON	STC-310
C13B9-00	CONTROL MODULE	×	×	×	ON	STC-313
C13BA-00	CONTROL MODULE POWER SUPPLY	×	×	×	ON	STC-319
C13BB-00	CONTROL MODULE POWER SUPPLY	×	×	×	OFF	STC-324
C13BC-00	CONTROL MODULE IGN POWER SUP	×	×	×	OFF	STC-328
C13BD-00	CONTROL MODULE IGN POWER SUP		×		ON	STC-332
C13BE-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13BF-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13C0-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334

A

B

C

D

E

F

STC

H

I

J

K

L

M

N

O

P

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13C1-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13C2-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13C3-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13C4-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13C5-00	STEERING ANGLE SENSOR SIGNAL	×			OFF	—
C13C6-00	G SENSOR SIGNAL	×			OFF	—
C13C7-00	VEHICL SPEED SIGNAL	×			OFF	—
C13C9-00	DRIVE MODE SIGNAL	×			OFF	—
C13CA-00	ENGINE STATUS SIGNAL	×			OFF	—
C13CC-00	T/M GEAR POSI SIGNAL	×			OFF	—
C13CD-00	ENGINE SPEED SIGNAL	×			OFF	—
C13CE-00	SLEEP WAKE UP SIGNAL	×			OFF	—
C13CF-00	ALC FUNCTION REQUEST SIGNAL		×		OFF	STC-354
C13D0-00	ALC FUNCTION REQUEST SIGNAL		×		OFF	STC-356
C13D1-00	STEERING ANGLE SENSOR SIGNAL		×		OFF	STC-358
C13D2-00	CONTROL MODULE	×	×	×	ON	STC-361
C13D3-00	CONTROL MODULE	×	×	×	ON	STC-364
C13D4-00	CONTROL MODULE	×	×	×	ON	STC-368
C13D5-00	CONTROL MODULE	×	×	×	ON	STC-374
C13D6-00	CONTROL MODULE	×	×	×	ON	STC-378
C13D7-00	CONTROL MODULE	×	×	×	ON	STC-384
C13D8-00	CONTROL MODULE	×	×		OFF	STC-388
C13D9-00	CONTROL MODULE	×	×		OFF	STC-390
C13DB-00	STEERING TORQUE SENSOR		×		ON	STC-392
C13DC-00	STEERING TORQUE SENSOR		×		ON	STC-395
C13DD-00	STEERING TORQUE SENSOR		×		ON	STC-398
C13DE-00	TEMPERATURE SENSOR	×	×	×	OFF	STC-403
C13DF-00	CONTROL MODULE		×		ON	STC-407
C13E0-00	ST CLUTCH COMMAND CIRCUIT	×			OFF	—
C13E1-00	STEERING CLUTCH	×			OFF	—
C13E2-00	BOOTING ST CLUTCH NORMAL ACT	×			OFF	—
C13E3-00	FRONT WHEEL SENSOR SIGNAL	×			OFF	—
C13E4-00	ST CLUTCH RELEASE PROTECTION	×			OFF	—
C13E5-00	ST CLUTCH RELEASE PROTECTION	×			OFF	—
C13E6-00	HEAT PROTECTION	×	×	×	OFF	STC-424

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13E7-00	LOW VOLTAGE PROTECTION	×	×	×	OFF	STC-428
C13E8-00	CURB STONE PROTECTION	×	×	×	OFF	STC-433
C13E9-00	BOOTING ANGLE PROCESSING		×		ON	STC-436
C13EA-00	BOOTING ANGLE PROCESSING	×			OFF	—
C13EB-00	BOOTING ANGLE PROCESSING		×	×	ON	STC-441
C13EE-00	INCOMP CONFIG	×	×	×	ON	STC-448
C13EF-00	CONFIG CHECK RESULT	×	×	×	ON	STC-452
C13F0-00	INCOMP DAST CALIBRATION	×	×	×	ON	STC-456
C13F1-00	INCOMP ST ANG SEN ADJST	×			OFF	—
C13F2-00	DIFFERENT SOFTWARE VERSION	×	×	×	ON	STC-460
U1000-01	CAN COMM CIRCUIT	×	×		OFF	STC-463
U1010-49	CONTROL UNIT (CAN)	×	×		OFF	STC-466

NOTE:

If two or more DTCs are detected, refer to [STC-167, "DTC Inspection Priority Chart"](#).

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

STEERING ANGLE SUB CONTROL MODULE

Reference Value

INFOID:000000013356564

VALUES ON THE DIAGNOSIS TOOL

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Monitor item	Condition	Display value
OWN ECU SYS STATUS	Judging system starting	BOOT
	System is diagnosing	DIAG1 – DIAG10
	Processing system shutdown	FIN1 – FIN12
	Finish the system control	DOWN1
	Wait for shutdown	DOWN2
	System is shutdown	DOWN3
	System is in fail-safe mode 1	MALF1
	System is in fail-safe mode 2	MALF2
	System is in fail-safe mode 3	MALF3
	Performing initial setting	SETTING
	System is in normal control	STD1 STD2
	System is in protection mode	STD3
	System is synchronizing	SYNC
	ST ANG MAIN SYS STATUS	Judging system starting
System is diagnosing		DIAG1 – DIAG10
Processing system shutdown		FIN1 – FIN12
Finish the system control		DOWN1
Wait for shutdown		DOWN2
System is shutdown		DOWN3
System is in fail-safe mode 1		MALF1
System is in fail-safe mode 2		MALF2
System is in fail-safe mode 3		MALF3
Performing initial setting		SETTING
System is in normal control		STD1 STD2
System is in protection mode		STD3
System is synchronizing		SYNC

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition	Display value	
ST ANG SUB SYS STATUS	Judging system starting	BOOT	A
	System is diagnosing	DIAG1 – DIAG10	
	Processing system shutdown	FIN1 – FIN12	B
	Finish the system control	DOWN1	
	Wait for shutdown	DOWN2	
	System is shutdown	DOWN3	C
	System is in fail-safe mode 1	MALF1	
	System is in fail-safe mode 2	MALF2	D
	System is in fail-safe mode 3	MALF3	
	Performing initial setting	SETTING	
	System is in normal control	STD1 STD2	E
	System is in protection mode	STD3	
	System is synchronizing	SYNC	F
	ST FORCE SYS STATUS	Judging system starting	BOOT
System is diagnosing		DIAG1 – DIAG10	STC
Processing system shutdown		FIN1 – FIN12	
Finish the system control		DOWN1	
Wait for shutdown		DOWN2	H
System is shutdown		DOWN3	
System is in fail-safe mode 1		MALF1	
System is in fail-safe mode 2		MALF2	I
System is in fail-safe mode 3		MALF3	
Performing initial setting		SETTING	J
System is in normal control		STD1 STD2	
System is in protection mode		STD3	K
System is synchronizing		SYNC	
BACK UP CIRCUIT STATUS		Always	0 – 255
CONTROL MODULE CRNT	Always	0 – 255 A	
DETAILED CODE 1	This is displayed, but it is not used.	0 – 255	
DETAILED CODE 2	This is displayed, but it is not used.	0 – 255	M
DETAILED CODE 3	This is displayed, but it is not used.	0 – 255	
FLEXRAY COMM SYNC STATS	Always	STAT1 – 10	N
STEERING MODE	Always	CHARA – CHARA I	
ST CLUTCH PRTCT STATUS	Always	STAT0 – STAT12, STAT20	O
ST CLUTCH CON RQUEST	Always	STAT0 – STAT5	
FLEXRAY COMM DIAG (OWN)	FlexRay communication of steering angle sub control module is normal.	NORMAL	
	FlexRay communication of steering angle sub control module is being diagnosed.	DIAG	P
	FlexRay communication of steering angle sub control module is malfunction.	MALF	

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value
FLEXRAY COMM DIAG (OTH1)	FlexRay communication of steering angle main control module is normal.		NORMAL
	FlexRay communication of steering angle main control module is being diagnosed.		DIAG
	FlexRay communication of steering angle main control module is malfunction.		MALF
FLEXRAY COMM DIAG (OTH2)	FlexRay communication of steering force control module is normal.		NORMAL
	FlexRay communication of steering force control module is being diagnosed.		DIAG
	FlexRay communication of steering force control module is malfunction.		MALF
POWER TRAIN STATUS	Power train stops.		STOP
	Power train starts.		RUN
IGN SW STATUS (OWN ECU)	Ignition switch: ON	Control module detects ignition voltage.	ON
		Control module does not detect ignition voltage.	OFF
IGN SW STATUS (SYSTEM)	Ignition switch: ON	Control module detects ignition voltage.	ON
		Control module does not detect ignition voltage.	OFF
STOP/START STATUS	Stop/start system is operating.		ON
	Stop/start system is not operating.		OFF
INSTANT VLT DROP DETECT	Instantaneous voltage drop status is not detected.		UNDTCT
	Instantaneous voltage drop status is detected.		DETECT
CURB STONE DETECT STATS	The state of hitting curb stone is not detected.		UNDTCT
	The state of hitting curb stone is detected.		DETECT
BACK UP CIRCUIT A STATUS	System is abnormal.		STAT1
	System is normal.		STAT2
BACK UP CIRCUIT B STATUS	System is abnormal.		STAT1
	System is normal.		STAT2
FREE ROLLER MODE	Free roller mode: ON		ON
	Free roller mode: OFF		OFF
CHASSIS DYNAMO MODE	Engine running	System is normal mode (Driving is OK)	PERMIT
		System is chassis dynamometer mode (Driving is NG)	PROHBT
WRITING STATUS	When system is starting, the required angle information is recorded in control module.		OK
	When system is starting, the required angle information is not recorded in control module.		NG
BACK UP SIG 1 VOLT	Ignition switch ON	When steering angle sub control module is normal.	Approx. 0.5 – 4.75 V
BACK UP SIG 2 VOLT	Ignition switch ON	When steering angle sub control module is normal.	Approx. 0.5 – 4.75 V
INVERTER RELAY ACT VOLT	Engine running		Battery voltage
CONT MODULE INSIDE VOLT	Engine running		Battery voltage – Approx. 0.6 V
BATTERY VOLT AGE	Ignition switch ON		Battery voltage

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value	
IGN VOLTAGE	Ignition switch ON		Battery voltage	A
C/M TEMPERATURE	Engine running		Display temperature of inside of steering angle sub control module [°C °F]	B
VEHICLE SPEED	Vehicle stopped		0.00 km/h or 0.00 MPH	C
	Start the engine. Wait a minute. Drive the vehicle. CAUTION: Check air pressure of tire under standard conditions.		Approximately equal to the indication on speedometer (Inside of ±10%)	
YAW RATE	Vehicle stopped		Approx. 0 deg/s	D
	Vehicle turning		Approx. 0 - ±201 deg/s	
SIDE G	Vehicle stopped		Approx. 0 m/s ²	E
	Vehicle turning		Approx. 0 - ±2 m/s ²	
ST CLUTCH ACT CURRENT	Engine running		Approx. 0 – 5 A	
MOTOR U ACT CURRENT	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 A	F
		Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)	STC
		Steering wheel: Left turn	Negative vale [Approx. (-70) - (0) A]	
MOTOR W ACT CURRENT	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 A	H
		Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)	I
		Steering wheel: Left turn	Negative vale [Approx. (-70) - (0) A]	
TORQUE SEN MAIN 1	Engine running		Approx. (-8.5) – 8.5 N·m	
TEMPERATURE SENSOR	Ignition switch ON or Engine running		Display temperature of inside of steering angle sub control module [°C °F]	J
ANGLE SENSOR SIGNAL 1	Engine running		Approx. 1.0 - 3.5 V	K
ANGLE SENSOR SIGNAL 2	Engine running		Approx. 1.0 - 3.5 V	
ANGLE 1	Engine running		Approx. (-4.4) – 4.4 deg	L
ANGLE 2	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg	M
		Steering wheel: Right turn	Positive vale	
		Steering wheel: Left turn	Negative vale	
F/B ANGLE 1	Engine running		Approx. (-20) – 20 deg	
F/B ANGLE 2	Engine running		Approx. (-6) – 6 deg	N
ST ANGLE SENSOR	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg	O
		Steering wheel: Right turn	Positive vale (Approx. 0 – 900 deg)	
		Steering wheel: Left turn	Negative vale [Approx. (-900) – 0 deg]	
ANGLE DIFFERENCE	Engine running		Approx. 0 – 300 deg	P

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value
STEERING PINION ANGLE	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 550 deg)
		Steering wheel: Left turn	Negative vale [Approx. (–550) – 0 deg]
STEERING PINION ANGLE 2	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 550 deg)
		Steering wheel: Left turn	Negative vale [Approx. (–550) – 0 deg]
ANGLE 3	Engine running		Approx. (–7425) – 7425 deg

Fail-safe

INFOID:000000013356565

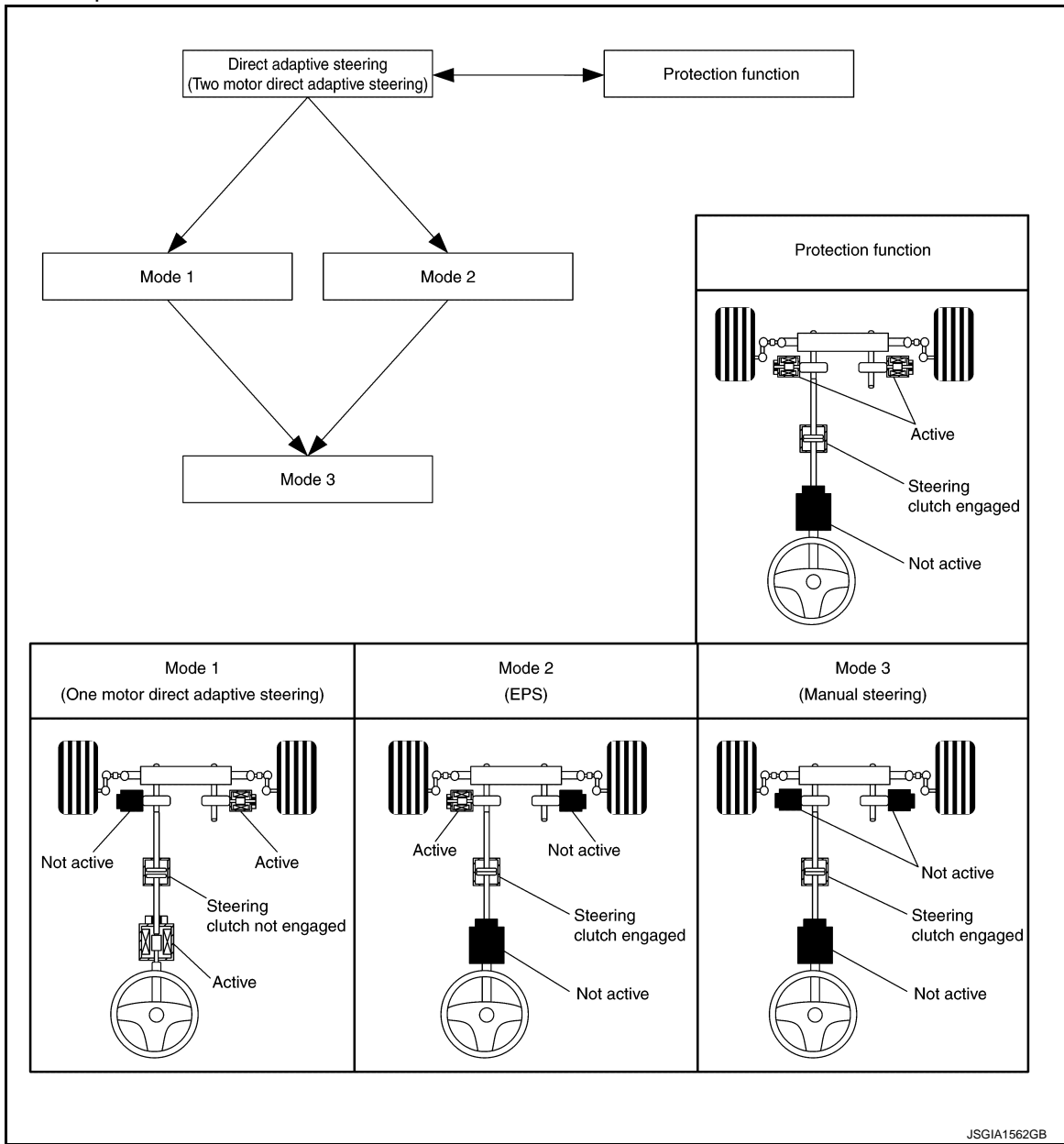
- If a malfunction occurs in the system, the fail-safe function stops the system (mode 3), activates the fail-safe mode (mode 1 or mode 2) or activates the protection mode. When the system enters mode 1, mode 2 or mode 3, the power steering warning lamp illuminates to inform the driver that the turning force is heavy in effect.
- Since three control modules monitor malfunctions mutually, DTC code varies from control module to control module.

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

- For details of protection function, refer to [STC-179. "Protection Function"](#).



DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13A0-00	Variable	Variable	Variable
C13A1-00	—	Mode 2	Mode 2
C13A2-00	Mode 1 or Mode 3	Mode 1 or Mode 3	Mode 1 or Mode 3
C13A3-00	Mode 2	Mode 2	Mode 2
C13A4-00	—	Mode 2	Mode 2
C13A5-00	—	—	Mode 2
C13A6-00	—	Mode 3	—
C13A7-00	—	Mode 3	—
C13A8-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13A9-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13AA-00	Mode 2	Mode 3	Mode 2

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13AB-00	Mode 2	Mode 3	Mode 2
C13AC-00	—	Mode 3	—
C13AD-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13AE-00	Mode 2	Mode 3	Mode 2
C13AF-00	Mode 2	Mode 3	Mode 2
C13B0-00	Mode 2	Mode 3	Mode 2
C13B1-00	Mode 2	Mode 3	Mode 2
C13B2-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B3-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B4-00	Mode 2	Mode 3	Mode 2
C13B5-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B6-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B7-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B8-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B9-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13BA-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13BB-00	—	—	—
C13BC-00	—	—	—
C13BD-00	—	Mode 2	—
C13BE-00	Mode 2	Mode 2	Mode 2
C13BF-00	Variable	Variable	Variable
C13C0-00	Mode 2 or Mode 3	Mode 2 or Mode 3	Mode 2 or Mode 3
C13C1-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3
C13C2-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3
C13C3-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3
C13C4-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13C5-00	Mode 2	—	—
C13C6-00	Mode 2	—	—
C13C7-00	Mode 2	—	—
C13C8-00	—	—	—
C13C9-00	—	—	—
C13CA-00	—	—	—
C13CB-00	—	—	—
C13CC-00	—	—	—
C13CD-00	—	—	—
C13CE-00	—	—	—
C13CF-00	—	—	—
C13D0-00	—	—	—
C13D1-00	—	—	—
C13D2-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D3-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D4-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D5-00	Mode 2	Mode 1 or Mode 3	Mode 2

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13D6-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D7-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D8-00	—	—	—
C13D9-00	—	—	—
C13DA-00	—	—	—
C13DB-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DC-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DD-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DE-00	Protection function mode	Protection function mode	Protection function mode
C13DF-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13E0-00	Mode 2	—	—
C13E1-00	Mode 2	—	—
C13E2-00	—	—	—
C13E3-00	Protection function mode	—	—
C13E4-00	Protection function mode	—	—
C13E5-00	Mode 2	—	—
C13E6-00	Protection function mode	Protection function mode	Protection function mode
C13E7-00	Protection function mode	Protection function mode	Protection function mode
C13E8-00	Protection function mode	Protection function mode	Protection function mode
C13E9-00	—	Mode 2	—
C13EA-00	Mode 2	—	—
C13EB-00	—	Mode 2	Mode 2
C13EE-00	Mode 3	Mode 3	Mode 3
C13EF-00	Mode 3	Mode 3	Mode 3
C13F0-00	Mode 2	Mode 2	Mode 2
C13F1-00	Mode 2	—	—
C13F2-00	Mode 2 or Mode 3	Mode 2 or Mode 3	Mode 2 or Mode 3
U1000-01	—	—	—
U1010-49	—	—	—

- *1: When control module detects a malfunction at startup.
- *2: When control module detects a malfunction except during startup.

Protection Function

INFOID:0000000013356566

- When battery voltage malfunctions temporarily, system overheats continuously and system is overloaded continuously, system is in protection mode temporarily. This is not malfunction.
- When a causative condition is cleared, the system returns to normal control automatically. (Except C13E5-00)
- Since the protection function condition is not malfunction, power steering warning lamp does not turn ON. (Except C13E5-00) The following DTCs remain to distinguish from malfunction.

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Condition	Vehicle condition
C13E3-00	The steering wheel is steered over the limit angle.	System changes to the protection mode temporarily. (Steering operation may become heavy temporarily, however steering wheel can be operated without interference. This is not a system malfunction.)
C13E4-00	When steering clutch is released, steering clutch is not released within regular time with overloading steering wheel.	
C13E5-00	When steering clutch is released, steering clutch is not released in spite of trying to release it many times with overloading steering wheel.	System changes to fail-safe mode (mode 2). For fail-safe, refer to STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe" .
C13E6-00	EPS/DAST 3: Internal temperature of steering force motor is 150°C (302°F) or more.	System changes to the protection mode temporarily. (Steering operation may become heavy temporarily, however steering wheel can be operated without interference. This is not a system malfunction.)
	DAST 1, DAST 2: Internal temperature of control module is 90°C (194°F) or more.	
C13E7-00	Power supply voltage of control module is low temporarily.	
C13E8-00	<ul style="list-style-type: none"> Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. Steering gear is out of neutral position. (Large) 	

DTC Inspection Priority Chart

INFOID:0000000113356567

When multiple DTCs are detected simultaneously, check one by one depending on the following priority list.

Priority	Priority order item (DTC)
1	<ul style="list-style-type: none"> U1000-01 CAN COMM CIRCUIT U1010-49 CONTROL UNIT (CAN)
2	<ul style="list-style-type: none"> C13C5-00 STEERING ANGLE SENSOR SIGNAL C13C6-00 G SENSOR SIGNAL C13C7-00 VEHICL SPEED SIGNAL C13C8-00 ST FUNCTION REQUEST SIGNAL C13C9-00 DRIVE MODE SIGNAL C13CA-00 ENGINE STATUS SIGNAL C13CB-00 STOP/START SIGNAL C13CC-00 T/M GEAR POSI SIGNAL C13CD-00 ENGINE SPEED SIGNAL C13CE-00 SLEEP/WAKEUP SIGNAL C13CF-00 ALC FUNCTION REQUEST SIGNAL C13D0-00 ALC FUNCTION REQUEST SIGNAL C13D1-00 STEERING ANGLE SENSOR SIGNAL
3	<ul style="list-style-type: none"> C13E9-00 BOOTING ANGLE PROCESSING C13EA-00 BOOTING ANGLE PROCESSING C13EB-00 BOOTING ANGLE PROCESSING C13EE-00 INCOMP CONFIG C13EF-00 CONFIG CHECK RESULT C13F0-00 IMCOMP DAST CALIBRATION C13F1-00 INCOMP ST ANG SEN ADJST C13F2-00 DIFFERENT SOFTWARE VERSION

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Priority	Priority order item (DTC)				
4	<ul style="list-style-type: none"> • C13A8-00 BACK UP CIRCUIT • C13A9-00 BACK UP CIRCUIT • C13AB-00 CONTROL MODULE • C13AC-00 CONTROL MODULE • C13B6-00 MOTOR CIRCUIT • C13B9-00 CONTROL MODULE • C13BB-00 CONTROL MODULE POWER SUPPLY • C13BC-00 CONTROL MODULE IGN POWER SUP • C13BD-00 CONTROL MODULE IGN POWER SUP • C13D4-00 CONTROL MODULE • C13D8-00 CONTROL MODULE • C13DB-00 STEERING TORQUE SENSOR • C13DC-00 STEERING TORQUE SENSOR • C13DD-00 STEERING TORQUE SENSOR • C13DE-00 TEMPERATURE SENSOR • C13E0-00 ST CLUTCH COMMAND CIRCUIT • C13E1-00 STEERING CLUTCH • C13E2-00 FRONT WHEEL SENSOR SIGNAL 	A B C D E			
	5	<ul style="list-style-type: none"> • C13BE-00 FLEXRAY COMMUNICATION • C13BF-00 FLEXRAY COMMUNICATION • C13C0-00 FLEXRAY COMMUNICATION • C13C1-00 FLEXRAY COMMUNICATION • C13C2-00 FLEXRAY COMMUNICATION • C13C3-00 FLEXRAY COMMUNICATION • C13C4-00 FLEXRAY COMMUNICATION 	F STC		
		6	<ul style="list-style-type: none"> • C13A0-00 CONTROL MODULE • C13A1-00 CONTROL MODULE • C13A2-00 CONTROL MODULE • C13A3-00 CONTROL MODULE • C13A4-00 CONTROL MODULE • C13A5-00 CONTROL MODULE • C13A6-00 CONTROL MODULE • C13A7-00 CONTROL MODULE • C13AA-00 CONTROL MODULE • C13AD-00 CONTROL MODULE • C13AE-00 CONTROL MODULE • C13AF-00 CONTROL MODULE • C13B0-00 CONTROL MODULE • C13B1-00 CONTROL MODULE • C13B2-00 CONTROL MODULE • C13B3-00 CONTROL MODULE • C13B4-00 CONTROL MODULE • C13B5-00 CONTROL MODULE • C13B7-00 CONTROL MODULE • C13B8-00 CONTROL MODULE • C13BA-00 CONTROL MODULE POWER SUPPLY • C13D2-00 CONTROL MODULE • C13D3-00 CONTROL MODULE • C13D5-00 CONTROL MODULE • C13D6-00 CONTROL MODULE • C13D7-00 CONTROL MODULE • C13D9-00 CONTROL MODULE • C13DF-00 CONTROL MODULE 	H I J K L M N O	
			7	<ul style="list-style-type: none"> • C13E3-00 SPIRAL CABLE PROTECTION • C13E4-00 ST CLUTCH RELEASE PROTECTION • C13E5-00 ST CLUTCH RELEASE PROTECTION • C13E6-00 HEAT PROTECTION • C13E7-00 LOW VOLTAGE PROTECTION • C13E8-00 CURB STONE PROTECTION 	P

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC Index

INFOID:000000013356568

×: Applicable

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13A0-00	CONTROL MODULE	×	×	×	ON	STC-219
C13A1-00	CONTROL MODULE	×	×	×	ON	STC-222
C13A2-00	CONTROL MODULE	×	×	×	ON	STC-226
C13A3-00	CONTROL MODULE	×	×	×	ON	STC-229
C13A4-00	CONTROL MODULE		×	×	ON	STC-231
C13A5-00	CONTROL MODULE			×	ON	STC-232
C13A6-00	CONTROL MODULE		×		OFF	—
C13A7-00	CONTROL MODULE		×		OFF	—
C13A8-00	BACK UP CIRCUIT	×	×	×	ON	STC-239
C13A9-00	BACK UP CIRCUIT	×	×	×	ON	STC-244
C13AA-00	CONTROL MODULE	×	×	×	ON	STC-248
C13AB-00	CONTROL MODULE	×	×	×	ON	STC-252
C13AC-00	CONTROL MODULE		×		OFF	—
C13AD-00	CONTROL MODULE	×	×	×	ON	STC-259
C13AE-00	CONTROL MODULE	×	×	×	ON	STC-263
C13AF-00	CONTROL MODULE	×	×	×	ON	STC-266
C13B0-00	CONTROL MODULE	×	×	×	ON	STC-269
C13B1-00	CONTROL MODULE	×	×	×	ON	STC-272
C13B2-00	CONTROL MODULE	×	×	×	ON	STC-277
C13B3-00	CONTROL MODULE	×	×	×	ON	STC-283
C13B4-00	CONTROL MODULE	×	×	×	ON	STC-287
C13B5-00	CONTROL MODULE	×	×	×	ON	STC-292
C13B6-00	MOTOR CIRCUIT	×	×	×	ON	STC-300
C13B7-00	CONTROL MODULE	×	×	×	ON	STC-306
C13B8-00	CONTROL MODULE	×	×	×	ON	STC-310
C13B9-00	CONTROL MODULE	×	×	×	ON	STC-315
C13BA-00	CONTROL MODULE POWER SUPPLY	×	×	×	ON	STC-321
C13BB-00	CONTROL MODULE POWER SUPPLY	×	×	×	OFF	STC-326
C13BC-00	CONTROL MODULE IGN POWER SUP	×	×	×	OFF	STC-328
C13BD-00	CONTROL MODULE IGN POWER SUP		×		OFF	—
C13BE-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13BF-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13C0-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13C1-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13C2-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13C3-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13C4-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-334
C13C5-00	STEERING ANGLE SENSOR SIGNAL	×			OFF	—
C13C6-00	G SENSOR SIGNAL	×			OFF	—
C13C7-00	VEHICL SPEED SIGNAL	×			OFF	—
C13C9-00	DRIVE MODE SIGNAL	×			OFF	—
C13CA-00	ENGINE STATUS SIGNAL	×			OFF	—
C13CC-00	T/M GEAR POSI SIGNAL	×			OFF	—
C13CD-00	ENGINE SPEED SIGNAL	×			OFF	—
C13CE-00	SLEEP WAKE UP SIGNAL	×			OFF	—
C13CF-00	ALC FUNCTION REQUEST SIGNAL		×		OFF	—
C13D0-00	ALC FUNCTION REQUEST SIGNAL		×		OFF	—
C13D1-00	STEERING ANGLE SENSOR SIGNAL		×		OFF	—
C13D2-00	CONTROL MODULE	×	×	×	ON	STC-361
C13D3-00	CONTROL MODULE	×	×	×	ON	STC-364
C13D4-00	CONTROL MODULE	×	×	×	ON	STC-370
C13D5-00	CONTROL MODULE	×	×	×	ON	STC-374
C13D6-00	CONTROL MODULE	×	×	×	ON	STC-380
C13D7-00	CONTROL MODULE	×	×	×	ON	STC-384
C13D8-00	CONTROL MODULE	×	×		OFF	—
C13D9-00	CONTROL MODULE	×	×		OFF	—
C13DB-00	STEERING TORQUE SENSOR		×		OFF	—
C13DC-00	STEERING TORQUE SENSOR		×		OFF	—
C13DD-00	STEERING TORQUE SENSOR		×		OFF	—
C13DE-00	TEMPERATURE SENSOR	×	×	×	OFF	STC-404
C13DF-00	CONTROL MODULE		×		OFF	—
C13E0-00	ST CLUTCH COMMAND CIRCUIT	×			OFF	—
C13E1-00	STEERING CLUTCH	×			OFF	—
C13E2-00	FRONT WHEEL SENSOR SIGNAL	×			OFF	—
C13E3-00	SPIRAL CABLE PROTECTION	×			OFF	—
C13E4-00	ST CLUTCH RELEASE PROTECTION	×			OFF	—
C13E5-00	ST CLUTCH RELEASE PROTECTION	×			OFF	—
C13E6-00	HEAT PROTECTION	×	×	×	OFF	STC-425

A

B

C

D

E

F

STC

H

I

J

K

L

M

N

O

P

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13E7-00	LOW VOLTAGE PROTECTION	×	×	×	OFF	STC-430
C13E8-00	CURB STONE PROTECTION	×	×	×	OFF	STC-434
C13E9-00	BOOTING ANGLE PROCESSING		×		OFF	—
C13EA-00	BOOTING ANGLE PROCESSING	×			OFF	—
C13EB-00	BOOTING ANGLE PROCESSING		×	×	ON	STC-443
C13EE-00	INCOMP CONFIG	×	×	×	ON	STC-449
C13EF-00	CONFIG CHECK RESULT	×	×	×	ON	STC-453
C13F0-00	INCOMP DAST CALIBRATION	×	×	×	ON	STC-456
C13F1-00	INCOMP ST ANG SEN ADJST	×			OFF	—
C13F2-00	DIFFERENT SOFTWARE VERSION	×	×	×	ON	STC-460
U1000-01	CAN COMM CIRCUIT	×	×		OFF	—
U1010-49	CONTROL UNIT (CAN)	×	×		OFF	—

NOTE:

If two or more DTCs are detected, refer to [STC-180, "DTC Inspection Priority Chart"](#).

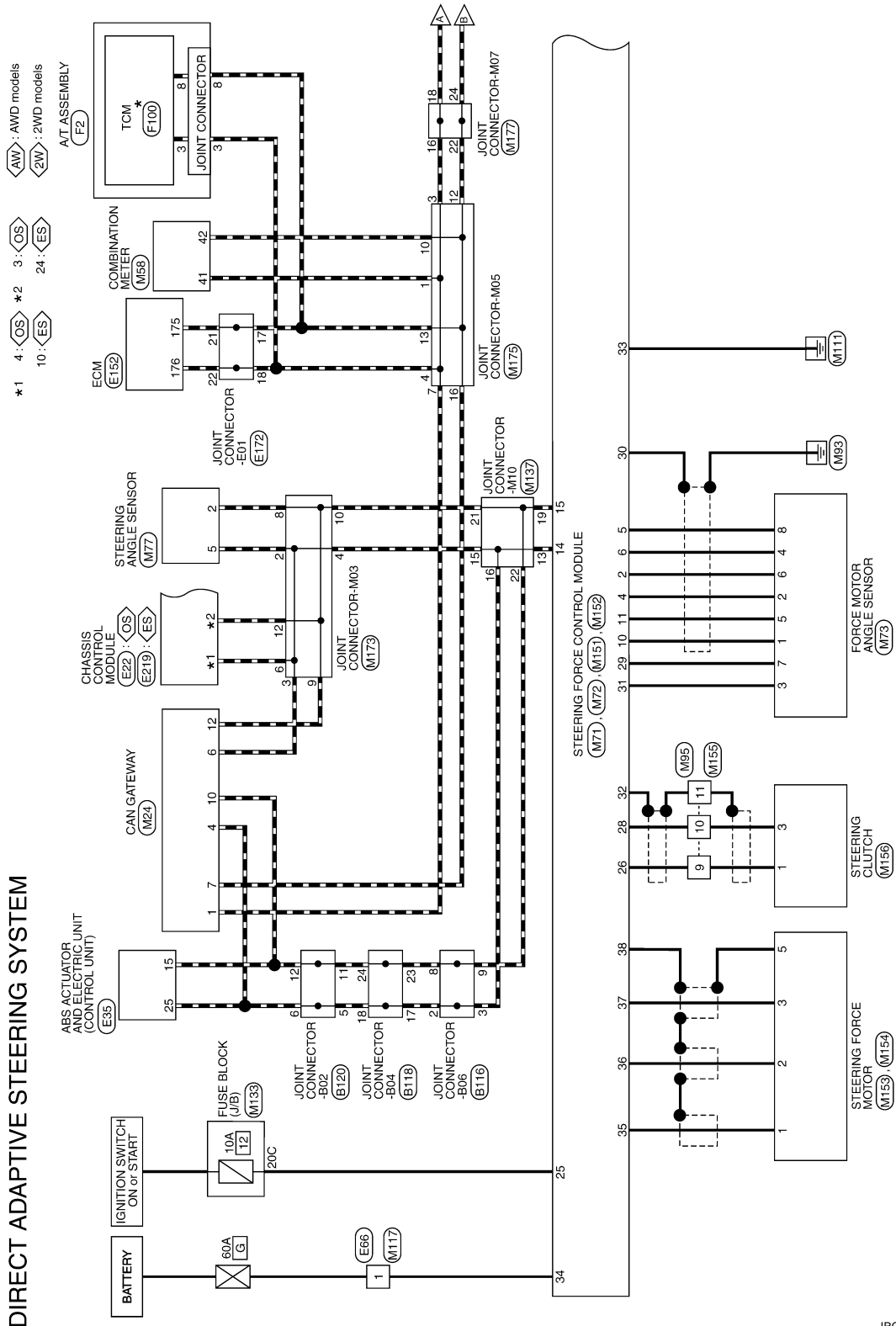
< WIRING DIAGRAM >

WIRING DIAGRAM

DIRECT ADAPTIVE STEERING

Wiring Diagram

INFOID:0000000013356569



*: This connector is not shown in "Harness Layout".

2016/02/15

JRGWC3184GB

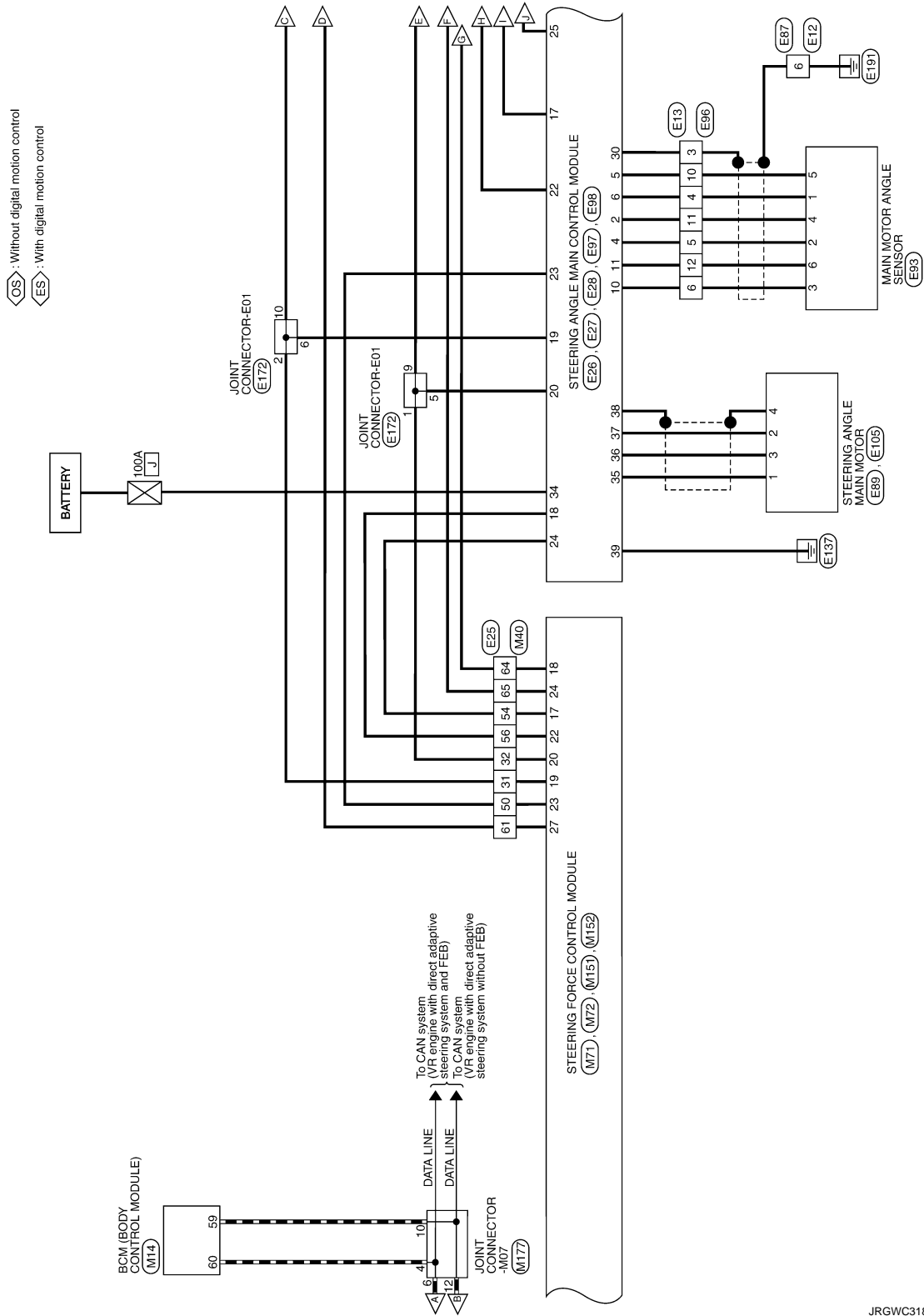
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P

STC

DIRECT ADAPTIVE STEERING

< WIRING DIAGRAM >

[DIRECT ADAPTIVE STEERING]



JRGWC3185GB

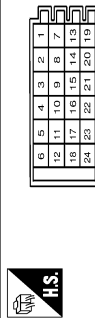
DIRECT ADAPTIVE STEERING

[DIRECT ADAPTIVE STEERING]

< WIRING DIAGRAM >

DIRECT ADAPTIVE STEERING SYSTEM

Connector No.	B116
Connector Name	JOINT CONNECTOR-B06
Connector Type	24342_4GAZA



Connector No.	B118
Connector Name	JOINT CONNECTOR-B04
Connector Type	24342_4GAZA

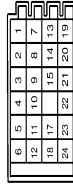


Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	L	-
4	L	-
5	L	-
6	L	-
7	R	-
8	R	- [With Gateway]
9	R	- [With Gateway]
10	R	- [Without Gateway]
11	V	- [With VR30 engine]
12	P	- [With Gateway]
13	SHIELD	-
14	SHIELD	-
15	B	- [With 2.0L turbo gasoline engine]
16	L	- [With VR30 engine]
17	L	- [With 2.0L turbo gasoline engine]
18	L	- [With VR30 engine]
19	SHIELD	- [With 2.0L turbo gasoline engine]
20	L	- [With VR30 engine]
21	L	- [With 2.0L turbo gasoline engine]
22	P	-
23	P	-
24	Y	- [With VR30 engine]

Terminal No.	Color Of Wire	Signal Name [Specification]
1	LG	- [With VR30 engine]
2	SHIELD	- [With 2.0L turbo gasoline engine]
3	SHIELD	- [With VR30 engine]
4	LG	-
5	SHIELD	- [With 2.0L turbo gasoline engine]
6	SHIELD	- [With VR30 engine]
7	R	- [Color of wire differs depending on production]
8	LG	- [With 2.0L turbo gasoline engine]
9	R	- [With VR30 engine and without paddle shift]
10	LG	- [With 2.0L turbo gasoline engine]
11	LG	- [With VR30 engine and without paddle shift]
12	SHIELD	- [With VR30 engine]
13	SHIELD	- [With VR30 engine]
14	P	- [With 2.0L turbo gasoline engine and without gateway]
15	R	- [With 2.0L turbo gasoline engine and with gateway]
16	L	- [With VR30 engine]
17	L	- [With 2.0L turbo gasoline engine]

18	L	-
19	L	- [With 2.0L turbo gasoline engine]
20	SHIELD	- [With VR30 engine]
21	L	- [With 2.0L turbo gasoline engine]
22	SHIELD	- [With VR30 engine]
23	R	-
24	R	-

Connector No.	B120
Connector Name	JOINT CONNECTOR-B02
Connector Type	24342_4GAZA



Terminal No.	Color Of Wire	Signal Name [Specification]
1	R	-
2	R	-
3	R	- [With VR30 engine]
4	L	- [With 2.0L turbo gasoline engine]
5	L	-
6	L	-
7	L	-
8	L	-
9	R	- [With 2.0L turbo gasoline engine]
10	L	- [With VR30 engine]
11	R	-
12	R	-
13	W	-
14	W	-
15	W	-
16	SHIELD	-
17	B	-
18	B	-
19	GR	- [With 2.0L turbo gasoline engine]

20	GR	- [With VR30 engine]
21	B	- [With 2.0L turbo gasoline engine]
22	GR	- [With VR30 engine]
23	W	-
24	W	-

Connector No.	E12
Connector Name	WIRE TO WIRE
Connector Type	RM10MB



Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	-
2	Y	-
3	G	-
4	BR	-
5	R	-
6	B	-
7	B	-
8	B	-
9	B	-
10	L	-

JRGWC3187GB

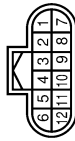
DIRECT ADAPTIVE STEERING

< WIRING DIAGRAM >

[DIRECT ADAPTIVE STEERING]

DIRECT ADAPTIVE STEERING SYSTEM

Connector No.	E13
Connector Name	WIRE TO WIRE
Connector Type	RH12FB



Terminal No.	Color Of Wire	Signal Name (Specification)
1	SB	-
2	GR	-
3	B	-
4	L	-
5	G	-
6	R	-
7	P	-
8	BR	-
9	LG	-
10	W	-
11	Y	-
12	BR	-

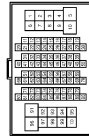
Connector No.	E22
Connector Name	CHASSIS CONTROL MODULE
Connector Type	TH24FW/AH



Terminal No.	Color Of Wire	Signal Name (Specification)
3	P	CAN-L [Without Gateway]
4	L	CAN-L [With Gateway]
5	V	CAN-H
6	Y	DRIVE MODE SELECT SWITCH (UP) [With VR30 engine]
7	G	DRIVE MODE SELECT SW (DOWN) [With 2.0L turbo gasoline engine]
8	Y	DRIVE MODE SELECT SW (DOWN) [With VR30 engine]
9	W	CHASSIS COMM-L

8	W	CHASSIS COMM-L
10	BG	IGN [With 2.0L turbo gasoline engine]
11	G	IGN [With VR30 engine]
12	L	CHASSIS COMM-H
13	B	GROUND [With VR30 engine]
14	B/W	GROUND [With 2.0L turbo gasoline engine]
15	BR	CHASSIS COMM-H [With VR30 engine]
16	L	CHASSIS COMM-H [With 2.0L turbo gasoline engine]
17	G	ESS RELAY [With VR30 engine]
18	R	ESS RELAY [With 2.0L turbo gasoline engine]

Connector No.	E25
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-LS16-TM4



Terminal No.	Color Of Wire	Signal Name (Specification)
1	BG	-
2	BR	-
3	B	-
4	LG	-
5	W	-
6	V	-
7	L	-
8	BG	- [With VR30 engine]
9	B	- [With 2.0L turbo gasoline engine]
10	GR	- [With 2.0L turbo gasoline engine]
11	GR	- [With VR30 engine] (Color of wire differs depending on production)
12	GR	- [With VR30 engine] (Color of wire differs depending on production)
13	SHIELD	- [With 2.0L turbo gasoline engine]
14	B	- [With VR30 engine]
15	SB	- [With VR30 engine]
16	BR	- [With 2.0L turbo gasoline engine]
17	Y	- [With VR30 engine]
18	G	- [With 2.0L turbo gasoline engine]
19	P	- [With 2.0L turbo gasoline engine]
20	Y	- [With VR30 engine]

70	R	-
71	G	- [With 2.0L turbo gasoline engine]
72	LG	- [With VR30 engine]
73	V	- [With 2.0L turbo gasoline engine]
74	G	- [With VR30 engine]
75	W	- [With 2.0L turbo gasoline engine]
76	BR	- [With VR30 engine]
77	L	- [With 2.0L turbo gasoline engine]
78	P	- [With 2.0L turbo gasoline engine and without ADAS]
79	SB	- [With 2.0L turbo gasoline engine and without ADAS]
80	G	-
81	R	-
82	V	-
83	BR	- [With 2.0L turbo gasoline engine]
84	R	- [With VR30 engine]
85	LG	-
86	BG	-
87	G	-
88	LG	-
89	GR	- [With VR30 engine]
90	G	- [With 2.0L turbo gasoline engine]
91	GR	- [With 2.0L turbo gasoline engine]
92	G	-
93	BG	- [With VR30 engine]
94	GR	- [With 2.0L turbo gasoline engine]
95	BG	- [With VR30 engine]
96	P	- [With 2.0L turbo gasoline engine and without ADAS]
97	W	- [With 2.0L turbo gasoline engine and without ADAS]
98	LG	-
99	LG	- [With 2.0L turbo gasoline engine]
100	SHIELD	- [With VR30 engine]

31	W	- [With 2.0L turbo gasoline engine]
32	G	- [With VR30 engine]
33	GR	- [With VR30 engine]
34	L	- [With 2.0L turbo gasoline engine]
35	Y	- [With 2.0L turbo gasoline engine]
36	P	- [With VR30 engine]
37	GR	- [With VR30 engine]
38	L	- [With 2.0L turbo gasoline engine]
39	P	- [With 2.0L turbo gasoline engine and without gateway]
40	SB	- [With 2.0L turbo gasoline engine and without gateway]
41	LG	-
42	Y	-
43	L	- [With 2.0L turbo gasoline engine]
44	Y	- [With VR30 engine]
45	W	- [With VR30 engine]
46	B	- [With 2.0L turbo gasoline engine]
47	G	- [With 2.0L turbo gasoline engine]
48	SHIELD	-
49	R	-
50	BR	- [With VR30 engine]
51	L	- [With 2.0L turbo gasoline engine]
52	W	-
53	V	- [With VR30 engine]
54	P	- [With 2.0L turbo gasoline engine]
55	B	- [With 2.0L turbo gasoline engine]
56	BG	- [With VR30 engine]
57	BG	- [With VR30 engine]
58	B	- [With 2.0L turbo gasoline engine]
59	W	- [Color of wire differs depending on production]
60	R	- [Color of wire differs depending on production]
61	R	- [Color of wire differs depending on production]
62	Y	- [Color of wire differs depending on production]
63	GR	- [Color of wire differs depending on production]
64	GR	- [Color of wire differs depending on production]
65	LG	-
66	LG	-
67	BG	-
68	BG	-
69	L	-

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P

STC

DIRECT ADAPTIVE STEERING

< WIRING DIAGRAM >

[DIRECT ADAPTIVE STEERING]

DIRECT ADAPTIVE STEERING SYSTEM

Connector No.	E26
Connector Name	STEERING ANGLE MAIN CONTROL MODULE
Connector Type	RH24FB-R28-L4H



Terminal No.	Color Of Wire	Signal Name [Specification]
1	BR	TORQUE SENSOR MAIN SIGNAL
2	Y	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (S1-S3)
3	LG	TORQUE SENSOR SUB SIGNAL
4	G	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (S1-S3)
5	W	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (S2-S4)
6	L	TORQUE SENSOR GROUND
7	SB	TORQUE SENSOR POWER SUPPLY
8	P	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (R1-R2)
10	R	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (R1-R2)
11	BR	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (R1-R2)
14	L	CHASSIS COMMUNICATION-H
15	W	CHASSIS COMMUNICATION-L
17	BG	BACK UP SIGNAL FROM STEERING ANGLE SUB CONTROL MODULE
18	SB	BACK UP SIGNAL FROM STEERING ANGLE SUB CONTROL MODULE
19	Y	FLEXRAY COMMUNICATION-L
20	GR	FLEXRAY COMMUNICATION-H
22	GR	BACK UP SIGNAL TO STEERING ANGLE SUB CONTROL MODULE
23	BR	CAN WAKE UP
24	P	BACK UP SIGNAL TO STEERING FORCE CONTROL MODULE
25	G	IGNITION POWER SUPPLY FROM STEERING ANGLE SUB CONTROL MODULE
30	B	GROUND
32	GR	GROUND

Connector No.	E27
Connector Name	STEERING ANGLE MAIN CONTROL MODULE
Connector Type	Y02FB-1V



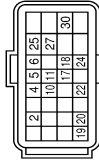
Terminal No.	Color Of Wire	Signal Name [Specification]
33	B	GROUND
34	R	BATTERY POWER SUPPLY

Connector No.	E28
Connector Name	STEERING ANGLE MAIN CONTROL MODULE
Connector Type	P01FB-A



Terminal No.	Color Of Wire	Signal Name [Specification]
39	B	GROUND

Connector No.	E29
Connector Name	STEERING ANGLE SUB CONTROL MODULE
Connector Type	RH24FB-R28-L4H



Terminal No.	Color Of Wire	Signal Name [Specification]
2	Y	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (S1-S3)
4	G	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (S1-S3)
5	L	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (S2-S4)
6	W	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (S2-S4)
10	R	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (R1-R2)
11	BR	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (R1-R2)
17	GR	BACK UP SIGNAL FROM STEERING ANGLE MAIN CONTROL MODULE
18	BR	BACK UP SIGNAL FROM STEERING ANGLE MAIN CONTROL MODULE
19	GR	BACK UP SIGNAL FROM STEERING ANGLE MAIN CONTROL MODULE
19	V	FLEXRAY COMMUNICATION-H
20	GR	FLEXRAY COMMUNICATION-L
22	BG	BACK UP SIGNAL TO STEERING ANGLE MAIN CONTROL MODULE
24	Y	BACK UP SIGNAL TO STEERING FORCE CONTROL MODULE
25	R	IGNITION POWER SUPPLY FROM STEERING FORCE CONTROL MODULE
27	G	IGNITION POWER SUPPLY TO STEERING ANGLE MAIN CONTROL MODULE
30	B	GROUND

Connector No.	E30
Connector Name	STEERING ANGLE SUB CONTROL MODULE
Connector Type	Y02FB-1V



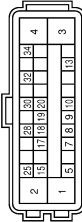
Terminal No.	Color Of Wire	Signal Name [Specification]
33	B	GROUND
34	G	BATTERY POWER SUPPLY

Connector No.	E31
Connector Name	STEERING ANGLE SUB CONTROL MODULE
Connector Type	P01FB-A



Terminal No.	Color Of Wire	Signal Name [Specification]
39	B	GROUND

Connector No.	E35
Connector Name	REACTIVATOR AND ELECTRIC UNIT CONTROL UNIT
Connector Type	SAK23MP-B-SJ24-U



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GND
2	B	GND
3	G	VALVE BATTERY (With VR30 engine)
3	P	VALVE BATTERY (With 2.0L turbo gasoline engine)
4	Y	MOTOR BATTERY
5	LG	STOP LAMP SW SIGNAL (With ADAS)
5	V	STOP LAMP SW SIGNAL (With ASCD)
7	GR	RR LH WHEEL SENSOR POWER SUPPLY
8	C	RR RH WHEEL SENSOR POWER SUPPLY
9	BR	FR RH WHEEL SENSOR SIGNAL
10	GR	FR RH WHEEL SENSOR POWER SUPPLY
13	R	VACUUM SENSOR SIGNAL
15	P	CAN-L (Without Gateway)
15	R	CAN-L (With Gateway)
17	Y	RR RH WHEEL SENSOR SIGNAL
18	LG	RR RH WHEEL SENSOR POWER SUPPLY (With VR30 engine)
18	V	RR RH WHEEL SENSOR POWER SUPPLY (With VR30 engine)
19	SB	FR LH WHEEL SENSOR SIGNAL
20	BG	FR LH WHEEL SENSOR POWER SUPPLY

JRGWC3189GB

DIRECT ADAPTIVE STEERING

< WIRING DIAGRAM >

[DIRECT ADAPTIVE STEERING]

DIRECT ADAPTIVE STEERING SYSTEM

Terminal No.	Color Of Wire	Signal Name [Specification]
25	L	CAN-H
28	G	VACUUM SENSOR POWER SUPPLY
30	R	VDC OFF SW SIGNAL
32	SHIELD	VACUUM SENSOR GROUND
34	G	IGN

Connector No.	E66
Connector Name	WIRE TO WIRE
Connector Type	LD1FB-MC



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-

Connector No.	E67
Connector Name	WIRE TO WIRE
Connector Type	RH10FB



Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	-
2	V	-
3	R	-
4	L	-
5	BR	-
6	GR	-
7	V	-
8	B	-
9	SHIELD	-
10	G	-

Connector No.	E89
Connector Name	STEERING ANGLE MAIN MOTOR
Connector Type	E-LA6



Terminal No.	Color Of Wire	Signal Name [Specification]
4	SHIELD	GROUND

Connector No.	E90
Connector Name	STEERING ANGLE SUB MOTOR
Connector Type	V03FB-R



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	STEERING ANGLE SUB MOTOR U-PHASE
2	W/L	STEERING ANGLE SUB MOTOR W-PHASE
3	W	STEERING ANGLE SUB MOTOR V-PHASE

Connector No.	E91
Connector Name	STEERING ANGLE SUB MOTOR
Connector Type	RSQ1FB



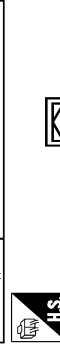
Terminal No.	Color Of Wire	Signal Name [Specification]
4	SHIELD	GROUND

Connector No.	E92
Connector Name	STEERING ANGLE SUB MOTOR
Connector Type	E-LA6



Terminal No.	Color Of Wire	Signal Name [Specification]
4	SHIELD	GROUND

Connector No.	E93
Connector Name	MAIN MOTOR ANGLE SENSOR
Connector Type	RH06FB



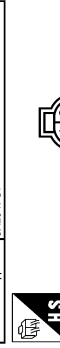
Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (S2-S4)
2	R	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (S1-S3)
3	BR	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (R1-R2)
4	Y	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (S1-S3)
5	G	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (S2-S4)
6	L	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (R1-R2)

Connector No.	E94
Connector Name	SUB MOTOR ANGLE SENSOR
Connector Type	RH06FB



Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (S2-S4)
2	R	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (S1-S3)
3	BR	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (R1-R2)
4	Y	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (S1-S3)
5	G	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (S2-S4)
6	L	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (R1-R2)

Connector No.	E95
Connector Name	STEERING TORQUE SENSOR
Connector Type	SAZ04E07



Terminal No.	Color Of Wire	Signal Name [Specification]
1	P	TORQUE SENSOR GROUND
2	BR	TORQUE SENSOR POWER SUPPLY
3	LG	TORQUE SENSOR SUB SIGNAL
4	SB	TORQUE SENSOR MAIN SIGNAL

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

DIRECT ADAPTIVE STEERING

[DIRECT ADAPTIVE STEERING]

< WIRING DIAGRAM >

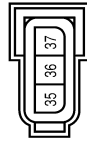
DIRECT ADAPTIVE STEERING SYSTEM

Connector No.	E96
Connector Name	WIRE TO WIRE
Connector Type	RH12MB



Terminal No.	Color Of Wire	Signal Name [Specification]
1	P	-
2	SHIELD	-
3	SHIELD	-
4	W	-
5	R	-
6	BR	-
7	BR	-
8	SB	-
9	LG	-
10	G	-
11	Y	-
12	L	-

Connector No.	E97
Connector Name	STEERING ANGLE MAIN CONTROL MODULE
Connector Type	Y03FB-L



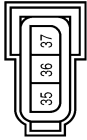
Terminal No.	Color Of Wire	Signal Name [Specification]
35	B	STEERING ANGLE MAIN MOTOR U-PHASE
36	W	STEERING ANGLE MAIN MOTOR V-PHASE
37	W/L	STEERING ANGLE MAIN MOTOR W-PHASE

Connector No.	E98
Connector Name	STEERING ANGLE MAIN CONTROL MODULE
Connector Type	P01FB-A



Terminal No.	Color Of Wire	Signal Name [Specification]
38	SHIELD	GROUND

Connector No.	E99
Connector Name	STEERING ANGLE SUB CONTROL MODULE
Connector Type	Y03FB-L



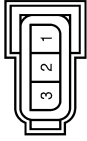
Terminal No.	Color Of Wire	Signal Name [Specification]
35	B	STEERING ANGLE SUB MOTOR U-PHASE
36	W	STEERING ANGLE SUB MOTOR V-PHASE
37	W/L	STEERING ANGLE SUB MOTOR W-PHASE

Connector No.	E100
Connector Name	STEERING ANGLE SUB CONTROL MODULE
Connector Type	P01FB-A



Terminal No.	Color Of Wire	Signal Name [Specification]
38	SHIELD	GROUND

Connector No.	E105
Connector Name	STEERING ANGLE MAIN MOTOR
Connector Type	Y03FB-L



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	STEERING ANGLE MAIN MOTOR U-PHASE
2	W/L	STEERING ANGLE MAIN MOTOR W-PHASE
3	W	STEERING ANGLE MAIN MOTOR V-PHASE

Connector No.	E152
Connector Name	ECM
Connector Type	RH24FB-R26L-RH



Terminal No.	Color Of Wire	Signal Name [Specification]
173	SB	FUEL TANK PRESSURE SENSOR
175	P	CAN-L
176	L	CAN-H
177	G	SENSOR POWER SUPPLY (FUEL TANK PRESSURE SENSOR)
178	V	TACHO METER SIGNAL
180	P	FUEL TANK TEMPERATURE SENSOR
182	W	FUEL PUMP CONTROL MODULE (FPWM) CHECK
185	SB	IGNITION SWITCH
186	SB	ASCD STEERING SWITCH
187	BG	SENSOR GROUND (ASCD STEERING SWITCH)
188	Y	FUEL PUMP CONTROL MODULE (FPWM)
189	Y	ENGINE COMMUNICATION LINE-L
190	L	ENGINE COMMUNICATION LINE-H
191	P	STOP LAMP SWITCH
192	BG	BRAKE PEDAL POSITION SWITCH
193	GR	IGNITION SWITCH
193	LG	IGNITION SWITCH
194	W	SENSOR POWER SUPPLY
195	BR	ACCELERATOR PEDAL POSITION SENSOR 2
196	R	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 2)
197	R	ECM POWER SUPPLY
198	L	SENSOR GROUND
199	B	ECM GROUND
200	V	SENSOR GROUND
201	B	ECM GROUND
203	Y	ACCELERATOR PEDAL POSITION SENSOR 1
203	G	SENSOR GROUND
204	B	ECM GROUND

JRGWC3191GB

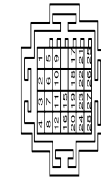
DIRECT ADAPTIVE STEERING

[DIRECT ADAPTIVE STEERING]

< WIRING DIAGRAM >

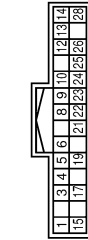
DIRECT ADAPTIVE STEERING SYSTEM

Connector No.	E172
Connector Name	JOINT CONNECTOR-E01
Connector Type	SGA28F1BR4



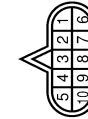
Terminal No.	Color Of Wire	Signal Name [Specification]
1	GR	-
2	Y	-
3	W	-
4	L	-
5	GR	-
6	Y	-
7	W	-
8	L	-
9	GR	-
10	Y	-
11	W	-
12	L	-
15	W	-
16	BG	-
17	P	-
18	L	-
19	W	-
20	BG	-
21	P	-
22	L	-
23	SB	- (Color of wire differs depending on production)
24	W	- (Color of wire differs depending on production)
24	BG	- (Color of wire differs depending on production)
24	LG	- (Color of wire differs depending on production)
25	P	-
26	L	-
27	Y	-
28	L	-

Connector No.	E219
Connector Name	CHASSIS CONTROL MODULE
Connector Type	TH28FW



Terminal No.	Color Of Wire	Signal Name [Specification]
1	LG	ACTUATOR (FL)-L
3	BR	ACTUATOR (RR)-H
4	BG	IGN
5	W	CHASSIS COMM-L
6	B	GROUND
8	BR	CHASSIS COMM-L (Color of wire differs depending on production)
8	L	CHASSIS COMM-L (Color of wire differs depending on production)
9	G	DRIVE MODE SELECT (Color of wire differs depending on production)
9	Y	DRIVE MODE SELECT (Color of wire differs depending on production)
10	L	CAN-H
12	G	ACTUATOR (FR)-H
13	G	ESS RELAY
14	L	ACTUATOR (RL)-L
15	Y	ACTUATOR (RR)-L
17	V	ACTUATOR (FL)-H
19	L	CHASSIS COMM-H
21	W	CHASSIS COMM-L
22	V	DRIVE MODE SELECT SWITCH (UP)
23	B	GROUND
24	P	CAN-L (Without Gateway)
24	R	CAN-L (With Gateway)
25	G	IGN
26	V	ACTUATOR (RL)-H
28	R	ACTUATOR (FR)-L

Connector No.	F2
Connector Name	A/T ASSEMBLY
Connector Type	RK1DFG-DGY



Terminal No.	Color Of Wire	Signal Name [Specification]
1	GR	IGNITION POWER SUPPLY (With 2.0L turbo gasoline engine)
1	L	IGNITION POWER SUPPLY (With V6E0 engine)
2	P	BATTERY POWER SUPPLY (MEMORY BACK-UP)
3	L	CAN-H
4	R	K-LINE
5	B	GROUND (With 2.0L turbo gasoline engine)
5	BR	GROUND (With V6E0 engine)
6	GR	IGNITION POWER SUPPLY
7	BG	BACK-UP LAMP RELAY
8	P	CAN-L
9	V	STARTER RELAY
10	B	GROUND

Connector No.	F100
Connector Name	TCM
Connector Type	SP1DFG



Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	IGNITION POWER SUPPLY
2	-	BATTERY POWER SUPPLY (MEMORY BACK-UP)
3	-	CAN-H
4	-	K-LINE
5	-	GROUND
6	-	IGNITION POWER SUPPLY
7	-	BACK-UP LAMP RELAY
8	-	CAN-L

9	-	STARTER RELAY
10	-	GROUND

Connector No.	M14
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FB-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
48	R	PUSH-BTN IGN SW (LL PWR)
52	G	DONGLE LINK
54	V	COMM LINE
55	R	RAIN SENSOR
59	P	CAN-L
60	L	CAN-H
61	G	REAR WINDOW DEF RLY CONT
62	R	STARTER RLY CONT
64	V	I-KEY WARN BUZZER
65	B	OUTS-HD LAMP CONT
66	B	BLOWER FAN RLY CONT (With V6E0 engine)
66	Y	BLOWER FAN RLY CONT (With 2.0L turbo gasoline engine)
67	W/B	IGN RLY V (F/B) CONT
68	R	DIMMER
69	GR	A/T SHFT SELECT PWB SW
70	B	IGN RLY V (PDM F/R) CONT
71	G	DR DOOR REQ SW
72	SR	PASS DOOR REQ SW
76	BR	COMBI SW IN/OUT 5
76	BG	COMBI SW IN/OUT 4
77	Y	COMBI SW IN/OUT 3
78	Y	COMBI SW INPUT 2
79	LG	COMBI SW INPUT 1
80	L	TR LID OPEN SW

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

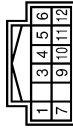
DIRECT ADAPTIVE STEERING

< WIRING DIAGRAM >

[DIRECT ADAPTIVE STEERING]

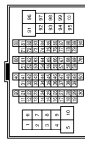
DIRECT ADAPTIVE STEERING SYSTEM

Connector No.	M24
Connector Name	CAN GATEWAY
Connector Type	TH12FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	CAN-H (CAN COMMUNICATION CIRCUIT 1)
2	W	BATTERY POWER SUPPLY
3	L	CAN-H (CAN COMMUNICATION CIRCUIT 2)
4	L	CAN-H (CAN COMMUNICATION CIRCUIT 2)
5	B	GROUND
6	L	CAN-H (CAN COMMUNICATION CIRCUIT 2)
7	P	CAN-H (CAN COMMUNICATION CIRCUIT 1)
8	R	IGNITION POWER SUPPLY (Except with VR30 engine and without ES)
9	W	CAN-H (CAN COMMUNICATION CIRCUIT 2)
10	R	CAN-H (CAN COMMUNICATION CIRCUIT 2)
11	B	GROUND
12	R	CAN-L (CAN COMMUNICATION CIRCUIT 2)

Connector No.	M40
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4



Terminal No.	Color Of Wire	Signal Name [Specification]
1	BG	W/B
2	W	W/B
3	BG	W/B
4	BR	W/B
5	LG	W/B
6	P	W/B
7	W	W/B
8	BG	W/B
9	LG	W/B
10	W	W/B
11	W	W/B

11	Y	- [With 2.0L turbo gasoline engine]
12	B	- [With VR30 engine]
13	GR	- [With 2.0L turbo gasoline engine]
14	B	- [With 2.0L turbo gasoline engine]
15	BG	- [With 2.0L turbo gasoline engine]
16	B	- [With VR30 engine]
17	LG	- [With 2.0L turbo gasoline engine]
18	B	- [With VR30 engine]
19	W/B	- [With 2.0L turbo gasoline engine]
20	Y	-
21	W	-
22	G	- [With 2.0L turbo gasoline engine]
23	V	- [With VR30 engine]
24	Y	- [With 2.0L turbo gasoline engine]
25	Y	- [With 2.0L turbo gasoline engine]
26	P	- [With VR30 engine]
27	B	- [With 2.0L turbo gasoline engine]
28	L	- [With VR30 engine]
29	Y	- [With 2.0L turbo gasoline engine]
30	R	- [With 2.0L turbo gasoline engine]
31	Y	- [With VR30 engine]
32	G	- [With 2.0L turbo gasoline engine]
33	V	- [With VR30 engine]
34	P	- [With VR30 engine]
35	BG	- [With VR30 engine]
36	G	- [With VR30 engine]
37	B	- [With 2.0L turbo gasoline engine]
38	L	- [With VR30 engine]
39	R	- [With 2.0L turbo gasoline engine]
40	GR	- [With VR30 engine]
41	L	- [With 2.0L turbo gasoline engine]
42	BR	- [With 2.0L turbo gasoline engine]
43	W	- [With VR30 engine]
44	Y	- [With 2.0L turbo gasoline engine]
45	Y	- [With VR30 engine]
46	Y	- [With 2.0L turbo gasoline engine]
47	BG	- [With 2.0L turbo gasoline engine]
48	SHIELD	- [With VR30 engine]
49	B	- [With VR30 engine]
50	B	- [With 2.0L turbo gasoline engine]
51	BR	- [With VR30 engine]
52	L	- [With VR30 engine]
53	G	- [With VR30 engine]
54	SB	- [With 2.0L turbo gasoline engine]
55	Y	- [With VR30 engine]
56	B	- [With 2.0L turbo gasoline engine]
57	P	- [With VR30 engine]

56	BG	- [With VR30 engine]
57	GR	- [With 2.0L turbo gasoline engine]
58	Y	- [With VR30 engine]
59	P	- [With 2.0L turbo gasoline engine]
60	B	- [With VR30 engine]
61	W/B	- [With VR30 engine]
62	Y	- [With VR30 engine]
63	R	- [With VR30 engine]
64	P	- [With VR30 engine]
65	V	- [With VR30 engine]
66	V	- [With VR30 engine]
67	LG	- [With VR30 engine]
68	BG	- [With VR30 engine]
69	L	- [With VR30 engine]
70	R	- [With VR30 engine]
71	V	- [With VR30 engine]
72	L	- [With 2.0L turbo gasoline engine]
73	L	- [With 2.0L turbo gasoline engine]
74	L	- [With VR30 engine]
75	B	- [With VR30 engine]
76	P	- [With 2.0L turbo gasoline engine]
77	W/B	- [With 2.0L turbo gasoline engine]
78	G	- [With VR30 engine]
79	LG	- [With 2.0L turbo gasoline engine]
80	G	- [With VR30 engine]
81	R	- [With VR30 engine]
82	LG	- [With VR30 engine]
83	BR	- [With 2.0L turbo gasoline engine]
84	V	- [With VR30 engine]
85	V	- [With VR30 engine]
86	V	- [With VR30 engine]
87	G	- [With VR30 engine]
88	V	- [With VR30 engine]
89	G	- [With VR30 engine]
90	V	- [With 2.0L turbo gasoline engine]
91	W	- [With 2.0L turbo gasoline engine]
92	G	- [With VR30 engine]
93	BR	- [With VR30 engine]
94	L	- [With 2.0L turbo gasoline engine]
95	BR	- [With VR30 engine]
96	P	- [With 2.0L turbo gasoline engine]
97	R	- [With 2.0L turbo gasoline engine]

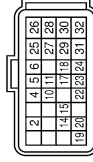
96	W	-
97	LG	-
98	Y	- [With VR30 engine]
99	BR	- [With 2.0L turbo gasoline engine]
100	SHIELD	- [With 2.0L turbo gasoline engine]

Connector No.	M58
Connector Name	COMBINATION METER
Connector Type	TH12FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
41	L	CAN-H
42	P	CAN-L
43	B	ILLUMINATION CONTROL SIGNAL
44	Y	FUEL LEVEL SENSOR GROUND
45	W	BATTERY POWER SUPPLY
46	BG	IGNITION SIGNAL (Except with VR30 engine and without ES)
47	R	IGNITION SIGNAL (With VR30 engine and without ES)
48	LG	AV COMMUNICATION SIGNAL (H)
49	LG	AV COMMUNICATION SIGNAL (L)
50	BR	FUEL LEVEL SENSOR SIGNAL
51	B	GROUND
52	B	GROUND

Connector No.	M71
Connector Name	STEERING FORCE CONTROL MODULE
Connector Type	RH24FB-R2L-RH



DIRECT ADAPTIVE STEERING

[DIRECT ADAPTIVE STEERING]

< WIRING DIAGRAM >

DIRECT ADAPTIVE STEERING SYSTEM

Terminal No.	Color Of Wire	Signal Name [Specification]
2	Y	STEERING FORCE MOTOR RESOLVER SIGNAL (S1-S3)
4	W	STEERING FORCE MOTOR RESOLVER SIGNAL (S1-S3)
5	G	STEERING FORCE MOTOR RESOLVER SIGNAL (S2-S4)
6	L	STEERING FORCE MOTOR RESOLVER SIGNAL (S2-S4)
10	B	STEERING FORCE MOTOR RESOLVER SIGNAL (R1-R2)
11	R	STEERING FORCE MOTOR RESOLVER SIGNAL (R1-R2)
14	L	CAN COMMUNICATION-L
15	P	CAN COMMUNICATION-L [Without Gateway]
17	R	CAN COMMUNICATION-L [With Gateway]
18	Y	BACK UP SIGNAL (FOR STEERING ANGLE MAIN CONTROL MODULE)
19	W	FLERAY COMMUNICATION-H
20	V	FLERAY COMMUNICATION-L
22	BG	BACK UP SIGNAL (TO STEERING ANGLE MAIN CONTROL MODULE)
23	BR	CAN WAKE UP
24	R	BACK UP SIGNAL (TO STEERING ANGLE MAIN CONTROL MODULE)
25	W	IGNITION POWER SUPPLY
26	R/W	STEERING CLUTCH+
27	W/B	IGNITION POWER SUPPLY (TO STEERING ANGLE MAIN CONTROL MODULE)
28	R	STEERING CLUTCH-
29	L	FORCE MOTOR TEMPERATURE SENSOR -
30	B	GROUND
31	R	FORCE MOTOR TEMPERATURE SENSOR +
32	B	GROUND

Connector No.	M72
Connector Name	STEERING FORCE CONTROL MODULE
Connector Type	Y02FB-1V



Terminal No.	Color Of Wire	Signal Name [Specification]
34	R	GROUND
		BATTERY POWER SUPPLY

Connector No.	M73
Connector Name	FORCE MOTOR ANGLE SENSOR
Connector Type	TH08FW-AH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	STEERING FORCE MOTOR RESOLVER SIGNAL (R1-R2)
2	W	STEERING FORCE MOTOR RESOLVER SIGNAL (S1-S3)
3	R	FORCE MOTOR TEMPERATURE SENSOR +
4	L	STEERING FORCE MOTOR RESOLVER SIGNAL (S2-S4)
5	R	STEERING FORCE MOTOR RESOLVER SIGNAL (R1-R2)
6	Y	STEERING FORCE MOTOR RESOLVER SIGNAL (S1-S3)
7	L	FORCE MOTOR TEMPERATURE SENSOR -
8	G	STEERING FORCE MOTOR RESOLVER SIGNAL (S2-S4)

Connector No.	M77
Connector Name	STEERING ANGLE SENSOR
Connector Type	TH08FW-AH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GROUND
2	P	CAN-L [Without Gateway]
3	R	CAN-L [With Gateway]
4	G	IGN
5	L	CAN-H

Connector No.	M95
Connector Name	WIRE TO WIRE
Connector Type	TH16AW-AH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	R	-
2	BR	-
3	BR	-
5	P	- [Without Gateway]
5	R	- [With Gateway]
6	Y	-
7	P	- [Without Gateway]
7	R	- [With Gateway]
9	R/W	-
10	R	-
11	SHIELD	-
13	L	-
14	L	-
15	L	-

Connector No.	M117
Connector Name	WIRE TO WIRE
Connector Type	LOT1MB-MC



Terminal No.	Color Of Wire	Signal Name [Specification]
1	R	-

Connector No.	M133
Connector Name	FUSE BLOCK (J/B)
Connector Type	TH40FW-AH



Terminal No.	Color Of Wire	Signal Name [Specification]
10C	V	-
12C	L	-
13C	L	-
14C	Y	-
15C	R	-
16C	R	-
17C	L	-
18C	BG	- [Without DRPO]
18C	P	- [With DRPO]
19C	B	-
1C	R	-
20C	W	-
21C	L	-
22C	L	-
23C	L	-
25C	LG	-
26C	SR	-
27C	P	-
28C	W	-
29C	W	-
2C	R	-
30C	R	-
31C	W	-
32C	B	-
33C	B	- [With VR30 engine]
33C	R	- [With 2.0L turbo gasoline engine]
34C	W/B	-
35C	SB	-
36C	R	-
37C	W	-
38C	SB	-
39C	V	-
3C	P	-
40C	G	-
4C	P	-
5C	P	-

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

DIRECT ADAPTIVE STEERING

[DIRECT ADAPTIVE STEERING]

< WIRING DIAGRAM >

DIRECT ADAPTIVE STEERING SYSTEM

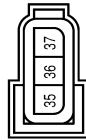
6C	G	-	-
7C	G	-	-
8C	G	-	-
9C	V	-	-

Connector No.	M137
Connector Name	JOINT CONNECTOR-M10
Connector Type	24342_4G82A



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	B	-
3	B	-
4	B	-
5	B	-
7	B	-
8	B	-
9	B	-
10	B	-
11	B	-
13	L	-
14	L	-
15	L	-
16	L	-
19	R	-
20	R	-
21	R	-
22	R	-

Connector No.	M151
Connector Name	STEERING FORCE CONTROL MODULE
Connector Type	Y03FB-R



Terminal No.	Color Of Wire	Signal Name [Specification]
35	B/R	STEERING FORCE MOTOR U-PHASE
36	B/L	STEERING FORCE MOTOR V-PHASE
37	B/G	STEERING FORCE MOTOR W-PHASE

Connector No.	M152
Connector Name	STEERING FORCE CONTROL MODULE
Connector Type	P01FB-A



Terminal No.	Color Of Wire	Signal Name [Specification]
38	B	GROUND

Connector No.	M153
Connector Name	STEERING FORCE MOTOR
Connector Type	5N403MW



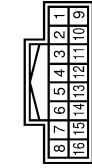
Terminal No.	Color Of Wire	Signal Name [Specification]
1	B/R	STEERING FORCE MOTOR U-PHASE
2	B/L	STEERING FORCE MOTOR V-PHASE
3	B/G	STEERING FORCE MOTOR W-PHASE

Connector No.	M154
Connector Name	STEERING FORCE MOTOR
Connector Type	TH04MW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
5	B	GROUND

Connector No.	M155
Connector Name	WIRE TO WIRE
Connector Type	TH16FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	R	-
3	R	-
5	P	- [Without ADAS and without Gateway]
5	R	- [Without ADAS and with Gateway]
6	Y	- [With ADAS]
7	P	- [Without Gateway]
7	R	- [With Gateway]
9	R/W	-
10	R	-
11	SHIELD	-
13	L	-
14	L	-
15	L	-

Connector No.	M156
Connector Name	STEERING CLUTCH
Connector Type	TH104FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	R/W	STEERING CLUTCH +
3	R	STEERING CLUTCH -

JRGWC3195GB

DIRECT ADAPTIVE STEERING

< WIRING DIAGRAM >

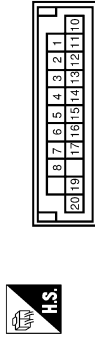
[DIRECT ADAPTIVE STEERING]

DIRECT ADAPTIVE STEERING SYSTEM

Connector No.	M173
Connector Name	JOINT CONNECTOR-M03
Connector Type	24342_4GAZA



Connector No.	M175
Connector Name	JOINT CONNECTOR-M05
Connector Type	NH20FL-DC



Connector No.	M177
Connector Name	JOINT CONNECTOR-M07
Connector Type	24342_4GAZA



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	L	-
4	L	-
5	L	-
6	L	-
7	R	-
8	R	-
9	R	-
10	R	-
11	R	-
12	R	-
13	SB	-
14	SB	-
15	SB	-
16	L	- [With 2.0L turbo gasoline engine] - [With VR30 engine]
17	L	- [With 2.0L turbo gasoline engine] - [With VR30 engine]
18	L	- [With 2.0L turbo gasoline engine] - [With VR30 engine]
19	SB	- [With VR30 engine]
19	BR	- [With VR30 engine]
19	LG	- [With 2.0L turbo gasoline engine]
20	BR	- [With VR30 engine]
20	LG	- [With 2.0L turbo gasoline engine]
21	BR	- [With VR30 engine]
21	LG	- [With 2.0L turbo gasoline engine]
22	R	- [With VR30 engine and without ISS]
22	SB	- [With VR30 engine and without ISS]
22	V	- [With VR30 engine and with ISS]
23	R	- [With VR30 engine and without ISS]
23	SB	- [With VR30 engine and without ISS]
23	V	- [With VR30 engine and with ISS]
24	R	- [With VR30 engine and without ISS]
24	SB	- [With VR30 engine and without ISS]
24	V	- [With VR30 engine and with ISS]

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	L	-
4	L	-
5	L	-
6	L	-
7	L	-
8	L	-
10	P	-
11	P	-
12	P	-
13	P	-
14	P	-
15	P	-
16	R	- [With 2.0L turbo gasoline engine] - [With VR30 engine]
17	R	- [With 2.0L turbo gasoline engine] - [With VR30 engine]
19	R	- [With VR30 engine and with ISS]
19	W	- [Except with VR30 engine and with ISS]
20	R	- [With VR30 engine and with ISS]
20	W	- [Except with VR30 engine and with ISS]

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	L	-
4	L	-
5	L	-
6	L	-
7	P	-
8	P	-
9	P	-
10	P	-
11	P	-
12	P	-
13	L	-
14	L	-
15	L	-
16	L	-
17	L	-
18	L	-
19	W	-
20	W	-
21	W	-
22	P	-
23	P	-
24	P	-

JRGWC3196GB

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000013356570

DETAILED FLOW

1. INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing [STC-199, "Diagnostic Work Sheet"](#) and reproduce symptoms as well as fully understand it. Ask customer about his/her complaints carefully. Check symptoms by driving vehicle with customer, if necessary.

CAUTION:

Customers are not professional. Never guess easily like “maybe the customer means that...,” or “maybe the customer mentions this symptom”.

>> GO TO 2.

2. CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained by interview. Also check that the symptom is not caused by protection function. Refer to [STC-128, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

CAUTION:

When the symptom is caused by normal operation, fully inspect each portion and obtain the understanding of customer that the symptom is not caused by a malfunction.

>> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “EPS/DAST 3”, “DAST 1” and “DAST 2”.

Is any DTC detected?

- YES >> Record or print DTC and freeze frame data. GO TO 4.
- NO >> GO TO 6.

4. RECHECK SYMPTOM

With CONSULT

1. Erase self-diagnostic results for “EPS/DAST 3”, “DAST 1” or “DAST 2”.
2. Perform DTC confirmation procedures for the error detected system.

NOTE:

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on [STC-154, "DTC Inspection Priority Chart"](#).

Is any DTC detected?

- YES >> GO TO 5.
- NO >> Check harness and connectors based on the information obtained by interview.
 - Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
 - Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

5. REPAIR OR REPLACE ERROR-DETECTED PARTS

1. Repair or replace error-detected parts.
2. Reconnect part or connector after repairing or replacing.
3. When DTC is detected, erase self-diagnostic results for “EPS/DAST 3”, “DAST 1” or “DAST 2”.

>> GO TO 7.

6. IDENTIFY ERROR-DETECTED SYSTEM BY SYMPTOM DIAGNOSIS

Estimate error-detected system based on symptom diagnosis and perform inspection.

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

Can the error-detected system be identified?

- YES >> GO TO 7.
- NO >> Check harness and connectors based on the information obtained by interview.
- Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
 - Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

7. FINAL CHECK

With CONSULT

1. Check the reference value for steering force control module, steering angle main control module or steering angle sub control module.
2. Recheck the symptom and check that symptom is not reproduced on the same conditions.

Is the symptom reproduced?

- YES >> GO TO 3.
- NO >> INSPECTION END

Diagnostic Work Sheet

INFOID:000000013356571

Description

- In general, customers have their own criteria for a problem. Therefore, it is important to understand the symptom and status well enough by asking the customer about his/her concerns carefully. To systemize all the information for the diagnosis, prepare the interview sheet referring to the interview points.
- In some cases, multiple conditions that appear simultaneously may cause a DTC to be detected.

Interview sheet sample

Interview sheet					
Customer name		Registration number		Initial year registration	
	MR/MS	Vehicle type		VIN	
Storage date		Engine		Mileage	km (Mile)
Symptom		<input type="checkbox"/> The steering wheel position (center) is in the wrong position.			
		<input type="checkbox"/> Power steering warning lamp turns on.			
		<input type="checkbox"/> The vehicle pulls to one direction.			
		<input type="checkbox"/> Steering effort fluctuates (<input type="checkbox"/> Not smooth <input type="checkbox"/> Abruptly <input type="checkbox"/> Increased <input type="checkbox"/> Decreased)			
		<input type="checkbox"/> Noise <input type="checkbox"/> Vibration			
		<input type="checkbox"/> Others ()			
First occurrence		<input type="checkbox"/> Recently <input type="checkbox"/> Others ()			
Frequency of occurrence		<input type="checkbox"/> Always <input type="checkbox"/> Under a certain conditions of <input type="checkbox"/> Sometimes (time(s)/day)			
Climate conditions		<input type="checkbox"/> Irrelevant			
		Weather <input type="checkbox"/> Fine <input type="checkbox"/> Cloud <input type="checkbox"/> Rain <input type="checkbox"/> Snow <input type="checkbox"/> Others ()			
		Temperature <input type="checkbox"/> Hot <input type="checkbox"/> Warm <input type="checkbox"/> Cool <input type="checkbox"/> Cold <input type="checkbox"/> Temperature [Approx. °C(°F)]			
Relative humidity		<input type="checkbox"/> High <input type="checkbox"/> Moderate <input type="checkbox"/> Low			
Road conditions		<input type="checkbox"/> Urban area <input type="checkbox"/> Suburb area <input type="checkbox"/> High way <input type="checkbox"/> Mounting road (uphill or down hill) <input type="checkbox"/> Rough road			
Steering mode settings		Infiniti drive mode selector (), Steering mode setting ()			
Operation conditions, etc.		<input type="checkbox"/> Irrelevant <input type="checkbox"/> When engine starts [Steering wheel angle (°), Tilt level (<input type="checkbox"/> High / <input type="checkbox"/> Mid / <input type="checkbox"/> Low)] <input type="checkbox"/> During driving <input type="checkbox"/> At constant speed driving <input type="checkbox"/> During idling <input type="checkbox"/> During acceleration <input type="checkbox"/> During deceleration <input type="checkbox"/> Traveling straight <input type="checkbox"/> During cornering (right curve or left curve) <input type="checkbox"/> During steering [Steering wheel angle (°), Steering speed (<input type="checkbox"/> High / <input type="checkbox"/> Mid / <input type="checkbox"/> Low), Steering effort (<input type="checkbox"/> Heavy / <input type="checkbox"/> Light)] <input type="checkbox"/> Fully steered right or left (Road condition:)			

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

Interview sheet

Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Engine		Mileage	km (Mile)
Other conditions					

Memo

ADDITIONAL SERVICE WHEN REMOVING 12V BATTERY NEGATIVE TERMINAL

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

ADDITIONAL SERVICE WHEN REMOVING 12V BATTERY NEGATIVE TERMINAL

Description

INFOID:000000013356572

When removing the 12V battery negative terminal, initialize is required for operating the direct adaptive steering normally. Refer to [STC-201, "Work Procedure"](#).

CAUTION:

When replacing the direct adaptive steering component parts, perform the corresponding work. Refer to [STC-203, "Work Procedure"](#).

Work Procedure

INFOID:000000013356573

1. DIRECT ADAPTIVE STEERING INITIALIZE

1. Set the steering wheel to the straight-ahead position.
2. Connect battery terminal.
3. Start the engine.
CAUTION:
Never drive the vehicle.
4. Turn the steering wheel from full left stop to full right stop.
5. Confirm the condition of turning the steering wheel is normal.

>> WORK END

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS

Special Repair Requirement

INFOID:000000013356574

x: Applicable

Parts name	Service performed		Required service	Reference
	Re- place- ment	Re- moval		
<ul style="list-style-type: none"> Steering force control module Steering angle main control module Steering angle sub control module 	x	—	<ul style="list-style-type: none"> Configuration for steering force control module Configuration for steering angle main control module Configuration for steering angle sub control module Clutch phase position learning Steering rack neutral position learning Adjustment of steering angle sensor neutral position 	STC-206. "Description" CAUTION: When off-center is bigger than 120°, refer to STC-478. "Diagnosis Procedure" to correct off-center before performing the work.
Steering wheel	*1	*1	<ul style="list-style-type: none"> Configuration for steering force control module Configuration for steering angle main control module Configuration for steering angle sub control module Clutch phase position learning Steering rack neutral position learning Adjustment of steering angle sensor neutral position 	STC-203. "Work Procedure"
Steering angle sensor	x	x	<ul style="list-style-type: none"> Configuration for steering force control module Configuration for steering angle main control module Configuration for steering angle sub control module Clutch phase position learning Steering rack neutral position learning Adjustment of steering angle sensor neutral position 	STC-203. "Work Procedure"
<ul style="list-style-type: none"> Steering column assembly Steering clutch assembly Steering upper shaft / Steering lower shaft 	x	x	<ul style="list-style-type: none"> Configuration for steering force control module Configuration for steering angle main control module Configuration for steering angle sub control module Clutch phase position learning Steering rack neutral position learning Adjustment of steering angle sensor neutral position 	STC-203. "Work Procedure"
<ul style="list-style-type: none"> Steering gear assembly Suspension components 	x	x	<ul style="list-style-type: none"> Configuration for steering force control module Configuration for steering angle main control module Configuration for steering angle sub control module Clutch phase position learning Steering rack neutral position learning Adjustment of steering angle sensor neutral position Wheel alignment (toe-in) adjustment with CONSULT 	<ul style="list-style-type: none"> ST-126. "ALIGNMENT TESTER : Inspection and Adjustment" (With alignment tester) ST-128. "EXCEPT ALIGNMENT TESTER : Inspection and Adjustment" (Without alignment tester)

*1: If the neutral position of the steering wheel is different from the straight-ahead status of the vehicle when installing the steering wheel to the same position when it was removed.

ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

Work Procedure

INFOID:000000013356575

WARNING:

Never move the vehicle during “DAST CALIBRATION (MODE1)” because the steering gear is held in neutral position until ignition switch is turned OFF.

CAUTION:

- Be careful for the moving parts, steering wheel and front wheels are steered automatically when start “DAST CALIBRATION (MODE1)”.
- Do not rotate road wheels during the DAST calibration because the system is detected the vehicle running.

1. CHECK OFF-CENTER (1)

With CONSULT

1. Set the vehicle to the straight-ahead position.
2. Turn the ignition switch ON.

CAUTION:

Never start the engine.

3. On the CONSULT screen, select “EPS/DAST 3” >> “DATA MONITOR” >> “ST ANGLE SENSOR”, and then and then check the value.

Monitor item	Standard value
ST ANGLE SENSOR	ST ANGLE SENSOR $\leq \pm 120$ deg

Is the inspection result normal?

YES >> GO TO 2.

NO >> • Refer to [STC-478, "Diagnosis Procedure"](#) to correct off-center and then, GO TO 2.

CAUTION:

Proceeding to the next step with off-center bigger than 120 deg causes the spiral cable to be torn off.

2. PREPARATION

1. Set the front wheel on the turn table.

NOTE:

Do not lift up the vehicle during “DAST CALIBRATION (MODE1)”

2. Connect the battery charger to protect the battery.

NOTE:

Much electricity is used in “DAST CALIBRATION (MODE1)”.

3. Connect the CONSULT.
4. Turn the ignition switch ON.

CAUTION:

Never start the engine.

>> GO TO 3.

3. ECU CONFIGURATION

With CONSULT

1. Perform configuration for steering force control module. Refer to [STC-212, "Work Procedure"](#).

NOTE:

The replacement of control module included in configuration is not required.

2. Perform configuration for steering angle main control module. Refer to [STC-214, "Work Procedure"](#).

NOTE:

The replacement of control module included in configuration is not required.

3. Perform configuration for steering angle sub control module. Refer to [STC-212, "Work Procedure"](#).

NOTE:

The replacement of control module included in configuration is not required.

>> GO TO 4.

4. DAST CALIBRATION (MODE1) [CLUTCH PHASE LEARNING]

ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

④ With CONSULT

1. Perform "DAST CALIBRATION (MODE1)". Refer to [STC-209, "Description"](#).
2. Turn the ignition switch OFF.

CAUTION:

Be sure to perform this step.

>> GO TO 5.

5. CHECK OFF-CENTER (2)

④ With CONSULT

NOTE:

This confirmation is procedure to confirm that the steering wheel is not rotated 360 deg when performing the DAST calibration.

CAUTION:

Proceeding to the next step with the steering wheel rotated 360 deg causes the spiral cable to be torn off.

1. Turn the ignition switch ON.

CAUTION:

Never start the engine.

2. On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "ST ANGLE SENSOR", and then and then check the value.

Monitor item	Standard value
ST ANGLE SENSOR	ST ANGLE SENSOR $\leq \pm 20$ deg

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6. CORRECT STEERING WHEEL NEUTRAL POSITION

④ With CONSULT

1. Separate steering upper shaft from steering clutch assembly. And then, turn the steering wheel to the direction that the value returns to 0 deg with checking "ST ANGLE SENSOR" on "DATA MONITOR".
2. Connect steering clutch assembly and steering upper shaft. Refer to [ST-139, "Removal and Installation"](#).

>> Re-perform the work from configuration to reset the learning information of clutch phase learning.
GO TO 3.

7. DAST CALIBRATION (MODE1) [STEERING RACK NEUTRAL POSITION LEARNING]

④ With CONSULT

Perform "DAST CALIBRATION (MODE1)". Refer to [STC-209, "Description"](#).

>> GO TO 8.

8. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

④ With CONSULT

1. On the CONSULT screen, select "ABS" >> "WORK SUPPORT" >> "ST ANGLE SENSOR ADJUSTMENT".
2. Touch START.

CAUTION:

Never touch steering wheel while adjusting steering angle sensor.

3. After approx. 10 seconds, select "END".
4. Turn ignition switch OFF, and then turn it ON again.

CAUTION:

Be sure to perform this step.

>> GO TO 9.

9. PERFORM SELF-DIAGNOSIS

ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

With CONSULT

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. Perform self-diagnosis for “EPS/DAST 3”, “DAST 1” and “DAST 2”.

Is any DTC detected?

YES >> When other than above DTC is detected, perform Perform trouble diagnosis for the detected DTC. Refer to [STC-156, "DTC Index"](#) (EPS/DAST 3), [STC-169, "DTC Index"](#) (DAST 1), [STC-182, "DTC Index"](#) (DAST 2).

NO >> GO TO 10.

10.FINAL CONFIRMATION

With CONSULT

1. Turn the ignition switch OFF to ON.

CAUTION:

Never start the engine.

2. On the CONSULT screen, select “EPS/DAST 3” >> “DATA MONITOR” >> “ANGLE 1”,and then and then check the value.

Monitor item	Standard value
ANGLE 1	-4.4 ≤ ANGLE 1 ≤ 4.4

STC

Is the confirmation result normal?

YES >> WORK END

NO >> Slightly lower the tilt position, and then re-perform “DAST CALIBRATION (MODE1)”. GO TO 3.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

ADDITIONAL SERVICE WHEN REPLACING CONTROL MODULE

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

ADDITIONAL SERVICE WHEN REPLACING CONTROL MODULE

Description

INFOID:000000013356576

When replacing steering force control module, steering angle main control module, or steering angle sub control module, configuration and DAST calibration are required. Refer to [STC-206, "Work Procedure"](#).

Work Procedure

INFOID:000000013356577

WARNING:

Never move the vehicle during "DAST CALIBRATION (MODE1)" because the steering gear is held in neutral position until ignition switch is turned OFF.

CAUTION:

- Be careful for the moving parts, steering wheel and front wheels are steered automatically when start "DAST CALIBRATION (MODE1)".
- Do not rotate road wheels during the DAST calibration because the system is detected the vehicle running.

1. CHECK OFF-CENTER (1)

With CONSULT

1. Set the vehicle to the straight-ahead position.
2. Turn the ignition switch ON.

CAUTION:

Never start the engine.

3. On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "ST ANGLE SENSOR", and then and then check the value.

Monitor item	Standard value
ST ANGLE SENSOR	ST ANGLE SENSOR $\leq \pm 120$ deg

Is the inspection result normal?

YES >> GO TO 2.

NO >> • Refer to [STC-478, "Diagnosis Procedure"](#) to correct off-center and then, GO TO 2.

CAUTION:

Proceeding to the next step with off-center bigger than 120 deg causes the spiral cable to be torn off.

2. PREPARATION

1. Set the front wheel on the turn table.

NOTE:

Do not lift up the vehicle during "DAST CALIBRATION (MODE1)"

2. Connect the battery charger to protect the battery.

NOTE:

Much electricity is used in "DAST CALIBRATION (MODE1)".

3. Connect the CONSULT.
4. Turn the ignition switch ON.

CAUTION:

Never start the engine.

>> GO TO 3.

3. ECU CONFIGURATION

With CONSULT

1. Perform configuration for steering force control module. Refer to [STC-212, "Work Procedure"](#).
2. Perform configuration for steering angle main control module. Refer to [STC-214, "Work Procedure"](#).
3. Perform configuration for steering angle sub control module. Refer to [STC-212, "Work Procedure"](#).

>> GO TO 4.

4. DAST CALIBRATION (MODE1) [CLUTCH PHASE LEARNING]

ADDITIONAL SERVICE WHEN REPLACING CONTROL MODULE

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

④ With CONSULT

1. Perform "DAST CALIBRATION (MODE1)". Refer to [STC-209. "Description"](#).
2. Turn the ignition switch OFF.

CAUTION:

Be sure to perform this step.

>> GO TO 5.

5. CHECK OFF-CENTER (2)

④ With CONSULT

NOTE:

This confirmation is procedure to confirm that the steering wheel is not rotated 360 deg when performing the DAST calibration.

CAUTION:

Proceeding to the next step with the steering wheel rotated 360 deg causes the spiral cable to be torn off.

1. Turn the ignition switch ON.

CAUTION:

Never start the engine.

2. On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "ST ANGLE SENSOR", and then and then check the value.

Monitor item	Standard value
ST ANGLE SENSOR	ST ANGLE SENSOR $\leq \pm 20$ deg

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6. CORRECT STEERING WHEEL NEUTRAL POSITION

④ With CONSULT

1. Separate steering upper shaft from steering clutch assembly. And then, turn the steering wheel to the direction that the value returns to 0 deg with checking "ST ANGLE SENSOR" on "DATA MONITOR".
2. Connect steering clutch assembly and steering upper shaft. Refer to [ST-139. "Removal and Installation"](#).

>> Re-perform the work from configuration to reset the learning information of clutch phase learning.
GO TO 3.

7. DAST CALIBRATION (MODE1) [STEERING RACK NEUTRAL POSITION LEARNING]

④ With CONSULT

Perform "DAST CALIBRATION (MODE1)". Refer to [STC-209. "Description"](#).

>> GO TO 8.

8. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

④ With CONSULT

1. On the CONSULT screen, select "ABS">>"WORK SUPPORT">>"ST ANGLE SENSOR ADJUSTMENT".
2. Touch START.

CAUTION:

Never touch steering wheel while adjusting steering angle sensor.

3. After approx. 10 seconds, select "END".
4. Turn ignition switch OFF, and then turn it ON again.

CAUTION:

Be sure to perform this step.

>> GO TO 9.

9. PERFORM SELF-DIAGNOSIS

ADDITIONAL SERVICE WHEN REPLACING CONTROL MODULE

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

Ⓟ With CONSULT

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Start the engine.
CAUTION:
Never drive the vehicle.
3. Perform self-diagnosis for “EPS/DAST 3”, “DAST 1” and “DAST 2”.

Is any DTC detected?

YES >> When other than above DTC is detected, perform Perform trouble diagnosis for the detected DTC. Refer to [STC-156, "DTC Index"](#) (EPS/DAST 3), [STC-169, "DTC Index"](#) (DAST 1), [STC-182, "DTC Index"](#) (DAST 2).

NO >> GO TO 10.

10.FINAL CONFIRMATION

Ⓟ With CONSULT

1. Turn the ignition switch OFF to ON.
CAUTION:
Never start the engine.
2. On the CONSULT screen, select “EPS/DAST 3” >> “DATA MONITOR” >> “ANGLE 1”, and then and then check the value.

Monitor item	Standard value
ANGLE 1	$-4.4 \leq \text{ANGLE 1} \leq 4.4$

Is the confirmation result normal?

YES >> WORK END

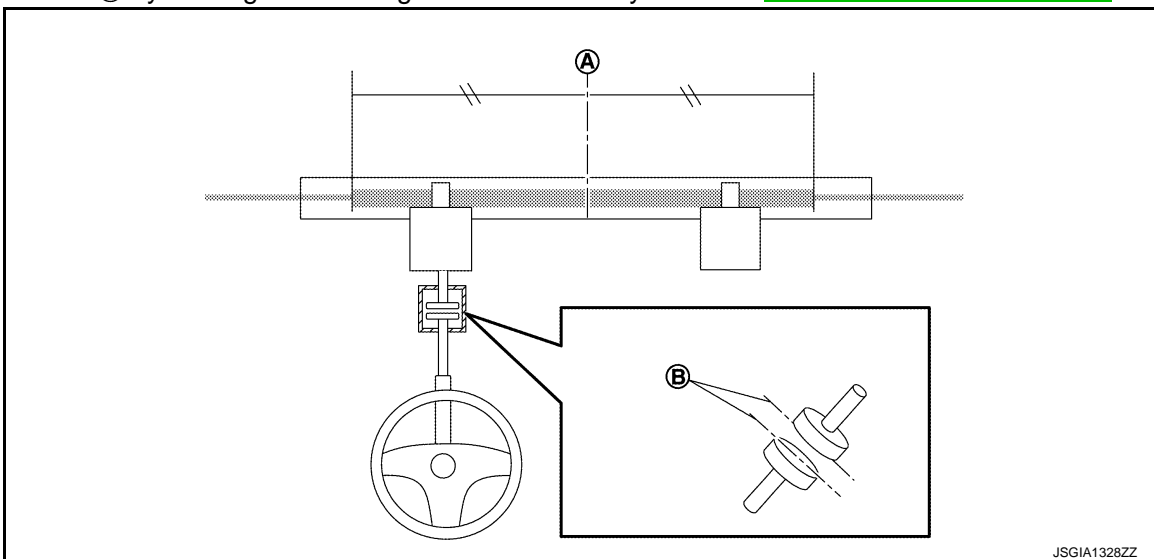
NO >> Slightly lower the tilt position, and then re-perform “DAST CALIBRATION (MODE1)”. GO TO 3.

DAST CALIBRATION (MODE1)

Description

INFOID:0000000013356578

“DAST CALIBRATION (MODE1)” is a function to learn the neutral position of steering rack (A) and the clutch phase position (B) by moving the steering rack automatically. Refer to [STC-209. "Work Procedure"](#).



JSGIA1328ZZ

Work Procedure

INFOID:0000000013356579

WARNING:

- Never move the vehicle during “DAST CALIBRATION (MODE1)” because the steering gear is held in neutral position until ignition switch is turned OFF.
- “DAST CALIBRATION (MODE1)” is additional service when removing/installing/replacing DAST parts or adjusting wheel alignment. “DAST CALIBRATION (MODE1)” is used in [Clutch phase learning] and [Steering rack neutral learning]. Using it incorrectly cause off-center. Refer to “ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS” (Refer to [STC-203. "Work Procedure"](#).) and “TOE-IN ADJUSTMENT” [Refer to [ST-126. "ALIGNMENT TESTER : Inspection and Adjustment"](#) (alignment tester), [ST-128. "EXCEPT ALIGNMENT TESTER : Inspection and Adjustment"](#) (except alignment tester).] before performing it.

CAUTION:

- Be careful for the moving parts, steering wheel and front wheels are steered automatically when start “DAST CALIBRATION (MODE1)”.
- Do not rotate road wheels during the DAST calibration because the system is detected the vehicle running.
- When the work stops (CONSULT freezing etc.), re-perform the work from the first step.

1. PREPARATION BEFORE DAST CALIBRATION

1. Set the front wheel on the turn table.

NOTE:

Do not lift up the vehicle during “DAST CALIBRATION (MODE1)”

2. Check that inner socket length is in the specified value. Refer to [ST-153. "Steering Gear and Linkage"](#).
3. Connect the battery charger to protect the battery.

NOTE:

Much electricity is used in “DAST CALIBRATION (MODE1)”.

4. Place the tilt to the highest level.

>> GO TO 2.

2. DAST CALIBRATION (MODE1)

Ⓜ With CONSULT

1. Erase self-diagnostic result for “EPS/DAST 3”, “DAST 1” and “DAST 2”.

DAST CALIBRATION (MODE1)

[DIRECT ADAPTIVE STEERING]

< BASIC INSPECTION >

2. On the CONSULT screen, select "EPS/DAST 3" >> "WORK SUPPORT" >> "DAST CALIBRATION (MODE1)".
3. Touch "START".

CAUTION:

Be careful for the moving parts, steering wheel and front wheels are steered automatically when touch "START".

NOTE:

- When DTC is detected, "WORK SUPPORT" may not be started. When DTC is detected, check the DTC. Refer to [STC-156, "DTC Index"](#).
- When "DAST CALIBRATION (MODE1)" is completed, the clutch is released.

4. After checking that the power steering warning lamp turns off, turn the steering wheel to the straight-ahead position. Then touch "START".

CAUTION:

- **Be careful in turning the steering wheel to the straight-ahead position.**
- **Since the force feedback of steering becomes smaller after the completion of auto steering, take good care for turning the steering.**

NOTE:

The clutch is engaged and then the steering shaft connects to steering gear.

5. Touch "END".

CAUTION:

Never turn the ignition switch OFF.

>> WORK END

DAST CALIBRATION (MODE2)

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

DAST CALIBRATION (MODE2)

Description

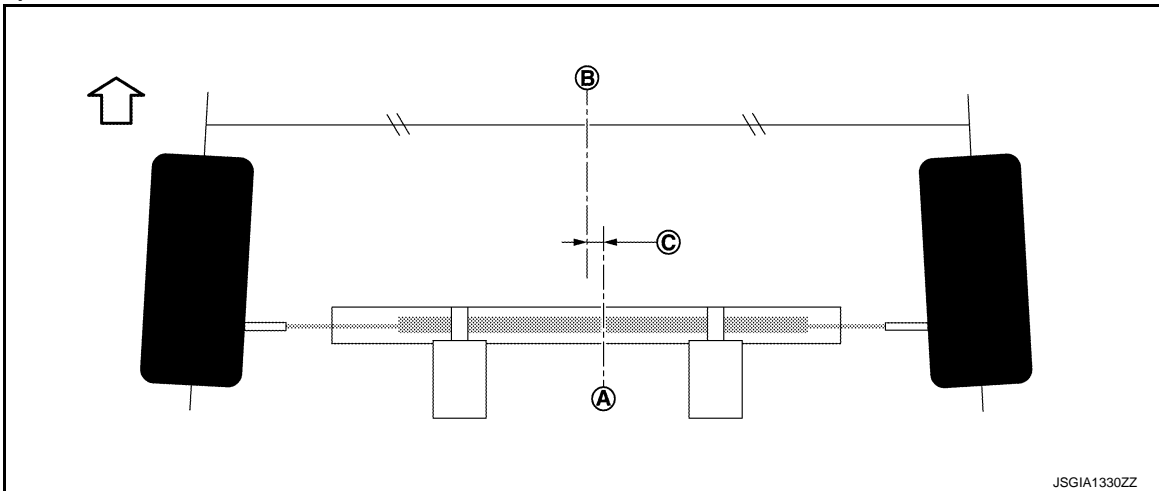
INFOID:000000013356580

“DAST CALIBRATION (MODE2)” is a function to calculate an off-center of the steering rack after adjust toe-in without using the alignment tester.

Off-center © is calculated by the difference between a neutral position of the vehicle’s alignment (A) and the neutral position of the steering rack (B). Refer to [STC-211, "Work Procedure"](#).

CAUTION:

When adjusting toe-in without using the alignment tester, always perform “DAST CALIBRATION (MODE2)”.



↶: Vehicle front

Work Procedure

INFOID:000000013356581

Toe-in adjustment: Refer to [ST-128, "EXCEPT ALIGNMENT TESTER : Inspection and Adjustment"](#).

CONFIGURATION (STEERING FORCE CONTROL MODULE)

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

CONFIGURATION (STEERING FORCE CONTROL MODULE)

Work Procedure

INFOID:000000013356582

CAUTION:

- Use “Manual Configuration” only when “TYPE ID” of steering force control module cannot be read.
- If an error occurs during configuration, start over from the beginning.
- When off-center is bigger than 120°, refer to [STC-478. "Diagnosis Procedure"](#) to correct off-center before performing the work.

1. CHECKING TYPE ID (1)

Use FAST (service parts catalogue) to search steering force control module of the applicable vehicle and find “Type ID”.

Is “Type ID” displayed?

YES >> Print out “Type ID” and GO TO 2.

NO >> “Configuration” is not required for steering force control module. Replace in the usual manner. Refer to [STC-492. "Removal and Installation"](#).

2. CHECKING TYPE ID (2)

ⓈCONSULT Configuration

1. Select “Before Replace ECU” of “Read/Write Configuration”.
2. Check that “Type ID” is displayed on the CONSULT screen.

Is “Type ID” displayed?

YES >> GO TO 3.

NO >> GO TO 7.

3. VERIFYING TYPE ID (1)

ⓈCONSULT Configuration

Compare a “Type ID” displayed on the CONSULT screen with the one searched by using FAST (service parts catalogue) to check that these “Type ID” agree with each other.

NOTE:

For the “Type ID” searched by using FAST (service parts catalog), use the last five digits of the “Type ID”.

>> GO TO 4.

4. SAVING TYPE ID

ⓈCONSULT Configuration

Save “Type ID” on CONSULT.

>> GO TO 5.

5. REPLACING STEERING FORCE CONTROL MODULE (1)

Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).

CAUTION:

Replace the control module only when necessary.

>> GO TO 6.

6. WRITING (AUTOMATIC WRITING)

ⓈCONSULT Configuration

1. Select “After Replace ECU” of “Re/programming, Configuration” or that of “Read / Write Configuration”.
2. Select the “Type ID” agreeing with the one stored on CONSULT and the one searched by using FAST (service parts catalogue) to write the “Type ID” into the steering force control module.

NOTE:

For the “Type ID” searched by using FAST (service parts catalog), use the last five digits of the “Type ID”.

>> GO TO 9.

CONFIGURATION (STEERING FORCE CONTROL MODULE)

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

7. REPLACING STEERING FORCE CONTROL MODULE (2)

Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).

CAUTION:

Replace the control module only when necessary.

>> GO TO 8.

8. WRITING (MANUAL WRITING)

Ⓜ CONSULT Configuration

1. Select "Manual Configuration".
2. Select the "Type ID" searched by using FAST (service parts catalogue) to write the "Type ID" into the steering force control module.

NOTE:

For the "Type ID" searched by using FAST (service parts catalog), use the last five digits of the "Type ID".

>> GO TO 9.

9. VERIFYING TYPE ID (2)

Compare "Type ID" written into the steering force control module with the one searched by using FAST (service parts catalogue) to check that these "Type ID" agree with each other.

NOTE:

For the "Type ID" searched by using FAST (service parts catalog), use the last five digits of the "Type ID".

>> WORK END.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

CONFIGURATION (STEERING ANGLE MAIN CONTROL MODULE)

Work Procedure

INFOID:000000013356583

CAUTION:

- Use “Manual Configuration” only when “TYPE ID” of steering angle main control module cannot be read.
- If an error occurs during configuration, start over from the beginning.
- When off-center is bigger than 120°, refer to [STC-478, "Diagnosis Procedure"](#) to correct off-center before performing the work.

1. CHECKING TYPE ID (1)

Use FAST (service parts catalogue) to search steering angle main control module of the applicable vehicle and find “Type ID”.

Is “Type ID” displayed?

YES >> Print out “Type ID” and GO TO 2.

NO >> “Configuration” is not required for steering angle main control module. Replace in the usual manner. Refer to [STC-493, "Removal and Installation"](#).

2. CHECKING TYPE ID (2)

ⓐCONSULT Configuration

1. Select “Before Replace ECU” of “Read/Write Configuration”.
2. Check that “Type ID” is displayed on the CONSULT screen.

Is “Type ID” displayed?

YES >> GO TO 3.

NO >> GO TO 7.

3. VERIFYING TYPE ID (1)

ⓐCONSULT Configuration

Compare a “Type ID” displayed on the CONSULT screen with the one searched by using FAST (service parts catalogue) to check that these “Type ID” agree with each other.

NOTE:

For the “Type ID” searched by using FAST (service parts catalog), use the last five digits of the “Type ID”.

>> GO TO 4.

4. SAVING TYPE ID

ⓐCONSULT Configuration

Save “Type ID” on CONSULT.

>> GO TO 5.

5. REPLACING STEERING ANGLE MAIN CONTROL MODULE (1)

Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

CAUTION:

Replace the control module only when necessary.

>> GO TO 6.

6. WRITING (AUTOMATIC WRITING)

ⓐCONSULT Configuration

1. Select “After Replace ECU” of “Re/programming, Configuration” or that of “Read / Write Configuration”.
2. Select the “Type ID” agreeing with the one stored on CONSULT and the one searched by using FAST (service parts catalogue) to write the “Type ID” into the steering angle main control module.

NOTE:

For the “Type ID” searched by using FAST (service parts catalog), use the last five digits of the “Type ID”.

CONFIGURATION (STEERING ANGLE MAIN CONTROL MODULE)

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

>> GO TO 9.

7. REPLACING STEERING ANGLE MAIN CONTROL MODULE (2)

Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

CAUTION:

Replace the control module only when necessary.

>> GO TO 8.

8. WRITING (MANUAL WRITING)

Ⓜ CONSULT Configuration

1. Select "Manual Configuration".
2. Select the "Type ID" searched by using FAST (service parts catalogue) to write the "Type ID" into the steering angle main control module.

NOTE:

For the "Type ID" searched by using FAST (service parts catalog), use the last five digits of the "Type ID".

>> GO TO 9.

9. VERIFYING TYPE ID (2)

Compare "Type ID" written into the steering angle main control module with the one searched by using FAST (service parts catalogue) to check that these "Type ID" agree with each other.

NOTE:

For the "Type ID" searched by using FAST (service parts catalog), use the last five digits of the "Type ID".

>> WORK END.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

CONFIGURATION (STEERING ANGLE SUB CONTROL MODULE)

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

CONFIGURATION (STEERING ANGLE SUB CONTROL MODULE)

Work Procedure

INFOID:000000013356584

CAUTION:

- Use “Manual Configuration” only when “TYPE ID” of steering angle sub control module cannot be read.
- If an error occurs during configuration, start over from the beginning.
- When off-center is bigger than 120°, refer to [STC-478, "Diagnosis Procedure"](#) to correct off-center before performing the work.

1. CHECKING TYPE ID (1)

Use FAST (service parts catalogue) to search steering angle sub control module of the applicable vehicle and find “Type ID”.

Is “Type ID” displayed?

YES >> Print out “Type ID” and GO TO 2.

NO >> “Configuration” is not required for steering angle sub control module. Replace in the usual manner. Refer to [STC-494, "Removal and Installation"](#).

2. CHECKING TYPE ID (2)

ⓐCONSULT Configuration

1. Select “Before Replace ECU” of “Read/Write Configuration”.
2. Check that “Type ID” is displayed on the CONSULT screen.

Is “Type ID” displayed?

YES >> GO TO 3.

NO >> GO TO 7.

3. VERIFYING TYPE ID (1)

ⓐCONSULT Configuration

Compare a “Type ID” displayed on the CONSULT screen with the one searched by using FAST (service parts catalogue) to check that these “Type ID” agree with each other.

NOTE:

For the “Type ID” searched by using FAST (service parts catalog), use the last five digits of the “Type ID”.

>> GO TO 4.

4. SAVING TYPE ID

ⓐCONSULT Configuration

Save “Type ID” on CONSULT.

>> GO TO 5.

5. REPLACING STEERING ANGLE SUB CONTROL MODULE (1)

Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

CAUTION:

Replace the control module only when necessary.

>> GO TO 6.

6. WRITING (AUTOMATIC WRITING)

ⓐCONSULT Configuration

1. Select “After Replace ECU” of “Re/programming, Configuration” or that of “Read / Write Configuration”.
2. Select the “Type ID” agreeing with the one stored on CONSULT and the one searched by using FAST (service parts catalogue) to write the “Type ID” into the steering angle sub control module.

NOTE:

For the “Type ID” searched by using FAST (service parts catalog), use the last five digits of the “Type ID”.

CONFIGURATION (STEERING ANGLE SUB CONTROL MODULE)

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

>> GO TO 9.

7. REPLACING STEERING ANGLE SUB CONTROL MODULE (2)

Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

CAUTION:

Replace the control module only when necessary.

>> GO TO 8.

8. WRITING (MANUAL WRITING)

Ⓜ CONSULT Configuration

1. Select "Manual Configuration".
2. Select the "Type ID" searched by using FAST (service parts catalogue) to write the "Type ID" into the steering angle sub control module.

NOTE:

For the "Type ID" searched by using FAST (service parts catalog), use the last five digits of the "Type ID".

>> GO TO 9.

9. VERIFYING TYPE ID (2)

Compare "Type ID" written into the steering angle sub control module with the one searched by using FAST (service parts catalogue) to check that these "Type ID" agree with each other.

NOTE:

For the "Type ID" searched by using FAST (service parts catalog), use the last five digits of the "Type ID".

>> WORK END.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

DTC/CIRCUIT DIAGNOSIS

C13A0-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356585

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A0-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected when the system is performing the initial setting.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Variable

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-218, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356586

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A0-00" detected?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 1

C13A0-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000013356587

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A0-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected when the system is performing the initial setting.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Variable

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13A0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-219, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356588

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13A0-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356589

DTC DETECTION LOGIC

C13A0-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A0-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected when the system is performing the initial setting.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Variable

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13A0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-220, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356590

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13A0-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13A1-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13A1-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356591

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A1-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering force control module is detected.

POSSIBLE CAUSE

- Steering force control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A1-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-221, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356592

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A1-00" detected?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000013356593

DTC DETECTION LOGIC

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

C13A1-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A1-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering force control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 1".

Is DTC "C13A1-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-222, "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356594

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "DAST 1".

Is DTC "C13A1-00" detected?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356595

DTC DETECTION LOGIC

C13A1-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A1-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering force control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 2".

Is DTC "C13A1-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-223, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356596

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "DAST 2".

Is DTC "C13A1-00" detected?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13A2-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356597

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A2-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering angle main control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A2-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-224, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356598

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.
CAUTION:
Never drive the vehicle.
5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A2-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13A2-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1

DAST 1 : DTC Description

INFOID:0000000013356599

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A2-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering angle main control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 1".

Is DTC "C13A2-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-225. "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:0000000013356600

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "DAST 1".

Is DTC "C13A2-00" detected?

- YES >> Replace steering angle main control module. Refer to [STC-493. "Removal and Installation"](#).
NO >> • Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

DAST 2

C13A2-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 2 : DTC Description

INFOID:000000013356601

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A2-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering angle main control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 2".

Is DTC "C13A2-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-226, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356602

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "DAST 2".

Is DTC "C13A2-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

- Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13A3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13A3-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356603

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A3-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering angle sub control module is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-227, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356604

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.
CAUTION:
Never drive the vehicle.
5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A3-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000013356605

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A3-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering angle sub control module is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 1".

Is DTC "C13A3-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-228, "DAST 1 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356606

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.
CAUTION:
Never drive the vehicle.
5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "DAST 1".

Is DTC "C13A3-00" detected?

- YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).
 NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
 • Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 2

C13A3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 2 : DTC Description

INFOID:000000013356607

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A3-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering angle sub control module is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 2".

Is DTC "C13A3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-229, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356608

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "DAST 2".

Is DTC "C13A3-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13A4-00 CONTROL MODULE

DAST 1

DAST 1 : DTC Description

INFOID:000000013356609

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A4-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering force control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 1".

Is DTC "C13A4-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-230, "DAST 1 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356610

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.
CAUTION:
Never drive the vehicle.
5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "DAST 1".

Is DTC "C13A4-00" detected?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
- NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13A4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 2

DAST 2 : DTC Description

INFOID:0000000013356611

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A4-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering force control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 2".

Is DTC "C13A4-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-231, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:0000000013356612

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "DAST 2".

Is DTC "C13A4-00" detected?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13A5-00 CONTROL MODULE

DAST 2

DAST 2 : DTC Description

INFOID:000000013356613

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A5-00	CONTROL MODULE (Control module)	The internal malfunction in steering angle sub control module is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
CAUTION:
Confirm the turning the steering wheel correctly by eyes.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 2".

Is DTC "C13A5-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-232, "DAST 2 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356614

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.
CAUTION:
Never drive the vehicle.
5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "DAST 2".

Is DTC "C13A5-00" detected?

- YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

C13A5-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

- NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13A6-00 CONTROL MODULE

DAST 1

DAST 1 : DTC Description

INFOID:0000000013356615

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A6-00	CONTROL MODULE (Control module)	When system is in fail-safe mode (mode 2), the internal malfunction in steering angle main control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
- CAUTION:**
Never drive the vehicle.
2. Perform self-diagnosis for "DAST 1".

Is DTC "C13A6-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-234, "DAST 1 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:0000000013356616

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13A6-00" detected?

- YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).
- NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13A7-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13A7-00 CONTROL MODULE

DAST 1

DAST 1 : DTC Description

INFOID:0000000013356617

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A7-00	CONTROL MODULE (Control module)	When system is in fail-safe mode (mode 2), the internal malfunction in steering angle main control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13A7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-235. "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:0000000013356618

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13A7-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493. "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

C13A8-00 BACK UP CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13A8-00 BACK UP CIRCUIT

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356619

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A8-00	BACK UP CIRCUIT (Back up circuit)	The signal voltage of back up circuit is following condition for 1 second or more continuously. <ul style="list-style-type: none">Terminal voltage < 0.5 V4.75 V < Terminal voltage

POSSIBLE CAUSE

- Back up circuit (between steering force control module and steering angle main control module) is open or short.
- Steering force control module
- Steering angle main control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A8-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-236, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356620

1. CHECK STEERING FORCE CONTROL MODULE SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "BACK UP SIG 1 VOLT".
3. Check the value

Monitor item	Standard value (Approx.)
BACK UP SIG 1 VOLT	0.5 – 4.75 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 2.

C13A8-00 BACK UP CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPIVE STEERING]

2. CHECK THE BACK UP SIGNAL CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect each control module harness connector.
3. Check the continuity between both control module harness connectors.

Steering force control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	17	E26	24	Existed

4. Check the continuity between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	17	Ground	Not existed

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair or replace error-detected part.

3. PERFORM SELF-DIAGNOSIS

 **With CONSULT**

1. Connect each control module harness connector.
2. Start the engine.
- CAUTION:**
Never drive the vehicle.
3. Perform self-diagnosis for "DAST 1".

Is any DTC is detected?

- YES >> Check the DTC. Refer to [STC-169, "DTC Index"](#).
 NO >> GO TO 4.

4. CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
 NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

INFOID:0000000013356621

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A8-00	BACK UP CIRCUIT (Back up circuit)	The signal voltage of back up circuit is following condition for 1 second or more continuously. <ul style="list-style-type: none"> • Terminal voltage < 0.5 V • 4.75 V < Terminal voltage

POSSIBLE CAUSE

- Back up circuit (between steering angle main control module and steering angle sub control module) is open or short.
- Steering angle main control module
- Steering angle sub control module

FAIL-SAFE

C13A8-00 BACK UP CIRCUIT

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13A8-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-238. "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356622

1. CHECK STEERING ANGLE MAIN CONTROL MODULE SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "BACK UP SIG 1 VOLT".
3. Check the value

Monitor item	Standard value (Approx.)
BACK UP SIG 1 VOLT	0.5 – 4.75 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 2.

2. CHECK THE BACK UP SIGNAL CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect each control module harness connector.
3. Check the continuity between both control module harness connectors.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	17	E29	22	Existed

4. Check the continuity between steering force control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	17	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3. PERFORM SELF-DIAGNOSIS

C13A8-00 BACK UP CIRCUIT

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

With CONSULT

1. Connect each control module harness connector.
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. Perform self-diagnosis for "DAST 2".

Is any DTC is detected?

YES >> Check the DTC. Refer to [STC-182, "DTC Index"](#).

NO >> GO TO 4.

4.CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 2

DAST 2 : DTC Description

INFOID:0000000013356623

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A8-00	BACK UP CIRCUIT (Back up circuit)	The signal voltage of back up circuit is following condition for 1 second or more continuously. <ul style="list-style-type: none">• Terminal voltage < 0.5 V• 4.75 V < Terminal voltage

POSSIBLE CAUSE

- Back up circuit (between steering angle sub control module and steering angle main control module) is open or short.
- Steering angle sub control module
- Steering angle main control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13A8-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-240, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

C13A8-00 BACK UP CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 2 : Diagnosis Procedure

INFOID:000000013356624

1. CHECK STEERING ANGLE SUB CONTROL MODULE SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "DAST 2" >> "DATA MONITOR" >> "BACK UP SIG 1 VOLT".
3. Check the value

Monitor item	Standard value (Approx.)
BACK UP SIG 1 VOLT	0.5 – 4.75 V

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 2.

2. CHECK THE BACK UP SIGNAL CIRCUIT

1. Turn the ignition switch OFF
2. Disconnect each control module harness connector.
3. Check the continuity between both control module harness connectors.

Steering angle sub control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	17	E26	24	Existed

4. Check the continuity between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	17	Ground	Not existed

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair or replace error-detected part.

3. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Connect each control module harness connector.
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. Perform self-diagnosis for "DAST 1".

Is any DTC is detected?

- YES >> Check the DTC. Refer to [STC-169, "DTC Index"](#).
NO >> GO TO 4.

4. CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

C13A9-00 BACK UP CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13A9-00 BACK UP CIRCUIT

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356625

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A9-00	BACK UP CIRCUIT (Back up circuit)	The signal voltage of back up circuit is following condition for 1 second or more continuously. <ul style="list-style-type: none">Terminal voltage < 0.5 V4.75 V < Terminal voltage

POSSIBLE CAUSE

- Back up circuit (between steering force control module and steering angle sub control module) is open or short.
- Steering force control module
- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A9-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-241, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [Gl-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356626

1. CHECK STEERING FORCE CONTROL MODULE SIGNAL

With CONSULT

- Turn the ignition switch ON.
- On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "BACK UP SIG 2 VOLT".
- Check the value

Monitor item	Standard value (Approx.)
BACK UP SIG 2 VOLT	0.5 – 4.75 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 2.

C13A9-00 BACK UP CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

2. CHECK THE BACK UP SIGNAL CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect each control module harness connector.
3. Check the continuity between both control module harness connectors.

Steering force control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	18	E29	24	Existed

4. Check the continuity between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	18	Ground	Not existed

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair or replace error-detected part.

3. PERFORM SELF-DIAGNOSIS

Ⓟ **With CONSULT**

1. Connect each control module harness connector.
2. Start the engine.
CAUTION:
Never drive the vehicle.
3. Perform self-diagnosis for "DAST 2".

Is any DTC is detected?

- YES >> Check the DTC. Refer to [STC-182, "DTC Index"](#).
NO >> GO TO 4.

4. CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

INFOID:000000013356627

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A9-00	BACK UP CIRCUIT (Back up circuit)	The signal voltage of back up circuit is following condition for 1 second or more continuously. <ul style="list-style-type: none">• Terminal voltage < 0.5 V• 4.75 V < Terminal voltage

POSSIBLE CAUSE

- Back up circuit (between steering angle main control module and steering force control module) is open or short.
- Steering angle main control module
- Steering force control module

FAIL-SAFE

C13A9-00 BACK UP CIRCUIT

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13A9-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-243, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:0000000013356628

1. CHECK STEERING FORCE CONTROL MODULE SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "BACK UP SIG 2 VOLT".
3. Check the value

Monitor item	Standard value (Approx.)
BACK UP SIG 2 VOLT	0.5 – 4.75 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 2.

2. CHECK THE BACK UP SIGNAL CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect each control module harness connector.
3. Check the continuity between both control module harness connectors.

Steering angle main control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	18	M71	22	Existed

4. Check the continuity between steering force control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	18	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3. PERFORM SELF-DIAGNOSIS

C13A9-00 BACK UP CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

With CONSULT

1. Connect each control module harness connector.
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. Perform self-diagnosis for "EPS/DAST 3".

Is any DTC is detected?

YES >> Check the DTC. Refer to [STC-156, "DTC Index"](#).

NO >> GO TO 4.

4.CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 2

DAST 2 : DTC Description

INFOID:000000013356629

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A9-00	BACK UP CIRCUIT (Back up circuit)	The signal voltage of back up circuit is following condition for 1 second or more continuously. <ul style="list-style-type: none">• Terminal voltage < 0.5 V• 4.75 V < Terminal voltage

POSSIBLE CAUSE

- Back up circuit (between steering angle sub control module and steering force control module) is open or short.
- Steering angle sub control module
- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Perform self-diagnosis for "DAST 2".

Is DTC "C13A9-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-245, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

C13A9-00 BACK UP CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 2 : Diagnosis Procedure

INFOID:000000013356630

1. CHECK STEERING FORCE CONTROL MODULE SIGNAL

Ⓜ With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "DAST 2" >> "DATA MONITOR" >> "BACK UP SIG 2 VOLT".
3. Check the value

Monitor item	Standard value (Approx.)
BACK UP SIG 2 VOLT	0.5 – 4.75 V

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 2.

2. CHECK THE BACK UP SIGNAL CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect each control module harness connector.
3. Check the continuity between both control module harness connectors.

Steering angle sub control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	18	M71	24	Existed

4. Check the continuity between steering force control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	18	Ground	Not existed

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair or replace error-detected part.

3. PERFORM SELF-DIAGNOSIS

Ⓜ With CONSULT

1. Connect each control module harness connector.
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. Perform self-diagnosis for "EPS/DAST 3".

Is any DTC is detected?

- YES >> Check the DTC. Refer to [STC-156, "DTC Index"](#).
NO >> GO TO 4.

4. CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

C13AA-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356631

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AA-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The inside relay malfunction in control module is detected when the system is starting. Malfunction of motor circuit is detected when the system is starting.

POSSIBLE CAUSE

- Steering force control module
- Motor circuit (between steering force control module and steering force motor) is open or short.

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AA-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-246, "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356632

1. CHECK THE MOTOR CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module and steering force motor harness connector.
3. Check the continuity between control module harness connector and motor harness connector.

Steering force control module		Steering force motor		Continuity
Connector	Terminal	Connector	Terminal	
M151	35	M153	1	Existed
	36		2	
	37		3	

4. Check the continuity between control module harness connector and ground.

C13AA-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		—	Continuity
Connector	Terminal		
M151	35	Ground	Not existed
	36		
	37		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2. CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

INFOID:0000000013356633

STC

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AA-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The inside relay malfunction in control module is detected when the system is starting. Malfunction of motor circuit is detected when the system is starting.

POSSIBLE CAUSE

- Steering angle main control module
- Motor circuit (between steering angle main control module and steering angle main motor) is open or short.

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13AA-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-248, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

C13AA-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : Diagnosis Procedure

INFOID:000000013356634

1.CHECK THE MOTOR CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module and steering angle main motor harness connector.
3. Check the continuity between control module harness connector and motor harness connector.

Steering angle main control module		Steering angle main motor		Continuity
Connector	Terminal	Connector	Terminal	
E97	35	E88*1 E105*2	1	Existed
	36		3	
	37		2	

*1: 2WD models

*2: AWD models

4. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E97	35	Ground	Not existed
	36		
	37		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493. "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 2

DAST 2 : DTC Description

INFOID:000000013356635

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AA-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none">• The inside relay malfunction in control module is detected when the system is starting.• Malfunction of motor circuit is detected when the system is starting.

POSSIBLE CAUSE

- Steering angle sub control module
- Motor circuit (between steering angle sub control module and steering angle sub motor) is open or short.

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

C13AA-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13AA-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-249, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356636

1. CHECK THE MOTOR CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module and steering angle sub motor harness connector.
3. Check the continuity between control module harness connector and motor harness connector.

Steering angle sub control module		Steering angle sub motor		Continuity
Connector	Terminal	Connector	Terminal	
E99	35	E90	1	Existed
	36		3	
	37		2	

4. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E99	35	Ground	Not existed
	36		
	37		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2. CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

C13AB-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356637

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AB-00	CONTROL MODULE (Control module)	Steering force control module detects the following status when the system is starting. <ul style="list-style-type: none"> • Malfunction of internal relay • Malfunction of each backup circuit • Malfunction of steering clutch circuit • Malfunction of inverter circuit • Malfunction of motor circuit • Malfunction of motor angle sensor circuit

POSSIBLE CAUSE

- Back up circuit (between steering force control module and steering angle main control module) is open or short.
- Back up circuit (between steering force control module and steering angle sub control module) is open or short.
- Steering clutch circuit
- Steering clutch
- Motor circuit (between steering force control module and steering force motor) is open or short.
- Motor angle sensor circuit (between steering force control module and force motor angle sensor) is open or short.
- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. CHECK DTC PRIORITY

If DTC "C13AB-00" is displayed with DTC "C13A8-00", "C13A9-00", "C13AD-00", "C13D4-00" or "C13E0-00", first perform the confirmation procedure (trouble diagnosis) for DTC "C13AB-00".

Is applicable DTC detected?

YES-1 (C13A8-00 is detected)>>Refer to [STC-236, "EPS/DAST 3 : Diagnosis Procedure"](#).

YES-2 (C13A9-00 is detected)>>Refer to [STC-241, "EPS/DAST 3 : Diagnosis Procedure"](#).

YES-3 (C13AD-00 is detected)>>Refer to [STC-256, "EPS/DAST 3 : Diagnosis Procedure"](#).

YES-4 (C13D4-00 is detected)>>Refer to [STC-366, "EPS/DAST 3 : Diagnosis Procedure"](#).

YES-5 (C13E0-00 is detected)>>Refer to [STC-408, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO >> GO TO 2.

2. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 3.

3. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

C13AB-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Is DTC "C13AB-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-251, "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356638

1.PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AB-00" detected?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
- NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000013356639

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AB-00	CONTROL MODULE (Control module)	Steering angle main control module detects the following status when the system is starting. <ul style="list-style-type: none">• Malfunction of internal relay• Malfunction of each backup circuit• Malfunction of inverter circuit• Malfunction of motor circuit• Malfunction of motor angle sensor circuit

POSSIBLE CAUSE

- Back up circuit (between steering angle main control module and steering angle sub control module) is open or short.
- Back up circuit (between steering angle main control module and steering force control module) is open or short.
- Motor circuit (between steering angle main control module and steering angle main motor) is open or short.
- Motor angle sensor circuit (between steering angle main control module and main motor angle sensor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC "C13AB-00" is displayed with DTC "C13A8-00", "C13A9-00", "C13AD-00" or "C13D4-00", first perform the confirmation procedure (trouble diagnosis) for DTC "C13AB-00".

Is applicable DTC detected?

- YES-1 (C13A8-00 is detected)>>Refer to [STC-238, "DAST 1 : Diagnosis Procedure"](#).
- YES-2 (C13A9-00 is detected)>>Refer to [STC-243, "DAST 1 : Diagnosis Procedure"](#).
- YES-3 (C13AD-00 is detected)>>Refer to [STC-258, "DAST 1 : Diagnosis Procedure"](#).

C13AB-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

YES-4 (C13D4-00 is detected)>>Refer to [STC-368. "DAST 1 : Diagnosis Procedure"](#).

NO >> GO TO 2.

2.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 3.

3.DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13AB-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-252. "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356640

1.PERFORM SELF-DIAGNOSIS

Ⓟ With CONSULT

1. Turn the ignition switch ON.

2. Erase self-diagnosis for "DAST 1".

3. Turn the ignition switch OFF and wait for at least 10 seconds.

4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13AB-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493. "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356641

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AB-00	CONTROL MODULE (Control module)	Steering angle sub control module detects the following status when the system is starting. <ul style="list-style-type: none">• Malfunction of internal relay• Malfunction of each backup circuit• Malfunction of inverter circuit• Malfunction of motor circuit• Malfunction of motor angle sensor circuit

POSSIBLE CAUSE

- Back up circuit (between steering angle sub control module and steering angle main control module) is open or short.
- Back up circuit (between steering angle sub control module and steering force control module) is open or short.
- Motor circuit (between steering angle sub control module and steering angle sub motor) is open or short.
- Motor angle sensor circuit (between steering angle sub control module and sub motor angle sensor) is open or short.

C13AB-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. CHECK DTC PRIORITY

If DTC "C13AB-00" is displayed with DTC "C13A8-00", "C13A9-00", "C13AD-00" or "C13D4-00", first perform the confirmation procedure (trouble diagnosis) for DTC "C13AB-00".

Is applicable DTC detected?

YES-1 (C13A8-00 is detected)>>Refer to [STC-240, "DAST 2 : Diagnosis Procedure"](#).

YES-2 (C13A9-00 is detected)>>Refer to [STC-245, "DAST 2 : Diagnosis Procedure"](#).

YES-3 (C13AD-00 is detected)>>Refer to [STC-260, "DAST 2 : Diagnosis Procedure"](#).

YES-4 (C13D4-00 is detected)>>Refer to [STC-371, "DAST 2 : Diagnosis Procedure"](#).

NO >> GO TO 2.

2. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 3.

3. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13AB-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-253, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356642

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13AB-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13AC-00 CONTROL MODULE

DAST 1

DAST 1 : DTC Description

INFOID:000000013356643

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AC-00	CONTROL MODULE (Control module)	Steering angle main control module detects the following status when the system is starting. <ul style="list-style-type: none"> • Malfunction of internal relay • Malfunction of each backup circuit

POSSIBLE CAUSE

- Power supply circuit for steering force control module is open or short.
- Power supply circuit for steering angle sub control module is open or short.
- Back up circuit (between steering angle main control module and steering angle sub control module) is open or short.
- Back up circuit (between steering angle main control module and steering force control module) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. CHECK DTC PRIORITY

If DTC "C13AC-00" is displayed with DTC "C13A8-00" or "C13A9-00", first perform the confirmation procedure (trouble diagnosis) for DTC "C13AC-00".

Is applicable DTC detected?

YES-1 (C13A8-00 is detected)>>Refer to [STC-238. "DAST 1 : Diagnosis Procedure"](#).

YES-2 (C13A9-00 is detected)>>Refer to [STC-243. "DAST 1 : Diagnosis Procedure"](#).

NO >> GO TO 2.

2. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 3.

3. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13AC-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-254. "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356644

1. CHECK STEERING FORCE CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch OFF.

C13AC-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

2. Disconnect steering force control module harness connector.
3. Check the voltage between steering force control module harness connector and ground.

Steering force control module		—	Voltage (Approx.)
Connector	Terminal		
M72	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2. CHECK STEERING FORCE CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 60A fusible link (#G).
2. Check the harness for open or short between steering force control module harness connector No.34 terminal and the 60A fusible link (#G).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

3. CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the voltage between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Voltage (Approx.)
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#H).
2. Check the harness for open or short between steering angle sub control module harness connector No.34 terminal and the 100A fusible link (#H).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

5. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13AC-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13AD-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356645

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AD-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The internal malfunction in control module is detected. Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering force motor
- Steering force motor harness connector
- Motor circuit (between steering force control module and steering force motor) is open or short.
- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AD-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-256. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356646

1. CHECK THE MOTOR

Check the steering force motor. Refer to [STC-257. "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-135. "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

1. Disconnect steering force control module and steering force motor harness connector.
2. Check the continuity between control module harness connector and motor harness connector.

C13AD-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Steering force motor		Continuity
Connector	Terminal	Connector	Terminal	
M151	35	M153	1	Existed
	36		2	
	37		3	
M152	38	M154	5	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M151	35	Ground	Not existed
	36		
	37		
M152	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:0000000013356647

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.

2. Disconnect steering force motor harness connector.

3. Check the continuity between motor connector terminals.

Steering force motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	5	Not existed
2	3	Existed
2	5	Not existed
3	5	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000013356648

DTC DETECTION LOGIC

C13AD-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AD-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The internal malfunction in control module is detected. Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering angle main motor
- Steering angle main motor harness connector
- Motor circuit (between steering angle main control module and steering angle main motor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13AD-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-258, "DAST 1 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356649

1. CHECK THE MOTOR

Check the steering angle main motor. Refer to [STC-259, "DAST 1 : Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
 NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

- Disconnect steering angle main control module and steering angle main motor harness connector.
- Check the continuity between control module harness connector and motor harness connector.

Steering angle main control module		Steering angle main motor		Continuity
Connector	Terminal	Connector	Terminal	
E97	35	E88*1 E105*2	1	Existed
	36		3	
	37		2	
E98	38	E89	4	

*1: 2WD models

*2: AWD models

- Check the continuity between control module harness connector and ground.

C13AD-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
E97	35	Ground	Not existed
	36		
	37		
E98	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 1 : Component Inspection

INFOID:000000013356650

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle main motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle main motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	4	Not existed
2	3	Existed
2	4	Not existed
3	4	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356651

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AD-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The internal malfunction in control module is detected. Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering angle sub motor
- Steering angle sub motor harness connector
- Motor circuit (between steering angle sub control module and steering angle sub motor) is open or short.
- Steering angle sub control module

C13AD-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13AD-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-260. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356652

1. CHECK THE MOTOR

Check the steering angle sub motor. Refer to [STC-261. "DAST 2 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-146. "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

1. Disconnect steering angle sub control module and steering angle sub motor harness connector.
2. Check the continuity between control module harness connector and motor harness connector.

Steering angle sub control module		Steering angle sub motor		Continuity
Connector	Terminal	Connector	Terminal	
E99	35	E90	1	Existed
	36		3	
	37		2	
E100	38	E91 ^{*1} E92 ^{*2}	4	

*1: 2WD models

*2: AWD models

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E99	35	Ground	Not existed
	36		
	37		
E100	38		

C13AD-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-494. "Removal and Installation"](#).
- NO >> Repair or replace error-detected part.

DAST 2 : Component Inspection

INFOID:0000000013356653

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle sub motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	4	Not existed
2	3	Existed
2	4	Not existed
3	4	Not existed

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-146. "Removal and Installation"](#).

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13AE-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356654

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AE-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AE-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-262, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356655

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AE-00" detected?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 1

C13AE-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000013356656

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AE-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13AE-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-263, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356657

1. PERFORM SELF-DIAGNOSIS

With CONSULT

- Turn the ignition switch ON.
- Erase self-diagnosis for "DAST 1".
- Turn the ignition switch OFF and wait for at least 10 seconds.
- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13AE-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356658

DTC DETECTION LOGIC

C13AE-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AE-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13AE-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-264, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356659

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13AE-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13AF-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13AF-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356660

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AF-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AF-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-265. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356661

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AF-00" detected?

YES >> Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

DAST 1

C13AF-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000013356662

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AF-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13AF-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-266, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356663

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13AF-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356664

DTC DETECTION LOGIC

C13AF-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AF-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13AF-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-267, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356665

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13AF-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

- Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13B0-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356666

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B0-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
- CAUTION:**
Never drive the vehicle.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B0-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-268, "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356667

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B0-00" detected?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
- NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 1

C13B0-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000013356668

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B0-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13B0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-269, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356669

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13B0-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356670

DTC DETECTION LOGIC

C13B0-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B0-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13B0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-270, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356671

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13B0-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

- Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13B1-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13B1-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356672

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B1-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B1-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-271. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356673

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B1-00" detected?

YES >> Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

DAST 1

C13B1-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000013356674

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B1-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13B1-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-272, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356675

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13B1-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356676

DTC DETECTION LOGIC

C13B1-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B1-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13B1-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-273, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356677

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13B1-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13B2-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356678

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B2-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The internal malfunction in control module is detected. Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering force motor
- Steering force motor harness connector
- Motor circuit (between steering force control module and steering force motor) is open or short.
- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B2-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-274, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356679

1. CHECK THE MOTOR

Check the steering force motor. Refer to [STC-275, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

1. Disconnect steering force control module and steering force motor harness connector.
2. Check the continuity between control module harness connector and motor harness connector.

C13B2-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Steering force motor		Continuity
Connector	Terminal	Connector	Terminal	
M151	35	M153	1	Existed
	36		2	
	37		3	
M152	38	M154	5	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M151	35	Ground	Not existed
	36		
	37		
M152	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:0000000013356680

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.

2. Disconnect steering force motor harness connector.

3. Check the continuity between motor connector terminals.

Steering force motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	5	Not existed
2	3	Existed
2	5	Not existed
3	5	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000013356681

DTC DETECTION LOGIC

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13B2-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B2-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The internal malfunction in control module is detected. Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering angle main motor
- Steering angle main motor harness connector
- Motor circuit (between steering angle main control module and steering angle main motor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13B2-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-276, "DAST 1 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356682

1. CHECK THE MOTOR

Check the steering angle main motor. Refer to [STC-277, "DAST 1 : Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
 NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

- Disconnect steering angle main control module and steering angle main motor harness connector.
- Check the continuity between control module harness connector and motor harness connector.

Steering angle main control module		Steering angle main motor		Continuity
Connector	Terminal	Connector	Terminal	
E97	35	E88*1 E105*2	1	Existed
	36		3	
	37		2	
E98	38	E89	4	

*1: 2WD models

*2: AWD models

- Check the continuity between control module harness connector and ground.

C13B2-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
E97	35	Ground	Not existed
	36		
	37		
E98	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 1 : Component Inspection

INFOID:000000013356683

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle main motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle main motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	4	Not existed
2	3	Existed
2	4	Not existed
3	4	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356684

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B2-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The internal malfunction in control module is detected. Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering angle sub motor
- Steering angle sub motor harness connector
- Motor circuit (between steering angle sub control module and steering angle sub motor) is open or short.
- Steering angle sub control module

C13B2-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13B2-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-278. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356685

1. CHECK THE MOTOR

Check the steering angle sub motor. Refer to [STC-279. "DAST 2 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-146. "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

1. Disconnect steering angle sub control module and steering angle sub motor harness connector.
2. Check the continuity between control module harness connector and motor harness connector.

Steering angle sub control module		Steering angle sub motor		Continuity
Connector	Terminal	Connector	Terminal	
E99	35	E90	1	Existed
	36		3	
	37		2	
E100	38	E91 ^{*1} E92 ^{*2}	4	

*1: 2WD models

*2: AWD models

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E99	35	Ground	Not existed
	36		
	37		
E100	38		

C13B2-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-494. "Removal and Installation"](#).
- NO >> Repair or replace error-detected part.

DAST 2 : Component Inspection

INFOID:0000000013356686

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle sub motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	4	Not existed
2	3	Existed
2	4	Not existed
3	4	Not existed

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-146. "Removal and Installation"](#).

C13B3-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356687

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B3-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The internal malfunction in control module is detected. Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering force motor
- Steering force motor harness connector
- Motor circuit (between steering force control module and steering force motor) is open or short.
- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel quickly from full left stop to full right stop.
3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-280, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356688

1. CHECK THE MOTOR

Check the steering force motor. Refer to [STC-281, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

1. Disconnect steering force control module and steering force motor harness connector.
2. Check the continuity between control module harness connector and motor harness connector.

C13B3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Steering force motor		Continuity
Connector	Terminal	Connector	Terminal	
M151	35	M153	1	Existed
	36		2	
	37		3	
M152	38	M154	5	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M151	35	Ground	Not existed
	36		
	37		
M152	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:0000000013356689

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.

2. Disconnect steering force motor harness connector.

3. Check the continuity between motor connector terminals.

Steering force motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	5	Not existed
2	3	Existed
2	5	Not existed
3	5	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000013356690

DTC DETECTION LOGIC

C13B3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B3-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The internal malfunction in control module is detected. Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering angle main motor
- Steering angle main motor harness connector
- Motor circuit (between steering angle main control module and steering angle main motor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Turn the steering wheel quickly from full left stop to full right stop.
- Perform self-diagnosis for "DAST 1".

Is DTC "C13B3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-282, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356691

1. CHECK THE MOTOR

Check the steering angle main motor. Refer to [STC-283, "DAST 1 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

- Disconnect steering angle main control module and steering angle main motor harness connector.
- Check the continuity between control module harness connector and motor harness connector.

Steering angle main control module		Steering angle main motor		Continuity
Connector	Terminal	Connector	Terminal	
E97	35	E88*1 E105*2	1	Existed
	36		3	
	37		2	
E98	38	E89	4	

*1: 2WD models

*2: AWD models

C13B3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E97	35	Ground	Not existed
	36		
	37		
E98	38		

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

- Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
- Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).
 NO >> Repair or replace error-detected part.

DAST 1 : Component Inspection

INFOID:0000000013356692

STC

1.CHECK THE MOTOR

- Turn the ignition switch OFF.
- Disconnect steering angle main motor harness connector.
- Check the continuity between motor connector terminals.

Steering angle main motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	4	Not existed
2	3	Existed
2	4	Not existed
3	4	Not existed

Is the inspection result normal?

- YES >> INSPECTION END
 NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

DAST 2

DAST 2 : DTC Description

INFOID:0000000013356693

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B3-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The internal malfunction in control module is detected. Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering angle sub motor
- Steering angle sub motor harness connector
- Motor circuit (between steering angle sub control module and steering angle sub motor) is open or short.
- Steering angle sub control module

C13B3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel quickly from full left stop to full right stop.
3. Perform self-diagnosis for "DAST 2".

Is DTC "C13B3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-284. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356694

1. CHECK THE MOTOR

Check the steering angle sub motor. Refer to [STC-285. "DAST 2 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-146. "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

1. Disconnect steering angle sub control module and steering angle sub motor harness connector.
2. Check the continuity between control module harness connector and motor harness connector.

Steering angle sub control module		Steering angle sub motor		Continuity
Connector	Terminal	Connector	Terminal	
E99	35	E90	1	Existed
	36		3	
	37		2	
E100	38	E91 ^{*1} E92 ^{*2}	4	

*1: 2WD models

*2: AWD models

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E99	35	Ground	Not existed
	36		
	37		
E100	38		

C13B3-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-494. "Removal and Installation"](#).
- NO >> Repair or replace error-detected part.

DAST 2 : Component Inspection

INFOID:0000000013356695

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle sub motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	4	Not existed
2	3	Existed
2	4	Not existed
3	4	Not existed

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-146. "Removal and Installation"](#).

C13B4-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356696

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B4-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B4-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-286, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356697

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B4-00" detected?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 1

C13B4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000013356698

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B4-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13B4-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-287, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356699

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13B4-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356700

DTC DETECTION LOGIC

C13B4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B4-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13B4-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-288, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356701

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13B4-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13B5-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13B5-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356702

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B5-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none">The internal malfunction in control module is detected.Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering force motor
- Steering force motor harness connector
- Motor circuit (between steering force control module and steering force motor) is open or short.
- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B5-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-289. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356703

1. CHECK THE MOTOR

Check the steering force motor. Refer to [STC-290. "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-135. "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

- Disconnect steering force control module and steering force motor harness connector.
- Check the continuity between control module harness connector and motor harness connector.

C13B5-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Steering force motor		Continuity
Connector	Terminal	Connector	Terminal	
M151	35	M153	1	Existed
	36		2	
	37		3	
M152	38	M154	5	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M151	35	Ground	Not existed
	36		
	37		
M152	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:0000000113356704

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.

2. Disconnect steering force motor harness connector.

3. Check the continuity between motor connector terminals.

Steering force motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	5	Not existed
2	3	Existed
2	5	Not existed
3	5	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000113356705

DTC DETECTION LOGIC

C13B5-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B5-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The internal malfunction in control module is detected. Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering angle main motor
- Steering angle main motor harness connector
- Motor circuit (between steering angle main control module and steering angle main motor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13B5-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-291, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356706

1. CHECK THE MOTOR

Check the steering angle main motor. Refer to [STC-292, "DAST 1 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

- Disconnect steering angle main control module and steering angle main motor harness connector.
- Check the continuity between control module harness connector and motor harness connector.

Steering angle main control module		Steering angle main motor		Continuity
Connector	Terminal	Connector	Terminal	
E97	35	E88*1 E105*2	1	Existed
	36		3	
	37		2	
E98	38	E89	4	

*1: 2WD models

*2: AWD models

- Check the continuity between control module harness connector and ground.

C13B5-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
E97	35	Ground	Not existed
	36		
	37		
E98	38		

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).
 NO >> Repair or replace error-detected part.

DAST 1 : Component Inspection

INFOID:000000013356707

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle main motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle main motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	4	Not existed
2	3	Existed
2	4	Not existed
3	4	Not existed

Is the inspection result normal?

- YES >> INSPECTION END
 NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356708

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B5-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The internal malfunction in control module is detected. Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering angle sub motor
- Steering angle sub motor harness connector
- Motor circuit (between steering angle sub control module and steering angle sub motor) is open or short.
- Steering angle sub control module

C13B5-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13B5-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-293. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356709

1. CHECK THE MOTOR

Check the steering angle sub motor. Refer to [STC-294. "DAST 2 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-146. "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

1. Disconnect steering angle sub control module and steering angle sub motor harness connector.
2. Check the continuity between control module harness connector and motor harness connector.

Steering angle sub control module		Steering angle sub motor		Continuity
Connector	Terminal	Connector	Terminal	
E99	35	E90	1	Existed
	36		3	
	37		2	
E100	38	E91 ^{*1} E92 ^{*2}	4	

*1: 2WD models

*2: AWD models

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E99	35	Ground	Not existed
	36		
	37		
E100	38		

C13B5-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).

2. Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to [STC-494. "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 2 : Component Inspection

INFOID:0000000013356710

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.

2. Disconnect steering angle sub motor harness connector.

3. Check the continuity between motor connector terminals.

Steering angle sub motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	4	Not existed
2	3	Existed
2	4	Not existed
3	4	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-146. "Removal and Installation"](#).

C13B6-00 MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13B6-00 MOTOR CIRCUIT

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356711

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B6-00	MOTOR CIRCUIT (Motor circuit)	<ul style="list-style-type: none">Malfunction of motor circuit is detected.Malfunction in each motor angle sensor is detected.

POSSIBLE CAUSE

- Steering force motor
- Steering force motor harness connector
- Motor circuit (between steering force control module and steering force motor) is open or short.
- Motor angle sensor circuit (between steering force control module and force motor angle sensor) is open or short.
- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓜ With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Turn the steering wheel from full left stop to full right stop.
- Return the steering wheel to the straight-ahead position.
- Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B6-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-295, "EPS/DAST 3 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356712

1. CHECK THE MOTOR

Check the steering force motor. Refer to [STC-297, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

- Disconnect steering force control module and steering force motor harness connector.
- Check the continuity between control module harness connector and motor harness connector.

C13B6-00 MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Steering force motor		Continuity
Connector	Terminal	Connector	Terminal	
M151	35	M153	1	Existed
	36		2	
	37		3	
M152	38	M154	5	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M151	35	Ground	Not existed
	36		
	37		
M152	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK THE SENSOR CIRCUIT

1. Disconnect force motor angle sensor harness connector.
2. Check the continuity between control module harness connector and angle sensor harness connector.

Steering force control module		Force motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
M71	10	M73	1	Existed
	11		5	
	6		4	
	5		8	
	4		2	
	2		6	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	10	Ground	Not existed
	11		
	6		
	5		
	4		
	2		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected part.

4.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

C13B6-00 MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:000000013356713

1. CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering force motor harness connector.
3. Check the continuity between motor connector terminals.

Steering force motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	5	Not existed
2	3	Existed
2	5	Not existed
3	5	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-135](#), "[Removal and Installation](#)".

STC

DAST 1

DAST 1 : DTC Description

INFOID:000000013356714

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B6-00	MOTOR CIRCUIT (Motor circuit)	<ul style="list-style-type: none">• Malfunction of motor circuit is detected.• Malfunction in each motor angle sensor is detected.

POSSIBLE CAUSE

- Steering angle main motor
- Steering angle main motor harness connector
- Motor circuit (between steering angle main control module and steering angle main motor) is open or short.
- Motor angle sensor circuit (between steering angle main control module and main motor angle sensor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125](#), "[DIRECT ADAPTIVE STEERING : Fail-safe](#)".

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

C13B6-00 MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Never drive the vehicle.

- Turn the steering wheel from full left stop to full right stop.
- Return the steering wheel to the straight-ahead position.
- Perform self-diagnosis for "DAST 1".

Is DTC "C13B6-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-298, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356715

1.CHECK THE MOTOR

Check the steering angle main motor. Refer to [STC-299, "DAST 1 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

2.CHECK THE MOTOR CIRCUIT

- Disconnect steering angle main control module and steering angle main motor harness connector.
- Check the continuity between control module harness connector and motor harness connector.

Steering angle main control module		Steering angle main motor		Continuity
Connector	Terminal	Connector	Terminal	
E97	35	E88*1 E105*2	1	Existed
	36		3	
	37		2	
E98	38	E89	4	

*1: 2WD models

*2: AWD models

- Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E97	35	Ground	Not existed
	36		
	37		
E98	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK THE SENSOR CIRCUIT

- Disconnect main motor angle sensor harness connector.
- Check the continuity between control module harness connector and angle sensor harness connector.

C13B6-00 MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		Main motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	10	E93	3	Existed
	11		6	
	6		1	
	5		5	
	4		2	
	2		4	

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	10	Ground	Not existed
	11		
	6		
	5		
	4		
	2		

Is the inspection result normal?

- YES >> GO TO 4.
- NO >> Repair or replace error-detected part.

4.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).
- NO >> Repair or replace error-detected part.

DAST 1 : Component Inspection

INFOID:000000013356716

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle main motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle main motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	4	Not existed
2	3	Existed
2	4	Not existed
3	4	Not existed

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

DAST 2

C13B6-00 MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 2 : DTC Description

INFOID:000000013356717

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B6-00	MOTOR CIRCUIT (Motor circuit)	<ul style="list-style-type: none">Malfunction of motor circuit is detected.Malfunction in each motor angle sensor is detected.

POSSIBLE CAUSE

- Steering angle sub motor
- Steering angle sub motor harness connector
- Motor circuit (between steering angle sub control module and steering angle sub motor) is open or short.
- Motor angle sensor circuit (between steering angle sub control module and sub motor angle sensor) is open or short.
- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.
CAUTION:
Never drive the vehicle.
- Turn the steering wheel from full left stop to full right stop.
- Return the steering wheel to the straight-ahead position.
- Perform self-diagnosis for "DAST 2".

Is DTC "C13B6-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-300, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356718

1. CHECK THE MOTOR

Check the steering angle sub motor. Refer to [STC-302, "DAST 2 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

- Disconnect steering angle sub control module and steering angle sub motor harness connector.
- Check the continuity between control module harness connector and motor harness connector.

C13B6-00 MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle sub control module		Steering angle sub motor		Continuity
Connector	Terminal	Connector	Terminal	
E99	35	E90	1	Existed
	36		3	
	37		2	
E100	38	E91*1 E92*2	4	

*1: 2WD models

*2: AWD models

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E99	35	Ground	Not existed
	36		
	37		
E100	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK THE SENSOR CIRCUIT

1. Disconnect sub motor angle sensor harness connector.
2. Check the continuity between control module harness connector and angle sensor harness connector.

Steering angle sub control module		Sub motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
E29	10	E94	3	Existed
	11		6	
	6		1	
	5		5	
	4		2	
	2		4	

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	10	Ground	Not existed
	11		
	6		
	5		
	4		
	2		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected part.

4.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

C13B6-00 MOTOR CIRCUIT

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

2. Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-494. "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

DAST 2 : Component Inspection

INFOID:0000000013356719

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle sub motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	4	Not existed
2	3	Existed
2	4	Not existed
3	4	Not existed

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-146. "Removal and Installation"](#).

C13B7-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13B7-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356720

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B7-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none">The internal malfunction in control module is detected.Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering force motor
- Steering force motor harness connector
- Motor circuit (between steering force control module and steering force motor) is open or short.
- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-303. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356721

1. CHECK THE MOTOR

Check the steering force motor. Refer to [STC-304. "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-135. "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

- Disconnect steering force control module and steering force motor harness connector.
- Check the continuity between control module harness connector and motor harness connector.

C13B7-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Steering force motor		Continuity
Connector	Terminal	Connector	Terminal	
M151	35	M153	1	Existed
	36		2	
	37		3	
M152	38	M154	5	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M151	35	Ground	Not existed
	36		
	37		
M152	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:0000000113356722

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.

2. Disconnect steering force motor harness connector.

3. Check the continuity between motor connector terminals.

Steering force motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	5	Not existed
2	3	Existed
2	5	Not existed
3	5	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000113356723

DTC DETECTION LOGIC

C13B7-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B7-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The internal malfunction in control module is detected. Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering angle main motor
- Steering angle main motor harness connector
- Motor circuit (between steering angle main control module and steering angle main motor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13B7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-305, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356724

1. CHECK THE MOTOR

Check the steering angle main motor. Refer to [STC-306, "DAST 1 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

- Disconnect steering angle main control module and steering angle main motor harness connector.
- Check the continuity between control module harness connector and motor harness connector.

Steering angle main control module		Steering angle main motor		Continuity
Connector	Terminal	Connector	Terminal	
E97	35	E88*1 E105*2	1	Existed
	36		3	
	37		2	
E98	38	E89	4	

*1: 2WD models

*2: AWD models

- Check the continuity between control module harness connector and ground.

C13B7-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
E97	35	Ground	Not existed
	36		
	37		
E98	38		

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).
 NO >> Repair or replace error-detected part.

DAST 1 : Component Inspection

INFOID:000000013356725

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle main motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle main motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	4	Not existed
2	3	Existed
2	4	Not existed
3	4	Not existed

Is the inspection result normal?

- YES >> INSPECTION END
 NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356726

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B7-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> • The internal malfunction in control module is detected. • Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering angle sub motor
- Steering angle sub motor harness connector
- Motor circuit (between steering angle sub control module and steering angle sub motor) is open or short.
- Steering angle sub control module

C13B7-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13B7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-307. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356727

1. CHECK THE MOTOR

Check the steering angle sub motor. Refer to [STC-308. "DAST 2 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-146. "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

1. Disconnect steering angle sub control module and steering angle sub motor harness connector.
2. Check the continuity between control module harness connector and motor harness connector.

Steering angle sub control module		Steering angle sub motor		Continuity
Connector	Terminal	Connector	Terminal	
E99	35	E90	1	Existed
	36		3	
	37		2	
E100	38	E91 ^{*1} E92 ^{*2}	4	

*1: 2WD models

*2: AWD models

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E99	35	Ground	Not existed
	36		
	37		
E100	38		

C13B7-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-494. "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

DAST 2 : Component Inspection

INFOID:000000013356728

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle sub motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	4	Not existed
2	3	Existed
2	4	Not existed
3	4	Not existed

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-146. "Removal and Installation"](#).

C13B8-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13B8-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356729

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B8-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B8-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-309. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356730

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B8-00" detected?

YES >> Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

DAST 1

C13B8-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000013356731

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B8-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13B8-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-310, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356732

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13B8-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356733

DTC DETECTION LOGIC

C13B8-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B8-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13B8-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-311, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356734

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13B8-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13B9-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356735

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B9-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> Malfunction of motor circuit is detected. The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force motor
- Steering force motor harness connector
- Motor circuit (between steering force control module and steering force motor) is open or short.
- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
 - CAUTION:**
 - Never drive the vehicle.**
2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B9-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-312, "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356736

1. CHECK THE MOTOR

Check the steering force motor. Refer to [STC-313, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

1. Disconnect steering force control module and steering force motor harness connector.
2. Check the continuity between control module harness connector and motor harness connector.

C13B9-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Steering force motor		Continuity
Connector	Terminal	Connector	Terminal	
M151	35	M153	1	Existed
	36		2	
	37		3	
M152	38	M154	5	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M151	35	Ground	Not existed
	36		
	37		
M152	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:0000000013356737

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.

2. Disconnect steering force motor harness connector.

3. Check the continuity between motor connector terminals.

Steering force motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	5	Not existed
2	3	Existed
2	5	Not existed
3	5	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000013356738

DTC DETECTION LOGIC

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13B9-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B9-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> Malfunction of motor circuit is detected. The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main motor
- Steering angle main motor harness connector
- Motor circuit (between steering angle main control module and steering angle main motor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Turn the steering wheel from full left stop to full right stop.
- Return the steering wheel to the straight-ahead position.
- Perform self-diagnosis for "DAST 1".

Is DTC "C13B9-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-314, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356739

1. CHECK THE MOTOR

Check the steering angle main motor. Refer to [STC-315, "DAST 1 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

- Disconnect steering angle main control module and steering angle main motor harness connector.
- Check the continuity between control module harness connector and motor harness connector.

Steering angle main control module		Steering angle main motor		Continuity
Connector	Terminal	Connector	Terminal	
E97	35	E88*1 E105*2	1	Existed
	36		3	
	37		2	
E98	38	E89	4	

*1: 2WD models

C13B9-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

*2: AWD models

- Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E97	35	Ground	Not existed
	36		
	37		
E98	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

- Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
- Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 1 : Component Inspection

INFOID:0000000013356740

1.CHECK THE MOTOR

- Turn the ignition switch OFF.
- Disconnect steering angle main motor harness connector.
- Check the continuity between motor connector terminals.

Steering angle main motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	4	Not existed
2	3	Existed
2	4	Not existed
3	4	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

DAST 2

DAST 2 : DTC Description

INFOID:0000000013356741

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B9-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> Malfunction of motor circuit is detected. The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle sub motor
- Steering angle sub motor harness connector
- Motor circuit (between steering angle sub control module and steering angle sub motor) is open or short.

C13B9-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Turn the steering wheel from full left stop to full right stop.
- Return the steering wheel to the straight-ahead position.
- Perform self-diagnosis for "DAST 2".

Is DTC "C13B9-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-316. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:0000000013356742

1.CHECK THE MOTOR

Check the steering angle sub motor. Refer to [STC-317. "DAST 2 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-146. "Removal and Installation"](#).

2.CHECK THE MOTOR CIRCUIT

- Disconnect steering angle sub control module and steering angle sub motor harness connector.
- Check the continuity between control module harness connector and motor harness connector.

Steering angle sub control module		Steering angle sub motor		Continuity
Connector	Terminal	Connector	Terminal	
E99	35	E90	1	Existed
	36		3	
	37		2	
E100	38	E91*1 E92*2	4	

*1: 2WD models

*2: AWD models

- Check the continuity between control module harness connector and ground.

C13B9-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle sub control module		—	Continuity
Connector	Terminal		
E99	35	Ground	Not existed
	36		
	37		
E100	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 2 : Component Inspection

INFOID:000000013356743

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.

2. Disconnect steering angle sub motor harness connector.

3. Check the continuity between motor connector terminals.

Steering angle sub motor		Continuity
Terminal		
1	2	Existed
1	3	Existed
1	4	Not existed
2	3	Existed
2	4	Not existed
3	4	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13BA-00 CONTROL MODULE POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13BA-00 CONTROL MODULE POWER SUPPLY

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356744

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BA-00	CONTROL MODULE POWER SUPPLY (Control module power supply)	Control module power supply is following condition. • Battery power supply ≤ 4 V

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fusible link
- Power supply circuit
- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

④ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13BA-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-318, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356745

1. CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	33	Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

2. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

C13BA-00 CONTROL MODULE POWER SUPPLY

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch ON.
2. Check the voltage between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 3.

3. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Check the 60A fusible link (#G).
3. Check the harness for open or short between steering force control module harness connector No.34 terminal and the 60A fusible link (#G).

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).
NO >> Repair or replace error-detected parts.

4. CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

INFOID:000000013356746

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BA-00	CONTROL MODULE POWER SUPPLY (Control module power supply)	Control module power supply is following condition. • Battery power supply \leq 4 V

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fusible link
- Power supply circuit
- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

C13BA-00 CONTROL MODULE POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13BA-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-320, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356747

1. CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	33	Ground	Existed
E28	39		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

2. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch ON.
2. Check the voltage between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Check the 100A fusible link (#J).
3. Check the harness for open or short between steering angle main control module harness connector No.34 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4. CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

C13BA-00 CONTROL MODULE POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 2

DAST 2 : DTC Description

INFOID:0000000013356748

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BA-00	CONTROL MODULE POWER SUPPLY (Control module power supply)	Control module power supply is following condition. • Battery power supply ≤ 4 V

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fusible link
- Power supply circuit
- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13BA-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-321, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:0000000013356749

1. CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	33	Ground	Existed
E31	39		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

2. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

C13BA-00 CONTROL MODULE POWER SUPPLY

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch ON.
2. Check the voltage between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 3.

3. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Check the 100A fusible link (#H).
3. Check the harness for open or short between steering angle sub control module harness connector No.34 terminal and the 100A fusible link (#H).

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).
NO >> Repair or replace error-detected parts.

4. CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

C13BB-00 CONTROL MODULE POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13BB-00 CONTROL MODULE POWER SUPPLY

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356750

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BB-00	CONTROL MODULE POWER SUPPLY (Control module power supply)	Control module power supply is following condition. • 20 V ≤ Battery power supply

POSSIBLE CAUSE

- Battery
- Power supply circuit
- Alternator
- Steering force control module

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13BB-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-323, "EPS/DAST 3 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356751

1. CHECK STEERING FORCE CONTROL MODULE SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "CONT MODULE INSIDE VOLT" and "BATTERY VOLTAGE".
3. Check the value

Monitor item	Standard value (Approx.)
CONT MODULE INSIDE VOLT	Battery voltage – 0.6 V
BATTERY VOLTAGE	Battery voltage

Is the inspection result normal?

- YES >> GO TO 5.
 NO >> GO TO 2.

2. CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between control module harness connector and ground.

C13BB-00 CONTROL MODULE POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		—	Continuity
Connector	Terminal		
M72	33	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch ON.
2. Check the voltage between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Check the 60A fusible link (#G).
3. Check the harness for open or short between steering force control module harness connector No.34 terminal and the 60A fusible link (#G).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

5.CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

INFOID:000000013356752

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BB-00	CONTROL MODULE POWER SUPPLY (Control module power supply)	Control module power supply is following condition. • 20 V ≤ Battery power supply

POSSIBLE CAUSE

- Battery
- Power supply circuit
- Alternator
- Steering angle main control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

C13BB-00 CONTROL MODULE POWER SUPPLY

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13BB-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-325, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356753

1. CHECK STEERING ANGLE MAIN CONTROL MODULE SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "CONT MODULE INSIDE VOLT" and "BATTERY VOLTAGE".
3. Check the value

Monitor item	Standard value (Approx.)
CONT MODULE INSIDE VOLT	Battery voltage – 0.6 V
BATTERY VOLTAGE	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 2.

2. CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	33	Ground	Existed
E28	39		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch ON.
2. Check the voltage between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

C13BB-00 CONTROL MODULE POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

4. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Check the 100A fusible link (#J).
3. Check the harness for open or short between steering angle main control module harness connector No.34 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

5. CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 2

DAST 2 : DTC Description

INFOID:000000013356754

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BB-00	CONTROL MODULE POWER SUPPLY (Control module power supply)	Control module power supply is following condition. • 20 V ≤ Battery power supply

POSSIBLE CAUSE

- Battery
- Power supply circuit
- Alternator
- Steering angle sub control module

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Perform self-diagnosis for "DAST 2".

Is DTC "C13BB-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-326, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356755

1. CHECK STEERING ANGLE SUB CONTROL MODULE SIGNAL

With CONSULT

C13BB-00 CONTROL MODULE POWER SUPPLY

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "DAST 2" >> "DATA MONITOR" >> "CONT MODULE INSIDE VOLT" and "BATTERY VOLTAGE".
3. Check the value

Monitor item	Standard value (Approx.)
CONT MODULE INSIDE VOLT	Battery voltage – 0.6 V
BATTERY VOLTAGE	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 2.

2.CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	33	Ground	Existed
E31	39		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch ON.
2. Check the voltage between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Check the 100A fusible link (#H).
3. Check the harness for open or short between steering angle sub control module harness connector No.34 terminal and the 100A fusible link (#H).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-20. "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

5.CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to [STC-494. "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

C13BC-00 CONTROL MODULE IGN POWER SUP

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13BC-00 CONTROL MODULE IGN POWER SUP

DTC Description

INFOID:000000013356756

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BC-00	CONTROL MODULE IGN POWER SUP (Control module ignition power supply)	The malfunction in control module ignition power supply circuit is detected

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fuse
- Ignition power supply circuit (open or short)
- Steering force control module
- Steering angle main control module
- Steering angle sub control module

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓜ With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3", "DAST 1" or "DAST 2".

Is DTC "C13BC-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-328, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000013356757

1. CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE MAIN CONTROL MODULE

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the voltage between steering angle main control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	0 V

4. Turn the ignition switch ON.
5. Check the voltage between steering angle control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

- YES >> GO TO 2.
 NO >> GO TO 3.

C13BC-00 CONTROL MODULE IGN POWER SUP

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

2. CHECK INTERMITTENT INCIDENT FOR STEERING ANGLE MAIN CONTROL MODULE

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

3. CHECK IGNITION POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between steering angle main control module harness connector and steering angle sub control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	25	E29	27	Existed

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

4. CHECK INTERNAL CIRCUIT IN STEERING ANGLE SUB CONTROL MODULE

Check the continuity between steering angle sub control module connector terminals.

Steering angle sub control module		Continuity
Terminal		
25	27	Existed

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

5. CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE SUB CONTROL MODULE

1. Check the voltage between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	0 V

2. Turn the ignition switch ON.
3. Check the voltage between steering angle control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

- YES >> GO TO 6.
NO >> GO TO 7.

6. CHECK INTERMITTENT INCIDENT FOR STEERING ANGLE SUB CONTROL MODULE

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

C13BC-00 CONTROL MODULE IGN POWER SUP

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace error-detected part.

7.CHECK IGNITION POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering angle sub control module harness connector and steering force control module harness connector.

Steering angle sub control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	25	M71	27	Existed

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

8.CHECK INTERNAL CIRCUIT IN STEERING FORCE CONTROL MODULE

Check the continuity between steering force control module connector terminals.

Steering force control module		Continuity
Terminal		
25	27	Existed

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

9.CHECK IGNITION POWER SUPPLY FOR STEERING FORCE CONTROL MODULE

1. Check the voltage between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	25	Ground	0 V

2. Turn the ignition switch ON.

3. Check the voltage between force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 11.

10.CHECK INTERMITTENT INCIDENT FOR STEERING FORCE CONTROL MODULE

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

11.CHECK IGNITION POWER SUPPLY CIRCUIT (3)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#12).
3. Check the harness for open or short between steering force control module harness connector No.25 terminal and the 10A fuse (#12).

Is the inspection result normal?

C13BC-00 CONTROL MODULE IGN POWER SUP

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-65. "VR30DDTT : Wiring Diagram - IGNITION POWER SUPPLY -"](#).
- NO >> Repair or replace error-detected parts.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13BD-00 CONTROL MODULE IGN POWER SUP

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13BD-00 CONTROL MODULE IGN POWER SUP

DAST 1

DAST 1 : DTC Description

INFOID:000000013356758

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BD-00	CONTROL MODULE IGN POWER SUP (Control module ignition power supply)	The malfunction in CAN wake up circuit is detected

POSSIBLE CAUSE

- Harness and connector
- CAN wake up circuit (open or short)
- Steering force control module
- Steering angle main control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3", "DAST 1" or "DAST 2".

Is DTC "C13BD-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-332. "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356759

1. CHECK CAN WAKE UP CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector and steering angle main control module harness connector.
3. Check the continuity between steering force control module harness connector and steering angle main control module harness connector.

Steering force control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	23	E26	23	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK STEERING ANGLE MAIN CONTROL MODULE SIGNAL

C13BD-00 CONTROL MODULE IGN POWER SUP

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

With CONSULT

1. Connect steering force control module harness connector and steering angle main control module harness connector. A
2. Turn the ignition switch ON.
3. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "SUB IGN VOLTAGE". B
4. Check the value

Monitor item	Standard value (Approx.)
SUB IGN VOLTAGE	Battery voltage

C

Is the inspection result normal?

YES >> GO TO 3. D

NO >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

3. PERFORM SELF-DIAGNOSIS FOR STEERING ANGLE MAIN CONTROL MODULE

With CONSULT

1. Turn the ignition switch OFF.
2. Connect steering angle main control module harness connector.
3. Turn the ignition switch ON. F
4. Erase self-diagnosis for "DAST 1".
5. Turn the ignition switch OFF and wait for at least 10 seconds.
6. Start the engine.

CAUTION:

Never drive the vehicle.

7. Perform self-diagnosis for "DAST 1". H

Is DTC "C13BD-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

- NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#). I
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13BE-00 - C13C4-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13BE-00 - C13C4-00 FLEXRAY COMMUNICATION

DTC Description

INFOID:000000013356760

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BE-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected when the system is starting.
C13BF-00	FLEXRAY COMMUNICATION (FlexRay communication)	<ul style="list-style-type: none"> The malfunction in FlexRay communication between control modules is detected. The malfunction status of other control module is detected.
C13C0-00	FLEXRAY COMMUNICATION (FlexRay communication)	<ul style="list-style-type: none"> The malfunction in FlexRay communication between control modules is detected. The malfunction status of other control module is detected.
C13C1-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected.
C13C2-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected.
C13C3-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected.
C13C4-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction of synchronization in FlexRay communication between control modules is detected.

POSSIBLE CAUSE

- FlexRay communication circuit (open or short)
- Steering force control module
- Steering angle main control module
- Steering angle sub control module
- Battery power supply circuit (open or short)
- Ignition power supply circuit (open or short)
- Harness connector

FAIL-SAFE

DTC	Fail-safe mode
C13BE-00	Mode 2
C13BF-00	Variable
C13C0-00	Mode 2 or Mode 3
C13C1-00	Mode 1, Mode 2 or Mode 3 ^{*1}
C13C2-00	Mode 1, Mode 2 or Mode 3 ^{*1}
C13C3-00	Mode 1, Mode 2 or Mode 3 ^{*1}
C13C4-00	Mode 2 ^{*2}

*1: When DTC is detected in steering angle main control module, fail-safe mode is Mode 2.

*1: When DTC is detected in steering angle main control module, fail-safe mode is Mode 1 or Mode 3.

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

C13BE-00 - C13C4-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for “EPS/DAST 3”, “DAST 1” or “DAST 2”.

Is DTC “C13BE-00” – “C13C4-00” detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-335, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013356761

1. CHECK FLEXRAY COMMUNICATION CIRCUIT

- Turn the ignition switch OFF.
- Disconnect each control module harness connector.
- Check the continuity between each control module harness connector.

Steering force control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	19	E26	19	Existed
	20		20	

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	19	E29	19	Existed
	20		20	

Steering force control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	19	E29	19	Existed
	20		20	

4. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	19	Ground	Not existed
	20		

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	19	Ground	Not existed
	20		

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	19	Ground	Not existed
	20		

Is the inspection result normal?

C13BE-00 - C13C4-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 2.
NO >> Repair or replace error-detected part.

2.CHECK STEERING FORCE CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the voltage between steering force control module harness connector and ground.

Steering force control module		—	Voltage (Approx.)
Connector	Terminal		
M72	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 3.

3.CHECK STEERING FORCE CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 60A fusible link (#G).
2. Check the harness for open or short between steering force control module harness connector No.34 terminal and the 60A fusible link (#G).

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20. "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).
NO >> Repair or replace error-detected parts.

4.CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Disconnect steering angle main control module harness connector.
2. Check the voltage between steering angle main control module harness connector and ground.

Steering angle main control module		—	Voltage (Approx.)
Connector	Terminal		
E27	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

- YES >> GO TO 6.
NO >> GO TO 5.

5.CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#J).
2. Check the harness for open or short between steering angle main control module harness connector No.34 terminal and the 100A fusible link (#J).

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20. "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).
NO >> Repair or replace error-detected parts.

6.CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Disconnect steering angle sub control module harness connector.
2. Check the voltage between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Voltage (Approx.)
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

- YES >> GO TO 8.
NO >> GO TO 7.

7.CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (2)

C13BE-00 - C13C4-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Check the 100A fusible link (#H).
2. Check the harness for open or short between steering angle sub control module harness connector No.34 terminal and the 100A fusible link (#H).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

8.CHECK IGNITION POWER SUPPLY CIRCUIT

Check ignition power supply circuit. Refer to [STC-328, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

9.CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module, steering angle sub control module and steering force control module. Refer to [STC-493, "Removal and Installation"](#), [STC-494, "Removal and Installation"](#) and [STC-492, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

C13C5-00 STEERING ANGLE SENSOR SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13C5-00 STEERING ANGLE SENSOR SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356762

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C5-00	STEERING ANGLE SENSOR SIGNAL (Steering angle sensor signal)	Malfunction is detected in steering angle sensor signal that is output from steering angle sensor for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Steering force control module
- Steering angle sensor

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C5-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-338, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356763

1. PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-72, "DTC Index"](#).

NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C5-00" detected?

YES >> GO TO 3.

C13C5-00 STEERING ANGLE SENSOR SIGNAL

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- NO >> • Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

3. CHECK TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector and then check steering force control module pin terminals for damage or loose connection with harness connector.
3. Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13C6-00 G SENSOR SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356764

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C6-00	G SENSOR SIGNAL (G sensor signal)	Malfunction is detected in G sensor signal that is output from ABS actuator and electric unit (control unit) for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Steering force control module
- ABS actuator and electric unit (control unit)

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C6-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-340, "EPS/DAST 3 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356765

1. PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-72, "DTC Index"](#).
 NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C6-00" detected?

- YES >> GO TO 3.

C13C6-00 G SENSOR SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

- NO >> • Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

3.CHECK TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector and then check steering force control module pin terminals for damage or loose connection with harness connector.
3. Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13C7-00 VEHICLE SPEED SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13C7-00 VEHICLE SPEED SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356766

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C7-00	VEHICL SPEED SIGNAL (Vehicle speed signal)	Malfunction is detected in vehicle speed signal (ABS) that is output from ABS actuator and electric unit (control unit) for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Steering force control module
- ABS actuator and electric unit (control unit)

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C7-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-342, "EPS/DAST 3 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356767

1. PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-72, "DTC Index"](#).
NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C7-00" detected?

C13C7-00 VEHICLE SPEED SIGNAL

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 3.

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

3.CHECK TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector and then check steering force control module pin terminals for damage or loose connection with harness connector.
3. Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13C9-00 DRIVE MODE SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356768

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C9-00	DRIVE MODE SIGNAL (Drive mode signal)	Malfunction is detected in drive mode signal that is output from chassis control module for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Steering force control module
- Chassis control module

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C9-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-344, "EPS/DAST 3 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356769

1. PERFORM CHASSIS CONTROL MODULE SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "CHASSIS CONTROL".

Is any DTC detected?

- YES >> Check the DTC. Refer to [DAS-550, "DTC Index"](#).
 NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C9-00" detected?

- YES >> GO TO 3.
 NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
 • Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

3. CHECK TERMINAL

C13C9-00 DRIVE MODE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector and then check steering force control module pin terminals for damage or loose connection with harness connector.
3. Disconnect chassis control module harness connector and then check chassis control module pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13CA-00 ENGINE STATUS SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13CA-00 ENGINE STATUS SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356770

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13CA-00	ENGINE STATUS SIGNAL (Engine status signal)	Malfunction is detected in engine status signal that is output from ECM for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Steering force control module
- ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13CA-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-346, "EPS/DAST 3 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356771

1.PERFORM ECM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "ENGINE".

Is any DTC detected?

- YES >> Check the DTC. Refer to [EC6-164, "TURBO HIGH PRESSURE MODEL : DTC Index"](#) (For USA and CANADA), [EC6-1139, "DTC Index"](#) (For MEXICO).
NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13CA-00" detected?

- YES >> GO TO 3.
NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

3.CHECK TERMINAL

C13CA-00 ENGINE STATUS SIGNAL

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector and then check steering force control module pin terminals for damage or loose connection with harness connector.
3. Disconnect ECM harness connector and then check ECM pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13CC-00 T/M GEAR POSI SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13CC-00 T/M GEAR POSI SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356772

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13CC-00	T/M GEAR POSI SIGNAL (T/M gear position signal)	Malfunction is detected in shift position signal that is output from TCM for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Steering force control module
- TCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13CC-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-348, "EPS/DAST 3 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356773

1.PERFORM TCM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "TRANSMISSION".

Is any DTC detected?

- YES >> Check the DTC. Refer to [TM-111, "VR30DDTT : DTC Index"](#).
NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13CC-00" detected?

- YES >> GO TO 3.
NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

3.CHECK TERMINAL

C13CC-00 T/M GEAR POSI SIGNAL

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector and then check steering force control module pin terminals for damage or loose connection with harness connector.
3. Disconnect TCM harness connector and then check TCM pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13CD-00 ENGINE SPEED SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13CD-00 ENGINE SPEED SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356774

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13CD-00	ENGINE SPEED SIGNAL (Engine speed signal)	Malfunction is detected in engine speed signal that is output from ECM for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Steering force control module
- ECM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13CD-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-350, "EPS/DAST 3 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356775

1.PERFORM ECM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "ENGINE".

Is any DTC detected?

- YES >> Check the DTC. Refer to [EC6-164, "TURBO HIGH PRESSURE MODEL : DTC Index"](#) (For USA and CANADA), [EC6-1139, "DTC Index"](#) (For MEXICO).
NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13CD-00" detected?

- YES >> GO TO 3.
NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

3.CHECK TERMINAL

C13CD-00 ENGINE SPEED SIGNAL

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector and then check steering force control module pin terminals for damage or loose connection with harness connector.
3. Disconnect ECM harness connector and then check ECM pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13CE-00 SLEEP/WAKE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13CE-00 SLEEP/WAKE SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356776

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13CE-00	SLEEP WAKE UP SIGNAL (Sleep wake up signal)	Malfunction is detected in sleep wake up signal that is output from BCM for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Steering force control module
- BCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13CE-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-352, "EPS/DAST 3 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356777

1.PERFORM BCM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "BCM".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BCS-63, "DTC Index"](#).
NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13CE-00" detected?

- YES >> GO TO 3.
NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

3.CHECK TERMINAL

C13CE-00 SLEEP/WAKE SIGNAL

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector and then check steering force control module pin terminals for damage or loose connection with harness connector.
3. Disconnect BCM harness connector and then check BCM pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13CF-00 ALC FUNCTION REQUEST SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13CF-00 ALC FUNCTION REQUEST SIGNAL

DAST 1

DAST 1 : DTC Description

INFOID:000000013356778

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13CF-00	ALC FUNCTION REQUEST SIGNAL (Active lane control function request signal)	Malfunction is detected in Active lane control signal A that is output from chassis control module for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (Chassis communication line)
- Steering angle main control module
- Chassis control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 1".

Is DTC "C13CF-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-354, "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356779

1.PERFORM CHASSIS CONTROL MODULE SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "CHASSIS CONTROL".

Is any DTC detected?

- YES >> Check the DTC. Refer to [DAS-550, "DTC Index"](#).
NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "DAST 1".

Is DTC "C13CF-00" detected?

- YES >> GO TO 3.
NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

3.CHECK TERMINAL

C13CF-00 ALC FUNCTION REQUEST SIGNAL

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector and then check steering angle main control module pin terminals for damage or loose connection with harness connector.
3. Disconnect chassis control module harness connector and then check chassis control module pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to [STC-493. "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13D0-00 ALC FUNCTION REQUEST SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13D0-00 ALC FUNCTION REQUEST SIGNAL

DAST 1

DAST 1 : DTC Description

INFOID:000000013356780

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D0-00	ALC FUNCTION REQUEST SIGNAL (Active lane control function request signal)	Malfunction is detected in active lane control signal B that is output from chassis control module for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (Chassis communication line)
- Steering angle main control module
- Chassis control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 1".

Is DTC "C13D0-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-356, "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356781

1.PERFORM CHASSIS CONTROL MODULE SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "CHASSIS CONTROL".

Is any DTC detected?

- YES >> Check the DTC. Refer to [DAS-550, "DTC Index"](#).
NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "DAST 1".

Is DTC "C13D0-00" detected?

- YES >> GO TO 3.
NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

3.CHECK TERMINAL

C13D0-00 ALC FUNCTION REQUEST SIGNAL

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector and then check steering angle main control module pin terminals for damage or loose connection with harness connector.
3. Disconnect chassis control module harness connector and then check chassis control module pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to [STC-493. "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13D1-00 STEERING ANGLE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13D1-00 STEERING ANGLE SIGNAL

DAST 1

DAST 1 : DTC Description

INFOID:000000013356782

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D1-00	STEERING ANGLE SENSOR SIGNAL (Steering angle sensor signal)	Malfunction is detected in steering angle sensor signal (received from steering angle sensor) that is output from chassis control module for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (Chassis communication line)
- Steering angle main control module
- Chassis control module
- Steering angle sensor

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

④ With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 1".

Is DTC "C13D1-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-358, "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356783

1. PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

④ With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-72, "DTC Index"](#).
NO >> GO TO 2.

2. PERFORM CHASSIS CONTROL MODULE SELF-DIAGNOSIS

④ With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "CHASSIS CONTROL".

Is any DTC detected?

- YES >> Check the DTC. Refer to [DAS-550, "DTC Index"](#).
NO >> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

④ With CONSULT

1. Turn the ignition switch ON.

C13D1-00 STEERING ANGLE SIGNAL

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "DAST 1".

Is DTC "C13D1-00" detected?

YES >> GO TO 4.

- NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

4. CHECK TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector and then check steering angle main control module pin terminals for damage or loose connection with harness connector.
3. Disconnect chassis control module harness connector and then check chassis control module pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13D2-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356784

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D2-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D2-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-360, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356785

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D2-00" detected?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 1

C13D2-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000013356786

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D2-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13D2-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-361, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356787

1. PERFORM SELF-DIAGNOSIS

With CONSULT

- Turn the ignition switch ON.
- Erase self-diagnosis for "DAST 1".
- Turn the ignition switch OFF and wait for at least 10 seconds.
- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13D2-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356788

DTC DETECTION LOGIC

C13D2-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D2-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13D2-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-362, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356789

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13D2-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

- Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13D3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13D3-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356790

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D3-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-363. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356791

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D3-00" detected?

YES >> Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

DAST 1

C13D3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000013356792

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D3-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13D3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-364, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356793

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13D3-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356794

DTC DETECTION LOGIC

C13D3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D3-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13D3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-365, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356795

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13D3-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

- Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13D4-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356796

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D4-00	CONTROL MODULE (Control module)	The malfunction in each motor angle sensor is detected.

POSSIBLE CAUSE

- Force motor angle sensor
- Sensor circuit (between steering force control module and force motor angle sensor) is open or short.
- Steering force control module

FAIL-SAFE

- Mode 1 or Mode 2

NOTE:

For details of fail-safe, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D4-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-366, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356797

1. CHECK THE ANGLE SENSOR

Check the force motor angle sensor. Refer to [STC-367, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Force motor angle sensor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

2. CHECK THE SENSOR CIRCUIT

1. Disconnect steering force control module and force motor angle sensor harness connector.
2. Check the continuity between control module harness connector and angle sensor harness connector.

C13D4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Force motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
M71	10	M73	1	Existed
	11		5	
	6		4	
	5		8	
	4		2	
	2		6	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	10	Ground	Not existed
	11		
	6		
	5		
	4		
	2		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:000000013356798

1.CHECK THE ANGLE SENSOR

1. Turn the ignition switch OFF.

2. Disconnect force motor angle sensor harness connector.

3. Check continuity between motor angle sensor connector terminals.

Force motor angle sensor		Continuity
Terminal		
1	2	Not existed
1	4	Not existed
1	5	Existed
1	6	Not existed
1	8	Not existed
2	4	Not existed
2	5	Not existed
2	6	Existed
2	8	Not existed
4	5	Not existed

C13D4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Force motor angle sensor		Continuity
Terminal		
4	6	Not existed
4	8	Existed
5	6	Not existed
5	8	Not existed
6	8	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Force motor angle sensor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000013356799

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D4-00	CONTROL MODULE (Control module)	The malfunction in each motor angle sensor is detected.

POSSIBLE CAUSE

- Main motor angle sensor
- Sensor circuit (between steering angle main control module and main motor angle sensor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For details of fail-safe, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
3. Perform self-diagnosis for "DAST 1".

Is DTC "C13D4-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-368, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356800

1. CHECK THE ANGLE SENSOR

Check the main motor angle sensor. Refer to [STC-369, "DAST 1 : Component Inspection"](#).

C13D4-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 2.

NO >> Main motor angle sensor is malfunction. Replace steering gear assembly. Refer to [ST-146](#), "[Removal and Installation](#)".

2.CHECK THE SENSOR CIRCUIT

1. Disconnect steering angle main control module and main motor angle sensor harness connector.
2. Check the continuity between control module harness connector and angle sensor harness connector.

Steering angle main control module		Main motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	10	E93	3	Existed
	11		6	
	6		1	
	5		5	
	4		2	
	2		4	

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	10	Ground	Not existed
	11		
	6		
	5		
	4		
	2		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42](#), "[How to Check Terminal](#)".
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45](#), "[Intermittent Incident](#)".

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493](#), "[Removal and Installation](#)".

NO >> Repair or replace error-detected part.

DAST 1 : Component Inspection

INFOID:0000000013356801

1.CHECK THE ANGLE SENSOR

1. Turn the ignition switch OFF.
2. Disconnect main motor angle sensor harness connector.
3. Check continuity between motor angle sensor connector terminals.

Main motor angle sensor		Continuity
Terminal		
1	2	Not existed
1	3	Not existed
1	4	Not existed
1	5	Existed

C13D4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Main motor angle sensor		Continuity
Terminal		
1	6	Not existed
2	3	Not existed
2	4	Existed
2	5	Not existed
2	6	Not existed
3	4	Not existed
3	5	Not existed
3	6	Existed
4	5	Not existed
4	6	Not existed
5	6	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Main motor angle sensor is malfunction. Replace steering gear assembly. Refer to [ST-146](#), "[Removal and Installation](#)".

DAST 2

DAST 2 : DTC Description

INFOID:000000013356802

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D4-00	CONTROL MODULE (Control module)	The malfunction in each motor angle sensor is detected.

POSSIBLE CAUSE

- Sub motor angle sensor
- Sensor circuit (between steering angle sub control module and sub motor angle sensor) is open or short.
- Steering sub control module

FAIL-SAFE

- Mode 2

NOTE:

For details of fail-safe, refer to [STC-125](#), "[DIRECT ADAPTIVE STEERING : Fail-safe](#)".

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ **With CONSULT**

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Perform self-diagnosis for "DAST 2".

Is DTC "C13D4-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-371](#), "[DAST 2 : Diagnosis Procedure](#)".

C13D4-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356803

1.CHECK THE ANGLE SENSOR

Check the sub motor angle sensor. Refer to [STC-371, "DAST 2 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Sub motor angle sensor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

2.CHECK THE SENSOR CIRCUIT

1. Disconnect steering angle sub control module and sub motor angle sensor harness connector.
2. Check the continuity between control module harness connector and angle sensor harness connector.

Steering angle sub control module		Sub motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
E29	10	E94	3	Existed
	11		6	
	6		1	
	5		5	
	4		2	
	2		4	

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	10	Ground	Not existed
	11		
	6		
	5		
	4		
	2		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 2 : Component Inspection

INFOID:000000013356804

1.CHECK THE ANGLE SENSOR

1. Turn the ignition switch OFF.
2. Disconnect sub motor angle sensor harness connector.
3. Check continuity between motor angle sensor connector terminals.

C13D4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Sub motor angle sensor		Continuity
Terminal		
1	2	Not existed
1	3	Not existed
1	4	Not existed
1	5	Existed
1	6	Not existed
2	3	Not existed
2	4	Existed
2	5	Not existed
2	6	Not existed
3	4	Not existed
3	5	Not existed
3	6	Existed
4	5	Not existed
4	6	Not existed
5	6	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Sub motor angle sensor is malfunction. Replace steering gear assembly. Refer to [ST-146](#).
["Removal and Installation"](#).

C13D5-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13D5-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356805

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D5-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D5-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-373. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356806

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D5-00" detected?

YES >> Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

DAST 1

C13D5-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000013356807

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D5-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Perform self-diagnosis for "DAST 1".

Is DTC "C13D5-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-374, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356808

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13D5-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356809

DTC DETECTION LOGIC

C13D5-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D5-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Perform self-diagnosis for "DAST 2".

Is DTC "C13D5-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-375, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356810

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13D5-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13D6-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356811

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D6-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The internal malfunction in control module is detected. The malfunction in each motor angle sensor is detected.

POSSIBLE CAUSE

- Force motor angle sensor
- Sensor circuit (between steering force control module and force motor angle sensor) is open or short.
- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D6-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-376, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356812

1. CHECK THE ANGLE SENSOR

Check the force motor angle sensor. Refer to [STC-377, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Force motor angle sensor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

2. CHECK THE SENSOR CIRCUIT

1. Disconnect steering force control module and force motor angle sensor harness connector.
2. Check the continuity between control module harness connector and angle sensor harness connector.

C13D6-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Force motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
M71	10	M73	1	Existed
	11		5	
	6		4	
	5		8	
	4		2	
	2		6	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	10	Ground	Not existed
	11		
	6		
	5		
	4		
	2		

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
- NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:000000013356813

1.CHECK THE ANGLE SENSOR

1. Turn the ignition switch OFF.
2. Disconnect force motor angle sensor harness connector.
3. Check continuity between motor angle sensor connector terminals.

Force motor angle sensor		Continuity
Terminal		
1	2	Not existed
1	4	Not existed
1	5	Existed
1	6	Not existed
1	8	Not existed
2	4	Not existed
2	5	Not existed
2	6	Existed
2	8	Not existed
4	5	Not existed

C13D6-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Force motor angle sensor		Continuity
Terminal		
4	6	Not existed
4	8	Existed
5	6	Not existed
5	8	Not existed
6	8	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Force motor angle sensor is malfunction. Replace steering column assembly. Refer to [ST-135](#), "[Removal and Installation](#)".

DAST 1

DAST 1 : DTC Description

INFOID:000000013356814

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D6-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The internal malfunction in control module is detected. The malfunction in each motor angle sensor is detected.

POSSIBLE CAUSE

- Main motor angle sensor
- Sensor circuit (between steering angle main control module and main motor angle sensor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125](#), "[DIRECT ADAPTIVE STEERING : Fail-safe](#)".

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13D6-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-378](#), "[DAST 1 : Diagnosis Procedure](#)".

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45](#), "[Intermittent Incident](#)".

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356815

1. CHECK THE ANGLE SENSOR

Check the main motor angle sensor. Refer to [STC-379](#), "[DAST 1 : Component Inspection](#)".

Is the inspection result normal?

C13D6-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 2.

NO >> Main motor angle sensor is malfunction. Replace steering gear assembly. Refer to [ST-146](#), "[Removal and Installation](#)".

2.CHECK THE SENSOR CIRCUIT

1. Disconnect steering angle main control module and main motor angle sensor harness connector.
2. Check the continuity between control module harness connector and angle sensor harness connector.

Steering angle main control module		Main motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	10	E93	3	Existed
	11		6	
	6		1	
	5		5	
	4		2	
	2		4	

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	10	Ground	Not existed
	11		
	6		
	5		
	4		
	2		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42](#), "[How to Check Terminal](#)".
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45](#), "[Intermittent Incident](#)".

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493](#), "[Removal and Installation](#)".

NO >> Repair or replace error-detected part.

DAST 1 : Component Inspection

INFOID:0000000013356816

1.CHECK THE ANGLE SENSOR

1. Turn the ignition switch OFF.
2. Disconnect main motor angle sensor harness connector.
3. Check continuity between motor angle sensor connector terminals.

Main motor angle sensor		Continuity
Terminal		
1	2	Not existed
1	3	Not existed
1	4	Not existed
1	5	Existed
1	6	Not existed

C13D6-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Main motor angle sensor		Continuity
Terminal		
2	3	Not existed
2	4	Existed
2	5	Not existed
2	6	Not existed
3	4	Not existed
3	5	Not existed
3	6	Existed
4	5	Not existed
4	6	Not existed
5	6	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Main motor angle sensor is malfunction. Replace steering gear assembly. Refer to [ST-146](#), "[Removal and Installation](#)".

DAST 2

DAST 2 : DTC Description

INFOID:0000000013356817

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D6-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The internal malfunction in control module is detected. The malfunction in each motor angle sensor is detected.

POSSIBLE CAUSE

- Sub motor angle sensor
- Sensor circuit (between steering angle sub control module and sub motor angle sensor) is open or short.
- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125](#), "[DIRECT ADAPTIVE STEERING : Fail-safe](#)".

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 2".

Is DTC "C13D6-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-381](#), "[DAST 2 : Diagnosis Procedure](#)".

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45](#), "[Intermittent Incident](#)".

NO-2 >> Confirmation after repair: INSPECTION END

C13D6-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

DAST 2 : Diagnosis Procedure

INFOID:000000013356818

1.CHECK THE ANGLE SENSOR

Check the sub motor angle sensor. Refer to [STC-381, "DAST 2 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Sub motor angle sensor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

2.CHECK THE SENSOR CIRCUIT

1. Disconnect steering angle sub control module and sub motor angle sensor harness connector.
2. Check the continuity between control module harness connector and angle sensor harness connector.

Steering angle sub control module		Sub motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
E29	10	E94	3	Existed
	11		6	
	6		1	
	5		5	
	4		2	
	2		4	

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	10	Ground	Not existed
	11		
	6		
	5		
	4		
	2		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 2 : Component Inspection

INFOID:000000013356819

1.CHECK THE ANGLE SENSOR

1. Turn the ignition switch OFF.
2. Disconnect sub motor angle sensor harness connector.
3. Check continuity between motor angle sensor connector terminals.

C13D6-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Sub motor angle sensor		Continuity
Terminal		
1	2	Not existed
1	3	Not existed
1	4	Not existed
1	5	Existed
1	6	Not existed
2	3	Not existed
2	4	Existed
2	5	Not existed
2	6	Not existed
3	4	Not existed
3	5	Not existed
3	6	Existed
4	5	Not existed
4	6	Not existed
5	6	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Sub motor angle sensor is malfunction. Replace steering gear assembly. Refer to [ST-146](#).
["Removal and Installation"](#).

C13D7-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13D7-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356820

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D7-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-383. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356821

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D7-00" detected?

YES >> Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

DAST 1

C13D7-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000013356822

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D7-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13D7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-384, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356823

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13D7-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356824

DTC DETECTION LOGIC

C13D7-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D7-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13D7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-385, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356825

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13D7-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

- Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13D8-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13D8-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356826

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D8-00	CONTROL MODULE (Control module)	The malfunction in each motor angle sensor is detected.

POSSIBLE CAUSE

- Force motor angle sensor
- Sensor circuit (between steering force control module and force motor angle sensor) is open or short.
- Steering force control module

DTC CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Turn the ignition switch OFF and wait for at least 10 seconds.
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D8-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-386, "EPS/DAST 3 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356827

1. CHECK THE ANGLE SENSOR

Check the force motor angle sensor. Refer to [STC-387, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
 NO >> Force motor angle sensor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

2. CHECK THE SENSOR CIRCUIT

1. Disconnect steering force control module and force motor angle sensor harness connector.
2. Check the continuity between control module harness connector and angle sensor harness connector.

Steering force control module		Force motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
M71	10	M73	1	Existed
	11		5	
	6		4	
	5		8	
	4		2	
	2		6	

3. Check the continuity between control module harness connector and ground.

C13D8-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		—	Continuity
Connector	Terminal		
M71	10	Ground	Not existed
	11		
	6		
	5		
	4		
	2		

A
B
C
D

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

E
F

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).
- NO >> Repair or replace error-detected part.

STC

EPS/DAST 3 : Component Inspection

INFOID:0000000013356828

1.CHECK THE ANGLE SENSOR

H

1. Turn the ignition switch OFF.
2. Disconnect force motor angle sensor harness connector.
3. Check continuity between motor angle sensor connector terminals.

I

Force motor angle sensor		Continuity
Terminal		
1	2	Not existed
1	4	Not existed
1	5	Existed
1	6	Not existed
1	8	Not existed
2	4	Not existed
2	5	Not existed
2	6	Existed
2	8	Not existed
4	5	Not existed
4	6	Not existed
4	8	Existed
5	6	Not existed
5	8	Not existed
6	8	Not existed

J
K
L
M
N
O
P

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Force motor angle sensor is malfunction. Replace steering column assembly. Refer to [ST-135. "Removal and Installation"](#).

DAST 1

C13D8-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000013356829

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D8-00	CONTROL MODULE (Control module)	The malfunction in each motor angle sensor is detected.

POSSIBLE CAUSE

- Main motor angle sensor
- Sensor circuit (between steering angle main control module and main motor angle sensor) is open or short.
- Steering angle main control module

DTC CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Turn the ignition switch OFF and wait for at least 10 seconds.
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. Perform self-diagnosis for "DAST 1".

Is DTC "C13D8-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-388, "DAST 1 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356830

1. CHECK THE ANGLE SENSOR

Check the main motor angle sensor. Refer to [STC-389, "DAST 1 : Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
 NO >> Main motor angle sensor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

2. CHECK THE SENSOR CIRCUIT

1. Disconnect steering angle main control module and main motor angle sensor harness connector.
2. Check the continuity between control module harness connector and angle sensor harness connector.

Steering angle main control module		Main motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	10	E93	3	Existed
	11		6	
	6		1	
	5		5	
	4		2	
	2		4	

3. Check the continuity between control module harness connector and ground.

C13D8-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	10	Ground	Not existed
	11		
	6		
	5		
	4		
	2		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).

2. Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493. "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 1 : Component Inspection

INFOID:0000000013356831

1.CHECK THE ANGLE SENSOR

1. Turn the ignition switch OFF.

2. Disconnect main motor angle sensor harness connector.

3. Check continuity between motor angle sensor connector terminals.

Main motor angle sensor		Continuity
Terminal		
1	2	Not existed
1	3	Not existed
1	4	Not existed
1	5	Existed
1	6	Not existed
2	3	Not existed
2	4	Existed
2	5	Not existed
2	6	Not existed
3	4	Not existed
3	5	Not existed
3	6	Existed
4	5	Not existed
4	6	Not existed
5	6	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Main motor angle sensor is malfunction. Replace steering gear assembly. Refer to [ST-146. "Removal and Installation"](#).

C13D9-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13D9-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356832

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D9-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force control module

DTC CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Turn the ignition switch OFF and wait for at least 10 seconds.
Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D9-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-390, "EPS/DAST 3 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356833

1. PERFORM SELF-DIAGNOSIS

Ⓟ With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D9-00" detected?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
 NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
 • Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000013356834

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D9-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

C13D9-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

DTC CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF and wait for at least 10 seconds.
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. Perform self-diagnosis for "DAST 1".

Is DTC "C13D9-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-391, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356835

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13D9-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

- Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13DB-00 STEERING TORQUE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13DB-00 STEERING TORQUE SENSOR

DAST 1

DAST 1 : DTC Description

INFOID:000000013356836

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13DB-00	STEERING TORQUE SENSOR (Steering torque sensor)	The signal voltage of steering torque sensor is following condition for 1 second or more continuously. <ul style="list-style-type: none"> Main signal voltage < 0.3 V, 4.7 V < Main signal voltage Sub signal voltage < 0.3 V, 4.7 V < Sub signal voltage

POSSIBLE CAUSE

- Steering torque sensor
- Sensor circuit (between steering angle main control module and steering torque sensor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 3 (When control module detects a malfunction at startup.)
- Mode 2 (When control module detects a malfunction except during startup.)

NOTE:

For details of fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.
NOTE:
Never drive the vehicle.
- Turn the steering wheel.
- Perform self-diagnosis for "DAST 1".

Is DTC "C13DB-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-392. "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356837

1. CHECK TORQUE SENSOR POWER SUPPLY CIRCUIT

With CONSULT

- Turn the ignition switch ON.
- On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "TORQUE SEN VOLTAGE".
- Check the value

Monitor item	Standard value (Approx.)
TORQUE SEN VOLTAGE	4.5 – 5.5 V

Is the inspection result normal?

YES >> GO TO 2.

C13DB-00 STEERING TORQUE SENSOR

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

2.CHECK TORQUE SENSOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	32	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK TORQUE SENSOR SIGNAL

 With CONSULT

1. Connect steering angle main control module harness connector.
2. Start the engine.
CAUTION:
Never drive the vehicle.
3. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "TORQUE SEN MAIN 2", and "TORQUE SEN SUB".
4. Check the value

Monitor item	Condition	Standard value (Approx.)
TORQUE SEN MAIN 2	Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
	Steering wheel: Right turn	Approx. 1.4 - 2.5 V
	Steering wheel: Left turn	Approx. 2.5 - 3.6 V
TORQUE SEN SUB	Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
	Steering wheel: Right turn	Approx. 1.4 - 2.5 V
	Steering wheel: Left turn	Approx. 2.5 - 3.6 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK TORQUE SENSOR CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Disconnect steering torque sensor harness connector.
4. Check the continuity between steering angle main control module harness connector and steering torque sensor harness connector.

Steering angle main control module		Steering torque sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	8	E95	2	Existed
	1		4	
	3		3	
	7		1	

5. Check the continuity between control module harness connector and ground.

C13DB-00 STEERING TORQUE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	8	Ground	Not existed
	1		
	3		
	7		

Is the inspection result normal?

YES >> Torque sensor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

C13DC-00 STEERING TORQUE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13DC-00 STEERING TORQUE SENSOR

DAST 1

DAST 1 : DTC Description

INFOID:0000000013356838

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13DC-00	STEERING TORQUE SENSOR (Steering torque sensor)	The signal voltage of steering torque sensor is following condition for 1 second or more continuously. <ul style="list-style-type: none">• Main signal voltage + Sub signal voltage < 4.75 V• 5.25 V < Main signal voltage + Sub signal voltage

POSSIBLE CAUSE

- Steering torque sensor
- Sensor circuit (between steering angle main control module and steering torque sensor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 3 (When control module detects a malfunction at startup.)
- Mode 2 (When control module detects a malfunction except during startup.)

NOTE:

For details of fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

NOTE:

Never drive the vehicle.

2. Turn the steering wheel.
3. Perform self-diagnosis for "DAST 1".

Is DTC "C13DC-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-395. "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:0000000013356839

1. CHECK TORQUE SENSOR POWER SUPPLY CIRCUIT

With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "TORQUE SEN VOLTAGE".
3. Check the value

Monitor item	Standard value (Approx.)
TORQUE SEN VOLTAGE	4.5 – 5.5 V

Is the inspection result normal?

YES >> GO TO 2.

C13DC-00 STEERING TORQUE SENSOR

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20. "VR30DDTT: Wiring Diagram - BATTERY POWER SUPPLY -"](#).

2. CHECK TORQUE SENSOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	32	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK TORQUE SENSOR SIGNAL

 With CONSULT

1. Connect steering angle main control module harness connector.
2. Start the engine.
CAUTION:
Never drive the vehicle.
3. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "TORQUE SEN MAIN 2", and "TORQUE SEN SUB".
4. Check the value

Monitor item	Condition	Standard value (Approx.)
TORQUE SEN MAIN 2	Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
	Steering wheel: Right turn	Approx. 1.4 - 2.5 V
	Steering wheel: Left turn	Approx. 2.5 - 3.6 V
TORQUE SEN SUB	Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
	Steering wheel: Right turn	Approx. 1.4 - 2.5 V
	Steering wheel: Left turn	Approx. 2.5 - 3.6 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. CHECK TORQUE SENSOR CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Disconnect steering torque sensor harness connector.
4. Check the continuity between steering angle main control module harness connector and steering torque sensor harness connector.

Steering angle main control module		Steering torque sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	8	E95	2	Existed
	1		4	
	3		3	
	7		1	

5. Check the continuity between steering torque sensor connector terminals.

C13DC-00 STEERING TORQUE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering torque sensor		Continuity
Terminal		
3	4	Not existed

6. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	8	Ground	Not existed
	1		
	3		
	7		

Is the inspection result normal?

YES >> Torque sensor is malfunction. Replace steering gear assembly. Refer to [ST-146. "Removal and Installation"](#).

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5.CHECK INTERMITTENT INCIDENT

- Turn the ignition switch OFF.
- Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).
- Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493. "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

C13DD-00 STEERING TORQUE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13DD-00 STEERING TORQUE SENSOR

DAST 1

DAST 1 : DTC Description

INFOID:000000013356840

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13DD-00	STEERING TORQUE SENSOR (Steering torque sensor)	The power supply voltage of steering torque sensor is following condition for 1 second or more continuously. • Power supply voltage < 4.5 V, 5.5 V < Power supply voltage

POSSIBLE CAUSE

- Steering torque sensor
- Sensor circuit (between steering angle main control module and steering torque sensor) is open, short or ground short.
- Steering angle main control module

FAIL-SAFE

- Mode 3 (When control module detects a malfunction at startup.)
- Mode 2 (When control module detects a malfunction except during startup.)

NOTE:

For details of fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Start the engine.
NOTE:
Never drive the vehicle.
2. Turn the steering wheel.
3. Perform self-diagnosis for "DAST 1".

Is DTC "C13DD-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-398, "DAST 1 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356841

1. CHECK TORQUE SENSOR POWER SUPPLY CIRCUIT

Ⓟ With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "TORQUE SEN VOLTAGE".
3. Check the value

Monitor item	Standard value (Approx.)
TORQUE SEN VOLTAGE	4.5 – 5.5 V

Is the inspection result normal?

YES >> GO TO 2.

C13DD-00 STEERING TORQUE SENSOR

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

2.CHECK TORQUE SENSOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	32	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK TORQUE SENSOR SIGNAL

 With CONSULT

1. Connect steering angle main control module harness connector.
2. Start the engine.
CAUTION:
Never drive the vehicle.
3. On the CONSULT screen, select "DAST 2" >> "DATA MONITOR" >> "TORQUE SEN MAIN 2", and "TORQUE SEN SUB".
4. Check the value

Monitor item	Condition	Standard value (Approx.)
TORQUE SEN MAIN 2	Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
	Steering wheel: Right turn	Approx. 1.4 - 2.5 V
	Steering wheel: Left turn	Approx. 2.5 - 3.6 V
TORQUE SEN SUB	Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
	Steering wheel: Right turn	Approx. 1.4 - 2.5 V
	Steering wheel: Left turn	Approx. 2.5 - 3.6 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK TORQUE SENSOR CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the continuity between steering angle main control module harness connector and steering torque sensor harness connector.

Steering angle main control module		Steering torque sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	8	E95	2	Existed
	1		4	
	3		3	
	7		1	

4. Check the continuity between control module harness connector and ground.

C13DD-00 STEERING TORQUE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	8	Ground	Not existed
	1		
	3		
	7		

Is the inspection result normal?

YES >> Torque sensor is malfunction. Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#)

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

C13DE-00 TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13DE-00 TEMPERATURE SENSOR

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356842

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13DE-00	TEMPERATURE SENSOR (Temperature sensor)	Control module detects that the internal temperature in steering force motor is in following state for 1 seconds or more. • Temperature < -50°C (-58°F), 250°C (482°F) < Temperature

POSSIBLE CAUSE

- Force motor temperature sensor (included in force motor angle sensor)
- Sensor circuit (between steering force control module and force motor angle sensor) is open or short.
- Steering force control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection functions, refer to [STC-128, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓜ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel.
3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13DE-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-401, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356843

1. CHECK TEMPERATURE SENSOR POWER SUPPLY (1)

1. Turn the ignition switch OFF.
2. Disconnect force motor angle sensor harness connector.
3. Turn the ignition switch ON.
4. Check the voltage between force motor angle sensor harness connector pin terminals.

Connector	Force motor angle sensor		Voltage (Approx.)
	Terminal		
M73	+	-	5 V
	3	7	

Is the inspection result normal?

C13DE-00 TEMPERATURE SENSOR

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 6.
- NO >> GO TO 2.

2.CHECK TEMPERATURE SENSOR POWER SUPPLY (2)

Check the voltage between force motor angle sensor harness connector pin terminals.

Force motor angle sensor		—	Voltage (Approx.)
Connector	Terminal		
M73	+	—	5 V
	3	Ground	

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> GO TO 4.

3.CHECK TEMPERATURE SENSOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering force control module harness connector and force motor angle sensor harness connector.

Steering force control module		Force motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
M71	29	M73	7	Existed

Is the inspection result normal?

- YES >> GO TO 7.
- NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4.CHECK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering force control module harness connector and force motor angle sensor harness connector.

Steering force control module		Force motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
M71	31	M73	3	Existed

4. Check the continuity between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	31	Ground	Not existed

Is the inspection result normal?

- YES >> GO TO 5.
- NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT

Check the power supply circuit for steering force control module. Refer to [STC-467. "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 7.
- NO >> Repair or replace error-detected part.

6.CHECK TEMPERATURE SENSOR

Check the force motor temperature sensor. Refer to [STC-403. "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

C13DE-00 TEMPERATURE SENSOR

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 7.

NO >> Force motor temperature sensor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

7.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:000000013356844

1.CHECK FORCE MOTOR TEMPERATURE SENSOR

1. Turn the ignition switch OFF.
2. Disconnect force motor angle sensor harness connector.
3. Check resistance between force motor angle sensor connector pin terminals.

Force motor angle sensor		Condition	Resistance (Approx.)
Terminal			
3	7	0°C	34.8 kΩ
		25°C	10.0 kΩ
		40°C	5.2 kΩ

4. Check continuity between force motor angle sensor connector and ground.

Force motor angle sensor	—	Continuity
Terminal		
3	Ground	Not existed
7		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Force motor temperature sensor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000013356845

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13DE-00	TEMPERATURE SENSOR (Temperature sensor)	Control module detects that the internal temperature in steering angle main control module is in following state for 1 seconds or more. • Temperature < -40°C (-40°F), 150°C (302°F) < Temperature

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection functions, refer to [STC-128, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

C13DE-00 TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel.
3. Perform self-diagnosis for "DAST 1".

Is DTC "C13DE-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-404, "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356846

1. CHECK THE TEMPERATURE OF CONTROL MODULE

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "C/M TEMPERATURE".
3. Wait with the ignition switch OFF until the data monitor indication becomes between -40°C (-40°F) and 150°C (302°F).

Does the temperature become between -40°C (-40°C) and 150°C (302°F)?

YES >> GO TO 2.

NO >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

2. PERFORM SELF-DIAGNOSIS

Ⓟ With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13DE-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000013356847

DTC DETECTION LOGIC

C13DE-00 TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13DE-00	TEMPERATURE SENSOR (Temperature sensor)	Control module detects that the internal temperature in steering angle sub control module is in following state for 1 seconds or more. <ul style="list-style-type: none">Temperature < -40°C (-40°F), 150°C (302°F) < Temperature

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection functions, refer to [STC-128, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.
CAUTION:
Never drive the vehicle.
- Turn the steering wheel.
- Perform self-diagnosis for "DAST 2".

Is DTC "C13DE-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-405, "DAST 2 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356848

1. CHECK THE TEMPERATURE OF CONTROL MODULE

With CONSULT

- Start the engine.
CAUTION:
Never drive the vehicle.
- On the CONSULT screen, select "DAST 2" >> "DATA MONITOR" >> "C/M TEMPERATURE".
- Wait with the ignition switch OFF until the data monitor indication becomes between -40°C (-40°F) and 150°C (302°F).

Does the temperature become between -40°C (-40°C) and 150°C (302°F)?

- YES >> GO TO 2.
NO >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

2. PERFORM SELF-DIAGNOSIS

With CONSULT

- Turn the ignition switch ON.
- Erase self-diagnosis for "DAST 2".
- Turn the ignition switch OFF and wait for at least 10 seconds.
- Start the engine.
CAUTION:
Never drive the vehicle.
- Perform self-diagnosis for "DAST 2".

C13DE-00 TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Is DTC "C13DE-00" detected?

- YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).
- NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13DF-00 CONTROL MODULE

DAST 1

DAST 1 : DTC Description

INFOID:0000000013356849

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13DF-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3 (When control module detects a malfunction at startup.)
- Mode 2 (When control module detects a malfunction except during startup.)

NOTE:

For details of fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

NOTE:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13DF-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-407, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:0000000013356850

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

NOTE:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13DF-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

C13E0-00 ST CLUTCH COMMAND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E0-00 ST CLUTCH COMMAND CIRCUIT

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356851

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E0-00	ST CLUTCH COMMAND CIRCUIT (Steering clutch command circuit)	Malfunction current in steering clutch activation circuit is detected.

POSSIBLE CAUSE

- Steering clutch
- Steering clutch circuit is open or short.
- Steering force control module

FAIL-SAFE

- MODE 2

NOTE:

For details of fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel.
3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-408, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356852

1. CHECK THE STEERING CLUTCH

Check the steering clutch. Refer to [STC-409, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to [ST-139, "Removal and Installation"](#).

2. CHECK THE CLUTCH CIRCUIT

1. Disconnect steering force control module.
2. Check the continuity between steering force control module harness connector and steering clutch harness connector.

C13E0-00 ST CLUTCH COMMAND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPIVE STEERING]

Steering force control module		Steering clutch		Continuity
Connector	Terminal	Connector	Terminal	
M71	26	M156	1	Existed
	28		3	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	26	Ground	Not existed
	28		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3. CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:000000013356853

1. CHECK THE STEERING CLUTCH

1. Turn the ignition switch OFF.
2. Disconnect steering clutch harness connector.
3. Check continuity between steering clutch connector pin terminals.

Steering clutch		Continuity
Terminal		
1	3	Existed

4. Check continuity between steering clutch connector and ground.

Steering clutch		—	Continuity
Terminal			
1		Ground	Not existed
3			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to [ST-139. "Removal and Installation"](#).

C13E1-00 STEERING CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E1-00 STEERING CLUTCH

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356854

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E1-00	STEERING CLUTCH (Steering clutch)	Malfunction of steering clutch is detected.

POSSIBLE CAUSE

- Steering clutch
- Steering clutch circuit is open or short.
- Steering gear

FAIL-SAFE

- MODE 2

NOTE:

For details of fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DATA MONITOR

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. On the CONSULT screen, select "EPS/DAST 3" >>> "DATA MONITOR" >> "TORQUE SEN MAIN 1".
3. Check that the value is within standard value while steering the steering wheel.

Monitor item	Standard value (Approx.)
TORQUE SEN MAIN 1	$-0.9 \text{ N}\cdot\text{m} \leq \text{TORQUE SEN MAIN 1} \leq 0.9 \text{ N}\cdot\text{m}$

Is the inspection result normal?

YES >> Steering clutch protection function is active temporarily by overloading the steering wheel. This is not system malfunction.

NO >> Proceed to diagnosis procedure. Refer to [STC-410, "EPS/DAST 3 : Diagnosis Procedure"](#).

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356855

1. CHECK THE STEERING CLUTCH

Check the steering clutch. Refer to [STC-411, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to [ST-139, "Removal and Installation"](#).

2. CHECK THE CLUTCH CIRCUIT

1. Disconnect steering force control module.
2. Check the continuity between steering force control module harness connector and steering clutch harness connector.

C13E1-00 STEERING CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Steering clutch		Continuity
Connector	Terminal	Connector	Terminal	
M71	26	M156	1	Existed
	28		3	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	26	Ground	Not existed
	28		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3. REPLACE STEERING CLUTCH

 With CONSULT

1. Replace steering clutch assembly. Refer to [ST-139, "Removal and Installation"](#).
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. On the CONSULT screen, select "EPS/DAST 3" >>> "DATA MONITOR" >> "TORQUE SEN MAIN 1".
4. Check that the value is within standard value while steering the steering wheel.

Monitor item	Standard value (Approx.)
TORQUE SEN MAIN 1	-0.9 N·m ≤ TORQUE SEN MAIN 1 ≤ 0.9 N·m

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4. REPLACE STEERING FORCE CONTROL MODULE

 With CONSULT

1. Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. On the CONSULT screen, select "EPS/DAST 3" >>> "DATA MONITOR" >> "TORQUE SEN MAIN 1".
4. Check that the value is within standard value while steering the steering wheel.

Monitor item	Standard value (Approx.)
TORQUE SEN MAIN 1	-0.9 N·m ≤ TORQUE SEN MAIN 1 ≤ 0.9 N·m

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

EPS/DAST 3 : Component Inspection

INFOID:000000013356856

1. CHECK THE STEERING CLUTCH

1. Turn the ignition switch OFF.
2. Disconnect steering clutch harness connector.
3. Check continuity between steering clutch connector pin terminals.

C13E1-00 STEERING CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering clutch		Continuity
Terminal		
1	3	Existed

4. Check continuity between steering clutch connector and ground.

Steering clutch	—	Continuity
Terminal		
1	Ground	Not existed
3		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to [ST-139, "Removal and Installation"](#).

C13E2-00 FRONT WHEEL SENSOR SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E2-00 FRONT WHEEL SENSOR SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356857

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E2-00	FRONT WHEEL SENSOR SIGNAL (Front wheel sensor signal)	Malfunction value of front wheel sensor (both side) is detected.

POSSIBLE CAUSE

- Using the 2 wheel chassis dynamometer
- Continuing the slip condition for long time
- Front wheel sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Turn the steering wheel.
3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E2-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-413. "EPS/DAST 3 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356858

1.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-72. "DTC Index"](#).
NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF and wait for at least 10 seconds.
2. Turn the ignition switch ON.
3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C7-00" or "C13E2-00" detected?

- YES-1 >> C13C7-00 is detected: Refer to [STC-342. "EPS/DAST 3 : DTC Description"](#).
YES-2 >> C13E2-00 is detected: Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).
NO >> • Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

C13E3-00 SPIRAL CABLE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E3-00 SPIRAL CABLE PROTECTION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356859

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E3-00	SPIRAL CABLE PROTECTION (Spiral cable protection)	Spiral cable protection function is active by steering the steering wheel over the limit angle.

POSSIBLE CAUSE

- Steering the steering wheel over the limit angle
- Steering force control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-128, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-414, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO >> Spiral cable protection function is active temporarily by steering the steering wheel over the limit angle. This is not system malfunction.

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356860

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel to the center position.

CAUTION:

Never touch the steering wheel after setting it to center position.

6. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E3-00" detected?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> Spiral cable protection function is active by steering the steering wheel over the limit angle. This is not system malfunction.

C13E4-00 ST CLUTCH RELEASE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E4-00 ST CLUTCH RELEASE PROTECTION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356861

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E4-00	ST CLUTCH RELEASE PROTECTION (Steering clutch release protection)	When steering clutch is released, steering clutch is not released within regular time.

POSSIBLE CAUSE

- When steering clutch is released, overloading the steering wheel.
- Steering clutch
- Steering force control module
- Steering gear

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-128, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DATA MONITOR

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. On the CONSULT screen, select "EPS/DAST 3" >>> "DATA MONITOR" >> "TORQUE SEN MAIN 1".
3. Check that the value is within standard value while steering the steering wheel.

Monitor item	Standard value (Approx.)
TORQUE SEN MAIN 1	-0.9 N·m ≤ TORQUE SEN MAIN 1 ≤ 0.9 N·m

Is the inspection result normal?

- YES >> Steering clutch protection function is active temporarily by overloading the steering wheel. This is not system malfunction.
- NO >> Proceed to diagnosis procedure. Refer to [STC-415, "EPS/DAST 3 : Diagnosis Procedure"](#).

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356862

1. CHECK THE STEERING CLUTCH

Check the steering clutch. Refer to [STC-416, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to [ST-139, "Removal and Installation"](#).

2. CHECK THE CLUTCH CIRCUIT

1. Disconnect steering force control module.

C13E4-00 ST CLUTCH RELEASE PROTECTION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

2. Check the continuity between steering force control module harness connector and steering clutch harness connector.

Steering force control module		Steering clutch		Continuity
Connector	Terminal	Connector	Terminal	
M71	26	M156	1	Existed
	28		3	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	26	Ground	Not existed
	28		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3. REPLACE STEERING CLUTCH

 With CONSULT

1. Replace steering clutch assembly. Refer to [ST-139, "Removal and Installation"](#).
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. On the CONSULT screen, select "EPS/DAST 3" >>> "DATA MONITOR" >> "TORQUE SEN MAIN 1".
4. Check that the value is within standard value while steering the steering wheel.

Monitor item	Standard value (Approx.)
TORQUE SEN MAIN 1	$-0.9 \text{ N}\cdot\text{m} \leq \text{TORQUE SEN MAIN 1} \leq 0.9 \text{ N}\cdot\text{m}$

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4. REPLACE STEERING FORCE CONTROL MODULE

 With CONSULT

1. Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. On the CONSULT screen, select "EPS/DAST 3" >>> "DATA MONITOR" >> "TORQUE SEN MAIN 1".
4. Check that the value is within standard value while steering the steering wheel.

Monitor item	Standard value (Approx.)
TORQUE SEN MAIN 1	$-0.9 \text{ N}\cdot\text{m} \leq \text{TORQUE SEN MAIN 1} \leq 0.9 \text{ N}\cdot\text{m}$

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

EPS/DAST 3 : Component Inspection

INFOID:0000000013356863

1. CHECK THE STEERING CLUTCH

1. Turn the ignition switch OFF.
2. Disconnect steering clutch harness connector.
3. Check continuity between steering clutch connector pin terminals.

C13E4-00 ST CLUTCH RELEASE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPIVE STEERING]

Steering clutch		Continuity
Terminal		
1	3	Existed

4. Check continuity between steering clutch connector and ground.

Steering clutch		Continuity
Terminal		
—		
1	Ground	Not existed
3		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to [ST-139, "Removal and Installation"](#).

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13E5-00 ST CLUTCH RELEASE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E5-00 ST CLUTCH RELEASE PROTECTION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356864

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E5-00	ST CLUTCH RELEASE PROTECTION (Steering clutch release protection)	When steering clutch is released, steering clutch is not released in spite of trying to release it many times.

POSSIBLE CAUSE

- When steering clutch is released, overloading steering wheel.
- Steering clutch
- Steering force control module
- Steering gear

FAIL-SAFE

- MODE 2

NOTE:

For details of fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DATA MONITOR

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. On the CONSULT screen, select "EPS/DAST 3" >>> "DATA MONITOR" >> "TORQUE SEN MAIN 1".
3. Check that the value is within standard value while steering the steering wheel.

Monitor item	Standard value (Approx.)
TORQUE SEN MAIN 1	-0.9 N·m ≤ TORQUE SEN MAIN 1 ≤ 0.9 N·m

Is the inspection result normal?

YES >> Steering clutch protection function is active temporarily by overloading the steering wheel. This is not system malfunction.

NO >> Proceed to diagnosis procedure. Refer to [STC-418, "EPS/DAST 3 : Diagnosis Procedure"](#).

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356865

1. CHECK THE STEERING CLUTCH

Check the steering clutch. Refer to [STC-419, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to [ST-139, "Removal and Installation"](#).

2. CHECK THE CLUTCH CIRCUIT

1. Disconnect steering force control module.

C13E5-00 ST CLUTCH RELEASE PROTECTION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- Check the continuity between steering force control module harness connector and steering clutch harness connector.

Steering force control module		Steering clutch		Continuity
Connector	Terminal	Connector	Terminal	
M71	26	M156	1	Existed
	28		3	

- Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	26	Ground	Not existed
	28		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3. REPLACE STEERING CLUTCH

 With CONSULT

- Replace steering clutch assembly. Refer to [ST-139, "Removal and Installation"](#).
- Start the engine.
CAUTION:
Never drive the vehicle.
- On the CONSULT screen, select "EPS/DAST 3" >>> "DATA MONITOR" >> "TORQUE SEN MAIN 1".
- Check that the value is within standard value while steering the steering wheel.

Monitor item	Standard value (Approx.)
TORQUE SEN MAIN 1	-0.9 N·m ≤ TORQUE SEN MAIN 1 ≤ 0.9 N·m

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4. REPLACE STEERING FORCE CONTROL MODULE

 With CONSULT

- Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
- Start the engine.
CAUTION:
Never drive the vehicle.
- On the CONSULT screen, select "EPS/DAST 3" >>> "DATA MONITOR" >> "TORQUE SEN MAIN 1".
- Check that the value is within standard value while steering the steering wheel.

Monitor item	Standard value (Approx.)
TORQUE SEN MAIN 1	-0.9 N·m ≤ TORQUE SEN MAIN 1 ≤ 0.9 N·m

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace steering gear assembly. Refer to [ST-146, "Removal and Installation"](#).

EPS/DAST 3 : Component Inspection

INFOID:0000000013356866

1. CHECK THE STEERING CLUTCH

- Turn the ignition switch OFF.
- Disconnect steering clutch harness connector.
- Check continuity between steering clutch connector pin terminals.

C13E5-00 ST CLUTCH RELEASE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering clutch		Continuity
Terminal		
1	3	Existed

4. Check continuity between steering clutch connector and ground.

Steering clutch	—	Continuity
Terminal		
1	Ground	Not existed
3		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to [ST-139, "Removal and Installation"](#).

C13E6-00 HEAT PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E6-00 HEAT PROTECTION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356867

NOTE:

The DTC "C13E6-00" may be detected due to the high temperature of engine in the following condition.

- Starting the direct adaptive steering system after idling the engine for a long time

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E6-00	HEAT PROTECTION (Heat protection)	The internal temperature of steering force motor reaches 150°C (302°F) or more, and then the protection function operates.

POSSIBLE CAUSE

- Continuing the overloading steering (Sports driving in the circuit etc.)
- Steering force motor

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-128, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E6-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-421, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO >> The temporary rise of steering force motor internal temperature caused the protection function to operate. This is not a system malfunction. INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356868

1. CHECK THE TEMPERATURE OF CONTROL MODULE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "C/M TEMPERATURE".

3. Wait with the ignition switch OFF until the data monitor indication becomes 140°C (284°F) or less.

Does the temperature drop to 140°C (284°F) or less?

YES >> GO TO 2.

NO >> GO TO 3.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

A

B

C

D

E

F

STC

H

I

J

K

L

M

N

O

P

C13E6-00 HEAT PROTECTION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E6-00" detected?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
NO >> The rise of steering force motor internal temperature caused the protection function to operate.
This is not a system malfunction. INSPECTION END

3.CHECK TEMPERATURE SENSOR POWER SUPPLY (1)

1. Turn the ignition switch OFF.
2. Disconnect force motor angle sensor harness connector.
3. Turn the ignition switch ON.
4. Check the voltage between force motor angle sensor harness connector pin terminals.

Force motor angle sensor			Voltage (Approx.)
Connector	Terminal		
	+	-	
M73	3	7	5 V

Is the inspection result normal?

- YES >> GO TO 9.
NO >> GO TO 4.

4.CHECK TEMPERATURE SENSOR POWER SUPPLY (2)

Check the voltage between force motor angle sensor harness connector pin terminals.

Force motor angle sensor			Voltage (Approx.)
Connector	Terminal		
	+	-	
M73	3	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 5.
NO >> GO TO 7.

5.CHECK TEMPERATURE SENSOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering force control module harness connector and force motor angle sensor harness connector.

Steering force control module		Force motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
M71	29	M73	7	Existed

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

6.CHECK CONTROL MODULE GROUND CIRCUIT

Check the continuity between steering force control module harness connector and ground.

C13E6-00 HEAT PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
M71	30	Ground	Existed
M72	33		

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

7.CHECK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering force control module harness connector and force motor angle sensor harness connector.

Steering force control module		Force motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
M71	31	M73	3	Existed

4. Check the continuity between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	31	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

8.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT

Check the power supply circuit for steering force control module. Refer to [STC-467, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace error-detected part.

9.CHECK TEMPERATURE SENSOR

Check the force motor temperature sensor. Refer to [STC-403, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 10.

NO >> Force motor temperature sensor is malfunction. Replace steering column assembly. Refer to [ST-135, "Removal and Installation"](#).

10.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:000000013356869

1.CHECK FORCE MOTOR TEMPERATURE SENSOR

1. Turn the ignition switch OFF.
2. Disconnect force motor angle sensor harness connector.
3. Check resistance between force motor angle sensor connector pin terminals.

C13E6-00 HEAT PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Force motor angle sensor		Condition	Resistance (Approx.)
Terminal			
3	7	0°C	34.8 kΩ
		25°C	10.0 kΩ
		40°C	5.2 kΩ

4. Check continuity between force motor angle sensor connector and ground.

Force motor angle sensor		Continuity
Terminal		
3	Ground	Not existed
7		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Force motor temperature sensor is malfunction. Replace steering column assembly. Refer to [STC-492. "Removal and Installation"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000013356870

NOTE:

The DTC "C13E6-00" may be detected due to the high temperature of engine in the following condition.

- Starting the direct adaptive steering system after idling the engine for a long time
- Repeating the engine idling and sports driving in the circuit
- Turning steering wheel in the front tire side face touching an abstraction like curb stone.
- Turning steering wheel repeatedly in the vehicle stopping for a long time.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E6-00	HEAT PROTECTION (Heat protection)	The internal temperature of steering angle main control module reaches 90°C (194°F) or more, and then the protection function operates.

POSSIBLE CAUSE

- Continuing the overloading steering (Sports driving in the circuit etc,)
- Steering force motor

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-128. "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

C13E6-00 HEAT PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13E6-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-425, "DAST 1 : Diagnosis Procedure"](#).
NO >> The temporary rise of steering angle main control module internal temperature caused the protection function to operate. This is not a system malfunction. INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356871

1. CHECK THE TEMPERATURE OF CONTROL MODULE

 With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "C/M TEMPERATURE".
3. Wait with the ignition switch OFF until the data monitor indication becomes 80°C (176°C) or less.

Does the temperature drop to 85°C (185°C) or less?

YES >> GO TO 2.

NO >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

2. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13E6-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> The rise of steering angle main control module internal temperature caused the protection function to operate. This is not a system malfunction. INSPECTION END

DAST 2

DAST 2 : DTC Description

INFOID:000000013356872

NOTE:

The DTC "C13E6-00" may be detected due to the high temperature of engine in the following condition.

- Starting the direct adaptive steering system after idling the engine for a long time
- Repeating the engine idling and sports driving in the circuit
- Turning steering wheel in the front tire side face touching an abstraction like curb stone.
- Turning steering wheel repeatedly in the vehicle stopping for a long time.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E6-00	HEAT PROTECTION (Heat protection)	The internal temperature of steering angle sub control module reaches 90°C (194°F) or more, and then the protection function operates.

POSSIBLE CAUSE

- Continuing the overloading steering (Sports driving in the circuit etc.)
- Steering force motor

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-128, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13E6-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-426, "DAST 2 : Diagnosis Procedure"](#).

NO >> The temporary rise of steering angle sub control module internal temperature caused the protection function to operate. This is not a system malfunction. INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356873

1. CHECK THE TEMPERATURE OF CONTROL MODULE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. On the CONSULT screen, select "DAST 2" >> "DATA MONITOR" >> "C/M TEMPERATURE".

3. Wait with the ignition switch OFF until the data monitor indication becomes 80°C (176°C) or less.

Does the temperature drop to 85°C (185°C) or less?

YES >> GO TO 2.

NO >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.

2. Erase self-diagnosis for "DAST 2".

3. Turn the ignition switch OFF and wait for at least 10 seconds.

4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13E6-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> The rise of steering angle sub control module internal temperature caused the protection function to operate. This is not a system malfunction. INSPECTION END

C13E7-00 LOW VOLTAGE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E7-00 LOW VOLTAGE PROTECTION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356874

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E7-00	LOW VOLTAGE PROTECTION (Low voltage protection)	The power supply voltage of control module is following condition for 1 second or more continuously, and then protection function is active. • Power supply voltage ≤ 9.1 V

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fusible link
- Power supply circuit
- Steering force control module

FAIL-SAFE

- Protection mode

STC

NOTE:

For details of protection mode, refer to [STC-128, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-427, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO >> Protection function is active temporarily by low battery voltage. This is not system malfunction.

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356875

1. CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	33	Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

C13E7-00 LOW VOLTAGE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

2.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

Check the voltage between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

- YES >> GO TO 4.
- NO >> GO TO 3.

3.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 60A fusible link (#G).
2. Check the harness for open or short between steering force control module harness connector No.34 terminal and the 60A fusible link (#G).

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).
- NO >> Repair or replace error-detected parts.

4.CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
- NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

INFOID:000000013356876

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E7-00	LOW VOLTAGE PROTECTION (Low voltage protection)	The power supply voltage of control module is following condition for 1 second or more continuously, and then protection function is active. <ul style="list-style-type: none">• Power supply voltage ≤ 9.1 V

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fusible link
- Power supply circuit
- Steering angle main control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-128, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

C13E7-00 LOW VOLTAGE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13E7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-429. "DAST 1 : Diagnosis Procedure"](#).

NO >> Protection function is active temporarily by low battery voltage. This is not system malfunction.

DAST 1 : Diagnosis Procedure

INFOID:000000013356877

1. CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.

2. Disconnect steering angle main control module harness connector.

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	33	Ground	Existed
E28	39		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

2. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

Check the voltage between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#J).

2. Check the harness for open or short between steering angle main control module harness connector No.34 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20. "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4. CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.

2. Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).

3. Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493. "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 2

C13E7-00 LOW VOLTAGE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 2 : DTC Description

INFOID:000000013356878

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E7-00	LOW VOLTAGE PROTECTION (Low voltage protection)	The power supply voltage of control module is following condition for 1 second or more continuously, and then protection function is active. <ul style="list-style-type: none">Power supply voltage ≤ 9.1 V

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fusible link
- Power supply circuit
- Steering angle sub control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-128, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13E7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-430, "DAST 2 : Diagnosis Procedure"](#).

NO >> Protection function is active temporarily by low battery voltage. This is not system malfunction.

DAST 2 : Diagnosis Procedure

INFOID:000000013356879

1. CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	33	Ground	Existed
E31	39		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

2. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

Check the voltage between control module harness connector and ground.

C13E7-00 LOW VOLTAGE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#H).
2. Check the harness for open or short between steering angle sub control module harness connector No.34 terminal and the 100A fusible link (#H).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4. CHECK INTERMITTENT INCIDENT

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13E8-00 CURB STONE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E8-00 CURB STONE PROTECTION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356880

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E8-00	CURB STONE PROTECTION (Curb stone protection)	Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances, and then the protection function is active.

POSSIBLE CAUSE

- Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances.
- Steering gear is out of neutral position. (Large)
- Steering force control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-128. "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.

NOTE:

Perform the work at the place where curbstones or other substances does not interfere with tire.

3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E8-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-432. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO >> Protection function is active by operating steering wheel under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. This is not system malfunction. Since this may cause mechanical malfunction, check the suspension, axle and steering component.

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356881

1. CHECK THE STEERING ANGLE

Turn the steering wheel to right and left.

Is the steering angle of right and left same?

YES >> GO TO 2.

NO >> Refer to [STC-473. "Symptom Table"](#).

2. PERFORM SELF-DIAGNOSIS

With CONSULT

C13E8-00 CURB STONE PROTECTION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel to the straight-ahead position. (There is no steering force)
6. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E8-00" detected?

- YES >> Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).
- NO >> Protection function is active by operating steering wheel under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. This is not system malfunction. Since this may cause mechanical malfunction, check the suspension, axle and steering component.

DAST 1

DAST 1 : DTC Description

INFOID:000000013356882

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E8-00	CURB STONE PROTECTION (Curb stone protection)	Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances, and then the protection function is active.

POSSIBLE CAUSE

- Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances.
- Steering gear is out of neutral position. (Large)
- Steering angle main control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection functions, refer to [STC-128. "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
- CAUTION:**
- Never drive the vehicle.**
2. Turn the steering wheel from full left stop to full right stop.

NOTE:

Perform the work at the place where curbstones or other substances does not interfere with tire.

3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 1".

Is DTC "C13E8-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-434. "DAST 1 : Diagnosis Procedure"](#).
- NO >> Protection function is active by operating steering wheel under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. This is not

C13E8-00 CURB STONE PROTECTION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

system malfunction. Since this may cause mechanical malfunction, check the suspension, axle and steering component.

DAST 1 : Diagnosis Procedure

INFOID:000000013356883

1. CHECK THE STEERING ANGLE

Turn the steering wheel to right and left.

Is the steering angle of right and left same?

YES >> GO TO 2.

NO >> Refer to [STC-473, "Symptom Table"](#).

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel to the straight-ahead position. (There is no steering force)
6. Perform self-diagnosis for "DAST 1".

Is DTC "C13E8-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> Protection function is active by operating steering wheel under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. This is not system malfunction. Since this may cause mechanical malfunction, check the suspension, axle and steering component.

DAST 2

DAST 2 : DTC Description

INFOID:000000013356884

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E8-00	CURB STONE PROTECTION (Curb stone protection)	Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances, and then the protection function is active.

POSSIBLE CAUSE

- Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances.
- Steering gear is out of neutral position. (Large)
- Steering angle sub control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-128, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

C13E8-00 CURB STONE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

④ With CONSULT

1. Start the engine.
2. Turn the steering wheel from full left stop to full right stop.

CAUTION:

Never drive the vehicle.

NOTE:

Perform the work at the place where curbstones or other substances does not interfere with tire.

3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 2".

Is DTC "C13E8-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-435. "DAST 2 : Diagnosis Procedure"](#).
- NO >> Protection function is active by operating steering wheel under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. This is not system malfunction. Since this may cause mechanical malfunction, check the suspension, axle and steering component.

DAST 2 : Diagnosis Procedure

INFOID:000000013356885

1.CHECK THE STEERING ANGLE

Turn the steering wheel to right and left.

Is the steering angle of right and left same?

- YES >> GO TO 2.
- NO >> Refer to [STC-473. "Symptom Table"](#).

2.PERFORM SELF-DIAGNOSIS

④ With CONSULT

1. Turn the ignition switch ON.
 2. Erase self-diagnosis for "DAST 2".
 3. Turn the ignition switch OFF and wait for at least 10 seconds.
 4. Start the engine.
- CAUTION:**
Never drive the vehicle.
5. Turn the steering wheel to the straight-ahead position. (There is no steering force)
 6. Perform self-diagnosis for "DAST 2".

Is DTC "C13E8-00" detected?

- YES >> Replace steering angle sub control module. Refer to [STC-494. "Removal and Installation"](#).
- NO >> Protection function is active by operating steering wheel under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. This is not system malfunction. Since this may cause mechanical malfunction, check the suspension, axle and steering component.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13E9-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E9-00 BOOTING ANGLE PROCESSING

DAST 1

DAST 1 : DTC Description

INFOID:000000013356886

NOTE:

During engine start, the DTC "C13E9-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E9-00	BOOTING ANGLE PROCESSING (Booting angle processing)	The malfunction of processing to acquire angle information is detected when control module is starting.

POSSIBLE CAUSE

- The malfunction of processing information

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13E9-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-436. "DAST 1 : Diagnosis Procedure"](#).

NO >> INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356887

1. CHECK THE SELF-DIAGNOSTIC RESULT

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3" and "DAST 2".
3. Check the diagnostic result for "EPS/DAST 3", "DAST 1" and "DAST 2".

What is DTC detected?

Except C13E9-00, C13EB-00, C13EE-00, C13EF-00, C13F0-00, C13F1-00 or C13F2-00>>Refer to [STC-156. "DTC Index"](#) (EPS/DAST 3), [STC-169. "DTC Index"](#) (DAST 1), [STC-182. "DTC Index"](#) (DAST 2).

C13EE-00, C13EF-00, C13F0-00, C13F1-00 or C13F2-00>>GO TO 4.

C13E9-00 or C13EB-00>>GO TO 2.

2. AUTO ADJUSTING MODE (1)

1. Drive straight ahead at around 32 km/h (20 MPH) or more for more than 5 seconds.

C13E9-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

CAUTION:

- Check the safety operation of the vehicle before driving.
- Bumps, pot holes, or other steering input may affect the calibration. Drive on a straight flat road.
- Keep the steering wheel, so the vehicle stays in a straight line.
- Traffic condition that requires steering input may affect the calibration. Drive on a road with very light or no traffic.

NOTE:

Drive at 65 km/h (40 MPH) or less, as much as possible. It is easy to succeed with the work.

2. Stop the vehicle.
3. Turn the ignition switch OFF, and then turn it ON again.

Does the power steering warning lamp turn OFF?

YES >> WORK END

NO-1 (Steering wheel is not off-center)>>Repeat the step 1-3 (driving - turning ignition switch OFF/ON) 5 times until the warning lamp turns OFF. When the warning lamp does not turn OFF, GO TO 3.

NO-2 (Steering wheel is off-center)>>GO TO 3.

3.AUTO ADJUSTING MODE (2)

1. When the vehicle has not yet stopped, stop the vehicle on the safety place.
2. Turn the ignition switch OFF, and then turn it ON again.
3. Turn the steering wheel to the center position.
4. Turn the steering wheel to left/right 90 degree or more from center position 2 times.
5. Drive straight ahead at around 32 km/h (20 MPH) or more for more than 5 seconds.

CAUTION:

- Check the safety operation of the vehicle before driving.
- Bumps, pot holes, or other steering input may affect the calibration. Drive on a straight flat road.
- Keep the steering wheel, so the vehicle stays in a straight line.
- Traffic condition that requires steering input may affect the calibration. Drive on a road with very light or no traffic.

NOTE:

Drive at 65 km/h (40 MPH) or less, as much as possible. It is easy to succeed with the work.

6. During driving the vehicle, turn the steering wheel to the center position slowly.
7. Stop the vehicle.
8. Turn the ignition switch OFF, and then turn it ON again.

Does the power steering warning lamp turn OFF?

YES >> WORK END

NO >> Repeat the step 3-8 (driving - turning ignition switch OFF/ON) 5 times until the warning lamp turns OFF. When the warning lamp does not turn OFF, GO TO 4.

4.PREPARATION

1. Set the front wheel on the turn table.

NOTE:

Do not lift up the vehicle during "DAST CALIBRATION (MODE1)"

2. Connect the battery charger to protect the 12V battery.

NOTE:

Much electricity is used in "DAST CALIBRATION (MODE1)".

3. Connect the CONSULT.
4. Turn the ignition switch ON.

CAUTION:

Never start the engine.

>> GO TO 5.

5.ECU CONFIGURATION

With CONSULT

1. Perform configuration for steering force control module. Refer to [STC-212. "Work Procedure"](#).

NOTE:

The replacement of control module included in configuration is not required.

2. Perform configuration for steering angle main control module. Refer to [STC-214. "Work Procedure"](#).

NOTE:

The replacement of control module included in configuration is not required.

C13E9-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

3. Perform configuration for steering angle sub control module. Refer to [STC-216. "Work Procedure"](#).

NOTE:

The replacement of control module included in configuration is not required.

>> GO TO 6.

6. DAST CALIBRATION (MODE1) [CLUTCH PHASE LEARNING]

With CONSULT

1. Perform "DAST CALIBRATION (MODE1)". Refer to [STC-209. "Description"](#).
2. Turn the ignition switch OFF.

CAUTION:

Be sure to perform this step.

>> GO TO 7.

7. DAST CALIBRATION (MODE1) [STEERING RACK NEUTRAL POSITION LEARNING]

With CONSULT

1. Turn the ignition switch ON.
CAUTION:
Never start the engine.
2. Perform "DAST CALIBRATION (MODE1)". Refer to [STC-209. "Description"](#).

>> GO TO 8.

8. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

With CONSULT

1. On the CONSULT screen, select "ABS">>"WORK SUPPORT">>"ST ANGLE SENSOR ADJUSTMENT".
2. Touch START.
CAUTION:
Never touch steering wheel while adjusting steering angle sensor.
3. After approx. 10 seconds, select "END".
4. Turn ignition switch OFF, and then turn it ON again.

CAUTION:

Be sure to perform this step.

>> GO TO 9.

9. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Start the engine.
CAUTION:
Never drive the vehicle.
3. Perform self-diagnosis for "DAST 1".

Is DTC "C13E9-00" detected?

YES >> Replace steering angle main control module, steering angle sub control module and steering force control module. Refer to [STC-493. "Removal and Installation"](#), [STC-494. "Removal and Installation"](#) and [STC-492. "Removal and Installation"](#). After replacing the control modules, confirm that DTC "C13E9-00" is not detected.

NO >> WORK END

C13EA-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13EA-00 BOOTING ANGLE PROCESSING

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356888

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EA-00	BOOTING ANGLE PROCESSING (Booting angle processing)	The malfunction of processing to acquire angle information is detected when control module is starting.

POSSIBLE CAUSE

- The malfunction of processing information

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13EA-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-439. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356889

1. CHECK THE SELF-DIAGNOSTIC RESULT

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1" and "DAST 2".
3. Check the diagnostic result for "EPS/DAST 3", "DAST 1" and "DAST 2".

What is DTC detected with DTC "C13EA-00"?

C13C5-00>>Refer to [STC-338. "EPS/DAST 3 : Diagnosis Procedure"](#).

C13D1-00>>Refer to [STC-358. "DAST 1 : Diagnosis Procedure"](#).

C13D2-00>>Refer to [STC-360. "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-361. "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-362. "DAST 2 : Diagnosis Procedure"](#) (DAST 2).

C13D3-00>>Refer to [STC-363. "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-364. "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-365. "DAST 2 : Diagnosis Procedure"](#) (DAST 2).

C13D4-00>>Refer to [STC-366. "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-368. "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-371. "DAST 2 : Diagnosis Procedure"](#) (DAST 2).

C13EA-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

-
- C13D5-00>>Refer to [STC-373. "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-374. "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-375. "DAST 2 : Diagnosis Procedure"](#) (DAST 2).
- C13D6-00>>Refer to [STC-376. "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-378. "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-381. "DAST 2 : Diagnosis Procedure"](#) (DAST 2).
- C13D7-00>>Refer to [STC-383. "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-384. "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-385. "DAST 2 : Diagnosis Procedure"](#) (DAST 2).

C13EB-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13EB-00 BOOTING ANGLE PROCESSING

DAST 1

DAST 1 : DTC Description

INFOID:0000000013356890

NOTE:

During engine start, the DTC "C13EB-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EB-00	BOOTING ANGLE PROCESSING (Booting angle processing)	The malfunction of processing to acquire angle information is detected when control module is starting.

POSSIBLE CAUSE

- The malfunction of processing information

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13EB-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-441. "DAST 1 : Diagnosis Procedure"](#).

NO >> INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:0000000013356891

1. CHECK THE SELF-DIAGNOSTIC RESULT

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3" and "DAST 2".
3. Check the diagnostic result for "EPS/DAST 3", "DAST 1" and "DAST 2".

What is DTC detected?

Except C13E9-00, C13EB-00, C13EE-00, C13EF-00, C13F0-00, C13F1-00 or C13F2-00>>Refer to [STC-156. "DTC Index"](#) (EPS/DAST 3), [STC-169. "DTC Index"](#) (DAST 1), [STC-182. "DTC Index"](#) (DAST 2).

C13EE-00, C13EF-00, C13F0-00, C13F1-00 or C13F2-00>>GO TO 4.

C13E9-00 or C13EB-00>>GO TO 2.

2. AUTO ADJUSTING MODE (1)

1. Drive straight ahead at around 32 km/h (20 MPH) or more for more than 5 seconds.

C13EB-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

CAUTION:

- Check the safety operation of the vehicle before driving.
- Bumps, pot holes, or other steering input may affect the calibration. Drive on a straight flat road.
- Keep the steering wheel, so the vehicle stays in a straight line.
- Traffic condition that requires steering input may affect the calibration. Drive on a road with very light or no traffic.

NOTE:

Drive at 65 km/h (40 MPH) or less, as much as possible. It is easy to succeed with the work.

2. Stop the vehicle.
3. Turn the ignition switch OFF, and then turn it ON again.

Does the power steering warning lamp turn OFF?

YES >> WORK END

NO-1 (Steering wheel is not off-center)>>Repeat the step 1-3 (driving - turning ignition switch OFF/ON) 5 times until the warning lamp turns OFF. When the warning lamp does not turn OFF, GO TO 3.

NO-2 (Steering wheel is off-center)>>GO TO 3.

3.AUTO ADJUSTING MODE (2)

1. When the vehicle has not yet stopped, stop the vehicle on the safety place.
2. Turn the ignition switch OFF, and then turn it ON again.
3. Turn the steering wheel to the center position.
4. Turn the steering wheel to left/right 90 degree or more from center position 2 times.
5. Drive straight ahead at around 32 km/h (20 MPH) or more for more than 5 seconds.

CAUTION:

- Check the safety operation of the vehicle before driving.
- Bumps, pot holes, or other steering input may affect the calibration. Drive on a straight flat road.
- Keep the steering wheel, so the vehicle stays in a straight line.
- Traffic condition that requires steering input may affect the calibration. Drive on a road with very light or no traffic.

NOTE:

Drive at 65 km/h (40 MPH) or less, as much as possible. It is easy to succeed with the work.

6. During driving the vehicle, turn the steering wheel to the center position slowly.
7. Stop the vehicle.
8. Turn the ignition switch OFF, and then turn it ON again.

Does the power steering warning lamp turn OFF?

YES >> WORK END

NO >> Repeat the step 3-8 (driving - turning ignition switch OFF/ON) 5 times until the warning lamp turns OFF. When the warning lamp does not turn OFF, GO TO 4.

4.PREPARATION

1. Set the front wheel on the turn table.

NOTE:

Do not lift up the vehicle during "DAST CALIBRATION (MODE1)"

2. Connect the battery charger to protect the 12V battery.

NOTE:

Much electricity is used in "DAST CALIBRATION (MODE1)".

3. Connect the CONSULT.
4. Turn the ignition switch ON.

CAUTION:

Never start the engine.

>> GO TO 5.

5.ECU CONFIGURATION

With CONSULT

1. Perform configuration for steering force control module. Refer to [STC-212, "Work Procedure"](#).

NOTE:

The replacement of control module included in configuration is not required.

2. Perform configuration for steering angle main control module. Refer to [STC-214, "Work Procedure"](#).

NOTE:

The replacement of control module included in configuration is not required.

C13EB-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

3. Perform configuration for steering angle sub control module. Refer to [STC-216, "Work Procedure"](#).

NOTE:

The replacement of control module included in configuration is not required.

>> GO TO 6.

6. DAST CALIBRATION (MODE1) [CLUTCH PHASE LEARNING]

With CONSULT

1. Perform "DAST CALIBRATION (MODE1)". Refer to [STC-209, "Description"](#).
2. Turn the ignition switch OFF.

CAUTION:

Be sure to perform this step.

>> GO TO 7.

7. DAST CALIBRATION (MODE1) [STEERING RACK NEUTRAL POSITION LEARNING]

With CONSULT

1. Turn the ignition switch ON.
CAUTION:
Never start the engine.
2. Perform "DAST CALIBRATION (MODE1)". Refer to [STC-209, "Description"](#).

>> GO TO 8.

8. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

With CONSULT

1. On the CONSULT screen, select "ABS">>"WORK SUPPORT">>"ST ANGLE SENSOR ADJUSTMENT".
2. Touch START.
CAUTION:
Never touch steering wheel while adjusting steering angle sensor.
3. After approx. 10 seconds, select "END".
4. Turn ignition switch OFF, and then turn it ON again.

CAUTION:

Be sure to perform this step.

>> GO TO 9.

9. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Start the engine.
CAUTION:
Never drive the vehicle.
3. Perform self-diagnosis for "DAST 1".

Is DTC "C13E9-00" detected?

YES >> Replace steering angle main control module, steering angle sub control module and steering force control module. Refer to [STC-493, "Removal and Installation"](#), [STC-494, "Removal and Installation"](#) and [STC-492, "Removal and Installation"](#). After replacing the control modules, confirm that DTC "C13E9-00" is not detected.

NO >> WORK END

DAST 2

DAST 2 : DTC Description

INFOID:000000013356892

NOTE:

During engine start, the DTC "C13EB-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

C13EB-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EB-00	BOOTING ANGLE PROCESSING (Booting angle processing)	The malfunction of processing to acquire angle information is detected when control module is starting.

POSSIBLE CAUSE

- The malfunction of processing information

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13EB-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-444, "DAST 2 : Diagnosis Procedure"](#).

NO >> INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356893

1. CHECK THE SELF-DIAGNOSTIC RESULT

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3" and "DAST 1".
3. Check the diagnostic result for "EPS/DAST 3", "DAST 1" and "DAST 2".

What is DTC detected?

Except C13E9-00, C13EB-00, C13EE-00, C13EF-00, C13F0-00, C13F1-00 or C13F2-00>>Refer to [STC-156, "DTC Index"](#) (EPS/DAST 3), [STC-169, "DTC Index"](#) (DAST 1), [STC-182, "DTC Index"](#) (DAST 2).

C13EE-00, C13EF-00, C13F0-00, C13F1-00 or C13F2-00>>GO TO 4.

C13E9-00 or C13EB-00>>GO TO 2.

2. AUTO ADJUSTING MODE (1)

1. Drive straight ahead at around 32 km/h (20 MPH) or more for more than 5 seconds.

CAUTION:

- Check the safety operation of the vehicle before driving.
- Bumps, pot holes, or other steering input may affect the calibration. Drive on a straight flat road.
- Keep the steering wheel, so the vehicle stays in a straight line.
- Traffic condition that requires steering input may affect the calibration. Drive on a road with very light or no traffic.

NOTE:

Drive at 65 km/h (40 MPH) or less, as much as possible. It is easy to succeed with the work.

2. Stop the vehicle.
3. Turn the ignition switch OFF, and then turn it ON again.

C13EB-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Does the power steering warning lamp turn OFF?

YES >> WORK END

NO-1 (Steering wheel is not off-center)>>Repeat the step 1-3 (driving - turning ignition switch OFF/ON) 5 times until the warning lamp turns OFF. When the warning lamp does not turn OFF, GO TO 3.

NO-2 (Steering wheel is off-center)>>GO TO 3.

3. AUTO ADJUSTING MODE (2)

1. When the vehicle has not yet stopped, stop the vehicle on the safety place.
2. Turn the ignition switch OFF, and then turn it ON again.
3. Turn the steering wheel to the center position.
4. Turn the steering wheel to left/right 90 degree or more from center position 2 times.
5. Drive straight ahead at around 32 km/h (20 MPH) or more for more than 5 seconds.

CAUTION:

- Check the safety operation of the vehicle before driving.
- Bumps, pot holes, or other steering input may affect the calibration. Drive on a straight flat road.
- Keep the steering wheel, so the vehicle stays in a straight line.
- Traffic condition that requires steering input may affect the calibration. Drive on a road with very light or no traffic.

NOTE:

Drive at 65 km/h (40 MPH) or less, as much as possible. It is easy to succeed with the work.

6. During driving the vehicle, turn the steering wheel to the center position slowly.
7. Stop the vehicle.
8. Turn the ignition switch OFF, and then turn it ON again.

Does the power steering warning lamp turn OFF?

YES >> WORK END

NO >> Repeat the step 3-8 (driving - turning ignition switch OFF/ON) 5 times until the warning lamp turns OFF. When the warning lamp does not turn OFF, GO TO 4.

4. PREPARATION

1. Set the front wheel on the turn table.

NOTE:

Do not lift up the vehicle during "DAST CALIBRATION (MODE1)"

2. Connect the battery charger to protect the 12V battery.

NOTE:

Much electricity is used in "DAST CALIBRATION (MODE1)".

3. Connect the CONSULT.
4. Turn the ignition switch ON.

CAUTION:

Never start or start the engine.

>> GO TO 5.

5. ECU CONFIGURATION

④ With CONSULT

1. Perform configuration for steering force control module. Refer to [STC-212, "Work Procedure"](#).

NOTE:

The replacement of control module included in configuration is not required.

2. Perform configuration for steering angle main control module. Refer to [STC-214, "Work Procedure"](#).

NOTE:

The replacement of control module included in configuration is not required.

3. Perform configuration for steering angle sub control module. Refer to [STC-216, "Work Procedure"](#).

NOTE:

The replacement of control module included in configuration is not required.

>> GO TO 6.

6. DAST CALIBRATION (MODE1) [CLUTCH PHASE LEARNING]

④ With CONSULT

1. Perform "DAST CALIBRATION (MODE1)". Refer to [STC-209, "Description"](#).

C13EB-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

2. Turn the ignition switch OFF.

CAUTION:

Be sure to perform this step.

>> GO TO 7.

7. DAST CALIBRATION (MODE1) [STEERING RACK NEUTRAL POSITION LEARNING]

Ⓟ **With CONSULT**

1. Turn the ignition switch ON.

CAUTION:

Never state or start the engine.

2. Perform "DAST CALIBRATION (MODE1)". Refer to [STC-209. "Description"](#).

>> GO TO 8.

8. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Ⓟ **With CONSULT**

1. On the CONSULT screen, select "ABS">>"WORK SUPPORT">>"ST ANGLE SENSOR ADJUSTMENT".
2. Touch START.

CAUTION:

Never touch steering wheel while adjusting steering angle sensor.

3. After approx. 10 seconds, select "END".
4. Turn ignition switch OFF, and then turn it ON again.

CAUTION:

Be sure to perform this step.

>> GO TO 9.

9. PERFORM SELF-DIAGNOSIS

Ⓟ **With CONSULT**

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. Perform self-diagnosis for "DAST 2".

Is DTC "C13E9-00" detected?

YES >> Replace steering angle main control module, steering angle sub control module and steering force control module. Refer to [STC-493. "Removal and Installation"](#), [STC-494. "Removal and Installation"](#) and [STC-492. "Removal and Installation"](#). After replacing the control modules, confirm that DTC "C13E9-00" is not detected.

NO >> WORK END

C13EE-00 INCOMP CONFIG

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356894

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EE-00	INCOMP CONFIG (Incomplete config)	Configuration of one control module at least in three control modules is wrong or incomplete.

POSSIBLE CAUSE

- Configuration of one control module at least in three control modules is wrong or incomplete.

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

 With CONSULT

1. Start engine.
CAUTION:
Never drive the vehicle.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13EE-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-447. "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356895

1. PERFORM CONFIGURATION

Perform configuration for each control module. Refer to [STC-212. "Work Procedure"](#) (EPS/DAST 3), [STC-214. "Work Procedure"](#) (DAST 1), [STC-216. "Work Procedure"](#) (DAST 2).

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13EE-00" detected?

- YES >> Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

< DTC/CIRCUIT DIAGNOSIS >

NO >> INSPECTION END

DAST 1

DAST 1 : DTC Description

INFOID:000000013356896

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EE-00	INCOMP CONFIG (Incomplete config)	Configuration of one control module at least in three control modules is wrong or incomplete.

POSSIBLE CAUSE

- Configuration of one control module at least in three control modules is wrong or incomplete.

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13EE-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-448, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356897

1. PERFORM CONFIGURATION

Perform configuration for each control module. Refer to [STC-212, "Work Procedure"](#) (EPS/DAST 3), [STC-214, "Work Procedure"](#) (DAST 1), [STC-216, "Work Procedure"](#) (DAST 2).

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13EE-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

< DTC/CIRCUIT DIAGNOSIS >

NO >> INSPECTION END

DAST 2

DAST 2 : DTC Description

INFOID:0000000013356898

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EE-00	INCOMP CONFIG (Incomplete config)	Configuration of one control module at least in three control modules is wrong or incomplete.

POSSIBLE CAUSE

- Configuration of one control module at least in three control modules is wrong or incomplete.

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

 With CONSULT

1. Start engine.
CAUTION:
Never drive the vehicle.
2. Perform self-diagnosis for "DAST 2".

Is DTC "C13EE-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-449, "DAST 2 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:0000000013356899

1. PERFORM CONFIGURATION

Perform configuration for each control module. Refer to [STC-212, "Work Procedure"](#) (EPS/DAST 3), [STC-214, "Work Procedure"](#) (DAST 1), [STC-216, "Work Procedure"](#) (DAST 2).

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start engine.
CAUTION:
Never drive the vehicle.
5. Perform self-diagnosis for "DAST 2".

Is DTC "C13EE-00" detected?

- YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

C13EE-00 INCOMP CONFIG

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

NO >> INSPECTION END

C13EF-00 CONFIG CHECK RESULT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13EF-00 CONFIG CHECK RESULT

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356900

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EF-00	CONFIG CHECK RESULT (Config checking result)	Configuration result of control module is malfunction.

POSSIBLE CAUSE

- Incomplete of configuration for steering force control module
- Mistake of configuration for steering force control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13EF-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-451, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356901

1. PERFORM CONFIGURATION

Perform configuration for control module. Refer to [STC-212, "Work Procedure"](#).

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13EF-00" detected?

YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

C13EF-00 CONFIG CHECK RESULT

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

NO >> INSPECTION END

DAST 1

DAST 1 : DTC Description

INFOID:000000013356902

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EF-00	CONFIG CHECK RESULT (Config checking result)	Configuration result of control module is malfunction.

POSSIBLE CAUSE

- Incomplete of configuration for steering angle main control module
- Mistake of configuration for steering angle main control module
- Incomplete of configuration for steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13EF-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-452. "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356903

1. PERFORM CONFIGURATION

Perform configuration for control module. Refer to [STC-214. "Work Procedure"](#).

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13EF-00" detected?

C13EF-00 CONFIG CHECK RESULT

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Replace steering angle main control module. Refer to [STC-493. "Removal and Installation"](#).
- NO >> INSPECTION END

DAST 2

DAST 2 : DTC Description

INFOID:000000013356904

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EF-00	CONFIG CHECK RESULT (Config checking result)	Configuration result of control module is malfunction.

POSSIBLE CAUSE

- Incomplete of configuration for steering angle sub control module
- Mistake of configuration for steering angle sub control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13EF-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-449. "DAST 2 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356905

1. PERFORM CONFIGURATION

Perform configuration for control module. Refer to [STC-216. "Work Procedure"](#).

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13EF-00" detected?

C13EF-00 CONFIG CHECK RESULT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

YES >> Replace steering angle sub control module. Refer to [STC-494. "Removal and Installation"](#).
NO >> INSPECTION END

C13F0-00 INCOMP DAST CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13F0-00 INCOMP DAST CALIBRATION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356906

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13F0-00	INCOMP DAST CALIBRATION (Incomplete direct adaptive steering calibration)	Initial learning of direct adaptive steering is incomplete.

POSSIBLE CAUSE

- Incomplete of direct adaptive steering initial learning.

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13F0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-455. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356907

1. PERFORM CALIBRATION

Perform the working including "DAST CALIBRATION (MODE1)" performed just before from the first. Refer to [STC-203. "Work Procedure"](#).

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13F0-00" detected?

YES >> Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).

NO >> INSPECTION END

DAST 1

C13F0-00 INCOMP DAST CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000013356908

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13F0-00	INCOMP DAST CALIBRATION (Incomplete direct adaptive steering calibration)	Initial learning of direct adaptive steering is incomplete.

POSSIBLE CAUSE

- Incomplete of direct adaptive steering initial learning.

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 1".

Is DTC "C13F0-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-456, "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356909

1.PERFORM CALIBRATION

Perform the working including "DAST CALIBRATION (MODE1)" performed just before from the first. Refer to [STC-203, "Work Procedure"](#).

>> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "DAST 1".

Is DTC "C13F0-00" detected?

- YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).
NO >> INSPECTION END

DAST 2

DAST 2 : DTC Description

INFOID:000000013356910

DTC DETECTION LOGIC

C13F0-00 INCOMP DAST CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13F0-00	INCOMP DAST CALIBRATION (Incomplete direct adaptive steering calibration)	Initial learning of direct adaptive steering is incomplete.

POSSIBLE CAUSE

- Incomplete of direct adaptive steering initial learning.

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 2".

Is DTC "C13F0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-457, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356911

1. PERFORM CALIBRATION

Perform the working including "DAST CALIBRATION (MODE1)" performed just before from the first. Refer to [STC-203, "Work Procedure"](#).

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "DAST 2".

Is DTC "C13F0-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> INSPECTION END

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13F1-00 INCOMP ST ANG SEN ADJST

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

C13F1-00 INCOMP ST ANG SEN ADJST

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356912

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13F1-00	INCOMP ST ANG SEN ADJST Incomplete steering angle sensor adjustment	Steering angle sensor neutral position adjustment is incomplete

POSSIBLE CAUSE

- In complete of steering angle sensor neutral position adjustment

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13F1-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-458, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356913

1. PERFORM CALIBRATION

Perform the working including "DAST CALIBRATION (MODE1)" performed just before from the first. Refer to [STC-203, "Work Procedure"](#).

>> GO TO 2.

2. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Adjust neutral position of steering angle sensor. Refer to [BRC-91, "Work Procedure"](#).

>> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13F1-00" detected?

C13F1-00 INCOMP ST ANG SEN ADJST

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

YES >> Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).
NO >> INSPECTION END

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

C13F2-00 MISMATCHED SOFTWARE VERSION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13F2-00 MISMATCHED SOFTWARE VERSION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000013356914

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13F2-00	DIFFERENT SOFTWARE VERSION (Different software version)	The software version of each control module is different.

POSSIBLE CAUSE

- The software version of steering force control module, steering angle main control module and steering angle main control module is different.

FAIL-SAFE

- Mode 2 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13F2-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-460, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000013356915

1. CHECK THE WORK

Check the work performed just before.

What is the work performed just before?

RE/PROGRAMMING>>Perform the "RE/PROGRAMMING" according to the procedure. Refer to "CONSULT Operation Manual",

Replacing control module>>When replacing the control module, replace three control modules as a set. Refer to [STC-492, "Removal and Installation"](#), [STC-493, "Removal and Installation"](#), [STC-494, "Removal and Installation"](#). After replacing three control modules, perform the self-diagnosis again, and then check that DTC "C13F2-00" is not detected.

DAST 1

DAST 1 : DTC Description

INFOID:000000013356916

DTC DETECTION LOGIC

C13F2-00 MISMATCHED SOFTWARE VERSION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13F2-00	DIFFERENT SOFTWARE VERSION (Different software version)	The software version of each control module is different.

POSSIBLE CAUSE

- The software version of steering force control module, steering angle main control module and steering angle main control module is different.

FAIL-SAFE

- Mode 2 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 1".

Is DTC "C13F2-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-460, "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356917

1. CHECK THE WORK

Check the work performed just before.

What is the work performed just before?

- RE/PROGRAMMING>>Perform the "RE/PROGRAMMING" according to the procedure. Refer to "CONSULT Operation Manual",
- Replacing control module>>When replacing the control module, replace three control modules as a set. Refer to [STC-492, "Removal and Installation"](#), [STC-493, "Removal and Installation"](#), [STC-494, "Removal and Installation"](#). After replacing three control modules, perform the self-diagnosis again, and then check that DTC "C13F2-00" is not detected.

DAST 2

DAST 2 : DTC Description

INFOID:000000013356918

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13F2-00	DIFFERENT SOFTWARE VERSION (Different software version)	The software version of each control module is different.

POSSIBLE CAUSE

- The software version of steering force control module, steering angle main control module and steering angle main control module is different.

FAIL-SAFE

- Mode 2 or Mode 3

C13F2-00 MISMATCHED SOFTWARE VERSION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

NOTE:

For fail-safe mode, refer to [STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓜ With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 2".

Is DTC "C13F2-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-460, "EPS/DAST 3 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000013356919

1. CHECK THE WORK

Check the work performed just before.

What is the work performed just before?

- RE/PROGRAMMING>>Perform the "RE/PROGRAMMING" according to the procedure. Refer to "CONSULT Operation Manual",
Replacing control module>>When replacing the control module, replace three control modules as a set. Refer to [STC-492, "Removal and Installation"](#), [STC-493, "Removal and Installation"](#), [STC-494, "Removal and Installation"](#). After replacing three control modules, perform the self-diagnosis again, and then check that DTC "C13F2-00" is not detected.

U1000-01 CAN COMM CIRCUIT

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356920

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit communicate data but selectively reads required data only.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
U1000-01	CAN COMM CIRCUIT (CAN communication circuit)	Steering force control module is not transmitting/receiving CAN communication signal for 2 seconds or more.

POSSIBLE CAUSE

- CAN communication error
- CAN communication line

FAIL-SAFE

- System continue normal control.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "U1000-01" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-463. "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356921

Proceed to [LAN-41. "Trouble Diagnosis Flow Chart"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000013356922

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CANH line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit communicate data but selectively reads required data only.

DTC DETECTION LOGIC

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

U1000-01 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
U1000-01	CAN COMM CIRCUIT (CAN communication circuit)	Steering angle main control module is not transmitting/receiving CAN communication signal for 2 seconds or more.

POSSIBLE CAUSE

- CAN communication error
- CAN communication line

FAIL-SAFE

- System continue normal control.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 1".

Is DTC "U1000-01" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-464, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356923

Proceed to [LAN-41, "Trouble Diagnosis Flow Chart"](#).

U1010-49 CONTROL UNIT (CAN)

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

U1010-49 CONTROL UNIT (CAN)

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000013356924

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit communicate data but selectively reads required data only.

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition
U1010-49	CONTROL UNIT(CAN)	When detecting error during the initial diagnosis of CAN controller to steering force control module.

POSSIBLE CAUSE

- Steering force control module internal error

FAIL-SAFE

- System continue normal control.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

Ⓜ With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "U1010-49" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-463, "EPS/DAST 3 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000013356925

1.PERFORM SELF-DIAGNOSIS

Ⓜ With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "U1010-49" detected?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
NO >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

DAST 1

U1010-49 CONTROL UNIT (CAN)

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

DAST 1 : DTC Description

INFOID:000000013356926

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit communicate data but selectively reads required data only.

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition
U1010-49	CONTROL UNIT(CAN)	When detecting error during the initial diagnosis of CAN controller to steering angle main control module.

POSSIBLE CAUSE

- Steering angle main control module internal error

FAIL-SAFE

- System continue normal control.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 1".

Is DTC "U1010-49" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-463. "EPS/DAST 3 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000013356927

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "DAST 1".

Is DTC "U1010-49" detected?

- YES >> Replace steering angle main control module. Refer to [STC-493. "Removal and Installation"](#).
NO >> • Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000013356929

1. CHECK STEERING FORCE CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	33	Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit in harness or connectors.

2. CHECK STEERING ANGLE MAIN CONTROL MODULE GROUND CIRCUIT

1. Disconnect steering angle main control module harness connector.
2. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	33	Ground	Existed
E28	39		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit in harness or connectors.

3. CHECK STEERING ANGLE SUB CONTROL MODULE GROUND CIRCUIT

1. Disconnect steering angle sub control module harness connector.
2. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	33	Ground	Existed
E31	39		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit in harness or connectors.

4. CHECK STEERING FORCE CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Disconnect steering force control module harness connector.
2. Check the voltage between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5. CHECK STEERING FORCE CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 60A fusible link (#G).

POWER SUPPLY AND GROUND CIRCUIT

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

2. Check the harness for open or short between steering force control module harness connector No.34 terminal and the 60A fusible link (#G).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

6.CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the voltage between steering angle main control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 7.

7.CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#J).
2. Check the harness for open or short between steering angle main control module harness connector No.34 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

8.CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the voltage between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 9.

9.CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#H).
2. Check the harness for open or short between steering angle sub control module harness connector No.34 terminal and the 100A fusible link (#H).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

10.CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE MAIN CONTROL MODULE

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the voltage between steering angle main control module harness connector and ground.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	0 V

- Turn the ignition switch ON.
- Check the voltage between steering angle control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

- YES >> INSPECTION END.
NO >> GO TO 11.

11.CHECK IGNITION POWER SUPPLY CIRCUIT (1)

- Turn the ignition switch OFF.
- Disconnect steering angle sub control module harness connector.
- Check the continuity between steering angle main control module harness connector and steering angle sub control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	25	E29	27	Existed

Is the inspection result normal?

- YES >> GO TO 12.
NO >> Repair or replace error-detected parts.

12.CHECK INTERNAL CIRCUIT IN STEERING ANGLE SUB CONTROL MODULE

Check the continuity between steering angle sub control module connector terminals.

Steering angle sub control module			Continuity
Terminal			
25	27		Existed

Is the inspection result normal?

- YES >> GO TO 13.
NO >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

13.CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE SUB CONTROL MODULE

- Check the voltage between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	0 V

- Turn the ignition switch ON.
- Check the voltage between steering angle control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

- YES >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).
NO >> GO TO 14.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

14. CHECK IGNITION POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering angle sub control module harness connector and steering force control module harness connector.

Steering angle sub control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	25	M71	27	Existed

Is the inspection result normal?

YES >> GO TO 15.

NO >> Repair or replace error-detected parts.

15. CHECK INTERNAL CIRCUIT IN STEERING FORCE CONTROL MODULE

Check the continuity between steering force control module connector terminals.

Steering force control module		Continuity
Terminal		
25	27	Existed

Is the inspection result normal?

YES >> GO TO 16.

NO >> Replace steering force control module. Refer to [STC-492. "Removal and Installation"](#).

16. CHECK IGNITION POWER SUPPLY FOR STEERING FORCE CONTROL MODULE

1. Check the voltage between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	25	Ground	0 V

2. Turn the ignition switch ON.

3. Check the voltage between force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> • Check enlarged contact spring of terminal. Refer to [GI-42. "How to Check Terminal"](#).

• Perform intermittent incident while turning steering wheel. Refer to [GI-45. "Intermittent Incident"](#).

NO >> GO TO 17.

17. CHECK IGNITION POWER SUPPLY CIRCUIT (3)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#12).
3. Disconnect fuse block (J/B) harness connector.
4. Check the continuity between steering force control module connector and fuse block (J/B).

Steering force control module		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M71	25	M133	20C	Existed

5. Check the continuity between steering force control module connector and ground.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		—	Continuity
Connector	Terminal		
M71	25	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-65, "VR30DDTT : Wiring Diagram - IGNITION POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

POWER STEERING WARNING LAMP

Component Function Check

INFOID:000000013356930

1. CHECK THE ILLUMINATION OF THE POWER STEERING WARNING LAMP

Check that the power steering warning lamp turns ON when ignition switch turns ON. Then, power steering warning lamp turns OFF after the engine is started.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Perform trouble diagnosis. Refer to [STC-467, "Diagnosis Procedure"](#)

Diagnosis Procedure

INFOID:000000013356931

1. PERFORM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for "EPS/DAST 3", "DAST 1" and "DAST 2".

Is any DTC detected?

YES >> Check the DTC. Refer to [STC-156, "DTC Index"](#) (EPS/DAST 3), [STC-169, "DTC Index"](#) (DAST 1) and [STC-182, "DTC Index"](#) (DAST 2).

NO >> GO TO 2.

2. CHECK POWER STEERING WARNING LAMP SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. On CONSULT screen, select "METER/M&A" >> "DATA MONITOR" >> "EPS W/L".
3. Check that the item in "DATA MONITOR" is "On".
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Check that the item in "DATA MONITOR" is "Off".

Is the inspection result normal?

YES >> Perform the trouble diagnosis for combination meter power supply circuit. Refer to [MWI-120, "COMBINATION METER : Diagnosis Procedure"](#).

NO >> Replace steering force control module. Refer to [MWI-141, "Removal and Installation"](#).

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

SYMPTOM DIAGNOSIS

SYSTEM SYMPTOM

Symptom Table

INFOID:0000000013356932

Symptom	Warning lamp	Possible cause	Diagnosis method	Priority
While driving the vehicle, steering wheel is off-center.	ON	Fail safe mode 2 For fail-safe mode, refer to STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe" .	Perform self-diagnosis	1
	OFF*3	Protection mode For protection function, refer to STC-128, "DIRECT ADAPTIVE STEERING : Protection Function" .	Perform self-diagnosis NOTE: When DTC is detected as "PAST", this is control in normal condition.	2
	OFF	Mistake of calibration procedure.	Perform self-diagnosis When DTC is not detected, refer to STC-203, "Work Procedure" .	2
	OFF	<ul style="list-style-type: none"> Steering wheel is off-center slightly. Steering wheel is off-center temporarily. 	Perform symptom diagnosis "THE VEHICLE PULLS TO ONE SIDE" Refer to STC-476, "Diagnosis Procedure" .	1
<ul style="list-style-type: none"> When turning the steering wheel from full left stop to full right stop, the sound is heard from left or right side. When turning the steering wheel from full left stop to full right stop, it is not able to turn until halfway position of left or right. 	The vehicle pulls to one direction. *2	<ul style="list-style-type: none"> Steering wheel is off-center slightly. Steering wheel is off-center temporarily. 	Perform symptom diagnosis "THE VEHICLE PULLS TO ONE SIDE" Refer to STC-476, "Diagnosis Procedure" .	1
	The vehicle does not pull to one direction. *1	The neutral position of the vehicle's alignment and the neutral position of the steering rack are off-center.	Perform "TOE-IN ADJUSTMENT" with alignment tester. Refer to ST-126, "ALIGNMENT TESTER : Inspection and Adjustment" . CAUTION: Be sure to use alignment tester for the symptom.	1
<ul style="list-style-type: none"> Steering gear ratio changes Steering wheel turning force is heavy 	ON	Fail safe mode 2 or 3 For fail-safe mode, refer to STC-125, "DIRECT ADAPTIVE STEERING : Fail-safe" .	Perform self-diagnosis	1
	OFF*3	Protection mode For protection function, refer to STC-128, "DIRECT ADAPTIVE STEERING : Protection Function" .	Perform self-diagnosis NOTE: When DTC is detected as "PAST", this is control in normal condition.	2
	OFF	Steering mode is except "Normal". For steering mode, refer to STC-118, "DIRECT ADAPTIVE STEERING : System Description" .	Not required NOTE: Since the steering mode is except "Normal", steering characteristic is changed. This is control in normal condition.	3

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Symptom	Warning lamp	Possible cause	Diagnosis method	Priority
Steering wheel turning force is light	ON	Fail safe mode 2 For fail-safe mode, refer to STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe" .	Perform self-diagnosis	1
	OFF*3	Protection mode For protection function, refer to STC-128. "DIRECT ADAPTIVE STEERING : Protection Function" .	Perform self-diagnosis NOTE: When DTC is detected as "PAST", this is control in normal condition.	2
	OFF	Steering mode is except "Normal". For steering mode, refer to STC-118. "DIRECT ADAPTIVE STEERING : System Description" .	Not required NOTE: Since the steering mode is except "Normal", steering characteristic is changed. This is control in normal condition.	3
Vibration / Noise occurs	ON	Fail safe mode 2 (Operation sound of steering clutch) For fail-safe mode, refer to STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe" .	Perform self-diagnosis	1
	OFF*3	Protection mode (Operation sound of steering clutch) For protection function, refer to STC-128. "DIRECT ADAPTIVE STEERING : Protection Function" .	Perform self-diagnosis NOTE: When DTC is detected as "PAST", this is control in normal condition.	2
	OFF	Operating sound of steering force actuator	Not required NOTE: This is an operating sound in normal condition of direct adaptive steering.	3
	OFF	Operating sound of steering angle actuator		
When start the engine, sound is heard.	ON	Malfunction of steering clutch (When sound is abnormal sound.)	Perform self-diagnosis	1
	OFF	Operating sound of steering clutch	Not required NOTE: This is an operating sound in normal condition of direct adaptive steering.	
Unbalance steering wheel turning force (torque variation)	ON	Fail safe mode 2 For fail-safe mode, refer to STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe" .	Perform self-diagnosis	1
	OFF*3	Protection mode For protection function, refer to STC-128. "DIRECT ADAPTIVE STEERING : Protection Function" .	Perform self-diagnosis NOTE: When DTC is detected as "PAST", this is control in normal condition.	2

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Symptom	Warning lamp	Possible cause	Diagnosis method	Priority	
When starting the engine ⇔ turning the ignition switch OFF, steering wheel moves.	OFF	Starting the engine in the condition that steering angle is over 360 degree	Not required NOTE: The gear ration is different between direct adaptive steering mode and others.if steering angle is over 360 degree when engine starts, the system adjust it.	2	A B C
	ON	Malfunction of steering clutch	Perform self-diagnosis NOTE: When starting the engine ⇔ turning the ignition switch OFF, it is normal that the steering wheel slightly moves.	1	D E
When turning quickly, the vehicle follows slowly compared with turning normally.	ON	Fail safe mode 1 For fail-safe mode, refer to STC-125. "DIRECT ADAPTIVE STEERING : Fail-safe" .	Perform self-diagnosis NOTE: After the system starts again, system is in fail-safe mode 3.	1	F
When turning the steering wheel from full left stop to full right stop, steering reaction force is light.	OFF	The output of steering force motor decreases.	Not required NOTE: System decrease the output of steering force motor to avoid overheating steering force motor. This is control in normal condition of direct adaptive steering.	1	STC H I

*1: Even if driver releases the hands of the steering wheel, the vehicle keeps running straightly.

*2: If driver tries to drive straightly, the steering wheel pulls and then the reaction force to be returned to the center position is generated. If driver releases the hands of the steering wheel, the steering wheel is returned to the center position and the vehicle pulls to one direction.

*3: Except C13E5-00

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

THE VEHICLE PULLS TO ONE SIDE

[DIRECT ADAPTIVE STEERING]

< SYMPTOM DIAGNOSIS >

THE VEHICLE PULLS TO ONE SIDE

Description

INFOID:000000013356933

- If driver tries to drive straightly, the steering wheel pulls and then the reaction force to be returned to the center position is generated.
- If driver releases the hands of the steering wheel, the steering wheel is returned to the center position and the vehicle pulls to one direction.

Diagnosis Procedure

INFOID:000000013356934

1. CHECK THE ILLUMINATION OF THE POWER STEERING WARNING LAMP

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Check that the power steering warning lamp turns OFF.

Does the power steering warning lamp turn OFF?

YES >> GO TO 2.

NO >> Perform self-diagnosis for "EPS/DAST 3", "DAST 1" and "DAST 2".

- EPS/DAST 3: Refer to [STC-156, "DTC Index"](#).
- DAST 1: Refer to [STC-169, "DTC Index"](#).
- DAST 2: Refer to [STC-182, "DTC Index"](#).

2. AUTO ADJUSTING MODE (1)

1. Turn the steering wheel to left/right 90 degree or more from center position 2 times.
2. Drive straight ahead at around 30 km/h (19 MPH) for more than 5 seconds.

CAUTION:

• **Drive on a straight flat road.**

• **Keep the steering wheel, so the vehicle stays in a straight line.**

NOTE:

Drive at between 30 km/h (19 MPH) and 40 km/h (25 MPH), as much as possible. It is easy to succeed with the work.

3. Stop the vehicle.

>> GO TO 3.

3. SYMPTOM CONFIRMATION

Recheck the symptom and check that symptom is not reproduced on the same conditions.

Is the symptom corrected?

YES >> INSPECTION END

NO >> GO TO 4.

4. AUTO ADJUSTING MODE (2)

1. Drive straight ahead at 60 km/h (37 MPH) or more for more than 15 seconds.

CAUTION:

• **Drive on a straight flat road.**

• **Keep the steering wheel, so the vehicle stays in a straight line.**

NOTE:

When the vehicle pulls to one side slightly, the driving at between 30 km/h (19 MPH) and 40 km/h (25 MPH) may not dissolve the symptom.

2. Stop the vehicle.
3. Repeat the driving and stopping 5 times.

>> GO TO 5.

5. SYMPTOM CONFIRMATION

Recheck the symptom and check that symptom is not reproduced on the same conditions.

Is the symptom corrected?

THE VEHICLE PULLS TO ONE SIDE

[DIRECT ADAPTIVE STEERING]

< SYMPTOM DIAGNOSIS >

YES >> INSPECTION END

NO >> GO TO 6.

6. CHECK SUSPENSION AND STEERING PARTS INSTALLATION CONDITION

Check suspension and steering parts installation condition.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Install suspension and steering parts properly. Then perform the toe-in adjustment. Refer to [ST-126. "ALIGNMENT TESTER : Inspection and Adjustment"](#).

7. TOE-IN ADJUSTMENT

Adjust toe-in. Refer to [ST-126. "ALIGNMENT TESTER : Inspection and Adjustment"](#).

>> GO TO 8.

8. FINAL CHECK

Recheck the symptom and check that symptom is not reproduced on the same conditions.

Is the symptom corrected?

YES >> INSPECTION END

NO >> GO TO 7.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

BIG OFF-CENTER OCCURS

Description

INFOID:000000013356935

The off-center that is bigger than 120° occurs.

NOTE:

This procedure is for preventing the spiral cable from being torn off when replacing the direct adaptive steering related parts.

CAUTION:

Never perform the replacement of control module, the configuration, or the DAST calibration, with off-center bigger than 120°.

Diagnosis Procedure

INFOID:000000013356936

1. CHECK THE ILLUMINATION OF THE POWER STEERING WARNING LAMP

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Check that the power steering warning lamp turns OFF.

Does the power steering warning lamp turn OFF?

YES >> GO TO 2.

NO >> Perform self-diagnosis for "EPS/DAST 3", "DAST 1" and "DAST 2".

- EPS/DAST 3: Refer to [STC-156, "DTC Index"](#).
- DAST 1: Refer to [STC-169, "DTC Index"](#).
- DAST 2: Refer to [STC-182, "DTC Index"](#).

2. AUTO ADJUSTING MODE (1)

1. Turn the steering wheel to left/right 90 degree or more from center position 2 times.
2. Drive straight ahead at around 30 km/h (19 MPH) or more for more than 5 seconds.

CAUTION:

- **Drive on a straight flat road.**
- **Keep the steering wheel, so the vehicle stays in a straight line.**

NOTE:

Drive at between 30 km/h (19 MPH) and 40 km/h (25 MPH), as much as possible. It is easy to succeed with the work.

3. Stop the vehicle.

>> GO TO 3.

3. SYMPTOM CONFIRMATION

Recheck the symptom and check that symptom is not reproduced on the same conditions.

Is the symptom corrected?

YES >> INSPECTION END

NO >> GO TO 4.

4. AUTO ADJUSTING MODE (2)

1. Drive straight ahead at 60 km/h (37 MPH) or more for more than 15 seconds.

CAUTION:

- **Drive on a straight flat road.**
- **Keep the steering wheel, so the vehicle stays in a straight line.**

NOTE:

When the vehicle pulls to one side slightly, the driving at between 30 km/h (19 MPH) and 40 km/h (25 MPH) may not dissolve the symptom.

2. Stop the vehicle.
3. Repeat the driving and stopping 5 times.

>> GO TO 5.

5. SYMPTOM CONFIRMATION

BIG OFF-CENTER OCCURS

[DIRECT ADAPTIVE STEERING]

< SYMPTOM DIAGNOSIS >

Recheck the symptom and check that symptom is not reproduced on the same conditions.

Is the symptom corrected?

YES >> INSPECTION END

NO >> GO TO 6.

6. PREPARATION

1. Set the front wheel on the turn table.

NOTE:

Do not lift up the vehicle during "DAST CALIBRATION (MODE1)"

2. Set the front wheel to the straight-ahead position.
3. Connect the battery charger to protect the 12V battery.

NOTE:

Much electricity is used in "DAST CALIBRATION (MODE1)".

>> GO TO 7.

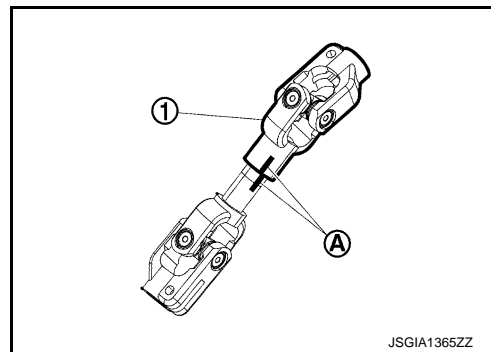
7. CORRECT STEERING WHEEL POSITION

With CONSULT

1. Remove steering upper shaft mounting bolt (steering clutch assembly side). Refer to [ST-139, "Removal and Installation"](#).

CAUTION:

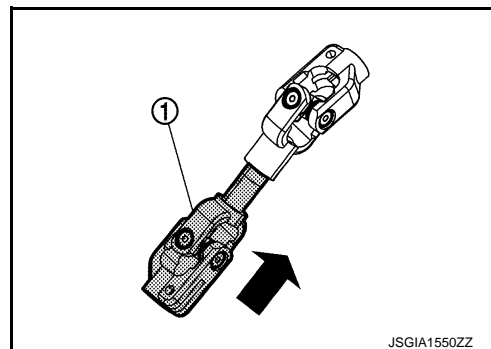
- When removing steering column assembly, fix the steering upper shaft using wire etc., because steering upper shaft may separate the steering column side and steering clutch side. Never separate steering upper shaft steering column side and steering clutch side.
- Place a matching marks **A** on steering upper shaft **1**. When the steering upper shaft is separated, use matching marks.



2. Move steering upper shaft **1** to the steering column side to separate it from steering clutch assembly.

CAUTION:

When separating steering upper shaft, never insert a tool, such as a screwdriver, into the yoke groove to pull out the steering upper shaft. In the case of the violation of the above, replace steering upper shaft with a new one.



3. Turn the ignition switch ON.

CAUTION:

Never start the engine.

4. On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "ST ANGLE SENSOR", and then check the value.
5. Turn the steering wheel until the value is 0 deg.

>> GO TO 8.

8. DAST CALIBRATION (MODE1) [CLUTCH PHASE LEARNING]

BIG OFF-CENTER OCCURS

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Ⓟ With CONSULT

Perform "DAST CALIBRATION (MODE1)" while holding the steering wheel with hand. Refer to [STC-209. "Description"](#).

CAUTION:

Never release the hand from the steering wheel.

>> GO TO 9.

9. CONNECT STEERING UPPER SHAFT

Ⓟ With CONSULT

1. After the movement of front wheel stops and then the steering clutch assembly is released by DAST calibration, connect the steering upper shaft to steering clutch assembly. Refer to [ST-139. "Removal and Installation"](#).

CAUTION:

About the aligning, turn the shaft part of steering clutch assembly by hand.

NOTE:

About the direction of rotation, both is OK. Because the shaft part of steering clutch is free in this timing.

2. Select "END".

3. Turn ignition switch OFF.

CAUTION:

Be sure to perform this step.

>> GO TO 10.

10. DAST CALIBRATION (MODE1) [STEERING RACK NEUTRAL POSITION LEARNING]

Ⓟ With CONSULT

1. Turn the ignition switch ON.

CAUTION:

Never start the engine.

2. Perform "DAST CALIBRATION (MODE1)". Refer to [STC-209. "Description"](#).

>> GO TO 11.

11. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Ⓟ With CONSULT

1. On the CONSULT screen, select "ABS">>"WORK SUPPORT">>"ST ANGLE SENSOR ADJUSTMENT".

2. Touch START.

CAUTION:

Never touch steering wheel while adjusting steering angle sensor.

3. After approx. 10 seconds, select "END".

4. Turn ignition switch OFF, and then turn it ON again.

CAUTION:

Be sure to perform this step.

>> WORK END

POWER STEERING WARNING LAMP DOES NOT TURN ON

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

POWER STEERING WARNING LAMP DOES NOT TURN ON

Description

INFOID:000000013356937

Power steering warning lamp does not illuminate when the ignition switch is turned ON (lamp check).

Diagnosis Procedure

INFOID:000000013356938

1. CHECK THE POWER STEERING WARNING LAMP

Perform trouble diagnosis for power steering warning lamp system. Refer to [STC-472, "Diagnosis Procedure"](#).

Is the check result normal?

- YES >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).
- NO >> Repair or replace the malfunctioning parts.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

POWER STEERING WARNING LAMP DOES NOT TURN OFF

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

POWER STEERING WARNING LAMP DOES NOT TURN OFF

Description

INFOID:000000013356939

Power steering warning lamp does not turn OFF several seconds after the engine is started.

Diagnosis Procedure

INFOID:000000013356940

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Start the engine.
2. Perform "EPS/DAST 3", "DAST 1" and "DAST 2" self-diagnosis.

Is any DTC displayed?

- YES >> Check the DTC.
- EPS/DAST 3: Refer to [STC-156, "DTC Index"](#).
 - DAST 1: Refer to [STC-169, "DTC Index"](#).
 - DAST 2: Refer to [STC-182, "DTC Index"](#).

NO >> GO TO 2.

2. CHECK THE POWER STEERING WARNING LAMP

Perform trouble diagnosis for power steering warning lamp system. Refer to [STC-472, "Diagnosis Procedure"](#).

Is the check result normal?

YES >> GO TO 3.

NO >> Repair or replace the malfunctioning parts.

3. CHECK THE DIRECT ADAPTIVE STEERING POWER AND GROUND CIRCUIT

Perform trouble diagnosis for the direct adaptive steering power and ground circuit. Refer to [STC-467, "Diagnosis Procedure"](#).

Is the check result normal?

- YES >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).
- NO >> Repair or replace the malfunctioning parts.

SYSTEM IS NOT DISPLAYED ON CONSULT

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

SYSTEM IS NOT DISPLAYED ON CONSULT

Description

INFOID:0000000113356941

“DAST 1”, “DAST 2” or “EPS/DAST 3” is not displayed on CONSULT.

Self-diagnostic result or System condition

Detected DTC or system condition			Possible cause	Reference
DAST 1	DAST 2	EPS/DAST 3		
System is not displayed on CONSULT	System is not displayed on CONSULT	System is not displayed on CONSULT	<ul style="list-style-type: none"> Battery power supply circuit Ignition power supply circuit Power supply circuit for steering force control module Steering force control module harness connector 	TYPE 1: Refer to STC-483 .
System is not displayed on CONSULT	C13BE-00, C13C0-00 or C13C2-00	C13BE-00, C13C0-00 or C13C2-00	<ul style="list-style-type: none"> FlexRay communication line Steering angle main control module 	TYPE 2: Refer to STC-485 .
System is not displayed on CONSULT	System is not displayed on CONSULT	C13C1-00 and C13C4-00	<ul style="list-style-type: none"> FlexRay communication line Steering force control module Steering angle main control module Steering angle sub control module 	TYPE 3: Refer to STC-485 .
C13C0-00, C13C2-00 or System is not displayed on CONSULT	System is not displayed on CONSULT	C13BE-00, C13C0-00 or C13C3-00	<ul style="list-style-type: none"> FlexRay communication line Steering angle sub control module 	TYPE 4: Refer to STC-486 .
System is not displayed on CONSULT	C13C0-00 and C13C2-00	C13C0-00 and C13C2-00	<ul style="list-style-type: none"> Power supply circuit for steering angle main control module Steering angle main control module harness connector Ignition power supply circuit (between steering angle main control module and steering angle sub control module) 	TYPE 5: Refer to STC-487 .
System is not displayed on CONSULT	System is not displayed on CONSULT	C13C0-00, C13C2-00 and C13C3-00	<ul style="list-style-type: none"> Ignition power supply circuit (between steering force control module and steering angle sub control module) Steering force control module Steering angle sub control module 	TYPE 6: Refer to STC-488 .
C13C0-00 and C13C2-00	System is not displayed on CONSULT	C13C0-00 and C13C3-00	<ul style="list-style-type: none"> Steering angle sub control module harness connector 	TYPE 7: Refer to STC-489 .
System is not displayed on CONSULT	System is not displayed on CONSULT	C13BE-00, C13C1-00 or C13C4-00	<ul style="list-style-type: none"> FlexRay communication line Steering force control module 	TYPE 8: Refer to STC-490 .

TYPE 1

TYPE 1 : Diagnosis Procedure

INFOID:0000000113356942

1. CHECK STEERING FORCE CONTROL MODULE GROUND CIRCUIT

- Turn the ignition switch OFF.
- Disconnect steering force control module harness connector.
- Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	33	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.

SYSTEM IS NOT DISPLAYED ON CONSULT

[DIRECT ADAPTIVE STEERING]

< SYMPTOM DIAGNOSIS >

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

2.CHECK STEERING FORCE CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the voltage between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK STEERING FORCE CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 60A fusible link (#G).
2. Check the harness for open or short between steering force control module harness connector No.34 terminal and the 60A fusible link (#G).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4.CHECK INTERNAL CIRCUIT IN STEERING FORCE CONTROL MODULE

Check the continuity between steering force control module connector terminals.

Steering force control module		Continuity
Terminal		
25	27	Existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).

5.CHECK IGNITION POWER SUPPLY FOR STEERING FORCE CONTROL MODULE

1. Check the voltage between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	25	Ground	0 V

2. Turn the ignition switch ON.
3. Check the voltage between force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

NO >> GO TO 6.

6.CHECK IGNITION POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#12).
3. Disconnect fuse block (J/B) harness connector.
4. Check the continuity between steering force control module connector and fuse block (J/B).

SYSTEM IS NOT DISPLAYED ON CONSULT

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M71	25	M133	20C	Existed

5. Check the continuity between steering force control module connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	25	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

TYPE 2

TYPE 2 : Diagnosis Procedure

INFOID:000000013356943

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect each control module harness connector.
3. Check the continuity between each control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	19	E29	19	Existed
	20		20	

4. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	19	Ground	Not existed
	20		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-493, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

TYPE 3

TYPE 3 : Diagnosis Procedure

INFOID:000000013356944

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect each control module harness connector.
3. Check the continuity between each control module harness connector.

A
B
C
D
E
F
H
I
J
K
L
M
N
O
P

STC

SYSTEM IS NOT DISPLAYED ON CONSULT

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	19	E29	19	Existed
	20		20	

Steering force control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	19	E26	19	Existed
	20		20	

4. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	19	Ground	Not existed
	20		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module, steering angle sub control module and steering force control module. Refer to [STC-493, "Removal and Installation"](#), [STC-494, "Removal and Installation"](#) and [STC-492, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

TYPE 4

TYPE 4 : Diagnosis Procedure

INFOID:000000013356945

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect each control module harness connector.
3. Check the continuity between each control module harness connector.

Steering angle sub control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	19	E26	19	Existed
	20		20	

4. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	19	Ground	Not existed
	20		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.CHECK INTERMITTENT INCIDENT

SYSTEM IS NOT DISPLAYED ON CONSULT

[DIRECT ADAPTIVE STEERING]

< SYMPTOM DIAGNOSIS >

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

TYPE 5

TYPE 5 : Diagnosis Procedure

INFOID:000000013356946

1. CHECK STEERING ANGLE MAIN CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	33	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

2. CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the voltage between steering angle main control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#J).
2. Check the harness for open or short between steering angle main control module harness connector No.34 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4. CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE MAIN CONTROL MODULE

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the voltage between steering angle main control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	0 V

4. Turn the ignition switch ON.
5. Check the voltage between steering angle control module harness connector and ground.

SYSTEM IS NOT DISPLAYED ON CONSULT

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

- YES >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

NO >> GO TO 5.

5.CHECK IGNITION POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between steering angle main control module harness connector and steering angle sub control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	25	E29	27	Existed

Is the inspection result normal?

- YES >> Check the ignition power supply circuit for steering force control module and steering angle sub control module. Refer to [STC-467, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

TYPE 6

TYPE 6 : Diagnosis Procedure

INFOID:0000000013356947

1.CHECK INTERNAL CIRCUIT IN STEERING ANGLE SUB CONTROL MODULE

Check the continuity between steering angle sub control module connector terminals.

Steering angle sub control module		Continuity
Terminal		
25	27	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace steering angle sub control module. Refer to [STC-494, "Removal and Installation"](#).

2.CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE SUB CONTROL MODULE

1. Check the voltage between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	0 V

2. Turn the ignition switch ON.

3. Check the voltage between steering angle control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 4.

3.CHECK INTERMITTENT INCIDENT

SYSTEM IS NOT DISPLAYED ON CONSULT

[DIRECT ADAPTIVE STEERING]

< SYMPTOM DIAGNOSIS >

1. Turn the ignition switch OFF.
2. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
3. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module and steering angle sub control module. Refer to [STC-492, "Removal and Installation"](#), [STC-494, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

4.CHECK IGNITION POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering angle sub control module harness connector and steering force control module harness connector.

Steering angle sub control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	25	M71	27	Existed

Is the inspection result normal?

YES >> Check the ignition power supply circuit for steering force control module. Refer to [STC-328, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

TYPE 7

TYPE 7 : Diagnosis Procedure

INFOID:000000013356948

1.CHECK STEERING ANGLE SUB CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	33	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

2.CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the voltage between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> • Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
• Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

NO >> GO TO 3.

3.CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#H).
2. Check the harness for open or short between steering angle sub control module harness connector No.34 terminal and the 100A fusible link (#H).

Is the inspection result normal?

SYSTEM IS NOT DISPLAYED ON CONSULT

[DIRECT ADAPTIVE STEERING]

< SYMPTOM DIAGNOSIS >

- YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-20, "VR30DDTT : Wiring Diagram - BATTERY POWER SUPPLY -"](#).
NO >> Repair or replace error-detected parts.

TYPE 8

TYPE 8 : Diagnosis Procedure

INFOID:000000013356949

1. CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering force control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	19	E26	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	19	Ground	Not existed
	20		

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair or replace error-detected part.

2. CHECK INTERMITTENT INCIDENT

1. Check enlarged contact spring of terminal. Refer to [GI-42, "How to Check Terminal"](#).
2. Perform intermittent incident while turning steering wheel. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-492, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

STEERING FORCE CONTROL MODULE

< REMOVAL AND INSTALLATION >

[DIRECT ADAPTIVE STEERING]

REMOVAL AND INSTALLATION

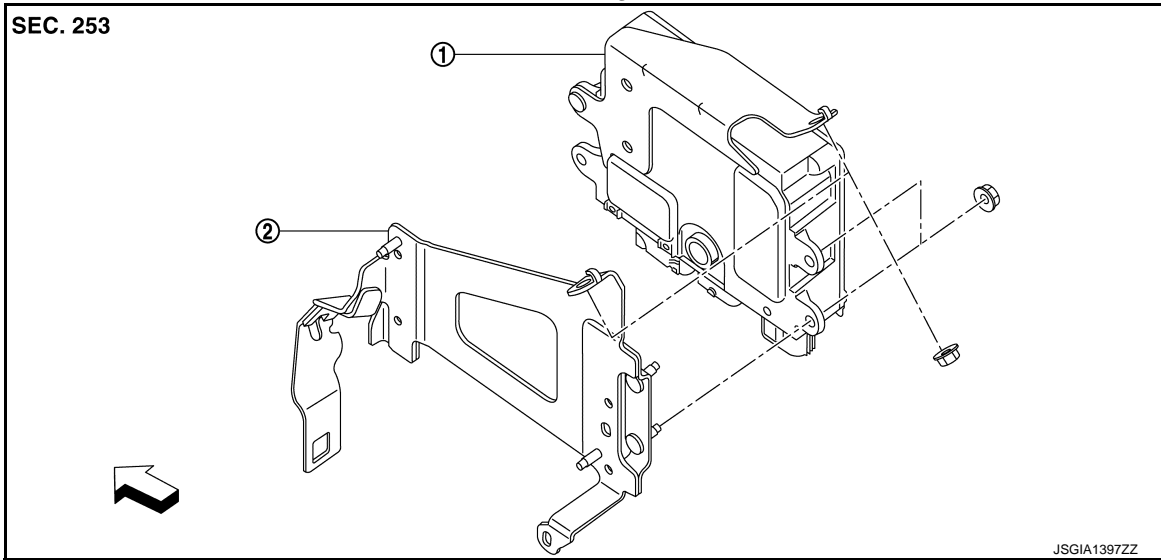
STEERING FORCE CONTROL MODULE

Exploded View

INFOID:0000000013356950

FOR VR30DDTT

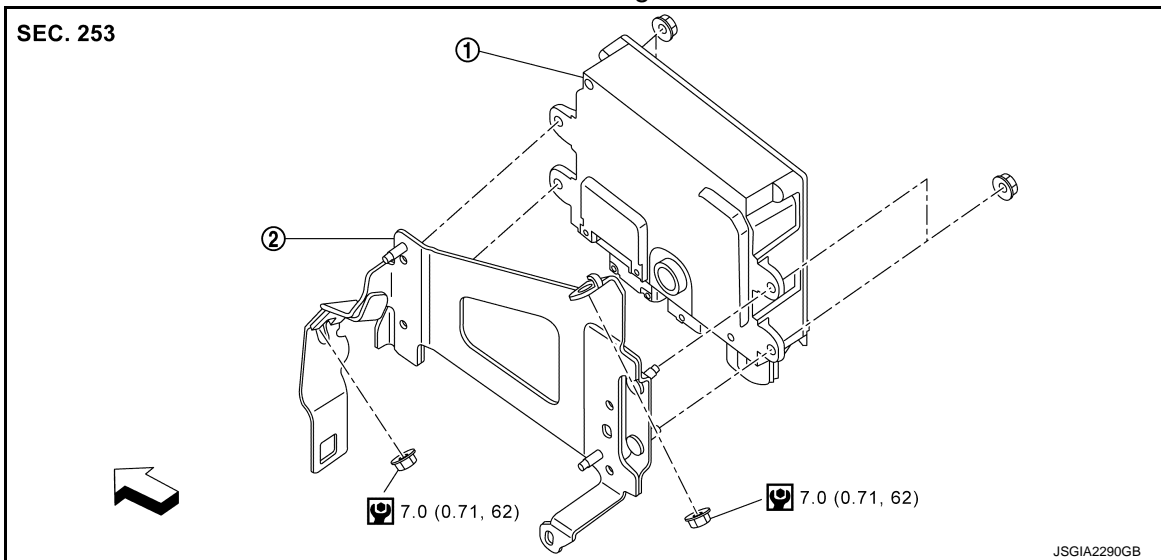
With sub bracket of steering force control module



- ① Steering force control module
- ② Bracket

↔: Vehicle front

Without sub bracket of steering force control module



- ① Steering force control module
- ② Bracket

↔: Vehicle front

⊙: N·m (kg·m, in·lb)

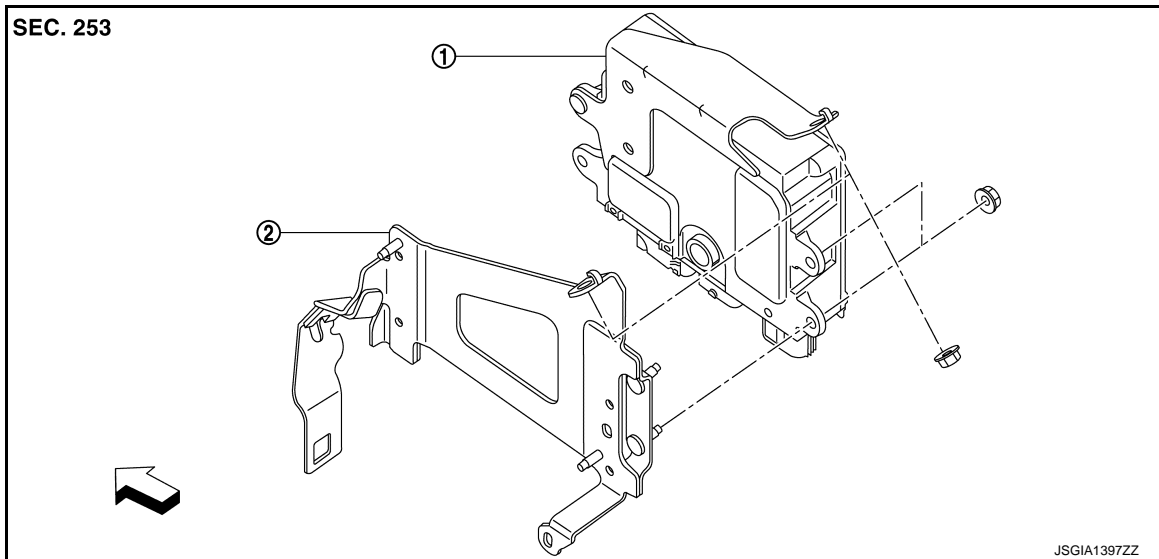
EXCEPT FOR VR30DDTT

A
B
C
D
E
F
STC
H
I
J
K
L
M
N
O
P

STEERING FORCE CONTROL MODULE

< REMOVAL AND INSTALLATION >

[DIRECT ADAPTIVE STEERING]



- ① Steering force control module ② Bracket

⇐ Vehicle front

Removal and Installation

INFOID:000000013356951

CAUTION:

- Perform additional service when replacing steering force control module. Refer to [STC-206, "Description"](#).
- When off-center is bigger than 120°, refer to [STC-478, "Diagnosis Procedure"](#) to correct off-center before performing the work.

REMOVAL

1. Remove the glove box. Refer to [IP-13, "Removal and Installation"](#).
2. Remove the instrument lower panel. Refer to [IP-13, "Removal and Installation"](#).
3. Disconnect steering force control module harness connectors.
4. Disconnect EMCM harness connector. (Except for VR30DDTT) Refer to [EC4-968, "Removal and Installation"](#).
5. Remove the bracket with steering force control module. (For VR30DDTT)
6. Remove the bracket with steering force control module and EMCM. (Except for VR30DDTT)
7. Remove the steering force control module from bracket.

CAUTION:

When replacing control module, replace the following control modules as a set.

- Steering force control module
- Steering angle main control module
- Steering angle sub control module

8. Remove the EMCM from bracket. (Except for VR30DDTT) Refer to [EC4-968, "Removal and Installation"](#).

INSTALLATION

Note following, and install in the reverse order of removal.

CAUTION:

Perform additional service when replacing steering force control module. Refer to [STC-206, "Description"](#).

STEERING ANGLE MAIN CONTROL MODULE

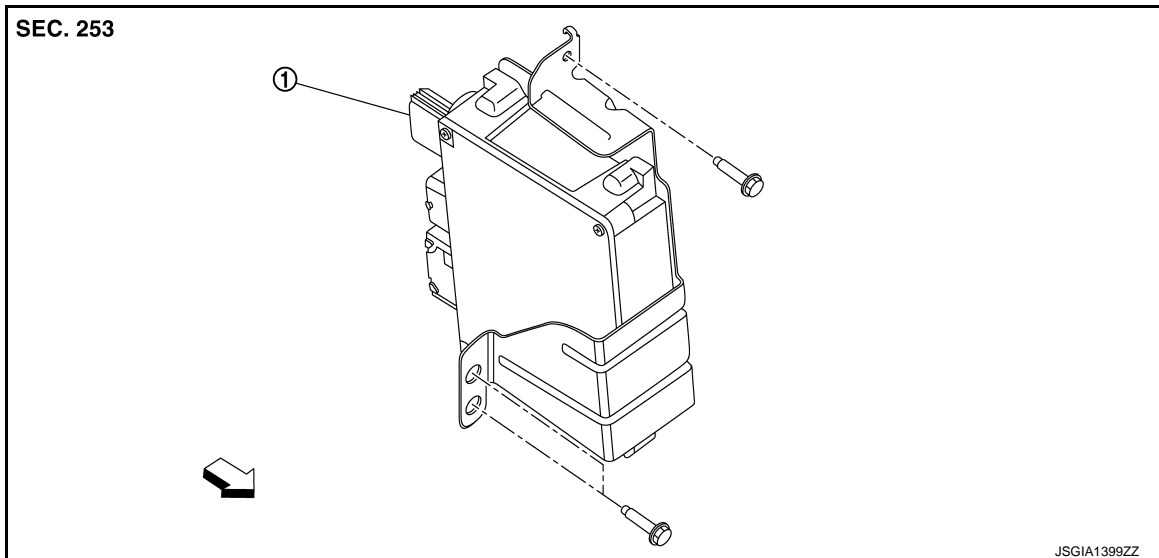
< REMOVAL AND INSTALLATION >

[DIRECT ADAPTIVE STEERING]

STEERING ANGLE MAIN CONTROL MODULE

Exploded View

INFOID:000000013356952



① Steering angle main control module

⇐: Vehicle front

Removal and Installation

INFOID:000000013356953

CAUTION:

- Perform additional service when replacing steering angle main control module. Refer to [STC-206, "Description"](#).
- When off-center is bigger than 120°, refer to [STC-478, "Diagnosis Procedure"](#) to correct off-center before performing the work.

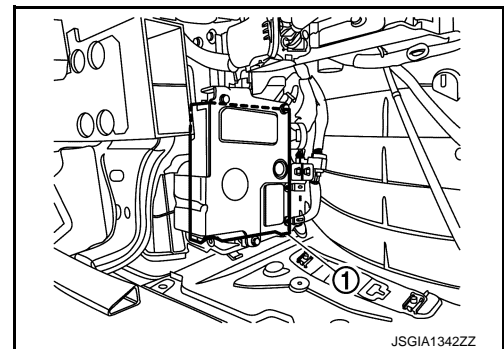
REMOVAL

1. Remove front bumper. Refer to [EXT-15, "Removal and Installation"](#)
2. Remove washer tank. Refer to [WW-63, "WASHER TANK : Removal and Installation"](#).
3. Disconnect steering angle main control module connectors.
4. Remove the bolts of steering angle main control module ①.
5. Remove the steering angle main control module.

CAUTION:

When replacing control module, replace the following control modules as a set.

- Steering force control module
- Steering angle main control module
- Steering angle sub control module



INSTALLATION

Note following, and install in the reverse order of removal.

CAUTION:

Perform additional service when replacing steering angle main control module. Refer to [STC-206, "Description"](#).

STEERING ANGLE SUB CONTROL MODULE

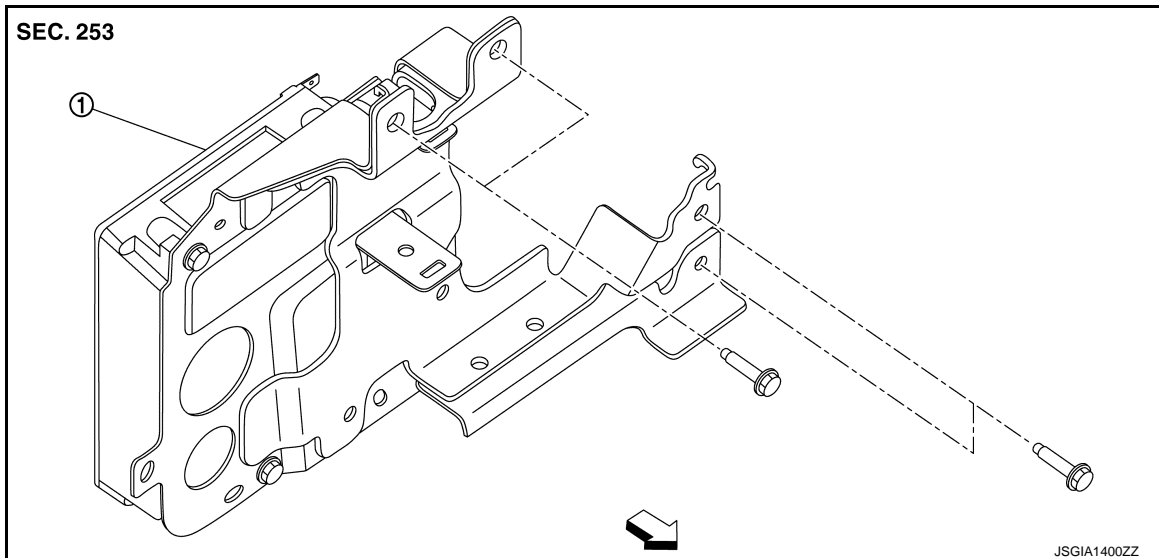
< REMOVAL AND INSTALLATION >

[DIRECT ADAPTIVE STEERING]

STEERING ANGLE SUB CONTROL MODULE

Exploded View

INFOID:000000013356954



① Steering angle sub control module

⇐: Vehicle front

Removal and Installation

INFOID:000000013356955

CAUTION:

- Perform additional service when replacing steering angle sub control module. Refer to [STC-206, "Description"](#).
- When off-center is bigger than 120°, refer to [STC-478, "Diagnosis Procedure"](#) to correct off-center before performing the work.

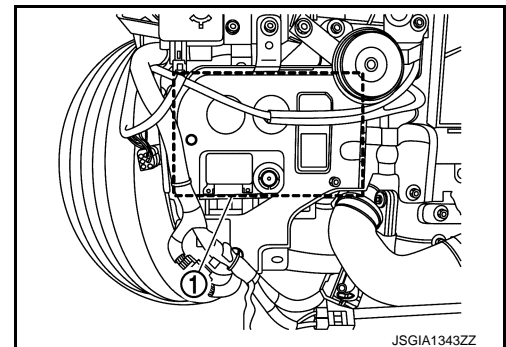
REMOVAL

1. Remove front bumper. Refer to [EXT-15, "Removal and Installation"](#)
2. Disconnect steering angle sub control module connectors.
3. Remove the bolts of steering angle sub control module ①.
4. Remove the steering angle sub control module.

CAUTION:

When replacing control module, replace the following control modules as a set.

- Steering force control module
- Steering angle main control module
- Steering angle sub control module



INSTALLATION

Note following, and install in the reverse order of removal.

CAUTION:

Perform additional service when replacing steering angle sub control module. Refer to [STC-206, "Description"](#).