STEERING CONTROL SYSTEM

CONTENTS

VEHICLE SPEED SENSITIVE P/S

PRECAUTION11
PRECAUTIONS
Precautions Necessary for Steering Wheel Rota- tion After Battery Disconnection11
SYSTEM DESCRIPTION13
COMPONENT PARTS13Component Parts Location13Power Steering Control Unit14Power Steering Solenoid Valve14
SYSTEM15
ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM
ECU DIAGNOSIS INFORMATION18
POWER STEERING CONTROL UNIT 18 Reference Value 18 Fail-safe 19
WIRING DIAGRAM20
EPS SYSTEM
BASIC INSPECTION23
DIAGNOSIS AND REPAIR WORK FLOW23

Work Flow23	F
DTC/CIRCUIT DIAGNOSIS24	
POWER SUPPLY AND GROUND CIRCUIT24 Description	ST
POWER STEERING SOLENOID VALVE 26 Component Function Check 26 Diagnosis Procedure 26 Component Inspection 27	H
ENGINE SPEED SIGNAL CIRCUIT	J
VEHICLE SPEED SIGNAL CIRCUIT	K
SYMPTOM DIAGNOSIS32	
UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)	L
REMOVAL AND INSTALLATION	
POWER STEERING CONTROL UNIT	Ν
PRECAUTION34	0
PRECAUTIONS 34 Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TEN-SIONER" SIONER" 34 Service Notice and Precautions for Direct Adaptive Steering 34	Ρ
SYSTEM DESCRIPTION	

А

В

С

D

Е

COMPONENT PARTS 35	5
Component Parts Location 35	5
Steering Force Control Module	7
Steering Angle Main Control Module 37	7
Steering Angle Sub Control Module	7
Steering Force Actuator 38	3
Steering Angle Actuator 38	3
Steering Clutch 39)
SYSTEM 40)
	`
DIRECT ADAPTIVE STEERING : System De-	,
DIRECT ADAPTIVE STEERING : Circuit Diagram	,
DIRECT ADAPTIVE STEERING · Fail-safe 47	, 7
DIRECT ADAPTIVE STEERING : Protection	`
	,
WARNING/INDICATOR/CHIME LIST	ł
Lamp/Indicator Lamp 51	l
	,
Handling Precautions for Direct Adaptive Steering 52	>
DIAGNOSIS SYSTEM (STEERING FORCE	
CONTROL MODULE)	3
CONSULT Function	2
	,
DIAGNOSIS SYSTEM (STEERING ANGLE	,
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)	}
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)	3
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)	3
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)	333
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)	33353
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)	3333
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)	3 3 3 3 4 A
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)	3 3 3 3 3 4 ×
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)	3 3 3 3
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE) 58 CONSULT Function 58 DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE) 63 CONSULT Function 63 CONSULT Function 63 ECU DIAGNOSIS INFORMATION 68 STEERING FORCE CONTROL MODULE 68 Reference Value 68 Fail-safe 74 Protection Function 77	3 3 3 3 3 4 7
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE) 58 CONSULT Function 58 DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE) 63 CONSULT Function 63 CONSULT Function 63 ECU DIAGNOSIS INFORMATION 68 STEERING FORCE CONTROL MODULE 68 Reference Value 68 Fail-safe 74 Protection Function 77 DTC Inspection Priority Chart 78	3 3 3 3 4 7 2
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE) 58 CONSULT Function 58 DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE) 63 CONSULT Function 63 ECU DIAGNOSIS INFORMATION 68 STEERING FORCE CONTROL MODULE 68 Reference Value 68 Fail-safe 74 Protection Function 77 DTC Inspection Priority Chart 78 DTC Index 80	3 3 3 3 4 7 3 1
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE) 58 CONSULT Function 58 DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE) 63 CONSULT Function 63 ECU DIAGNOSIS INFORMATION 68 STEERING FORCE CONTROL MODULE 68 Reference Value 68 Fail-safe 74 Protection Function 77 DTC Inspection Priority Chart 78 DTC Index 80	3 3 3 3 3 3 3 3
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE) 58 CONSULT Function 58 DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE) 63 CONSULT Function 63 CONSULT Function 63 ECU DIAGNOSIS INFORMATION 68 STEERING FORCE CONTROL MODULE 68 Reference Value 68 Fail-safe 74 Protection Function 77 DTC Inspection Priority Chart 78 DTC Index 80 STEERING ANGLE MAIN CONTROL MOD-	3 3 3 3 3 3 3 3
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE) 58 CONSULT Function 58 DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE) 63 CONSULT Function 63 CONSULT Function 63 CONSULT Function 63 ECU DIAGNOSIS INFORMATION 68 STEERING FORCE CONTROL MODULE 68 Reference Value 68 Fail-safe 74 Protection Function 77 DTC Inspection Priority Chart 78 DTC Index 80 STEERING ANGLE MAIN CONTROL MOD- 83	3 3 3 3 3 3 3 3
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE) 58 CONSULT Function 58 DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE) 63 CONSULT Function 63 ECU DIAGNOSIS INFORMATION 68 STEERING FORCE CONTROL MODULE 68 Reference Value 68 Fail-safe 74 Protection Function 77 DTC Inspection Priority Chart 78 DTC Index 80 STEERING ANGLE MAIN CONTROL MOD- 83 Reference Value 83 Reference Value 83	3 3 3 3 3 3 3 3
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE) 58 CONSULT Function 58 DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE) 63 CONSULT Function 63 CONSULT Function 63 ECU DIAGNOSIS INFORMATION 68 STEERING FORCE CONTROL MODULE 68 Reference Value 68 Fail-safe 74 Protection Function 77 DTC Inspection Priority Chart 78 DTC Index 80 STEERING ANGLE MAIN CONTROL MOD- 83 Reference Value 83	3 3 3 3
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE) 58 CONSULT Function 58 DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE) 63 CONSULT Function 63 CONSULT Function 63 ECU DIAGNOSIS INFORMATION 68 STEERING FORCE CONTROL MODULE 68 Reference Value 68 Fail-safe 74 Protection Function 77 DTC Inspection Priority Chart 78 DTC Index 80 STEERING ANGLE MAIN CONTROL MOD- 01 ULE 83 Reference Value 83 Protection Function 77 DTC Index 80 STEERING ANGLE MAIN CONTROL MOD- 01 ULE 83 Reference Value 83 Fail-safe 89 Protection Function 92	3 3 3 3 3 3 3 3
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE) 58 CONSULT Function 58 DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE) 63 CONSULT Function 63 CONSULT Function 63 ECU DIAGNOSIS INFORMATION 68 STEERING FORCE CONTROL MODULE 68 Reference Value 68 Fail-safe 74 Protection Function 77 DTC Inspection Priority Chart 78 DTC Index 80 STEERING ANGLE MAIN CONTROL MOD-ULE 83 Reference Value 83 Protection Function 77 DTC Index 80 STEERING ANGLE MAIN CONTROL MOD-ULE 83 Protection Function 93 DTC Index 83 Protection Function 93 DTC Inspection Priority Chart 93 Protection Function 93 DTC Inspection Priority Chart 93	3 3 3 3 3 3 3 3
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE) 58 CONSULT Function 58 DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE) 63 CONSULT Function 63 CONSULT Function 63 ECU DIAGNOSIS INFORMATION 68 STEERING FORCE CONTROL MODULE 68 Reference Value 68 Fail-safe 74 Protection Function 77 DTC Inspection Priority Chart 78 DTC Index 80 STEERING ANGLE MAIN CONTROL MOD- 83 Reference Value 83 Protection Function 77 DTC Index 80 STEERING ANGLE MAIN CONTROL MOD- 83 ULE 83 Reference Value 83 Protection Function 92 DTC Inspection Priority Chart 93 DTC Inspection Priority Chart 93 DTC Index 95	3 3 3 3 3 3 3 3 3 3
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE) 58 CONSULT Function 58 DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE) 63 CONSULT Function 63 ECU DIAGNOSIS INFORMATION 68 STEERING FORCE CONTROL MODULE 68 Reference Value 68 Fail-safe 74 Protection Function 77 DTC Inspection Priority Chart 78 DTC Index 80 STEERING ANGLE MAIN CONTROL MOD- 83 Reference Value 83 Fail-safe 93 DTC Index 80 STEERING ANGLE MAIN CONTROL MOD- 92 DTC Inspection Priority Chart 93 Fail-safe 82 Protection Function 92 DTC Inspection Priority Chart 93 DTC Inspection Priority Chart 93 DTC Inspection Priority Chart 93 DTC Index 95 STEERING ANGLE SUB CONTROL MOD- 95	3 3 3 3 3 3 3 3 3 3
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE) 58 CONSULT Function 58 DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE) 63 CONSULT Function 63 CONSULT Function 63 ECU DIAGNOSIS INFORMATION 68 STEERING FORCE CONTROL MODULE 68 Reference Value 68 Fail-safe 74 Protection Function 77 DTC Inspection Priority Chart 78 DTC Index 80 STEERING ANGLE MAIN CONTROL MOD- 83 Reference Value 83 Reference Value 83 STEERING ANGLE MAIN CONTROL MOD- 92 DTC Inspection Priority Chart 93 DTC Index 95 STEERING ANGLE SUB CONTROL MOD- 94	3 3 3 3 3 3 3 3 3 3
DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE) 58 CONSULT Function 58 DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE) 63 CONSULT Function 63 CONSULT Function 63 CONSULT Function 63 ECU DIAGNOSIS INFORMATION 68 STEERING FORCE CONTROL MODULE 68 Reference Value 68 Fail-safe 74 Protection Function 77 DTC Inspection Priority Chart 78 DTC Index 80 STEERING ANGLE MAIN CONTROL MOD- 83 Reference Value 83 Reference Value 83 Fail-safe 89 Protection Function 92 DTC Inspection Priority Chart 93 Fail-safe 89 Protection Function 92 DTC Inspection Priority Chart 93 DTC Index 95 STEERING ANGLE SUB CONTROL MOD- 94 ULE 98 Reference Value 98	3 3 3 3 3 3 3 3 3 3

Protection Function107

DTC Inspection Priority Chart	-
WIRING DIAGRAM113	
DIRECT ADAPTIVE STEERING	
BASIC INSPECTION123	
DIAGNOSIS AND REPAIR WORK FLOW123 Work Flow	
ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS	
ADDITIONAL SERVICE WHEN REPLACING STEERING FORCE CONTROL MODULE129 Description	
ADDITIONAL SERVICE WHEN REPLACING	
STEERING ANGLE MAIN CONTROL MOD- ULE	
ULE	
Work Procedure 133	
Work Procedure133DAST CALIBRATION (MODE1)135Description135Work Procedure135	
Work Procedure 133 DAST CALIBRATION (MODE1) 135 Description 135 Work Procedure 135 DAST CALIBRATION (MODE2) 138 Description 138 Work Procedure 138	
Work Procedure 133 DAST CALIBRATION (MODE1) 135 Description 135 Work Procedure 135 DAST CALIBRATION (MODE2) 138 Description 138 Work Procedure 138 CONFIGURATION (STEERING FORCE CON- 140 Work Procedure 140	
Work Procedure 133 DAST CALIBRATION (MODE1) 135 Description 135 Work Procedure 135 DAST CALIBRATION (MODE2) 138 Description 138 Work Procedure 138 CONFIGURATION (STEERING FORCE CONTROL MODULE) 140 Work Procedure 140 Work Procedure 140 Work Procedure 140 Work Procedure 140	
Work Procedure133DAST CALIBRATION (MODE1)135Description135Work Procedure135DAST CALIBRATION (MODE2)138Description138Work Procedure138Work Procedure138CONFIGURATION (STEERING FORCE CON- TROL MODULE)140Work Procedure140Work Procedure142CONFIGURATION (STEERING ANGLE MAIN CONTROL MODULE)142Work Procedure142Work Procedure142Work Procedure142Work Procedure144Work Procedure144	
Work Procedure133DAST CALIBRATION (MODE1)135Description135Work Procedure135DAST CALIBRATION (MODE2)138Description138Work Procedure138CONFIGURATION (STEERING FORCE CON- TROL MODULE)140Work Procedure140Work Procedure140Work Procedure140CONFIGURATION (STEERING ANGLE MAIN CONTROL MODULE)142Work Procedure142Work Procedure142Work Procedure144DTC/CIRCUIT DIAGNOSIS146	
Work Procedure133DAST CALIBRATION (MODE1)135Description135Work Procedure135DAST CALIBRATION (MODE2)138Description138Work Procedure138CONFIGURATION (STEERING FORCE CON- TROL MODULE)140Work Procedure140CONFIGURATION (STEERING ANGLE MAIN CONTROL MODULE)142Work Procedure142Work Procedure142Work Procedure142Work Procedure142Work Procedure144DTC/CIRCUIT DIAGNOSIS146C13A0-00 CONTROL MODULE146	

EPS/DAST 3 : Diagnosis Procedure	146
DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure	146 147 147
DAST 2 DAST 2 : DTC Description	147 147
C13A1-00 CONTROL MODULE	140 149
EPS/DAST 3	149
EPS/DAST 3 : Diagnosis Procedure	149
DAST 1	149
DAST 1 : DTC Description	149
DAST 1 : Diagnosis Procedure	150
DAST 2	150
DAST 2 : DTC Description	150
	450
CISA2-00 CONTROL MODULE	152
EPS/DAST 3	152
EPS/DAST 3 : DTC Description	152
EPS/DAST 3 . Diagnosis Procedure	152
DAST 1	152
DAST 1 : DTC Description	153
DAST 1 : Diagnosis Procedure	153
DAST 2	153
DAST 2 : DTC Description	154
DAST 2 : Diagnosis Procedure	154
C13A3-00 CONTROL MODULE	155
EPS/DAST 3	155
EPS/DAST 3 : DTC Description	155
EPS/DAST 3 : Diagnosis Procedure	155
DAST 1	155
DAST 1 : DTC Description	156
DAST 1 : Diagnosis Procedure	156
DAST 2	156
DAST 2 : DTC Description	157
DAST 2 : Diagnosis Procedure	157
C13A4-00 CONTROL MODULE	158
DAST 1	158
DAST 1 : DTC Description	158
DAST 1 : Diagnosis Procedure	158
DAST 2	158
DAST 2 : DTC Description	159
DAST 2 : Diagnosis Procedure	159
C13A5-00 CONTROL MODULE	160
DAST 2	160

DAST 2 : DTC Description	А
C13A6-00 CONTROL MODULE161	
DAST 1	В
C13A7-00 CONTROL MODULE 162	С
DAST 1 162 DAST 1 : DTC Description 162 DAST 1 : Diagnosis Procedure 162	D
C13A8-00 BACK UP CIRCUIT163	F
EPS/DAST 3163EPS/DAST 3 : DTC Description163EPS/DAST 3 : Diagnosis Procedure163	F
DAST 1	STO
DAST 2	Н
C13A9-00 BACK UP CIRCUIT169	
EPS/DAST 3169EPS/DAST 3 : DTC Description169EPS/DAST 3 : Diagnosis Procedure169	I
DAST 1 170 DAST 1 : DTC Description 170 DAST 1 : Diagnosis Procedure 171	J
DAST 2	L
C13AA-00 CONTROL MODULE175	
EPS/DAST 3175EPS/DAST 3 : DTC Description175EPS/DAST 3 : Diagnosis Procedure175	Μ
DAST 1	N
DAST 2 176 DAST 2 : DTC Description 176 DAST 2 : Diagnosis Procedure 177	P
C13AB-00 CONTROL MODULE 178	
EPS/DAST 3178EPS/DAST 3 : DTC Description178EPS/DAST 3 : Diagnosis Procedure179	
DAST 1	

DAST 1 : Diagnosis Procedure	.180
DAST 2	.180
DAST 2 : DTC Description	.180
DAST 2 : Diagnosis Procedure	.181
C13AC-00 CONTROL MODULE	182
DAST 1	.182
DAST 1 : DTC Description	.182
DAST 1 : Diagnosis Procedure	.182
C13AD-00 CONTROL MODULE	184
EPS/DAST 3	.184
EPS/DAST 3 : DTC Description	.184
EPS/DAST 3 : Diagnosis Procedure	.184
DAST 1	.184
DAST 1 : DTC Description	.184
DAST 1 : Diagnosis Procedure	.185
DAST 2	.185
DAST 2 : DTC Description	.185
DAST 2 : Diagnosis Procedure	.186
C13AE-00 CONTROL MODULE	187
EPS/DAST 3	.187
EPS/DAST 3 : DTC Description	.187
LF 3/DAST 3 . Diagnosis Flocedure	. 107
DAST 1	.187
DAST 1 : DIC Description	.187
DAST T. Diagnosis Procedure	. 100
DAST 2	.188
DAST 2 : DTC Description	.188
DAST 2 : Diagnosis Procedure	.189
C13AF-00 CONTROL MODULE	190
EPS/DAST 3	.190
EPS/DAST 3 : DTC Description	.190
EPS/DAST 3 : Diagnosis Procedure	.190
DAST 1	.190
DAST 1 : DTC Description	.190
DAST 1 : Diagnosis Procedure	.191
DAST 2	.191
DAST 2 : DTC Description	.191
DAST 2 : Diagnosis Procedure	.192
C13B0-00 CONTROL MODULE	193
EPS/DAST 3	.193
EPS/DAST 3 : DTC Description	.193
EPS/DAST 3 : Diagnosis Procedure	.193
DAST 1	.193
DAST 1 : DTC Description	.193
DAST 1 : Diagnosis Procedure	.194
DACT 0	404

DAST 2 : DTC Description DAST 2 : Diagnosis Procedure	194 195
C13B1-00 CONTROL MODULE	196
EPS/DAST 3	196
FPS/DAST 3 · DTC Description	196
EPS/DAST 3 : Diagnosis Procedure	196
DAST 1	196
DAST 1 · DTC Description	196
DAST 1 : Diagnosis Procedure	197
DAST 2	197
DAST 2 : DTC Description	197
DAST 2 : Diagnosis Procedure	198
C13B2-00 CONTROL MODULE	199
EPS/DAST 3	199
EPS/DAST 3 : DTC Description	199
EPS/DAST 3 · Diagnosis Procedure	199
	100
DAST 1	199
DAST 1 : DTC Description	199
DAST 1 · Diagnosis Procedure	200
	200
DAST 2	200
DAST 2 : DTC Description	200
DAST 2 : Diagnosis Procedure	201
C13B3-00 CONTROL MODULE	202
EPS/DAST 3	202
EPS/DAST 3 EPS/DAST 3 : DTC Description	202 202
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure	202 202 202
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure	202 202 202
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1	202 202 202 202
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description	202 202 202 202 202 202
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure	202 202 202 202 202 202 203
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure	 202 202 202 202 202 203
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2	 202 202 202 202 202 203 203 203
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description	 202 202 202 202 202 203 203 203
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : DTC Description	 202 202 202 202 203 203 203 203 204
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13B4-00 CONTROL MODULE	 202 202 202 202 203 203 203 204 205
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : DIC Description DAST 2 : Diagnosis Procedure EDS/DAST 2	 202 202 202 202 203 203 203 204 205 205
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure EPS/DAST 3	 202 202 202 202 203 203 203 204 205 205
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13B4-00 CONTROL MODULE EPS/DAST 3 EPS/DAST 3 : DTC Description	 202 202 202 202 203 203 203 204 205 205 205
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13B4-00 CONTROL MODULE EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure	 202 202 202 202 203 203 203 204 205 205 205
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 2 DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure EPS/DAST 3 EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Desc	 202 202 202 202 202 203 203 203 203 204 205 205 205 205 205 205
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13B4-00 CONTROL MODULE EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 1 : DTC Description	 202 202 202 202 203 203 203 203 204 205 205 205 205 205 205 205
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 2 DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description	 202 202 202 202 203 203 203 203 204 205 205 205 205 205 205 205 205 205
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 2 DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13B4-00 CONTROL MODULE EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 1 : DTC Description DAST 2	 202 202 202 202 203 203 203 203 204 205 205
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 2 DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13B4-00 CONTROL MODULE EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description DAST 2 : DTC Description	 202 202 202 202 203 203 203 203 204 205 205 205 205 205 206 206 206
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13B4-00 CONTROL MODULE EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description DAST 2 : DTC Description DAST 3 : DTC Description DAST 4 : DTC Description DAST 5 : DTC Description DAST 5 : DTC Description DAST 6 : DTC Description DAST 7 : DTC Description	 202 202 202 202 203 203 203 203 204 205 205 205 205 206 206 206 207
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13B4-00 CONTROL MODULE EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 : DTC Description DAST 1 : DTC Description DAST 2 : DTC Description DAST 3 : DTC Description DAST 4 : DTC Description DAST 5 : DTC Description DAST 5 : DTC Description DAST 6 : DTC Description DAST 7 : DTC Description DAST 7 : DTC Description DAST 6 : DTC Description DAST 7 : DTC Description DAST 7 : DTC Description DAST 7 : DTC DESCRIPTION DAST 7 : DTC DESCRIPTION DAST 6 : DTC DESCRIPTION DAST 7 : DTC DESCRIPTION DAST 7 : DTC DESCRIPTION DAST 6 : DTC DESCRIPTION DAST 6 : DTC DESCRIPTION DAST 7 : DTC	202 202 202 202 203 203 203 203 203 204 205 205 205 205 205 205 205 205 205 205
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 1 : DTC Description DAST 2 DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13B4-00 CONTROL MODULE EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description DAST 1 : DTC Description DAST 2 : DTC Description	 202 202 202 202 203 203 203 203 204 205 205 205 205 205 205 205 205 205 206 206 207 208
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 3 : DTC Description EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description DAST 1 : DTC Description DAST 2 : DTC Description DAST 3 : DTC Description	 202 202 202 202 203 203 203 203 204 205 205 205 205 205 205 206 206 207 208 208
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13B4-00 CONTROL MODULE EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description DAST 2 : DTC Description DAST 2 : DTC Description DAST 1 : DTC Description DAST 2 : DTC Description DAST 3 : DTC Description DAST 3 : DTC Description DAST 3 : DTC Description	 202 202 202 202 203 203 203 203 203 204 205 205 205 205 205 206 206 206 207 208 208 208
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 2 DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13B4-00 CONTROL MODULE EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description DAST 2 : DTC Description DAST 3 : DTC Description EPS/DAST 3 : DTC Description	 202 202 202 202 203 203 203 203 203 204 205 205

DAST 1	D
DAST 1 : DTC Description	
DAST 2	
DAST 2 : DTC Description 209	С
DAST 2 : Diagnosis Procedure210	S
C13B6-00 MOTOR CIRCUIT211	E
EPS/DAST 3	
EPS/DAST 3 : DTC Description	-
EPS/DAST 3 : Diagnosis Procedure	D
DAST 1	
DAST 1 : DTC Description	D
DAST 1 : Diagnosis Procedure	
DAST 1: Component Inspection214	
DAST 2	C
DAST 2 : DIC Description	S
DAST 2 : Diagnosis Procedure	E
	_
EPS/DAST 3	D
EPS/DAST 3 : DTC Description	
EPS/DAST 3 : Diagnosis Procedure	
DAST 1	D
DAST 1 : Diagnosis Procedure	
DAST 2 218	с С
DAST 2 : DTC Description	
DAST 2 : Diagnosis Procedure	3
C13B8-00 CONTROL MODULE220	
FPS/DAST 3 220	С
EPS/DAST 3 : DTC Description	S
EPS/DAST 3 : Diagnosis Procedure	
DAST 1 220	
DAST 1 · DTC Description 220	
DAST 1 : Diagnosis Procedure	С
DAST 2	-
DAST 2 : DTC Description	E
DAST 2 : Diagnosis Procedure	
C13B9-00 CONTROL MODULE223	
EPS/DAST 3	-
EPS/DAST 3 : DTC Description	U
EPS/DAST 3 : Diagnosis Procedure	
EPS/DAST 3 : Component Inspection	D
DAST 1	
DAST 1: DIC Description	
DAST 1: Diagnosis Procedure	С
DAGT T. Component inspection	

)8)8)9	DAST 2226DAST 2 : DTC Description226DAST 2 : Diagnosis Procedure227DAST 2 : Component Inspection228	A
)9 0	C13BA-00 CONTROL MODULE POWER SUPPLY229	В
1 1 1	EPS/DAST 3229EPS/DAST 3 : DTC Description229EPS/DAST 3 : Diagnosis Procedure229	С
1 2 2	DAST 1230DAST 1 : DTC Description230DAST 1 : Diagnosis Procedure231	D
2 3 4	DAST 2	F
4 4	C13BB-00 CONTROL MODULE POWER SUPPLY234	-
5 6 7	EPS/DAST 3234EPS/DAST 3 : DTC Description234EPS/DAST 3 : Diagnosis Procedure234	STO
7 7 7	DAST 1	Н
7 7 8	DAST 2	J
8 8 9 20	C13BC-00 CONTROL MODULE IGN POWER SUP	K
2 0 20	C13BD-00 CONTROL MODULE IGN POWER SUP242	L
20 2 0 20	DAST 1	M
21	C13BE-00 FLEXRAY COMMUNICATION 244	Ν
21 21 22 23	EPS/DAST 3244EPS/DAST 3 : DTC Description244EPS/DAST 3 : Diagnosis Procedure (Pattern 1)245EPS/DAST 3 : Diagnosis Procedure (Pattern 2)245EPS/DAST 3 : Diagnosis Procedure (Pattern 3)246	0
23 23 23	DAST 1	Ρ
24 2 4 24	DAST 2	
25	C13BF-00 FLEXRAY COMMUNICATION 249	

EPS/DAST 3	9 9 50
EPS/DAST 3 : Diagnosis Procedure (Pattern 2)25 DAST 1	51 51
DAST 1 : DTC Description	;2
DAST 2	5 2 53
C13C0-00 FLEXRAY COMMUNICATION 25	5
EPS/DAST 3	55 56 57 57 58 59
DAST 1	50 51 52
DAST 2	52 54 54
C13C1-00 FLEXRAY COMMUNICATION 26	57
C13C1-00 FLEXRAY COMMUNICATION 26 EPS/DAST 3	57 57 58 58
C13C1-00 FLEXRAY COMMUNICATION 26 EPS/DAST 3	57 57 57 57 58 58 58 59 59 59
C13C1-00 FLEXRAY COMMUNICATION 26 EPS/DAST 3 26 EPS/DAST 3 : DTC Description 26 EPS/DAST 3 : Diagnosis Procedure (Pattern 1) 26 EPS/DAST 3 : Diagnosis Procedure (Pattern 2) 26 DAST 1 26 DAST 1 : DTC Description 26 DAST 2 26 DAST 2 : DTC Description 26	57 57 57 57 58 58 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59
C13C1-00 FLEXRAY COMMUNICATION 26 EPS/DAST 3	57 57 57 58 58 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59 59
C13C1-00 FLEXRAY COMMUNICATION 26 EPS/DAST 3	7 8 8 9 9 9 9 9 1 1 1 2 3 4 1
C13C1-00 FLEXRAY COMMUNICATION 26 EPS/DAST 3 DTC Description 26 EPS/DAST 3: DTC Description 26 EPS/DAST 3: Diagnosis Procedure (Pattern 1) 26 EPS/DAST 3: Diagnosis Procedure (Pattern 2) 26 DAST 1 26 DAST 1 26 DAST 2 26 DAST 2: DTC Description 26 DAST 2: DTC Description 26 DAST 2: DTC Description 26 C13C2-00 FLEXRAY COMMUNICATION 27 EPS/DAST 3: DTC Description 27 EPS/DAST 3: DTC Description 27 EPS/DAST 3: DTC Description 27 EPS/DAST 3: Diagnosis Procedure (Pattern 1) 27 EPS/DAST 3: Diagnosis Procedure (Pattern 2) 27 DAST 1 27 <	7 7 7 8 9 9 1 1 1 2 3 4 5 5 6 6 7

C13C3-00 FLEXRAY COMMUNICATION282

EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure (Pattern 1) . EPS/DAST 3 : Diagnosis Procedure (Pattern 2) . EPS/DAST 3 : Diagnosis Procedure (Pattern 3) .	282 282 283 283 283 283
DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure (Pattern 1) DAST 1 : Diagnosis Procedure (Pattern 2)	285 285 286 286
DAST 2 DAST 2 : DTC Description DAST 2 : Diagnosis Procedure	288 288 289
C13C4-00 FLEXRAY COMMUNICATION	.291
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure (Pattern 1) . EPS/DAST 3 : Diagnosis Procedure (Pattern 2) .	291 291 292 292
DAST 1 DAST 1 : DTC Description	. 293 . 293
DAST 2 DAST 2 : DTC Description	. 293 . 293
C13C5-00 STEERING ANGLE SENSOR SIG- NAL	.295
	205
LF 3/DA31 3	. 295
EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure	. 295 . 295
EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C6-00 G SENSOR SIGNAL	. 295 . 295 . 297
EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C6-00 G SENSOR SIGNAL EPS/DAST 3	. 295 . 295 . 297 . 297
EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C6-00 G SENSOR SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure	. 295 . 295 . 297 . 297 . 297 . 297
EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C6-00 G SENSOR SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C7-00 VEHICLE SPEED SIGNAL	. 295 . 295 . 297 . 297 . 297 . 297 . 297 . 299
EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C6-00 G SENSOR SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C7-00 VEHICLE SPEED SIGNAL EPS/DAST 3	. 295 . 295 . 297 . 297 . 297 . 297 . 297 . 299 . 299
EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C6-00 G SENSOR SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C7-00 VEHICLE SPEED SIGNAL EPS/DAST 3 EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description	. 295 . 295 . 297 . 297 . 297 . 297 . 297 . 299 . 299 . 299 . 299
EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C6-00 G SENSOR SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C7-00 VEHICLE SPEED SIGNAL EPS/DAST 3 EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure	. 295 . 295 . 297 . 297 . 297 . 297 . 297 . 299 . 299 . 299 . 299 . 301
EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C6-00 G SENSOR SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C7-00 VEHICLE SPEED SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C9-00 DRIVE MODE SIGNAL EPS/DAST 3	. 295 . 295 . 297 . 297 . 297 . 297 . 299 . 299 . 299 . 299 . 301
EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C6-00 G SENSOR SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C7-00 VEHICLE SPEED SIGNAL EPS/DAST 3 EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C9-00 DRIVE MODE SIGNAL EPS/DAST 3 EPS/DAST 3 EPS/DAST 3 EPS/DAST 3	. 295 . 295 . 297 . 297 . 297 . 297 . 299 . 299 . 299 . 299 . 299 . 301 . 301 . 301
EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C6-00 G SENSOR SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C7-00 VEHICLE SPEED SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C9-00 DRIVE MODE SIGNAL EPS/DAST 3 EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC DESCRIPTION	. 295 . 295 . 297 . 297 . 297 . 297 . 299 . 299 . 299 . 299 . 301 . 301 . 301 . 301 . 301
EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C6-00 G SENSOR SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C7-00 VEHICLE SPEED SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C9-00 DRIVE MODE SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 EPS/DAST 3	. 295 . 295 . 297 . 297 . 297 . 297 . 299 . 299 . 299 . 299 . 301 . 301 . 301 . 301 . 302 . 302
EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C6-00 G SENSOR SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C7-00 VEHICLE SPEED SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C9-00 DRIVE MODE SIGNAL EPS/DAST 3 EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description	295 295 297 297 297 297 299 299 299 299 301 301 301 301 301 301 302 302 302
EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C6-00 G SENSOR SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C7-00 VEHICLE SPEED SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C9-00 DRIVE MODE SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC	. 295 . 295 . 297 . 297 . 297 . 297 . 299 . 299 . 299 . 299 . 301 . 301 . 301 . 301 . 302 . 302 . 302 . 303
EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C6-00 G SENSOR SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C7-00 VEHICLE SPEED SIGNAL EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure C13C9-00 DRIVE MODE SIGNAL EPS/DAST 3 EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description	2955 297 297 297 297 299 299 299 299 301 301 301 301 301 302 302 302 302 302 303

EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure	303 303
C13CD-00 ENGINE SPEED SIGNAL	304
EPS/DAST 3	304
EPS/DAST 3 : DTC Description	304
EPS/DAST 3 : Diagnosis Procedure	304
C13CE-00 SLEEP/WAKE SIGNAL	305
EPS/DAST 3	305
EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure	305 305
C13CE-00 ALC FUNCTION REQUEST SIG	i-
NAL	306
DAST 1	306
DAST 1 : DTC Description	306
DAST 1 : Diagnosis Procedure	306
C13D0-00 ALC FUNCTION REQUEST SIG	i-
NAL	307
DAST 1	307
DAST 1 : DTC Description	307
DAST 1 : Diagnosis Procedure	307
C13D1-00 STEERING ANGLE SIGNAL	308
DAST 1	308
DAST 1 : DTC Description	308
DAST 1 : Diagnosis Procedure	308
C13D2-00 CONTROL MODULE	310
EPS/DAST 3	310
EPS/DAST 3 : DTC Description	310
EPS/DAST 3 : Diagnosis Procedure	310
DAST 1	310
DAST 1 : DTC Description	310
DAST 1 : Diagnosis Procedure	311
DAST 2	311
DAST 2 : DTC Description	311
DAST 2 : Diagnosis Procedure	312
C13D3-00 CONTROL MODULE	313
EPS/DAST 3	313
EPS/DAST 3 : DTC Description	313
EPS/DAST 3 : Diagnosis Procedure	313
DAST 1	313
DAST 1 : DTC Description	
DAST 1 : Diagnosis Procedure	314
DAST 2	21/
DAST 2 : DTC Description	314
DAST 2 : Diagnosis Procedure	315
C13D4-00 CONTROL MODULE	

EPS/DAST 3316EPS/DAST 3 : DTC Description316EPS/DAST 3 : Diagnosis Procedure316EPS/DAST 3 : Component Inspection317	A
DAST 1	B
DAST 2319DAST 2 : DTC Description319DAST 2 : Diagnosis Procedure320DAST 2 : Component Inspection321	D
C13D5-00 CONTROL MODULE	Е
EPS/DAST 3	F
DAST 1	STO
DAST 2	Н
C13D6-00 CONTROL MODULE	
EPS/DAST 3	J
DAST 1	K
DAST 2	L
C13D7-00 CONTROL MODULE	
EPS/DAST 3328EPS/DAST 3 : DTC Description328EPS/DAST 3 : Diagnosis Procedure328	M
DAST 1	N
DAST 2 329 DAST 2 : DTC Description 329 DAST 2 : Diagnosis Procedure 330	P
C13D8-00 CONTROL MODULE	
EPS/DAST 3	

DAST 1	
DART 1 , DTC Description	.332
	.332
DAST 1 : Diagnosis Procedure	.333
DAST 1 · Component Inspection	334
	.001
C13D9-00 CONTROL MODULE	335
EPS/DAST 3	.335
EPS/DAST 3 : DTC Description	.335
EPS/DAST 3 : Diagnosis Procedure	.335
DAST 4	~~~
	.335
	.335
DAST 1 : Diagnosis Procedure	.336
C13DB-00 STEERING TOROUE SENSOR	337
	001
DAST 1	.337
DAST 1 : DTC Description	.337
DAST 1 : Diagnosis Procedure	.337
C13DC-00 STEERING TORQUE SENSOR	340
DACT 4	240
	.340
DAST 1: DTC Description	.340
DAST 1: Diagnosis Procedure	.340
C13DD-00 STEERING TOROUE SENSOR	3/13
	040
DAST 1	.343
DAST 1 : DTC Description	.343
DAST 1 : Diagnosis Procedure	.343
C13DE-00 TEMPERATURE SENSOR	346
	240
EPS/DAST 3	.346
EPS/DAST 3 EPS/DAST 3 : DTC Description	.346 .346
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure	.346 .346 .346
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection	.346 .346 .346 .348
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection	.346 .346 .346 .348 .348
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1	.346 .346 .346 .348 .348
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure	.346 .346 .348 .348 .348
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure	.346 .346 .348 .348 .348 .348 .349
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2	.346 .346 .348 .348 .348 .348 .349
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description	.346 .346 .348 .348 .348 .348 .349 .349
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : DTC Description	.346 .346 .348 .348 .348 .349 .349 .349 .349
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure	.346 .346 .348 .348 .348 .349 .349 .349 .350
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13DF-00 CONTROL MODULE	.346 .346 .348 .348 .348 .349 .349 .349 .349 .350 351
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure DAST 2 : Diagnosis Procedure	.346 .346 .348 .348 .348 .348 .349 .349 .349 .349 .350 351
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13DF-00 CONTROL MODULE DAST 1	.346 .346 .348 .348 .348 .349 .349 .349 .350 351
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13DF-00 CONTROL MODULE DAST 1 DAST 1 : DTC Description	.346 .348 .348 .348 .348 .349 .349 .350 .351 .351
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13DF-00 CONTROL MODULE DAST 1 DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description	.346 .346 .348 .348 .349 .349 .349 .349 .350 .351 .351 .351
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : DTC Description DAST 2 DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13DF-00 CONTROL MODULE DAST 1 DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 C13E0-00 ST CLUTCH COMMAND CIRCUIT.	.346 .346 .348 .348 .348 .349 .350 .351 .351 .351 .351 .351
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : DTC Description DAST 2 DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13DF-00 CONTROL MODULE DAST 1 DAST 1 : DTC Description DAST 1 : D	.346 .346 .348 .348 .348 .349 .349 .350 .351 .351 .351 .351 .351
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13DF-00 CONTROL MODULE DAST 1 DAST 1 : DTC Description DAST 1	.346 .346 .348 .348 .348 .349 .349 .350 .351 .351 .351 .351 .352 .352
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13DF-00 CONTROL MODULE DAST 1 DAST 1 : DTC Description DAST 1 : DTC D	.346 .346 .348 .348 .348 .349 .349 .350 351 .351 .351 .351 .352 .352
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : DIC Description DAST 2 : Diagnosis Procedure C13DF-00 CONTROL MODULE DAST 1 DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description	.346 .346 .348 .348 .348 .349 .349 .350 351 .351 .351 .351 .352 .352 .352
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : DTC Description DAST 2 DAST 2 : DTC Description DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13DF-00 CONTROL MODULE DAST 1 DAST 1 : DTC Description DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection	.3466 .3466 .3488 .3488 .3489 .3499 .3499 .3500 3511 .3511 .3511 .3512 .3522 .3522 .3522 .3532
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13DF-00 CONTROL MODULE DAST 1 DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description EPS/DAST 3 : Component Inspection	.3466 .3466 .3488 .3488 .3499 .3499 .3499 .3501 .3511 .3511 .3511 .3522 .3522 .3522 .3523 .3523 .3523 .3523
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13DF-00 CONTROL MODULE DAST 1 DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection EPS/DAST 3 : Component Inspection EPS/DAST 3 : Component Inspection	.3466 .3466 .3488 .3488 .3499 .3499 .3499 .3501 .3511 .3511 .3511 .3522 .3522 .3523 .3524
EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13DF-00 CONTROL MODULE DAST 1 DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DTC Description DAST 1 : DIC Description DAST 1 : DIC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure EPS/DAST 3 : Component Inspection EPS/DAST 3 : Component Inspection	.346 .346 .348 .348 .348 .349 .349 .350 351 .351 .351 .352 .352 .352 .353 354

C13E2-00 FRONT WHEEL SENSOR SIGNAL.356
EPS/DAST 3
C13E3-00 SPIRAL CABLE PROTECTION357
EPS/DAST 3
C13E4-00 ST CLUTCH RELEASE PROTEC- TION
EPS/DAST 3358EPS/DAST 3 : DTC Description358EPS/DAST 3 : Diagnosis Procedure358EPS/DAST 3 : Component Inspection359
C13E5-00 ST CLUTCH RELEASE PROTEC- TION
EPS/DAST 3361EPS/DAST 3 : DTC Description361EPS/DAST 3 : Diagnosis Procedure361EPS/DAST 3 : Component Inspection362
C13E6-00 HEAT PROTECTION364
EPS/DAST 3364EPS/DAST 3 : DTC Description364EPS/DAST 3 : Diagnosis Procedure364EPS/DAST 3 : Component Inspection366
DAST 1 367 DAST 1 : DTC Description 367 DAST 1 : Diagnosis Procedure 367
DAST 2 368 DAST 2 : DTC Description 368 DAST 2 : Diagnosis Procedure 369
C13E7-00 LOW VOLTAGE PROTECTION370
EPS/DAST 3
DAST 1 371 DAST 1 : DTC Description 371 DAST 1 : Diagnosis Procedure 372
DAST 2 372 DAST 2 : DTC Description 373 DAST 2 : Diagnosis Procedure 373
C13E8-00 CURB STONE PROTECTION375
EPS/DAST 3
C-8 2014 Q50

EPS/DAST 3 : DTC Description 354 EPS/DAST 3 : Diagnosis Procedure 354 EPS/DAST 3 : Component Inspection 355

EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure	. 375 . 375
DAST 1	. 376
DAST 1 : DTC Description	. 376
DAST 1 : Diagnosis Procedure	. 376
DAST 2	. 377
DAST 2 : DIC Description	.377
C13E9-00 BOOTING ANGLE PROCESSING	.379
DAST 1	. 379
DAST 1 : DTC Description	. 379
DAST 1 : Diagnosis Procedure	. 379
C13EA-00 BOOTING ANGLE PROCESSING	. 381
EPS/DAST 3	. 381
EPS/DAST 3 : DTC Description	. 381
EPS/DAST 3 : Diagnosis Procedure	. 381
C13EB-00 BOOTING ANGLE PROCESSING	. 382
DAST 1	. 382
DAST 1 : DTC Description	. 382
DAST 1 : Diagnosis Procedure	. 382
DAST 2 · DTC Description	- 383 383
DAST 2 : Diagnosis Procedure	. 383
C13EC-00 BOOTING ANGLE PROCESSING	. 385
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3	.385 .385
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3 EPS/DAST 3 : DTC Description	.385 .385 .385
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure	. 385 . 385 . 385 . 385
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1	. 385 . 385 . 385 . 385 . 385
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description	.385 .385 .385 .385 .385 .385 .385
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure	. 385 . 385 . 385 . 385 . 385 . 385 . 385 . 386
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2	. 385 . 385 . 385 . 385 . 385 . 385 . 386 . 386
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3	.385 .385 .385 .385 .385 .385 .386 .386 .386 .386 .387
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3	.385 .385 .385 .385 .385 .385 .386 .386 .386 .386 .387 .388
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3	.385 .385 .385 .385 .385 .385 .386 .386 .386 .386 .387 .388
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3	.385 .385 .385 .385 .385 .385 .386 .386 .386 .386 .387 .388 .388
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 DAST 1 : DTC Description DAST 2 DAST 2 DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13ED-00 ENGINE STATUS EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description	.385 .385 .385 .385 .385 .385 .386 .386 .386 .386 .387 .388 .388 .388
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 1 : Diagnosis Procedure DAST 2 DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13ED-00 ENGINE STATUS EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description	.385 .385 .385 .385 .385 .386 .386 .386 .386 .386 .387 .388 .388 .388 .388
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 : DTC Description DAST 2 DAST 2 : DTC Description DAST 2 : Diagnosis Procedure C13ED-00 ENGINE STATUS EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 1 : DTC Description	.385 .385 .385 .385 .385 .385 .386 .386 .386 .387 .388 .388 .388 .388 .388 .388
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : Diagnosis Procedure DAST 1 DAST 1 DAST 1 : DTC Description DAST 2 DAST 2 DAST 2 : DTC Description DAST 2 : DIC Description DAST 2 : Diagnosis Procedure C13ED-00 ENGINE STATUS EPS/DAST 3 EPS/DAST 3 : DTC Description EPS/DAST 3 : DTC Description DAST 1 : DTC Description	.385 .385 .385 .385 .385 .385 .386 .386 .386 .386 .387 .388 .388 .388 .388 .388 .388 .388
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3	.385 .385 .385 .385 .385 .385 .386 .386 .386 .387 .388 .388 .388 .388 .388 .388 .388
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3 EPS/DAST 3 : DTC Description DAST 1	.385 .385 .385 .385 .385 .385 .386 .386 .386 .386 .388 .388 .388 .388
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3 EPS/DAST 3: DTC Description EPS/DAST 3: Diagnosis Procedure DAST 1 DAST 1 DAST 1: DTC Description DAST 2 DAST 2: DTC Description DAST 2: Diagnosis Procedure C13ED-00 ENGINE STATUS EPS/DAST 3 EPS/DAST 3: DTC Description EPS/DAST 1: DTC Description EPS/DAST 2: DTC Description DAST 1: DTC Description DAST 1: DTC Description DAST 2: DTC Description	.385 .385 .385 .385 .385 .385 .386 .386 .386 .386 .387 .388 .388 .388 .388 .388 .388 .388
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3	.385 .385 .385 .385 .385 .385 .386 .386 .386 .387 .388 .388 .388 .388 .388 .388 .388
C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3	.385 .385 .385 .385 .385 .386 .386 .386 .386 .387 .388 .388 .388 .388 .388 .388 .388

EPS/DAST 3 : Diagnosis Procedure	
DAST 1	A
DAST 2 392 DAST 2 : DTC Description 393 DAST 2 : Diagnosis Procedure 393	С
C13EF-00 CONFIG CHECK RESULT	
EPS/DAST 3	D
DAST 1	E
DAST 2	F
C13F0-00 INCOMP DAST CALIBRATION 398	STO
EPS/DAST 3	Н
DAST 1	I
DAST 2	J
C13F1-00 INCOMP ST ANG SEN ADJST 401	Κ
EPS/DAST 3401EPS/DAST 3 : DTC Description401EPS/DAST 3 : Diagnosis Procedure401	L
U1000-01 CAN COMM CIRCUIT 403	ЪЛ
EPS/DAST 3403EPS/DAST 3 : DTC Description403EPS/DAST 3 : Diagnosis Procedure403	N
DAST 1 403 DAST 1 : DTC Description 403 DAST 1 : Diagnosis Procedure 404	0
U1010-49 CONTROL UNIT (CAN) 405	
EPS/DAST 3405EPS/DAST 3 : DTC Description405EPS/DAST 3 : Diagnosis Procedure405	Ρ
DAST 1	
POWER SUPPLY AND GROUND CIRCUIT 407	

Revision: 2013 October

DTC Description	107
Diagnosis Procedure	107
POWER STEERING WARNING LAMP	112
Component Function Check	112
Diagnosis Procedure	12
SYMPTOM DIAGNOSIS	113
SYSTEM SYMPTOM	113
Symptom Table	¥13
THE VEHICLE PULLS TO ONE SIDE	116
Description	116
Diagnosis Procedure	16
POWER STEERING WARNING LAMP DOSE NOT TURN ON	117
Description	17
Diagnosis Procedure	17
POWER STEERING WARNING LAMP DOSE	
NOT TURN OFF	18
Description	18
Diagnosis Procedure	1 18
SYSTEM IS NOT DISPLAYED ON CONSULT.	119
Description	19
TYPE 1	119
TVDE 1 : Diagnosia Brossdura	

TYPE 2 421 TYPE 2 · Diagnosis Procedure 421
TYPE 3 : Diagnosis Procedure
TYPE 4
TYPE 4 : Diagnosis Procedure 422
TYPE 5 422
TYPE 5 : Diagnosis Procedure 423
TYPE 6
TYPE 6 : Diagnosis Procedure 424
TYPE 7
TYPE 7 : Diagnosis Procedure 425
TYPE 8
I YPE 8 : Diagnosis Procedure 425
REMOVAL AND INSTALLATION427
STEERING FORCE CONTROL MODULE427
Removal and Installation 427
STEERING ANGLE MAIN CONTROL MOD-
ULE
Removal and Installation
STEERING ANGLE SUB CONTROL MOD-
Removal and Installation 429

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< PRECAUTION > PRECAUTION PRECAUTIONS

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

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, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, 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, and wait at least 3 minutes before performing any service.

Precautions Necessary for Steering Wheel Rotation After Battery Disconnection

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- Before removing and installing any control units, first turn the ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

- Connect both battery cables.
 NOTE: Supply power using jumper cables if battery is discharged.
- Turn the ignition switch to ACC position. (At this time, the steering lock will be released.)
- 3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.

STC-11

< PRECAUTION >

- 4. Perform the necessary repair operation.
- 5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the ignition switch is turned to LOCK position.)
- 6. Perform self-diagnosis check of all control units using CONSULT.

COMPONENT PARTS

[VEHICLE SPEED SENSITIVE P/S]

< SYSTEM DESCRIPTION > SYSTEM DESCRIPTION **COMPONENT PARTS**

Component Parts Location

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- At the back of glove box assembly B Steering gear assembly
- C: Vehicle front

No.	Component	Function	
1	ECM	 Transmits the following signal to power steering control unit. Engine speed signal For detailed installation location, refer to <u>EC-16</u>, "<u>ENGINE CON-TROL SYSTEM</u>: Component Parts Location". 	L
2	Combination meter	 Transmits the following signal to power steering control unit. Vehicle speed signal For detailed installation location, refer to <u>MWI-7</u>, "<u>METER SYS-TEM</u>: Component Parts Location". 	Ν
3	Power steering control unit	STC-14, "Power Steering Control Unit"	
4	Power steering solenoid valve	STC-14, "Power Steering Solenoid Valve"	0

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Power Steering Control Unit

- · Signals from various sensors control the driving voltage to power steering solenoid valve.
- Power steering control unit controls the driving voltage to power steering solenoid valve for maintaining the power steering assist force when the fail-safe function is activated. (The engine speed signals control electronically controlled power steering system if any vehicle speed signal error is detected.)



Power Steering Solenoid Valve

Power steering solenoid valve ① controls the power steering oil pressure in the gear housing assembly.



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SYSTEM

< SYSTEM DESCRIPTION > SYSTEM ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM : System Description INFOID:000000009236937

- Electronically controlled power steering system controls the power steering solenoid valve through the power steering control unit.
- The valve driving voltage to control the power steering solenoid valve varies according to the vehicle speed.



CONTROL DIAGRAM



CROSS-SECTIONAL VIEW

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SYSTEM

< SYSTEM DESCRIPTION >



1. Combination meter

Pinion

7.

- 4. Steering gear assembly
- 2. Power steering control unit
- 3. Power steering solenoid valve

- 8.
- Gear housing assembly
 Power steering oil pump
- Gear sub-assembly
 Reservoir tank

OPERATION PRINCIPLE

During Parking (When Turning The Steering Wheel To The Right.)



- 1. Power steering solenoid valve is closed while a vehicle is stopped.
- 2. Pinion "1R", "2R" and "3R" are closed depending on steering torque of steering wheel.
- Oil pressure "P" in the gear housing assembly is the sum of oil pressures occurred in "2R" and "3R". This
 results in a light steering force because of high pressure.

During High-speed Operation



- 1. Power steering solenoid valve is opened during high-speed operation.
- 2. Pinion "1R", "2R" and "3R" are closed depending on steering torque of steering wheel.
- 3. Oil pressure "2R" does not occur because the power steering solenoid valve is on full throttle.
- 4. Oil pressure "P" in the gear housing assembly includes only oil pressure occurred in "3R" and results in a heavy steering force.

STC-16

SYSTEM

[VEHICLE SPEED SENSITIVE P/S]

< SYSTEM DESCRIPTION >

ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM : Circuit Diagram

ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM : Fail-safe

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- Electronically controlled power steering system enters the fail-safe mode (that allows the steering force to be controlled without impairing the drive ability) if any of the input/output values to/from electronically controlled power steering system (power steering control unit) deviate from the standard range.
- Power steering control unit controls the driving voltage to power steering solenoid valve for maintaining the power steering assist force when the fail-safe function is activated. (The engine speed signals control electronically controlled power steering system if any vehicle speed signal error is detected.)

Error area and root cause	Cancel condition	Ν
Engine speed is 1,500 rpm or more and there is no vehicle speed signal input for over 10 seconds during vehicle travel.	When a vehicle speed signal of 2 km/h (1.2 MPH) or more is inputted	-
Vehicle speed signal has abruptly dropped from 30 km/h (19 MPH) or more to 2 km/h (1.2 MPH) or less within 1.4 seconds.	Key switch is turned OFF to ON.	С

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[VEHICLE SPEED SENSITIVE P/S]

ECU DIAGNOSIS INFORMATION POWER STEERING CONTROL UNIT

Reference Value

TERMINAL LAYOUT

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PHYSICAL VALUES

Termi	nal No.	Description					
+	_	Signal name	Input/ Output	Condition	Value (Approx.)		
1	Cround	Power steering solenoid	Output	Vehicle speed: 0 km/h (0 MPH) (Engine is running)	4.4 - 6.6 V		
(LG)	Ground	valve voltage	Output	Vehicle speed: 100 km/h (62 MPH)	1.7 – 2.9 V		
3	Ground	Ignition switch power sup-	Input	Ignition switch: ON	Battery voltage		
(W)	Ciouna	ply	input	Ignition switch: OFF	0 V		
5 (B)	Ground	Power steering solenoid valve ground		Always	0 V		
6 (B)	Ground	Ground		Always	0 V		
8 (L)	Ground	Vehicle speed signal	Input	Vehicle speed: 40 km/h (25 MPH) CAUTION: Check air pressure of tire un- der standard condition.	0 50 ms JSNIA0015GB		
10 (V)	10	Ground Engine speed signal	Ground	Engine speed signal	Input	Engine speed: At idle (Warm-up condition)	10mSec/div 10mSec/div 2V/div JMBIA0076GB
	Ground		Engine speed: Approx. 2,000 rpm (Warm-up condition)	10mSec/div 10mSec/div 2V/div JMBIA0077GB			

< ECU DIAGNOSIS INFORMATION >

CAUTION:

When using circuit tester or oscilloscope to measure voltage for inspection, be sure not to forcibly A extend any connector terminals.

Fail-safe

- Electronically controlled power steering system enters the fail-safe mode (that allows the steering force to be controlled without impairing the drive ability) if any of the input/output values to/from electronically controlled power steering system (power steering control unit) deviate from the standard range.
- Power steering control unit controls the driving voltage to power steering solenoid valve for maintaining the power steering assist force when the fail-safe function is activated. (The engine speed signals control electronically controlled power steering system if any vehicle speed signal error is detected.)

		F
Error area and root cause	Cancel condition	-
Engine speed is 1,500 rpm or more and there is no vehicle speed signal input for over 10 seconds during vehicle travel.	When a vehicle speed signal of 2 km/h (1.2 MPH) or more is inputted	ST
Vehicle speed signal has abruptly dropped from 30 km/h (19 MPH) or more to 2 km/h (1.2 MPH) or less within 1.4 seconds.	Key switch is turned OFF to ON.	

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< WIRING DIAGRAM > WIRING DIAGRAM

EPS SYSTEM

Wiring Diagram

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[VEHICLE SPEED SENSITIVE P/S]

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< WIRING DIAGRAM >

DIAGNOSIS AND REPAIR WORK FLOW

[VEHICLE SPEED SENSITIVE P/S]

BASIC INSPECTION	Δ
DIAGNOSIS AND REPAIR WORK FLOW	A
Work Flow	В
DETAILED FLOW	
1.COLLECT THE INFORMATION FROM THE CUSTOMER	С
It is also important to clarify customer complaints before inspection. First of all, reproduce symptoms, and understand them fully. Ask customer about his/her complaints carefully. In some cases, it is necessary to check symptoms by driving vehicle with customer. CAUTION:	D
Customers are not professional. It is dangerous to make an easy guess like "maybe the customer means that," or "maybe the customer mentions this symptom".	Е
>> GO TO 2.	
2.CHECK THE STATUS	F
 Power steering fluid leakage and check the power steering fluid level. Refer to <u>ST-27, "Inspection"</u>. Check the drive belt tension. Refer to EM-19. "Checking" 	
 Check the power steering gear for damages, cracks and fluid leakage. Refer to <u>ST-42, "2WD : Inspection</u> and Adjustment" (2WD) ST-47, "AVD : Inspection" (AWD) 	STC
 Check the relief oil pressure. Refer to <u>ST-53, "Inspection"</u>. 	
>> GO TO 3	Η
3. DIAGNOSIS CHART BY SYMPTOM	
Perform the diagnosis by symptom.	I
	1
4.FINAL CHECK	J
Check the input/output standard values for the power steering control unit.	K
Are the power steering control unit input/output values within standard ranges respectively?	IX
NO $>>$ GO TO 2.	L
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< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS POWER SUPPLY AND GROUND CIRCUIT

Description

Power supply to electronically controlled power steering system.

Diagnosis Procedure

1.CHECK POWER SUPPLY (1)

- 1. Turn the ignition switch OFF.
- 2. Disconnect power steering control unit harness connector.
- 3. Check the voltage between power steering control unit harness connector and ground.

Power steering control unit			
Connector	Terminal		Voltage (Approx.)
Connector	+	_	
M49	3	Ground	0 V

4. Turn the ignition switch ON. CAUTION:

Never start the engine.

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

I Ower Steerin	ng control unit			
Connector	Terminal	_	Voltage (Approx.)	
Connector	+	_		
M49	3	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK POWER SUPPLY (2)

1. Turn the ignition switch OFF.

2. Check 10Å fuse (#12).

3. Disconnect fuse block (J/B) harness connector.

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

Power steering control unit		Fuse block (J/B)		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
M49	3	M133	20C	Existed	

5. Check the continuity between power steering control unit harness connector and ground.

Power steering	ng control unit	_	Continuity	
Connector	Terminal		Continuity	
M49	3	Ground	Not existed	

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply circuit. Refer to <u>PG-54. "Wiring Diagram -</u> <u>IGNITION POWER SUPPLY -"</u>.

NO >> Repair or replace damaged parts.

3. CHECK GROUND CIRCUIT

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POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch OFF.

2. Check the continuity between power steering control unit harness connector and ground.

	Power steerin	g control unit		Continuity	
	Connector	Terminal		Continuity	В
	M49	6	Ground	Existed	-
Is the i	nspection result norm	nal?			C
YES NO	>> GO TO 4. >> Repair or replac	ce damaged parts.			
4. CH	ECK TERMINALS AN	ID HARNESS CONNECT	TORS		D
Check	the power steering c	ontrol unit pin terminals fo	or damage or loose connectio	n with harness connector.	-
<u>Is the i</u>	nspection result norm	nal?			_
YES	>> INSPECTION E	ND			E
NO	>> Repair or replace	ce damaged parts.			
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[VEHICLE SPEED SENSITIVE P/S]

POWER STEERING SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

POWER STEERING SOLENOID VALVE

Component Function Check

1.CHECK POWER STEERING SOLENOID VALVE OPERATION

Check changes in steering force from a halt condition to high-speed driving.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check the power steering solenoid valve. Refer to <u>STC-26, "Diagnosis Procedure"</u>.

Diagnosis Procedure

1.CHECK POWER STEERING SOLENOID VALVE SIGNAL

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

Power steeri	ng control unit				
Connector	Terminal	_	Condition	Voltage (Approx.)	
Connector	+	_			
M49	1	Ground	Vehicle speed: 0 km/h (0 MPH) (Engine is running)	4.4 – 6.6 V	
			Vehicle speed: 100 km/h (62 MPH)	1.7 – 2.9 V	

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 2.

2. CHECK POWER STEERING SOLENOID VALVE CIRCUIT

1. Turn the ignition switch OFF.

2. Disconnect power steering solenoid valve harness connector.

3. Disconnect power steering control unit harness connector.

4. Check the continuity between power steering solenoid valve harness connector and the power steering control unit harness connector.

Power steering	g solenoid valve	Power steering control unit		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E13	1	M49	1	Existed
	2		5	Existed

5. Check the continuity between power steering control unit harness connector and ground.

Power steeri	ng control unit		Continuity	
Connector	Terminal		Continuity	
M49 1	Ground	Not existed		
	5	Clouid	Not existed	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

 $\mathbf{3.}$ CHECK POWER STEERING SOLENOID VALVE

Check the power steering solenoid valve. Refer to STC-27, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Power steering solenoid valve is malfunctioning. Replace gear housing assembly. Refer to <u>ST-39</u>. <u>"2WD : Removal and Installation"</u> (2WD), <u>ST-44</u>, "AWD : Removal and Installation" (AWD).

STC-26

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POWER STEERING SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[VEHICLE SPEED SENSITIVE P/S]

 Check the power steering control unit pin terminals for damage or loose corol check the power steering solenoid valve pin terminals for damage or loose corol tor. Is the inspection result normal? YES >> INSPECTION END NO >> Repair or replace error-detected parts. Component Inspection CHECK POWER STEERING SOLENOID VALVE Turn the ignition switch OFF. Disconnect power steering solenoid valve harness connector. Check the resistance between power steering solenoid valve connector to the reminal 1 2 Check the power steering solenoid valve connector to by listening for its ope tery voltage to power steering solenoid valve connector terminal 1 (Positive) 2 (Negative) Is the inspection result normal? YES >> INSPECTION END 	onnection with harness connector.	oin terminals for damage or loo re pin terminals for damage or l cted parts.	heck the power steering control heck the power steering solenoid r. <u>he inspection result normal?</u> ES >> INSPECTION END D >> Repair or replace error-
tot. st the inspection result normal? YES >> INSPECTION END NO >> Repair or replace error-detected parts. Component Inspection .CHECK POWER STEERING SOLENOID VALVE . Turn the ignition switch OFF. 2. Disconnect power steering solenoid valve harness connector. 3. Check the resistance between power steering solenoid valve connector to Power steering solenoid valve Terminal 1 2 4. Check the power steering solenoid valve connector by listening for its ope tery voltage to power steering solenoid valve connector terminals. Power steering solenoid valve Terminal 1 2 Image: Power steering solenoid valve connector by listening for its ope tery voltage to power steering solenoid valve connector terminals. Power steering solenoid valve Terminal 1 (Positive) 2 (Negative) st the inspection result normal? YES > INSPECTION END	INFOID:0000000923694;	cted parts.	ne inspection result normal? ES >> INSPECTION END D >> Repair or replace error-
YES >> INSPECTION END NO >> Repair or replace error-detected parts. component Inspection .CHECK POWER STEERING SOLENOID VALVE Turn the ignition switch OFF. Disconnect power steering solenoid valve harness connector. Check the resistance between power steering solenoid valve connector terminal 1 2 Check the power steering solenoid valve connector by listening for its ope tery voltage to power steering solenoid valve connector terminals. Power steering solenoid valve Terminal 1 2 Power steering solenoid valve connector terminals. Power steering solenoid valve connector terminals. Power steering solenoid valve Image: the inspection result normal? YES >> INSPECTION END	INFOID:0000000923694	cted parts.	ES >> INSPECTION END D >> Repair or replace error-
NO >> Repair or replace error-detected parts. component Inspection .CHECK POWER STEERING SOLENOID VALVE Turn the ignition switch OFF. Disconnect power steering solenoid valve harness connector. Check the resistance between power steering solenoid valve connector to Power steering solenoid valve Terminal 1 2 Check the power steering solenoid valve connector by listening for its oper tery voltage to power steering solenoid valve connector terminals. Power steering solenoid valve Terminal 1 2 Check the power steering solenoid valve connector terminals. Power steering solenoid valve Terminal 1 2 (Negative) the inspection result normal? YES >> INSPECTION END	INFOID:0000000923694	cted parts.	 >> Repair or replace error-
COMPONENT INSPECTION .CHECK POWER STEERING SOLENOID VALVE Turn the ignition switch OFF. Disconnect power steering solenoid valve harness connector. Check the resistance between power steering solenoid valve connector terminal 1 2 Check the power steering solenoid valve connector by listening for its operatory voltage to power steering solenoid valve connector terminals. Power steering solenoid valve 1 2 Check the power steering solenoid valve connector by listening for its operatory voltage to power steering solenoid valve connector terminals. Power steering solenoid valve 1 2 (Negative) terminal 1 (Positive) 2 (Negative) 2 (Negative) The inspection result normal? YES >> INSPECTION END	INFOID:0000000923694		
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Terminal 1 2 1 2 2 Check the power steering solenoid valve connector by listening for its oper tery voltage to power steering solenoid valve connector terminals. Power steering solenoid valve connector terminals. Power steering solenoid valve Terminal 1 (Positive) 2 (Negative) the inspection result normal? YES YES >> INSPECTION END		noid valve	Power steerin
1 2 Check the power steering solenoid valve connector by listening for its oper tery voltage to power steering solenoid valve connector terminals. Power steering solenoid valve Terminal 1 (Positive) 2 (Negative) the inspection result normal? YES YES	Resistance (Approx.)		Ter
Check the power steering solenoid valve connector by listening for its oper tery voltage to power steering solenoid valve connector terminals. Power steering solenoid valve Terminal 1 (Positive) 2 (Negative) the inspection result normal? YES	4 – 6 Ω	2	1
Terminal 1 (Positive) 2 (Negative) the inspection result normal? YES YES >> INSPECTION END		Did Valve connector terminals.	tery voltage to power steering s
1 (Positive) 2 (Negative) the inspection result normal? YES >> INSPECTION END	Operation sound		Ter
the inspection result normal? YES >> INSPECTION END	Evictod	2 (Negotivo)	
<u>"2WD : Removal and Installation"</u> (2WD), <u>S1-44, "AWD : Remova</u>	<u>ral and Installation"</u> (AWD).	i <u>tion"</u> (2WD), <u>ST-44, "AWD : R</u> i	<u>"2WD : Removal and In</u>

INFOID:000000009236948

ENGINE SPEED SIGNAL CIRCUIT

Diagnosis Procedure

1.PERFORM ECM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for "ENGINE".

Is any error system detected?

YES >> Check the DTC. Refer to EC-106, "DTC Index".

NO >> GO TO 2.

2.CHECK ENGINE SPEED SIGNAL CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Disconnect ECM harness connectors.
- 3. Disconnect power steering control unit harness connector.
- 4. Check the continuity between ECM harness connector and power steering control unit harness connector.

Power steering control unit		ECM		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
M49	10	M37	110	Existed	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace damaged parts.

3.CHECK ENGINE SPEED SIGNAL (ECM)

1. Connect ECM harness connectors.

2. Check the signal between ECM harness connector and ground with oscilloscope.

ECM		Condition		Value (Approx.)	
Connector	Terminal		Condition		
M37	110	Cround	Engine speed: At idle (Warm-up condition)	10mSec/div 10mSec/div 2V/div	
		Clound	Engine speed: Approx. 2,000 rpm (Warm-up condition)	10mSec/div	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace ECM. Refer to EC-152. "Description".

4.CHECK ENGINE SPEED SIGNAL (POWER STEERING CONTROL UNIT)

1. Turn the ignition switch OFF.

2. Connect power steering control unit harness connector.

3. Check the signal between power steering control unit harness connector and ground with oscilloscope.

ENGINE SPEED SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

Power steel	ring control unit		Condition	Value (Approx.)	
Connector	Terminal				
M4Q	10	Ground	Engine speed: At idle (Warm-up condition)	10mSec/div 10mSec/div 2V/div JMBIA0076GB	
M49			Engine speed: Approx. 2,000 rpm (Warm-up condition)	10mSec/div	
Is the inspection result normal? YES >> GO TO 5. S NO >> Replace power steering control unit. Refer to STC 33. "Removal and Installation." S					
 5. CHECK TERMINALS AND HARNESS CONNECTORS Check the power steering control unit pin terminals for damage or loose connection with harness connector. Check ECM pin terminals for damage or loose connection with harness connector. 					
<u>Is the inspection result normal?</u> YES >> INSPECTION END NO >> Repair or replace damaged parts.					

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INFOID:00000009236949

VEHICLE SPEED SIGNAL CIRCUIT

Diagnosis Procedure

1.PERFORM COMBINATION METER SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for "METER/M&A".

Is any error system detected?

YES >> Check the DTC. Refer to <u>MWI-80, "DTC Index"</u>.

NO >> GO TO 2.

2.CHECK VEHICLE SPEED SIGNAL CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Disconnect power steering control unit harness connector.
- 3. Disconnect combination meter harness connector.
- 4. Check the continuity between combination meter harness connector and power steering control unit harness connector.

Power steering control unit		Combina	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
M49	8	M57	39	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace damaged parts.

3.CHECK VEHICLE SPEED SIGNAL (COMBINATION METER)

1. Connect combination meter harness connector.

2. Check the combination meter input/output standard values. Refer to MWI-70, "Reference Value".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace combination meter. Refer to <u>MWI-126, "Removal and Installation"</u>.

4.CHECK VEHICLE SPEED SIGNAL (POWER STEERING CONTROL UNIT)

1. Connect power steering control unit harness connector.

2. Check the signal between power steering control unit harness connector and ground with oscilloscope.

Power steering control unit					
Connector	Terminal		Condition	Value (Approx.)	
	+	_			
M49	8	Ground	Vehicle speed: 40 km/h (25 MPH) CAUTION: Check the air pressure of tire un- der standard condition.	0 50 ms JSNIA0015GB	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace power steering control unit. Refer to STC-33, "Removal and Installation".

5.CHECK TERMINALS AND HARNESS CONNECTORS

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

• Check the combination meter pin terminals for damage or loose connection with harness connector. Is the inspection result normal?

STC-30

	VEHICLE SPEED SIG	NAL CIRCUIT
< DTC/	/CIRCUIT DIAGNOSIS >	[VEHICLE SPEED SENSITIVE P/S]
YES	>> INSPECTION END	
NO	>> Repair or replace damaged parts.	
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UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION) < SYMPTOM DIAGNOSIS > [VEHICLE SPEED SENSITIVE P/S]

SYMPTOM DIAGNOSIS

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIA-TION)

Description

INFOID:000000009236950

- Hard steering when fully turning the steering wheel.
- Light steering when driving at a high speed.

Diagnosis Procedure

INFOID:000000009236951

1.CHECK SYSTEM FOR POWER SUPPLY AND GROUND

Perform trouble diagnosis for power supply and ground. Refer to <u>STC-24, "Diagnosis Procedure"</u>. Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace damaged parts.

2.CHECK SYSTEM FOR VEHICLE SPEED SIGNAL

Perform trouble diagnosis for vehicle speed signal. Refer to STC-30, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace damaged parts.

 $\mathbf{3.}$ CHECK SYSTEM FOR ENGINE SPEED SIGNAL

Perform trouble diagnosis for engine speed signal. Refer to STC-28, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace damaged parts.

4.CHECK SYSTEM FOR POWER STEERING SOLENOID VALVE

Perform trouble diagnosis for power steering solenoid valve. Refer to <u>STC-26, "Diagnosis Procedure"</u>. <u>Is the inspection result normal?</u>

- YES >> Perform the symptom diagnosis for the steering system. Refer to <u>ST-25, "NVH Troubleshooting</u> <u>Chart"</u>.
- NO >> Repair or replace damaged parts.

POWER STEERING CONTROL UNIT < REMOVAL AND INSTALLATION > [VEHICLE SPEED SENSITIVE]	P/S]
REMOVAL AND INSTALLATION	A
POWER STEERING CONTROL UNIT	
Removal and Installation)009236952 B
REMOVAL	
 Remove glove box. Refer to <u>IP-12, "Removal and Installation"</u>. Disconnect power steering control unit connector. Remove power steering control unit. 	С
	D
Install in the reverse order of removal.	
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< PRECAUTION > PRECAUTION PRECAUTIONS

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

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, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, 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, and wait at least 3 minutes before performing any service.

Service Notice and Precautions for Direct Adaptive Steering

INFOID:000000009728085

- 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".
- Refer to <u>STC-126. "Special Repair Requirement"</u> for the replacement of each component.

[DIRECT ADAPTIVE STEERING]

< SYSTEM DESCRIPTION > SYSTEM DESCRIPTION COMPONENT PARTS

Component Parts Location

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COMPONENT PARTS

< SYSTEM DESCRIPTION >

A Behind of glove box

D

- B Steering gear assembly
- Behind of front bumper (left side)
- Steering column assembly and steering shaft assembly

C Behind of front bumper (right side)

No.	Component	Function
1	Drive mode select switch	 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 <u>DMS-3</u>, "<u>Component</u> <u>Parts Location</u>".
2	ТСМ	 Transmits mainly the following signals to steering force control module via CAN communication. Shift position signal For detailed installation location, refer to <u>TM-12</u>, "A/T CON-<u>TROL SYSTEM : Component Parts Location</u>".
3	ECM	 Transmits mainly the following signals to steering force control module via CAN communication. Engine speed signal For detailed installation location, refer to <u>EC-16, "ENGINE</u> <u>CONTROL SYSTEM : Component Parts Location"</u>.
4	ВСМ	 Transmits mainly the following signals to steering force control module via CAN communication. Sleep/wake up signal For detailed installation location, refer to <u>BCS-4, "BODY CON-TROL SYSTEM : Component Parts Location"</u>.
5	ABS actuator and electric unit (control unit)	 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 <u>BRC-9, "Component Parts Location"</u>.
6	Chassis control module	 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 <u>DAS-393, "Component Parts Location"</u>.
7	Combination meter (Steering warning lamp)	 Transmits mainly the following signals to steering force control module via CAN communication. Odometer signal For detailed installation location, refer to <u>MWI-7, "METER SYS-TEM : Component Parts Location"</u>. 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 <u>STC-51, "WARNING/INDI-CATOR/CHIME LIST : Warning Lamp/Indicator Lamp"</u>.
8	Steering angle sensor	 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 <u>BRC-9, "Component</u> <u>Parts Location"</u>.
9	Steering force control module	STC-37, "Steering Force Control Module"
COMPONENT PARTS

< SYSTEM DESCRIPTION >

[DIRECT	ADAPTIVE	STEERING]
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No.	Io. Component		Function	
		Steering angle sub motor		- A
10	Steering angle sub actu-	Sub motor angle sensor	STC-38, "Steering Angle Actuator"	
		Sub reduction gear		В
		Steering angle main motor		
6	Steering angle main ac-	Steering angle main ac- Main motor angle sensor	STC 29. "Steering Angle Actuator"	
(1) tuator	Main reduction gear	<u>- STC-S6. Steering Angle Actualor</u>	С	
		Steering torque sensor	_	
(12)	(2) Steering angle sub control module		STC-37, "Steering Angle Sub Control Module"	D
(13)	③ Steering angle main control module		STC-37, "Steering Angle Main Control Module"	
14	Steering clutch		STC-39. "Steering Clutch"	F
(15)	Image: Steering force actuator		STC-38, "Steering Force Actuator"	

Steering Force Control Module

- 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.
- 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.

Steering Angle Main Control Module

- 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.
- Steering angle main control module transmits the pinion torgue signal transmitted from the steering torque sensor to the steering force control module.
- · Quickly switches the control after a malfunction occurs according to synchronous control using FlexRay communication.

Steering Angle Sub Control Module

- 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.
- 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).



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< SYSTEM DESCRIPTION > Steering Force Actuator

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

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

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).



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 toque signal to the steering angle main control module by converting into voltage.

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.

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< SYSTEM DESCRIPTION >

SUB REDUCTION GEAR

Sub reduction gear increases the steering assist torque provided from steering angle sub motor with worm A 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 steer-

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 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.



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SYSTEM DIRECT ADAPTIVE STEERING

DIRECT ADAPTIVE STEERING : System Description



- 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-547, "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 <u>DMS-7</u>, "Infiniti Drive Mode Selector : System Description".
- This enables trouble diagnosis with CONSULT.

[DIRECT ADAPTIVE STEERING]

< SYSTEM DESCRIPTION >





INPUT/OUTPUT SIGNAL

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

Control unit	Signal status	N
Chassis control module	 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 	O
ABS actuator and electric unit (control unit)	 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 	

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< SYSTEM DESCRIPTION >

Control unit	Signal status
ECM	 Transmits mainly the following signals to steering force control module via CAN communication. Engine status signal Engine speed signal Stop/Start status signal Receives mainly the following signals from steering force control module via CAN communication. Steering torque signal
ТСМ	 Transmits mainly the following signals to steering force control module via CAN communication. Shift position signal
Combination meter	 Transmits mainly the following signals to steering force control module via CAN communication. Odometer signal Receives mainly the following signals from steering force control module via CAN communication. Power steering warning lamp signal
Steering angle sensor	 Transmits mainly the following signals to steering force control module via CAN communication. Steering angle sensor signal Steering angle sensor malfunction signal
BCM	 Transmits mainly the following signals to steering force control module via CAN communication. Sleep wake up signal
Steering force control module Steering angle main control module Steering angle sub control module	 Interactively transmits and receives mainly the following signals via FlexRay communication[*]. Direct adaptive steering control signal

*: 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.

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

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

- 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 <u>DMS-7</u>, "Infiniti Drive Mode Selector : System Description".

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.
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< SYSTEM DESCRIPTION >

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



- The steering clutch is engaged, and the system changes to manual steering status.
- No electrical control is performed.

[DIRECT ADAPTIVE STEERING]

SYSTEM

< SYSTEM DESCRIPTION >

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DIRECT ADAPTIVE STEERING : Circuit Diagram



< SYSTEM DESCRIPTION >



SYSTEM

< SYSTEM DESCRIPTION >





DIRECT ADAPTIVE STEERING : Fail-safe

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- 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 DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

• For details of protection function, refer to STC-50, "DIRECT ADAPTIVE STEERING : Protection Function".



	Direct adaptive steering operating condition in fail-safe mode			
DTC	Steering force control module	Steering angle main control module	Steering angle sub control module	
C13A0-00	Variable	Variable	Variable	
C13A1-00	—	Mode 2	Mode 2	
C13A2-00	Mode 3	Mode 3	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 3	Mode 2	
C13A9-00	Mode 2	Mode 3	Mode 2	
C13AA-00	Mode 2	Mode 3	Mode 2	

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[DIRECT ADAPTIVE STEERING]

Direct adaptive ste		steering operating condition in fail-safe mode		
DTC	Steering force control module	Steering angle main control module	Steering angle sub control module	1
C13AB-00	Mode 2	Mode 3	Mode 2	
C13AC-00		Mode 3		1
C13AD-00	Mode 2	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 3	Mode 2	
C13B3-00	Mode 2	Mode 3	Mode 2	
C13B4-00	Mode 2	Mode 3	Mode 2	
C13B5-00	Mode 2	Mode 3	Mode 2	
C13B6-00	Mode 2	Mode 3	Mode 2	
C13B7-00	Mode 2	Mode 3	Mode 2	
C13B8-00	Mode 2	Mode 3	Mode 2	Ś
C13B9-00	Mode 2	Mode 3	Mode 2	0
C13BA-00	Mode 2	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	Mode 2	Mode 2	,
C13C1-00	Mode 2	Mode 2	Mode 2	
C13C2-00	Mode 2	Mode 2	Mode 2	
C13C3-00	Mode 2	Mode 2	Mode 2	
C13C4-00	Mode 2	Mode 2	Mode 2	
C13C5-00	Mode 2*1 *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 3	Mode 2	
C13D3-00	Mode 2	Mode 3	Mode 2	
C13D4-00	Mode 2	Mode 3	Mode 2	

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

	Direct adaptive steering operating condition in fail-safe mode			
DTC	Steering force control module	Steering angle main control module	Steering angle sub control module	
C13D5-00	Mode 2	Mode 3	Mode 2	
C13D6-00	Mode 2	Mode 3	Mode 2	
C13D7-00	Mode 2	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	
C13EC-00		_	_	
C13ED-00	Protection function mode	Protection function mode	Protection function mode	
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			
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:000000009728096

- 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.

STC-50

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

DTC	Condition	Vehicle condition	А
C13E3-00	The steering wheel is steered over the limit angle.	System changes to the protection mode temporarily. (Steering op-	
C13E4-00	When steering clutch is released, steering clutch is not released within regular time with overloading steering wheel.	eration may become heavy temporarily, however steering wheel can be operated without interference. This is not a system mal- function.)	В
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 <u>STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe"</u> .	С
C12E6 00	EPS/DAST 3: Internal temperature of steering force motor is 150°C (302°F) or more.		D
C13E0-00	DAST 1, DAST 2: Internal temperature of control module is 85°C (185°F) or more.	System changes to the protection mode temporarily. (Steering op-	E
C13E7-00	Power supply voltage of control module is low tem- porarily.	can be operated without interference. This is not a system mal- function.)	
01258.00	 Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of authors are other authors. 		F
01328-00	stances.Steering gear is out of neutral position. (Large)		STO
WARNIN	G/INDICATOR/CHIME LIST		

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

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INFOID:000000009728097	

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Name	Design	Layout/Function	
Steering warning lamp		For layout, refer to <u>MWI-8, "METER SYSTEM : Design"</u> . For function, refer to <u>MWI-38, "WARNING LAMPS/INDICATOR</u> LAMPS : Power Steering Warning Lamp".	J

HANDLING PRECAUTION

Handling Precautions for Direct Adaptive Steering

INFOID:000000009809242

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 is 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 slightly turned even when driving on a straight road. 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 and at low speeds.
- If the direct adaptive steering system is malfunctioning, the steering wheel may turn slightly even when driving on a straight road.
- Under the followings, the steering wheel may turn slightly even when driving on a straight road. 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 the steering wheel is held in the full lock position or when the front tire touches an obstruction.
- The steering wheel will return to the normal position after the protection mechanism deactivates. To return to the normal position, turn the engine off, restart the engine, and then drive the vehicle for a period of time.
- 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 turn slightly even when driving on a straight road. 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.

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (STEERING FORCE CONTROL MODULE)

CONSULT Function

INFOID:000000009728098

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[DIRECT ADAPTIVE STEERING]

APPLICATION ITEMS

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

Diagnostic test mode	Function	С
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.	D
Work support	This mode enable a technican to adjust some devices faster and more accurately by fol- lowing the indication on the CONSULT.	
Re/programming. Configuration	 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 <u>STC-80, "DTC Index"</u>.

When "PRSNT" 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 protection 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)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Freeze Frame Data Item	Description
FLEXRAY COMM DIAG (OTH2)	Display the diagnosis status of FlexRay communication. (steering angle sub control mod- ule)
POWER TRAIN STATUS	Display the status of power train.
IGN SW STATUS (OWN ECU)	Display ignition switch status recognized steering force control module.
IGN SW STATUS (SYSTEM)	Display the status of ignition switch.
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.
ST N POSI LEARN	Display the status of steering N position learning.
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 control module.
VEHICLE SPEED	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN com- munication.
YAW RATE	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN commu- nication.
SIDE G	Display side G value from ABS actuator and electric unit (control unit) via CAN commu- nication.
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 output main signal 1 of steering torque sensor.
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 angle information used for system control.
ANGLE 2	Display the command angle for steering force motor.
F/B ANGLE 1	Display the feedback angle 1 for steering force motor.
F/B ANGLE 2	Display the feedback angle 2 for steering force 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.
OFF-CENTER	Display the adjustment value of DAST calibration.

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

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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.

	X: Applicable	В
Monitor item [Unit]	Remarks	
OWN ECU SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAF8/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.	C
ST ANG MAIN SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAF8/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.	F
ST ANG SUB SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAF8/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.	Н
ST FORCE SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAF8/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.	J
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.	L
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.	Ъ.Л
DETAILED CODE 3 [0 – 255]	This is displayed, but it is not used.	IVI
FLESRAY COMM SYNC STATS [STAT1/STAT2/STAT3/STAT4/STAT5/ STAT6/STAT7/STAT8/STAT9/STAT10]	Display the sync status of FlexRay communication.	Ν
STEERING MODE [CHARA A/CHARA B/CHARA C/CHARA D/ CHARA E/CHARA F/CHARA G/CHARA H/ CHARA I]	Display the steering mode.	0
ST CLUTCH PRTCT STATUS [STAT0/STAT1/STAT2/STAT3/STAT4/ STAT5/STAT6/STAT7/STAT8/STAT9/ STAT10/STAT11/STAT12/STAT20]	Display the protection status of steering clutch.	Ρ
ST CLUTCH CON RQEST [STAT0/STAT1/STAT2/STAT3/STAT4/ STAT5]	Display the control request status steering clutch.	

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Monitor item [Unit]	Remarks
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.
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 status of ignition switch.
IGN SW STATUS (SYSTEM) [ON/OFF]	Display the status of ignition switch.
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.
ST N POSI LEARN [NORMAL/LEARN/COMP]	Display the status of steering N position learning.
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 control module.
VEHICLE SPEED [km/h] or [MPH]	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN com- munication.
YAW RATE [deg/s]	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN commu- nication.
SIDE G [m/s^2]	Display side G value from ABS actuator and electric unit (control unit) via CAN commu- nication.
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 [V]	Display the output main signal 1 of steering torque sensor.
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 angle information used for system control.

Revision: 2013 October

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Monitor item [Unit]	Remarks	
ANGLE 2 [deg]	Display the command angle for steering force motor.	A
F/B ANGLE 1 [deg]	Display the feedback angle 1 for steering force motor.	
F/B ANGLE 2 [deg]	Display the feedback angle 2 for steering force motor.	В
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.	С
STEERING PINION ANGLE 2 [deg]	Display the steering pinion angle.	
ANGLE 3 [deg]	Display the angle information used for system control.	D
OFF-CENTER [°]	Display the adjustment value of DAST calibration.	

WORK SUPPORT

Item	Description	
DAST CALIBRATION (MODE1)	Perform direct adaptive steering calibration.	_
DAST CALIBRATION (MODE2)	Perform direct adaptive steering calibration.	Г

RE/PROGRAMMING, CONFIGURATION Configuration includes the following functions.

Ite	em	Description	
Read/Write Configu-	Before replacing ECU	Allows the reading of vehicle specification (Type ID) written in steering force control mod- ule to store the specification in CONSULT.	ŀ
ration	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.	

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DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE) < SYSTEM DESCRIPTION > [DIRECT ADAPTIVE STEERING]

DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)

CONSULT Function

INFOID:000000009728099

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. $\overset{*}{}$
Data Monitor	Input/Output data in the steering angle main control module can be read.
Re/programming. Configuration	 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-95, "DTC Index".

When "PRSNT" 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 protection status of steering clutch.
ST CLUTCH CON RQEST	Display the control request status steering clutch.
SHIFT POSITION	Display the shift position from ECM via CAN communication.
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)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Freeze Frame Data Item	Description	
POWER TRAIN STATUS	Display the status of power train.	A
IGN SW STATUS (OWN ECU)	Display ignition switch status recognized steering angle main control module.	
IGN SW STATUS (SYSTEM)	Display the status of ignition switch.	В
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.	С
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.	D
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.	E
ST N POSI LEARN	Display the status of steering N position learning.	
BACK UP SIG 1 VOLT	Display the voltage of buck up signal 1.	F
BACK UP SIG 2 VOLT	Display the voltage of buck up signal 2.	Г
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.	STO
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 temperature of steering angle main control module.	H
VEHICLE SPEED	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN com- munication.	1
YAW RATE	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN commu- nication.	I
SIDE G	Display side G value from ABS actuator and electric unit (control unit) via CAN commu- nication.	J
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.	К
MOTOR W ACT CURRENT	Display the activation current of steering angle main motor W phase.	
TORQUE SEN MAIN 2	Display the output main signal 2 of steering torque sensor.	
TORQUE SEN MAIN 1	Display the output main signal 1 of steering torque sensor.	L
TORQUE SEN SUB	Display the output sub signal of steering torque sensor.	
TORQUE SEN VOLTAGE	Display the power supply voltage for steering torque sensor.	NЛ
TEMPERATURE SENSOR	Display the temperature of steering angle main control module.	IVI
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.	Ν
ANGLE SENSOR SIGNAL 2	Display the voltage of angle sensor signal.	
ANGLE 1	Display the angle information used for system control.	
ANGLE 2	Display the command angle for steering angle main motor.	0
F/B ANGLE 1	Display the feedback angle 1 for steering angle main motor.	
F/B ANGLE 2	Display the feedback angle 2 for steering angle main motor.	Ρ
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.	

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Freeze Frame Data Item	Description
ANGLE 3	Display the angle information used for system control.
OFF-CENTER	Display the adjustment value of DAST calibration.

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.

	X: Applicable
Monitor item [Unit]	Remarks
OWN ECU SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAF8/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/DIAF8/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/DIAF8/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/DIAF8/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 protection status of steering clutch.

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Monitor item [Unit]	Remarks
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 TCM via CAN communication.
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)
FLEXRAY COMM DIAG (OTH2) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering angle force control module)
POWER TRAIN STATUS [STOP/RUN]	Display the status of power train.
IGN SW STATUS (OWN ECU) [ON/OFF]	Display the status of ignition switch.
IGN SW STATUS (SYSTEM) [ON/OFF]	Display the status of ignition switch.
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 main control module.
ST N POSI LEARN [NORMAL/LEARN/COMP]	Display the status of steering N position learning.
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 main control module.
BATTERY VOLTAGE [V]	Display the power supply voltage for steering angle main control module.
IGN VOLTAGE [V]	Display the ignition power supply voltage for steering angle main control module.
C/M TEMPERATURE [°C] or [°F]	Display the temperature of steering angle main control module.
VEHICLE SPEED [km/h] or [MPH]	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN com- munication.
YAW RATE [deg/s]	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN commu- nication.
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 main motor U phase.
MOTOR W ACT CURRENT [A]	Display the activation current of steering angle main motor W phase.
TORQUE SEN MAIN 2 [V]	Display the output main signal 2 of steering torque sensor.
TORQUE SEN MAIN 1 [V]	Display the output main signal 1 of steering torque sensor.
TORQUE SEN SUB [V]	Display the output sub signal of steering torque sensor.

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Monitor item [Unit]	Remarks
TORQUE SEN VOLTAGE [V]	Display the power supply voltage for steering torque sensor.
TEMPERATURE SENSOR [°C] or [°F]	Display the temperature of steering angle main control module.
SUB IGN VOLTAGE [V]	Display the sub ignition power supply voltage for steering angle main control module.
ANGLE SENSOR SIGNAL 1 [V]	Display the voltage of angle main motor angle sensor signal.
ANGLE SENSOR SIGNAL 2 [V]	Display the voltage of angle main motor angle sensor signal.
ANGLE 1 [deg]	Display the angle information used for system control.
ANGLE 2 [deg]	Display the command angle for steering angle main motor.
F/B ANGLE 1 [deg]	Display the feedback angle 1 for steering angle main motor.
F/B ANGLE 2 [deg]	Display the feedback angle 2 for steering angle main 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.
OFF-CENTER [°]	Display the adjustment value of DAST calibration.

RE/PROGRAMMING, CONFIGURATION Configuration includes the following functions.

Item		Description	
Read/Write Configu-	Before replacing ECU	Allows the reading of vehicle specification (Type ID) written in steering angle main control module to store the specification in CONSULT.	
ration	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) [DIRECT ADAPTIVE STEERING]

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE)

CONSULT Function

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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	 Read and save the vehicle specification (TYPE ID). Write the vehicle specification (TYPE ID) when replacing steering angle sub control module. 	-
*: The following diagnosis inform	nation is erased by erasing.	•
• DIC • Freeze frame data (FED)		

• Freeze frame data (FFD)

ECU IDENTIFICATION

Steering angle sub control module part number can be read.

SELF DIAGNOSTIC RESULT

Refer to STC-110, "DTC Index".

When "PRSNT" 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 protection 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 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)	

Revision: 2013 October

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Freeze Frame Data Item	Description		
POWER TRAIN STATUS	Display the status of power train.		
IGN SW STATUS (OWN ECU)	Display ignition switch status recognized steering angle sub control module.		
IGN SW STATUS (SYSTEM)	Display the status of ignition switch.		
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.		
ST N POSI LEARN	Display the status of steering N position learning.		
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 temperature of steering angle sub control module.		
VEHICLE SPEED	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN com munication.		
YAW RATE	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN comm nication.		
SIDE G	Display side G value from ABS actuator and electric unit (control unit) via CAN comm nication.		
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 output main signal 1 of steering torque sensor.		
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 angle information used for system control.		
ANGLE 2	Display the command angle for steering angle sub motor.		
F/B ANGLE 1	Display the feedback angle 1 for steering angle sub motor.		
F/B ANGLE 2	Display the feedback angle 2 for 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.		
OFF-CENTER	Display the adjustment value of DAST calibration.		

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.

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

	X: Applicable
Monitor item [Unit]	Remarks
OWN ECU SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAF8/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 ANG MAIN SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAF8/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/DIAF8/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/DIAF8/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 sub 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 protection 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.
FLEXRAY COMM DIAG (OWN) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering angle sub control mod- ule)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Monitor item [Unit]	Remarks		
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 force control module)		
POWER TRAIN STATUS [STOP/RUN]	Display the status of power train.		
IGN SW STATUS (OWN ECU) [ON/OFF]	Display the status of ignition switch.		
IGN SW STATUS (SYSTEM) [ON/OFF]	Display the status of ignition switch.		
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.		
ST N POSI LEARN [NORMAL/LEARN/COMP]	Display the status of steering N position learning.		
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 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 com- munication.		
YAW RATE [deg/s]	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN commu- nication.		
SIDE G [m/s^2]	Display side G value from ABS actuator and electric unit (control unit) via CAN commu- nication.		
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 [V]	Display the output main signal 1 of steering torque sensor.		
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 angle information used for system control.		
ANGLE 2 [deg]	Display the command angle for steering angle sub motor.		
F/B ANGLE 1 [deg]	Display the feedback angle 1 for steering angle sub motor.		
F/B ANGLE 2 [deg]	Display the feedback angle 2 for 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.		

Revision: 2013 October

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STÉERING]

Monitor item [Unit]	Remarks	^
STEERING PINION ANGLE [deg]	Display the steering pinion angle.	A
STEERING PINION ANGLE 2 [deg]	Display the steering pinion angle.	
ANGLE 3 [deg]	Display the angle information used for system control.	В
OFF-CENTER [°]	Display the adjustment value of DAST calibration.	

RE/PROGRAMMING, CONFIGURATION

Configuration includes the following functions.

Item		Description
Read/Write Configu-	Before replacing ECU	Allows the reading of vehicle specification (Type ID) written in steering angle sub control module to store the specification in CONSULT.
ration	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.

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ECU DIAGNOSIS INFORMATION STEERING FORCE CONTROL MODULE

Reference Value

INFOID:000000009728101

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 DIAG2 DIAG3 DIAG4 DIAG5 DIAG6 DIAG7 DIAG8 DIAG9 DIAG10
	Processing system shutdown	FIN1 FIN2 FIN3 FIN4 FIN5 FIN6 FIN7 FIN8 FIN9 FIN10 FIN11 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

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition	Display value
	Judging system starting	BOOT
		DIAG1 DIAG2
		DIAG3
		DIAG4
		DIAG5
		DIAG6
		DIAG7
		DIAG8
		DIAG9 DIAG10
		FIN1
		FIN2
		FIN3
	Processing system shutdown	FIN4
		FIN5
		FIN6
		FIN7
ST ANG MAIN SYS STATUS		FIN8
		FIN9
		FIN10
		FINTI SI
	Finish the system control	
	Wait for shutdown	
	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 k
	System is synchronizing	SYNC

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< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition	Display value
ST ANG SUB SYS STATUS	Judging system starting	BOOT
		DIAG1 DIAG2 DIAG3 DIAG4 DIAG5 DIAG6 DIAG7 DIAG8 DIAG9 DIAG10
	Processing system shutdown	FIN1 FIN2 FIN3 FIN4 FIN5 FIN6 FIN7 FIN8 FIN9 FIN10 FIN11 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

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition	Display value	
ST FORCE SYS STATUS	Judging system starting	BOOT	- /
		DIAG1 DIAG2 DIAG3 DIAG4 DIAG5 DIAG6 DIAG7 DIAG8 DIAG9 DIAG10	E
	Processing system shutdown	FIN1 FIN2 FIN3 FIN4 FIN5 FIN6 FIN7 FIN8 FIN9 FIN10 FIN11 FIN12	S
	Finish the system control	DOWN1	-
	Wait for shutdown	DOWN2	ŀ
	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	- I
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	ľ
DETAILED CODE 3	This is displayed, but it is not used.	0 – 255	
FLEXRAY COMM SYNC STATS	Always	STAT1 – 10	ľ
STEERING MODE	Always	CHARA – CHARA I	-
ST CLUTCH PRTCT STATUS	Always	STAT0 – STAT12, STAT20	
ST CLUTCH CON RQEST	Always	STAT0 – STAT5	(

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< 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	Ν
		Shift selector: P	Р
		CVT mode	CVT
		Range is unknown	UKNWN
FLEXRAY COMM DIAG (OWN)	FlexRay communication of steering force control module is nor- mal.		NORMAL
	FlexRay communication of steering force control module is being diagnosed.		DIAG
	FlexRay communication of steering force control module is mal- function.		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		ON
	Ignition switch: OFF		OFF
IGN SW STATUS (SYSTEM)	Ignition switch: ON		ON
	Ignition switch: OFF		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.		
	Instantaneous voltage drop status is detected.		
CURB STONE DETECT STATS BACK UP CIRCUIT A STATUS	The state of hitting curb stone is not detected.		
	Back up circuit A links control modules		
	back up circuit A does not link control modules		STAT2
BACK UP CIRCUIT B STATUS	back up circuit B links control modules		
	back up circuit B does not link control modules.		STAT2
			00012
< ECU DIAGNOSIS INFORMATION >

Monitor item	Con	Display value	0		
	Free roller mode: ON	ON	А		
FREE ROLLER MODE	Free roller mode: OFF	OFF			
	System can switch the mode to	PERMIT	В		
CHASSIS DYNAMO MODE	System cannot switch the mode	to chassis dynamometer mode	PROHBT		
	When system is starting, the req ed in control module.	uired angle information is record-	ОК	С	
	When system is starting, the req corded in control module.	uired angle information is not re-	NG		
	System is normal.		NORMAL	D	
ST N POSI LEARN	Steering N position learning is pe	erforming.	LEARN		
	Steering N position learning is co	ompleted.	COMP		
BACK UP SIG 1 VOLT	Steering force control module is	normal.	Approx. 0.5 – 3.0 V		
BACK UP SIG 2 VOLT	Steering force control module is	normal.	Approx. 0.5 – 3.0 V		
INVERTER RELAY ACT VOLT	Engine running		Battery voltage	F	
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	ST	
C/M TEMPERATURE	Engine running	Engine running			
	Vehicle stopped		0.00 km/h or 0.00 MPH	Н	
VEHICLE SPEED	Start the engine. Wait a minute. CAUTION: Check air pressure of tire under	Approximately equal to the indi- cation on speedometer (Inside of ±10%)	I		
	Vehicle stopped		Approx. 0 deg/s		
YAW RATE	Vehicle turning		Approx. 0 - ±201 deg/s	. [
0.55.0	Vehicle stopped		Approx. 0 m/s^2	0	
SIDE G	Vehicle turning		Approx. 0 - ±2 m/s^2		
ST CLUTCH ACT CURRENT	Engine running		Display the activation current of steering clutch. (A)	Κ	
		Steering wheel: Not steering (There is no steering force)	Approx. 0 A	L	
MOTOR U ACT CURRENT	Engine running	Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)		
		Steering wheel: Left turn	Negative vale [Approx. (–70) - (0) A]	Μ	
		Steering wheel: Not steering (There is no steering force)	Approx. 0 A	Ν	
MOTOR W ACT CURRENT	Engine running	Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)		
		Steering wheel: Left turn	Negative vale [Approx. (–70) - (0) A]	0	
		Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V	Ρ	
IORQUE SEN MAIN 1	Engine running	Steering wheel: Right turn	Approx. 2.5 - 3.7 V		
		Steering wheel: Left turn	Approx. 1.3 - 2.5 V		
TEMPERATURE SENSOR	Ignition switch ON or Engine run	ning	Display temperature of inside of steering force motor [°C °F)]		

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Con	dition	Display value
	Engine stopped		0 Tr/min
ENGINE SPEED	Engine running		Display the engine speed (Tr/ min)
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		Display the angle used for sys- tem control. (deg)
		Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
ANGLE 2	Engine running	Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
F/B ANGLE 1	Engine running	gine running	
F/B ANGLE 2	Engine running		Display the feedback angle for steering force motor. (deg)
ST ANGLE SENSOR		Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
	Engine running	Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
ANGLE DIFFERENCE	Engine running		Display the difference angle be- tween steering wheel and steer- ing pinion. (deg)
		Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
STEERING PINION ANGLE	Engine running	Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
		Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
STEERING PINION ANGLE 2	Engine running	Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
ANGLE 3	Engine running		Display the angle used for sys- tem control. (deg)
OFF-CENTER	Always		Display the adjustment value of DAST calibration. (deg)

Fail-safe

INFOID:000000009728102

- 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.

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

• For details of protection function, refer to STC-77. "Protection Function".



	Direct adaptive steering operating condition in fail-safe mode					
DTC	Steering force control module	Steering angle main control module	Steering angle sub control module			
C13A0-00	Variable	Variable	Variable			
C13A1-00	_	Mode 2	Mode 2			
C13A2-00	Mode 3	Mode 3	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 3	Mode 2			
C13A9-00	Mode 2	Mode 3	Mode 2			
C13AA-00	Mode 2	Mode 3	Mode 2			

Revision: 2013 October

< ECU DIAGNOSIS INFORMATION >

	Direct adaptive steering operating condition in fail-safe mode				
DTC	Steering force control module	Steering angle main control module	Steering angle sub control module		
C13AB-00	Mode 2	Mode 3	Mode 2		
C13AC-00	_	Mode 3	_		
C13AD-00	Mode 2	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 3	Mode 2		
C13B3-00	Mode 2	Mode 3	Mode 2		
C13B4-00	Mode 2	Mode 3	Mode 2		
C13B5-00	Mode 2	Mode 3	Mode 2		
C13B6-00	Mode 2	Mode 3	Mode 2		
C13B7-00	Mode 2	Mode 3	Mode 2		
C13B8-00	Mode 2	Mode 3	Mode 2		
C13B9-00	Mode 2	Mode 3	Mode 2		
C13BA-00	Mode 2	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	Mode 2	Mode 2		
C13C1-00	Mode 2	Mode 2	Mode 2		
C13C2-00	Mode 2	Mode 2	Mode 2		
C13C3-00	Mode 2	Mode 2	Mode 2		
C13C4-00	Mode 2	Mode 2	Mode 2		
C13C5-00	Mode 2*1	_	_		
C13C6-00	Mode 2	_	_		
C13C7-00	Mode 2	_	_		
C13C9-00	_	_	_		
C13CA-00	_	_	_		
C13CC-00	_	_	_		
C13CD-00	_	_	_		
C13CE-00	_	_	_		
C13CF-00	_	_	_		
C13D0-00	_	_	_		
C13D1-00		_	_		
C13D2-00	Mode 2	Mode 3	Mode 2		
C13D3-00	Mode 2	Mode 3	Mode 2		
C13D4-00	Mode 2	Mode 3	Mode 2		
C13D5-00	Mode 2	Mode 3	Mode 2		
C13D6-00	Mode 2	Mode 3	Mode 2		

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

	Direct adaptive steering operating condition in fail-safe mode				
DTC	Steering force control module	Steering angle main control module	Steering angle sub control module		
C13D7-00	Mode 2	Mode 3	Mode 2		
C13D8-00	—	_	—		
C13D9-00	_	_	_		
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		
C13EC-00	_	_	_		
C13ED-00	Protection function mode	Protection function mode	Protection function mode		
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	_	_		
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

- 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.

INFOID:000000009728103

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< ECU DIAGNOSIS INFORMATION >

DTC	Condition	Vehicle condition
C13E3-00	The steering wheel is steered over the limit angle.	System changes to the protection mode temporarily. (Steering op-
C13E4-00	When steering clutch is released, steering clutch is not released within regular time with overloading steering wheel.	eration may become heavy temporarily, however steering wheel can be operated without interference. This is not a system mal- function.)
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 <u>STC-74, "Fail-safe"</u> .
C13E6.00	EPS/DAST 3: Internal temperature of steering force motor is 150°C (302°F) or more.	
C13E6-00	DAST 1, DAST 2: Internal temperature of control module is 85°C (185°F) or more.	System changes to the protection mode temporarily. (Steering op-
	Power supply voltage of control module is low temporarily.	 can be operated without interference. This is not a system mal- function.)
C13E8-00	 Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other sub- stances. Steering gear is out of neutral position. (Large) 	

DTC Inspection Priority Chart

INFOID:000000009728104

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

Priority	Priority order item (DTC)
1	 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 U1000-01 CAN COMM CIRCUIT U1010-49 CONTROL UNIT (CAN)
2	 C13E9-00 BOOTING ANGLE PROCESSING C13EA-00 BOOTING ANGLE PROCESSING C13EB-00 BOOTING ANGLE PROCESSING C13EC-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

< ECU DIAGNOSIS INFORMATION >

Priority	Priority order item (DTC)	i
3	 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 POWER SUPPLY C13BB-00 CONTROL MODULE IGN POWER SUP C13BC-00 CONTROL MODULE IGN POWER SUP C13BD-00 CONTROL MODULE IGN POWER SUP C13BD-00 CONTROL MODULE IGN POWER SUP C13D4-00 CONTROL MODULE C13D8-00 STEERING TORQUE SENSOR C13DC-00 STEERING TORQUE SENSOR C13DD-00 STEERING TORQUE SENSOR C13DE-00 TEMPERATURE SENSOR C13E1-00 ST CLUTCH COMMAND CIRCUIT C13E1-00 STEERING CLUTCH C13E2-00 FRONT WHEEL SENSOR SIGNAL 	
4	 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 	S
	 C13A0-00 CONTROL MODULE C13A1-00 CONTROL MODULE C13A2-00 CONTROL MODULE C13A3-00 CONTROL MODULE C13A4-00 CONTROL MODULE C13A6-00 CONTROL MODULE C13A7-00 CONTROL MODULE C13AA-00 CONTROL MODULE C13AA-00 CONTROL MODULE C13AD-00 CONTROL MODULE 	
5	 C13AE-00 CONTROL MODULE C13BF-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 C13B8-00 CONTROL MODULE C13BA-00 CONTROL MODULE C13BA-00 CONTROL MODULE 	
	 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 	
6	 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 C13ED-00 FNGINE STATUS 	

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC Index

INFOID:000000009728105

 \times : Applicable

		Detecting control module				1	
DTC	Items	Steering force control module	Steering angle main control module	Steering angle sub control module	Power steering warning lamp	Reference	
C13A0-00	CONTROL MODULE	×	×	×	ON	<u>STC-146</u>	
C13A1-00	CONTROL MODULE	×	×	×	OFF	<u>STC-149</u>	
C13A2-00	CONTROL MODULE	×	×	×	ON	STC-152	
C13A3-00	CONTROL MODULE	×	×	×	ON	<u>STC-155</u>	
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	<u>STC-163</u>	
C13A9-00	BACK UP CIRCUIT	×	×	×	ON	<u>STC-169</u>	
C13AA-00	CONTROL MODULE	×	×	×	ON	<u>STC-175</u>	
C13AB-00	CONTROL MODULE	×	×	×	ON	<u>STC-178</u>	
C13AC-00	CONTROL MODULE		×		OFF	_	
C13AD-00	CONTROL MODULE	×	×	×	ON	<u>STC-184</u>	
C13AE-00	CONTROL MODULE	×	×	×	ON	<u>STC-187</u>	
C13AF-00	CONTROL MODULE	×	×	×	ON	<u>STC-190</u>	
C13B0-00	CONTROL MODULE	×	×	×	ON	<u>STC-193</u>	
C13B1-00	CONTROL MODULE	×	×	×	ON	<u>STC-196</u>	
C13B2-00	CONTROL MODULE	×	×	×	ON	<u>STC-199</u>	
C13B3-00	CONTROL MODULE	×	×	×	ON	STC-202	
C13B4-00	CONTROL MODULE	×	×	×	ON	STC-205	
C13B5-00	CONTROL MODULE	×	×	×	ON	STC-208	
C13B6-00	MOTOR CIRCUIT	×	×	×	ON	STC-211	
C13B7-00	CONTROL MODULE	×	×	×	ON	<u>STC-217</u>	
C13B8-00	CONTROL MODULE	×	×	×	ON	<u>STC-220</u>	
C13B9-00	CONTROL MODULE	×	×	×	ON	STC-223	
C13BA-00	CONTROL MODULE POWER SUPPLY	×	×	×	ON	STC-229	
C13BB-00	CONTROL MODULE POWER SUPPLY	×	×	×	OFF	<u>STC-234</u>	
C13BC-00	CONTROL MODULE IGN POWER SUP	×	×	×	OFF	<u>STC-239</u>	
C13BD-00	CONTROL MODULE IGN POWER SUP		×		OFF	_	
C13BE-00	FLEXRAY COMMUNICATION	×	×	×	ON	<u>STC-244</u>	
C13BF-00	FLEXRAY COMMUNICATION	×	×	×	ON	<u>STC-249</u>	
C13C0-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-255	

< ECU DIAGNOSIS INFORMATION >

		Detec	ting control	module			^
DTC	Items	eering force control module	ing angle main control module	ring angle sub control module	Power steering warning lamp	Reference	B
		5	Steer	Stee			D
C13C1-00	FLEXRAY COMMUNICATION	×	×	×	ON	<u>STC-267</u>	_
C13C2-00	FLEXRAY COMMUNICATION	×	×	×	ON	<u>STC-271</u>	E
C13C3-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-282	_
C13C4-00	FLEXRAY COMMUNICATION	×	×	×	ON	<u>STC-291</u>	F
C13C5-00	STEERING ANGLE SENSOR SIGNAL	×			ON	<u>STC-295</u>	_ '
C13C6-00	G SENSOR SIGNAL	×			ON	<u>STC-297</u>	_
C13C7-00	VEHICL SPEED SIGNAL	×			ON	<u>STC-299</u>	STC
C13C9-00	DRIVE MODE SIGNAL	×			OFF	<u>STC-301</u>	-
C13CA-00	ENGINE STATUS SIGNAL	×			OFF	<u>STC-302</u>	- Ц
C13CC-00	T/M GEAR POSI SIGNAL	×			OFF	<u>STC-303</u>	_ !!
C13CD-00	ENGINE SPEED SIGNAL	×			OFF	<u>STC-304</u>	_
C13CE-00	SLEEP/WAKE UP SIGNAL	×			OFF	<u>STC-305</u>	
C13CF-00	ALC FUNCTION REQUEST SIGNAL		×		OFF		
C13D0-00	ALC FUNCTION REQUEST SIGNAL		×		OFF		-
C13D1-00	STEERING ANGLE SENSOR SIGNAL		×		ON		J
C13D2-00	CONTROL MODULE	×	×	×	ON	<u>STC-310</u>	_
C13D3-00	CONTROL MODULE	×	×	×	ON	STC-313	K
C13D4-00	CONTROL MODULE	×	×	×	ON	<u>STC-316</u>	
C13D5-00	CONTROL MODULE	×	×	×	ON	<u>STC-322</u>	-
C13D6-00	CONTROL MODULE	×	×	×	ON	<u>STC-325</u>	- L
C13D7-00	CONTROL MODULE	×	×	×	ON	<u>STC-328</u>	_
C13D8-00	CONTROL MODULE	×	×		OFF	<u>STC-331</u>	M
C13D9-00	CONTROL MODULE	×	×		OFF	<u>STC-335</u>	_
C13DB-00	STEERING TORQUE SENSOR		×		OFF	—	-
C13DC-00	STEERING TORQUE SENSOR		×		OFF	—	Ν
C13DD-00	STEERING TORQUE SENSOR		×		OFF		_
C13DE-00	TEMPERATURE SENSOR	×	×	×	OFF	<u>STC-346</u>	0
C13DF-00	CONTROL MODULE		×		OFF	—	
C13E0-00	ST CLUTCH COMMAND CIRCUIT	×			ON	<u>STC-352</u>	
C13E1-00	STEERING CLUTCH	×			ON	<u>STC-354</u>	Ρ
C13E2-00	FRONT WHEEL SENSOR SIGNAL	×			OFF	<u>STC-356</u>	_
C13E3-00	SPIRAL CABLE PROTECTION	×			OFF	<u>STC-357</u>	_
C13E4-00	ST CLUTCH RELEASE PROTECTION	×			OFF	<u>STC-358</u>	_
C13E5-00	ST CLUTCH RELEASE PROTECTION	×			ON	<u>STC-361</u>	_
C13E6-00	HEAT PROTECTION	×	×	×	OFF	<u>STC-364</u>	

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

		Detect	ing control i	module		
DTC	Items	Steering force control module	Steering angle main control module	Steering angle sub control module	Power steering warning lamp	Reference
C13E7-00	LOW VOLTAGE PROTECTION	×	×	×	OFF	<u>STC-370</u>
C13E8-00	CURB STONE PROTECTION	×	×	×	OFF	<u>STC-375</u>
C13E9-00	BOOTING ANGLE PROCESSING		×		OFF	_
C13EA-00	BOOTING ANGLE PROCESSING	×			ON	<u>STC-381</u>
C13EB-00	BOOTING ANGLE PROCESSING		×	×	OFF	_
C13EC-00	BOOTING ANGLE PROCESSING	×	×	×	OFF	<u>STC-385</u>
C13ED-00	ENGINE STATUS	×	×	×	OFF	<u>STC-388</u>
C13EE-00	INCOMP CONFIG	×	×	×	ON	<u>STC-391</u>
C13EF-00	CONFIG CHECK RESULT	×	×	×	ON	<u>STC-394</u>
C13F0-00	INCOMP DAST CALIBRATION	×	×	×	ON	<u>STC-398</u>
C13F1-00	INCOMP ST ANG SEN ADJST	×			ON	<u>STC-401</u>
U1000-01	CAN COMM CIRCUIT	×	×		OFF	<u>STC-403</u>
U1010-49	CONTROL UNIT (CAN)	×	×		OFF	STC-405

NOTE:

If two or more DTCs are detected, refer to STC-78, "DTC Inspection Priority Chart".

< ECU DIAGNOSIS INFORMATION >

STEERING ANGLE MAIN CONTROL MODULE

Reference Value

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	_		
	Judging system starting	BOOT	D		
		DIAG1			
		DIAG2			
		DIAG3			
		DIAG4			
	System is diagnosing	DIAG5			
		DIAG6	66 67 F		
		DIAG7			
		DIAG8			
		DIAG9			
		DIAGTO	от		
		FIN1	51		
		FIN2			
		FIN3 EINI4	Н		
		FING			
	Processing system shutdown	FIN7			
		FIN8			
OWN ECU SYS STATUS		FIN9	I		
		FIN10			
		FIN11			
		FIN12	J		
	Finish the system control	DOWN1			
	Wait for shutdown	DOWN2			
	System is shutdown	DOWN3	ň		
	System is in fail-safe mode 1	MALF1			
	System is in fail-safe mode 2	MALF2	L		
	System is in fail-safe mode 3	MALF3			
	Performing initial setting	SETTING			
	System is in normal control	STD1	N		
		STD2	_		
	System is in protection mode	STD3	— N		
	System is synchronizing	SYNC	11		

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[DIRECT ADAPTIVE STEERING]

INFOID:000000009728106

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< ECU DIAGNOSIS INFORMATION >

Monitor item	Condition	Display value
	Judging system starting	BOOT
ST ANG MAIN SYS STATUS		DIAG1 DIAG2 DIAG3 DIAG4 DIAG5 DIAG6 DIAG7 DIAG8 DIAG9 DIAG10
	Processing system shutdown	FIN1 FIN2 FIN3 FIN4 FIN5 FIN6 FIN7 FIN8 FIN9 FIN10 FIN11 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

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition	Display value	
	Judging system starting	BOOT	A
		DIAG1	
		DIAG2	_
		DIAG3	В
		DIAG4	
		DIAG5	
		DIAG6	С
		DIAG7	0
		DIAG8	
		DIAG9	
		DIAGIU	D
		FIN1	
		FIN2	
		FIN3 FIN4	E
	Processing system shutdown	FIN4 FIN5	
		FING	
		FIN7	_
		FIN8	F
STANG SUB SYS STATUS		FIN9	
		FIN10	
		FIN11	ST
		FIN12	
	Finish the system control	DOWN1	
	Wait for shutdown	DOWN2	Н
	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	

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< ECU DIAGNOSIS INFORMATION >

Monitor item	Condition	Display value
	Judging system starting	BOOT
		DIAG1
		DIAG2
		DIAG3
		DIAG5
		DIAG6
		DIAG7
		DIAG8
		DIAG9
		FIN1 FIN2
		FIN3
		FIN4
		FIN5
	Processing system shutdown	FIN6
		FIN7
ST FORCE SYS STATUS		FINO
		FIN10
		FIN11
		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

< ECU DIAGNOSIS INFORMATION >

Monitor item	Condition		Display value	
		Idle neutral is active	IDLE	- A
SHIFT POSITION	Engine running	Shift selector: Manual mode	1ST 2ND 3RD 4TH 5TH 6TH 7TH 8TH	B
		Shift selector: R	R	_
		Shift selector: N	Ν	— D
		Shift selector: P	Р	
		CVT mode	CVT	E
		Range is unknown	UKNWN	_
	FlexRay communication of steer normal.	ing angle main control module is	NORMAL	F
FLEXRAY COMM DIAG (OWN)	FlexRay communication of steer being diagnosed.	ing angle main control module is	DIAG	_
	FlexRay communication of steer malfunction.	ing angle main control module is	MALF	STO
	FlexRay communication of steer normal.	ing angle sub control module is	NORMAL	- н
FLEXRAY COMM DIAG (OTH1)	FlexRay communication of steering angle sub control module is being diagnosed.		DIAG	_
	FlexRay communication of steering angle sub control module is malfunction.		MALF	
	FlexRay communication of steering force control module is nor- mal.		NORMAL	J
FLEXRAY COMM DIAG (OTH2)	FlexRay communication of steering force control module is being diagnosed.		DIAG	_
	FlexRay communication of steering force control module is mal- function.		MALF	K
POWER TRAIN STATUS	Power train stops.		STOP	_
	Power train starts.		RUN	L
IGN SW STATUS (OWN ECU)	Ignition switch: ON		ON	
	Ignition switch: OFF		OFF	- M
IGN SW STATUS (SYSTEM)	Ignition switch: ON		ON	
	Ignition switch: OFF		OFF	
STOP/START STATUS	Stop/start system is operating.		ON	N
	Stop/start system is not operating.		OFF	_
INSTANT VLT DROP DETECT	Instantaneous voltage drop status is not detected.		UNDTCT	- 0
	Instantaneous voltage drop statu	us is detected.	DETECT	_
CURB STONE DETECT STATS	The state of hitting curb stone is not detected.		UNDICI	_
	Real up arouit A links control is		DETECT	P
BACK UP CIRCUIT A STATUS			51A11	_
	back up circuit A does not link co		51A12 ••••••	
BACK UP CIRCUIT B STATUS	back up circuit B doos not link of	ontrol modules	STALL	_
			SIAIZ	_

< ECU DIAGNOSIS INFORMATION >

FREE ROLLER MODE Free r Free r Free r CHASSIS DYNAMO MODE System When ed in of When WRITING STATUS When	oller mode: ON oller mode: OFF m can switch the mode to o m cannot switch the mode system is starting, the req control module. system is starting, the req d in control module. m is normal.	chassis dynamometer mode to chassis dynamometer mode juired angle information is record- juired angle information is not re-	ON OFF PERMIT PROHBT OK
FREE ROLLER MODE Free r CHASSIS DYNAMO MODE System When ed in or When ed in or	oller mode: OFF m can switch the mode to o m cannot switch the mode system is starting, the req control module. system is starting, the req d in control module. m is normal.	chassis dynamometer mode to chassis dynamometer mode uired angle information is record- uired angle information is not re-	OFF PERMIT PROHBT OK
CHASSIS DYNAMO MODE System When ed in e When WRITING STATUS	m can switch the mode to o m cannot switch the mode system is starting, the req control module. system is starting, the req d in control module. m is normal.	chassis dynamometer mode to chassis dynamometer mode uired angle information is record- uired angle information is not re-	PERMIT PROHBT OK
WRITING STATUS	m cannot switch the mode system is starting, the req control module. system is starting, the req d in control module. m is normal.	to chassis dynamometer mode uired angle information is record- uired angle information is not re-	PROHBT OK
When ed in e	system is starting, the req control module. system is starting, the req d in control module. m is normal.	uired angle information is record- uired angle information is not re-	ОК
WRITING STATUS When	system is starting, the req d in control module. m is normal.	uired angle information is not re-	
corde	m is normal.		NG
Syste			NORMAL
ST N POSI LEARN Steeri	ng N position learning is pe	erforming.	LEARN
Steeri	ng N position learning is co	ompleted.	COMP
BACK UP SIG 1 VOLT steering	ng angle main control mod	ule is normal.	Approx. 0.5 – 3.0 V
BACK UP SIG 2 VOLT steerin	ng angle main control mod	ule is normal.	Approx. 0.5 – 3.0 V
INVERTER RELAY ACT VOLT Engin	ne running		Battery voltage
CONT MODULE INSIDE VOLT Engin	ne running		Battery voltage – Approx. 0.6 V
BATTERY VOLTAGE Ignitio	n switch ON		Battery voltage
IGN VOLTAGE Ignitio	n switch ON		Battery voltage
C/M TEMPERATURE Engin	e running		Display temperature of inside of steering angle main control module [°C °F)]
Vehicl	Vehicle stopped		0.00 km/h or 0.00 MPH
VEHICLE SPEED Start t CAUT Check	he engine. Wait a minute. <mark>TON:</mark> k air pressure of tire unde	Drive the vehicle. er standard conditions.	Approximately equal to the indi- cation on speedometer (Inside of ±10%)
Vehicl	e stopped		Approx. 0 deg/s
YAW RATE Vehicl	e turning		Approx. 0 - ±201 deg/s
Vehicl	e stopped		Approx. 0 m/s^2
SIDE G Vehicle turning			Approx. 0 - ±2 m/s^2
ST CLUTCH ACT CURRENT Engin	e running		Display the activation current of steering clutch. (A)
		Steering wheel: Not steering (There is no steering force)	Approx. 0 A
MOTOR U ACT CURRENT Engin	e running	Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)
		Steering wheel: Left turn	Negative vale [Approx. (–70) - (0) A]
		Steering wheel: Not steering (There is no steering force)	Approx. 0 A
MOTOR W ACT CURRENT Engin	e running	Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)
		Steering wheel: Left turn	Negative vale [Approx. (-70) - (0) A]
		Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
I ORQUE SEN MAIN 2 Engin	Engine running	Steering wheel: Right turn	Approx. 2.5 - 3.7 V
		Steering wheel: Left turn	Approx. 1.3 - 2.5 V

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Con	dition	Display value
		Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
TORQUE SEN MAIN 1	Engine running	Steering wheel: Right turn	Approx. 2.5 - 3.7 V
		Steering wheel: Left turn	Approx. 1.3 - 2.5 V
		Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
TORQUE SEN SUB	Engine running	Steering wheel: Right turn	Approx. 2.5 - 3.7 V
		Steering wheel: Left turn	Approx. 1.3 - 2.5 V
TORQUE SEN VOLTAGE	Ignition switch ON		Approx. 4.5 – 5.5 V
TEMPERATURE SENSOR	Ignition switch ON or Engine rur	ning	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		Display the angle used for sys- tem control. (deg)
	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
ANGLE 2		Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
F/B ANGLE 1	Engine running		Display the feedback angle for steering angle main motor. (deg)
F/B ANGLE 2	Engine running		Display the feedback angle for steering angle main motor. (deg)
	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
ST ANGLE SENSOR		Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
ANGLE DIFFERENCE	Engine running		Display the difference angle be- tween steering wheel and steer- ing pinion. (deg)
		Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
STEERING PINION ANGLE	Engine running	Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
		Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
STEERING PINION ANGLE 2	Engine running	Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
ANGLE 3	Engine running		Display the angle used for sys- tem control. (deg)
OFF-CENTER	Always		Display the adjustment value of DAST calibration. (deg)

Fail-safe

INFOID:000000009728107

• 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

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

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.
- For details of protection function, refer to <u>STC-92, "Protection Function"</u>.



	Direct adap	tive steering operating condition in fa	ail-safe mode
DTC	Steering force control module	Steering angle main control module	Steering angle sub control module
C13A0-00	Variable	Variable	Variable
C13A1-00	—	Mode 2	Mode 2
C13A2-00	Mode 3	Mode 3	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	—

< ECU DIAGNOSIS INFORMATION >

Direct		adaptive steering operating condition in fail-safe mode	
DTC	Steering force control module	Steering angle main control module	Steering angle sub control module
C13A8-00	Mode 2	Mode 3	Mode 2
C13A9-00	Mode 2	Mode 3	Mode 2
C13AA-00	Mode 2	Mode 3	Mode 2
C13AB-00	Mode 2	Mode 3	Mode 2
C13AC-00	_	Mode 3	
C13AD-00	Mode 2	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 3	Mode 2
C13B3-00	Mode 2	Mode 3	Mode 2
C13B4-00	Mode 2	Mode 3	Mode 2
C13B5-00	Mode 2	Mode 3	Mode 2
C13B6-00	Mode 2	Mode 3	Mode 2
C13B7-00	Mode 2	Mode 3	Mode 2
C13B8-00	Mode 2	Mode 3	Mode 2
C13B9-00	Mode 2	Mode 3	Mode 2
C13BA-00	Mode 2	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	Mode 2	Mode 2
C13C1-00	Mode 2	Mode 2	Mode 2
C13C2-00	Mode 2	Mode 2	Mode 2
C13C3-00	Mode 2	Mode 2	Mode 2
C13C4-00	Mode 2	Mode 2	Mode 2
C13C5-00	Mode 2*1 *2	_	_
C13C6-00	Mode 2	_	
C13C7-00	Mode 2	_	
C13C9-00	-	_	_
C13CA-00	—	_	_
C13CC-00	_	_	_
C13CD-00	-	_	_
C13CE-00	_	_	_
C13CF-00	_	_	
C13D0-00	_	_	
C13D1-00	_	_	
C13D2-00	Mode 2	Mode 3	Mode 2
C13D3-00	Mode 2	Mode 3	Mode 2

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

	Direct adaptive steering operating condition in fail-safe mode		
DTC	Steering force control module	Steering angle main control module	Steering angle sub control module
C13D4-00	Mode 2	Mode 3	Mode 2
C13D5-00	Mode 2	Mode 3	Mode 2
C13D6-00	Mode 2	Mode 3	Mode 2
C13D7-00	Mode 2	Mode 3	Mode 2
C13D8-00	—	—	_
C13D9-00	—	—	_
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
C13EC-00	—	_	_
C13ED-00	Protection function mode	Protection function mode	Protection function mode
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		
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:000000009728108

- 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.

STC-92

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Condition	Vehicle condition	Α
C13E3-00	The steering wheel is steered over the limit angle.	System changes to the protection mode temporarily. (Steering op-	
C13E4-00	When steering clutch is released, steering clutch is not released within regular time with overloading steering wheel.	eration may become heavy temporarily, however steering wheel can be operated without interference. This is not a system mal- function.)	В
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 <u>STC-89, "Fail-safe"</u> .	С
C13E6.00	EPS/DAST 3: Internal temperature of steering force motor is 150°C (302°F) or more.		D
C13E0-00	DAST 1, DAST 2: Internal temperature of control module is 85°C (185°F) or more.	System changes to the protection mode temporarily. (Steering op-	E
C13E7-00	Power supply voltage of control module is low tem- porarily.	can be operated without interference. This is not a system mal- function.)	
C13E8-00	 Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other sub- 		F
0.020 00	stances.Steering gear is out of neutral position. (Large)		STO

DTC Inspection Priority Chart

INFOID:000000009728109

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

Priority	Priority order item (DTC)	
1	 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 U1000-01 CAN COMM CIRCUIT U1010-49 CONTROL UNIT (CAN) 	I K L
2	 C13E9-00 BOOTING ANGLE PROCESSING C13EA-00 BOOTING ANGLE PROCESSING C13EB-00 BOOTING ANGLE PROCESSING C13EC-00 BOOTING ANGLE PROCESSING 	M
2	 C13EE-00 INCOMP CONFIG C13EF-00 CONFIG CHECK RESULT C13F0-00 IMCOMP DAST CALIBRATION C13F1-00 INCOMP ST ANG SEN ADJST 	Ν
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< ECU DIAGNOSIS INFORMATION >

Priority	Priority order item (DTC)
3	 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 POWER SUPPLY C13BB-00 CONTROL MODULE IGN POWER SUP C13BC-00 CONTROL MODULE IGN POWER SUP C13BD-00 CONTROL MODULE IGN POWER SUP C13D4-00 CONTROL MODULE C13D4-00 CONTROL MODULE C13D6-00 STEERING TORQUE SENSOR C13DC-00 STEERING TORQUE SENSOR C13DE-00 TEMPERATURE SENSOR C13DE-00 TEMPERATURE SENSOR C13E0-00 ST CLUTCH COMMAND CIRCUIT C13E1-00 STEERING CLUTCH C13E2-00 FRONT WHEEL SENSOR SIGNAL
4	 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
5	 C13A0-00 CONTROL MODULE C13A1-00 CONTROL MODULE C13A2-00 CONTROL MODULE C13A3-00 CONTROL MODULE C13A4-00 CONTROL MODULE C13A5-00 CONTROL MODULE C13A7-00 CONTROL MODULE C13A7-00 CONTROL MODULE C13A7-00 CONTROL MODULE C13AD-00 CONTROL MODULE C13AD-00 CONTROL MODULE C13AD-00 CONTROL MODULE C13AF-00 CONTROL MODULE C13B0-00 CONTROL MODULE C13B0-00 CONTROL MODULE C13B1-00 CONTROL MODULE C13B2-00 CONTROL MODULE C13B3-00 CONTROL MODULE C13B3-00 CONTROL MODULE C13B4-00 CONTROL MODULE C13B5-00 CONTROL MODULE C13D5-00 CONTROL MODULE<
6	 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 C13ED-00 ENGINE STATUS

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC Index

INFOID:000000009728110

×: Applicable

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		Detecting control module					-
DTC	Items	Steering force control module	Steering angle main control module	Steering angle sub control module	Power steering warning lamp	Reference	B C D E
C13A0-00	CONTROL MODULE	×	×	×	ON	<u>STC-147</u>	-
C13A1-00	CONTROL MODULE	×	×	×	ON	<u>STC-149</u>	F
C13A2-00	CONTROL MODULE	×	×	×	ON	<u>STC-153</u>	-
C13A3-00	CONTROL MODULE	×	×	×	ON	<u>STC-156</u>	- етс
C13A4-00	CONTROL MODULE		×	×	ON	<u>STC-158</u>	
C13A5-00	CONTROL MODULE			×	OFF		-
C13A6-00	CONTROL MODULE		×		ON	<u>STC-161</u>	Н
C13A7-00	CONTROL MODULE		×		ON	STC-162	-
C13A8-00	BACK UP CIRCUIT	×	×	×	ON	<u>STC-164</u>	-
C13A9-00	BACK UP CIRCUIT	×	×	×	ON	<u>STC-170</u>	-
C13AA-00	CONTROL MODULE	×	×	×	ON	STC-175	-
C13AB-00	CONTROL MODULE	×	×	×	ON	<u>STC-179</u>	J
C13AC-00	CONTROL MODULE		×		ON	<u>STC-182</u>	-
C13AD-00	CONTROL MODULE	×	×	×	ON	<u>STC-184</u>	-
C13AE-00	CONTROL MODULE	×	×	×	ON	<u>STC-187</u>	- K
C13AF-00	CONTROL MODULE	×	×	×	ON	<u>STC-190</u>	-
C13B0-00	CONTROL MODULE	×	×	×	ON	<u>STC-193</u>	L
C13B1-00	CONTROL MODULE	×	×	×	ON	<u>STC-196</u>	-
C13B2-00	CONTROL MODULE	×	×	×	ON	<u>STC-199</u>	-
C13B3-00	CONTROL MODULE	×	×	×	ON	<u>STC-202</u>	M
C13B4-00	CONTROL MODULE	×	×	×	ON	STC-205	-
C13B5-00	CONTROL MODULE	×	×	×	ON	STC-208	N
C13B6-00	MOTOR CIRCUIT	×	×	×	ON	STC-212	
C13B7-00	CONTROL MODULE	×	×	×	ON	<u>STC-217</u>	-
C13B8-00	CONTROL MODULE	×	×	×	ON	<u>STC-220</u>	0
C13B9-00	CONTROL MODULE	×	×	×	ON	<u>STC-224</u>	-
C13BA-00	CONTROL MODULE POWER SUPPLY	×	×	×	ON	<u>STC-230</u>	- D
C13BB-00	CONTROL MODULE POWER SUPPLY	×	×	×	OFF	<u>STC-235</u>	- P
C13BC-00	CONTROL MODULE IGN POWER SUP	×	×	×	OFF	STC-239	-
C13BD-00	CONTROL MODULE IGN POWER SUP		×		ON	<u>STC-242</u>	-
C13BE-00	FLEXRAY COMMUNICATION	×	×	×	ON	<u>STC-246</u>	-
C13BF-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-252	-
C13C0-00	FLEXRAY COMMUNICATION	×	×	×	ON	<u>STC-260</u>	-

< ECU DIAGNOSIS INFORMATION >

		Detect	ing control i	module		
DTC	Items	Steering force control module	Steering angle main control module	Steering angle sub control module	Power steering warning lamp	Reference
C13C1-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-269
C13C2-00	FLEXRAY COMMUNICATION	×	×	×	ON	<u>STC-275</u>
C13C3-00	FLEXRAY COMMUNICATION	×	×	×	ON	<u>STC-285</u>
C13C4-00	FLEXRAY COMMUNICATION	×	×	×	ON	<u>STC-293</u>
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	<u>STC-306</u>
C13D0-00	ALC FUNCTION REQUEST SIGNAL		×		OFF	<u>STC-307</u>
C13D1-00	STEERING ANGLE SENSOR SIGNAL		×		OFF	STC-308
C13D2-00	CONTROL MODULE	×	×	×	ON	<u>STC-310</u>
C13D3-00	CONTROL MODULE	×	×	×	ON	<u>STC-313</u>
C13D4-00	CONTROL MODULE	×	×	×	ON	<u>STC-317</u>
C13D5-00	CONTROL MODULE	×	×	×	ON	STC-322
C13D6-00	CONTROL MODULE	×	×	×	ON	STC-325
C13D7-00	CONTROL MODULE	×	×	×	ON	<u>STC-328</u>
C13D8-00	CONTROL MODULE	×	×		OFF	STC-332
C13D9-00	CONTROL MODULE	×	×		OFF	<u>STC-335</u>
C13DB-00	STEERING TORQUE SENSOR		×		ON	<u>STC-337</u>
C13DC-00	STEERING TORQUE SENSOR		×		ON	<u>STC-340</u>
C13DD-00	STEERING TORQUE SENSOR		×		ON	<u>STC-343</u>
C13DE-00	TEMPERATURE SENSOR	×	×	×	OFF	<u>STC-348</u>
C13DF-00	CONTROL MODULE		×		ON	<u>STC-351</u>
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-367

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

		Detec	Detecting control module				٨
		trol module	control module	ontrol module	warning lamp		B
DTC	ltems	ng force con	angle main c	angle sub o	er steering v	Reference	С
		Steerir	Steering a	Steering	Pow		D
C13E7-00	LOW VOLTAGE PROTECTION	×	×	×	OFF	<u>STC-371</u>	
C13E8-00	CURB STONE PROTECTION	×	×	×	OFF	<u>STC-376</u>	E
C13E9-00	BOOTING ANGLE PROCESSING		×		ON	<u>STC-379</u>	
C13EA-00	BOOTING ANGLE PROCESSING	×			OFF		F
C13EB-00	BOOTING ANGLE PROCESSING		×	×	ON	<u>STC-382</u>	
C13EC-00	BOOTING ANGLE PROCESSING	×	×	×	OFF	<u>STC-385</u>	
C13ED-00	ENGINE STATUS	×	×	×	OFF	<u>STC-388</u>	ST
C13EE-00	INCOMP CONFIG	×	×	×	ON	<u>STC-392</u>	
C13EF-00	CONFIG CHECK RESULT	×	×	×	ON	<u>STC-395</u>	Н
C13F0-00	INCOMP DAST CALIBRATION	×	×	×	ON	<u>STC-399</u>	
C13F1-00	INCOMP ST ANG SEN ADJST	×			OFF		
U1000-01	CAN COMM CIRCUIT	×	×		OFF	<u>STC-403</u>	
U1010-49	CONTROL UNIT (CAN)	×	×		OFF	<u>STC-405</u>	

NOTE:

If two or more DTCs are detected, refer to STC-78. "DTC Inspection Priority Chart".

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< ECU DIAGNOSIS INFORMATION >

STEERING ANGLE SUB CONTROL MODULE

Reference Value

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
	Judging system starting	BOOT
	System is diagnosing	DIAG1 DIAG2 DIAG3 DIAG4 DIAG5 DIAG6 DIAG7 DIAG8 DIAG9 DIAG10
OWN ECU SYS STATUS	Processing system shutdown	FIN1 FIN2 FIN3 FIN4 FIN5 FIN6 FIN7 FIN8 FIN9 FIN10 FIN11 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

INFOID:000000009728111

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition	Display value	
	Judging system starting	BOOT	— A
		DIAG1 DIAG2 DIAG3	В
		DIAG4 DIAG5 DIAG6 DIAG7	С
		DIAG8 DIAG9 DIAG10	D
ST ANG MAIN SYS STATUS		FIN1 FIN2 FIN3 FIN4 FIN5 FIN6	E
	Processing system shuldown	FIN7 FIN8 FIN9 FIN10 FIN11 FIN12	F
	Finish the system control	DOWN1	
	Wait for shutdown	DOWN2	Н
	System is shutdown	DOWN3	
	System is in fail-safe mode 1	MALF1	1
	System is in fail-safe mode 2	MALF2	
	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	

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< ECU DIAGNOSIS INFORMATION >

Monitor item	Condition	Display value
	Judging system starting	BOOT
		DIAG1 DIAG2 DIAG3 DIAG4 DIAG5 DIAG6 DIAG7 DIAG8 DIAG9 DIAG10
ST ANG SUB SYS STATUS	Processing system shutdown	FIN1 FIN2 FIN3 FIN4 FIN5 FIN6 FIN7 FIN8 FIN9 FIN10 FIN11 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

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition	Display value	
	Judging system starting	BOOT	A
		DIAG1 DIAG2 DIAG3 DIAG4 DIAG5 DIAG6 DIAG7 DIAG8 DIAG9 DIAG10 FIN1 FIN2	B C
ST FORCE SYS STATUS	Processing system shutdown	FIN3 FIN4 FIN5 FIN6 FIN7 FIN8 FIN9 FIN10 FIN11 FIN12	F ST
	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	
	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	-
ST CLUTCH CON RQEST	Always	STAT0 – STAT5	0

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< ECU DIAGNOSIS INFORMATION >

Monitor item	Condition		Display value
		Idle neutral is active	IDLE
SHIFT POSITION	Engine running	Shift selector: Manual mode	1ST 2ND 3RD 4TH 5TH 6TH 7TH 8TH
		Shift selector: R	
		Shift selector: N	N
		Shift selector: P	Р
		CVT mode	CVT
		Range is unknown	UKNWN
	FlexRay communication of steen normal.	ing angle sub control module is	NORMAL
FLEXRAY COMM DIAG (OWN)	FlexRay communication of steen being diagnosed.	ing angle sub control module is	DIAG
	FlexRay communication of steen malfunction.	ing angle sub control module is	MALF
	FlexRay communication of steering angle main control module is normal.		NORMAL
FLEXRAY COMM DIAG (OTH1)	FlexRay communication of steering angle main control module is being diagnosed.		DIAG
	FlexRay communication of steen malfunction.	MALF	
	FlexRay communication of steen mal.	NORMAL	
FLEXRAY COMM DIAG (OTH2)	FlexRay communication of steen diagnosed.	DIAG	
	FlexRay communication of steer function.	MALF	
POWER TRAIN STATUS	Power train stops.		STOP
	Power train starts.		RUN
IGN SW STATUS (OWN FCU)	Ignition switch: ON		ON
	Ignition switch: OFF		OFF
IGN SW STATUS (SYSTEM)	Ignition switch: ON		ON
	Ignition switch: OFF		OFF
STOP/START STATUS	Stop/start system is operating.		ON
	Stop/start system is not operatin	g.	OFF
INSTANT VLT DROP DETECT	Instantaneous voltage drop statu	us is not detected.	UNDICI
	Instantaneous voltage drop stati	us is detected.	
CURB STONE DETECT STATS	The state of hitting curb stone is	not detected.	
	Back up circuit A links control m	odules	
BACK UP CIRCUIT A STATUS	back up circuit A does not link o	ontrol modules	
	back up circuit B links control m	odules	STAT1
BACK UP CIRCUIT B STATUS	back up circuit B does not link o	ontrol modules.	STAT2

< ECU DIAGNOSIS INFORMATION >

Monitor item	Cor	ndition	Display value	٨
	Free roller mode: ON	ON	А	
FREE KOLLER MODE	Free roller mode: OFF		OFF	
	System can switch the mode to	PERMIT	В	
CHASSIS DYNAMO MODE	System cannot switch the mode	to chassis dynamometer mode	PROHBT	
	When system is starting, the rec	quired angle information is record-	ОК	С
	When system is starting, the recorded in control module.	quired angle information is not re-	NG	
	System is normal.		NORMAL	D
ST N POSI LEARN	Steering N position learning is p	erforming.	LEARN	
	Steering N position learning is c	ompleted.	COMP	F
BACK UP SIG 1 VOLT	Steering angle sub control mode	ule is normal.	Approx. 0.5 – 3.0 V	
BACK UP SIG 2 VOLT	Steering angle sub control mode	ule is normal.	Approx. 0.5 – 3.0 V	
INVERTER RELAY ACT VOLT	Engine running		Battery voltage	F
CONT MODULE INSIDE VOLT	Engine running		Battery voltage – Approx. 0.6 V	
BATTERY VOLT AGE	Ignition switch ON		Battery voltage	0.7
IGN VOLTAGE	Ignition switch ON		Battery voltage	SI
C/M TEMPERATURE	Engine running	Engine running		
	Vehicle stopped	0.00 km/h or 0.00 MPH		
VEHICLE SPEED	Start the engine. Wait a minute. Drive the vehicle. CAUTION: Check air pressure of tire under standard conditions.		Approximately equal to the indi- cation on speedometer (Inside of ±10%)	Ι
	Vehicle stopped		Approx. 0 deg/s	
YAW RATE	Vehicle turning		Approx. 0 - ±201 deg/s	J
0.55.0	Vehicle stopped		Approx. 0 m/s^2	
SIDE G	Vehicle turning		Approx. 0 - ±2 m/s^2	K
ST CLUTCH ACT CURRENT	Engine running		Display the activation current of steering clutch. (A)	
		Steering wheel: Not steering (There is no steering force)	Approx. 0 A	L
MOTOR U ACT CURRENT	Engine running	Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)	M
		Steering wheel: Left turn	Negative vale [Approx. (–70) - (0) A]	
		Steering wheel: Not steering (There is no steering force)	Approx. 0 A	Ν
MOTOR W ACT CURRENT	Engine running	Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)	0
		Steering wheel: Left turn	Negative vale [Approx. (-70) - (0) A]	0
		Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V	Ρ
I ORQUE SEN MAIN 1	Engine running	Steering wheel: Right turn	Approx. 2.5 - 3.7 V	
		Steering wheel: Left turn	Approx. 1.3 - 2.5 V	
TEMPERATURE SENSOR	Ignition switch ON or Engine ru	nning	Display temperature of inside of steering angle sub control mod- ule [°C °F)]	

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value
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		Display the angle used for sys- tem control. (deg)
		Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
ANGLE 2	Engine running	Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
F/B ANGLE 1	Engine running		Display the feedback angle for steering angle sub motor. (deg)
F/B ANGLE 2	Engine running		Display the feedback angle for steering angle sub motor. (deg)
		Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
ST ANGLE SENSOR	Engine running	Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
ANGLE DIFFERENCE	Engine running		Display the difference angle be- tween steering wheel and steer- ing pinion. (deg)
	_	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
STEERING PINION ANGLE	Engine running	Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
		Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
STEERING PINION ANGLE 2	Engine running	Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
ANGLE 3	Engine running		Display the angle used for sys- tem control. (deg)
OFF-CENTER	ITER Always		Display the adjustment value of DAST calibration. (deg)

Fail-safe

INFOID:000000009728112

- 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.

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

• For details of protection function, refer to STC-107, "Protection Function".



	Direct adaptive steering operating condition in fail-safe mode			
DTC	Steering force control module	Steering angle main control module	Steering angle sub control module	
C13A0-00	Variable	Variable	Variable	
C13A1-00	_	Mode 2	Mode 2	
C13A2-00	Mode 3	Mode 3	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 3	Mode 2	
C13A9-00	Mode 2	Mode 3	Mode 2	
C13AA-00	Mode 2	Mode 3	Mode 2	

Revision: 2013 October

< ECU DIAGNOSIS INFORMATION >

	Direct adaptive steering operating condition in fail-safe mode					
DTC	Steering force control module	Steering angle main control module	Steering angle sub control module			
C13AB-00	Mode 2	Mode 3	Mode 2			
C13AC-00	_	Mode 3	_			
C13AD-00	Mode 2	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 3	Mode 2			
C13B3-00	Mode 2	Mode 3	Mode 2			
C13B4-00	Mode 2	Mode 3	Mode 2			
C13B5-00	Mode 2	Mode 3	Mode 2			
C13B6-00	Mode 2	Mode 3	Mode 2			
C13B7-00	Mode 2	Mode 3	Mode 2			
C13B8-00	Mode 2	Mode 3	Mode 2			
C13B9-00	Mode 2	Mode 3	Mode 2			
C13BA-00	Mode 2	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	Mode 2	Mode 2			
C13C1-00	Mode 2	Mode 2	Mode 2			
C13C2-00	Mode 2	Mode 2	Mode 2			
C13C3-00	Mode 2	Mode 2	Mode 2			
C13C4-00	Mode 2	Mode 2	Mode 2			
C13C5-00	Mode 2 ^{*1}	_	_			
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 3	Mode 2			
C13D3-00	Mode 2	Mode 3	Mode 2			
C13D4-00	Mode 2	Mode 3	Mode 2			

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

	Direct adaptive steering operating condition in fail-safe mode		
DTC	Steering force control module	Steering angle main control module	Steering angle sub control module
C13D5-00	Mode 2	Mode 3	Mode 2
C13D6-00	Mode 2	Mode 3	Mode 2
C13D7-00	Mode 2	Mode 3	Mode 2
C13D8-00		_	
C13D9-00	_	_	
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
C13EC-00	_	_	_
C13ED-00	—	—	_
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	—	-
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:000000009728113
- 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.

STC-107

< ECU DIAGNOSIS INFORMATION >

DTC	Condition	Vehicle condition	
C13E3-00	The steering wheel is steered over the limit angle.	System changes to the protection mode temporarily. (Steering op-	
C13E4-00	When steering clutch is released, steering clutch is not released within regular time with overloading steering wheel.	eration may become heavy temporarily, however steering wheel can be operated without interference. This is not a system mal- function.)	
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 <u>STC-104, "Fail-safe"</u> .	
C13E6.00	EPS/DAST 3: Internal temperature of steering force motor is 150°C (302°F) or more.		
C13E6-00	DAST 1, DAST 2: Internal temperature of control module is 85°C (185°F) or more.	System changes to the protection mode temporarily. (Steering op- eration may become heavy temporarily, however steering wheel can be operated without interference. This is not a system mal- function.)	
C13E7-00	Power supply voltage of control module is low temporarily.		
C13E8-00	 Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other sub- stances. Steering gear is out of neutral position. (Large) 		

DTC Inspection Priority Chart

INFOID:000000009728114

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

Priority	Priority order item (DTC)		
1	 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 C13CC-00 T/M GEAR POSI SIGNAL C13CC-00 ENGINE SPEED SIGNAL C13CD-00 ENGINE SPEED SIGNAL C13CF-00 SLEEP/WAKEUP SIGNAL C13CF-00 ALC FUNCTION REQUEST SIGNAL C13D0-00 ALC FUNCTION REQUEST SIGNAL C13D1-00 STEERING ANGLE SENSOR SIGNAL U1000-01 CAN COMM CIRCUIT U1010-49 CONTROL UNIT (CAN) 		
2	 C13EE-00 INCOMP CONFIG C13EF-00 CONFIG CHECK RESULT C13F0-00 IMCOMP DAST CALIBRATION C13F1-00 INCOMP ST ANG SEN ADJST 		
< ECU DIAGNOSIS INFORMATION >

Priority	Priority order item (DTC)	
	C13A8-00 BACK UP CIRCUIT	А
	C13A9-00 BACK UP CIRCUIT C13AB-00 CONTROL MODULE	
	C13AC-00 CONTROL MODULE	В
	C13B6-00 MOTOR CIRCUIT C13B9-00 CONTROL MODULE	
	C13BB-00 CONTROL MODULE POWER SUPPLY	
	C13BC-00 CONTROL MODULE IGN POWER SUP	С
3	C13BD-00 CONTROL MODULE IGN POWER SUP C13D4-00 CONTROL MODULE	
	C13D8-00 CONTROL MODULE	D
	C13DB-00 STEERING TORQUE SENSOR C13DC-00 STEERING TORQUE SENSOR	D
	C13DD-00 STEERING TORQUE SENSOR	
	C13DE-00 TEMPERATURE SENSOR C13E0-00 ST CLUTCH COMMAND CIPCUIT	Е
	C13E1-00 STEERING CLUTCH	
	C13E2-00 FRONT WHEEL SENSOR SIGNAL	
	C13BE-00 FLEXRAY COMMUNICATION	F
	C13C0-00 FLEXRAY COMMUNICATION	
4	C13C1-00 FLEXRAY COMMUNICATION	STC
	C13C2-00 FLEXRAY COMMUNICATION C13C3-00 FLEXRAY COMMUNICATION	010
	C13C4-00 FLEXRAY COMMUNICATION	
	C13A0-00 CONTROL MODULE	Н
	C13A1-00 CONTROL MODULE C13A2-00 CONTROL MODULE	
	C13A3-00 CONTROL MODULE	
	C13A4-00 CONTROL MODULE C13A5-00 CONTROL MODULE	I
	C13A6-00 CONTROL MODULE	
	C13A7-00 CONTROL MODULE	J
	C13AD-00 CONTROL MODULE	
	C13AE-00 CONTROL MODULE	
	C13AF-00 CONTROL MODULE C13B0-00 CONTROL MODULE	Κ
5	C13B1-00 CONTROL MODULE	
-	C13B2-00 CONTROL MODULE C13B3-00 CONTROL MODULE	1
	C13B4-00 CONTROL MODULE	
	C13B5-00 CONTROL MODULE	
	C13B8-00 CONTROL MODULE	M
	C13BA-00 CONTROL MODULE POWER SUPPLY	
	C13D3-00 CONTROL MODULE	
	C13D5-00 CONTROL MODULE	Ν
	C13D6-00 CONTROL MODULE C13D7-00 CONTROL MODULE	
	C13D9-00 CONTROL MODULE	\bigcirc
	C13DF-00 CONTROL MODULE	0
	C13E3-00 SPIRAL CABLE PROTECTION C13E4-00 ST CLUTCH RELEASE PROTECTION	
	C13E5-00 ST CLUTCH RELEASE PROTECTION	Ρ
	C13E6-00 HEAT PROTECTION C13E7-00 LOW VOLTAGE PROTECTION	
6	C13E8-00 CURB STONE PROTECTION	
	C13E9-00 BOOTING ANGLE PROCESSING	
	CI3EA-00 BOOTING ANGLE PROCESSING CI3EB-00 BOOTING ANGLE PROCESSING	
	C13EC-00 BOOTING ANGLE PROCESSING	
	• C13ED-00 ENGINE STATUS	

< ECU DIAGNOSIS INFORMATION >

DTC Index

[DIRECT ADAPTIVE STEERING]

INFOID:000000009728115

 \times : Applicable

		Detect	ing control	module		
DTC	Items	Steering force control module	Steering angle main control module	Steering angle sub control module	Power steering warning lamp	Reference
C13A0-00	CONTROL MODULE	×	×	×	ON	<u>STC-147</u>
C13A1-00	CONTROL MODULE	×	×	×	ON	<u>STC-150</u>
C13A2-00	CONTROL MODULE	×	×	×	ON	<u>STC-154</u>
C13A3-00	CONTROL MODULE	×	×	×	ON	<u>STC-157</u>
C13A4-00	CONTROL MODULE		×	×	ON	<u>STC-159</u>
C13A5-00	CONTROL MODULE			×	ON	<u>STC-160</u>
C13A6-00	CONTROL MODULE		×		OFF	_
C13A7-00	CONTROL MODULE		×		OFF	_
C13A8-00	BACK UP CIRCUIT	×	×	×	ON	<u>STC-166</u>
C13A9-00	BACK UP CIRCUIT	×	×	×	ON	<u>STC-172</u>
C13AA-00	CONTROL MODULE	×	×	×	ON	<u>STC-176</u>
C13AB-00	CONTROL MODULE	×	×	×	ON	<u>STC-180</u>
C13AC-00	CONTROL MODULE		×		OFF	_
C13AD-00	CONTROL MODULE	×	×	×	ON	<u>STC-185</u>
C13AE-00	CONTROL MODULE	×	×	×	ON	<u>STC-188</u>
C13AF-00	CONTROL MODULE	×	×	×	ON	<u>STC-191</u>
C13B0-00	CONTROL MODULE	×	×	×	ON	<u>STC-194</u>
C13B1-00	CONTROL MODULE	×	×	×	ON	<u>STC-197</u>
C13B2-00	CONTROL MODULE	×	×	×	ON	<u>STC-200</u>
C13B3-00	CONTROL MODULE	×	×	×	ON	<u>STC-203</u>
C13B4-00	CONTROL MODULE	×	×	×	ON	STC-206
C13B5-00	CONTROL MODULE	×	×	×	ON	<u>STC-209</u>
C13B6-00	MOTOR CIRCUIT	×	×	×	ON	<u>STC-214</u>
C13B7-00	CONTROL MODULE	×	×	×	ON	<u>STC-218</u>
C13B8-00	CONTROL MODULE	×	×	×	ON	STC-221
C13B9-00	CONTROL MODULE	×	×	×	ON	STC-226
C13BA-00	CONTROL MODULE POWER SUPPLY	×	×	×	ON	STC-231
C13BB-00	CONTROL MODULE POWER SUPPLY	×	×	×	OFF	STC-237
C13BC-00	CONTROL MODULE IGN POWER SUP	×	×	×	OFF	<u>STC-239</u>
C13BD-00	CONTROL MODULE IGN POWER SUP		×		OFF	_
C13BE-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-247
C13BF-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-252
C13C0-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-262

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

		Detec	ting control	module			_
DTC	Items	Steering force control module	Steering angle main control module	Steering angle sub control module	Power steering warning lamp	Reference	B C D
C13C1-00	FLEXRAY COMMUNICATION	×	×	×	ON	<u>STC-269</u>	_
C13C2-00	FLEXRAY COMMUNICATION	×	×	×	ON	<u>STC-278</u>	E
C13C3-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-288	_
C13C4-00	FLEXRAY COMMUNICATION	×	×	×	ON	<u>STC-293</u>	- F
C13C5-00	STEERING ANGLE SENSOR SIGNAL	×			OFF		_ '
C13C6-00	G SENSOR SIGNAL	×			OFF		-
C13C7-00	VEHICL SPEED SIGNAL	×			OFF		STC
C13C9-00	DRIVE MODE SIGNAL	×			OFF	_	-
C13CA-00	ENGINE STATUS SIGNAL	×			OFF	_	- н
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	_	J
C13D2-00	CONTROL MODULE	×	×	×	ON	<u>STC-311</u>	_
C13D3-00	CONTROL MODULE	×	×	×	ON	<u>STC-314</u>	K
C13D4-00	CONTROL MODULE	×	×	×	ON	<u>STC-319</u>	_
C13D5-00	CONTROL MODULE	×	×	×	ON	<u>STC-323</u>	_
C13D6-00	CONTROL MODULE	×	×	×	ON	<u>STC-326</u>	- L
C13D7-00	CONTROL MODULE	×	×	×	ON	<u>STC-329</u>	_
C13D8-00	CONTROL MODULE	×	×		OFF	_	M
C13D9-00	CONTROL MODULE	×	×		OFF	_	
C13DB-00	STEERING TORQUE SENSOR		×		OFF	_	_
C13DC-00	STEERING TORQUE SENSOR		×		OFF	_	N
C13DD-00	STEERING TORQUE SENSOR		×		OFF	_	_
C13DE-00	TEMPERATURE SENSOR	×	×	×	OFF	<u>STC-349</u>	0
C13DF-00	CONTROL MODULE		×		OFF	—	_
C13E0-00	ST CLUTCH COMMAND CIRCUIT	×			OFF		_
C13E1-00	STEERING CLUTCH	×			OFF		Ρ
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	<u>STC-368</u>	

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

		Detect	ing control i	module		
DTC	Items	Steering force control module	Steering angle main control module	Steering angle sub control module	Power steering warning lamp	Reference
C13E7-00	LOW VOLTAGE PROTECTION	×	×	×	OFF	<u>STC-373</u>
C13E8-00	CURB STONE PROTECTION	×	×	×	OFF	<u>STC-377</u>
C13E9-00	BOOTING ANGLE PROCESSING		×		OFF	_
C13EA-00	BOOTING ANGLE PROCESSING	×			OFF	_
C13EB-00	BOOTING ANGLE PROCESSING		×	×	ON	<u>STC-383</u>
C13EC-00	BOOTING ANGLE PROCESSING	×	×	×	OFF	<u>STC-386</u>
C13ED-00	ENGINE STATUS	×	×	×	OFF	<u>STC-389</u>
C13EE-00	INCOMP CONFIG	×	×	×	ON	<u>STC-393</u>
C13EF-00	CONFIG CHECK RESULT	×	×	×	ON	<u>STC-396</u>
C13F0-00	INCOMP DAST CALIBRATION	×	×	×	ON	<u>STC-399</u>
C13F1-00	INCOMP ST ANG SEN ADJST	×			OFF	_
U1000-01	CAN COMM CIRCUIT	×	×		OFF	
U1010-49	CONTROL UNIT (CAN)	×	×		OFF	_

NOTE:

If two or more DTCs are detected, refer to STC-78, "DTC Inspection Priority Chart".



Revision: 2013 October

DIRECT ADAPTIVE STEERING







JRGWC0318GB

DIRECT ADAPTIVE STEERING

[DIRECT ADAPTIVE STEERING]

	А
	В
Not Off Start Not Off Not Off <td>С</td>	С
30 31 30 81 31 32 31 32 31 32 31 32 31 32 31 32 31 32 31 31 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 33 32 32 33 32 33 33 33 33 33 33 33 33 33 33 33 33 33 33 33 33 33 33 34 101 <td>D</td>	D
	E
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JRGWC0320GB

DIRECT ADAPTIVE STEERING

[DIRECT ADAPTIVE STEERING]



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DIRECT	ADAPTIVE :	STEERING SYSTEM	٧									
Connector No.	M14		Connect	tor No.	M24	106	Ч	FUEL TANK TEMPERATURE SENSOR	37	8	-	
Connector Nam	BCM (BODY CON	NTROL MODULE)	Connect	tor Name	CAN GATEWAY	107	GR	stronge earlieft sureur, ritikka opkrault, svyritek adtronett strenge, litikaustekenn instanuett strundea	88	٦	I	П
						108	>	SENSOR GROUND (ASCD/ICC STEERING SWITCH)	39	≻	1	
Connector Type	TH40FB-NH		Connect	ctor Type	TH12FW-NH	109	BR	TRANSMISSION RANGE SWITCH	40	GR	-	
•						110	>	ENGINE SPEED SIGNAL OUTPUT	41	٦		Т
-					[112	>	GNDA PDPRES/FTPRES	44	BR	I	Т
Ľ		K	Ľ			113	٩	CAN COMMUNICATION LINE	45	×	I	Т
Ϋ́Ρ	AD 50 54		2 H 2		1 2 4 5 6	114		CAN COMMUNICATION LINE	46	σ	П	Т
	8 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	13 23 23 23 23 23 23 23 23 23 23 23 23 23			> : + : - :	117	>	DATA LINK CONNECTOR	47	œ		Т
					7 9 10 11 12	121	ΓC	EVAP CANISTER VENT CONTROL VALVE	48	SHIELD		Т
						122	SB	STOP LAMP SWITCH	49	в		
						123	8	ECM GROUND	50	BR		
Terminal Colo,	r Of Simal h	Name [Snarification]	Termina	al Color Of	Signal Name [Snacification]	124	8	ECM GROUND	51	L	1	
No. Wi	Le	,	Ŷ	Wire		125	~	POWER SUPPLY FOR ECM	52	×		
48 F	PUSH-E	BTN IGN SW ILL PWR	-	-	CAN-H	126	BG	BRAKE PEDAL POSITION SWITCH	53	J	T	
52 C	-	DONGLE LINK	e	>	BATTERY	127	8	ECM GROUND	54	≻		Т
54		COMM LINE	4		CAN2-H	128	в	ECM GROUND	55	٩	-	
55 F	4	RAIN SENSOR	2	в	GND				56	BG	-	
59 F		CAN-L	9	-	CAN3-H	Connecto	or No.	M40	57	GR	-	
P09		CAN-H	7	٩	CAN-L	J	- M		58	8	1	
61 6	3 REAR WI	INDOW DEF RLY CONT	6	ч	IGN	CONTRACTO	A INGUIG		59	SB	1	
62 F	STA STA	ARTER RLY CONT	10	н	CAN2-L	Connecto	or Type	TH80MW-CS16-TM4	61	W/B	1	
64 V	/ I-KE	EY WARN BUZZER	1	8	GND				64	Y	-	
65 E	3 OUT:	S HD LAMP CONT	12	я	CAN3-L				65	я	-	
66 E	BLOW	VER FAN RLY CONT				Ę			99	>		
67 W/	B IGN F	RLYAY (F/B) CONT				H.S.			67	ГG	1	
68 F	~	DIMMER	Connect	tor No.	M37			5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	68	BG	-	
69 G	R A/T SHIF	FT SELECT PWR SPLY	Connect	tor Nama	FCM				71	>	-	
70 E	3 IGN RLY.	AY (IPDM E/R) CONT			LOW				72	ΓC	-	
71 6	DR	R DOOR REG SW	Connect	ctor Type	RH24FGY-RZ8-R-LH-Z				73	ж		
72 Si	B PAS	SS DOOR REQ SW			[Terminal	Color Of	Simul Nama [Sanaifination]	74	BR	-	
75 B.	R COI	MBI SW INPUT 5		_		No.	Wire	Olgian Maine Lopeonication	75	в	-	
76 B1	G COI	MBI SW INPUT 4				2	GR	-	78	5	-	
77	/ COI	MBI SW INPUT 3	S:H		127 123 Multil 00	8	٦	1	79	н	1	
78 7	00	MBI SW INPUT 2			20 000 000 000 000 000 000 000 000 000	4	^	1	83	н	1	
79 LV	G COI	MBI SW INPUT 1			AC 701 001 011 111 771 071	9	W/B	1	86	>	1	
80 L	TF	R LID OPNR SW				7	~	-	91	w	-	
						10	M	1	92	В	1	
			Termina	al Color Of	C	11	M	1	94	BG		
			No.	Wire	oigrai ivaine Lopeciiicatiorij	12	8	-	92	BR	1	
			97	Y	ACCELERATOR PEDAL POSITION SENSOR 1	13	GR	1	96	w	1	
			98	BR	ACCELERATOR PEDAL POSITION SENSOR 2	14	8	-	97	ГG	-	
			66	M	SENSOR POWER SUPPLY (ACCELURATOR PEDAL POSITION SENSOR 1)	15	SB	-	98	Y	-	
			100	9	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR I)	16	в	-	66	BR	-	
			101	SB	ASCD STEERING SWITCH	17	ΓC	T	100	SHIELD		
			101	SB	ICC STEERING SWITCH	18	8	1				

JRGWC0322GB

[DIRECT ADAPTIVE STEERING]



JRGWC0323GB



JRGWC0324GB

BASIC INSPECTION DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

DETAILED FLOW

1.INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing <u>STC-124. "Diagnostic</u> <u>Work Sheet"</u> 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 <u>STC-50</u>.

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".	J
Is any DTC detected?	
YES >> Record or print DTC and freeze frame data. GO TO 4.NO >> GO TO 6.	K
4.RECHECK SYMPTOM	
 With CONSULT Erase self-diagnostic results for "EPS/DAST 3", "DAST 1" or "DAST 2". Perform DTC confirmation procedures for the error detected system. NOTE: 	L
If some DTCs are detected at the same time, determine the order for performing the diagnosis based on <u>STC-78, "DTC Inspection Priority Chart"</u> .	Μ
Is any DTC detected?	
YES >> GO TO 5. NO >> Check harness and connectors based on the information obtained by interview. Refer to <u>GI-43</u> , <u>"Intermittent Incident"</u> .	Ν
5. REPAIR OR REPLACE ERROR-DETECTED PARTS	0
 Repair or replace error-detected parts. Reconnect part or connector after repairing or replacing. When DTC is detected erase self-diagnostic results for "EPS/DAST 3" "DAST 1" or "DAST 2" 	P

>> GO TO 7.

O.IDENTIFY ERROR-DETECTED SYSTEM BY SYMPTOM DIAGNOSIS

Estimate error-detected system based on symptom diagnosis and perform inspection. Can the error-detected system be identified?

STC-123

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INFOID:000000009728117

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained by interview. Refer to <u>GI-43</u>, <u>"Intermittent Incident"</u>.

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:000000009728118

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	MR/MS	Registration number		Initial year registration	
name		Vehicle type		VIN	
Storage date		Engine		Mileage	km (Mile)
		□The steering	wheel position (center) is in the	wrong position.	
		□Power steerir	ng warning lamp turns on.		
		□The vehicle p	ulls to one direction.		
Symptom		□Steering effor	t fluctuates (Not smooth	Abruptly Dincre	eased Decreased)
		□Noise □\	'ibration		
		□Others ()
First occurrent	ce	□Recently	□Others ()
Frequency of	occurrence	□Always □	Under a certain conditions of	□Sometimes	(time(s)/day)
Climate con- ditions		□Irrelevant			
	Weather	□Fine □Cl	oud □Rain □Snow	□Others ()
	Temperature	□Hot □Wa	rm □Cool □Cold □	Temperature [A	oprox. °C(°F)]
	Relative humidity	□High □M	oderate DLow		
Road conditions		□Urban area □Mounting roa	□Suburb area □High wa d (uphill or down hill) □Rou	ay ıgh road	
Steering mode settings		Infiniti drive mo	de selector (), Steer	ing mode setting	()
Operation con	ditions, etc.	□Irrelevant □When engine □During driving □During accele □Traveling strat □During steering Steering effort □Fully steered	starts [Steering wheel angle (At constant speed of aration During deceleration ight During cornering (ng [Steering wheel angle ((DHeavy / DLight)] right or left (Road condition:	°), Tilt level (I driving □Du n right curve or left ²), Steering speed	□High / □Mid /□Low)] ring idling t curve) d (□High / □Mid /□Low),)

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

-

[DIRECT ADAPTIVE STEERING]

		Interv	view sheet			0
Customer	MR/MS	Registration number	Initial y registra	/ear ation		A
name		Vehicle type	VIN			D
Storage date		Engine	Mileag	e	km (Mile)	D
Other condition	ns					С
Memo						
						D

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Revision: 2013 October

STC-125

ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS [DIRECT ADAPTIVE STEERING]

< BASIC INSPECTION >

ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS

Special Repair Requirement

INFOID:000000009785377

×:	App	licab	le
----	-----	-------	----

	Service per- formed			
Parts name	Re- place- ment	Re- moval	Required service	Reference
 Steering force control module Steering angle main control module Steering angle sub control module 	×		 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-129, "Work Proce- dure", STC-131, "Work Proce- dure", STC-133, "Work Proce- dure" NOTE: Work procedure is the same as three control modules.
Steering wheel	*1	*1	 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-127, "Work Proce- dure"
Steering angle sensor	×	×	 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-127, "Work Proce- dure"
 Steering column assembly Steering clutch assembly Steering upper shaft / Steering lower shaft 	×	×	 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-127, "Work Proce- dure"
 Steering gear assembly Suspension components 	×	×	 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 CON-SULT 	 <u>ST-81, "ALIGNMENT</u> <u>TESTER : Inspection</u> <u>and Adjustment"</u> (With alignment tester) <u>ST-82, "EXCEPT</u> <u>ALIGNMENTTESTER :</u> <u>Inspection and Adjust-</u> <u>ment"</u> (Without alignment tester)

*1: If the neutral position of the steering wheel is different from the straight-ahead status of the vehicle.

ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS

< BASIC INSPECTION >

Work Procedure

[DIRECT ADAPTIVE STEERING] INFOID:000000009805148

WARNING:

Never move the vehicle during "DAST CALIBRATION (MODE1)" because the steering gear is held in neutral position until ignition switch is turned OFF. В **CAUTION:** • Be careful for the moving parts, steering wheel and front wheels are steered automatically when start "DAST CALIBRATION (MODE1)". С • Do not rotate road wheels during the DAST calibration because the system is detected the vehicle running. А

Ι.	PREPARATION	D
1. 2.	Lift up the vehicle or set the vehicle on the turn table. Connect the battery charger to protect the battery.	
3.	Much electricity is used in "DAST CALIBRATION (MODE1)". Connect the CONSULT.	E
4.	Turn the ignition switch ON.	_
	Never start the engine.	F
~	>> GO TO 2.	ST
2.	ECU CONFIGURATION	
() 1. 2.	With CONSULT Perform configuration for steering force control module. Refer to <u>STC-140, "Work Procedure"</u> . Perform configuration for steering angle main control module. Refer to <u>STC-142, "Work Procedure"</u> .	Н
3.	Perform configuration for steering angle sub control module. Refer to <u>STC-140, "Work Procedure"</u> .	I
	>> GO TO 3.	
3.	DAST CALIBRATION (MODE1) [CLUTCH PHASE LEARNING]	J
	With CONSULT	-
1. 2.	Perform "DAST CALIBRATION (MODE1)". Refer to <u>STC-135, "Work Procedure"</u> . Turn the ignition switch OFF.	K
	Be sure to perform this step.	
		L
Л	>> GO TO 4.	
4.	DAST CALIBRATION (MODE1) [STEERING RACK NEUTRAL POSITION LEARNING]	- M
®' 1.	With CONSULT Turn the ignition switch ON.	
	Never start the engine.	Ν
2.	Perform "DAST CALIBRATION (MODE1)". Refer to <u>STC-135, "Work Procedure"</u> .	
	>> GO TO 5	0
5	AD ILISTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION	
U.		-
(円) 1. 2.	With CONSULT On the CONSULT screen, select "ABS">>"WORK SUPPORT">>"ST ANGLE SENSOR ADJUSTMENT". Touch START.	Р
	Never touch steering wheel while adjusting steering angle sensor.	
3.	After approx. 10 seconds, select "END".	

Turn ignition switch OFF, and then turn it ON again. 4. CAUTION:

А

ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

Be sure to perform this step.

>> WORK END

ADDITIONAL SERVICE WHEN REPLACING STEERING FORCE CONTROL MODULE	
< BASIC INSPECTION > [DIRECT ADAPTIVE STEERING]	
ADDITIONAL SERVICE WHEN REPLACING STEERING FORCE CONTROL MODULE	4
Description	3
When replacing steering force control module, configuration and DAST calibration are required.	
Work Procedure	2
 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. PREPARATION)
 Lift up the vehicle or set the vehicle on the turn table. Connect the battery charger to protect the battery. 	
NOTE: Much electricity is used in "DAST CALIBRATION (MODE1)". 3. Connect the CONSULT.	ГC
 4. Turn the ignition switch ON. CAUTION: Never start the engine. 	-
>> GO TO 2.	
2.ECU CONFIGURATION	
 With CONSULT Perform configuration for steering force control module. Refer to <u>STC-140, "Work Procedure"</u>. Perform configuration for steering angle main control module. Refer to <u>STC-142, "Work Procedure"</u>. Perform configuration for steering angle sub control module. Refer to <u>STC-140, "Work Procedure"</u>. 	J
>> GO TO 3.	
3.DAST CALIBRATION (MODE1) [CLUTCH PHASE LEARNING]	-
 With CONSULT Perform "DAST CALIBRATION (MODE1)". Refer to <u>STC-135. "Work Procedure"</u>. Turn the ignition switch OFF. CAUTION: 	Л
Be sure to perform this step.	J
>> GO TO 4.	
4.DAST CALIBRATION (MODE1) [STEERING RACK NEUTRAL POSITION LEARNING])
With CONSULT Turn the ignition switch ON. CAUTION: F	D
 Never start the engine. Perform "DAST CALIBRATION (MODE1)". Refer to <u>STC-135, "Work Procedure"</u>. 	
>> GO TO 5.	

 ${\bf 5.} {\rm adjustment} \ {\rm of \ steering \ angle \ sensor \ neutral \ position}$

With CONSULT

ADDITIONAL SERVICE WHEN REPLACING STEERING FORCE CONTROL MODULE

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

- 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

ADDITIONAL SERVICE WHEN REPLACING STEERING ANGLE MAIN CON- TROL MODULE	
< BASIC INSPECTION > [DIRECT ADAPTIVE STEERING]	
ADDITIONAL SERVICE WHEN REPLACING STEERING ANGLE MAIN CONTROL MODULE	А
Description	В
When replacing steering force control module, configuration and DAST calibration are required.	
Work Procedure	С
 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)" 	D
 Do not rotate road wheels during the DAST calibration because the system is detected the vehicle running 	E
1.PREPARATION	F
 Lift up the vehicle or set the vehicle on the turn table. Connect the battery charger to protect the battery. 	
NOTE: Much electricity is used in "DAST CALIBRATION (MODE1)".	STO
 Connect the CONSULT. Turn the ignition switch ON. CAUTION: Never start the engine. 	Н
>> GO TO 2	
2.ECU CONFIGURATION	
 With CONSULT Perform configuration for steering force control module. Refer to <u>STC-140, "Work Procedure"</u>. Perform configuration for steering angle main control module. Refer to <u>STC-142, "Work Procedure"</u>. 	J
3. Perform configuration for steering angle sub control module. Refer to <u>STC-140, "Work Procedure"</u> .	Κ
>> GO TO 3. 3_{-} dast calibration (mode1) iclutch phase Learning)	L
With CONSULT	
 Perform "DAST CALIBRATION (MODE1)". Refer to <u>STC-135, "Work Procedure"</u>. Turn the ignition switch OFF. CAUTION: 	M
Be sure to perform this step.	Ν
>> GO TO 4.	
	0
1. Turn the ignition switch ON. CAUTION:	Р
Never start the engine. 2. Perform "DAST CALIBRATION (MODE1)". Refer to <u>STC-135. "Work Procedure"</u> .	I

>> GO TO 5.

 $\mathbf{5.}$ Adjustment of steering angle sensor neutral position

() With CONSULT

ADDITIONAL SERVICE WHEN REPLACING STEERING ANGLE MAIN CON-TROL MODULE

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

- 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

ADDITIONAL SERVICE WHEN REPLACING STEERING ANGLE SUB CONTROL MODULE	
< BASIC INSPECTION > [DIRECT ADAPTIVE STEERING]	
ADDITIONAL SERVICE WHEN REPLACING STEERING ANGLE SUB CON- TROL MODULE	A
Description INFOID:00000009728123	B
When replacing steering force control module, configuration and DAST calibration are required.	
Work Procedure	С
 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. 	D
1.PREPARATION	F
 Lift up the vehicle or set the vehicle on the turn table. Connect the battery charger to protect the battery. 	
NOTE: Much electricity is used in "DAST CALIBRATION (MODE1)". 3. Connect the CONSULT.	STO
4. Turn the ignition switch ON. CAUTION: Never start the engine.	Η
>> GO TO 2.	
2.ECU CONFIGURATION	
 With CONSULT Perform configuration for steering force control module. Refer to <u>STC-140, "Work Procedure"</u>. Perform configuration for steering angle main control module. Refer to <u>STC-142, "Work Procedure"</u>. Perform configuration for steering angle sub control module. Refer to <u>STC-140, "Work Procedure"</u>. 	J
>> GO TO 3.	
3.DAST CALIBRATION (MODE1) [CLUTCH PHASE LEARNING]	L
 With CONSULT Perform "DAST CALIBRATION (MODE1)". Refer to <u>STC-135, "Work Procedure"</u>. Turn the ignition switch OFF. CAUTION: 	Μ
Be sure to perform this step.	Ν
>> GO TO 4.	
4.DAST CALIBRATION (MODE1) [STEERING RACK NEUTRAL POSITION LEARNING]	0
 (P)With CONSULT 1. Turn the ignition switch ON. CAUTION: 	Ρ
 Perform "DAST CALIBRATION (MODE1)". Refer to <u>STC-135, "Work Procedure"</u>. 	
>> GO TO 5.	

 ${\bf 5.} {\sf ADJUSTMENT} \text{ of steering angle sensor neutral position}$

With CONSULT

ADDITIONAL SERVICE WHEN REPLACING STEERING ANGLE SUB CONTROL MODULE

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

- On the CONSULT screen, select "ABS">>"WORK SUPPORT">>"ST ANGLE SENSOR ADJUSTMENT". 1.
- 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

DAST CALIBRATION (MODE1)

< BASIC INSPECTION >

DAST CALIBRATION (MODE1)

Description

"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.

(A)

R



>> GO TO 2.

2. DAST CALIBRATION (MODE 1)

With CONSULT

- 1. Erase self-diagnostic result for "EPS/DAST 3", "DAST 1" and "DAST 2".
- On the CONSULT screen, select "EPS/DAST 3" >> "WORK SUPPORT" >> "DAST CALIBRATION (MODE1)".
- Touch "START".
 CAUTION:

Be careful for the moving parts, steering wheel and front wheels are steered automatically when touch "START".

NOTE:

When "DAST CALIBRATION (MODE1)" is completed, the clutch is released.

4. Turn the steering wheel to the straight-ahead position. Then touch "START".

STC-135

[DIRECT ADAPTIVE STEERING]

А

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D

INFOID:000000009785379

DAST CALIBRATION (MODE1)

< BASIC INSPECTION >

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. Also, do not turn the steering beyond 120 degrees.
- 5. Touch "END".

>> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

(B) With CONSULT

- 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-1 >> When C13F0-00 is detected as "PAST", perform "DAST CALIBRATION (MODE1)" again. GO TO 2.

YES-2 >> When other than above DTC is detected, perform Perform trouble diagnosis for the detected DTC. Refer to <u>STC-80, "DTC Index"</u> (EPS/DAST 3), <u>STC-95, "DTC Index"</u> (DAST 1), <u>STC-110, "DTC Index"</u> (DAST 2).

NO >> GO TO 4.

4. IDENTIFICATION NUMBER CONFIRMATION

Confirm the identification number.

TYPE A	Up to VIN: JN1BV7AP6EM675853 (2WD)
	JN1BV7AR6EM689124 (AWD)
TYPE B	From VIN:
	JN1BV7AP6EM675854 (2WD)
	JN1BV7AR6EM689125 (AWD)

TYPE A>> GO TO 5. TYPE B>> GO TO 6.

5.FINAL CONFIRMATION (TYPEA)

() With CONSULT

- Turn the ignition switch OFF to ON.
- 2. On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "ST ANGLE SENSOR", and then turn the steering wheel to the straight-ahead position.

Monitor item	Standard value
ST ANGLE SENSOR	0 deg

3. On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "STEERING PINION ANGLE 1" and "STEERING PINION ANGLE 2", and then check the value.

4. Confirm that the absolute value of the difference between "STEERING PINION ANGLE 1" and "STEER-ING PINION ANGLE 2" is 4.4 or less.

- 5. Using "ST ANGLE SENSOR" on "DATA MONITOR", turn the steering wheel to 10 degree.
- 6. Confirm that the absolute value of the difference between "STEERING PINION ANGLE 1" and "STEER-ING PINION ANGLE 2" is 4.4 or less.
- 7. Confirm the work of step 5 and 6 in the range of 0 deg \rightarrow 180 deg \rightarrow 0 deg.

Is the confirmation result normal?

YES >> WORK END

NO >> Slightly lower the tilt position, and then re-perform "DAST CALIBRATION (MODE1)". GO TO 2.

6.FINAL CONFIRMATION (TYPE B)

DAST CALIBRATION (MODE1)

< BASIC INSPECTION >

With CONSULT

- 1. Turn the ignition switch OFF to ON.
- On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "ANGLE 1", and then and then check the value.

Monitor item	Standard value	D
ANGLE 1	4.4 or less	
le the confirmation requit normal?		0

<u>Is the confirmation result normal?</u>

YES >> WORK END

NO >> Slightly lower the tilt position, and then re-perform "DAST CALIBRATION (MODE1)". GO TO 2.

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< BASIC INSPECTION >

DAST CALIBRATION (MODE2)

Description

INFOID:000000009785381

"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).



Work Procedure

INFOID:000000009785382

CAUTION:

- Be careful for the moving parts, steering wheel and front wheels are steered automatically when start "DAST CALIBRATION (MODE2)".
- Do not rotate road wheels during the DAST calibration because the system is detected the vehicle running.
- **1.**PREPARATION BEFORE DAST CALIBRATION
- 1. Lift up the vehicle or set the vehicle on the turn table.
- 2. Check that inner socket length is in the specified value. Refer to ST-104, "Steering Gear and Linkage".
- Connect the battery charger to protect the battery.
 NOTE:

Much electricity is used in "DAST CALIBRATION (MODE2)".

Place the tilt to the highest level (2WD) or place the tilt to the lowest level (AWD).
 CAUTION:
 Securely lock the tilt lever

Securely lock the tilt lever.

>> GO TO 2.

2. DAST CALIBRATION (MODE2) [AUTO STEERING]

With CONSULT

- 1. On the CONSULT screen, select "EPS/DAST 3" >> "WORK SUPPORT" >> "DAST CALIBRATION (MODE2)".
- 2. Touch "START".

CAUTION:

Be careful for the moving parts, steering wheel and front wheels are steered automatically when touch "START".

NOTE:

When "DAST CALIBRATION (MODE2)" is completed, the clutch is released.

3. Turn the steering wheel to the straight-ahead position. Then touch "START". CAUTION:

Since the force feedback of steering becomes smaller after the completion of auto steering, take good care for turning the steering. Also, do not turn the steering beyond 120 degrees.

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DAST CALIBRATION (MODE2)	
< BASIC INSPECTION > [DIRECT ADAPTIVE STEERING]	
>> GO TO 3.	
3. DAST CALIBRATION (MODE2) [OFF-CENTER CALCULATION]	А
With CONSULT	
1. Disconnect the battery charger.	В
2. Lift down the vehicle.	
3. Start the engine.	
CAUTION: Nover stop the orgine while performing this stop	C
Note.	0
Keep the connecting with CONSULT.	
4. Drive straight the vehicle and then stop.	D
 Press "Start" while keeping the angle of steering wheel as the vehicle's straight position. Becord or print the displayed value of "OFF-CENTER". 	D
	_
>> GO TO 4.	E
4. PERFORM SELF-DIAGNOSIS	
	F
1 Turn ignition switch OFF and wait at least 10 seconds	
2. Start the engine.	
CAUTION:	STO
Never drive the vehicle.	
3. Perform self-diagnosis for "EPS/DAST 3", "DAST 1" and "DAST 2".	
Is any DTC detected?	Н
Yes-1 >> When C13E9-00, C13EA-00, C13EB-00, C13EC-00 and/or C13F0-00 is detected, perform "DAST	
CALIBRATION (MODE1)" again. GO TO 2.	
Pres-2 >> when other than above DTC is detected, perform Perform trouble diagnosis for the detected	
No >> Adjust "OFF-CENTER" Proceed to ST-82 "EXCEPT ALIGNMENT TESTER : Inspection and	
Adjustment".	
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CONFIGURATION (STEERING FORCE CONTROL MODULE) [DIRECT ADAPTIVE STEERING]

< BASIC INSPECTION >

CONFIGURATION (STEERING FORCE CONTROL MODULE)

Work Procedure

INFOID:000000009728133

CAUTION:

- Use "Manual Configuration" only when "TYPE ID" of steering force control module cannot be read.
- Be sure to perform the DAST calibration after perform the configuration.
- If an error occurs during configuration, start over from the beginning.

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 <u>STC-427. "Removal and Installation"</u>.

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 \Rightarrow GO TO 3. NO \Rightarrow 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-427, "Removal and Installation".

>> GO TO 6.

6.WRITING (AUTOMATIC WRITING)

CONSULT Configuration

- 1. Select "After Replace ECU" of "Re/programming, Configuration" or that of "Read / Write Configuration".
- 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.

/.REPLACING STEERING FORCE CONTROL MODULE (2)

Replace steering force control module. Refer to STC-427. "Removal and Installation".

STC-140

CONFIGURATION (STEERING FORCE CONTROL MODULE)

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

>> GO TO 8. 8.WRITING (MANUAL WRITING)	А
 CONSULT Configuration Select "Manual Configuration". 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". 	B
>> GO TO 9. 9.VERIFYING TYPE ID (2)	D
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.	Е
For the "Type ID" searched by using FAST (service parts catalog), use the last five digits of the "Type ID".	F
>> WORK END.	STC
>> WORK END.	STC
>> WORK END.	STC
>> WORK END.	H J
>> WORK END:	H I J K

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CONFIGURATION (STEERING ANGLE MAIN CONTROL MODULE)

< BASIC INSPECTION >

CONFIGURATION (STEERING ANGLE MAIN CONTROL MODULE)

Work Procedure

INFOID:000000009728134

[DIRECT ADAPTIVE STEERING]

CAUTION:

- Use "Manual Configuration" only when "TYPE ID" of steering angle main control module cannot be read.
- Be sure to perform the DAST calibration after perform the configuration.
- If an error occurs during configuration, start over from the beginning.

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 <u>STC-428, "Removal and Installation"</u>.

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-428. "Removal and Installation".

>> GO TO 6.

6.WRITING (AUTOMATIC WRITING)

CONSULT Configuration

- 1. Select "After Replace ECU" of "Re/programming, Configuration" or that of "Read / Write Configuration".
- 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".

>> GO TO 9.

I.REPLACING STEERING ANGLE MAIN CONTROL MODULE (2)

STC-142

CONFIGURATION (STEERING ANGLE MAIN CONTROL MODULE)

[DIRECT ADAPTIVE STEERING]

< BASIC INSPECTION >

Replace steering angle main control module. Refer to STC-428, "Removal and Installation". А >> GO TO 8. 8.WRITING (MANUAL WRITING) В 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 С 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". D >> GO TO 9. 9. VERIFYING TYPE ID (2) Е 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: F For the "Type ID" searched by using FAST (service parts catalog), use the last five digits of the "Type ID". >> WORK END. STC

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CONFIGURATION (STEERING ANGLE SUB CONTROL MODULE) [DIRECT ADAPTIVE STEERING]

< BASIC INSPECTION >

CONFIGURATION (STEERING ANGLE SUB CONTROL MODULE)

Work Procedure

INFOID:000000009728135

CAUTION:

- Use "Manual Configuration" only when "TYPE ID" of steering angle sub control module cannot be read.
- Be sure to perform the DAST calibration after perform the configuration.
- If an error occurs during configuration, start over from the beginning.

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 <u>STC-429, "Removal and Installation"</u>.

2. CHECKING TYPE ID (2)

CONSULT Configuration

- 1. Select "Before Replace ECU" of "Read/Write Configuration".
- 2. Check that "Type D" 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-429, "Removal and Installation".

>> GO TO 6.

6.WRITING (AUTOMATIC WRITING)

CONSULT Configuration

- 1. Select "After Replace ECU" of "Re/programming, Configuration" or that of "Read / Write Configuration".
- 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".

>> GO TO 9.

I.REPLACING STEERING ANGLE SUB CONTROL MODULE (2)

STC-144
CONFIGURATION (STEERING ANGLE SUB CONTROL MODULE)

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

Replace steering angle sub control module. Refer to STC-429, "Removal and Installation".

А >> GO TO 8. 8.WRITING (MANUAL WRITING) В 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 С 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". D >> GO TO 9. 9. VERIFYING TYPE ID (2) Е 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: F For the "Type ID" searched by using FAST (service parts catalog), use the last five digits of the "Type ID".

>> WORK END.

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DTC/CIRCUIT DIAGNOSIS C13A0-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009784909

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-47, "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

(B) With CONSULT

- 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-146, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009784910

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-427, "Removal and Installation".
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

DAST 1

C13A0-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

DAST 1 :	DTC Description	INF0ID:000000009784911	Δ
DTC DETE	ECTION LOGIC		A
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	В
C13A0-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected when the system is performing the initial setting.	С
POSSIBLESteering a	ECAUSE angle main control module		
FAIL-SAFE • Variable NOTE: For fail-sa	fe mode, refer to <u>STC-47, "DIRECT AD/</u>	APTIVE STEERING : Fail-safe".	E
DTC CON	FIRMATION PROCEDURE		
1.PRECO	NDITIONING		F
If "DTC COI wait at least	NFIRMATION PROCEDURE" has been t 10 seconds before conducting the next GO TO 2.	previously conducted, always turn ignition switch OFF and test.	ST
∠.DTC RE	PRODUCTION PROCEDURE		Н
With CO 1. Start th CAUTE Never 2. Perforn	NSULT e engine. ON: drive the vehicle. n self-diagnosis for "DAST 1".		I
<u>ls DTC "C1</u>	3A0-00" detected?		J
YES >> NO-1 >> NO-2 >>	Proceed to diagnosis procedure. Refer To check malfunction symptom before r Confirmation after repair: INSPECTION	to <u>STC-148, "DAST 2 : Diagnosis Procedure"</u> . epair: Refer to <u>GI-43, "Intermittent Incident"</u> . END	IZ.
DAST 1 :	Diagnosis Procedure	INFOID:000000009784912	N
1.PERFOR	RM SELF-DIAGNOSIS		L
With CO 1. Turn the 2. Erase s 3. Turn the 4. Start the	NSULT e ignition switch ON. self-diagnosis for "DAST 1". e ignition switch OFF and wait for at leas	st 10 seconds.	M
4. Start th CAUTIC Never (5. Perform	e engine. <mark>ON:</mark> drive the vehicle. n self-diagnosis for "DAST 1".		Ν
IS DTC "C13 YES >> NO >>	3A0-00" detected? Replace steering angle main control mo Check the intermittent incident. Refer to	odule. Refer to <u>STC-428, "Removal and Installation"</u> . <u>GI-43, "Intermittent Incident"</u> .	0
DA21 2			Ρ
DAST 2 :	DTC Description	INFOID:000000009784913	
DTC DETE	CTION LOGIC		

C13A0-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

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-47, "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.
- Perform self-diagnosis for "DAST 2".

Is DTC "C13A0-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-148. "DAST 2 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000009784914

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-429, "Removal and Installation".
- NO >> Check the intermittent incident. Refer to GI-43, "Intermittent Incident".

< DTC/CIRCUIT DIAGNOSIS >

C13A1-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

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 Steering f 	CAUSE orce control module	
	FIRMATION PROCEDURE	
	NDITIONING	reviewely conducted, always turn ignition switch OFF and
wait at least	t 10 seconds before conducting the next te	est.
>>	GO TO 2.	
2.dtc re	PRODUCTION PROCEDURE	
With CO Start th	NSULT e engine	
CAUTI	ON:	
2. Turn the 3. Return	e steering wheel from full left stop to full rig the steering wheel to the straight-ahead p	ght stop. position.
4. Perforn	n self-diagnosis for "EPS/DAST 3".	
<u>IS DIC "C1;</u> YES >>	<u>3A1-00" detected?</u> Proceed to diagnosis procedure. Refer to	STC-149. "EPS/DAST 3 : Diagnosis Procedure".
NO-1 >> NO-2 >>	To check malfunction symptom before rep Confirmation after repair: INSPECTION E	pair: Refer to <u>GI-43, "Intermittent Incident"</u> . END
EPS/DAS	ST 3 : Diagnosis Procedure	INFOID:00000009809297
1.PERFOR	RM SELF-DIAGNOSIS	
With CO	NSULT	
2. Erase s	self-diagnosis for "EPS/DAST 3".	
 1 urn the 4. Start the 	e ignition switch OFF and wait for at least engine.	10 seconds.
CAUTI Never	ON: drive the vehicle.	
5. Turn the	e steering wheel from full left stop to full rig	ght stop.
7. Perforn	n self-diagnosis for "EPS/DAST 3".	
Is DTC "C1:	3A1-00" detected?	ofer to STC 427 "Permaval and Installation"
NO >> DAST 1	Check the intermittent incident. Refer to (<u>31-43, "Intermittent Incident"</u> .
DAST 1 :	DTC Description	INFOID:000000009784917
	· ·	

А

В

INFOID:000000009809296

C13A1-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

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-47, "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.

- 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-150, "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43</u>, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009784918

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-427, "Removal and Installation".
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

DAST 2

DAST 2 : DTC Description

DTC DETECTION LOGIC

INFOID:000000009784919

C13A1-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	А
C13A1-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering force control module is detected.	B
POSSIBLE • Steering for	CAUSE orce control module		
FAIL-SAFE	E		С
NOTE: For fail-sa	fe mode, refer to <u>STC-47, "DIRECT ADAP</u>	TIVE STEERING : Fail-safe".	D
DTC CON	FIRMATION PROCEDURE		
1.PRECOM	NDITIONING		Е
If "DTC COI wait at least	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next test	viously conducted, always turn ignition switch OFF and st.	_
>>	GO TO 2.		F
2.DTC RE	PRODUCTION PROCEDURE		sт
With CO	NSULT		
1. Start the CAUTI	e engine. ON:		Н
2 Turn the	drive the vehicle.	ht stop	
3. Return	the steering wheel to the straight-ahead po	sition.	
4. Perform	n self-diagnosis for "DAST 2". 341-00" detected?		I
YES >>	Proceed to diagnosis procedure. Refer to	STC-151, "DAST 2 : Diagnosis Procedure".	
NO-1 >> NO-2 >>	To check malfunction symptom before repared Confirmation after repair: INSPECTION EN	air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND	J
DAST 2 :	Diagnosis Procedure	INF0ID:00000009784920	K
1.PERFOR	RM SELF-DIAGNOSIS		
With CO	NSULT		L
 1. Turn the 2. Erase s 	e ignition switch ON. self-diagnosis for "DAST 2".		
3. Turn the	e ignition switch OFF and wait for at least 1	0 seconds.	M
CAUTI	ON:		
5. Turn the	e steering wheel from full left stop to full rig	ht stop.	Ν
 Return Perform 	the steering wheel to the straight-ahead po n self-diagnosis for "DAST 2".	sition.	
Is DTC "C13	3A1-00" detected?		0
YES >> NO >>	Replace steering force control module. Re Check the intermittent incident. Refer to G	fer to <u>STC-427, "Removal and Installation"</u> . I-43, "Intermittent Incident".	
	· · · · · · · · · · · · · · · · · · ·		Ρ

C13A2-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009784921

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 3

NOTE:

For fail-safe mode, refer to STC-47. "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-152, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009784922

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 <u>STC-428, "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to GI-43, "Intermittent Incident".

DAST 1

STC-152

C13A2-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

DAST 1 :	DTC Description	INFOID:000000009784923
DTC DETE	ECTION 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 Steering a 	E CAUSE angle main control module	
FAIL-SAFE • Mode 3 NOTE: For fail-sa	fe mode, refer to <u>STC-47, "DIRECT AD</u>	DAPTIVE STEERING : Fail-safe".
DTC CON	FIRMATION PROCEDURE	
1.PRECO	NDITIONING	
If "DTC CO wait at leas >> 2.DTC RF	NFIRMATION PROCEDURE" has been t 10 seconds before conducting the nex GO TO 2.	r previously conducted, always turn ignition switch OFF and t test.
1. Start th CAUTI Never 2. Turn th	e engine. <mark>ON:</mark> drive the vehicle. e steering wheel from full left stop to ful	ll right stop.
 Return Perforn 	the steering wheel to the straight-ahead n self-diagnosis for "DAST 1".	d position.
Is DTC "C1	<u>3A2-00" detected?</u>	r to STC 153 "DAST 1 · Diagnosis Procedure"
NO-1 >> NO-2 >>	To check malfunction symptom before Confirmation after repair: INSPECTIO	repair: Refer to <u>GI-43. "Intermittent Incident"</u> . N END
DAST 1 :	Diagnosis Procedure	INFOID:000000009784924
1.PERFOR	RM SELF-DIAGNOSIS	
With CO	NSULT	
1. Turn th 2. Erase s 3. Turn th	e ignition switch ON. self-diagnosis for "DAST 1". e ignition switch OFF and wait for at lea	ast 10 seconds.
4. Start th CAUTI Never	e engine. <mark>ON:</mark> drive the vehicle.	
 Turn th Return Perform 	e steering wheel from full left stop to ful the steering wheel to the straight-ahea n self-diagnosis for "DAST 1".	l right stop. d position.
<u>ls DTC "C1</u>	3A2-00" detected?	
YES >> NO >> DAST 2	Replace steering angle main control m Check the intermittent incident. Refer t	iodule. Refer to <u>STC-428, "Removal and Installation"</u> . to <u>GI-43, "Intermittent Incident"</u> .

< DTC/CIRCUIT DIAGNOSIS >

DAST 2 : DTC Description

[DIRECT ADAPTIVE STEERING]

INFOID:000000009784925

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 3
- NOTE:

For fail-safe mode, refer to STC-47, "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.
- 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-154, "DAST 2 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000009784926

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 <u>STC-428, "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

C13A3-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

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 mod- ule is detected.
POSSIBLE • Steering a	CAUSE	
FAIL-SAFE • Mode 2 NOTE: For fail-sa	fe mode, refer to <u>STC-47, "DIRECT ADAF</u>	PTIVE STEERING : Fail-safe".
DTC CON	FIRMATION PROCEDURE	
1.PRECON	NDITIONING	
If "DTC COI wait at least	NFIRMATION PROCEDURE" has been protected to the next term of ter	eviously conducted, always turn ignition switch OFF and est.
>>	GO TO 2.	
2.DTC RE	PRODUCTION PROCEDURE	
With CO 1. Start the CAUTIO	NSULT e engine. ON:	
2. Turn the	drive the vehicle. e steering wheel from full left stop to full rid	aht stop.
3. Return	the steering wheel to the straight-ahead po	osition.
Is DTC "C1:	3A3-00" detected?	
YES >> NO-1 >> NO-2 >>	Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep Confirmation after repair: INSPECTION E	<u>STC-152, "EPS/DAST 3 : Diagnosis Procedure"</u> . bair: Refer to <u>GI-43, "Intermittent Incident"</u> . ND
EPS/DAS	ST 3 : Diagnosis Procedure	INFOID:00000009784928
1.PERFOR	RM SELF-DIAGNOSIS	
With CO	NSULT	
 1. Turn the 2. Erase s 3. Turn the 4. Start the 	e ignition switch ON. self-diagnosis for "EPS/DAST 3". e ignition switch OFF and wait for at least e engine.	10 seconds.
5. Turn the 6. Return 7. Perform	drive the vehicle. e steering wheel from full left stop to full rig the steering wheel to the straight-ahead po n self-diagnosis for "EPS/DAST 3".	ght stop. osition.
Is DTC "C1: YES >> NO >> DAST 1	3A3-00" detected? Replace steering angle sub control modul Check the intermittent incident. Refer to <u>G</u>	le. Refer to <u>STC-429, "Removal and Installation"</u> . BI-43, "Intermittent Incident".

STC-155

А

В

INFOID:000000009784927

< DTC/CIRCUIT DIAGNOSIS >

DAST 1 : DTC Description

INFOID:000000009784929

[DIRECT ADAPTIVE STEERING]

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 mod- ule is detected.

POSSIBLE CAUSE

• Steering angle sub control module

FAIL-SAFE

- Mode 2
- NOTE:

For fail-safe mode, refer to STC-47, "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

(B) With CONSULT

- 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 <u>STC-156, "DAST 1 : Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009784930

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 <u>STC-429, "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

DAST 2

STC-156

C13A3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

DAST 2 : DTC Description

DASIZ	DIC Description	INFOID:000000009784931	Δ
DTC DETE	ECTION LOGIC		
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	В
C13A3-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering angle sub control mod- ule is detected.	С
POSSIBLE	ECAUSE		
 Steering a 	angle sub control module		D
FAIL-SAFE • Mode 2 NOTE: For fail-sa	afe mode, refer to <u>STC-47, "DIRECT ADA</u>	PTIVE STEERING : Fail-safe".	E
DTC CON	FIRMATION PROCEDURE		
1.PRECO	NDITIONING		F
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been po t 10 seconds before conducting the next to	reviously conducted, always turn ignition switch OFF and est.	STO
>> 2.DTC RE	GO TO 2. PRODUCTION PROCEDURE		Н
With CO Start th CAUTI Never	NSULT e engine. ON: drive the vehicle.		I
 1 urn th 3. Return 4. Perforr 	e steering wheel from full left stop to full ri the steering wheel to the straight-ahead p n self-diagnosis for "DAST 2".	ght stop. position.	J
<u>Is DTC "C1</u> YES >> NO-1 >> NO-2 >>	3A3-00" detected? Proceed to diagnosis procedure. Refer to To check malfunction symptom before re Confirmation after repair: INSPECTION E	STC-157, "DAST 2 : Diagnosis Procedure". pair: Refer to <u>GI-43, "Intermittent Incident"</u> . END	K
DAST 2 :	Diagnosis Procedure	INFOID:000000009784932	L
1.PERFO	RM SELF-DIAGNOSIS		
With CO I. Turn th C. Erases	NSULT e ignition switch ON. self-diagnosis for "DAST 2".		Μ
 Turn th Start th CAUTI 	e ignition switch OFF and wait for at least e engine. ON:	10 seconds.	Ν
Never 5. Turn th 6. Return	drive the vehicle. e steering wheel from full left stop to full ri the steering wheel to the straight-ahead p	ght stop. oosition.	0
IS DTC "C1	n seir-diagnosis for "DAST 2". 343-00" detected?		P
YES >> NO >>	Replace steering angle sub control modu Check the intermittent incident. Refer to (Ile. Refer to <u>STC-429, "Removal and Installation"</u> . GI-43, "Intermittent Incident".	1

C13A4-00 CONTROL MODULE DAST 1

DAST 1 : DTC Description

INFOID:000000009784933

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-47, "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-158, "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

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 <u>STC-427, "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to GI-43, "Intermittent Incident".

DAST 2

STC-158

INFOID:000000009784934

C13A4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

DAST 2:	DIC Description	INFOID:00000009784935	Δ
DTC DETE	ECTION LOGIC		~
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	В
C13A4-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering force control module is detected.	С
POSSIBLE			
 FAIL-SAFE Mode 2 NOTE: For fail-sa 	afe mode, refer to <u>STC-47, "DIRECT AD</u>	APTIVE STEERING : Fail-safe".	D
DTC CON	FIRMATION PROCEDURE		
1.PRECO	NDITIONING		F
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been t 10 seconds before conducting the nex	previously conducted, always turn ignition switch OFF and t test.	ST
>> 2.dtc re	PRODUCTION PROCEDURE		Н
With CO Start th CAUTI Never	NSULT e engine. ON: drive the vehicle.	right stop	I
 a. Return A. Perforn Js DTC "C1 	the steering wheel from full left stop to full the steering wheel to the straight-ahead n self-diagnosis for "DAST 2".	l position.	J
YES >> NO-1 >> NO-2 >>	 Proceed to diagnosis procedure. Refer To check malfunction symptom before Confirmation after repair: INSPECTION 	to <u>STC-159, "DAST 2 : Diagnosis Procedure"</u> . repair: Refer to <u>GI-43, "Intermittent Incident"</u> . I END	K
DAST 2 :	Diagnosis Procedure	INFCID:00000009784936	L
1.PERFOR	RM SELF-DIAGNOSIS		
With CO 1. Turn th 2. Erases	NSULT e ignition switch ON. self-diagnosis for "DAST 2".		M
 Turn th Start th CAUTI 	e ignition switch OFF and wait for at lea e engine. ON:	st 10 seconds.	Ν
5. Turn th 6. Return 7 Perform	drive the vehicle. e steering wheel from full left stop to full the steering wheel to the straight-ahead n self-diagnosis for "DAST 2"	right stop. I position.	0
Is DTC "C1	3A4-00" detected?		Ρ
YES >> NO >>	Replace steering force control module. Check the intermittent incident. Refer to	Refer to <u>STC-427, "Removal and Installation"</u> . o <u>GI-43, "Intermittent Incident"</u> .	

C13A5-00 CONTROL MODULE DAST 2

DAST 2 : DTC Description

INFOID:000000009784937

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-47, "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 "C13A5-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-160, "DAST 2 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

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 <u>STC-429, "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to GI-43, "Intermittent Incident".

STC-160

INFOID:000000009784938

C13A6-00 CONTROL MODULE DAST 1

DAST 1 : DTC Description

DTC DETECTION LOGIC

			\sim
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	C
C13A6-00	CONTROL MODULE (Control module)	When system is in fail-safe mode (mode 2), the internal malfunc- tion in steering angle main control module is detected.	D
POSSIBLE	CAUSE		
 Steering a 	angle main control module		Е
FAIL-SAFE	1		
NOTE:			F
For fail-sa	afe mode, refer to <u>STC-47, "DIRECT ADAF</u>	PTIVE STEERING : Fail-safe".	Г
DTC CON	FIRMATION PROCEDURE		
1.PRECO	NDITIONING		STC
If "DTC CO	NFIRMATION PROCEDURE" has been pr	eviously conducted, always turn ignition switch OFF and	
wait at least	t 10 seconds before conducting the next te	est.	Н
>>	GO TO 2.		
2.DTC RE	PRODUCTION PROCEDURE		1
With CO	NSIIIT		1
1. Start th	e engine.		
	ON: drive the vehicle		J
2. Perform	n self-diagnosis for "DAST 1".		
Is DTC "C1	3A6-00" detected?		Κ
YES >>	Proceed to diagnosis procedure. Refer to	STC-161, "DAST 1 : Diagnosis Procedure".	
NO-1 >> NO-2 >>	Confirmation after repair: INSPECTION E	ND	I
DAST 1 :	Diagnosis Procedure	INFOID-0000000784940	
4	2.49.100.01.100044.0		
1.PERFOR	RM SELF-DIAGNOSIS		M
With CO	NSULT		
 1. Turn the 2. Erase s 	e ignition switch ON. self-diagnosis for "DAST 1".		Ν
3. Turn the	e ignition switch OFF and wait for at least	10 seconds.	
4. Start th	e engine. ON:		\bigcirc
Never	drive the vehicle.		0
5. Perform	n self-diagnosis for "DAST 1".		
YFS >>	Replace steering angle main control mod	ule Refer to STC-428 "Removal and Installation"	Ρ
NO >>	Check the intermittent incident. Refer to (GI-43, "Intermittent Incident".	

А

В

INFOID:000000009784939

C13A7-00 CONTROL MODULE DAST 1

DAST 1 : DTC Description

INFOID:000000009784941

[DIRECT ADAPTIVE STEERING]

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 malfunc- tion 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-47. "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-162, "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009784942

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.
- 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 <u>STC-428, "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

C13A8-00 BACK UP CIRCUIT EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009784943

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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. Terminal voltage < 0.5 V 3 V < Terminal voltage
POSSIBLE	CAUSE	
 Back up of short 	circuit (between steering force control mod	ule and steering angle main control module) is open or
Steering f	orce control module	
Steering a	angle main control module -	
AIL-SAFE Mode 2	-	
NOTE:		
For fail-sa	ate mode, refer to STC-47, "DIRECT ADAP	<u>TIVE STEERING : Fail-safe"</u> .
wait at leas	t 10 seconds before conducting the next te	st.
<u>>></u>	GO TO 2.	
Z. DTC RE	PRODUCTION PROCEDURE	
With CO	NSULT	
CAUTI	ON:	
2 Perform	drive the vehicle. a self-diagnosis for "EPS/DAST 3"	
Is DTC "C1	<u>3A8-00" detected?</u>	
YES >>	Proceed to diagnosis procedure. Refer to	STC-163, "EPS/DAST 3 : Diagnosis Procedure".
NO-1 >> NO-2 >>	 Io check malfunction symptom before rep Confirmation after repair: INSPECTION EI 	air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND
EPS/DAS	ST 3 : Diagnosis Procedure	INFC/ID-0000000784944
1		
I.CHECK	STEERING FORCE CONTROL MODULE	SINGNAL
With CO	NSULT	
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 SI	G 1 VOLT	0.5 – 3 V
Is the inspe	ction result normal?	

Is the inspection result norma

YES >> GO TO 5. NO >> GO TO 2.

< DTC/CIRCUIT DIAGNOSIS >

2. CHECK THE INPUT SIGNAL VOLTAGE

- 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			Voltage (Approx.)	
Connector Terminal				
M71	17	Ground	0.5 – 3 V	

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 3.

3.CHECK THE BACK UP SIGNAL CIRCUIT

1. Disconnect each control module harness connector.

2. Check the continuity between both control module harness connectors.

Steering force control module		Steering angle main control module		Continuity
Connector	Terminal	Connector Terminal		Continuity
M71	17	E26	24	Existed

3. Check the continuity between steering force control module harness connector and ground.

Steering force	control module		Continuity	
Connector Terminal			Continuity	
M71	17	Ground	Not existed	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected part.

4.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 <u>STC-95. "DTC Index"</u>.
- NO >> GO TO 5.

5.CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering force control module. Refer to STC-427, "Removal and Installation".

NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

DTC DETECTION LOGIC

INFOID:000000009784945

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

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. Terminal voltage < 0.5 V 3 V < Terminal voltage 	
 POSSIBLE Back up c or short. 	CAUSE ircuit (between steering angle main cont	rol module and steering angle sub control module) is open	
Steering aSteering a	angle main control module angle sub control module		
FAIL-SAFE • Mode 3 NOTE: For fail-sa	fe mode, refer to <u>STC-47, "DIRECT AD/</u>	APTIVE STEERING : Fail-safe".	
DTC CON	FIRMATION PROCEDURE		
1.PRECO	NDITIONING		
If "DTC CO wait at least	NFIRMATION PROCEDURE" has been t 10 seconds before conducting the next	previously conducted, always turn ignition switch OFF and test.	
>>	GO TO 2.		
2.dtc re	PRODUCTION PROCEDURE		
With CO 1. Start the CAUTIC Never	NSULT e engine. ON: drive the vehicle.		
2. Perform	n self-diagnosis for "DAST 1".		
YES >> NO-1 >> NO-2 >>	Proceed to diagnosis procedure. Refer To check malfunction symptom before r Confirmation after repair: INSPECTION	to <u>STC-165, "DAST 1 : Diagnosis Procedure"</u> . epair: Refer to <u>GI-43, "Intermittent Incident"</u> . END	
DAST 1 :	Diagnosis Procedure	INFOID:000000009784946	
1.снеск	STEERING ANGLE MAIN CONTROL M	IODULE SINGNAL	
With CO 1. Turn the 2. On the 3. Check	NSULT e ignition switch ON. CONSULT screen, select "DAST 1" >> " the value	DATA MONITOR" >> "BACK UP SIG 1 VOLT".	
	Monitor item	Standard value (Approx.)	
BACK UP SI	G 1 VOLT	0.5 – 3 V	
Is the inspe YES >> NO >>	ction result normal? GO TO 5. GO TO 2.		
∠.CHECK	THE INPUT SIGNAL VOLTAGE		

2. Check the voltage between steering angle main control module harness connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

Steering angle ma	ain control module		Voltage (Approx.)
Connector Terminal			Voltage (Approx.)
E26	17	Ground	0.5 – 3 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 3.

3.CHECK THE BACK UP SIGNAL CIRCUIT

1. Disconnect each control module harness connector.

Check the continuity between both control module harness connectors.

Steering angle ma	Steering angle main control module Steering angle sub control module		Continuity	
Connector	Terminal	Connector	Terminal	Continuity
E26	17	E29	22	Existed

3. Check the continuity between steering force control module harness connector and ground.

Steering angle main control module			Continuity
Connector	Terminal		Continuity
E26	17	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected part.

4.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 <u>STC-110, "DTC Index"</u>.

NO >> GO TO 5.

5. CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to STC-428, "Removal and Installation".

NO >> Repair or replace error-detected part.

DAST 2

DAST 2 : DTC Description

INFOID:000000009784947

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. Terminal voltage < 0.5 V 3 V < Terminal voltage

POSSIBLE CAUSE

Back up circuit (between steering angle sub control module and steering angle main control module) is oper or short. Steering angle sub control module Steering angle sub control module Steering angle main control module harness connector Steering angle main control module Steering angle sub control module harness connector and ground. Steering angle sub control module harness connector Steering angle sub control module Steering angle sub control mo	< DTC/CIRCUIT DIAGNOSIS >	[DIRECT ADAPTIVE STEERING]
Steering angle sub control module Steering angle main control module Mode 2 NOTE: For fail-safe Mode 2 I.PRECONDITIONING If "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. S 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-167. "DAST 2." Diagnosis Procedure". NO-1 >> To check maffunction symptom before repair: Refer to G1-43. "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END DAST 2: Diagnosis Procedure 1.CHECK STEERING ANGLE SUB CONTROL MODULE SINGNAL (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 Monitor item Monitor item Monitor item Monitor item Standard value (Approx.) Is the inspection result normal? YES >> GO TO 5. NO >> GO TO 2. 2.CHECK THE INPUT SIGNAL VOLTAGE 1. Disconnect steering angle sub control module harness connector and ground. Steering angle sub control module harness connector and ground. 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 harness connector: Connector Terminal Connector Terminal Connector Terminal Connector Terminal Connector Connector Terminal Connector Connector Connector Terminal Connecto	Back up circuit (between steering angle sub control or short.	module and steering angle main control module) is open
• Steering angle main control module FAIL-SAFE FAIL-SAFE WortE: For fail-safe mode, refer to <u>STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe"</u> . DTC CONFIRMATION PROCEDURE 1.PRECONDITIONING ff "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 C'13A8-00" detected? YES >> Proceed to diagnosis procedure. Refer to <u>STC-167, "DAST 2 : Diagnosis Procedure"</u> . NO-1 >> To check maffunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u> . NO-2 >> Confirmation after repair: INSPECTION END DAST 2 : Diagnosis Procedure 1. CHECK STEERING ANGLE SUB CONTROL MODULE SINGNAL @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 Monitor item Standard value (Approx.) BACK UP SIG 1 VOLT SIG 1 VOLT 0.5-3 V Is the inspection result normal? YES >> GO TO 5. NO	Steering angle sub control module	
FAIL-SAFE • Mode 2 NOTE: For fail-safe mode, refer to <u>STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe"</u> . DTC CONFIRMATION PROCEDURE 1.PRECONDITIONING II "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. CAUTTON: Never drive the vehicle. 2. Perform self-diagnosis for "DAST 2". Is DTC "CI3A8-00" detected? YES >> Proceed to diagnosis procedure. Refer to <u>STC-167, "DAST 2: Diagnosis Procedure"</u> . NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u> . NO-2 >> Confirmation after repair: INSPECTION END DAST 2: Diagnosis Procedure 1. CHECK STEERING ANGLE SUB CONTROL MODULE SINGNAL With CONSULT 1. Turn the ignition switch ON. 2. On the CONSULT 0.5-3 V Is the inspection result normal? YES >> GO TO 5. NO >> GO TO 2. 2.CHECK THE INPUT SIGNAL VOLTAGE 1. Disconnect steering angle sub control module harness connector. 3. Check the voltage between steering angle sub control module harness connector. 3. Check the voltage between steering angle sub control module harness connector. 3. Check the voltage between steering angle sub control module harness connector. 3. Check the voltage between steering angle sub control module harness connector. 3. Check the voltage between steering angle sub control module harness connector. 3. Check the voltage between steering angle sub control module harness connector. 3. Check the voltage between steering angle sub control module harness connector. 3. Check the voltage between steering angle sub control module harness connector. 3. Check the voltage between steering angle sub control module harness connector. 3. Check the voltage between steering angle sub control module harness connector. 3. Check the voltage between steering angle sub control module harness connector. 3. Check the voltage between steering angle sub control module harness connector. 3. Check the volta	 Steering angle main control module 	
• Mode 2 NoTE: For fail-safe mode, refer to STC-47. "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 YES YES > Proceed to diagnosis procedure. Refer to STC-167. "DAST 2.: Diagnosis Procedure". NO-1 >> To check malfunction symptom before repair: Refer to GI-43. "Intermittent Incident". NO-2 NO-1 >> To check malfunction symptom before repair: Refer to GI-43. "Intermittent Incident". NO-2 NO-1 >> To check malfunction symptom before repair: Refer to GI-43. "Intermittent Incident". NO-2 NO-1 >> To check malfunction symptom before repair: Refer to GI-43. "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END DAST 2: Diagnosis Procedure 1. Turn the ignition switch ON. 2. On the 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 BACK UP SIG 1 VOLT So G TO 5. NO S GO TO 5. NO S GO TO 5	FAIL-SAFE	
NOTE: For fail-safe mode, refer to STC-47. "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-167. "DAST 2 : Diagnosis Procedure". NO-1 >> To check malfunction symptom before repair: Refer to GI-43. "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END DAST 2 : Diagnosis Procedure	Mode 2	
The field of the second secon	NOTE: For fail-safe mode_refer to STC-47_"DIRECT ADAR	PTIVE STEERING · Fail-safe"
1. PRECONDITIONING 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-167. "DAST 2 : Diagnosis Procedure". NO-1 > To check malfunction symptom before repair: Refer to GL-43. "Intermittent Incident". NO-2 > Confirmation after repair: INSPECTION END DAST 2 : Diagnosis Procedure	DTC CONFIRMATION PROCEDURE	
In Trade 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-167, "DAST 2 : Diagnosis Procedure". NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident". NO-2 > Confirmation after repair: INSPECTION END DAST 2 : Diagnosis Procedure		
In Die Contribution of the optimized in a been previously conducted, always turning inton switch of that wait at least 10 seconds before conducting the next test.		reviewely conducted, always turn ignition switch OEE and
>> 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 <u>STC-167</u> . "DAST 2 : Diagnosis Procedure". NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43</u> . "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END DAST 2 : Diagnosis Procedure 1. CHECK STEERING ANGLE SUB CONTROL MODULE SINGNAL 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 BACK UP SIG 1 VOLT USE >> GO TO 5. NO >> GO TO 2. 2. CHECK THE INPUT SIGNAL VOLTAGE 1. Disconnect steering angle sub control module harness connector and ground. Steering angle sub control module harness connector and ground. Steering angle sub control module harness connector and ground.	wait at least 10 seconds before conducting the next te	est.
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-167. "DAST 2 : Diagnosis Procedure". NO-1 NO-1 >> To check maffunction symptom before repair: Refer to G1-43. "Intermittent Incident". NO-2 NO-2 >> Confirmation after repair: INSPECTION END DAST 2 : Diagnosis Procedure ************************************	>> GO TO 2	
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-167. "DAST 2 : Diagnosis Procedure". NO-1 >> To check malfunction symptom before repair: Refer to GI-43. "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END DAST 2 : Diagnosis Procedure Intermittent Incident". 1. CHECK STEERING ANGLE SUB CONTROL MODULE SINGNAL Immonstrate and the age of th		
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-167. "DAST 2 : Diagnosis Procedure". NO-1 >> To check malfunction symptom before repair: Refer to GI-43. "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END DAST 2 : Diagnosis Procedure ************************************		
Mever drive the vehicle. 2. Perform self-diagnosis for "DAST 2". Is DTC "C13A8-00" detected? YES >> Proceed to diagnosis procedure. Refer to STC-167, "DAST 2 : Diagnosis Procedure". NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END DAST 2 : Diagnosis Procedure	B)With CONSULI Start the engine	
Never drive the vehicle. 2. Perform self-diagnosis for "DAST 2". Is DTC "C13A8-00" detected? YES >> Proceed to diagnosis procedure. Refer to STC-167. "DAST 2 : Diagnosis Procedure". NO-1 >> To check malfunction symptom before repair: Refer to GI-43. "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END DAST 2 : Diagnosis Procedure #FORECONDEND DAST 2 : Diagnosis Procedure #FORECONDEND I. CHECK STEERING ANGLE SUB CONTROL MODULE SINGNAL #FORECONDENDEND @With CONSULT 1. Turn the ignition switch ON. 1. Turn the ignition switch ON. 0. the CONSULT screen, select "DAST 2" >> "DATA MONITOR" >> "BACK UP SIG 1 VOLT". 3. Check the value 0.5 - 3 V Is the inspection result normal? YES >> GO TO 5. NO >> GO TO 2. 2. 2. CHECK THE INPUT SIGNAL VOLTAGE 1. 1. Disconnect steering angle sub control module harness connector. 2. 2. Check the voltage between steering angle sub control module harness connector and ground. Steering angle sub control module	CAUTION:	
2. Perform self-diagnosis for DAST 2 . Is DTC "C13A8-00" detected? YES >> Proceed to diagnosis procedure. Refer to STC-167. "DAST 2 : Diagnosis Procedure". NO-1 >> To check malfunction symptom before repair: Refer to GI-43. "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END DAST 2 : Diagnosis Procedure ##00000000000000000000000000000000000	Never drive the vehicle.	
YES >> Proceed to diagnosis procedure. Refer to STC-167, "DAST 2 : Diagnosis Procedure". NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END DAST 2 : Diagnosis Procedure ####################################	2. Perform self-diagnosis for "DAST 2".	
Instruction symptotes by boccuties to girceftor. Day 12. Diagnosis Procedure. NO-1 >> To check malfunction symptome before repair: Refer to GI-43. "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END DAST 2 : Diagnosis Procedure Intermittent Incident". I.CHECK STEERING ANGLE SUB CONTROL MODULE SINGNAL Intermittent Incident". I.CHECK STEERING ANGLE SUB CONTROL MODULE SINGNAL Intermittent Incident". I.Turn the ignition switch ON. . 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 0.5-3 V Monitor item Standard value (Approx.) BACK UP SIG 1 VOLT Integration result normal? YES > GO TO 5. NO >> GO TO 2. CHECK THE INPUT SIGNAL VOLTAGE 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.) E29	<u>SDIC CISAO-00 delected?</u>	STC 167 "DAST 2 : Diagnosis Procedure"
DAST 2 : Diagnosis Procedure INFORMATION PROFESSION FUNCTION 1.CHECK STEERING ANGLE SUB CONTROL MODULE SINGNAL Image: Standard Stream Stre	NO-1 >> To check malfunction symptom before rep NO-2 >> Confirmation after repair: INSPECTION E	pair: Refer to <u>GI-43, "Intermittent Incident"</u> . END
1.CHECK STEERING ANGLE SUB CONTROL MODULE SINGNAL 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 - 3 V Is the inspection result normal? YES >> GO TO 5. NO >> GO TO 2. 2.CHECK THE INPUT SIGNAL VOLTAGE 1. Disconnect steering angle sub control module harness connector. 2. Check the voltage between steering angle sub control module harness connector. 2. Check the voltage between steering angle sub control module harness connector. 2. Check the voltage between steering angle sub control module harness connector. 2. Check the voltage between steering angle sub control module harness connector. 2. Check the voltage between steering angle sub control module harness connector. 2. Check the voltage between steering angle sub control module harness connector. 2. Check the voltage between steering angle sub control module harness connector. 2. Check the voltage between steering angle sub control module harness connector. 2. E29 17	DAST 2 : Diagnosis Procedure	
1. CHECK STEERING ANGLE SUB CONTROL MODULE SINGNAL Image: Subscript of the state of		INFOID:00000009784948
BWith 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 Monitor item Monitor item Standard value (Approx.) BACK UP SIG 1 VOLT Standard value (Approx.) Standard value (Approx.) Steering angle sub control module harness connector. Connector Terminal Voltage (Approx.) Connector Terminal On the colspan Steering angle sub control module Connector Voltage (Approx.) <td>1.CHECK STEERING ANGLE SUB CONTROL MOD</td> <td>DULE SINGNAL</td>	1.CHECK STEERING ANGLE SUB CONTROL MOD	DULE SINGNAL
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 Steering result normal? YES >> GO TO 2. CHECK THE INPUT SIGNAL VOLTAGE 1. Disconnect steering angle sub control module harness connector. Monitor Voltage (Approx.) Connector Terminal		
Monitor item Standard value (Approx.) BACK UP SIG 1 VOLT 0.5 - 3 V BACK UP SIG 1 VOLT 0.5 - 3 V Is the inspection result normal? YES YES >> GO TO 5. NO >> GO TO 2. 2.CHECK THE INPUT SIGNAL VOLTAGE 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 Connector Terminal E29 17	1. Turn the ignition switch ON.	
Monitor item Standard value (Approx.) BACK UP SIG 1 VOLT 0.5 - 3 V Is the inspection result normal? YES >> GO TO 5. YES >> GO TO 2. 2.CHECK THE INPUT SIGNAL VOLTAGE 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 — Voltage (Approx.) E29 17 Ground 0.5 - 3 V	3. Check the value	ATA MONITOR >> BACK OF SIG I VOLI .
Monitor item Standard value (Approx.) BACK UP SIG 1 VOLT 0.5 - 3 V Is the inspection result normal? YES >> GO TO 5. YES >> GO TO 2. 2.CHECK THE INPUT SIGNAL VOLTAGE 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.) Steering angle sub control module — Voltage (Approx.) E29 17 Ground 0.5 - 3 V		
BACK UP SIG 1 VOLT 0.5 – 3 V s the inspection result normal? YES >> GO TO 5. NO >> GO TO 2. 2.CHECK THE INPUT SIGNAL VOLTAGE 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	Monitor item	Standard value (Approx.)
s the inspection result normal? YES >> GO TO 5. NO >> GO TO 2. 2.CHECK THE INPUT SIGNAL VOLTAGE 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 Connector Terminal E29 17 Ground 0.5 – 3 V	BACK UP SIG 1 VOLT	0.5 – 3 V
YES >> GO TO 5. NO >> GO TO 2. 2.CHECK THE INPUT SIGNAL VOLTAGE 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	s the inspection result normal?	
NO >> GO TO 2. 2.CHECK THE INPUT SIGNAL VOLTAGE 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 Connector Terminal E29 17 Ground	YES >> GO TO 5.	
2.CHECK THE INPUT SIGNAL VOLTAGE 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	NO $>>$ GO IO 2.	
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 Connector Terminal E29 17 Ground 0.5 – 3 V	2.CHECK THE INPUT SIGNAL VOLTAGE	
Steering angle sub control module	 Disconnect steering angle sub control module ha Check the voltage between steering angle sub co 	rness connector. ontrol module harness connector and ground.
ConnectorTerminalVoltage (Approx.)E2917Ground $0.5 - 3$ V	Steering angle sub control module	
E29 17 Ground 0.5 – 3 V	Connector Terminal	Voltage (Approx.)
	E29 17	Ground 0.5 – 3 V
Is the inspection result normal?	Is the inspection result normal?	
YES >> GO TO 5. NO >> GO TO 3.	YES >> GO TO 5. NO >> GO TO 3.	
YES >> GO TO 5. NO >> GO TO 3.	YES >> GO TO 5. NO >> GO TO 3.	

3.CHECK THE BACK UP SIGNAL CIRCUIT

1. Disconnect each control module harness connector.

2. Check the continuity between both control module harness connectors.

< DTC/CIRCUIT DIAGNOSIS >

Steering angle s	ub control module	Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E29	17	E26	24	Existed

3. Check the continuity between steering angle sub control module harness connector and ground.

Steering angle sub control module			Continuity	
Connector	Terminal		Continuity	
E29	17	Ground	Not existed	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected part.

4.PERFORM SELF-DIAGNOSIS

() With CONSULT

- 1. Connect each control module harness connector.
- 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-95, "DTC Index".
- NO >> GO TO 5.

5. CHECK INTERMITTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to <u>STC-429, "Removal and Installation"</u>.
- NO >> Repair or replace error-detected part.

C13A9-00 BACK UP CIRCUIT **EPS/DAST 3**

EPS/DAST 3 : DTC Description

INFOID:000000009784949

А

В

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. Terminal voltage < 0.5 V 3 V < Terminal voltage
POSSIBLE	CAUSE	
 Back up c short. 	sircuit (between steering force control mod	ule and steering angle sub control module) is open or
• Steering for	orce control module	
Mode 2		
NOTE:	fo mode, refer to STC 47 "DIRECT ADAR"	
		TIVE STEEKING . Lairsale.
If "DTC COI	NFIRMATION PROCEDURE" has been pre	eviously conducted, always turn ignition switch OFF and
wait at least	10 seconds before conducting the next tes	St.
>>	GO TO 2.	
2.DTC REI	PRODUCTION PROCEDURE	
With CO	NSULT	
1. Start the CAUTIC	e engine. <mark>DN:</mark>	
Never of	drive the vehicle.	
Is DTC "C1:	3A9-00" detected?	
YES >>	Proceed to diagnosis procedure. Refer to	STC-169, "EPS/DAST 3 : Diagnosis Procedure".
NO-1 >> NO-2 >>	To check malfunction symptom before repair: Confirmation after repair: INSPECTION EN	air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND
EPS/DAS	T 3 : Diagnosis Procedure	INF01D-00000002784950
1		
I.CHECK	STEERING FORCE CONTROL MODULE	SINGNAL
With COI	NSULT	
1 1 1 1 1 1 1 1 1 1	CONSULT screen, select "EPS/DAST 3" >:	> "DATA MONITOR" >> "BACK UP SIG 2 VOLT".
2. On the		
 On the Check t 	he value	
2. On the 3. Check t	he value Monitor item	Standard value (Approx.)

YES >> GO TO 5.

NO >> GO TO 2.

< DTC/CIRCUIT DIAGNOSIS >

2. CHECK THE INPUT SIGNAL VOLTAGE

- 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			Voltage (Approx.)
Connector	Terminal		voliage (Applox.)
M71	18	Ground	0.5 – 3 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 3.

3.CHECK THE BACK UP SIGNAL CIRCUIT

1. Disconnect each control module harness connector.

2. Check the continuity between both control module harness connectors.

Steering force	control module	Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M71	18	E29	24	Existed

3. Check the continuity between steering force control module harness connector and ground.

Steering force control module			Continuity
Connector	Terminal		Continuity
M71	18	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected part.

4.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 <u>STC-110, "DTC Index"</u>.

NO >> GO TO 5.

5.CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering force control module. Refer to STC-427, "Removal and Installation".

NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

DTC DETECTION LOGIC

INFOID:000000009784951

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

(Trouble diagnosis content)	Malfunction detected condition
BACK UP CIRCUIT (Back up circuit)	 The signal voltage of back up circuit is following condition for 1 second or more continuously. Terminal voltage < 0.5 V 3 V < Terminal voltage
CAUSE	
ircuit (between steering angle main con	trol module and steering force control module) is open or
ngle main control module prce control module	
ie mode, refer to <u>STC-47, "DIRECT AD</u> /	APTIVE STEERING : Fail-safe".
IDITIONING	
IFIRMATION PROCEDURE" has been 10 seconds before conducting the next	previously conducted, always turn ignition switch OFF and test.
GO TO 2.	
PRODUCTION PROCEDURE	
NSULT e engine. DN: Irive the vehicle.	
self-diagnosis for "DAST 1".	
Proceed to diagnosis procedure. Refer To check malfunction symptom before r Confirmation after repair: INSPECTION	to <u>STC-171, "DAST 1 : Diagnosis Procedure"</u> . epair: Refer to <u>GI-43, "Intermittent Incident"</u> . END
Diagnosis Procedure	INFOID:000000009784952
STEERING FORCE CONTROL MODUL	LE SINGNAL
ISULT e ignition switch ON. CONSULT screen, select "DAST 1" >> " he value	DATA MONITOR" >> "BACK UP SIG 2 VOLT".
Monitor item	Standard value (Approx.)
3 2 VOLT	0.5 – 3 V
ction result normal? GO TO 5. GO TO 2.	
THE INPUT SIGNAL VOLTAGE	
	BACK UP CIRCUIT (Back up circuit) CAUSE rcuit (between steering angle main con angle main control module rce control module re mode, refer to <u>STC-47</u> , " <u>DIRECT AD</u> / IRMATION PROCEDURE IDITIONING IFIRMATION PROCEDURE" has been and 10 seconds before conducting the next GO TO 2. PRODUCTION PROCEDURE ISULT a engine. N: Irive the vehicle. self-diagnosis for "DAST 1". <u>A9-00" detected?</u> Proceed to diagnosis procedure. Refer To check malfunction symptom before r Confirmation after repair: INSPECTION Diagnosis Procedure STEERING FORCE CONTROL MODUL ISULT a ignition switch ON. CONSULT screen, select "DAST 1" >> " he value Monitor item 3 2 VOLT <u>ction result normal?</u> GO TO 5. GO TO 2. IFHE INPUT SIGNAL VOLTAGE

Check the voltage between steering angle main control module narness connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

Steering angle main control module			Voltage (Approx.)
Connector	Terminal		Volidge (Applox.)
E26	18	Ground	0.5 – 3 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 3.

3.CHECK THE BACK UP SIGNAL CIRCUIT

1. Disconnect each control module harness connector.

2. Check the continuity between both control module harness connectors.

Steering angle ma	ain control module	Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E26	18	M71	22	Existed

3. Check the continuity between steering force control module harness connector and ground.

Steering angle main control module			Continuity
Connector	Terminal		Continuity
E26	18	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected part.

4.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 <u>STC-80, "DTC Index"</u>.

NO >> GO TO 5.

5. CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to STC-428, "Removal and Installation".

NO >> Repair or replace error-detected part.

DAST 2

DAST 2 : DTC Description

INFOID:000000009784953

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. Terminal voltage < 0.5 V 3 V < Terminal voltage

POSSIBLE CAUSE

< DTC/CIRCUIT DIAGNOSIS >	[DIRECT ADAPTIVE STEERING]
• 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	
For fail-safe mode, refer to STC-47, "DIRECT ADAP"	TIVE STEERING : Fail-safe".
DTC CONFIRMATION PROCEDURE	
	aviously conducted always turn ignition switch OFF and
wait at least 10 seconds before conducting the next tes	st.
>> GO TO 2.	
2. DTC REPRODUCTION PROCEDURE	
1. Start the engine. CAUTION:	
Never drive the vehicle.	
2. Perform self-diagnosis for "DAST 2".	-
YES >> Proceed to diagnosis procedure. Refer to 1	STC-173 "DAST 2 : Diagnosis Procedure"
NO-1 >> To check malfunction symptom before repaired	air: Refer to <u>GI-43, "Intermittent Incident"</u> .
NO-2 >> Confirmation after repair: INSPECTION EI	ND
DAST 2 : Diagnosis Procedure	INFOID:00000009784954
1. CHECK STEERING FORCE CONTROL MODULE	SINGNAL
With CONSULT	
1. Turn the ignition switch ON.	ATA MONITOR" >> "BACK LIP SIG 2 VOLT"
3. Check the value	
	Standard value (Approx.)
Is the inspection result normal?	0.5 – 3 V
YES >> GO TO 5.	
NO >> GO TO 2.	
2. CHECK THE INPUT SIGNAL VOLTAGE	
1. Disconnect steering angle sub control module har	ness connector.
2. Check the voltage between steering angle sub cor	and module namess connector and ground.
Steering angle sub control module	– Voltage (Approx.)
Connector Terminal	
E29 18	Ground 0.5 – 3 V
Is the inspection result normal?	
YES >> GUTU5. NO >> GOTO3.	

J.CHECK THE BACK UP SIGNAL CIRCUIT

1. Disconnect each control module harness connector.

2. Check the continuity between both control module harness connectors.

< DTC/CIRCUIT DIAGNOSIS >

Steering angle sub control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E29	18	M71	24	Existed

3. Check the continuity between steering force control module harness connector and ground.

Steering angle sub control module			Continuity
Connector	Terminal	—	Continuity
E29	18	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected part.

4.PERFORM SELF-DIAGNOSIS

() With CONSULT

- 1. Connect each control module harness connector.
- 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-80, "DTC Index".
- NO >> GO TO 5.

5. CHECK INTERMITTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to <u>STC-429, "Removal and Installation"</u>.
- NO >> Repair or replace error-detected part.

C13AA-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009784955

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В

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AA-00	CONTROL MODULE (Control module)	The inside relay malfunction in control module is detected when the system is starting.
POSSIBLE Steering for 	CAUSE orce control module	
FAIL-SAFE • Mode 2 NOTE: For fail-sa	fe mode, refer to <u>STC-47, "DIRECT ADA</u>	APTIVE STEERING : Fail-safe".
DTC CON	FIRMATION PROCEDURE	
1.PRECOM	NDITIONING	
If "DTC COI wait at least	NFIRMATION PROCEDURE" has been p t 10 seconds before conducting the next	previously conducted, always turn ignition switch OFF and test.
>> 2. dtc re	GO TO 2. PRODUCTION PROCEDURE	
With CO Start the CAUTIC Never c 2. Perform	NSULT e engine. ON: d rive the vehicle. n self-diagnosis for "EPS/DAST 3".	
Is DTC "C13 YES >> NO-1 >> NO-2 >>	<u>3AA-00" detected?</u> Proceed to diagnosis procedure. Refer to To check malfunction symptom before re Confirmation after repair: INSPECTION	to <u>STC-175, "EPS/DAST 3 : Diagnosis Procedure"</u> . epair: Refer to <u>GI-43, "Intermittent Incident"</u> . END
EPS/DAS	ST 3 : Diagnosis Procedure	INFOID:000000009784956
1.PERFOR	RM SELF-DIAGNOSIS	
With CO 1. Turn the 2. Erase s 3. Turn the 4. Start the	NSULT e ignition switch ON. self-diagnosis for "EPS/DAST 3". e ignition switch OFF and wait for at leas e engine.	st 10 seconds.
CAUTION Never 0 5. Perform	ongine ON: drive the vehicle. n self-diagnosis for "EPS/DAST 3".	
Is DTC "C1; YES >> NO >> DAST 1	<u>3AA-00" detected?</u> Replace steering force control module. Check the intermittent incident. Refer to	Refer to STC-427. "Removal and Installation". GI-43. "Intermittent Incident".
DAST 1 :	DTC Description	INFOID:00000009784957
DTC DETE	ECTION LOGIC	

C13AA-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AA-00	CONTROL MODULE (Control module)	The inside relay malfunction in control module is detected when the system is starting.

POSSIBLE CAUSE

• Steering angle main control module

FAIL-SAFE

Mode 3

NOTE:

For fail-safe mode, refer to STC-47, "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 "C13AA-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-176. "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009784958

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.
- Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13AA-00" detected?

- YES >> Replace steering angle main control module. Refer to <u>STC-428. "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

DAST 2

DAST 2 : DTC Description

INFOID:000000009784959

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AA-00	CONTROL MODULE (Control module)	The inside relay malfunction in control module is detected when the system is starting.

POSSIBLE CAUSE

C13AA-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >	[DIRECT ADAPTIVE STEERING]
 Steering angle sub control module 	
FAIL-SAFE	
• Mode 2	
For fail-safe mode, refer to <u>STC-47, "DIRECT ADAPTIVE STEERING</u>	: Fail-safe".
DTC CONFIRMATION PROCEDURE	
1.preconditioning	(
If "DTC CONFIRMATION PROCEDURE" has been previously conducted wait at least 10 seconds before conducting the next test.	ed, always turn ignition switch OFF and
>> GO TO 2.	
2.DTC REPRODUCTION PROCEDURE	
(F)With CONSULT	
1. Start the engine.	
Never drive the vehicle.	F
2. Perform self-diagnosis for "DAST 2".	
Is DTC "C13AA-00" detected?	S
 NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-4</u> NO-2 >> Confirmation after repair: INSPECTION END 	2 : Diagnosis Procedure". 3. "Intermittent Incident".
DAST 2 : Diagnosis Procedure	INFOID:00000009784960
1. PERFORM SELF-DIAGNOSIS	
With CONSULT	
1. Turn the ignition switch ON.	
 Turn the ignition switch OFF and wait for at least 10 seconds. 	· · · · · · · · · · · · · · · · · · ·
4. Start the engine.	
Never drive the vehicle.	ł
5. Perform self-diagnosis for "DAST 2".	
<u>Is DTC "C13AA-00" detected?</u>	
YES >> Replace steering angle sub control module. Refer to <u>STC-4</u>	29 Removal and Installation
NO >> Check the intermittent incident. Refer to GI-43, Intermitten	t Incident".
NO >> Check the intermittent incident. Refer to <u>GI-43, intermitten</u>	t Incident".
NO >> Check the intermittent incident. Refer to GI-43, Intermitten	t Incident".
NO >> Check the intermittent incident. Refer to GI-43, intermitten	<u>t Incident"</u> .
NO >> Check the intermittent incident. Refer to GI-43, intermitten	t Incident".

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C13AB-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009784961

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. Malfunction of internal relay Malfunction of each backup circuit Malfunction of steering clutch 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
- Steering force control module

FAIL-SAFE

- Mode 2
- NOTE:

For fail-safe mode, refer to <u>STC-47. "DIRECT ADAPTIVE STEERING : Fail-safe"</u>.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC "C13AB-00" is displayed with DTC "C13A8-00", "C13A9-00" 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-163, "EPS/DAST 3 : Diagnosis Procedure".

- YES-2 (C13A9-00 is detected)>>Refer to STC-169, "EPS/DAST 3 : Diagnosis Procedure".
- YES-3 (C13E0-00 is detected)>>Refer to STC-352, "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".

Is DTC "C13AB-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-179, "EPS/DAST 3 : Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43</u>, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

INFOID:000000009784963

F

EPS/DAST 3 : Diagnosis Procedure	INFOID:000000009784962	Λ
1.PERFORM SELF-DIAGNOSIS		A
 With CONSULT 1. Turn the ignition switch ON. 2. Frase self-diagnosis for "EPS/DAST 3" 		В
 Turn the ignition switch OFF and wait for at least 10 seconds. Start the engine. CAUTION: Never drive the vehicle 		С
5. Perform self-diagnosis for "EPS/DAST 3". <u>Is DTC "C13AB-00" detected?</u>		D
YES >> Replace steering force control module. Refer to <u>STC-427, "Removal and Installation</u> NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u> . DAST 1	<u>n"</u> .	Е

DAST 1 : DTC Description

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	ST
C13AB-00	CONTROL MODULE (Control module)	Steering angle main control module detects the following status when the system is starting. • Malfunction of internal relay • Malfunction of each backup circuit	Н
POSSIBLE	CAUSE	·	
Back up c	ircuit (between steering angle main control	module and steering angle sub control module) is open	
 or short. Back up of short. Steering a 	xircuit (between steering angle main contro	ol module and steering force control module) is open or	J
FAIL-SAFF			K
• Mode 3	-		
NOTE:	to mode refer to STC 47 "DIDECT ADAD		
For fall-sa	The mode, refer to <u>STC-47, DIRECT ADAP</u>	TIVE STEERING : Fail-safe.	L
	-IRMATION PROCEDURE		
1.CHECK	DTC PRIORITY		М
If DTC "C13 (trouble dia	AB-00" is displayed with DTC "C13A8-00" gnosis) for DTC "C13AB-00".	or "C13A9-00", first perform the confirmation procedure	1 1 1
Is applicable	e DTC detected?		Ν
YES-1 (C1 YES-2 (C1 NO >>	3A8-00 is detected)>>Refer to <u>STC-165, "</u> 3A9-00 is detected)>>Refer to <u>STC-171, "</u> GO TO 2.	<u>'DAST 1 : Diagnosis Procedure"</u> . 'DAST 1 : Diagnosis Procedure".	
2.PRECO	NDITIONING		0
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and st.	Ρ
>>	GO TO 3.		

3.DTC REPRODUCTION PROCEDURE

(B) With CONSULT 1. Start the engine.

CAUTION:

C13AB-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13AB-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-180, "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

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-428, "Removal and Installation".
- NO >> Check the intermittent incident. Refer to GI-43, "Intermittent Incident",

DAST 2

DAST 2 : DTC Description

INFOID:000000009784965

INFOID:000000009784964

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.Malfunction of internal relayMalfunction of each backup 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.
- Steering angle sub control module

FAIL-SAFE

- Mode 2
- NOTE:

For fail-safe mode, refer to STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe".

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC "C13AB-00" is displayed with DTC "C13A8-00" or "C13A9-00", first perform the confirmation procedure (trouble diagnosis) for DTC "C13AB-00".

Is applicable DTC detected?

YES-1 (C13A8-00 is detected)>>Refer to STC-167, "DAST 2 : Diagnosis Procedure".

YES-2 (C13A9-00 is detected)>>Refer to STC-173, "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.

STC-180
>> GO TO 3.	А
Order Reproduction Procedure Order Pr	В
 Never drive the vehicle. 2. Perform self-diagnosis for "DAST 2". Is DTC "C13AB-00" detected? 	С
 YES >> Proceed to diagnosis procedure. Refer to <u>STC-181, "DAST 2 : Diagnosis Procedure"</u>. NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>. NO-2 >> Confirmation after repair: INSPECTION END 	D
DAST 2 : Diagnosis Procedure	Е
1.PERFORM SELF-DIAGNOSIS	
 With CONSULT 1. Turn the ignition switch ON. 2. Erase self-diagnosis for "DAST 2". 	F
 Turn the ignition switch OFF and wait for at least 10 seconds. Start the engine. 	STC
Never drive the vehicle. 5. Perform self-diagnosis for "DAST 2". <u>Is DTC "C13AB-00" detected?</u>	Η
 YES >> Replace steering angle sub control module. Refer to <u>STC-429, "Removal and Installation"</u>. NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>. 	I
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	Ρ

C13AC-00 CONTROL MODULE DAST 1

DAST 1 : DTC Description

INFOID:000000009784967

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.Malfunction of internal relayMalfunction of each backup 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.
- Steering angle main control module

FAIL-SAFE

Mode 3
 NOTE:

For fail-safe mode, refer to STC-47, "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-165. "DAST 1 : Diagnosis Procedure".

YES-2 (C13A9-00 is detected)>>Refer to STC-171, "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-182, "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

1.PERFORM SELF-DIAGNOSIS

With CONSULT

- Turn the ignition switch ON.
- 2. Erase self-diagnosis for "DAST 1".

C13AC-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

3. 4.	Turn the ignition switch OFF and wait for at least 10 seconds. Start the engine. CAUTION:	A
5. <u>Is E</u>	Perform self-diagnosis for "DAST 1". DTC "C13AC-00" detected?	В
YE N(>> Replace steering angle main control module. Refer to <u>STC-428, "Removal and Installation"</u>. >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>. 	С
		D

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C13AD-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009784969

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AD-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-47. "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-184, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009784970

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 "C13AD-00" detected?

- YES >> Replace steering force control module. Refer to <u>STC-427. "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

DAST 1

DAST 1 : DTC Description

INFOID:000000009784971

DTC DETECTION LOGIC

C13AD-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item	Malfunction detected condition	A
C13AD-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.	
POSSIBLE • Steering a	E CAUSE angle main control module	L	В
FAIL-SAFE • Mode 3			С
For fail-sa	fe mode, refer to <u>STC-47, "DIRECT ADAP</u>	TIVE STEERING : Fail-safe".	D
DTC CON	FIRMATION PROCEDURE		
1.PRECO	NDITIONING		E
If "DTC CO wait at least	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and st.	_
	60 TO 2		F
2.DTC RE	PRODUCTION PROCEDURE		0.7
(P)With CO	NSULT		ST
1. Start th CAUTION Never 2. Perform	e engine. ON: drive the vehicle. n self-diagnosis for "DAST 1".		Η
Is DTC "C13	3AD-00" detected?		1
YES >> NO-1 >> NO-2 >>	Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep Confirmation after repair: INSPECTION E	<u>STC-185, "DAST 1 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND	
DAST 1 :	Diagnosis Procedure	INFOID:000000009784972	J
1			
			Κ
1. Turn the 2. Erase s	e ignition switch ON. self-diagnosis for "DAST 1".	10 seconds	L
4. Start th	e engine. ON:	IU Seconds.	M
5. Perform	n self-diagnosis for "DAST 1".		
<u>Is DTC "C1</u> YES >>	3AD-00" detected? Replace steering angle main control modu	Ile. Refer to STC-428, "Removal and Installation".	Ν
NO >> DAST 2	Check the intermittent incident. Refer to G	il-43, "Intermittent Incident".	0
DAST 2 :	DTC Description	INFOID:000000009784973	U
DTC DETE	ECTION LOGIC		Ρ
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	

C13AD-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

• Steering angle sub control module

FAIL-SAFE

Mode 2

NOTE:

For fail-safe mode, refer to <u>STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe"</u>.

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-186. "DAST 2 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000009784974

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 "C13AD-00" detected?

- YES >> Replace steering angle sub control module. Refer to STC-429, "Removal and Installation".
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

C13AE-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

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 start- ing.
POSSIBLE • Steering f	E CAUSE force control module	
FAIL-SAFE • Mode 2 NOTE: For fail-sa	afe mode, refer to STC-47, "DIRECT AI	DAPTIVE STEERING : Fail-safe".
DTC CON	FIRMATION PROCEDURE	
1.PRECO	NDITIONING	
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has beer t 10 seconds before conducting the nex	n previously conducted, always turn ignition switch OFF and xt test.
>> 2.dtc re	GO TO 2. PRODUCTION PROCEDURE	
With CO Start th CAUTIC Never C. Perforn	NSULT e engine. ON: drive the vehicle. n self-diagnosis for "EPS/DAST 3".	
<u>Is DTC "C1</u> YES >> NO-1 >> NO-2 >>	<u>3AE-00" detected?</u> • Proceed to diagnosis procedure. Refe • To check malfunction symptom before • Confirmation after repair: INSPECTIO	er to <u>STC-187, "EPS/DAST 3 : Diagnosis Procedure"</u> . e repair: Refer to <u>GI-43, "Intermittent Incident"</u> . N END
EPS/DAS	ST 3 : Diagnosis Procedure	INFOID:000000009784976
1.PERFOR	RM SELF-DIAGNOSIS	
 With CO 1. Turn th 2. Erase s 3. Turn th 4 Start th 	NSULT e ignition switch ON. self-diagnosis for "EPS/DAST 3". e ignition switch OFF and wait for at lea e engine	ast 10 seconds.
CAUTI Never	ON: drive the vehicle.	
5. Perform <u>Is DTC "C1</u> YES >> NO >> DAST 1	n seit-diagnosis for "EPS/DAST 3". <u>3AE-00" detected?</u> • Replace steering force control module • Check the intermittent incident. Refer	e. Refer to <u>STC-427, "Removal and Installation"</u> . to <u>GI-43, "Intermittent Incident"</u> .
DAST 1 :	DTC Description	INFOID:00000009784977
DTC DETE	ECTION LOGIC	

А

В

INFOID:000000009784975

C13AE-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AE-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is start- ing.

POSSIBLE CAUSE

• Steering angle main control module

FAIL-SAFE

Mode 3

NOTE:

For fail-safe mode, refer to STC-47, "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 "C13AE-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-188. "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009784978

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.
- Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13AE-00" detected?

- YES >> Replace steering angle main control module. Refer to <u>STC-428, "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

DAST 2

DAST 2 : DTC Description

INFOID:000000009784979

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 start- ing.

C13AE-00 CONTROL MODULE

	[DIRECT ADAPTIVE STEERING]
Steering angle sub control module	
AIL-SAFE	
Mode 2	
For fail-safe mode, refer to STC-47, "DIRECT ADAPTIVE STEERIN	IG : Fail-safe".
TC CONFIRMATION PROCEDURE	
f "DTC CONFIRMATION PROCEDURE" has been previously conduc	ted always turn ignition switch OFF and
vait at least 10 seconds before conducting the next test.	
>> GO TO 2.	
DTC REPRODUCTION PROCEDURE	
. Start the engine.	
Never drive the vehicle.	
Perform self-diagnosis for "DAST 2".	
<u>3 DTC "C13AE-00" detected?</u>	
NO-1 $>>$ To check malfunction symptom before repair: Refer to GI	-43, "Intermittent Incident".
NO 2 Confirmation ofter rendim INCDECTION END	
NO-2 >> Confirmation after repair: INSPECTION END	
AST 2 : Diagnosis Procedure	INFOID:00000009784980
AST 2 : Diagnosis Procedure	INFOID:000000009784980
AST 2 : Diagnosis Procedure PERFORM SELF-DIAGNOSIS	INF01D:00000009784980
AST 2 : Diagnosis Procedure PERFORM SELF-DIAGNOSIS With CONSULT . Turn the ignition switch ON.	INFOID:00000009784980
AST 2 : Diagnosis Procedure PERFORM SELF-DIAGNOSIS With CONSULT Turn the ignition switch ON. Erase self-diagnosis for "DAST 2". Turn the ignition switch OEE and wait for at least 10 seconds.	INFOID:00000009784980
ACC-2 >> Confirmation after repair: INSPECTION END ACCONNEND ACCO	INFOID:00000009784980
AST 2 : Diagnosis Procedure 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: News drive the webiale	INFOID:00000009784980
NO-2 >> Commution after repair: INSPECTION END OAST 2 : Diagnosis Procedure .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".	INFOID:00000009784980
NO-2 >> Commution after repair: INSPECTION END OAST 2 : Diagnosis Procedure 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". SDTC "C13AE-00" detected?	INFOID:00000009784980
AND-2 >> Commution after repair: INSPECTION END DAST 2 : Diagnosis Procedure 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". DTC "C13AE-00" detected? YES >> Replace steering angle sub control module. Refer to STC	UNFOID:00000009784980
 AST 2 : Diagnosis Procedure 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". TURD THE VEHICLE. Perform self-diagnosis for "DAST 2". TUR S >> Replace steering angle sub control module. Refer to STO NO >> Check the intermittent incident. Refer to GI-43, "Intermitted to the second secon	D-429. "Removal and Installation".
 AST 2 : Diagnosis Procedure 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". TC "C13AE-00" detected? YES >> Replace steering angle sub control module. Refer to STC NO >> Check the intermittent incident. Refer to GI-43, "Intermittent incident." 	C-429. "Removal and Installation".
 AG-2 >> Commution after repair: INSPECTION END DAST 2 : Diagnosis Procedure 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:	2-429. "Removal and Installation".
 NO-2 >> Commution after repair: INSPECTION END DAST 2 : Diagnosis Procedure .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". DTC "C13AE-00" detected? YES >> Replace steering angle sub control module. Refer to STC NO >> Check the intermittent incident. Refer to GI-43. "Intermitted incident. Refer to STC NO >> Check the intermittent incident. Refer to GI-43. "Intermitted incident. Refer to STC NO >> Check the intermittent incident. Refer to GI-43. "Intermitted incident. Refer to STC NO >> Check the intermittent incident. Refer to GI-43. "Intermitted incident. Refer to GI-43. "Intermitted incident. Refer to GI-43. "Intermitted incident. Refer to GI-43." 	C-429, "Removal and Installation".

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C13AF-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009784981

[DIRECT ADAPTIVE STEERING]

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 start- ing.

POSSIBLE CAUSE

Steering force control module

FAIL-SAFE

Mode 2

NOTE:

For fail-safe mode, refer to STC-47. "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-190, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009784982

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 <u>STC-427, "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43. "Intermittent Incident"</u>.

DAST 1

DAST 1 : DTC Description

INFOID:000000009784983

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 start- ing.
POSSIBLE • Steering a	CAUSE angle main control module	
FAIL-SAFE • Mode 3 NOTE: For fail-sa	fe mode, refer to <u>STC-47, "DIRECT ADAF</u>	PTIVE STEERING : Fail-safe".
DTC CON	FIRMATION PROCEDURE	
1.PRECO	NDITIONING	
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been pr t 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and est.
>>	GO TO 2.	
2.DTC RE	PRODUCTION PROCEDURE	
With CO Start th	NSULT e engine.	
2. Perform	drive the vehicle. n self-diagnosis for "DAST 1".	
Is DTC "C1 YES >> NO-1 >>	<u>3AF-00" detected?</u> Proceed to diagnosis procedure. Refer to To check malfunction symptom before rec	STC-191, "DAST 1 : Diagnosis Procedure". Dair: Refer to GI-43, "Intermittent Incident".
NO-2 >>	Confirmation after repair: INSPECTION E	ND
DAST 1 :	Diagnosis Procedure	INFOID:000000009784984
1.PERFOR	RM SELF-DIAGNOSIS	
With CO	NSULT	
 1. Turn th 2. Erase s 3. Turn th 4 Start th 	e ignition switch ON. self-diagnosis for "DAST 1". e ignition switch OFF and wait for at least e engine	10 seconds.
5. Perform	origino. ON: drive the vehicle. n self-diagnosis for "DAST 1".	
Is DTC "C1	<u>3AF-00" detected?</u>	
YES >> NO >> DAST 2	Replace steering angle main control mod Check the intermittent incident. Refer to <u>C</u>	ule. Refer to <u>STC-428, "Removal and Installation"</u> . <u>3I-43, "Intermittent Incident"</u> .
DAST 2 :	DTC Description	INFOID:00000009784985
DTC DETE	ECTION LOGIC	
	Display item	Malfunction detected condition

DIC	(Trouble diagnosis content)	
C13AF-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is start- ing.

• Steering angle sub control module

FAIL-SAFE

Mode 2

NOTE:

For fail-safe mode, refer to <u>STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe"</u>.

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-192, "DAST 2 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000009784986

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-429, "Removal and Installation".
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

C13B0-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

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 start- ing.
POSSIBLE • Steering f	CAUSE orce control module	
FAIL-SAFE • Mode 2 NOTE: For fail-sa	afe mode, refer to STC-47, "DIRECT AD	APTIVE STEERING : Fail-safe".
DTC CON	FIRMATION PROCEDURE	
1.PRECO	NDITIONING	
If "DTC CO wait at least	NFIRMATION PROCEDURE" has been t 10 seconds before conducting the next	previously conducted, always turn ignition switch OFF and test.
>> 2. dtc re	GO TO 2. PRODUCTION PROCEDURE	
With CO 1. Start the CAUTION Never of 2. Perform	NSULT e engine. ON: drive the vehicle. n self-diagnosis for "EPS/DAST 3".	
Is DTC "C13 YES >> NO-1 >> NO-2 >>	<u>3B0-00" detected?</u> • Proceed to diagnosis procedure. Refer • To check malfunction symptom before r • Confirmation after repair: INSPECTION	to <u>STC-193, "EPS/DAST 3 : Diagnosis Procedure"</u> . repair: Refer to <u>GI-43, "Intermittent Incident"</u> . I END
EPS/DAS	ST 3 : Diagnosis Procedure	INFOID:00000009784988
1.PERFOR	RM SELF-DIAGNOSIS	
With CO 1. Turn the 2. Erase s 3. Turn the 4. Start the	NSULT e ignition switch ON. self-diagnosis for "EPS/DAST 3". e ignition switch OFF and wait for at leas e engine	st 10 seconds.
CAUTION Never	origino. ON: drive the vehicle.	
5. Perform Is DTC "C13 YES >> NO >> DAST 1	n self-diagnosis for "EPS/DAST 3". <u>3B0-00" detected?</u> • Replace steering force control module. • Check the intermittent incident. Refer to	Refer to <u>STC-427, "Removal and Installation"</u> . o <u>GI-43, "Intermittent Incident"</u> .
DAST 1 :	DTC Description	INFOID:00000009784989
DTC DETE	ECTION LOGIC	

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В

INFOID:000000009784987

C13B0-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B0-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is start- ing.

POSSIBLE CAUSE

• Steering angle main control module

FAIL-SAFE

Mode 3

NOTE:

For fail-safe mode, refer to STC-47, "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-194. "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009784990

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.
- 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 <u>STC-428. "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43</u>, "Intermittent Incident".

DAST 2

DAST 2 : DTC Description

INFOID:000000009784991

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 start- ing.

C13B0-00 CONTROL MODULE

: DTC/CIRCUIT DIAGNOSIS >	[DIRECT ADAPTIVE STEERING]
Steering angle sub control module	
AIL-SAFE	
Mode 2	
NOTE: For fail-safe mode, refer to STC-47, "DIRECT ADAPTIVE STEE	RING : Fail-safe".
	ducted always turn ignition switch OFF and
vait at least 10 seconds before conducting the next test.	ducted, always turn ignition switch OFF and
5	
>> GO TO 2.	
2.DTC REPRODUCTION PROCEDURE	
With CONSULT	
. Start the engine.	
Never drive the vehicle.	
 Perform self-diagnosis for "DAST 2". 	
s DTC "C13B0-00" detected?	
YES >> Proceed to diagnosis procedure. Refer to <u>STC-195. "</u>	DAST 2 : Diagnosis Procedure".
NO-2 >> Confirmation after repair: INSPECTION END	or-is, intermittent incident.
DAST 2 : Diagnosis Procedure	INFOID:00000000784992
J	
I .PERFORM SELF-DIAGNOSIS	
 Furn the ignition switch ON. Erase self-diagnosis for "DAST 2". 	
3. Turn the ignition switch OFF and wait for at least 10 seconds.	
A Start the engine.	
Never drive the vehicle.	
5. Perform self-diagnosis for "DAST 2".	
s DTC "C13B0-00" detected?	
NO >> Check the intermittent incident Refer to GI-43 "Interm	nittent Incident".

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C13B1-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009784993

[DIRECT ADAPTIVE STEERING]

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 start- ing.

POSSIBLE CAUSE

• Steering force control module

FAIL-SAFE

Mode 2

NOTE:

For fail-safe mode, refer to STC-47, "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-196, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009784994

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 <u>STC-427, "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43. "Intermittent Incident"</u>.

DAST 1

DAST 1 : DTC Description

INFOID:000000009784995

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 start- ing.
POSSIBLE • Steering a	CAUSE angle main control module	·
FAIL-SAFE • Mode 3 NOTE: For fail-sa	ife mode, refer to <u>STC-47, "DIRECT ADAP</u>	<u>TIVE STEERING : Fail-safe"</u> .
DTC CON	FIRMATION PROCEDURE	
1.PRECO	NDITIONING	
If "DTC CO wait at least	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and st.
>> 2 DTO DE		
1. Start th CAUTIC Never (2 Perform	e engine. ON: drive the vehicle. a self-diagnosis for "DAST 1"	
<u>Is DTC "C13</u> YES >> NO-1 >> NO-2 >>	<u>3B1-00" detected?</u> Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep Confirmation after repair: INSPECTION E	<u>STC-197, "DAST 1 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND
DAST 1 :	Diagnosis Procedure	INF0/D:00000009784996
1.PERFOR	RM SELF-DIAGNOSIS	
With CO	NSULT	
 Turn the Erase s Turn the Start the 	e ignition switch ON. self-diagnosis for "DAST 1". e ignition switch OFF and wait for at least 1 e engine.	10 seconds.
5. Perform	ON: drive the vehicle. n self-diagnosis for "DAST 1".	
IS DTC "C1: YES >> NO >> DAST 2	<u>3B1-00" detected?</u> Replace steering angle main control modu Check the intermittent incident. Refer to <u>G</u>	ule. Refer to <u>STC-428, "Removal and Installation"</u> . I-43, "Intermittent Incident".
	DTC Description	
DA21 2 :		INFOID:00000009784997
DTC DETE	ECTION LOGIC	
DTC	Display item	Malfunction detected condition

DIC	(Trouble diagnosis content)	
C12P1 00	CONTROL MODULE	The internal malfunction is detected when control module is start-
01301-00	(Control module)	ing.

• Steering angle sub control module

FAIL-SAFE

Mode 2

NOTE:

For fail-safe mode, refer to <u>STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe"</u>.

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-198. "DAST 2 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000009784998

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-429, "Removal and Installation".
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

C13B2-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B2-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.
POSSIBLE • Steering f	CAUSE orce control module	
FAIL-SAFE • Mode 2 NOTE: For fail-sa	e mode refer to STC-47 "DIRECT ADAE	PTIVE STEERING · Fail-safe"
DTC CONI	FIRMATION PROCEDURE	<u>The offerning fails and the state of the st</u>
1.PRECO	NDITIONING	
If "DTC CO wait at least	NFIRMATION PROCEDURE" has been protected to the next text text text text text text tex	eviously conducted, always turn ignition switch OFF and st.
>> 2 DTC RE		
With CO	NSULT	
1. Start th CAUTIC Never C	e engine. ON: drive the vehicle.	
<u>Is DTC "C13</u> YES >> NO-1 >>	<u>3B2-00" detected?</u> Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep	STC-199, "EPS/DAST 3 : Diagnosis Procedure". air: Refer to <u>GI-43, "Intermittent Incident"</u> .
FPS/DAS	ST 3 · Diagnosis Procedure	
1.PERFOR	RM SELF-DIAGNOSIS	INPOLD.00000009785000
With CO 1. Turn the 2. Erase s 3. Turn the	NSULT e ignition switch ON. self-diagnosis for "EPS/DAST 3". e ignition switch OFF and wait for at least	10 seconds.
4. Start in CAUTION Never	e engine. <mark>ON:</mark> drive the vehicle.	
5. Perform <u>Is DTC "C13</u> YES >> NO >> DAST 1	n self-diagnosis for "EPS/DAST 3". 3B2-00" detected? Replace steering force control module. Re Check the intermittent incident. Refer to G	efer to <u>STC-427, "Removal and Installation"</u> . GI-43, "Intermittent Incident".
DAST 1 :	DTC Description	INFOID:000000009785001
DTC DETE	ECTION LOGIC	

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INFOID:000000009784999

C13B2-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B2-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

• Steering angle main control module

FAIL-SAFE

Mode 3

NOTE:

For fail-safe mode, refer to STC-47, "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 "C13B2-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-200. "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009785002

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.
- Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13B2-00" detected?

- YES >> Replace steering angle main control module. Refer to <u>STC-428. "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

DAST 2

DAST 2 : DTC Description

INFOID:000000009785003

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B2-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

C13B2-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >	[DIRECT ADAPTIVE STEERING]
Steering angle sub control module	
FAIL-SAFE • Mode 2 NOTE: For fail-safe mode, refer to STC-47, "DIRECT ADAPTIVE STEERING	: Fail-safe".
DTC CONFIRMATION PROCEDURE	
1.preconditioning	
If "DTC CONFIRMATION PROCEDURE" has been previously conducted wait at least 10 seconds before conducting the next test.	ed, always turn ignition switch OFF and
>> GO TO 2.	
2.DTC REPRODUCTION PROCEDURE	
 With CONSULT Start the engine. CAUTION: Never drive the vehicle. Perform self-diagnosis for "DAST 2". <u>Is DTC "C13B2-00" detected?</u> YES >> Proceed to diagnosis procedure. Refer to <u>STC-201, "DAST</u> NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-4</u>: NO-2 >> Confirmation after repair: INSPECTION END 	2 : Diagnosis Procedure". 3. "Intermittent Incident".
DAST 2 : Diagnosis Procedure	INFOID:000000009785004
1.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.	29. "Removal and Installation". t Incident".

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C13B3-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785005

[DIRECT ADAPTIVE STEERING]

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B3-00	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-47. "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 "C13B3-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-202, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785006

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 "C13B3-00" detected?

- YES >> Replace steering force control module. Refer to <u>STC-427. "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43. "Intermittent Incident"</u>.

DAST 1

DAST 1 : DTC Description

INFOID:000000009785007

DTC DETECTION LOGIC

Revision: 2013 October

STC-202

C13B3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	A
C13B3-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.	R
POSSIBLE	CAUSE		D
Steering a	angle main control module		C
 FAIL-SAFE Mode 3 NOTE: For fail-sa 	fe mode, refer to <u>STC-47, "DIRECT ADAP</u>	<u>TIVE STEERING : Fail-safe"</u> .	D
DTC CON	FIRMATION PROCEDURE		
1.PRECO	NDITIONING		Е
If "DTC CO wait at least	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and st.	
	e e e e e e e e e e e e e e e e e e e		F
<u>>></u>	GO TO 2.		
2.DTC RE	PRODUCTION PROCEDURE		ST
With CO Start th CAUTIO Never C Porform	NSULT e engine. ON: drive the vehicle.		Н
2. Perform	3B3-00" detected?		
YES >>	Proceed to diagnosis procedure. Refer to	STC-203, "DAST 1 : Diagnosis Procedure".	
NO-1 >>	To check malfunction symptom before rep	air: Refer to <u>GI-43, "Intermittent Incident"</u> .	
	Commation alter repair. INSPECTION E	ND	J
DAST 1:	Diagnosis Procedure	INF01D:000000009785008	
1.PERFOR	RM SELF-DIAGNOSIS		K
With CO	NSULT		
2. Erase s	self-diagnosis for "DAST 1".		L
3. Turn the	e ignition switch OFF and wait for at least 1	0 seconds.	
CAUTI	ON:		NЛ
5 Perform	drive the vehicle. a self-diagnosis for "DAST 1"		IVI
Is DTC "C1	<u>3B3-00" detected?</u>		
YES >> NO >>	Replace steering angle main control module Check the intermittent incident. Refer to G	Ile. Refer to <u>STC-428, "Removal and Installation"</u> . I-43, "Intermittent Incident".	Ν
DAST 2			0
DAST 2 :	DTC Description	INFOID:000000009785009	
DTC DETE	ECTION LOGIC		Ρ
	Display item	Malfunction detected condition	
DIC	(Trouble diagnosis content)		

C13B3-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

• Steering angle sub control module

FAIL-SAFE

Mode 2

NOTE:

For fail-safe mode, refer to <u>STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe"</u>.

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 "C13B3-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-204, "DAST 2 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000009785010

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 "C13B3-00" detected?

- YES >> Replace steering angle sub control module. Refer to STC-429, "Removal and Installation".
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

C13B4-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

В

INFOID:000000009785011

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	С
C13B4-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control ing.	module is start-
POSSIBLE	CAUSE	I -	
Steering f	orce control module		E
FAIL-SAFE			
NOTE:			F
For fail-sa		<u>TIVE STEERING : Fail-sare"</u> .	
			STO
If "DTC COI	NFIRMATION PROCEDURE" has been pre	eviously conducted, always turn ignition sv	vitch OFF and
wait at least	10 seconds before conducting the next te	st.	Н
>>	GO TO 2.		
2.DTC RE	PRODUCTION PROCEDURE		I
With CO	NSULT		
1. Start the CAUTI	e engine. <mark>DN:</mark>		J
2 Perform	drive the vehicle. a self-diagnosis for "EPS/DAST 3"		
Is DTC "C1;	<u>3B4-00" detected?</u>		K
YES >>	Proceed to diagnosis procedure. Refer to	STC-205, "EPS/DAST 3 : Diagnosis Proce	<u>edure"</u> .
NO-1 >> NO-2 >>	Confirmation after repair: INSPECTION EI	ND	L
EPS/DAS	ST 3 : Diagnosis Procedure		INFOID:000000009785012
1.PERFOR	RM SELF-DIAGNOSIS		M
With CO	NSULT		
 Turn the Erase s 	e ignition switch ON. self-diagnosis for "EPS/DAST 3".		Ν
3. Turn the	e ignition switch OFF and wait for at least 1	0 seconds.	
CAUTI	ON:		0
5. Perform	drive the vehicle. a self-diagnosis for "EPS/DAST 3".		
Is DTC "C1	3B4-00" detected?		Р
YES >>	Replace steering force control module. Re	fer to STC-427, "Removal and Installation	<u>ı"</u> .
DAST 1			
DAST 1 :	DTC Description		INFOID:000000009785013
DTC DETE	CTION LOGIC		

STC-205

C13B4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B4-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is start- ing.

POSSIBLE CAUSE

• Steering angle main control module

FAIL-SAFE

Mode 3

NOTE:

For fail-safe mode, refer to STC-47, "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-206. "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009785014

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.
- 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 <u>STC-428. "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

DAST 2

DAST 2 : DTC Description

INFOID:000000009785015

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 start- ing.

C13B4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >	[DIRECT ADAPTIVE STEERING]
Steering angle sub control module	
FAIL-SAFE	Ą
Mode 2	
NOTE: For fail-safe mode, refer to STC-47, "DIRECT ADAPTIVE STEERING	: Fail-safe".
DTC CONFIRMATION PROCEDURE	
1.PRECONDITIONING	C
If "DTC CONFIRMATION PROCEDURE" has been previously conducted wait at least 10 seconds before conducting the next test.	d, always turn ignition switch OFF and
>> GO TO 2.	L
2. DTC REPRODUCTION PROCEDURE	F
	h
1. Start the engine.	
Never drive the vehicle.	F
2. Perform self-diagnosis for "DAST 2".	
Is DTC "C13B4-00" detected?	ST
YES >> Proceed to diagnosis procedure. Refer to <u>STC-207, "DAST</u> NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43</u> NO-2 >> Confirmation after repair: INSPECTION END	2 : Diagnosis Procedure". 3. "Intermittent Incident".

DAST 2 : Diagnosis Procedure

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?

>> Replace steering angle sub control module. Refer to STC-429, "Removal and Installation". YES NO >> Check the intermittent incident. Refer to GI-43. "Intermittent Incident".

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INFOID:000000009785016

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C13B5-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785017

[DIRECT ADAPTIVE STEERING]

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B5-00	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-47. "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 "C13B5-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-208, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785018

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 "C13B5-00" detected?

- YES >> Replace steering force control module. Refer to STC-427. "Removal and Installation".
- NO >> Check the intermittent incident. Refer to <u>GI-43. "Intermittent Incident"</u>.

DAST 1

DAST 1 : DTC Description

INFOID:000000009785019

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)	The internal malfunction in control module is detected.
POSSIBLE • Steering a	CAUSE	
FAIL-SAFE		
• Mode 3 NOTE: For fail-sa	afe mode, refer to <u>STC-47, "DIRECT ADAP</u>	TIVE STEERING : Fail-safe".
DTC CON	FIRMATION PROCEDURE	
1.PRECO	NDITIONING	
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and st.
2.DTC RF	PRODUCTION PROCEDURE	
	NSULT	S
1. Start th CAUTI Never	e engine. ON: drive the vehicle.	
2. Perform	n self-diagnosis for "DAST 1". 3B5-00" detected?	
YES >> NO-1 >>	 Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep 	<u>STC-209, "DAST 1 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> .
NO-2 >>	Confirmation after repair: INSPECTION El	ND
DASI 1:	Diagnosis Procedure	INFOID:000000009785020
1.PERFOR	RM SELF-DIAGNOSIS	
With CO	NSULT	
2. Erase s	self-diagnosis for "DAST 1".	
 I urn th Start th 	e ignition switch OFF and wait for at least 1 e engine.	U seconds.
CAUTI Never	ON: drive the vehicle.	
5. Perform	n self-diagnosis for "DAST 1".	
YES >>	<u>3B5-00° detected?</u> Replace steering angle main control modu	le. Refer to STC-428. "Removal and Installation".
NO >>	Check the intermittent incident. Refer to G	I-43, "Intermittent Incident".
DAST 2		
DAST 2 :	DIC Description	INFO/D:00000009785021
DTC DETE	ECTION LOGIC	
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition

C13B5-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

• Steering angle sub control module

FAIL-SAFE

Mode 2

NOTE:

For fail-safe mode, refer to <u>STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe"</u>.

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-210, "DAST 2 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000009785022

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 "Cube-00" detected?

- YES >> Replace steering angle sub control module. Refer to STC-429, "Removal and Installation".
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

C13B6-00 MOTOR CIRCUIT EPS/DAST 3

EPS/DAST 3 : DTC Description

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B6-00	MOTOR CIRCUIT (Motor circuit)	Malfunction of motor circuit is detected.
POSSIBLE • Steering f • Steering f • Motor circ • Steering f	E CAUSE orce motor orce motor harness connector uit (between steering force control module orce control module	e and steering force motor) is open or short.
FAIL-SAFE • Mode 2 NOTE: For fail-sa	fe mode, refer to <u>STC-47, "DIRECT ADA</u>	PTIVE STEERING : Fail-safe".
DTC CON	FIRMATION PROCEDURE	-
1.PRECO	NDITIONING	
If "DTC CO	NFIRMATION PROCEDURE" has been pr	eviously conducted, always turn ignition switch OFF and
wait at leas	To seconds before conducting the next to	
>>	GO TO 2.	
2.dtc re	PRODUCTION PROCEDURE	
With CO	NSULT	
1. Start th	e engine.	
Never	drive the vehicle.	
2. Turn th 3 Return	e steering wheel from full left stop to full rig	ght stop.
4. Perforn	self-diagnosis for "EPS/DAST 3".	
<u>ls DTC "C1</u>	3B6-00" detected?	
YES >> NO-1 >> NO-2 >>	Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep Confirmation after repair: INSPECTION E	STC-211, "EPS/DAST 3 : Diagnosis Procedure". Dair: Refer to <u>GI-43, "Intermittent Incident"</u> . END
EPS/DAS	ST 3 : Diagnosis Procedure	INF0ID:00000009785024
1. снеск	THE MOTOR	
Check the s	teering force motor. Refer to <u>STC-212, "E</u>	PS/DAST 3 : Component Inspection".
Is the inspe	ction result normal?	
YES >> NO >>	Steering force motor is malfunction. I "Removal and Installation".	Replace steering column assembly. Refer to <u>ST-87,</u>
2.снеск	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.

A

В

INFOID:000000009785023

< DTC/CIRCUIT DIAGNOSIS >

Steering force	control module	Steering f	orce motor	Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
	35		1		
M151	36	M153	M153 2	2	Existed
	37		3	Existed	
M152	38	M154	5		

3. Check the continuity between control module harness connector and ground.

Steering force control module			Continuity
Connector	Terminal	_	Continuity
	35		
M151	36	Ground	Not ovisted
	37	Ground	NOT EXISTED
M152	38		

Is the inspection result normal?

YES >> GO TO 3.

NO	>> Repair o	r replace	error-detected	part.
----	-------------	-----------	----------------	-------

3.CHECK INTERMITTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering force control module. Refer to STC-427, "Removal and Installation".

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:000000009785025

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	
Terr	Continuity		
1			
2	5	Exist	
3	* -		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to <u>ST-87</u>, <u>"Removal and Installation"</u>.

DAST 1

DAST 1 : DTC Description

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B6-00	MOTOR CIRCUIT (Motor circuit)	Malfunction of motor circuit is detected.

POSSIBLE CAUSE

Revision: 2013 October

INFOID:000000009785026

< DTC/CIRCUIT DIA	GNOSIS >		[DIRECT ADA	PTIVE STEERING	
 Steering angle main Steering angle main Motor circuit (betwe Steering angle main 	n motor n motor harness connector een steering angle main control module and steering angle main motor) is open or short. n control module			A	
FAIL-SAFE					В
Mode 3					
For fail-safe mode,	refer to <u>STC-47, "DIRE</u>	CT ADAPTIVE STEE	RING : Fail-safe".		С
DTC CONFIRMATIO	ON PROCEDURE				0
1.PRECONDITIONIN	NG				D
If "DTC CONFIRMATI wait at least 10 secon	ON PROCEDURE" had before conducting to the set of the s	as been previously cor the next test.	nducted, always turn ig	nition switch OFF and	D
					Е
2.DTC REPRODUCT	TION PROCEDURE				
					F
1. Start the engine.					
CAUTION: Never drive the	vehicle.				STC
2. Turn the steering	wheel from full left sto	p to full right stop.			
 Return the steering Perform self-diag 	ng wheel to the straigh nosis for "DAST 1"	t-ahead position.			ш
Is DTC "C13B6-00" de	etected?				Π
YES >> Proceed	to diagnosis procedure	e. Refer to <u>STC-213, "</u>	DAST 1 : Diagnosis Pr	ocedure".	
NO-1 >> To check	malfunction symptom	before repair: Refer to	GI-43, "Intermittent In	<u>cident"</u> .	
	sis Procoduro				
AST I. Diagno				INFOID:000000009785027	J
1. СНЕСК ТНЕ МОТ	OR				
Check the steering an	igle main motor. Refer	to STC-214, "DAST 1	: Component Inspecti	<u>on"</u> .	K
Is the inspection result	It normal?				
YES >> GO TO 2 NO >> Steering	angle main motor is	malfunction Replace	e steering gear assem	bly Refer to ST-98	
<u>"Remova</u>	and Installation".		, steering gear assert	ioly. Refer to <u>01.00.</u>	L
2. СНЕСК ТНЕ МОТ	OR CIRCUIT				
 Disconnect steeri Check the continu 	ng angle main control uity between control m	module and steering a odule harness connect	angle main motor harne stor and motor harness	ess connector. connector.	Μ
Steering angle ma	ain control module	Steering ang	le main motor	Continuity	Ν
Connector	Terminal	Connector	Terminal	Continuity	1.4
	35	F 00 ^{*1}	1		
E97	36	E88 ⁻ E105 ^{*2}	3	Existed	0

*1: 2WD models

E98

*2: AWD models

3. Check the continuity between control module harness connector and ground.

37

38

E89

2

4

Ρ

< DTC/CIRCUIT DIAGNOSIS >

Steering angle main control module			Continuity	
Connector	Terminal	—	Continuity	
	35			
E97	36	Ground	Not existed	
	37	Cround	Notexisted	
E98	38			

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3. CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to <u>STC-428, "Removal and Installation"</u>. NO >> Repair or replace error-detected part.

DAST 1 : Component Inspection

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
Terr	Continuity	
1		
2	4	Exist
3		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to <u>ST-98.</u> <u>"Removal and Installation"</u>.

DAST 2

DAST 2 : DTC Description

INFOID:000000009785029

INFOID-000000009785028

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B6-00	MOTOR CIRCUIT (Motor circuit)	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

FAIL-SAFE

Mode 2
 NOTE:

For fail-safe mode, refer to STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe".

STC-214

< DTC/CIRCUIT DIA	GNOSIS >		[DIRECT A	DAPTIVE STEERING]
DTC CONFIRMATION	ON PROCEDURE			
	٨G			
f "DTC CONFIRMATI wait at least 10 secon	ON PROCEDURE" ha ds before conducting t	is been previously of the next test.	conducted, always turn	ignition switch OFF and
>> GO TO 2				
2.DTC REPRODUC	TION PROCEDURE			
With CONSULT Start the engine. CAUTION: Never drive the Cauries Never drive the steering	vehicle. wheel from full left sto	p to full right stop.		
 Return the steerir Perform self-diag 	ng wheel to the straigh nosis for "DAST 2".	t-ahead position.		
<u>Is DTC "C13B6-00" d</u>	etected?			
YES >> Proceed NO-1 >> To check NO-2 >> Confirma	o diagnosis procedure malfunction symptom tion after repair: INSPE	 Refer to <u>STC-215</u> before repair: Refe ECTION END 	5, "DAST 2 : Diagnosis r to <u>GI-43, "Intermitten</u>	<u>Procedure"</u> . <u>t Incident"</u> .
DAST 2 : Diagno	sis Procedure			INFOID:000000009785030
1. снеск тне мот	OR			
Check the steering an	ale sub motor. Refer t	o STC-216 "DAST	2 · Component Inspec	tion"
s the inspection resul	t normal?			
YES >> GO TO 2				
NO >> Steering	angle sub motor is r	malfunction. Repla	ce steering gear ass	embly. Refer to <u>ST-98,</u>
<u>"Remova</u>	and Installation".			
2. CHECK THE MOT	OR CIRCUIT			
 Disconnect steeri Check the continu 	ng angle sub control m uity between control m	nodule and steering odule harness conr	angle sub motor harn nector and motor harne	ess connector. ess connector.
Steering angle s	ub control module	Steering	angle sub motor	Continuity
Connector	Terminal	Connector	Terminal	Continuity
	35		1	
E99	36	E90	3	
	37		2	Existed
E100	38	E91 ^{*1} E92 ^{*2}	4	
*1: 2WD models				
*2: AWD models				
3. Check the continu	uity between control m	odule harness conr	nector and ground.	
Steering a	ingle sub control module			Continuity
Connector	Termina	al		Continuity
	35			
E99	36		Ground Not existed	
	37			
E100	38			
s the inspection resu	t normal?			

YES >> GO TO 3.

>> Repair or replace error-detected part. NO

< DTC/CIRCUIT DIAGNOSIS >

3. CHECK INTERMITTTENT INCIDENT

Refer to <u>GI-43</u>, "Intermittent Incident". Is the inspection result normal?

<u>NEO</u> Barlaga staging angle sub santal madula. Bafan t

- YES >> Replace steering angle sub control module. Refer to <u>STC-429</u>, "Removal and Installation".
- NO >> Repair or replace error-detected part.

DAST 2 : Component Inspection

INFOID:000000009785031

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
Terr	Continuity	
1		
2	4	Exist
3		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to <u>ST-98.</u> <u>"Removal and Installation"</u>.
C13B7-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	
C13B7-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.	
POSSIBLE • Steering f	CAUSE orce control module		
FAIL-SAFE • Mode 2 NOTE: For fail-sa	ife mode, refer to <u>STC-47, "DIRECT ADA</u>	PTIVE STEERING : Fail-safe".	
DTC CON	FIRMATION PROCEDURE		
1.PRECO	NDITIONING		S
If "DTC CO wait at least	NFIRMATION PROCEDURE" has been p t 10 seconds before conducting the next t	previously conducted, always turn ignition switch OFF and test.	
>> 2.dtc re	GO TO 2. PRODUCTION PROCEDURE		
With CO Start th CAUTIO Never C. Perform DCC	NSULT e engine. ON: drive the vehicle. n self-diagnosis for "EPS/DAST 3".		
YES >> NO-1 >> NO-2 >>	<u>B7-00[°] detected ?</u> Proceed to diagnosis procedure. Refer to To check malfunction symptom before re Confirmation after repair: INSPECTION	o <u>STC-217, "EPS/DAST 3 : Diagnosis Procedure"</u> . pair: Refer to <u>GI-43, "Intermittent Incident"</u> . END	
EPS/DAS	ST 3 : Diagnosis Procedure	INF0ID:00000000978503	;
1.PERFOR	RM SELF-DIAGNOSIS		
With CO 1. Turn the 2. Erase s 3. Turn the 4. Start the	NSULT e ignition switch ON. self-diagnosis for "EPS/DAST 3". e ignition switch OFF and wait for at least e engine	t 10 seconds.	
CAUTION Never	ongine. ON: drive the vehicle.		(
5. Perforn <u>Is DTC "C13</u> YES >> NO >> DAST 1	n self-diagnosis for "EPS/DAST 3". <u>3B7-00" detected?</u> Replace steering force control module. F Check the intermittent incident. Refer to	Refer to STC-427, "Removal and Installation". GI-43, "Intermittent Incident".	
DAST 1 :	DTC Description	INFOID:00000000978503	I
DTC DETE	ECTION LOGIC		

А

В

INFOID:000000009785032

< DTC/CIRCUIT DIAGNOSIS >

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B7-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

• Steering angle main control module

FAIL-SAFE

Mode 3

NOTE:

For fail-safe mode, refer to STC-47, "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 "C13B7-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-218. "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009785035

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.
- Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13B7-00" detected?

- YES >> Replace steering angle main control module. Refer to <u>STC-428. "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

DAST 2

DAST 2 : DTC Description

INFOID:000000009785036

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B7-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

< DTC/CIRCUIT DIAGNOSIS >	[DIRECT ADAPTIVE STEERING]	
Steering angle sub control module		
FAIL-SAFE		А
• Mode 2		
For fail-safe mode, refer to <u>STC-47, "DIRECT ADAPTIVE STEERING</u>	<u>; Fail-safe"</u> .	В
DTC CONFIRMATION PROCEDURE		
1.preconditioning		С
If "DTC CONFIRMATION PROCEDURE" has been previously conducte wait at least 10 seconds before conducting the next test.	ed, always turn ignition switch OFF and	
Ŭ		D
>> GO TO 2.		
2. DTC REPRODUCTION PROCEDURE		E
With CONSULT		
1. Start the engine.		
Never drive the vehicle.		F
2. Perform self-diagnosis for "DAST 2".		
Is DTC "C13B7-00" detected?		STC
VEC Dreased to diagnosis pressedure. Defer to CTC 210 "DACT	10 - Diagnasia Drasadural	010

- YES >> Proceed to diagnosis procedure. Refer to STC-219, "DAST 2 : Diagnosis Procedure". NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

With CONSULT

- Turn the ignition switch ON. 1. Erase self-diagnosis for "DAST 2". 2.
- 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 "C13B7-00" detected?

- >> Replace steering angle sub control module. Refer to STC-429, "Removal and Installation". YES NO >> Check the intermittent incident. Refer to GI-43, "Intermittent Incident".
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INFOID:000000009785037

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< DTC/CIRCUIT DIAGNOSIS >

C13B8-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785038

[DIRECT ADAPTIVE STEERING]

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-47. "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-220, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785039

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 <u>STC-427, "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

DAST 1

DAST 1 : DTC Description

INFOID:000000009785040

DTC DETECTION LOGIC

< 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 • Steering a	CAUSE	
FAIL-SAFE		
NOTE: For fail-sa	afe mode, refer to <u>STC-47, "DIRECT ADAP</u>	TIVE STEERING : Fail-safe".
DTC CON	FIRMATION PROCEDURE	
1.PRECO	NDITIONING	
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and st.
	00 TO 2	
2.DTC RE	PRODUCTION PROCEDURE	
With CO	NSULT	S
1. Start th	e engine.	
Never	drive the vehicle.	
2. Perforn	n self-diagnosis for "DAST 1". 3B8-00" detected?	
YES >>	Proceed to diagnosis procedure. Refer to	<u>STC-221, "DAST 1 : Diagnosis Procedure"</u> .
NO-1 >> NO-2 >>	To check malfunction symptom before rep Confirmation after repair: INSPECTION E	air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND
DAST 1 :	Diagnosis Procedure	
1		
	RM SELF-DIAGNOSIS	
1. Turn th	e ignition switch ON.	
2. Erase s	self-diagnosis for "DAST 1". e ignition switch OEE and wait for at least 1	I seconds
4. Start th	e engine.	
Never	ON: drive the vehicle.	I
5. Perforn	n self-diagnosis for "DAST 1".	
YES >>	Replace steering angle main control modu	Ile. Refer to STC-428, "Removal and Installation".
NO >>	Check the intermittent incident. Refer to G	il-43, "Intermittent Incident"
DASTZ		
DAST 2 :	DIC Description	INFOID:00000009785042
DTC DETE	ECTION 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

< DTC/CIRCUIT DIAGNOSIS >

• Steering angle sub control module

FAIL-SAFE

Mode 2

NOTE:

For fail-safe mode, refer to <u>STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe"</u>.

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-222, "DAST 2 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000009785043

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-429, "Removal and Installation".
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

C13B9-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785044

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DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B9-00	CONTROL MODULE (Control module)	Malfunction of motor circuit is detected.The internal malfunction in control module is detected.
POSSIBLE • Steering fo • Steering fo • Motor circ • Steering fo	CAUSE orce motor orce motor harness connector uit (between steering force control module orce control module	and steering force motor) is open or short.
FAIL-SAFE • Mode 2 NOTE: For fail-sa	fe mode, refer to <u>STC-47, "DIRECT ADAP</u>	TIVE STEERING : Fail-safe".
DTC CONF	FIRMATION PROCEDURE	-
1.PRECOM	NDITIONING	
vait at least	GO TO 2.	viously conducted, always turn ignition switch OFF and st.
1. Start the CAUTION Never of	e engine. DN: drive the vehicle.	
 I urn the Return Perform Is DTC "C13" 	e steering wheel from full left stop to full rig the steering wheel to the straight-ahead po a self-diagnosis for "EPS/DAST 3". 3B9-00" detected?	nt stop. osition.
YES >> NO-1 >> NO-2 >>	Proceed to diagnosis procedure. Refer to To check malfunction symptom before repair: Confirmation after repair: INSPECTION Efforts	<u>STC-223, "EPS/DAST 3 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND
EPS/DAS	ST 3 : Diagnosis Procedure	INFOID:00000009785045
1.снеск	THE MOTOR	
Check the s Is the insper YES >> NO >>	teering force motor. Refer to <u>STC-224, "EF</u> <u>ction result normal?</u> GO TO 2. Steering force motor is malfunction. R <u>"Removal and Installation"</u> .	<u>S/DAST 3 : Component Inspection</u> ". eplace steering column assembly. Refer to <u>ST-87,</u>
2.снеск	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.

< DTC/CIRCUIT DIAGNOSIS >

Steering force control module		Steering force motor		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
	35	M153	1		
M151	36		2	Evicted	
	37		3	EXISTED	
M152	38	M154	5		

3. Check the continuity between control module harness connector and ground.

Steering force	control module		Continuity	
Connector Terminal			Continuity	
	35			
M151	36	Ground	Not existed	
	37			
M152	38			

Is the inspection result normal?

YES >> GO TO 3.

NO	>> Repair o	r replace	error-detected	part.
----	-------------	-----------	----------------	-------

3.CHECK INTERMITTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering force control module. Refer to STC-427, "Removal and Installation".

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

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	
Terr	ninal	Continuity	
1			
2	5	Exist	
3			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to <u>ST-87</u>, <u>"Removal and Installation"</u>.

DAST 1

DAST 1 : DTC Description

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B9-00	CONTROL MODULE (Control module)	Malfunction of motor circuit is detected.The internal malfunction in control module is detected.

POSSIBLE CAUSE

Revision: 2013 October

INFOID:000000009785047

INFOID:000000009785046

< DTC/CIRCUIT DIA	GNOSIS >		[DIRECT AD/	APTIVE STEERING]
 Steering angle main Steering angle main Motor circuit (between Steering angle main 	motor motor harness conne en steering angle mair control module	ctor າ control module and s	steering angle main mo	otor) is open or short.
FAIL-SAFE • Mode 3 NOTE: For fail acto mode 4				
		CTADAPTIVE STEE	<u>RING: Fail-Sale</u> .	
	NG			
If "DTC CONFIRMATI wait at least 10 secon	ON PROCEDURE" ha ds before conducting t	as been previously con the next test.	iducted, always turn ig	nition switch OFF and
>> GO TO 2.				
2.DTC REPRODUCT	TION PROCEDURE			
With CONSULT				
1. Start the engine. CAUTION:				S
2. Turn the steering	/ehicle. wheel from full left sto	o to full right stop.		5
3. Return the steerin	ng wheel to the straigh	t-ahead position.		
4. Perform self-diag	nosis for "DAST 1".			
YES >> Proceed t	o diagnosis procedure	Refer to STC-225	DAST 1 · Diagnosis Pr	ocedure"
NO-1 >> To check NO-2 >> Confirmat	malfunction symptom	before repair: Refer to ECTION END	GI-43, "Intermittent In	<u>cident"</u> .
DAST 1 : Diagnos	sis Procedure			INFOID:000000009785048
1. СНЕСК ТНЕ МОТ	OR			
Check the steering an	gle main motor. Refer	to STC-226, "DAST 1	: Component Inspecti	<u>on"</u> .
Is the inspection resul	t normal?			
YES >> GO TO 2.	angle main motor is	malfunction Replace	steering gear assen	bly Refer to ST-98
"Removal	and Installation".		bicening gear assen	ibly. Refer to <u>01 66.</u>
2. СНЕСК ТНЕ МОТ	OR CIRCUIT			
 Disconnect steering Check the continue 	ng angle main control uity between control m	module and steering a odule harness connect	angle main motor harn ctor and motor harness	ess connector. connector.
Steering angle ma	ain control module	Steering ang	le main motor	
Connector	Terminal	Connector	Terminal	Continuity
	35	F 22*1	1	
E97	36	E88 ⁻ E105 ^{*2}	3	Existed

*1: 2WD models

E98

*2: AWD models

3. Check the continuity between control module harness connector and ground.

37

38

E89

2

4

Ρ

< DTC/CIRCUIT DIAGNOSIS >

Steering angle main control module				
Connector Terminal	Steering angle main control module			Continuity
	Connector	Terminal		Continuity
35		35		
E97 36 Ground Not existed	E97	36	Ground	Not ovisted
37 Ground Not existed	Ĭ	37	Gibunu	NOT EXISTED
E98 38	E98	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3. CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to <u>STC-428, "Removal and Installation"</u>. NO >> Repair or replace error-detected part.

DAST 1 : Component Inspection

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	
Terr	ninal	Continuity	
1			
2	4	Exist	
3			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to <u>ST-98.</u> <u>"Removal and Installation"</u>.

DAST 2

DAST 2 : DTC Description

INFOID:000000009785050

INFOID-000000009785049

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B9-00	CONTROL MODULE (Control module)	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.
- Steering angle sub control module

FAIL-SAFE

• Mode 2 NOTE:

For fail-safe mode, refer to STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe".

STC-226

C13B9-00 CONTROL MODULE [DIRECT ADAPTIVE STEERING] < DTC/CIRCUIT DIAGNOSIS > DTC CONFIRMATION PROCEDURE А 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. В >> GO TO 2. 2.DTC REPRODUCTION PROCEDURE Start the engine. D CAUTION: Never drive the vehicle. Turn the steering wheel from full left stop to full right stop. 3. Return the steering wheel to the straight-ahead position. E 4. Perform self-diagnosis for "DAST 2". Is DTC "C13B9-00" detected? >> Proceed to diagnosis procedure. Refer to STC-227, "DAST 2 : Diagnosis Procedure". F >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END DAST 2 : Diagnosis Procedure INFOID:000000009785051 **1.**CHECK THE MOTOR Check the steering angle sub motor. Refer to STC-228, "DAST 2 : Component Inspection". Is the inspection result normal? >> GO TO 2. >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to ST-98, "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 Terminal Connector Connector Terminal 35 1 E99 36 E90 3 2 Existed 37 M E91^{*1} E100 38 4 E92^{*2} *1: 2WD models Ν *2: AWD models Check the continuity between control module harness connector and ground. Steering angle sub control module Continuity Connector Terminal 35 Ρ E99 36 Ground Not existed 37

Is the inspection result normal?

E100

YES >> GO TO 3.

1

2.

YES

YES

NO

1.

2.

NO-1

>> Repair or replace error-detected part. NO

38

STC

< DTC/CIRCUIT DIAGNOSIS >

3. CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to STC-429, "Removal and Installation".
- NO >> Repair or replace error-detected part.

DAST 2 : Component Inspection

INFOID:000000009785052

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		Continuity
1		
2	4	Exist
3		

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to <u>ST-98.</u> <u>"Removal and Installation"</u>.

C13BA-00 CONTROL MODULE POWER SUPPLY AGNOSIS > [DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

C13BA-00 CONTROL MODULE POWER SUPPLY EPS/DAST 3

EPS/DAST 3 : DTC Description

А

В

INFOID:000000009785053

DTC DETECTION LOGIC

DTC	(Troul	Display item ble diagnosis content)	Malfunction de	tected condition	С
C13BA-00	CONTROL MODI (Control module p	JLE POWER SUPPLY power supply)	Control module power supply is	lower than normal.	D
POSSIBLE	CAUSE				
Harness aBattery	ind connector				Е
• Fusible lin	k nalv sizevit				
 Power sup Steering for 	orce control mo	dule			F
FAIL-SAFE					
Mode 2 NOTE:					STC
For fail-sa	fe mode, refer t	o <u>STC-47, "DIRECT ADAP</u> "	TIVE STEERING : Fail-safe		
DTC CONF	FIRMATION P	ROCEDURE			ш
1.PRECOM	NDITIONING				П
If "DTC CO	VFIRMATION P	ROCEDURE" has been pre	eviously conducted, always t	urn ignition switch OFF and	
wait at least	10 seconds be	fore conducting the next tes	St.		
>>	GO TO 2.				
2.DTC REI	PRODUCTION	PROCEDURE			J
With CO	NSULT				
1. Start the	e engine.				Κ
Never o	drive the vehic				
2. Perform	1 Self-diagnosis	for "EPS/DAST 3".			L
YES >>	Proceed to dia	gnosis procedure. Refer to	<u>STC-229, "EPS/DAST 3 : D</u>	iagnosis Procedure".	
NO-1 >>	To check malfu	Inction symptom before repart	air: Refer to <u>GI-43, "Intermit</u>	tent Incident".	M
		nei repair. INSPECTION Er			
EF 3/DAG	or 5. Diayin			INFOID:00000009785054	NI
1.CHECK	CONTROL MO	DULE GROUND CIRCUIT			IN
1. Turn the	e ignition switch	OFF.	connector		
3. Check t	he continuity be	etween control module harn	ess connector and ground.		0
	Steering force	control module		1	
Со	nnector	Terminal	_	Continuity	Ρ
	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)

< 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		Continuity
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 <u>PG-12, "Wiring Diagram -</u> <u>BATTERY POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

4.CHECK INTERMITTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to STC-427, "Removal and Installation".
- NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

INFOID:000000009785055

[DIRECT ADAPTIVE STEERING]

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 lower than normal.

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fusible link
- Power supply circuit
- Steering angle main control module

FAIL-SAFE

Mode 3

NOTE:

For fail-safe mode, refer to <u>STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe"</u>.

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

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Start the engine. CAUTION: А Never drive the vehicle. Perform self-diagnosis for "DAST 1". Is DTC "C13BA-00" detected? >> Proceed to diagnosis procedure. Refer to STC-231, "DAST 1 : Diagnosis Procedure". YES >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident". NO-1 NO-2 >> Confirmation after repair: INSPECTION END DAST 1 : Diagnosis Procedure INFOID:000000009785056 1. CHECK CONTROL MODULE GROUND CIRCUIT D 1. Turn the ignition switch OFF. Disconnect steering angle main control module harness connector. 2. 3. Check the continuity between control module harness connector and ground. Steering angle main control module Continuity F Connector Terminal E27 33 Ground Existed E28 39 STC 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. Н **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? Κ YES >> GO TO 4. NO >> GO TO 3. **3.**CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2) Turn the ignition switch OFF. 1. Check the 100A fusible link (#J). 2. 3. Check the harness for open or short between steering angle main control module harness connector M 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-12, "Wiring Diagram -Ν BATTERY POWER SUPPLY -". NO >> Repair or replace error-detected parts. 4. CHECK INTERMITTTENT INCIDENT Refer to GI-43, "Intermittent Incident". Is the inspection result normal? Ρ >> Replace steering angle main control module. Refer to STC-428, "Removal and Installation". YES NO >> Repair or replace error-detected part. DAST 2 DAST 2 : DTC Description INFOID:000000009785057 DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction dete	ected condition
C13BA-00	CONTROL MODULE POWER SUPPLY (Control module power supply)	Control module power supply is lo	ower than normal.
POSSIBLE Harness a Battery Fusible lir Power su Steering a	E CAUSE and connector hk pply circuit angle sub control module		
AIL-SAFE Mode 3 NOTE: For fail-sa	afe mode, refer to <u>STC-47, "DIRECT AD</u>	DAPTIVE STEERING : Fail-safe".	
OTC CON	FIRMATION PROCEDURE		
1.preco	NDITIONING		
wait at leas	t 10 seconds before conducting the nex	tt test.	
>>	GO TO 2.		
>> 2.DTC RE	GO TO 2. PRODUCTION PROCEDURE		
>> 2.DTC RE With CO 1. Start th CAUTI Never 2. Perform <u>s DTC "C1</u> YES >> NO-1 >> NO-2 >>	GO TO 2. PRODUCTION PROCEDURE NSULT e engine. ON: drive the vehicle. n self-diagnosis for "DAST 2". <u>3BA-00" detected?</u> Proceed to diagnosis procedure. Refer To check malfunction symptom before Confirmation after repair: INSPECTION	r to <u>STC-232, "DAST 2 : Diagnos</u> repair: Refer to <u>GI-43, "Intermitte</u> N END	is Procedure". ent Incident".
>> 2.DTC RE With CO 1. Start th CAUTI Never 2. Perform s DTC "C1 YES >> NO-1 >> NO-2 >> DAST 2 2	GO TO 2. PRODUCTION PROCEDURE NSULT e engine. ON: drive the vehicle. n self-diagnosis for "DAST 2". <u>3BA-00" detected?</u> Proceed to diagnosis procedure. Refer To check malfunction symptom before Confirmation after repair: INSPECTION Diagnosis Procedure	r to <u>STC-232, "DAST 2 : Diagnos</u> repair: Refer to <u>GI-43, "Intermitte</u> N END	is Procedure". ent Incident".
>> 2. DTC RE With CO 1. Start th CAUTI Never 2. Perform <u>s DTC "C1</u> YES >> NO-1 >> NO-2 >> DAST 2 : 1 outpoint	GO TO 2. PRODUCTION PROCEDURE NSULT e engine. ON: drive the vehicle. n self-diagnosis for "DAST 2". <u>3BA-00" detected?</u> Proceed to diagnosis procedure. Refer To check malfunction symptom before Confirmation after repair: INSPECTION Diagnosis Procedure	r to <u>STC-232, "DAST 2 : Diagnos</u> repair: Refer to <u>GI-43, "Intermitte</u> N END	is Procedure". ent Incident".
2.DTC RE With CO Start th CAUTI Never 2. Perform Is DTC "C1 YES NO-1 NO-2 DAST 2 1. CHECK 1. Turn th 2. Discon 3. Check	GO TO 2. PRODUCTION PROCEDURE NSULT e engine. ON: drive the vehicle. n self-diagnosis for "DAST 2". <u>3BA-00" detected?</u> Proceed to diagnosis procedure. Refer To check malfunction symptom before Confirmation after repair: INSPECTION Diagnosis Procedure CONTROL MODULE GROUND CIRCU e ignition switch OFF. nect steering angle sub control module the	r to <u>STC-232. "DAST 2 : Diagnos</u> repair: Refer to <u>GI-43, "Intermitte</u> N END UIT harness connector. harness connector and ground.	is Procedure". ent Incident". INFOID:0000000097850
2.DTC RE With CO Start th CAUTI Never 2. Perform S DTC "C1 YES >> NO-1 >> NO-2 >> DAST 2 : 1.CHECK 1. Turn th 2. Discon 3. Check	GO TO 2. PRODUCTION PROCEDURE NSULT e engine. ON: drive the vehicle. n self-diagnosis for "DAST 2". <u>3BA-00" detected?</u> Proceed to diagnosis procedure. Refer To check malfunction symptom before Confirmation after repair: INSPECTION Diagnosis Procedure CONTROL MODULE GROUND CIRCU e ignition switch OFF. nect steering angle sub control module the the continuity between control module the	r to <u>STC-232, "DAST 2 : Diagnos</u> repair: Refer to <u>GI-43, "Intermitte</u> N END UIT harness connector. narness connector and ground.	is Procedure". ent Incident". INFOID:0000000097850
>> 2.DTC RE With CO 1. Start th CAUTI Never 2. Perform <u>s DTC "C1</u> YES >> NO-1 >> NO-2 >> DAST 2 : 1.CHECK 1. Turn th 2. Discon 3. Check	GO TO 2. PRODUCTION PROCEDURE NSULT e engine. ON: drive the vehicle. n self-diagnosis for "DAST 2". <u>3BA-00" detected?</u> Proceed to diagnosis procedure. Refer To check malfunction symptom before Confirmation after repair: INSPECTION CONTROL MODULE GROUND CIRCU e ignition switch OFF. nect steering angle sub control module the Continuity between control module to Steering angle sub control module to Steering angle sub control module to Diagnosis Procedure	r to <u>STC-232, "DAST 2 : Diagnos</u> repair: Refer to <u>GI-43, "Intermitte</u> N END UIT harness connector. harness connector and ground.	is Procedure". ent Incident". INFOID:0000000097850
>> 2.DTC RE With CO 1. Start th CAUTI Never 2. Perform <u>s DTC "C1</u> YES >> NO-1 >> NO-2 >> DAST 2 : 1.CHECK 1. Turn th 2. Discon 3. Check	GO TO 2. PRODUCTION PROCEDURE NSULT e engine. ON: drive the vehicle. n self-diagnosis for "DAST 2". <u>3BA-00" detected?</u> Proceed to diagnosis procedure. Refer To check malfunction symptom before Confirmation after repair: INSPECTION CONTROL MODULE GROUND CIRCU e ignition switch OFF. nect steering angle sub control module the <u>Steering angle sub control module</u> <u>Steering angle sub control module</u>	r to <u>STC-232. "DAST 2 : Diagnos</u> repair: Refer to <u>GI-43, "Intermitte</u> N END UIT harness connector. harness connector and ground.	is Procedure". ent Incident". INFOID:0000000097850 Continuity Existed

1. Turn the ignition switch ON.

2. Check the voltage between control module harness connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle su	id control module	_	Continuity
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V
s the inspection result norm	<u>nal?</u>		
YES >> GO TO 4.			
CHECK CONTROL MOL			
. Turn the ignition switch	OFF.		
. Check the harness for c	open or short between steer	ing angle sub control modu	le harness connector No.34
terminal and the 100A f	usible link (#H).	5 5	
s the inspection result norm	<u>nal?</u>		
YES >> Perform the trop	uble diagnosis for battery p	ower supply circuit. Refer	o <u>PG-12, "Wiring Diagram -</u>
NO >> Repair or replace	ce error-detected parts.		
CHECK INTERMITTTEN			
ofor to CL 42 "Intermittent	Incident"		
the inspection result norm	nal?		
YES >> Replace steerin	<u>na angle sub control module</u>	Refer to STC-429 "Remo	val and Installation"
NO >> Repair or replace	ce error-detected part.		

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13BB-00 CONTROL MODULE POWER SUPPLY EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785059

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 higher than normal.

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fusible link
- Power supply circuit
- 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.
 Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13BB-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-234, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785060

1. CHECK STEERING FORCE CONTROL MODULE SINGNAL

With CONSULT

- 1. Turn the ignition switch ON.
- 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.

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

	the continuity betw	een control module ha	rness connector and ground.	
	Steering force con	trol module		Oractionity
Connector Terminal			Continuity	
	M72	33	Ground	Existed
Is the inspe YES >> NO >> 3. CHECK	GO TO 3. Repair open circui	? t or short to ground or LE POWER SUPPLY (short to power in harness or co CIRCUIT (1)	onnectors.
1. Turn th 2. Check	e ignition switch Of the voltage betwee	N. n control module harne	ess connector and ground.	
	Steering force con	trol module		Continuity
Co	onnector	Terminal		· · · ····,
	M72	34	Ground	10.5 – 16.0 V
1. Turn th 2. Check 3. Check minal a <u>Is the inspe</u> YES >> NO >> 5. CHECK	e ignition switch Of the 60A fusible link the harness for ope and the 60A fusible ection result normal Perform the trouble <u>BATTERY POWE</u> Repair or replace	F. (#G). en or short between ste link (#G). <u>?</u> le diagnosis for battery <u>R SUPPLY -"</u> . error-detected parts. INCIDENT	eering force control module har	ness connector No.34 ter- PG-12, "Wiring Diagram -
Defer to Cl	42 "Intermittent In	aidant"		
Is the inspe YES >> NO >> DAST 1	• Replace steering f • Replace steering f	<u>2</u> Force control module. F error-detected part.	Refer to <u>STC-427, "Removal an</u>	d Installation".
DAST 1 :	DTC Descripti	on		INFOID:000000009785061
DTC DETE				
DTC DETE	Di (Trouble c	splay item liagnosis content)	Malfunction dete	cted condition

- Harness and connector
- Battery
- Fusible link
- Power supply circuit
- Steering angle main control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Ρ

< 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.
 Perform self-diagnosis for "DAST 1".

Is DTC "C13BB-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-236, "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009785062

1.CHECK STEERING ANGLE MAIN CONTROL MODULE SINGNAL

With CONSULT

- 1. Turn the ignition switch ON.
- 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	Evistod
E28	39	Ground	LAISIEU

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.

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

4. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)	А
 Turn the ignition switch OFF. Check the 100A fusible link (#J). Check the harness for open or short between steering angle main control module harness connector No.34 terminal and the 100A fusible link (#J). 	В
Is the inspection result normal?	
 YES >> Perform the trouble diagnosis for power supply circuit. Refer to <u>PG-12, "Wiring Diagram - BAT-</u> <u>TERY POWER SUPPLY -"</u>. NO >> Repair or replace error-detected parts. 	С
5. CHECK INTERMITTENT INCIDENT	D
Refer to GI-43, "Intermittent Incident".	
Is the inspection result normal?	
 YES >> Replace steering angle main control module. Refer to <u>STC-428, "Removal and Installation"</u>. NO >> Repair or replace error-detected part. 	E
DAST 2	
DAST 2 : DTC Description	F

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 higher than normal.
POSSIBLE Harness a Battery Fusible lin Power sup Steering a 	CAUSE nd connector k oply circuit ngle sub control module	
	FIRMATION PROCEDURE	
1.PRECON	IDITIONING	
If "DTC CON wait at least	NFIRMATION PROCEDURE" has been pr 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and est.
>> 2. dtc ref	GO TO 2. PRODUCTION PROCEDURE	
With COI 1. Start the CAUTIC Never c	NSULT e engine. DN: Irive the vehicle.	
2. Perform	n self-diagnosis for "DAST 2".	
YES >> NO-1 >> NO-2 >>	Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep Confirmation after repair: INSPECTION E	STC-237, "DAST 2 : Diagnosis Procedure". Dair: Refer to <u>GI-43, "Intermittent Incident"</u> . ND
DAST 2 :	Diagnosis Procedure	INFOID:00000009785064
1.снеска	STEERING ANGLE SUB CONTROL MOD	DULE SINGNAL
	NSULT	

1. Turn the ignition switch ON.

STC

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- 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	Evistod
E31	39	Giodila	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.

 ${
m 3.}$ 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 st	ub control module	ntrol module	
Connector	Terminal		Continuity
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 <u>PG-12, "Wiring Diagram BAT-</u> <u>TERY POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

5.CHECK INTERMITTENT INCIDENT

Refer to GI-43. "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to <u>STC-429, "Removal and Installation"</u>.
- NO >> Repair or replace error-detected part.

C13BC-00 CONTROL MODULE IGN POWER SUP AGNOSIS > [DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

C13BC-00 CONTROL MODULE IGN POWER SUP

DTC Description

А

В

DTC DETECTION LOGIC

DTC	(Trout	Display item le diagnosis content)	Malfunction de	tected condition
C13BC-00	CONTROL MODU	JLE IGN POWER SUP	The malfunction in control modu detected	le ignition power supply circuit is
POSSIBI F				
Harness a	ind connector			
 Battery 				
 Fuse Ignition pc 	wer supply circ	uit (open or short)		
 Steering for 	orce control mo	dule		
 Steering a Steering a 	ingle main contr	ol module I module		
		RUCEDURE		
I.PRECON	NDITIONING			
If "DTC CON		ROCEDURE" has been pre	eviously conducted, always t	urn ignition switch OFF and
wall at least			51.	
>>	GO TO 2.			
2.DTC REI	PRODUCTION	PROCEDURE		
1. Turn the	e ignition switch	ON.		
2. Perform	n self-diagnosis	for "EPS/DAST 3", "DAST	1" or "DAST 2".	
ls DTC "C13	BC-00" detecte	ed?		
YES >> NO-1 >> NO-2 >>	Proceed to diag To check malfu Confirmation at	gnosis procedure. Refer to nction symptom before rep ter repair: INSPECTION El	<u>STC-239, "Diagnosis Proce</u> air: Refer to <u>GI-43, "Intermit</u> ND	<u>dure"</u> . <u>tent Incident"</u> .
Diagnosis	s Procedure			INFOID:00000009785066
1.снески	IGNITION POW	ER SUPPLY FOR STEER	ING ANGLE MAIN CONTRO	DL MODULE
1 Turn the	e ignition switch	OFF		
2. Disconr	nect steering an	gle main control module ha	arness connector.	
3. Check t	he voltage betw	een steering angle main co	ontrol module harness conne	ector and ground.
	Steering angle ma	ain control module		
Со	nnector	Terminal		Continuity
	E26	25	Ground	0 V
 Turn the Check t 	e ignition switch he voltage betw	ON. reen steering angle control	module harness connector	and ground.
	Steering angle ma	ain control module		
Со	nnector	Terminal		Continuity
	E26	25	Ground	10.5 – 16.0 V
s the inspe	ction result nor	nal?	I	<u> </u>

YES >> GO TO 2. NO >> GO TO 3.

C13BC-00 CONTROL MODULE IGN POWER SUP

< DTC/CIRCUIT DIAGNOSIS >

2.check intermittent incident for steering angle main control module

Refer to GI-43. "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to STC-428. "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 ma	Steering angle main control module		Steering angle sub control module		
Connector	Terminal	Connector Terminal		Continuity	
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 s	Continuity	
Terr	Continuity	
25	Existed	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace steering angle sub control module. Refer to STC-429, "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 st	ub control module		Continuity	
Connector	Terminal		Continuity	
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 s	ub control module		Continuity	
Connector	Terminal		Continuity	
E29	25	Ground	10.5 – 16.0 V	

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 7.

 $\mathbf{6}$. CHECK INTERMITTTENT INCIDENT FOR STEERING ANGLE SUB CONTROL MODULE

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to <u>STC-429, "Removal and Installation"</u>.

NO >> Repair or replace error-detected part.

1.CHECK IGNITION POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.

C13BC-00 CONTROL MODULE IGN POWER SUP AGNOSIS > [DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

2. Disconnect steering force control module harness connector.

3. Check the continuity between steering angle sub control module harness connector and steering force A control module harness connector.

Steering angle sub	control module	Steering force	control module	Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
E29	25	M71	27	Existed	
Is the inspection result YES >> GO TO 8. NO >> Repair or re 8.CHECK INTERNAL	normal? eplace error-detected CIRCUIT IN STEERII	parts. NG FORCE CONTR	OL MODULE		
Check the continuity be	tween steering force	control module conne	ector terminals.		
	Steering force control mo	odule			
	Terminal			Continuity	
25		27		Existed	
YES >> GO TO 9. NO >> Replace sto 9.CHECK IGNITION P 1. Check the voltage I	eering force control m POWER SUPPLY FOR between steering forc	odule. Refer to <u>STC</u> R STEERING FORC e control module har	427, "Removal and E CONTROL MODU ness connector and	Installation". JLE I ground.	
Steering f	orce control module				
Connector	Terminal		_	Continuity	
M71	25		Ground	0 V	
 Turn the ignition sw Check the voltage I Steering f 	vitch ON. between force control	module harness cor	nector and ground.		
Connector	Terminal		—	Continuity	
M71	25		Ground	10.5 – 16.0 V	
Is the inspection result	normal?				
YES >> GO TO 10. NO >> GO TO 11.					
10. CHECK INTERMI	TTTENT INCIDENT F	OR STEERING FOR	RCE CONTROL MC	DULE	
Refer to <u>GI-43, "Intermi</u>	ttent Incident".				
Is the inspection result YES >> Replace sto NO >> Repair or re 11.CHECK IGNITION	normal? eering force control m eplace error-detected I POWER SUPPLY C	odule. Refer to <u>STC-</u> part. IRCUIT (3)	-427, "Removal and	Installation".	
 Turn the ignition sw Check the 10A fuse Check the harness minal and the 10A fuse 	vitch OFF. e (#12). for open or short betv fuse (#12).	ween steering force o	control module harn	ess connector No.25 ter-	
Is the inspection result I	<u>normal?</u>	r ignition notice at the	lu oirouit. Dafar (- 5		
IES >> Perform the	e trouble diagnosis fo <u>POWER SUPPLY -"</u> .	r ignition power supp	ny circuit. Refer to <u>F</u>	-G-54, wiring Diagram -	

NO >> Repair or replace error-detected parts.

C13BD-00 CONTROL MODULE IGN POWER SUP

< DTC/CIRCUIT DIAGNOSIS >

C13BD-00 CONTROL MODULE IGN POWER SUP DAST 1

DAST 1 : DTC Description

INFOID:000000009785067

[DIRECT ADAPTIVE STEERING]

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-47, "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

(I) 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-242, "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009785068

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.
- 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		Continuity	
M71	23	E26	23	Existed	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK STEERING FORCE CONTROL MODULE SIGNAL

1. Connect steering force control module harness connector.

2. Turn the ignition switch ON.

C13BD-00 CONTROL MODULE IGN POWER SUP

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		ring angle main control module		Continuity
Connector	Terminal	—	Condition	
E26	23	Ground	Open/Close the door.	10.5 – 16.0 V
YES >> GO TO 3 NO >> Replace s	steering force control n	nodule. Refer to <u>ST</u> ERING ANGLE MA	C-427, "Removal and Inst AIN CONTROL MODULE	allation".
With CONSULT . Turn the ignition s . Connect steering	switch OFF. angle main control mc	odule harness conn	ector.	
 Erase self-diagno Turn the ignition s Start the engine. CAUTION: Never drive the self-diag Perform self-diag DTC "C13BD-00" d 	sis for "DAST 1". switch OFF and wait fo vehicle. nosis for "DAST 1". <u>etected?</u>	r at least 10 second	ds.	
YES >> Replace s NO >> Check the	steering angle main co e intermittent incident.	ntrol module. Refer Refer to <u>GI-43. "Int</u>	to <u>STC-428, "Removal ar</u> ermittent Incident".	nd Installation".

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< DTC/CIRCUIT DIAGNOSIS >

C13BE-00 FLEXRAY COMMUNICATION EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785069

[DIRECT ADAPTIVE STEERING]

NOTE:

During engine start, the DTC "C13BE-00" may be detected due to temporary low voltage.

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 mod- ules is detected when the system is starting.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering force control module
- Steering angle main control module
- Steering angle sub control module

FAIL-SAFE

- Mode 2
 - NOTE:

For fail-safe mode, refer to STC-47, "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 "C13BE-00" detected?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK INTERMITTENT INCIDENT

- 1. Check intermittent incident. Refer to GI-43, "Intermittent Incident".
- 2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13BE-00" detected?

YES >> GO TO 4.

NO >> INSPECTION END

4.CHECK MALFUNCTION PATTERN

With CONSULT

Start the engine.
 CAUTION:

Never drive the vehicle.

- 2. Perform self-diagnosis for "DAST 1" and "DAST 2".
- 3. Check the each system self-diagnostic result.

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Detec	ted DTC or :	system co	ndition			_		Malfunction
DAST 1	DAS	T 2	EPS	/DAST 3		Possible cause		pattern
System is not dis- played on CON- SULT	C13BE-00 00 or C1	, C13C0- 3C2-00	C13BE 00 or	-00, C13C0- C13C2-00	FlexRay ofSteering a	communication circuit angle main control module		Pattern 1
C13C0-00, C13C2- 00 or System is not displayed on CON- SULT	System is played o SUI	s not dis- n CON- LT	C13BE 00 or	-00, C13C0- C13C3-00	FlexRay communication circuitSteering angle sub control module			Pattern 2
System is not dis- played on CON- SULT	System is played of SUI	s not dis- n CON- LT	C13BE 00 or	-00, C13C1- C13C4-00	FlexRay communication circuitSteering force control module			Pattern 3
Vhat is the malfur	oction patt	ern?						
Pattern 1>>Proce tern 1 Pattern 2>>Proce tern 2 Pattern 3>>Proce tern 3	eed to dia <u>)"</u> . eed to dia <u>)"</u> . eed to dia <u>)"</u> .	gnosis p gnosis p gnosis p	rocedur	e. Refer to e. Refer to e. Refer to	o <u>STC-245.</u> o <u>STC-245.</u> o <u>STC-246.</u>	"EPS/DAST 3 : Diag "EPS/DAST 3 : Diag "EPS/DAST 3 : Diag	<u>nosis Pro</u> nosis Pro nosis Pro	<u>cedure (Pat- cedure (Pat- cedure (Pat-</u>
PS/DAST 3 :	Diagno RAY COMI	SIS Pro	DCEdui TION C	re (Patte IRCUIT	ern 1)		IN	IFOID:000000009785070
 Disconnect ea Check the cor 	ich contro itinuity bei	l module tween ea	harnes ach cont	s connecto trol module	or. e harness co	onnector.		
Steering angle main control module Steering angle sub control module					Co	ntinuity		
Connector		Terminal		Coni	Connector Terminal			antinuity
E26		19		E	29	19	E	xisted
. Check the cor	ntinuity be	tween co	ontrol m	odule harn	ess connec	ctor and ground.		
Steerir	ng angle ma	in control r	nodule				0	
Connector			Termina	ıl		_	Contir	nuity
E26			19		-	Ground	Not ex	isted
			20					
<u>s the inspection re</u> YES >> GO T(NO >> Repai 2.CHECK INTER	<u>esult norm</u> D 2. r or replac MITTTEN	i <u>al?</u> ce error-c IT INCID	detectec ENT	l part.				
Refer to <u>GI-43, "In</u>	termittent	Incident						
s the inspection re YES >> Repla	esult norm ce steerin r or replac	<u>al?</u> g angle i	main co	ntrol modu I part	ıle. Refer to	STC-428, "Removal	and Instal	lation".
EPS/DAST 3 :	Diagno	sis Pro	cedu	e (Patte	ern 2)		IN	IFOID:0000000009785071
CHECK FLEXF		MUNICA	TION C	IRCUIT	<i>,</i>			
1. Disconnect ea	ch contro	I module	harnes	s connecto	or.			
2. Check the cor	ntinuity be	tween ea	ach cont	trol module	e harness c	onnector.		

< DTC/CIRCUIT DIAGNOSIS >

Steering angle s	ub control module	Steering angle ma	Continuity	
Connector	Terminal	Connector Terminal		Continuity
E20	19	E26	19	Evistod
E29	20	E20	20	EXISTED

3. Check the continuity between control module harness connector and ground.

Steering angle s	ub control module		Continuity
Connector	Terminal		Continuity
E20	19	Ground	Not existed
LZJ	20	Giodila	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2. CHECK INTERMITTTENT INCIDENT

Refer to <u>GI-43</u>, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to STC-429, "Removal and Installation".
- NO >> Repair or replace error-detected part.

EPS/DAST 3 : Diagnosis Procedure (Pattern 3)

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	Continuity	
M71	19	E26	19	Existed	
	1017 1	20	E20	20	Existed

3. Check the continuity between control module harness connector and ground.

Steering force control module			Continuity	
Connector	Terminal		Continuity	
M71 -	19	Ground	Not ovisted	
	20	Giouna	NUL EXISIEU	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to STC-427, "Removal and Installation".
- NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

NOTE:

During engine start, the DTC "C13BE-00" may be detected due to temporary low voltage.

STC-246

INFOID:000000009785073

INFOID:000000009785072

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

DTC DETECTION LOGIC

			А
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	
C13BE-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control mod- ules is detected when the system is starting.	В
POSSIBLE	CAUSE		
• FlexRay of	communication circuit		С
• Steering a NOTE:	angle main control module		
• When "C	13BE-00"is detected as "PRSNT", "DAST	1" is not displayed on CONSULT. For diagnosis, refer to	D
• When "C dent".	<u>"Description"</u> . 13BE-00"is detected as "PAST", Check th	e intermittent incident. Refer to GI-43, "Intermittent Inci-	_
FAIL-SAFE	=		E
Mode 2	-		
NOTE: For fail-sa	afe mode refer to STC-47 "DIRECT ADAI	PTIVE STEERING : Fail-safe"	F
DAST 2			
DAST 2 :	DTC Description	INFOID:00000009785074	ST
NOTE:			
During engi	ne start, the DTC "C13BE-00" may be det	ected due to temporary low voltage.	Н
DTC DETE	ECTION LOGIC		
	Display item		
DIC	(Trouble diagnosis content)	Maifunction detected condition	
C13BE-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control mod- ules is detected when the system is starting.	J
POSSIBLE	CAUSE		
FlexRay of Stooring of St	communication circuit		K
	-		
Mode 2	-		
NOTE:			L
For fail-sa	afe mode, refer to <u>STC-47. "DIRECT ADAF</u>	<u> PTIVE STEERING : Fail-safe"</u> .	
DTC CON	FIRMATION PROCEDURE		M
1.PRECO	NDITIONING		

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 "C13BE-00" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>STC-248, "DAST 2 : Diagnosis Procedure"</u>.

NO >> GO TO 3.

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< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

3. CHECK INTERMITTENT INCIDENT

- 1. Check intermittent incident. Refer to GI-43. "Intermittent Incident".
- 2. Perform self-diagnosis for "DAST 2".

Is DTC "C13BE-00" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>STC-248. "DAST 2 : Diagnosis Procedure"</u>. NO >> INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000009785075

1. CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.

2. Check the continuity between each control module harness connector.

Steering angle m	ain control module	Steering angle sub control module		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
E26	19	E20	19	Existed	
	20	E29	20	EXISIEU	

3. Check the continuity between control module harness connector and ground.

Steering angle main control module			Continuity	
Connector	Terminal	—	Continuity	
E26	19	Ground	Not ovisted	
	20	Gibunu	NOL EXISTED	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2. CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to STC-428, "Removal and Installation".

NO >> Repair or replace error-detected part.

< DTC/CIRCUIT DIAGNOSIS > C13BF-00 FLEXRAY COMMUNICATION EPS/DAST 3

EPS/DAST 3 : DTC Description

EPS/DASTS.DIC Description	D:0000000009785076
NOTE: During engine start, the DTC "C13BF-00" may be detected due to temporary low voltage. DTC DETECTION LOGIC	

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	D
C13BF-00	FLEXRAY COMMUNICATION (FlexRay communication)	 The malfunction in FlexRay communication between control modules is detected. The malfunction status of other control module is detected. 	E
POSSIBLE	CAUSE		
 Steering a Steering a Steering a Ignition point 	orce control module ingle main control module ingle sub control module ower supply circuit		F
FAIL-SAFE • Variable NOTE: For fail-sa	fe mode, refer to <u>STC-47, "DIRECT ADAP</u> "	TIVE STEERING : Fail-safe".	ST
DTC CONF	FIRMATION PROCEDURE		
1.PRECON	NDITIONING		
If "DTC COI wait at least	NFIRMATION PROCEDURE" has been pre 10 seconds before conducting the next tes	viously conducted, always turn ignition switch OFF and st.	
			J
>> 2 DTC DE			
			Κ
1. Start the	e engine.		
CAUTION Never of	ON: drive the vehicle.		L
2. Perform	n self-diagnosis for "EPS/DAST 3".		
YES >>	GO TO 4.		M
NO >>	GO TO 3.		
J.CHECK			Ν
 Check I Perform 	ntermittent incident. Refer to <u>GI-43, "Interm</u> n self-diagnosis for "EPS/DAST 3".	hittent Incident".	
<u>ls DTC "C1</u>	3BF-00" detected?		0
YES >> NO >>	GO TO 4. INSPECTION END		
4.СНЕСК	MALFUNCTION PATTERN		Ρ
With CO 1. Start the CAUTION	NSULT e engine. DN:		

Never drive the vehicle.

- 2. Perform self-diagnosis for "DAST 1" and "DAST 2".
- 3. Check the each system self-diagnostic result.

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< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Detec	Detected DTC or system condition		Possible cause	Malfunction	
DAST 1	DAST 2	EPS/DAST 3		pattern	
C13C2-00 and C13C3-00	C13BF-00	C13BF-00	 Ignition power supply circuit (between steering angle main control module and steering angle sub control module) Steering angle main control module Steering angle sub control module 	Pattern 1	
C13C3-00	C13C3-00	C13BF-00	 Ignition power supply circuit (between steering force control module and steering angle sub control module) Steering force control module Steering angle sub control module 	Pattern 2	

What is the malfunction pattern?

Pattern 1>>Proceed to diagnosis procedure. Refer to <u>STC-250, "EPS/DAST 3 : Diagnosis Procedure (Pattern 1)"</u>.

Pattern 2>>Proceed to diagnosis procedure. Refer to <u>STC-251, "EPS/DAST 3 : Diagnosis Procedure (Pattern 2)"</u>.

EPS/DAST 3 : Diagnosis Procedure (Pattern 1)

INFOID:000000009785077

$1. {\sf check ignition power supply for steering angle main control module}$

- 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	_	Continuity
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		Continuity
E26	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 3.

2.CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering angle main control module and steering angle sub control module. Refer to <u>STC-428, "Removal and Installation"</u>, <u>STC-429, "Removal and Installation"</u>.

NO >> Repair or replace error-detected part.

3.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 m	ain control module	Steering angle sub control module		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
E26	25	E29	27	Existed	

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> Check the ignition power supply circuit for steering force control module and steering angle sub А control module. Refer to STC-407, "Diagnosis Procedure".
- NO >> Repair or replace error-detected parts.

EPS/DAST 3 : Diagnosis Procedure (Pattern 2)

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1. CHECK INTERNAL CIRCUIT IN STEERING ANGLE SUB CONTROL MODULE

Check the continuity between steering angle sub control module connector terminals.

Steering angle su	- Continuity		
Terminal			
25	27	Existed	
Is the inspection result normal?			E

Is the inspection result normal?

YES >> GO TO 2.

NO

>> Replace steering angle sub control module. Refer to STC-429, "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	STC	
Connector	Terminal		Continuity		
E29	25	Ground	0 V	Н	

Turn the ignition switch ON. 2.

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

Steering angle sub control module			Continuity	
Connector	Terminal		Continuity	
E29	25	Ground	10.5 – 16.0 V	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 4.

3.CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering force control module and steering angle sub control module. Refer to STC-427, "Removal and Installation", STC-429, "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.

Check the continuity between steering angle sub control module harness connector and steering force 3. control module harness connector.

Steering angle sub control module		Steering force control module		Continuity	-
Connector	Terminal	Connector	Terminal	Continuity	F
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-407, "Diagnosis Procedure".

NO >> Repair or replace error-detected parts.

DAST 1

< DTC/CIRCUIT DIAGNOSIS >

DAST 1 : DTC Description

INFOID:000000009785079

[DIRECT ADAPTIVE STEERING]

NOTE:

During engine start, the DTC "C13BF-00" may be detected due to temporary low voltage. DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BF-00	FLEXRAY COMMUNICATION (FlexRay communication)	 The malfunction in FlexRay communication between control modules is detected. The malfunction status of other control module is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering force control module
- Steering angle main control module
- Steering angle sub control module
- Ignition power supply circuit

NOTE:

- When "C13BF-00" is detected as "PRSNT", "DAST 1" is not displayed on CONSULT. For diagnosis, refer to <u>STC-419, "Description"</u>.
- When "C13BF-00" is detected as "PAST", Check the intermittent incident. Refer to <u>GI-43</u>, "Intermittent Incident".

FAIL-SAFE

• Variable

NOTE:

For fail-safe mode, refer to <u>STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe"</u>. DAST 2

DAST 2 : DTC Description

NOTE:

During engine start, the DTC "C13BF-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BF-00	FLEXRAY COMMUNICATION (FlexRay communication)	 The malfunction in FlexRay communication between control modules is detected. The malfunction status of other control module is detected.

POSSIBLE CAUSE

- Steering angle main control module
- Steering angle sub control module
- Ignition power supply circuit

FAIL-SAFE

Variable
 NOTE:

For fail-safe mode, refer to STC-47, "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.

INFOID:000000009785080
< DTC/CIRCUIT DIAGNOSI	S>	[DIRECT AD	APTIVE STEERING]
2.DTC REPRODUCTION PR	ROCEDURE		
 With CONSULT Start the engine. CAUTION: Never drive the vehicle. Perform self-diagnosis for Is DTC "C13BF-00" detected? 	r "DAST 2".		
YES >> Proceed to diagno NO >> GO TO 3.	Disis procedure. Refer to	STC-253, "DAST 2 : Diagnosis P	rocedure".
CHECK INTERMITTENT I Check intermittent incider	NCIDEN I	mittant Incident"	
 2. Perform self-diagnosis for Is DTC "C13BF-00" detected? YES >> Proceed to diagnosis 	r "DAST 2".	<u>STC-253, "DAST 2 : Diagnosis P</u>	rocedure".
NO >> INSPECTION EN	D		
DAST 2 : Diagnosis Pro	ocedure		INFOID:000000009785081
1.CHECK IGNITION POWE	R SUPPLY FOR STEER	RING ANGLE MAIN CONTROL M	ODULE
 Turn the ignition switch O Disconnect steering angle Check the voltage betwee 	FF. e main control module ha en steering angle main c	arness connector. control module harness connector	and ground.
Steering angle main	control module		Continuity
Connector	Terminal		Continuity
E26	25	Ground	0 V
 Turn the ignition switch O Check the voltage betwee 	N. en steering angle contro	I module harness connector and g	jround.
Steering angle main	control module		Continuity
Connector	Terminal		Continuity
E26	25	Ground	10.5 – 16.0 V
Is the inspection result norma YES >> GO TO 2. NO >> GO TO 3. 2.CHECK INTERMITTTENT	<u>I?</u> INCIDENT		
Refer to GI-43, "Intermittent Ir	ncident".		
Is the inspection result norma	<u>l?</u>		
YES >> Replace steering <u>STC-428, "Remo</u> NO >> Repair or replace 2	angle main control mo val and Installation", ST(error-detected part.	odule and steering angle sub con C-429, "Removal and Installation"	ntrol module. Refer to
J.CHECK IGNITION POWE	R SUPPLY CIRCUIT		
 Turn the ignition switch O Disconnect steering angle Check the continuity betw sub control module harne 	FF. e sub control module ha veen steering angle mai ss connector.	rness connector. in control module harness connec	tor and steering angle
Steering angle main contro	l module Si	teering angle sub control module	
			- Continuity

E26 25 E29

Terminal

Is the inspection result normal?

Connector

Connector

Terminal

27

Existed

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

- YES >> Check the ignition power supply circuit for steering force control module and steering angle sub control module. Refer to <u>STC-407, "Diagnosis Procedure"</u>.
- NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS >

C13C0-00 FLEXRAY COMMUNICATION EPS/DAST 3

EPS/DAST 3 : DTC Description NOTE: During engine start, the DTC "C13C0-00" may be detected due to temporary low voltage. DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	D
C13C0-00	FLEXRAY COMMUNICATION (FlexRay communication)	 The malfunction in FlexRay communication between control modules is detected. The malfunction status of other control module is detected. 	E
POSSIBLE	CAUSE		
 FlexRay of Steering a Steering a Steering a Battery po Ignition po Harness of 	communication circuit orce control module angle main control module angle sub control module ower supply circuit ower supply circuit connector		F
FAIL-SAFE • Mode 2 NOTE: For fail-sa	fe mode, refer to <u>STC-47, "DIRECT ADAP</u>	<u>'TIVE STEERING : Fail-safe"</u> .	Н
DTC CON	FIRMATION PROCEDURE		I
1.PRECO	NDITIONING		
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and st.	J
~~	GO TO 2		Κ
2.DTC RE	PRODUCTION PROCEDURE		
With CO	NSULT		L
1. Start th	e engine.		
Never	drive the vehicle.		M
2. Perform	n self-diagnosis for "EPS/DAST 3".		
IS DIC "C1			NI
NO >>	GO TO 3.		IN
3. CHECK	INTERMITTENT INCIDENT		
 Check Perform 	intermittent incident. Refer to <u>GI-43, "Interr</u> n self-diagnosis for "EPS/DAST 3".	nittent Incident".	0
Is DTC "C1	3C0-00" detected?		P
YES >> NO >>	GO TO 4. INSPECTION END		1
4. CHECK	MALFUNCTION PATTERN		

With CONSULT
 Start the engine.
 CAUTION:
 Never drive the vehicle.

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< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

- 2. Perform self-diagnosis for "DAST 1" and "DAST 2".
- 3. Check the each system self-diagnostic result.

Detected DTC or system condition		ndition	Dessible source	Deference
DAST 1	DAST 2	EPS/DAST 3	Possible cause	Relefence
System is not dis- played on CON- SULT	C13BE-00, C13C0- 00 or C13C2-00	C13BE-00, C13C0- 00 or C13C2-00	FlexRay communication circuitSteering angle main control module	Pattern 1
C13C0-00, C13C2- 00 or System is not displayed on CON- SULT	System is not dis- played on CON- SULT	C13BE-00, C13C0- 00 or C13C3-00	FlexRay communication circuitSteering angle sub control module	Pattern 2
System is not dis- played on CON- SULT	C13C0-00 and C13C2-00	C13C0-00 and C13C2-00	 Battery 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) 	Pattern 3
System is not dis- played on CON- SULT	System is not dis- played on CON- SULT	C13C0-00, C13C2- 00 and C13C3-00	 Ignition power supply circuit (between steering force control module and steering angle sub control module) Steering force control module Steering angle sub control module 	Pattern 4
C13C0-00 and C13C2-00	System is not dis- played on CON- SULT	C13C0-00 and C13C3-00	Battery power supply circuit for steering angle sub control module	Pattern 5

What is the malfunction pattern?

Pattern 1>>Proceed to diagnosis procedure. Refer to <u>STC-256, "EPS/DAST 3 : Diagnosis Procedure (Pat-tern 1)"</u>.

Pattern 2>>Proceed to diagnosis procedure. Refer to <u>STC-257. "EPS/DAST 3 : Diagnosis Procedure (Pattern 2)"</u>.

Pattern 3>>Proceed to diagnosis procedure. Refer to <u>STC-257. "EPS/DAST 3 : Diagnosis Procedure (Pat-tern 3)"</u>.

Pattern 4>>Proceed to diagnosis procedure. Refer to <u>STC-258</u>, "EPS/DAST 3 : <u>Diagnosis Procedure (Pat-tern 4)</u>".

Pattern 5>>Proceed to diagnosis procedure. Refer to <u>STC-259. "EPS/DAST 3 : Diagnosis Procedure (Pat-tern 5)"</u>.

EPS/DAST 3 : Diagnosis Procedure (Pattern 1)

INFOID:000000009785083

1. CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.

2. Check the continuity between each control module harness connector.

Steering angle m	ain control module	Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E26	19	E20	19	Existed
E26	20	E29	20	EXISTED

3. Check the continuity between control module harness connector and ground.

Steering angle main control module			Continuity
Connector	Terminal		Continuity
E26	19	Ground Not existed	Not existed
L20	20	Ground	NOT EXISTED

Is the inspection result normal?

[DIRECT ADAPTIVE STEERING]

2.CHECK INTERMIT	TENT INCIDENT			
Refer to <u>GI-43, "Interm</u>	ttent Incident".			
Is the inspection result	normal?			
YES >> Replace st	eering angle main cor	trol module. Refer to	STC-428, "Remova	al and Installation".
		part.		
=PS/DAST 3 : Dia	gnosis Procedur	e (Pattern 2)		INFOID:00000000978508
1. CHECK FLEXRAY	COMMUNICATION CI	RCUIT		
1. Disconnect each c	ontrol module harness	s connector.		
2. Check the continui	ty between each conti	rol module harness co	onnector.	
Steering angle sub	control module	Steering angle ma	ain control module	
Connector	Terminal	Connector	Terminal	Continuity
Connector	19	Connector	19	
E29 —	20	E26	20	Existed
3 Check the continui	tv between control mo	dule harness connec	tor and ground	
Steering an	gle sub control module		_	Continuity
Connector	Terminal			
E29	19		Ground	Not existed
	20			
ls the inspection result	normal?			
YES >> GO 10 2.	enlace error-detected	nart		
		purt		
Pofor to CL 42 "Intermi	ttent Incident"			
Is the inspection result	normal?			
YES >> Replace st	eering angle sub cont	rol module. Refer to §	STC-429. "Removal	and Installation".
NO >> Repair or r	eplace error-detected	part.		<u></u> .
EPS/DAST 3 : Dia	anosis Procedur	e (Pattern 3)		INFOID:00000000978508
4	0	(
1. CHECK STEERING	ANGLE MAIN CONT	ROL MODULE GRO	UND CIRCUIT	
1. Turn the ignition sv	vitch OFF.			
 Disconnect steerin Check the continuit 	g angle main control r ty between control mo	nodule harness conne odule harness connec	ector. tor and ground	
			tor and groanal	
Steering ang	le main control module		_	Continuity
Connector	Terminal			
E27	33		Ground	Existed
E28	39			
Is the inspection result	normal?			
YES >> GO TO 2.	n circuit or chart to ar	ound or chart to now	or in hornoon or oon	noctors
- - - - - - - - - -				

- 2.
- Disconnect steering angle main control module harness connector. Check the voltage between steering angle main control module harness connector and ground. 3.

< DTC/CIRCUIT DIAGNOSIS >

STC-257

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module			Continuity
Connector	Terminal		Continuity
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 <u>PG-12, "Wiring Diagram -</u> <u>BATTERY POWER SUPPLY -"</u>.

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		Continuity
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		Continuity
E26	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> Perform intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

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.

 Check the continuity between steering angle main control module harness connector and steering angle sub control module harness connector.

Steering angle m	ain control module	Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
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 <u>STC-407</u>, "Diagnosis Procedure".

NO >> Repair or replace error-detected parts.

EPS/DAST 3 : Diagnosis Procedure (Pattern 4)

INFOID:000000009785086

1.CHECK INTERNAL CIRCUIT IN STEERING ANGLE SUB CONTROL MODULE

Check the continuity between steering angle sub control module connector terminals.

STC-258

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Terminal 25 27 Is the inspection result normal? YES >> GO TO 2. NO >> Replace steering angle sub control module. F 2.CHECK IGNITION POWER SUPPLY FOR STEERING 1. Check the voltage between steering angle sub control Steering angle sub control module	Refer to <u>STC-429, "Remova</u> S ANGLE SUB CONTROL of module harness connected	Existed al and Installation". MODULE or and ground.
25 27 Is the inspection result normal? YES >> GO TO 2. NO >> Replace steering angle sub control module. F 2.CHECK IGNITION POWER SUPPLY FOR STEERING 1. Check the voltage between steering angle sub control Steering angle sub control module Connector	Refer to <u>STC-429, "Remova</u> S ANGLE SUB CONTROL of module harness connected	Existed al and Installation". MODULE or and ground.
Is the inspection result normal? YES >> GO TO 2. NO >> Replace steering angle sub control module. F 2.CHECK IGNITION POWER SUPPLY FOR STEERING 1. Check the voltage between steering angle sub control Steering angle sub control module Connector	Refer to <u>STC-429, "Remova</u> S ANGLE SUB CONTROL I module harness connecte	al and Installation". MODULE or and ground.
1. Check the voltage between steering angle sub contro Steering angle sub control module	ol module harness connecto	or and ground.
Steering angle sub control module		
Connector Terminal		
	_	Continuity
E29 25	Ground	0 V
 Turn the ignition switch ON. Check the voltage between steering angle control module 	odule harness connector ar	nd ground.
Connector Terminal	—	Continuity
E29 25	Ground	10.5 – 16.0 V
 YES >> Replace steering force control module and st <u>"Removal and Installation"</u>, STC-429, "Removal and Installation", StC-429, "Removal and Installatin", StC-429, "Removal and Instal	teering angle sub control m val and Installation". nnector. ontrol module harness con	nodule. Refer to <u>STC-427</u> , nector and steering force
Steering angle sub control module Stee	ering force control module	
Connector Terminal Connec	tor Terminal	Continuity
E29 25 M71	27	Existed
<u>s the inspection result normal?</u> YES >> Check the ignition power supply circuit for ste <u>nosis Procedure</u> ". NO >> Repair or replace error-detected parts. EPS/DAST 3 : Diagnosis Procedure (Pattern	ering force control module.	. Refer to <u>STC-407, "Diag-</u>
 CHECK STEERING ANGLE SUB CONTROL MODUL Turn the ignition switch OFF. Disconnect steering angle sub control module barnes 		

< DTC/CIRCUIT DIAGNOSIS >

Steering angle sub control module		_	Continuity
Connector	Terminal		Continuity
E30	33	Ground	Existed
E31	39	Gibana	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		Continuity	
E30	34	Ground	10.5 – 16.0 V	

Is the inspection result normal?

YES >> Perform intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

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?

- YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to <u>PG-12</u>, "Wiring Diagram <u>BATTERY POWER SUPPLY -</u>".
- NO >> Repair or replace error-detected parts.

DAST 1

DAST 1 : DTC Description

INFOID:000000009785088

NOTE:

During engine start, the DTC "C13C0-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C0-00	FLEXRAY COMMUNICATION (FlexRay communication)	 The malfunction in FlexRay communication between control modules is detected. The malfunction status of other control module is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering angle sub control module
- Battery power supply circuit
- FAIL-SAFE
- Mode 2
- NOTE:

For fail-safe mode, refer to STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe".

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

[DIRECT ADAPTIVE STEERING]

А

< 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. В 2. DTC REPRODUCTION PROCEDURE With CONSULT Start the engine. **CAUTION:** Never drive the vehicle. Perform self-diagnosis for "DAST 1". D Is DTC "C13C0-00" detected? YES >> GO TO 4. NO >> GO TO 3. Е 3. CHECK INTERMITTENT INCIDENT 1. Check intermittent incident. Refer to GI-43, "Intermittent Incident". 2. Perform self-diagnosis for "DAST 1". F Is DTC "C13C0-00" detected? YES >> GO TO 4. NO >> INSPECTION END STC 4.CHECK MALFUNCTION PATTERN (P)With CONSULT Н Start the engine. 1 **CAUTION:**

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2" and "EPS/DAST 3".

3. Check the each system self-diagnostic result.

Detected DTC or system condition			Possible source	Poforonco	J
DAST 1	DAST 2	EPS/DAST 3	russible cause	Relefence	
C13C0-00, C13C2- 00 or System is not displayed on CON- SULT	System is not dis- played on CON- SULT	C13BE-00, C13C0- 00 or C13C3-00	FlexRay communication circuitSteering angle sub control module	Pattern 1	K
C13C0-00 and C13C2-00	System is not dis- played on CON- SULT	C13C0-00 and C13C3-00	Battery power supply circuit for steering angle sub control module	Pattern 2	L

What is the malfunction pattern?

Pattern 1>>Proceed to diagnosis procedure. Refer to <u>STC-261, "DAST 1 : Diagnosis Procedure (Pattern 1)"</u>. Pattern 2>>Proceed to diagnosis procedure. Refer to <u>STC-262, "DAST 1 : Diagnosis Procedure (Pattern 2)"</u>.

DAST 1 : Diagnosis Procedure (Pattern 1)

INFOID:000000009785089

Μ

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.

2. Check the continuity between each control module harness connector.

Steering angle s	ub control module	Steering angle ma	ain control module	Continuity	F
Connector	Terminal	Connector	Terminal	Continuity	
E20	19	E26	19	Existed	-
L29	20	LZO	20	LAISIEU	

3. Check the continuity between control module harness connector and ground.

STC-261

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle sub control module			Continuity
Connector	Terminal		Continuity
E20	19	Ground	Not existed
23	20	Ground	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2. CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to STC-429, "Removal and Installation".
- NO >> Repair or replace error-detected part.

DAST 1 : Diagnosis Procedure (Pattern 2)

INFOID:000000009785090

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		Continuity
E30	33	Ground	Existed
E31	39	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 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 >> Perform intermittent incident. Refer to GI-43, "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?

- YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to <u>PG-12, "Wiring Diagram -</u> <u>BATTERY POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

DAST 2

DAST 2 : DTC Description

NOTE:

INFOID:000000009785091

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

During engine start, the DTC "C13C0-00" may be detected due to temporary low voltage. А DTC DETECTION LOGIC Display item DTC Malfunction detected condition В (Trouble diagnosis content) · The malfunction in FlexRay communication between control FLEXRAY COMMUNICATION C13C0-00 modules is detected. (FlexRay communication) The malfunction status of other control module is detected. POSSIBLE CAUSE FlexRay communication circuit D Steering angle main control module Battery power supply circuit Ignition power supply circuit Harness connector Е FAIL-SAFE Mode 2 NOTE: F For fail-safe mode, refer to STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe". DTC CONFIRMATION PROCEDURE STC 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. Н >> GO TO 2. 2.DTC REPRODUCTION PROCEDURE (P)With CONSULT Start the engine. 1. CAUTION: Never drive the vehicle. Perform self-diagnosis for "DAST 2". Κ Is DTC "C13C0-00" detected? YES >> GO TO 4. NO >> GO TO 3. L ${ m 3.}$ CHECK INTERMITTENT INCIDENT Check intermittent incident. Refer to GI-43, "Intermittent Incident". 1. Perform self-diagnosis for "DAST 2". 2. M Is DTC "C13C0-00" detected? YES >> GO TO 4. NO >> INSPECTION END Ν 4.CHECK MALFUNCTION PATTERN (P)With CONSULT Start the engine. 1 **CAUTION:** Never drive the vehicle. 2. Perform self-diagnosis for "DAST 1" and "EPS/DAST 3". Ρ

3. Check the each system self-diagnostic result.

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Detected DTC or system condition		ndition	Possible cause	Reference
DAST 1	DAST 2	EPS/DAST 3	i ussible cause	Reference
System is not dis- played on CON- SULT	C13BE-00, C13C0- 00 or C13C2-00	C13BE-00, C13C0- 00 or C13C2-00	FlexRay communication circuitSteering angle main control module	Pattern 1
System is not dis- played on CON- SULT	C13C0-00 and C13C2-00	C13C0-00 and C13C2-00	 Battery 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) 	Pattern 2

What is the malfunction pattern?

Pattern 1>>Proceed to diagnosis procedure. Refer to <u>STC-264, "DAST 2 : Diagnosis Procedure (Pattern 1)"</u>. Pattern 2>>Proceed to diagnosis procedure. Refer to <u>STC-264, "DAST 2 : Diagnosis Procedure (Pattern 2)"</u>.

DAST 2 : Diagnosis Procedure (Pattern 1)

INFOID:000000009785092

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

- 1. Disconnect each control module harness connector.
- 2. Check the continuity between each control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
F26	19	E20	19	Evisted
E26 20 E29		E29	20	EXISIED

3. Check the continuity between control module harness connector and ground.

Steering angle main control module			Continuity
Connector	Terminal		Continuity
F26	19	Ground	Not existed
EZO	20	Giouna	INOI EXISIEU

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2. CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to STC-428, "Removal and Installation".

NO >> Repair or replace error-detected part.

DAST 2 : Diagnosis Procedure (Pattern 2)

INFOID:000000009785093

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 ma	ain control module		Continuity
Connector	Terminal	_	Community
E27	33	Ground	Evisted
E28	39	Ground	LAISIEU

< DTC/CIRCUIT DIAGNO	SIS >	[DIRECT	ADAPTIVE STEERING]
Is the inspection result norr	nal?		
YES >> GO TO 2.			
NO >> Repair open cii	cuit or short to ground or sh	ort to power in harness or c	onnectors.
Z .CHECK STEERING AN	GLE MAIN CONTROL MOD	ULE POWER SUPPLY CIR	CUIT (1)
 Turn the ignition switch Disconnect steering an Check the voltage betw 	OFF. gle main control module har veen steering angle main co	ness connector. ntrol module harness conne	ector and ground.
Steering angle ma	ain control module		
Connector	Terminal	—	Continuity
E27	34	Ground	10.5 – 16.0 V
Is the inspection result norr YES >> GO TO 4. NO >> GO TO 3. 3.CHECK STEERING AND	nal? GLE MAIN CONTROL MOD	DULE POWER SUPPLY CIR	CUIT (2)
INVESTIGATION FORMATION	nal? puble diagnosis for battery p <u>VER SUPPLY -"</u> . ce error-detected parts. /ER SUPPLY FOR STEERIN OFF. gle main control module har	ower supply circuit. Refer to	9 <u>PG-12. "Wiring Diagram -</u> 9L MODULE
		nitor module namess conne	
Steering angle ma		_	Continuity
	Ierminai	Orecursd	0.1/
 Turn the ignition switch Check the voltage bety 	ON. veen steering angle control r	module harness connector a	and around.
Cteoring engls m			<u> </u>
Steering angle ma		—	Continuity
Eac	reminal	Cround	10.5 16.0.1/
	20	Giouria	10.5 - 18.0 V
IS the inspection result norr YES >> Perform interm NO >> GO TO 5. 5.CHECK IGNITION POW	nar <u>?</u> ittent incident. Refer to <u>GI-4</u> /ER SUPPLY CIRCUIT	3. "Intermittent Incident".	
 Turn the ignition switch Disconnect steering an Check the continuity be sub control module har 	OFF. gle sub control module harn etween steering angle main ness connector.	ess connector. control module harness co	nnector and steering angle

Steering angle ma	ain control module	Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
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 <u>STC-407, "Diagnosis Procedure"</u>.

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace error-detected parts.

[DIRECT ADAPTIVE STEERING]

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INFOID:000000009785094

< DTC/CIRCUIT DIAGNOSIS > C13C1-00 FLEXRAY COMMUNICATION **EPS/DAST 3**

EPS/DAST 3 : DTC Description

NOTE: During eng	ine start, the DTC "C13C1-00" may be o	detected due to temporary low voltage.
DTC DETI	ECTION LOGIC	
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C1-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control mod- ules is detected.
 POSSIBLE FlexRay Steering = Steering = Steering = 	E CAUSE communication circuit force control module angle main control module angle sub control module	
FAIL-SAFI • Mode 2 NOTE: For fail-sa	E afe mode, refer to <u>STC-47. "DIRECT AI</u>	DAPTIVE STEERING : Fail-safe".
DTC CON	FIRMATION PROCEDURE	
1.PRECO	NDITIONING	
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been at 10 seconds before conducting the nex	n previously conducted, always turn ignition switch OFF and t test.
>>	• GO TO 2.	
2.dtc re	PRODUCTION PROCEDURE	
With CO 1. Start th CAUTI	NSULT ne engine. I <mark>ON:</mark>	
Never 2. Perforr	drive the vehicle. m self-diagnosis for "EPS/DAST 3".	
<u>ls DTC "C1</u>	3C1-00" detected?	
YES >> NO >>	> GO TO 4. > GO TO 3.	

Perform self-diagnosis for "EPS/DAST 3". 2. Is DTC "C13C1-00" detected?

YES >> GO TO 4.

NO >> INSPECTION END

4. CHECK MALFUNCTION PATTERN

3.CHECK INTERMITTENT INCIDENT

() With CONSULT

1.

1. Start the engine. **CAUTION:**

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1" and "DAST 2".

Check intermittent incident. Refer to GI-43, "Intermittent Incident".

3. Check the each system self-diagnostic result.

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< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Detected DTC or system condition			Bossible course	Reference
DAST 1	DAST 2	EPS/DAST 3	r ussible cause	Reference
System is not dis- played on CON- SULT	System is not dis- played on CON- SULT	C13C1-00 and C13C4-00	 FlexRay communication circuit Steering force control module Steering angle main control module Steering angle sub control module 	Pattern 1
System is not dis- played on CON- SULT	System is not dis- played on CON- SULT	C13BE-00, C13C1- 00 or C13C4-00	FlexRay communication circuitSteering force control module	Pattern 2

What is the malfunction pattern?

Pattern 1>>Proceed to diagnosis procedure. Refer to <u>STC-268, "EPS/DAST 3 : Diagnosis Procedure (Pat-tern 1)"</u>.

Pattern 2>>Proceed to diagnosis procedure. Refer to <u>STC-268, "EPS/DAST 3 : Diagnosis Procedure (Pat-tern 2)"</u>.

EPS/DAST 3 : Diagnosis Procedure (Pattern 1)

INFOID:000000009785095

1. CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.

2. Check the continuity between each control module harness connector.

Steering angle m	ain control module	Steering angle sub control module Connector Terminal		Continuity
Connector	Terminal			Continuity
E26	19	E20	19	Existed
	20	L23	20	Existed

Steering force	control module	Steering angle main control module Connector Terminal		Continuity
Connector	Terminal			Continuity
N/71	19	E26	19	Evicted
	20	E20	20	EXISTED

3. Check the continuity between control module harness connector and ground.

Steering angle main control module			Continuity
Connector	Terminal		
F26 19		Ground	Not ovisted
EZO	20	Giouna	NUL EXISIEU

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.check intermitttent incident

Refer to GI-43, "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 <u>STC-428</u>, "Removal and Installation", <u>STC-429</u>, "Removal and Installation".
- NO >> Repair or replace error-detected part.

EPS/DAST 3 : Diagnosis Procedure (Pattern 2)

INFOID:000000009785096

1. CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.

2. Check the continuity between each control module harness connector.

STC-268

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

St	eering force contro	l module	Stee	ering angle m	ain control module	Continuity
Conne	ector	Terminal	Conr	nector	Terminal	Continuity
M7	·1	19 20	E26		19 20	Existed
3. Check t	the continuity be	etween control m	odule harn	ess connec	ctor and ground.	
	Steering force	control module			_	Continuity
Co	onnector	Termina	al			Continuity
	M71	19		Ground Not existed		Not existed
		20				
YES >> NO >> 2.CHECK	GO TO 2. Repair or repla INTERMITTTEI	ace error-detected	d part.			
Is the insperior of the inspectation of t	ction result norr Replace steerin Repair or repla	<u>mal?</u> ng force control r ace error-detected	nodule. Re d part.	fer to <u>STC</u> -	-427, "Removal an	d Installation".
DAST 1 :	DTC Descr	iption				INFOID:000000009785097
NOTE: During engi DTC DETE	ne start, the DT CTION LOGI	C "C13C1-00" m	ay be dete	cted due to	e temporary low vo	ltage.
DTC	(Troul	ble diagnosis conten	t)		Malfunction dete	cted condition
C13C1-00	FLEXRAY COMM (FlexRay commu	IUNICATION nication)		The malfund ules is dete	ction in FlexRay comm cted.	unication between control mod-
POSSIBLE • FlexRay c • Steering a NOTE:	CAUSE communication on angle main cont	circuit rol module				
 When "C1 <u>STC-419,</u> When "C1 <u>dent"</u>. 	3C1-00"is dete "Description" 3C1-00"is dete	cted as "PRSNT cted as "PAST",	", "DAST 1 [*] Check the	is not dis intermitter	played on CONSU nt incident. Refer to	LT. For diagnosis, refer to <u>GI-43. "Intermittent Inci-</u>
FAIL-SAFE • Mode 2 NOTE:	1					
For fail-sa	te mode, refer t	to <u>STC-47, "DIRI</u>	<u>-CT ADAP</u>	IIVE STEE	<u>:RING : Fail-safe"</u> .	
DAST 2 :	DTC Descr	iption				INFOID:000000009785098
NOTE: During engi DTC DETE	ne start, the DT	⁻ C "C13C1-00" m C	ay be dete	cted due to	temporary low vo	ltage.

< DTC/CIRCUIT DIAGNOSIS >

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C1-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected.

POSSIBLE CAUSE

• FlexRay communication circuit

• Steering angle sub control module

NOTE:

- When "C13C1-00" is detected as "PRSNT", "DAST 2" is not displayed on CONSULT. For diagnosis, refer to <u>STC-419</u>, "Description".
- When "C13C1-00" is detected as "PAST", Check the intermittent incident. Refer to <u>GI-43</u>, "Intermittent Incident".

FAIL-SAFE

Mode 2

NOTE:

For fail-safe mode, refer to STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe".

< DTC/CIRCUIT DIAGNOSIS > C13C2-00 FLEXRAY COMMUNICATION EPS/DAST 3

EPS/DAST 3 : DTC Description

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C2-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control mod- ules is detected.
POSSIBLE	CAUSE	
 FlexRay of Steering a Steering a Steering a Battery po Ignition po Harness of 	communication circuit force control module angle main control module angle sub control module ower supply circuit ower supply circuit connector	
FAIL-SAFE	E	
 Mode 2 NOTE: For fail-sa 	afe mode, refer to <u>STC-47, "DIRECT AD</u>	DAPTIVE STEERING : Fail-safe".
DTC CON	FIRMATION PROCEDURE	
DTC CON	FIRMATION PROCEDURE	
DTC CON 1 .PRECO If "DTC CO wait at leas	FIRMATION PROCEDURE NDITIONING NFIRMATION PROCEDURE" has been t 10 seconds before conducting the nex	previously conducted, always turn ignition switch OFF and t test.
DTC CON 1. PRECO If "DTC CO wait at leas >>	FIRMATION PROCEDURE NDITIONING NFIRMATION PROCEDURE" has been t 10 seconds before conducting the nex	previously conducted, always turn ignition switch OFF and t test.
DTC CON 1.PRECO If "DTC CO wait at leas >> 2.DTC RE	FIRMATION PROCEDURE NDITIONING NFIRMATION PROCEDURE" has been t 10 seconds before conducting the nex • GO TO 2. PRODUCTION PROCEDURE	previously conducted, always turn ignition switch OFF and t test.
DTC CON 1.PRECO If "DTC CO wait at leas >> 2.DTC RE With CO 1. Start th CAUTION Never O 2. Perform	FIRMATION PROCEDURE NDITIONING NFIRMATION PROCEDURE" has been t 10 seconds before conducting the nex GO TO 2. PRODUCTION PROCEDURE NSULT e engine. ON: drive the vehicle. n self-diagnosis for "EPS/DAST 3".	previously conducted, always turn ignition switch OFF and t test.
DTC CON 1.PRECO If "DTC CO wait at leas 2.DTC RE With CO 1. Start th CAUTI Never 2. Perform IS DTC "C1: YES >>	FIRMATION PROCEDURE NDITIONING NFIRMATION PROCEDURE" has been t 10 seconds before conducting the nex GO TO 2. PRODUCTION PROCEDURE NSULT e engine. ON: drive the vehicle. n self-diagnosis for "EPS/DAST 3". <u>3C2-00" detected?</u> GO TO 4. CO TO 2.	previously conducted, always turn ignition switch OFF and t test.
DTC CON 1.PRECO If "DTC CO wait at leas 2.DTC RE With CO 1. Start th CAUTION Never 2. Perform Is DTC "C1: YES >> NO >> 3.CHECK	FIRMATION PROCEDURE NDITIONING NFIRMATION PROCEDURE" has been t 10 seconds before conducting the nex GO TO 2. PRODUCTION PROCEDURE NSULT e engine. ON: drive the vehicle. n self-diagnosis for "EPS/DAST 3". <u>3C2-00" detected?</u> GO TO 4. GO TO 4. GO TO 3. INTERMITTENT INCIDENT	previously conducted, always turn ignition switch OFF and t test.
DTC CON 1.PRECO If "DTC CO wait at leas 2.DTC RE With CO 1. Start th CAUTION Never 2. Perform IS DTC "C1 2. Perform 1. Check 1. Check 1. Check 1. Check	FIRMATION PROCEDURE NDITIONING NFIRMATION PROCEDURE" has been t 10 seconds before conducting the nex GO TO 2. PRODUCTION PROCEDURE NSULT e engine. ON: drive the vehicle. n self-diagnosis for "EPS/DAST 3". <u>3C2-00" detected?</u> GO TO 4. GO TO 3. INTERMITTENT INCIDENT intermittent incident. Refer to <u>GI-43, "Inf</u> n self-diagnosis for "EPS/DAST 3". <u>3C2-00" detected?</u>	previously conducted, always turn ignition switch OFF and t test.
DTC CON 1.PRECO If "DTC CO wait at leas 2.DTC RE With CO 1. Start th CAUTI Never 2. Perforn IS DTC "C1 YES >> NO >> 3.CHECK 1. Check 2. Perforn IS DTC "C1 YES >> NO >> 3.CHECK	FIRMATION PROCEDURE NDITIONING NFIRMATION PROCEDURE" has been t 10 seconds before conducting the nex GO TO 2. PRODUCTION PROCEDURE NSULT e engine. ON: drive the vehicle. n self-diagnosis for "EPS/DAST 3". <u>3C2-00" detected?</u> GO TO 4. GO TO 3. INTERMITTENT INCIDENT intermittent incident. Refer to <u>GI-43, "Inf</u> n self-diagnosis for "EPS/DAST 3". <u>3C2-00" detected?</u> GO TO 4. INTERMITTENT INCIDENT	previously conducted, always turn ignition switch OFF and t test.

- 1. Start the engine. CAUTION: Never drive the vehicle.
- 2. Perform self-diagnosis for "DAST 1" and "DAST 2".

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INFOID:000000009785099

< DTC/CIRCUIT DIAGNOSIS >

3. Check the each system self-diagnostic result.

Detec	cted DTC or system co	ndition	Possible cause	Poforonco
DAST 1	DAST 2	EPS/DAST 3	r ussible cause	Kelelence
System is not dis- played on CON- SULT	C13BE-00, C13C0- 00 or C13C2-00	C13BE-00, C13C0- 00 or C13C2-00	FlexRay communication circuitSteering angle main control module	Pattern 1
System is not dis- played on CON- SULT	C13C0-00 and C13C2-00	C13C0-00 and C13C2-00	 Battery 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) 	Pattern 2
System is not dis- played on CON- SULT	System is not dis- played on CON- SULT	C13C0-00, C13C2- 00 and C13C3-00	 Ignition power supply circuit (between steering force control module and steering angle sub control module) Steering force control module Steering angle sub control module 	Pattern 3

What is the malfunction pattern?

Pattern 1>>Proceed to diagnosis procedure. Refer to <u>STC-272, "EPS/DAST 3 : Diagnosis Procedure (Pat-tern 1)"</u>.

Pattern 2>>Proceed to diagnosis procedure. Refer to <u>STC-273, "EPS/DAST 3 : Diagnosis Procedure (Pat-tern 2)"</u>.

EPS/DAST 3 : Diagnosis Procedure (Pattern 1)

INFOID:000000009785100

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

- 1. Disconnect each control module harness connector.
- 2. Check the continuity between each control module harness connector.

Steering angle r	nain control module	Steering angle sub control module Connector Terminal		Continuity
Connector	Terminal			Continuity
E26	19	E20	19	Existed
220	20	L29	20	LAISIEU

3. Check the continuity between control module harness connector and ground.

Steering angle main control module			Continuity
Connector	Terminal		Continuity
E26	19	Ground	Not existed
	20	Ciouna	Not existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2. CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to STC-428, "Removal and Installation".

NO >> Repair or replace error-detected part.

Pattern 3>>Proceed to diagnosis procedure. Refer to <u>STC-274, "EPS/DAST 3 : Diagnosis Procedure (Pat-tern 3)"</u>.

< DTC/CIRCUIT DIAGNOSIS >

EPS/DAST 3 : Diagnosis Procedure (Pattern 2)

[DIRECT ADAPTIVE STEERING]

INFOID:00000000978510

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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 m	ain control module		Continuity	С
Connector	Terminal			
E27	33	Oraciand	Evistad	
E28	39	– Grouna	Existed	D
Is the inspection result nor	nal?			
YES >> GO TO 2. NO >> Repair open ci 2. CHECK STEERING AN	rcuit or short to ground or s GLE MAIN CONTROL MO	short to power in harness or DULE POWER SUPPLY CI	connectors. RCUIT (1)	E
 Turn the ignition switch Disconnect steering ar Check the voltage betw 	OFF. gle main control module have a steering angle main c	arness connector. ontrol module harness conn	ector and ground.	F
Steering angle m	ain control module			510
Connector	Terminal		Continuity	
E27	34	Ground	10.5 – 16.0 V	Н

Is the inspection result normal?

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 <u>PG-12, "Wiring Diagram -</u> <u>BATTERY POWER SUPPLY -"</u>.

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	N
Connector	Terminal		Continuity	
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	Ρ
Connector	Terminal		Continuity	
E26	25	Ground	10.5 – 16.0 V	

Is the inspection result normal?

YES >> Perform intermittent incident. Refer to GI-43, "Intermittent Incident".

NO >> GO TO 5.

< DTC/CIRCUIT DIAGNOSIS >

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	Continuity
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 <u>STC-407. "Diagnosis Procedure"</u>.

NO >> Repair or replace error-detected parts.

EPS/DAST 3 : Diagnosis Procedure (Pattern 3)

INFOID:000000009785102

1.CHECK INTERNAL CIRCUIT IN STEERING ANGLE SUB CONTROL MODULE

Check the continuity between steering angle sub control module connector terminals.

Steering angle s	Continuity	
Terr	Continuity	
25 27		Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace steering angle sub control module. Refer to STC-429, "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		Continuity	
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		Continuity	
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

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace steering force control module and steering angle sub control module. Refer to <u>STC-427</u>, <u>"Removal and Installation"</u>, <u>STC-429</u>, "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.

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steer	ing angle sub	control module	5	Steering force control module		A
Conne	ctor	Terminal	Conr	nector	Terminal	Continuity
E29)	25	М	71	27	Existed
Is the inspec YES >> NO >> DAST 1 DAST 1 :	tion result Check the i nosis Proce Repair or re DTC Des	normal? gnition power supply adure". eplace error-detected scription	/ circuit for s	steering fo	rce control module. F	Refer to <u>STC-407, "Diag-</u>
NOTE: During engir DTC DETE	ne start, the CTION LC	DTC "C13C2-00" m OGIC	ay be dete	cted due to	o temporary low volta	ige.
DTC	(Display item Frouble diagnosis conten	t)		Malfunction detected	ed condition F
C13C2-00	FLEXRAY CO (FlexRay con	DMMUNICATION		The malfun ules is dete	ction in FlexRay commun	ication between control mod-
 POSSIBLE FlexRay co Steering an Steering and 	CAUSE ommunicati ngle main c ngle sub co	on circuit ontrol module ntrol module				ŀ
FAIL-SAFE • Mode 2 NOTE: For fail-saf	e mode, re	fer to <u>STC-47. "DIRI</u>	ECT ADAP	TIVE STEE	ERING : Fail-safe".	I
DTC CONF	IRMATION	N PROCEDURE				J
1.PRECON	IDITIONING	3				
If "DTC CON wait at least	IFIRMATIO 10 seconds	N PROCEDURE" has before conducting	as been pre the next tes	viously co st.	nducted, always turn	ignition switch OFF and
>> 2.dtc ref	GO TO 2. PRODUCTI	ON PROCEDURE				L
With CON Start the CAUTIC	SULT engine.					N
2. Perform	self-diagno	ehicle. osis for "DAST 1".				Ν
<u>Is DTC "C13</u> YES >> NO >>	<u>C2-00" det</u> GO TO 4. GO TO 3.	ected?				C
3. снеск і	NTERMITT	ENT INCIDENT				
1. Check ir 2. Perform Is DTC "C13	ntermittent i self-diagno C2-00" det	ncident. Refer to <u>Gl</u> osis for "DAST 1". <u>ected?</u>	-43, "Interm	iittent Incic	<u>lent"</u> .	F
YES >> NO >>	GO TO 4. INSPECTIO					
	ISULT					

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

1. Start the engine. CAUTION: Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2" and "EPS/DAST 3".

3. Check the each system self-diagnostic result.

Detected DTC or system condition			Pessible course	Poforonoo
DAST 1	DAST 2	EPS/DAST 3	r ussible cause	Reference
C13C0-00, C13C2- 00 or System is not displayed on CON- SULT	System is not dis- played on CON- SULT	C13BE-00, C13C0- 00 or C13C3-00	FlexRay communication circuitSteering angle sub control module	Pattern 1
C13C0-00 and C13C2-00	System is not dis- played on CON- SULT	C13C0-00 and C13C3-00	Battery power supply circuit for steering angle sub control module	Pattern 2
C13C2-00 and C13C3-00	C13BF-00	C13BF-00	 Ignition power supply circuit (between steering angle main control module and steering angle sub control module) Steering angle main control module Steering angle sub control module 	Pattern 3

What is the malfunction pattern?

Pattern 1>>Proceed to diagnosis procedure. Refer to <u>STC-276</u>, "DAST 1 : Diagnosis Procedure (Pattern 1)". Pattern 2>>Proceed to diagnosis procedure. Refer to <u>STC-276</u>, "DAST 1 : Diagnosis Procedure (Pattern 2)". Pattern 3>>Proceed to diagnosis procedure. Refer to <u>STC-277</u>, "DAST 1 : Diagnosis Procedure (Pattern 3)".

DAST 1 : Diagnosis Procedure (Pattern 1)

INFOID:000000009785104

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.

2. Check the continuity between each control module harness connector.

Steering angle s	ub control module	Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E20	19	E26	19	Existed
29	20	E26		LAISIEU

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module			Continuity
Connector	Terminal	—	Continuity
E20	19	Ground	Not existed
E29	20	Ground	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to STC-429, "Removal and Installation".

NO >> Repair or replace error-detected part.

DAST 1 : Diagnosis Procedure (Pattern 2)

1.CHECK STEERING ANGLE SUB CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.

STC-276

INFOID:000000009785105

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle s	ub control module		Continuity
Connector	Terminal	—	Continuity
E30	33	Ground	Fxisted
E31	39	Cround	Existed
YES >> GO TO 2. NO >> Repair open ci CHECK STEERING AN . Turn the ignition switch . Disconnect steering ar . Check the voltage bety	rcuit or short to ground or sh GLE SUB CONTROL MOD OFF. Ingle sub control module harr veen steering angle sub con	nort to power in harness or c ULE POWER SUPPLY CIRC ness connector. htrol module harness connect	connectors. CUIT (1)
Steering angles	ub control module		
	Terminal	—	Continuity
E30	34	Ground	10.5 – 16.0 V
s the inspection result por	mal?		
 3.CHECK STEERING AN I. Check the 100A fusible 2. Check the harness for terminal and the 100A 	GLE SUB CONTROL MOD e link (#H). open or short between steer fusible link (#H)	ULE POWER SUPPLY CIRC	CUIT (2) e harness connector No.3
 CHECK STEERING AN Check the 100A fusible Check the harness for terminal and the 100A <u>s the inspection result normal sectors</u> YES >> Perform the trophysical sectors NO >> Repair or replace DAST 1 : Diagnosis F 	GLE SUB CONTROL MODE open or short between steer fusible link (#H). <u>mal?</u> puble diagnosis for battery p <u>WER SUPPLY -"</u> . ace error-detected parts. Procedure (Pattern 3)	ULE POWER SUPPLY CIRC	CUIT (2) e harness connector No.3 o <u>PG-12, "Wiring Diagram</u>
 3.CHECK STEERING AN 1. Check the 100A fusible 2. Check the harness for terminal and the 100A ls the inspection result normation result normalized by the second second	GLE SUB CONTROL MOD e link (#H). open or short between steer fusible link (#H). <u>mal?</u> puble diagnosis for battery p <u>WER SUPPLY -"</u> . ace error-detected parts. Procedure (Pattern 3)	ULE POWER SUPPLY CIRC ing angle sub control modul ower supply circuit. Refer to NG ANGLE MAIN CONTRO	CUIT (2) e harness connector No.3 p <u>PG-12, "Wiring Diagram</u> INFOID:000000097851 pL MODULE
 CHECK STEERING AN Check the 100A fusible Check the harness for terminal and the 100A check the harness for terminal and the 100A s the inspection result norm result norm YES >> Perform the troe BATTERY PO NO >> Repair or replation DAST 1 : Diagnosis F CHECK IGNITION POW Turn the ignition switch Disconnect steering ar Check the voltage betw 	GLE SUB CONTROL MODE e link (#H). open or short between steer fusible link (#H). <u>mal?</u> puble diagnosis for battery p <u>WER SUPPLY -"</u> . ace error-detected parts. Procedure (Pattern 3) WER SUPPLY FOR STEERING OFF. ngle main control module have ween steering angle main co	ULE POWER SUPPLY CIRC ing angle sub control modul oower supply circuit. Refer to NG ANGLE MAIN CONTRO rness connector.	CUIT (2) e harness connector No.3 p <u>PG-12, "Wiring Diagram</u> <i>INFOID:00000009785</i> pL MODULE ector and ground.
 CHECK STEERING AN Check the 100A fusible Check the harness for terminal and the 100A the inspection result norm of the inspection of the inspection of the inspectation of the inspectat	GLE SUB CONTROL MODE e link (#H). open or short between steer fusible link (#H). <u>mal?</u> puble diagnosis for battery p <u>WER SUPPLY -"</u> . ace error-detected parts. Procedure (Pattern 3) WER SUPPLY FOR STEERING OFF. ngle main control module have veen steering angle main control module have	ULE POWER SUPPLY CIRC ring angle sub control modul power supply circuit. Refer to NG ANGLE MAIN CONTRO rness connector. ontrol module harness conne	CUIT (2) e harness connector No.3 p <u>PG-12, "Wiring Diagram</u> <i>INFOID:000000097851</i> pL MODULE ector and ground. Continuity
 CHECK STEERING AN Check the 100A fusible Check the harness for terminal and the 100A check the harness for terminal and the 100A s the inspection result norn YES >> Perform the tropic structure NO >> Repair or replation DAST 1 : Diagnosis F CHECK IGNITION POV Turn the ignition switch Disconnect steering ar Check the voltage betw 	GLE SUB CONTROL MODE e link (#H). open or short between steer fusible link (#H). <u>mal?</u> puble diagnosis for battery p <u>WER SUPPLY -"</u> . ace error-detected parts. Procedure (Pattern 3) WER SUPPLY FOR STEERING OFF. ngle main control module have veen steering angle main control module have ain control module	ULE POWER SUPPLY CIRC ring angle sub control modul bower supply circuit. Refer to NG ANGLE MAIN CONTRO rness connector. ontrol module harness conne	CUIT (2) e harness connector No.3 o PG-12, "Wiring Diagram INFOLD:000000097851 oL MODULE ector and ground. Continuity
 S.CHECK STEERING AN Check the 100A fusible Check the harness for terminal and the 100A s the inspection result norm result	GLE SUB CONTROL MODE e link (#H). open or short between steer fusible link (#H). <u>mal?</u> buble diagnosis for battery p <u>WER SUPPLY -"</u> . ace error-detected parts. Procedure (Pattern 3) WER SUPPLY FOR STEERING o OFF. agle main control module have en steering angle main control ain control module Terminal 25 o ON. ween steering angle control	ULE POWER SUPPLY CIRC ring angle sub control modul oower supply circuit. Refer to NG ANGLE MAIN CONTRO rness connector. ontrol module harness connector Ground module harness connector a	CUIT (2) e harness connector No.3 p PG-12, "Wiring Diagram INFOID:00000009785: pL MODULE ector and ground. Continuity 0 V and ground.
 CHECK STEERING AN Check the 100A fusible Check the harness for terminal and the 100A Sthe inspection result norm r	GLE SUB CONTROL MODE e link (#H). open or short between steer fusible link (#H). mal? buble diagnosis for battery p <u>WER SUPPLY -"</u> . ace error-detected parts. Procedure (Pattern 3) WER SUPPLY FOR STEERING o OFF. ogle main control module have en steering angle main control module Terminal 25 o ON. ween steering angle control ain control module	ULE POWER SUPPLY CIRC ring angle sub control modul power supply circuit. Refer to NG ANGLE MAIN CONTRO rness connector. ontrol module harness connector Ground module harness connector a	CUIT (2) e harness connector No.3 p PG-12, "Wiring Diagram INFOID:00000009785: pL MODULE ector and ground. Continuity 0 V and ground.
3.CHECK STEERING AN 1. Check the 100A fusible 2. Check the harness for terminal and the 100A s the inspection result norrection resu	GLE SUB CONTROL MODE e link (#H). open or short between steer fusible link (#H). <u>mal?</u> puble diagnosis for battery p <u>WER SUPPLY -"</u> . ace error-detected parts. Procedure (Pattern 3) WER SUPPLY FOR STEERING OFF. agle main control module have veen steering angle main control module <u>Terminal</u> 25 n ON. ween steering angle control ain control module Terminal	ULE POWER SUPPLY CIRC ing angle sub control modul bower supply circuit. Refer to NG ANGLE MAIN CONTRO rness connector. ontrol module harness connector a Ground module harness connector a	CUIT (2) e harness connector No.3 o PG-12, "Wiring Diagram INFOLD:00000009785: OL MODULE ector and ground. Continuity 0 V and ground. Continuity

2.CHECK INTERMITTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> Replace steering angle main control module and steering angle sub control module. Refer to <u>STC-428, "Removal and Installation"</u>, <u>STC-429, "Removal and Installation"</u>.
- NO >> Repair or replace error-detected part.

 ${\it 3.}$ 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 m	ain control module	Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
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 <u>STC-407</u>, "Diagnosis Procedure".

NO >> Repair or replace error-detected parts.

DAST 2

DAST 2 : DTC Description

INFOID:000000009785107

NOTE:

During engine start, the DTC "C13C2-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C2-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control mod- ules is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering angle main control module
- Battery power supply circuit
- Ignition power supply circuit
- Harness connector

FAIL-SAFE

Mode 2

NOTE:

For fail-safe mode, refer to STC-47, "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 "C13C2-00" detected?

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

YES \Rightarrow GO TO 4. NO \Rightarrow GO TO 3. 3. CHECK INTERMITTENT INCIDENT	А
 Check intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>. Perform self-diagnosis for "DAST 2". 	В
Is DTC "C13C2-00" detected? YES >> GO TO 4. NO >> INSPECTION END	С
4.CHECK MALFUNCTION PATTERN	
With CONSULT Start the engine. CAUTION: Never drive the vehicle	D
	E

2. Perform self-diagnosis for "DAST 1" and "EPS/DAST 3".

3. Check the each system self-diagnostic result.

Detected DTC or system condition		Possible cause	Poforonco	F	
DAST 1	DAST 2	EPS/DAST 3	russible cause	Relefence	
System is not dis- played on CON- SULT	C13BE-00, C13C0- 00 or C13C2-00	C13BE-00, C13C0- 00 or C13C2-00	FlexRay communication circuitSteering angle main control module	Pattern 1	STC
System is not dis- played on CON- SULT	C13C0-00 and C13C2-00	C13C0-00 and C13C2-00	 Battery 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) 	Pattern 2	H

What is the malfunction pattern?

Pattern 1>>Proceed to diagnosis procedure. Refer to <u>STC-279, "DAST 2 : Diagnosis Procedure (Pattern 1)"</u>. Pattern 2>>Proceed to diagnosis procedure. Refer to <u>STC-280, "DAST 2 : Diagnosis Procedure (Pattern 2)"</u>.

DAST 2 : Diagnosis Procedure (Pattern 1)

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1. CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.

2. Check the continuity between each control module harness connector.

Steering angle m	ain control module	Steering angle sub control module		Continuity	M
Connector	Terminal	Connector	Terminal	Continuity	
E26	19	E 20	19	Existed	
L20	20	L25	20	Existed	N

3. Check the continuity between control module harness connector and ground.

Steering angle main control module			Continuity	0
Connector	Terminal	—	Continuity	
E26	19	Ground	Not existed	Ρ
E20	20		- Grouna Not exist	NUL EXISTED

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2. CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to STC-428, "Removal and Installation".
- NO >> Repair or replace error-detected part.

DAST 2 : Diagnosis Procedure (Pattern 2)

INFOID:000000009785109

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		Continuity
E27	33	Ground	Existed
E28	39	Croand	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		Continuity
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 <u>PG-12, "Wiring Diagram -</u> <u>BATTERY POWER SUPPLY -"</u>.

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		Continuity
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		Continuity
E26	25	Ground	10.5 – 16.0 V

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> Perform intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.
- 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		Continuity	
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 <u>STC-407, "Diagnosis Procedure"</u>.

NO >> Repair or replace error-detected parts.

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[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

C13C3-00 FLEXRAY COMMUNICATION EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785110

[DIRECT ADAPTIVE STEERING]

NOTE:

During engine start, the DTC "C13C3-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C3-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering force control module
- Steering angle sub control module
- Battery power supply circuit

FAIL-SAFE

- Mode 2
 - NOTE:

For fail-safe mode, refer to STC-47, "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 "C13C3-00" detected?

- YES >> GO TO 4.
- NO >> GO TO 3.
- **3.**CHECK INTERMITTENT INCIDENT
- 1. Check intermittent incident. Refer to GI-43, "Intermittent Incident".
- 2. Perform self-diagnosis for "EPS/DAST 3".
- Is DTC "C13C3-00" detected?
- YES >> GO TO 4.
- NO >> INSPECTION END
- **4.**CHECK MALFUNCTION PATTERN

With CONSULT

- Start the engine.
 CAUTION:
 - Never drive the vehicle.
- 2. Perform self-diagnosis for "DAST 1" and "DAST 2".
- 3. Check the each system self-diagnostic result.

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Detec	Detected DTC or system condition					Deference	
DAST 1	DAST 2	EPS	/DAST 3	_	Possible cause		Reference
C13C0-00, C13C2- 00 or System is not displayed on CON- SULT	System is not dis played on CON- SULT	- C13BE- 00 or	-00, C13C0- C13C3-00	 FlexRay c Steering a 	communication circuit angle sub control module		Pattern 1
System is not dis- played on CON- SULT	System is not dis played on CON- SULT	- C13C0- 00 and	-00, C13C2- I C13C3-00	 Ignition power supply circuit (between steering force control module and steering angle sub control module) Steering force control module Steering angle sub control module 			Pattern 2
C13C0-00 and C13C2-00	System is not dis played on CON- SULT	- C130 C1	0-00 and 3C3-00	Battery power supply circuit for steering angle sub control module			Pattern 3
Nhat is the malfun	ction pattern?						
Pattern 1>>Proce	ed to diagnosis	s procedur	e. Refer to	o <u>STC-283,</u>	<u>"EPS/DAST 3 : Diac</u>	<u>nosis Pro</u>	<u>cedure (Pat-</u>
Pattern 2>>Proce	 ed to diagnosis	s procedur	e. Refer to	o <u>STC-283.</u>	"EPS/DAST 3 : Diac	inosis Pro	<u>cedure (Pat-</u>
Eattern 3>> Proce	<u>"</u> . Ned to diagnosis	, procedur	a Refer t	0 STC 284		inosis Pro	coduro (Pot
tern 3	<u>-</u> .	s procedul		0 <u>010-204,</u>	LE SIDAST S. DIAU	<u>110315 P10</u>	Cecure (Pal-
EPS/DAST 3 :	Diagnosis F	rocedur	e (Patte	ern 1)		10	IFOID:0000000009785111
4	2 iagneere i		0 (1 0.110				
I.CHECK FLEXR		CATION C	IRCUIT				
1. Disconnect ea	ch control modu	ule harnes	s connecto	or.	oppostor		
2. Check the con	linuity between	each com		e namess o	Unnector.		
Steering ang	le sub control modu	ıle	Ste	ering angle ma	ain control module	Co	ntinuity
Connector	Termi	nal	Con	nector	Terminal	00	
E29	19		E	26	19	- E	xisted
	20				20		
3. Check the con	tinuity between	control m	odule harn	less connec	ctor and ground.		
Steeri	ng angle sub contro	ol module				0	
Connector		Termina	l	1	—	Contir	nuity
E20		19			Ground	Not ev	isted
L23		20					
s the inspection re	sult normal?						
YES >> GO TO) 2.	r dotoctoc	l nort				
			i part.				
Refer to <u>GI-43, "In</u>	termittent Incide	<u>ent"</u> .					
YES >> Replac	ce steering and	e sub con	trol module	e. Refer to s	STC-429 "Removal a	nd Installa	ation".
NO >> Repair	or replace erro	r-detected	l part.				
EPS/DAST 3 :	Diagnosis F	rocedur	e (Patte	ern 2)		IN	IFOID:0000000009785112
1							
I .CHECK INTER	NAL CIRCUIT I	NSIEERI	NG ANGL	E SUB CO	NTROL MODULE		
Check the continui	ty between stee	ering angle	e sub contr	ol module c	connector terminals.		

STC-283

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle su	Continuity	
Tern	Continuity	
25 27		Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace steering angle sub control module. Refer to <u>STC-429, "Removal and Installation"</u>.

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 s	ub control module		Continuity	
Connector	Terminal		Continuity	
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 s	ub control module		Continuity	
Connector	Terminal		Continuity	
E29	25	Ground	10.5 – 16.0 V	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 4.

3.CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace steering force control module and steering angle sub control module. Refer to <u>STC-427,</u> <u>"Removal and Installation"</u>, <u>STC-429, "Removal and Installation"</u>.
- 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 so	Steering angle sub control module		Steering force control module		
Connector	Terminal	Connector Terminal		Continuity	
E29	25	M71	27	Existed	

Is the inspection result normal?

- YES >> Check the ignition power supply circuit for steering force control module. Refer to <u>STC-407, "Diag-nosis Procedure"</u>.
- NO >> Repair or replace error-detected parts.

EPS/DAST 3 : Diagnosis Procedure (Pattern 3)

INFOID:000000009785113

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.

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

	Steering angle s	ub control module		Continuity
Co	onnector	Terminal		Continuity
	E30 E31	33 39	Ground	Existed
le the inene	ction result nor	mal2		
YES >> NO >> 2.CHECK 1. Turn the 2. Disconr 3. Check t	GO TO 2. Repair open ci STEERING AN e ignition switch nect steering ar the voltage betw	rcuit or short to ground or s GLE SUB CONTROL MOD OFF. Igle sub control module har veen steering angle sub cor	hort to power in harness or o ULE POWER SUPPLY CIR ness connector. htrol module harness connect	connectors. CUIT (1) ctor and ground.
	Stooring onglo o	ub control modulo		
	Steering angle s			Continuity
	F30	34	Ground	10 5 – 16 0 V
le the incre	ction result nor	 mal2	Cround	10.0 10.0 V
1. Check t 2. Check t termina Is the inspe YES >> NO >> DAST 1 DAST 1 : NOTE: During engi DTC DETE	the 100A fusible the harness for and the 100A <u>ction result norr</u> Perform the tro <u>BATTERY PON</u> Repair or repla	iption	ring angle sub control modu	le harness connector No.34 o <u>PG-12, "Wiring Diagram -</u> INFOID:000000009785114 oltage.
DTC	(Trou	Display item ble diagnosis content)	Malfunction de	tected condition
C13C3-00	FLEXRAY COMM (FlexRay commu	IUNICATION nication)	The malfunction in FlexRay com ules is detected.	munication between control mod-
POSSIBLE • Steering a • Steering a • Steering a • Ignition po	CAUSE orce control mo ingle main cont ingle sub contro ower supply circ	dule rol module ol module suit		
FAIL-SAFE • Mode 2 NOTE: For fail as	fo mode, refer			"

For fail-safe mode, refer to STC-47, "DIRE **KIIN** Fall-sate . . ADAI

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

< 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.
 Perform self-diagnosis for "DAST 1".

Is DTC "C13C3-00" detected?

YES >> GO TO 4. NO >> GO TO 3.

NO >> GO IO 3.

3. CHECK INTERMITTENT INCIDENT

1. Check intermittent incident. Refer to GI-43, "Intermittent Incident".

Perform self-diagnosis for "DAST 1".

Is DTC "C13C3-00" detected?

YES >> GO TO 4.

NO >> INSPECTION END

4.CHECK MALFUNCTION PATTERN

() With CONSULT

1. Start the engine. CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2" and "EPS/DAST 3".

3. Check the each system self-diagnostic result.

Detec	Detected DTC or system condition		Possible cause	Malfunction
DAST 1	DAST 2	EPS/DAST 3	r ussible cause	pattern
C13C2-00 and C13C3-00	C13BF-00	C13BF-00	 Ignition power supply circuit (between steering angle main control module and steering angle sub control module) Steering angle main control module Steering angle sub control module 	Pattern 1
C13C3-00	C13C3-00	C13BF-00	 Ignition power supply circuit (between steering force control module and steering angle sub control module) Steering force control module Steering angle sub control module 	Pattern 2

What is the malfunction pattern?

Pattern 1>>Proceed to diagnosis procedure. Refer to <u>STC-286, "DAST 1 : Diagnosis Procedure (Pattern 1)"</u>. Pattern 2>>Proceed to diagnosis procedure. Refer to <u>STC-287, "DAST 1 : Diagnosis Procedure (Pattern 2)"</u>.

DAST 1 : Diagnosis Procedure (Pattern 1)

INFOID:000000009785115

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		Continuity	
E26	25	Ground	0 V	

4. Turn the ignition switch ON.

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering an	gle main control module			Continuity
Connector	Termina	al	_	Continuity
E26	25		Ground	10.5 – 16.0 V
s the inspection result YES >> GO TO 2. NO >> GO TO 3. CHECK INTERMIT Refer to GI-43. "Interm s the inspection result YES >> Replace s STC-428. NO >> Repair or CHECK ICNITION	TTENT INCIDENT <u>nittent Incident"</u> . <u>t normal?</u> steering angle main of <u>"Removal and Installa</u> replace error-detected	control module and st ation", <u>STC-429, "Rem</u> d part.	eering angle so oval and Install	ub control module. Refer t ation".
 Turn the ignition s Disconnect steerir Check the continu sub control modul 	witch OFF. ng angle sub control n ity between steering e harness connector.	nodule harness conner angle main control mo	ctor. dule harness c	onnector and steering angle
Steering angle ma	in control module	Steering angle su	b control module	Continuity
Connector	Terminal	Connector	Terminal	Continuity
E26	25	E29	27	Existed
DAST 1 : Diagnos 1.CHECK INTERNAL Check the continuity b	sis Procedure (Pa CIRCUIT IN STEER etween steering angle	attern 2) ING ANGLE SUB CO e sub control module c	NTROL MODUL	INFOID:0000000097851 LE nals.
	Steering angle sub control	l module		
	Terminal			Continuity
25		27		Existed
Is the inspection result YES >> GO TO 2. NO >> Replace s 2.CHECK IGNITION 1. Check the voltage	teering angle sub con POWER SUPPLY FO between steering and	trol module. Refer to <u>s</u> R STEERING ANGLE gle sub control module	STC-429, "Rem SUB CONTRO harness conne	oval and Installation". DL MODULE ector and ground.
Steering an	ngle sub control module			Continuity
Connector	Termina	al		Continuity
E29	25		Ground	0 V
 Turn the ignition s Check the voltage 	witch ON. between steering and	gle control module har	ness connector	and ground.
Steering ar	igie sub control module		_	Continuity
Connector	T	51		,

E29

Ground

25

10.5 – 16.0 V

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 4.

3.CHECK INTERMITTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering force control module and steering angle sub control module. Refer to <u>STC-427.</u> <u>"Removal and Installation"</u>, <u>STC-429.</u> "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			control module	Continuity
Connector	Terminal	Connector Terminal		Continuity
E29	25	M71	27	Existed

Is the inspection result normal?

YES >> Check the ignition power supply circuit for steering force control module. Refer to <u>STC-407, "Diag-nosis Procedure"</u>.

NO >> Repair or replace error-detected parts.

DAST 2

DAST 2 : DTC Description

INFOID:000000009785117

NOTE:

During engine start, the DTC "C13C3-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C3-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control mod- ules is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering force control module
- Steering angle sub control module

FAIL-SAFE

- Mode 2
- NOTE:

For fail-safe mode, refer to STC-47. "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.
C13C3-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNO	SIS >		[DIRECT ADAPTIVE STEERING]
CAUTION:			
Never drive the vehic	le.		A
2. Perform self-diagnosis	TOF DAST 2.		
VES >> Proceed to dia	<u>;u:</u> gnosis procedure. E	Pefer to STC-280 "DAST 2	· Diagnosis Procedure"
NO >> GO TO 3.		leiei lo <u>310-209, DAST 2</u>	<u>. Diagnosis Frocedure</u> .
3. CHECK INTERMITTEN	T INCIDENT		
1. Check intermittent incid	dent. Refer to <u>GI-43</u>	, "Intermittent Incident".	C
2. Perform self-diagnosis	for "DAST 2".		
Is DTC "C13C3-00" detecte	<u>;d?</u>		D
YES >> Proceed to dia NO >> INSPECTION	gnosis procedure. R END	efer to <u>STC-289, "DAST 2</u>	: Diagnosis Procedure".
DAST 2 : Diagnosis F	Procedure		INFOID:000000009785118
A			
1. CHECK INTERNAL CIR	CUIT IN STEERING	G ANGLE SUB CONTROL	MODULE
Check the continuity betwe	en steering angle si	ub control module connecto	pr terminals.
Steer	ing angle sub control mo	odule	
	Terminal		Continuity
25		27	Existed
Is the inspection result norr	nal?		
YES >> GO TO 2.			F
NO >> Replace steering	ng angle sub contro	I module. Refer to STC-429	"Removal and Installation".
2. CHECK IGNITION POW	ER SUPPLY FOR	STEERING ANGLE SUB C	ONTROL MODULE
1. Check the voltage betw	veen steering angle	sub control module harnes	s connector and ground.
Steering angle s	ub control module		
Connector	Terminal		Continuity
E29	25	Ground	0 V
2. Turn the ignition switch	ON.		
3. Check the voltage betw	veen steering angle	control module harness co	nnector and ground.
Steering angle s	ub control module		L
Connector	Terminal		Continuity
E29	25	Ground	10.5 – 16.0 V
Is the inspection result norr	nal?	0.00.00	
YES >> GO TO 3.			
NO >> GO TO 4.			1
3. CHECK INTERMITTER	NT INCIDENT		
Refer to GI-43, "Intermitten	t Incident".		
Is the inspection result norr	nal?		C
YES >> Replace steering	ng force control mo	dule and steering angle sub	o control module. Refer to <u>STC-427,</u>
"Removal and	Installation", STC-4	29, "Removal and Installation	<u></u>
NU >> Repair or repla	ce error-detected pa	aπ.	Г
4.CHECK IGNITION POW	ER SUPPLY CIRC	UII (2)	
1. Turn the ignition switch	OFF.		

 Disconnect steering force control module harness connector.
 Check the continuity between steering angle sub control module harness connector and steering force control module harness connector.

C13C3-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

Steering angle sub control module		Steering force control module		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
E29	25	M71	27	Existed	

Is the inspection result normal?

YES >> Check the ignition power supply circuit for steering force control module. Refer to <u>STC-407, "Diag-nosis Procedure"</u>.

NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS > C13C4-00 FLEXRAY COMMUNICATION EPS/DAST 3

EPS/DAST 3 : DTC Description

NOTE: During engine start, the DTC "C13C4-00" may be detected due to temporary low voltage. DTC DETECTION LOGIC Display item DTC Malfunction detected condition (Trouble diagnosis content) FLEXRAY COMMUNICATION The malfunction of synchronization in FlexRay communication be-C13C4-00 tween control modules is detected. (FlexRay communication) POSSIBLE CAUSE FlexRay communication circuit Steering force control module Steering angle main control module Steering angle sub control module FAIL-SAFE Mode 2 NOTE: For fail-safe mode, refer to STC-47, "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 (P)With CONSULT Start the engine. CAUTION: Never drive the vehicle. 2. Perform self-diagnosis for "EPS/DAST 3". Is DTC "C13C4-00" detected? >> GO TO 4. YES NO >> GO TO 3. $\mathbf{3}.$ check intermittent incident 1. Check intermittent incident. Refer to GI-43, "Intermittent Incident". Perform self-diagnosis for "EPS/DAST 3". 2. Is DTC "C13C4-00" detected? YES >> GO TO 4. NO >> INSPECTION END

4.CHECK MALFUNCTION PATTERN

With CONSULT

1. Start the engine. CAUTION:

Never drive the vehicle.

- 2. Perform self-diagnosis for "DAST 1" and "DAST 2".
- 3. Check the each system self-diagnostic result.

[DIRECT ADAPTIVE STEERING]

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C13C4-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Detected DTC or system condition			Possible cause	Poforonco	
DAST 1	DAST 1 DAST 2 EPS		r ussible cause	Reference	
System is not dis- played on CON- SULT	System is not dis- played on CON- SULT	C13C1-00 and C13C4-00	 FlexRay communication circuit Steering force control module Steering angle main control module Steering angle sub control module 	Pattern 1	
System is not dis- played on CON- SULT	System is not dis- played on CON- SULT	C13BE-00, C13C1- 00 or C13C4-00	FlexRay communication circuitSteering force control module	Pattern 2	

What is the malfunction pattern?

Pattern 1>>Proceed to diagnosis procedure. Refer to <u>STC-292, "EPS/DAST 3 : Diagnosis Procedure (Pat-tern 1)"</u>.

Pattern 2>>Proceed to diagnosis procedure. Refer to <u>STC-292, "EPS/DAST 3 : Diagnosis Procedure (Pat-tern 2)"</u>.

EPS/DAST 3 : Diagnosis Procedure (Pattern 1)

INFOID:000000009785120

1. CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.

2. Check the continuity between each control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
E26	19	E20	19	Existed	
	20	L23	20	LAISted	

Steering force control module		Steering angle ma	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
N/71	19	E26	19	Existed
IVI7 1	20	E20	20	EXISTED

3. Check the continuity between control module harness connector and ground.

Steering angle main control module			Continuity	
Connector	Terminal	_	Continuity	
E26	19	Ground	Not ovisted	
	20	Giouna	NOT EXISTED	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.check intermitttent incident

Refer to GI-43, "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 <u>STC-428</u>, "Removal and Installation", <u>STC-429</u>, "Removal and Installation".
- NO >> Repair or replace error-detected part.

EPS/DAST 3 : Diagnosis Procedure (Pattern 2)

INFOID:000000009785121

1. CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.

2. Check the continuity between each control module harness connector.

STC-292

C13C4-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Ste	eering force contro	l module	Stee	ering angle m	ain control module	
Conne	ector	Terminal	Connector		Terminal	Continuity
M7 ⁻	1	19 20	E	26	19 20	Existed
3. Check t	he continuity be	etween control m	odule harn	ess connec	tor and ground.	
	Steering force	control module				Questionsite
Co	nnector	Termina	al	•	_	Continuity
	M71	19			Ground	Not existed
		20			Cround	Not existed
2.CHECK I Refer to <u>GI-</u> Is the inspec YES >> NO >> DAST 1 DAST 1 : NOTE:	NTERMITTTEI 43. "Intermitten ction result norr Replace steerin Repair or repla DTC Descr	NT INCIDENT <u>t Incident"</u> . <u>mal?</u> ng force control r ice error-detected iption	nodule. Re d part.	fer to <u>STC-</u>	427, "Removal and	Installation".
DIC DEIE	CTION LOGI (Troul	Display item ble diagnosis conten	t)		Malfunction detec	ted condition
C13C4-00	FLEXRAY COMM (FlexRay commu	IUNICATION nication)		The malfund tween contr	ction of synchronization ol modules is detected.	in FlexRay communication be-
POSSIBLE • FlexRay co • Steering a • Steering a • Steering a NOTE: • When "C1 <u>STC-419</u> . • When "C1 <u>dent</u> ". FAIL-SAFE • Mode 2	CAUSE ommunication of orce control mo ngle main control ngle sub control 3C4-00"is dete <u>"Description"</u> . 3C4-00"is dete	circuit dule rol module ol module cted as "PRSNT cted as "PAST",	", "DAST 1' Check the	" is not disp intermitten	blayed on CONSUI t incident. Refer to	-T. For diagnosis, refer to 9 <u>GI-43, "Intermittent Inci-</u>
Mode 2 NOTE: For fail-sat DAST 2	fe mode, refer t	to <u>STC-47. "DIRF</u>	ECT ADAP	TIVE STEE	<u>RING : Fail-safe"</u> .	
DAST 2 :	DTC Descr	iption				INFOID:000000009785123
NOTE: During engir DTC DETE	ne start, the DT	[.] C "C13C4-00" m C	ay be dete	cted due to	temporary low volt	age.

STC-293

C13C4-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C4-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction of synchronization in FlexRay communication be- tween control modules is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering force control module
- Steering angle main control module
- Steering angle sub control module

NOTE:

- When "C13C4-00" is detected as "PRSNT", "DAST 1" is not displayed on CONSULT. For diagnosis, refer to <u>STC-419</u>, "Description".
- When "C13C4-00" is detected as "PAST", Check the intermittent incident. Refer to <u>GI-43</u>, "Intermittent Incident".

FAIL-SAFE

Mode 2

NOTE:

For fail-safe mode, refer to STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe".

C13C5-00 STEERING ANGLE SENSOR SIGNAL GNOSIS > [DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

C13C5-00 STEERING ANGLE SENSOR SIGNAL EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785124

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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 out- put from steering angle sensor for 2 seconds or more.
POSSIBLE • Harness of • Steering f • Steering a	ECAUSE or connector (CAN communication line) orce control module angle sensor	
FAIL-SAFE • Mode 2 (V • Not applic NOTE:	When control module detects a malfunction bable (When control module detects a malfu	at startup.) unction except during startup.)
For fail-sa	Ife mode, refer to <u>STC-47, "DIRECT ADAP</u>	TIVE STEERING : Fail-safe".
DTC CONI	FIRMATION PROCEDURE	
1.PRECO	NDITIONING	
If "DTC CO wait at least	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and st.
>> 2 === ==	GO TO 2.	
Z.DTC RE	PRODUCTION PROCEDURE	
With CO 1. Turn the 2 Perform	NSULT e ignition switch ON. self-diagnosis for "EPS/DAST 3"	
Is DTC "C1;	3C5-00" detected?	
YES >> NO-1 >> NO-2 >>	Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep Confirmation after repair: INSPECTION EI	<u>STC-295, "EPS/DAST 3 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND
EPS/DAS	ST 3 : Diagnosis Procedure	INFOID:000000009785125
1 .PERFOR	RM ABS ACTUATOR AND ELECTRIC UNI	T (CONTROL UNIT) SELF-DIAGNOSIS
With CO I. Turn the C. Perform Is any DTC	NSULT e ignition switch ON. n self-diagnosis for "ABS". detected?	
YES >> NO >>	Check the DTC. Refer to <u>BRC-57, "DTC Ir</u> GO TO 2.	ndex".
2.PERFOR	RM SELF-DIAGNOSIS	
With CO 1. Turn the 2. Erase s 3. Turn the 4. Turn the 5. Perform Is DTC "C13	NSULT e ignition switch ON. self-diagnosis for "EPS/DAST 3". e ignition switch OFF and wait for at least 1 e ignition switch ON. n self-diagnosis for "EPS/DAST 3". 3C5-00" detected?	0 seconds.

C13C5-00 STEERING ANGLE SENSOR SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

- >> Replace steering force control module. Refer to <u>STC-427, "Removal and Installation"</u>. >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>. YES
- NO

C13C6-00 G SENSOR SIGNAL EPS/DAST 3

EPS/DAST 3 : DTC Description

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 Harness of Steering for ABS actual 	E CAUSE or connector (CAN communication line) orce control module ator and electric unit (control unit)	
FAIL-SAFE • Mode 2 NOTE: For fail-sa	ife mode, refer to <u>STC-47, "DIRECT ADA</u>	PTIVE STEERING : Fail-safe".
DTC CON	FIRMATION PROCEDURE	
1.PRECO	NDITIONING	
If "DTC CO wait at least	NFIRMATION PROCEDURE" has been p t 10 seconds before conducting the next t	reviously conducted, always turn ignition switch OFF and est.
>>	GO TO 2.	
2.dtc re	PRODUCTION PROCEDURE	
With CO 1. Turn the 2. Perforn	NSULT e ignition switch ON. n self-diagnosis for "EPS/DAST 3".	
Is DTC "C1	3C6-00" detected?	
YES >> NO-1 >> NO-2 >>	Proceed to diagnosis procedure. Refer to To check malfunction symptom before re Confirmation after repair: INSPECTION	o <u>STC-307, "DAST 1 : Diagnosis Procedure"</u> . pair: Refer to <u>GI-43, "Intermittent Incident"</u> . END
EPS/DAS	ST 3 : Diagnosis Procedure	INF0ID:000000009785127
1. PERFOR	RM ABS ACTUATOR AND ELECTRIC UN	NIT (CONTROL UNIT) SELF-DIAGNOSIS
With CO 1. Turn the 2. Perforn	NSULT e ignition switch ON. n self-diagnosis for "ABS".	
Is any DTC YES >> NO >>	<u>detected?</u> Check the DTC. Refer to <u>BRC-57, "DTC</u> GO TO 2.	Index".
2.PERFOR	RM SELF-DIAGNOSIS	
With CO 1. Turn the 2. Erase s 3. Turn the 4. Turn the 5. Perform Is DTC "C1:	NSULT e ignition switch ON. self-diagnosis for "EPS/DAST 3". e ignition switch OFF and wait for at least e ignition switch ON. n self-diagnosis for "EPS/DAST 3". <u>3C6-00" detected?</u>	10 seconds.
YES >>	Replace steering force control module. F	Refer to STC-427, "Removal and Installation".

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INFOID:000000009785126

C13C6-00 G SENSOR SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

< DTC/CIRCUIT DIAGNOSIS >

C13C7-00 VEHICLE SPEED SIGNAL EPS/DAST 3

EPS/DAST 3 : DTC Description

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 d Steering f ABS actused 	or connector (CAN communication line) force control module	
	ator and electric unit (control unit)	
Mode 2 NOTE: For fail-sa	= afe mode_refer to STC-47 "DIRECT ADAP	TIVE STEERING · Fail-safe"
		The officient of the output of
1.PRECO	NDITIONING	
If "DTC CO	NFIRMATION PROCEDURE" has been pre	eviously conducted, always turn ignition switch OFF and
wait at leas	t 10 seconds before conducting the next te	st.
	CO TO 3	
	PRODUCTION PROCEDURE	
	NSULT	
1. Turn th	e ignition switch ON.	
2. Perform	n self-diagnosis for "EPS/DAST 3".	
YES >>	 Proceed to diagnosis procedure. Refer to 	STC-307 "DAST 1 : Diagnosis Procedure"
NO-1 >>	To check malfunction symptom before rep	air: Refer to <u>GI-43, "Intermittent Incident"</u> .
NO-2 >>	Confirmation after repair: INSPECTION EI	ND
EPS/DAS	ST 3 : Diagnosis Procedure	INFOID:000000009785129
1.PERFOR	RM ABS ACTUATOR AND ELECTRIC UNI	T (CONTROL UNIT) SELF-DIAGNOSIS
With CO	NSULT	
 1. Turn th 2. Perform 	e ignition switch ON. n self-diagnosis for "ABS".	
<u>Is any DTC</u>	detected?	
YES >>	Check the DTC. Refer to <u>BRC-57, "DTC Ir</u>	ndex".
2.PERFOR	RM SELF-DIAGNOSIS	
	NSIII T	
1. Turn th	e ignition switch ON.	
2. Erases 3. Turn th	seir-diagnosis for "EPS/DAST 3". e ignition switch OFF and wait for at least 1	0 seconds.
4. Turn th	e ignition switch ON.	
5. Penom	II SEII-UIAYIIUSIS IUI EFS/DASI 3.	

INFOID:000000009785128

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< DTC/CIRCUIT DIAGNOSIS >

- >> Replace steering force control module. Refer to <u>STC-427, "Removal and Installation"</u>. >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>. YES
- NO

C13C9-00 DRIVE MODE SIGNAL EPS/DAST 3

EPS/DAST 3 : DTC Description

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	С
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.	D
POSSIBLE • Harness c • Steering for • Chassis c	CAUSE or connector (CAN communication line) orce control module ontrol module		E
DTC CONF	FIRMATION PROCEDURE		F
1.PRECOM	NDITIONING		
If "DTC COI wait at least	NFIRMATION PROCEDURE" has been pro t 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and st.	STC
>>	GO TO 2.		Ц
2.DTC RE	PRODUCTION PROCEDURE		
With CO 1. Turn the 2. Perform	NSULT e ignition switch ON. n self-diagnosis for "EPS/DAST 3". 3C9-00" detected?		
YES >> NO-1 >> NO-2 >>	Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep Confirmation after repair: INSPECTION E	<u>STC-307, "DAST 1 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND	J
EPS/DAS	ST 3 : Diagnosis Procedure	INFOID:000000009785133	Κ
1.perfor	RM CHASSIS CONTROL MODULE SELF-	DIAGNOSIS	I
With CO	NSULT e ignition switch ON.		
2. Perform Is any DTC YES >>	detected? Check the DTC. Refer to <u>DAS-422, "DTC</u>	Index".	Μ
2.PERFOR	RM SELF-DIAGNOSIS		Ν
With COI 1. Turn the 2. Erase s 3. Turn the	NSULT e ignition switch ON. self-diagnosis for "EPS/DAST 3". e ignition switch OFF and wait for at least <i>c</i>	10 seconds.	0
4. Turn the 5. Perform Is DTC "C1:	n self-diagnosis for "EPS/DAST 3".		Ρ
YES >>	Replace steering force control module. Re	eter to <u>STC-427, "Removal and Installation"</u> .	

NO >> Check the intermittent incident. Refer to GI-43, "Intermittent Incident".

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INFOID:000000009785132

C13CA-00 ENGINE STATUS SIGNAL EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785134

[DIRECT ADAPTIVE STEERING]

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

- 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-307, "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785135

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 EC-106, "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 "C13CA-00" detected?

- YES >> Replace steering force control module. Refer to <u>STC-427, "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to GI-43, "Intermittent Incident".

STC-302

C13CC-00 T/M GEAR POSI SIGNAL EPS/DAST 3

EPS/DAST 3 : DTC Description

DTC DETECTION LOGIC

	1		\sim
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	С
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.	D
POSSIBLE	CAUSE		
 Steering f TCM 	Force control module		Ε
DTC CON	FIRMATION PROCEDURE		F
1.PRECO	NDITIONING		
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been t 10 seconds before conducting the nex	previously conducted, always turn ignition switch OFF and t test.	STC
>>	GO TO 2.		
2.DTC RE	PRODUCTION PROCEDURE		Η
With CO 1. Turn th 2. Perform	NSULT e ignition switch ON. n self-diagnosis for "EPS/DAST 3".		I
Is DTC "C1	3CC-00" detected?		
YES >> NO-1 >>	 Proceed to diagnosis procedure. Refer To check malfunction symptom before 	to <u>STC-307, "DAST 1 : Diagnosis Procedure"</u> . repair: Refer to <u>GI-43, "Intermittent Incident"</u> .	J
NO-2 >>	Confirmation after repair: INSPECTION	N END	
EPS/DAS	51 3 : Diagnosis Procedure	INFOID:00000009785139	K
1.PERFOR	RM TCM SELF-DIAGNOSIS		
With CO 1. Turn th	NSULT e ignition switch ON.		L
2. Perform	n self-diagnosis for "TRANSMISSION".		M
YES >>	• Check the DTC. Refer to <u>TM-85, "DTC</u> • GO TO 2.	Index".	
2.PERFOR	RM SELF-DIAGNOSIS		Ν
With CO	NSULT		
1. Turn th	e ignition switch ON. self-diagnosis for "EPS/DAST 3"		0
3. Turn th	e ignition switch OFF and wait for at lea	st 10 seconds.	
4. Turn th 5. Perforn	e ignition switch ON. n self-diagnosis for "EPS/DAST 3".		Ρ
Is DTC "C1	3CC-00" detected?		
YES >>	• Replace steering force control module.	Refer to <u>STC-427</u> , "Removal and Installation".	

NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

INFOID:000000009785138

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STC-303

C13CD-00 ENGINE SPEED SIGNAL EPS/DAST 3

EPS/DAST 3 : DTC Description

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13CD-00	ENGINE SPEED SIGNAL (Drive mode 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

- 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-307, "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

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 EC-106, "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 "C13CD-00" detected?

- YES >> Replace steering force control module. Refer to <u>STC-427, "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

INFOID-000000009785140

STC-304

INFOID:000000009785141

C13CE-00 SLEEP/WAKE SIGNAL EPS/DAST 3

EPS/DAST 3 : DTC Description

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	С
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.	D
POSSIBLE	CAUSE		
Harness cSteering forBCM	or connector (CAN communication line) orce control module		Ε
DTC CONF	FIRMATION PROCEDURE		_
1.PRECOM	NDITIONING		F
If "DTC COI wait at least	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next tee	viously conducted, always turn ignition switch OFF and st.	STC
>>	GO TO 2.		
2.DTC RE	PRODUCTION PROCEDURE		Н
With CO 1. Turn the 2. Perform	NSULT e ignition switch ON. n self-diagnosis for "EPS/DAST 3".		I
YES >> NO-1 >> NO-2 >>	<u>3CE-00^{°°} detected?</u> Proceed to diagnosis procedure. Refer to To check malfunction symptom before repa Confirmation after repair: INSPECTION El	<u>STC-308, "DAST 1 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND	J
EPS/DAS	ST 3 : Diagnosis Procedure	INFOID:00000000785143	Κ
1.PERFOF	RM BCM SELF-DIAGNOSIS		
With CO	NSULT		L
1. Turn the 2 Perform	e ignition switch ON. self-diagnosis for "BCM"		
Is any DTC	detected?		M
YES >> NO >>	Check the DTC. Refer to <u>BCS-62, "DTC In</u> GO TO 2.	ndex".	
2.PERFOF	RM SELF-DIAGNOSIS		Ν
With CO	NSULT		
1. Turn the	e ignition switch ON.		0
3. Turn the	e ignition switch OFF and wait for at least 1	0 seconds.	
4. Turn the	e ignition switch ON.		Ρ
Is DTC "C1:	3CE-00" detected?		
YES >>	Replace steering force control module. Re	fer to STC-427, "Removal and Installation".	

NO >> Check the intermittent incident. Refer to GI-43, "Intermittent Incident".

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INFOID:000000009785142

C13CF-00 ALC FUNCTION REQUEST SIGNAL DAST 1

DAST 1 : DTC Description

INFOID:000000009785144

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 function request sig- nal (steering force) 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

- T. 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-307, "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009785145

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 <u>DAS-422, "DTC Index"</u>.
- 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 >> Replace steering angle main control module. Refer to <u>STC-427, "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to GI-43, "Intermittent Incident".

STC-306

C13D0-00 ALC FUNCTION REQUEST SIGNAL [DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

C13D0-00 ALC FUNCTION REQUEST SIGNAL DAST 1

DAST 1 : DTC Description

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INFOID:000000009785146

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 function request sig- nal (steering angle) that is output from chassis control module for 2 seconds or more.
POSSIBLE • Harness c • Steering a • Chassis c	CAUSE or connector (Chassis communication line angle main control module control module	e)
DTC CON	FIRMATION PROCEDURE	
1.PRECO	NDITIONING	
If "DTC COI wait at least	NFIRMATION PROCEDURE" has been p t 10 seconds before conducting the next	previously conducted, always turn ignition switch OFF and test.
>> 2. dtc re	GO TO 2. PRODUCTION PROCEDURE	
With CO Turn the Perform BDTC "C1: YES >> NO-1 >> NO-2 >> 	NSULT e ignition switch ON. n self-diagnosis for "DAST 1". <u>3D0-00" detected?</u> Proceed to diagnosis procedure. Refer to To check malfunction symptom before re Confirmation after repair: INSPECTION	to <u>STC-307, "DAST 1 : Diagnosis Procedure"</u> . epair: Refer to <u>GI-43, "Intermittent Incident"</u> . END
DAST 1 :	Diagnosis Procedure	INFOID:000000009785147
1.PERFOR	RM CHASSIS CONTROL MODULE SEL	F-DIAGNOSIS
(E) With CO 1. Turn the 2. Perform	NSULT e ignition switch ON. n self-diagnosis for "CHASSIS CONTRO	
Is any DTC YES >> NO >>	detected? Check the DTC. Refer to <u>DAS-422. "DT</u> GO TO 2.	<u>C Index"</u> .
Z .PERFOR	RM SELF-DIAGNOSIS	
 With CO Turn the Erase s Turn the Turn the Turn the Perform 	NSULT e ignition switch ON. self-diagnosis for "DAST 1". e ignition switch OFF and wait for at leas e ignition switch ON. n self-diagnosis for "DAST 1".	t 10 seconds.
YES >>	<u>3DU-UU" detected?</u> Replace steering angle main control mo	dule. Refer to STC-427, "Removal and Installation".

NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

STC-307

C13D1-00 STEERING ANGLE SIGNAL DAST 1

DAST 1 : DTC Description

INFOID:000000009785148

[DIRECT ADAPTIVE STEERING]

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D1-00	ALC FUNCTION REQUEST SIGNAL (Active lane control function request signal)	Malfunction is detected in active lane control function request sig- nal (steering angle) 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

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 <u>STC-308</u>, "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-40, "How to Check Terminal".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009785149

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

With CONSULT

- Turn the ignition switch ON.
- 2. Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>BRC-57, "DTC Index"</u>.

NO >> GO TO 2.

2. PERFORM CHASSIS CONTROL MODULE SELF-DIAGNOSIS

With CONSULT

Turn the ignition switch ON.

2. Perform self-diagnosis for "CHASSIS CONTROL".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>DAS-422, "DTC Index"</u>.

NO >> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

With CONSULT

Turn the ignition switch ON.

C13D1-00 STEERING ANGLE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >	[DIRECT ADAPTIVE STEERING]	
 Erase self-diagnosis for "DAST 1". Turn the ignition switch OFF and wait for at least 10 seconds. Turn the ignition switch ON. 		А
 5. Perform self-diagnosis for "DAST 1". <u>Is DTC "C13D1-00" detected?</u> YES >> Replace steering angle main control module. Refer to <u>STC-4</u> 	427, "Removal and Installation".	В
NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent</u>	Incident".	С
		D
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C13D2-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785150

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-47. "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-310, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785151

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 <u>STC-427. "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43</u>, "Intermittent Incident".

DAST 1

DAST 1 : DTC Description

INFOID:000000009785152

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	
	-	
 Mode 3 NOTE: For fail-sa 	fe mode, refer to STC-47, "DIRECT ADAF	PTIVE STEERING : Fail-safe".
DTC CON	FIRMATION PROCEDURE	
1.PRECO	NDITIONING	
If "DTC CO wait at least	NFIRMATION PROCEDURE" has been pr t 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and est.
>>	GO TO 2.	
Z. DTC RE	PRODUCTION PROCEDURE	
With CO Start th CAUTIC Never	NSULT e engine. ON: drive the vehicle.	
2. Perform	n self-diagnosis for "DAST 1".	
IS DTC "C1	<u>3D2-00" detected?</u>	STC 211 "DAST 1 : Diagnosis Procedure"
NO-1 >> NO-2 >>	To check malfunction symptom before rep Confirmation after repair: INSPECTION E	pair: Refer to <u>GI-43, "Intermittent Incident"</u> . ND
DAST 1 :	Diagnosis Procedure	INFOID:000000009785153
1.PERFOR	RM SELF-DIAGNOSIS	
With CO	NSULT	
1. Turn th	e ignition switch ON.	
2. Erase s 3. Turn the	e ignition switch OFF and wait for at least	10 seconds.
4. Start th	e engine.	
Never	UN: drive the vehicle.	
5. Perform	n self-diagnosis for "DAST 1".	
Is DTC "C1	<u>3D2-00" detected?</u>	ula Defente CTC 420 "Demovel and leatellation"
NO >>	Check the intermittent incident. Refer to <u>(</u>	GI-43, "Intermittent Incident".
DAST 2		
DAST 2 :	DTC Description	INFO/D:00000009785154
DTC DETE	ECTION LOGIC	
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition

	(Trouble diagnosis content)	
C13D2-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

< DTC/CIRCUIT DIAGNOSIS >

• Steering angle sub control module

FAIL-SAFE

Mode 2

NOTE:

For fail-safe mode, refer to <u>STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe"</u>.

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-312, "DAST 2 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000009785155

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-429, "Removal and Installation".
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

C13D3-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

DTC DETECTION LOGIC

			0
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	С
C13D3-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.	D
POSSIBLE • Steering f	CAUSE orce control module		F
FAIL-SAFE • Mode 2 NOTE: For fail-sa	fe mode, refer to <u>STC-47, "DIRECT ADA</u>	PTIVE STEERING : Fail-safe".	F
DTC CON	FIRMATION PROCEDURE		
1.PRECO	NDITIONING		ST
If "DTC CO wait at least	NFIRMATION PROCEDURE" has been pr t 10 seconds before conducting the next to	reviously conducted, always turn ignition switch OFF and est.	Н
>>	GO TO 2.		
2.DTC RE	PRODUCTION PROCEDURE		
With CO Start th CAUTIO Never C Porform	NSULT e engine. ON: drive the vehicle.		J
<u>Is DTC "C13</u> YES >> NO-1 >>	3D3-00" detected? Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep	9 <u>STC-313, "EPS/DAST 3 : Diagnosis Procedure"</u> . pair: Refer to <u>GI-43, "Intermittent Incident"</u> .	K
			L
1.PERFOR	RM SELE-DIAGNOSIS	INFOID:00000009785157	M
With CO I. Turn the Erase s I. Turn the Construction of the second seco	NSULT e ignition switch ON. self-diagnosis for "EPS/DAST 3". e ignition switch OFF and wait for at least	10 seconds.	Ν
4. Start in CAUTION Never	on: drive the vehicle.		0
5. Perform <u>Is DTC "C13</u> YES >> NO >> DAST 1	n self-diagnosis for "EPS/DAST 3". <u>3D3-00" detected?</u> • Replace steering force control module. R • Check the intermittent incident. Refer to <u>(</u>	efer to <u>STC-427, "Removal and Installation"</u> . GI-43, "Intermittent Incident".	Ρ
DAST 1 :	DTC Description	INFOID:00000009785158	
DTC DETE	ECTION LOGIC		

А

В

INFOID:000000009785156

C13D3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

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 3

NOTE:

For fail-safe mode, refer to STC-47, "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-314. "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009785159

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.
- 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 <u>STC-428. "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

DAST 2

DAST 2 : DTC Description

INFOID:000000009785160

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

C13D3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >	[DIRECT ADAPTIVE STEERING]	
Steering angle sub control module		
FAIL-SAFE		А
Mode 2		
NOTE: For fail-safe mode refer to STC-47 "DIRECT ADAPTIVE STEERING	· Fail-safe"	В
If "DTC CONFIRMATION PROCEDURE" has been providually conductor	d always turn ignition switch OFF and	C
wait at least 10 seconds before conducting the next test.		
		D
>> GO TO 2.		
2.DTC REPRODUCTION PROCEDURE		Е
With CONSULT		
1. Start the engine.		_
Never drive the vehicle.		F
2. Perform self-diagnosis for "DAST 2".		
<u>IS DTC_C13D3-00_detected ?</u> VES Proceed to diagnosis procedure. Refer to STC-315_"DAST.	2 : Diagnosis Procedure"	STC
NO-1 $>>$ To check malfunction symptom before repair: Refer to <u>GI-43</u>	3. "Intermittent Incident".	
NO-2 >> Confirmation after repair: INSPECTION END		Н
DAST 2 : Diagnosis Procedure	INFOID:000000009785161	
1. PERFORM SELF-DIAGNOSIS		
With CONSULT		
 Turn the ignition switch ON. Erase self-diagnosis for "DAST 2" 		I
3. Turn the ignition switch OFF and wait for at least 10 seconds.		J
4. Start the engine.		
Never drive the vehicle.		Κ
5. Perform self-diagnosis for "DAST 2".		
Is DTC "C13D3-00" detected?		L
NO >> Check the intermittent incident. Refer to GI-43, "Intermittent	Incident"	
		в. Л
		IVI
		Ν
		0

C13D4-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785162

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 2

NOTE:

For details of fail-safe, refer to STC-47, "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

(B) With CONSULT

- Start the engine.
 CAUTION: Never drive the vehicle.
- 2. Turn the steering wheel.
- Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D4-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-316, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785163

1.CHECK THE ANGLE SENSOR

Check the force motor angle sensor. Refer to <u>STC-317, "EPS/DAST 3 : Component Inspection"</u>. <u>Is the inspection result normal?</u>

YES >> GO TO 2.

NO >> Force motor angle sensor is malfunction. Replace steering column assembly. Refer to <u>ST-87.</u> <u>"Removal and Installation"</u>.

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 >

Connector	Steering force control module		Force moto	Continuity	
	Terminal	Conr	nector	Terminal	Continuity
	10			1	
	11			5	
M71	6	N	172	4	Existed
	5		175	8	Existed
	4			2	
	2			6	
3. Check the continu	uity between con	trol module harn	ess conne	ctor and ground.	
Steerin	g force control modu	le			Continuity
Connector	-	Terminal			Continuity
		10			
		11	1		
N/71		6		Ground	Not ovisted
1017-1		5	1	Grounu	
		4	1		
		2	1		
YES >> Replace NO >> Repair or EPS/DAST 3 : Co 1.CHECK THE ANG	steering force con replace error-de Omponent Ins LE SENSOR switch OFF. motor angle sen between motor a	ntrol module. Re tected part. spection	fer to <u>STC</u>	-427, "Removal and	Installation".
 Turn the ignition : Disconnect force Check continuity 		ingle sensor con			
 Turn the ignition s Disconnect force Check continuity 	Force motor ar	Ingle sensor con			
 Turn the ignition : Disconnect force Check continuity 	Force motor ar Termir	ngle sensor con			Continuity
 Turn the ignition : Disconnect force Check continuity 	Force motor ar Termir	ngle sensor con ngle sensor nal	5		Continuity
 Turn the ignition : Disconnect force Check continuity 1 4 	Force motor ar Termir	ngle sensor con ngle sensor nal	5 8		Continuity Existed

DTC DETECTION LOGIC

C13D4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

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 3
- NOTE:

For details of fail-safe, refer to STC-47, "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.

- 2. Turn the steering wheel.
- 3. Perform self-diagnosis for "DAST 1".

Is DTC "C13D4-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-318. "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009785166

1.CHECK THE ANGLE SENSOR

Check the main motor angle sensor. Refer to STC-319, "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 <u>ST-98</u>, <u>"Removal and Installation"</u>.

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	Continuity
	10		3	
	11	E93	6	
Fac	6		1	Eviated
E20	5		5	Existed
	4		2	
	2		4	

C13D4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

	Steering angle main control	module			
Conr	nector	Terminal			Continuity
		10			
		11	-		
E*	26	6	Ground		Not existed
E,	20	5	Ground		
		4			
		2			
is the inspection	ion result normal?				
YES >> G	GO TO 3.	datastad part			
3 CHECK IN					
Keter to <u>GI-43</u>	3, "Intermittent Inciden	<u>t"</u> .			
	<u>ion result normal?</u> Penlace steering angle	main control modu	le Refer to STC-42	28 "Removal a	and Installation"
NO >> R	Repair or replace error-	detected part.	no. Nerei lo <u>010-42</u>	LO, INGINUVALA	<u>and motalialion</u> .
DAST 1 · C	Component Inspe	ction			INECID-000000000
	1				111 010.0000000000000000000000000000000
1					WW 012.0000000000
1. CHECK TH	HE ANGLE SENSOR				NY 012.00000000
1. CHECK TH	HE ANGLE SENSOR ignition switch OFF.				
1. CHECK TH 1. Turn the i 2. Disconne 3. Check co	HE ANGLE SENSOR ignition switch OFF. ect main motor angle so ontinuity between moto	ensor harness con r angle sensor con	nector. nector terminals.		<i>IN 012.00000000</i>
1 .CHECK TH 1. Turn the i 2. Disconne 3. Check co	HE ANGLE SENSOR ignition switch OFF. ect main motor angle so ontinuity between moto	ensor harness con r angle sensor con	nector. nector terminals.		
1. CHECK TH 1. Turn the i 2. Disconne 3. Check co	HE ANGLE SENSOR ignition switch OFF. ect main motor angle so ontinuity between moto Main motor	ensor harness con r angle sensor con	nector. nector terminals.		
1. CHECK TH 1. Turn the i 2. Disconne 3. Check co	HE ANGLE SENSOR ignition switch OFF. ect main motor angle so ontinuity between moto Main motor	ensor harness con r angle sensor con r angle sensor	nector. nector terminals.		Continuity
1. CHECK TH 1. Turn the i 2. Disconne 3. Check co	HE ANGLE SENSOR ignition switch OFF. ect main motor angle so ontinuity between moto Main motor Ter 3	ensor harness con r angle sensor con ⁻ angle sensor ⁻ minal	nector. nector terminals.		Continuity
1. CHECK TH 1. Turn the i 2. Disconne 3. Check co	HE ANGLE SENSOR ignition switch OFF. ect main motor angle se ontinuity between moto Main motor Ter 3 1	ensor harness con r angle sensor con ⁻ angle sensor ⁻ minal	nector. nector terminals. 6 5		Continuity
1.CHECK TH 1. Turn the i 2. Disconne 3. Check co	HE ANGLE SENSOR ignition switch OFF. ect main motor angle se ontinuity between moto Main motor Ter 3 1 4	ensor harness con r angle sensor con angle sensor minal	nector. nector terminals.		Continuity
1 .CHECK TH 1. Turn the i 2. Disconne 3. Check co Is the inspection	HE ANGLE SENSOR ignition switch OFF. ect main motor angle so ontinuity between moto Main motor Ter 3 1 4 ion result normal?	ensor harness con r angle sensor con r angle sensor rminal	nector. nector terminals. 6 5 2		Continuity
1.CHECK TH 1. Turn the i 2. Disconne 3. Check co Is the inspection YES >> IN	HE ANGLE SENSOR ignition switch OFF. ect main motor angle se ontinuity between moto Main motor Ter 3 1 4 ion result normal? NSPECTION END	ensor harness con r angle sensor con minal	nector. nector terminals.		Continuity
1. CHECK TH 1. Turn the i 2. Disconne 3. Check co Is the inspection YES >> IN NO >> M	HE ANGLE SENSOR ignition switch OFF. ect main motor angle se ontinuity between moto Main motor Ter 3 1 4 ion result normal? NSPECTION END Main motor angle ser	ensor harness con r angle sensor con rangle sensor rminal	nector. nector terminals. 6 5 2 n. Replace steering	g gear assem	Continuity Existed
1.CHECK TH 1. Turn the i 2. Disconne 3. Check co Is the inspection YES >> IN NO >> M DAST 2	HE ANGLE SENSOR ignition switch OFF. ect main motor angle se ontinuity between moto Main motor Ter 3 1 4 ion result normal? NSPECTION END Main motor angle ser Removal and Installation	ensor harness con r angle sensor con minal	nector. nector terminals. 6 5 2 n. Replace steering	g gear assem	Continuity Existed
1.CHECK TH 1. Turn the i 2. Disconne 3. Check co Is the inspection YES >> IN NO >> M DAST 2	HE ANGLE SENSOR ignition switch OFF. ect main motor angle se ontinuity between moto Main motor Ter 3 1 4 ion result normal? NSPECTION END Main motor angle ser Removal and Installation	ensor harness con r angle sensor con minal	nector. nector terminals.	g gear assem	Continuity Existed
1.CHECK TH 1. Turn the i 2. Disconne 3. Check co Is the inspect YES >> IN NO >> M DAST 2 : D	HE ANGLE SENSOR ignition switch OFF. ect main motor angle se ontinuity between moto Main motor 3 1 4 ion result normal? NSPECTION END Main motor angle ser Removal and Installation	ensor harness con r angle sensor con minal sor is malfunction	nector. nector terminals. 6 5 2 n. Replace steering	g gear assem	Continuity Existed hbly. Refer to <u>ST-</u>
1.CHECK TH 1. Turn the i 2. Disconne 3. Check co Is the inspection YES >> IN NO >> M DAST 2 DAST 2 : E	HE ANGLE SENSOR ignition switch OFF. ect main motor angle se ontinuity between moto Main motor Ter 3 1 4 ion result normal? NSPECTION END Main motor angle ser Removal and Installation DTC Description	ensor harness con r angle sensor con minal	nector. nector terminals.	g gear assem	Continuity Existed hbly. Refer to <u>ST-</u>
1.CHECK TH 1. Turn the i 2. Disconne 3. Check co Is the inspective YES >> IN NO >> M DAST 2 DAST 2 : D DTC DETEC	HE ANGLE SENSOR ignition switch OFF. ect main motor angle sector Main motor Main motor 3 1 4 ion result normal? NSPECTION END Main motor angle ser Removal and Installation DTC Description	ensor harness con r angle sensor con minal sor is malfunction	nector. nector terminals. 6 5 2 n. Replace steering	g gear assem	Continuity Existed
1.CHECK TH 1. Turn the i 2. Disconne 3. Check co Is the inspective YES >> IN NO >> M DAST 2 DAST 2 : D DTC DETEC	HE ANGLE SENSOR ignition switch OFF. ect main motor angle se ontinuity between moto Main motor Ter 3 1 4 ion result normal? NSPECTION END Main motor angle ser Removal and Installation DTC Description	ensor harness con r angle sensor con minal sor is malfunction	nector. nector terminals. 6 5 2 n. Replace steering	g gear assem	Continuity Existed hbly. Refer to <u>ST</u> -
1.CHECK TH 1. Turn the i 2. Disconne 3. Check co Is the inspection YES >> IN NO >> M DAST 2 DAST 2 : D DTC DETEC DTC	HE ANGLE SENSOR ignition switch OFF. ect main motor angle secont inuity between motor Main motor Ter 3 1 4 ion result normal? NSPECTION END Main motor angle ser Removal and Installation DTC Description CTION LOGIC Display in (Trouble diagnost)	ensor harness con r angle sensor con minal sor is malfunction	nector. nector terminals. 6 5 2 n. Replace steering Malfe	g gear assem	Continuity Existed hbly. Refer to <u>ST-</u> <i>INFOID:000000009</i>

• 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

< DTC/CIRCUIT DIAGNOSIS >

NOTE:

For details of fail-safe, refer to STC-47, "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

(B) With CONSULT

1. Start the engine. CAUTION:

Never drive the vehicle.

- 2. Turn the steering wheel.
- 3. Perform self-diagnosis for "DAST 2".

Is DTC "C13D4-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-320, "DAST 2 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000009785169

1.CHECK THE ANGLE SENSOR

Check the sub motor angle sensor. Refer to STC-321, "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 <u>ST-98,</u> <u>"Removal and Installation"</u>.

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 s	Steering angle sub control module		Sub motor angle sensor	
Connector	Terminal	Connector	Terminal	Continuity
	10	E94	3	
	11		6	
E20	6		1	Evistod
E29	5		5	EXISTED
	4		2	
	2		4	

3. Check the continuity between control module harness connector and ground.

Steering angle	sub control module		Continuity
Connector	Connector Terminal		Continuity
	10		
	11		
E20	6	Ground	Not existed
L29	5	Ground	
	4		
	2		

C [,]	13D4-00 CONTROL MODUL	.E
< DTC/CIRCUIT DIAGNOSIS >		[DIRECT ADAPTIVE STEERING]
Is the inspection result normal?		
YES >> GO TO 3.		
NO >> Repair or replace error-	detected part.	
3. CHECK INTERMITTTENT INCID	ENT	
Refer to GI-43, "Intermittent Incident	<u>.</u>	
Is the inspection result normal?		
YES >> Replace steering angle s NO >> Repair or replace error-o	sub control module. Refer to <u>STC-42</u> detected part.	9. "Removal and Installation".
DAST 2 : Component Inspec	ction	INFOID:000000009785170
1 CHECK THE ANGLE SENSOR		
 I urn the ignition switch OFF. Disconnect sub motor angle sen 	sor harness connector.	
3. Check continuity between motor	angle sensor connector terminals.	
Sub motor a	angle sensor	
Terr	ninal	Continuity
3	6	
1	5	Existed
4	2	
Is the inspection result normal?		
YES >> INSPECTION END		
NO >> Sub motor angle sens	or is malfunction. Replace steerin	g gear assembly. Refer to <u>ST-98,</u>
"Removal and Installatio	<u>un"</u> .	

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< DTC/CIRCUIT DIAGNOSIS >

C13D5-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785171

[DIRECT ADAPTIVE STEERING]

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-47. "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 "C13D5-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-322, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785172

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 <u>STC-427. "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43. "Intermittent Incident"</u>.

DAST 1

DAST 1 : DTC Description

INFOID:000000009785173

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 • Steering a	CAUSE angle main control module			
FAIL-SAFE • Mode 3 NOTE: For fail-sa	ife mode, refer to <u>STC-47, "DIRECT ADAP</u>	TIVE STEERING : Fail-safe".		
DTC CON	FIRMATION PROCEDURE			
1.PRECO	NDITIONING			
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been pre	eviously conducted, always turn ignition switch OFF and st.		
>> 2	GO TO 2.			
Z.DTC RE				
With CO Start th CAUTI Never Perform	NSULT e engine. ON: drive the vehicle. a self-diagnosis for "DAST 1"			
Is DTC "C1	<u>3D5-00" detected?</u>			
YES >> NO-1 >>	Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep	<u>STC-323, "DAST 1 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> .		
	Diagnosis Procedure			
	Diagnosis i locedure	INFOID:00000009785174		
1.PERFOR	1.PERFORM SELF-DIAGNOSIS			
With CO 1. Turn th	NSULT e ignition switch ON.			
 Erase self-diagnosis for "DAST 1". Turn the ignitian switch OEE and wait for at least 10 accords 				
4. Start th	e engine.	i Seconds.		
CAUTI Never	ON: drive the vehicle.			
5. Perform	n self-diagnosis for "DAST 1".			
YES >>	<u>3D5-00" detected?</u> Replace steering angle main control modu	le. Refer to STC-428. "Removal and Installation".		
NO >>	Check the intermittent incident. Refer to G	I-43, "Intermittent Incident".		
DAST 2				
DAST 2 :	DTC Description	INFOID:000000009785175		
DTC DETE	ECTION 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

< DTC/CIRCUIT DIAGNOSIS >

• Steering angle sub control module

FAIL-SAFE

Mode 2

NOTE:

For fail-safe mode, refer to <u>STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe"</u>.

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 "C13D5-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-324, "DAST 2 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000009785176

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-429, "Removal and Installation".
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.
C13D6-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	С
C13D6-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.	D
POSSIBLE • Steering for	CAUSE proce control module		F
FAIL-SAFE • Mode 2 NOTE: For fail-sa	fe mode, refer to <u>STC-47. "DIRECT ADAP</u>	TIVE STEERING : Fail-safe".	F
DTC CON	FIRMATION PROCEDURE		
1.PRECON	NDITIONING		STC
If "DTC COI wait at least	NFIRMATION PROCEDURE" has been pre to the next test to the next test test to the next test to the next test test test to the next test test test test test test test t	eviously conducted, always turn ignition switch OFF and st.	Н
>>	GO TO 2.		
2.DTC RE	PRODUCTION PROCEDURE		
With CO Start the CAUTIO Never	NSULT e engine. DN: drive the vehicle.		J
<u>Is DTC "C1:</u> YES >> NO-1 >>	<u>3D6-00" detected?</u> Proceed to diagnosis procedure. Refer to To check malfunction symptom before repair.	STC-325, "EPS/DAST 3 : Diagnosis Procedure". air: Refer to <u>GI-43, "Intermittent Incident"</u> .	K
			L
1.PERFOR	RM SELF-DIAGNOSIS	INFOID:00000009785178	M
With CO T. Turn the C. Erase s Turn the C. Start the	NSULT e ignition switch ON. elf-diagnosis for "EPS/DAST 3". e ignition switch OFF and wait for at least 1	0 seconds.	Ν
CAUTION Never	drive the vehicle.		0
5. Perform <u>Is DTC "C13</u> YES >> NO >> DAST 1	n self-diagnosis for "EPS/DAST 3". 3 <u>D6-00" detected?</u> Replace steering force control module. Re Check the intermittent incident. Refer to <u>G</u>	fer to <u>STC-427, "Removal and Installation"</u> . I-43, "Intermittent Incident".	Ρ
DAST 1 :	DTC Description	INF0ID:000000009785179	
DTC DETE	CTION LOGIC		

А

В

INFOID:000000009785177

C13D6-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D6-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

• Steering angle main control module

FAIL-SAFE

Mode 3

NOTE:

For fail-safe mode, refer to STC-47, "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 "C13D6-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-326. "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009785180

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.
- Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13D6-00" detected?

- YES >> Replace steering angle main control module. Refer to <u>STC-428. "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

DAST 2

DAST 2 : DTC Description

INFOID:000000009785181

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D6-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

C13D6-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >	[DIRECT ADAPTIVE STEERING]
Steering angle sub control module	<u>_</u>
FAIL-SAFE	А
• Mode 2	
NOTE: For fail-safe mode, refer to STC-47, "DIRECT ADAPTIVE STE	ERING : Fail-safe" B
wait at least 10 seconds before conducting the next test.	nducted, always turn ignition switch OFF and
Ŭ	D
>> GO TO 2.	
2.DTC REPRODUCTION PROCEDURE	E
With CONSULT	
1. Start the engine.	_
Never drive the vehicle.	F
2. Perform self-diagnosis for "DAST 2".	
YES >> Proceed to diagnosis procedure Refer to STC-327	"DAST 2 : Diagnosis Procedure"
NO-1 >> To check malfunction symptom before repair: Refer to NO-2 >> Confirmation after repair: INSPECTION END	to <u>GI-43, "Intermittent Incident"</u> .
DAST 2 : Diagnosis Procedure	INFOID:000000009785182
1. Turn the ignition switch ON.	
2. Erase self-diagnosis for "DAST 2".	J
 Furn the ignition switch OFF and wait for at least 10 seconds Start the engine. 	5.
CAUTION:	K
5. Perform self-diagnosis for "DAST 2".	
Is DTC "C13D6-00" detected?	
YES >> Replace steering angle sub control module. Refer to	STC-429, "Removal and Installation".
NO >> Check the intermittent incident. Refer to <u>GI-43, "Inter</u>	rmittent Incident".
	Μ
	Ν
	-
	0

Ρ

< DTC/CIRCUIT DIAGNOSIS >

C13D7-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785183

[DIRECT ADAPTIVE STEERING]

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-47. "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-328, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785184

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 <u>STC-427. "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43. "Intermittent Incident"</u>.

DAST 1

DAST 1 : DTC Description

INFOID:000000009785185

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 • Steering a	CAUSE	·
FAIL-SAFE • Mode 3 NOTE: For fail as	5 5 6 mode, refer to STC 47 "DIRECT ADAR	
DTC CON	FIRMATION PROCEDURE	The Steening . Fail-sale.
1.PRECO	NDITIONING	
If "DTC CO	NFIRMATION PROCEDURE" has been pre	eviously conducted, always turn ignition switch OFF and st.
>> 2 DTO DE		
1. Start th CAUTIC Never (2. Perform	e engine. ON: drive the vehicle. n self-diagnosis for "DAST 1".	
<u>Is DTC "C1</u> YES >> NO-1 >>	<u>3D7-00" detected?</u> Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep	<u>STC-329, "DAST 1 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> .
NO-2 >>	Confirmation after repair: INSPECTION El	ND
DASIT.	Diagnosis Procedure	INFOID:00000009785186
	RM SELF-DIAGNOSIS	
 With CO Turn th Erase s Turn th 	NSULT e ignition switch ON. self-diagnosis for "DAST 1". e ignition switch OFF and wait for at least 1	0 seconds.
4. Start in CAUTION Never (5. Perform	e engine. <mark>ON:</mark> drive the vehicle. n self-diagnosis for "DAST 1".	
IS DTC "C1: YES >> NO >> DAST 2	<u>3D7-00" detected?</u> Replace steering angle main control modu Check the intermittent incident. Refer to <u>G</u>	Ile. Refer to <u>STC-428, "Removal and Installation"</u> .
	DTC Description	
DAST 2:	DIC Description	INFOID:00000009785187
DTC DETE	ECTION LOGIC	
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition

C13D7-00 (Control module) The internal malfunction in control module is detected.	C13D7-00

POSSIBLE CAUSE

< DTC/CIRCUIT DIAGNOSIS >

• Steering angle sub control module

FAIL-SAFE

Mode 2

NOTE:

For fail-safe mode, refer to <u>STC-47, "DIRECT ADAPTIVE STEERING : Fail-safe"</u>.

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-330, "DAST 2 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000009785188

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-429, "Removal and Installation".
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

C13D8-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

DTC DETECTION LOGIC

DTC	DTC Display item Malfunction detected condition (Trouble diagnosis content)						
C13D8-00	0 CONTROL MODULE (Control module) The malfunction in each motor angle sensor is detected.						
POSSIBLE Force motion Sensor cirits Steering for the steering fo	CAUSE tor angle se rcuit (betwe orce contro	ensor en steering force con I module	trol module a	nd force motor angle	e sensor) is open	or short.	
DTC CON	FIRMATIO	N PROCEDURE					
1. DTC RE	PRODUCT	ION PROCEDURE					
With CO 1. Turn the 2. Start the CAUTIC	NSULT e ignition sv e engine. ON:	witch OFF and wait fo	or at least 10 s	econds.		S	
3. Perform	n self-diagn 3D8-00" de	enicie. osis for "EPS/DAST 3 tected?	3".				
YES >> NO-1 >> NO-2 >>	Proceed to To check n Confirmati	o diagnosis procedure nalfunction symptom on after repair: INSPE	e. Refer to <u>ST</u> e before repair: ECTION END	<u>C-331, "EPS/DAST</u> Refer to <u>GI-43, "Inte</u>	3 : Diagnosis Pro ermittent Incident	<u>cedure"</u> . <u>"</u> .	
EPS/DAS	ST 3 : Dia	agnosis Procedui	re			INFOID:000000009785190	
1.снеск	THE ANGL	E SENSOR					
Check the fe Is the inspe YES >> NO >> 2 OUTOUS	orce motor ction result GO TO 2. Force mot <u>"Removal</u>	angle sensor. Refer to <u>normal?</u> or angle sensor is m and Installation".	o <u>STC-332, "f</u> nalfunction. R	<u>EPS/DAST 3 : Comp</u>	oonent Inspection umn assembly. F	<u>"</u> . Refer to <u>ST-87,</u>	
1. Disconr 2. Check 1	nect steerin the continui	g force control modul ty between control m	e and force m odule harness	notor angle sensor h s connector and ang	arness connector le sensor harnes	r. s connector.	
St	eering force o	ontrol module	Fc	rce motor angle sensor		Continuity	
Conne	ector	Terminal	Connect	or Term	inal	Continuity	
		10		1	1		
		11		5			
M7	′1	6	M73	4		Existed	
	-	5		8			
		4		2			
		2		6			

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В

INFOID:000000009785189

C13D8-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

Steering force control module			Continuity		
Connector	Terminal				
	10				
	11				
M71	6	Ground	Not ovisted		
	5	Ground	NUT EXISTED		
	4				
	2				
s the inspection result normal?					

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to STC-427, "Removal and Installation".
- NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

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
Terr		
1	5	
4	8	Existed
2	6	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Force motor angle sensor is malfunction. Replace steering column assembly. Refer to <u>ST-87</u>. <u>"Removal and Installation"</u>.

DAST 1

DAST 1 : DTC Description

INFOID:000000009785192

INFOID:000000009785191

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

C13D8-00 CONTROL MODULE

DTC/CIRCUIT DIA	GNOSIS >			[DIRECT AD	DAPTIVE STEERING]
With CONSULT Turn the ignition s Start the engine.	witch OFF and wait fo	r at least 10 se	econds.		
CAUTION: Never drive the	vehicle.				
Perform self-diag	nosis for "DAST 1".				
<u>DTC "C13D8-00" de</u>	etected?				
ES >> Proceed t D-1 >> To check D-2 >> Confirmat	o diagnosis procedure malfunction symptom l tion after repair: INSPE	e. Refer to <u>STC</u> before repair: I ECTION END	- <u>333, "DAS</u> Refer to <u>GI-</u>	<u>T 1 : Diagnosis I</u> 43, "Intermittent	<u>Procedure"</u> . Incident".
ST 1 : Diagno	sis Procedure				INFOID:000000009785193
CHECK THE ANG	LE SENSOR				
eck the main motor	angle sensor. Refer to	o STC-334, "D	AST 1 : Cor	nponent Inspect	ion".
he inspection resul ES >> GO TO 2 O >> Main mo <u>"Remova</u>	<u>t normal?</u> tor angle sensor is r and Installation".	nalfunction. R	eplace stee	ering gear asse	mbly. Refer to <u>ST-98.</u>
CHECK THE SEN					
Disconnect steeri	ng angle main control	module and m	ain motor a	ale sensor harn	less connector
Check the continu	uity between control m	odule harness	connector a	and angle sensor	r harness connector.
Steering angle ma	ain control module	Ma	in motor angle	sensor	Continuity
Connector	Terminal	Connecto	or	Terminal	Continuity
	10			3	
	11			6	
F26	6	F93		1	Existed
	5			5	
	4			2	
	2			4	
Check the continu	uity between control me	odule harness	connector a	and ground.	
Steering a	ngle main control module				
Connector	Termina	ıl	_		Continuity
	10				
	11				
Fac	6				New Street
E20	5		Grou	ia	NOT EXISTED
	4				
	2				
ne inspection resul S >> GO TO 3 >> Repair or CHECK INTERMIT	<u>t normal?</u> replace error-detectec	l part.			
for to CL 42 "Interm					
iei lu <u>GI-43, "Interr</u>	t normal?				
	thoring angle main as	ntrol module [Defer to CT	2 420 "Damair	and Installation"
IO >> Repair or	replace error-detected	l part.		<u>-420, Kemova</u>	<u>anu mstaliation</u> .

< DTC/CIRCUIT DIAGNOSIS >

DAST 1 : Component Inspection

INFOID:000000009785194

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
Terr		
3	6	
1	5	Existed
4	2	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Main motor angle sensor is malfunction. Replace steering gear assembly. Refer to <u>ST-98.</u> <u>"Removal and Installation"</u>.

C13D9-00 CONTROL MODULE EPS/DAST 3

EPS/DAST 3 : DTC Description

DTC DETECTION LOGIC

DTC (Trouble diagnosis content)	Malfunction detected condition
C13D9-00 CONTROL MODULE (Control module)	The internal malfunction in control module is detected while igni- tion switch is OFF.
POSSIBLE CAUSE	
 Steering force control module 	
DTC CONFIRMATION PROCEDURE	
1. DTC REPRODUCTION PROCEDURE	
 With CONSULT Turn the ignition switch OFF and wait for at least Start the engine. CAUTION: Never drive the vehicle. 	10 seconds.
2. Perform self-diagnosis for "EPS/DAST 3".	
Is DTC "C13D9-00" detected?	
NO-1 >> To check malfunction symptom before re NO-2 >> Confirmation after repair: INSPECTION E	pair: Refer to <u>GI-43, "Intermittent Incident"</u> . END
EPS/DAST 3 : Diagnosis Procedure	INFOID:000000009785196
1.PERFORM SELF-DIAGNOSIS	
 With CONSULT Turn the ignition switch ON. Erase self-diagnosis for "EPS/DAST 3". Turn the ignition switch OFF and wait for at least 	10 seconds.
 Start the engine. CAUTION: Never drive the vehicle. Perform self-diagnosis for "EPS/DAST 3". 	
<u>Is DTC "C13D9-00" detected?</u> YES >> Replace steering force control module. R	Refer to STC-427 "Removal and Installation"
NO >> Check the intermittent incident. Refer to DAST 1	GI-43, "Intermittent Incident".
DAST 1 : DTC Description	INFOID:00000009785197
DTC DETECTION LOGIC	
DTC: Display item	Malfunction detected condition

DIC	(Trouble diagnosis content)	Manunction detected condition
C13D9-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected while igni- tion switch is OFF.

POSSIBLE CAUSE

Steering angle main control module

DTC CONFIRMATION PROCEDURE

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INFOID:000000009785195

< DTC/CIRCUIT DIAGNOSIS >

1.DTC REPRODUCTION PROCEDURE

With CONSULT

- 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-336. "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009785198

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 <u>STC-428, "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

DAST 1 : DTC Description

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В

INFOID:000000009785205

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. Main signal voltage < 0.3 V, 4.7 V < Main signal voltage Sub signal voltage < 0.3 V, 4.7 V < Sub signal voltage
OSSIBLE	CAUSE	
Steering to Sensor cir Steering a	orque sensor cuit (between steering angle main control ngle main control module	module and steering torque sensor) is open or short.
AIL-SAFE Mode 3 (V Mode 2 (V NOTE: For details	When control module detects a malfunction When control module detects a malfunction s of fail-safe mode, refer to STC-47, "DIRE	n at startup.) n except during startup.) ECT ADAPTIVE STEERING : Fail-safe".
	FIRMATION PROCEDURE	
	NDITIONING	
f "DTC COI wait at least	NFIRMATION PROCEDURE" has been pr 10 seconds before conducting the next te	reviously conducted, always turn ignition switch OFF and est.
>>	GO TO 2.	
DTC RE	PRODUCTION PROCEDURE	
With CO Start the NOTE:	NSULT e engine.	
Never c 2. Turn the 3. Perform	rrive the vehicle. e steering wheel. a self-diagnosis for "DAST 1".	
YES >> NO-1 >> NO-2 >>	Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep Confirmation after repair: INSPECTION E	9 <u>STC-337, "DAST 1 : Diagnosis Procedure"</u> . pair: Refer to <u>GI-43, "Intermittent Incident"</u> . END
DAST 1 :	Diagnosis Procedure	INFOID:000000009785206
.CHECK	TORQUE SENSOR POWER SUPPLY CI	RCUIT
With CO . Turn the . On the . Check t	NSULT e ignition switch ON. CONSULT screen, select "DAST 1" >> "D he value	ATA MONITOR" >> "TORQUE SEN VOLTAGE".
	Monitor item	Standard value (Approx.)
TORQUE SE	N VOLTAGE	4.5 – 5.5 V

Is the inspection result normal?

YES >> GO TO 2.

C13DB-00 STEERING TORQUE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- [DIRECT ADAPTIVE STEERING]
- NO >> Perform the trouble diagnosis for battery power supply circuit. Refer to <u>PG-12, "Wiring Diagram -</u> <u>BATTERY POWER SUPPLY -"</u>.

2. CHECK TORQUE SENSOR 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		Continuity
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.

${\it 3.}$ 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 1", and "TORQUE SEN SUB".
- 4. Check the value

Monitor item	Condition	Standard value (Approx.)
TORQUE SEN MAIN 1	Steering wheel: Steering	1.3 – 3.7 V
TORQUE SEN SUB	Steering wheel: Steering	1.3 – 3.7 V

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 4.

4.CHECK TORQUE SENSOR CIRCUIT

- 1. Disconnect steering angle main control module harness connector.
- Check the continuity between steering angle main control module harness connector and steering torque sensor harness connector.

Steering angle m	ain control module	Steering torque sensor		Steering torque sensor		Continuity
Connector	Terminal	Connector	Terminal	Continuity		
E26	8	E95		2		
	1		4	Existed		
	3		3	Existed		
	7		1			

3. Check the continuity between control module harness connector and ground.

Steering angle main control module			Continuity
Connector	Terminal		Continuity
E26	8		Not existed
	1	Ground	
	3	Gibana	
	7		

Is the inspection result normal?

YES >> Torque sensor is malfunction. Replace steering gear assembly. Refer to <u>ST-98, "Removal and</u> <u>Installation"</u>.

C13DB-00 STEERING	
< DTC/CIRCUIT DIAGNOSIS >	
NO >> Repair open circuit or short to ground or sho	rt to power in harness or connectors.
D .CHECK INTERMITTTENT INCIDENT	
Refer to GI-43, "Intermittent Incident".	
Is the inspection result normal?	
YES >> Replace steering angle main control module NO >> Repair or replace error-detected part.	. Refer to STC-428, "Removal and Installation".

[DIRECT ADAPTIVE STEERING]

C13DC-00 STEERING TORQUE SENSOR DAST 1

DAST 1 : DTC Description

INFOID:000000009785207

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. 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-47, "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-340, "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009785208

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]

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< DTC/CIRCUIT DIAGNOSIS >

NO >> Perform the trouble diagnosis for battery power supply circuit. Refer to <u>PG-12, "Wiring Diagram -</u> <u>BATTERY POWER SUPPLY -"</u>.

2. CHECK TORQUE SENSOR 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		Continuity	C
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.

${ m 3.}$ 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 1", and STC "TORQUE SEN SUB".
- 4. Check the value

Monitor item	Condition	Standard value (Approx.)	H
TORQUE SEN MAIN 1	Steering wheel: Steering	1.3 – 3.7 V	
TORQUE SEN SUB	Steering wheel: Steering	1.3 – 3.7 V	

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK TORQUE SENSOR CIRCUIT

- 1. Disconnect steering angle main control module harness connector.
- Check the continuity between steering angle main control module harness connector and steering torque sensor harness connector.

Steering angle m	ain control module	Steering to	rque sensor	Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
	8		2		N
F26	1	FQ5	4	Existed	1.4
L20	3	L90	3	LAISIEU	
	7		1		Ν

3. Check the continuity between control module harness connector and ground.

Steering angle ma	ain control module		Continuity	С
Connector	Terminal		Continuity	
	8			D
E26	1	Ground	Not ovisted	Γ
E20	3	Ground	NOL EXISTED	
	7	-		

Is the inspection result normal?

YES >> Torque sensor is malfunction. Replace steering gear assembly. Refer to <u>ST-98, "Removal and</u> <u>Installation"</u>.

C13DC-00 STEERING TORQUE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to <u>STC-428. "Removal and Installation"</u>.
- NO >> Repair or replace error-detected part.

C13DD-00 STEERING TORQUE SENSOR DAST 1

DAST 1 : DTC Description

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В

INFOID:000000009785209

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 Steering to Sensor circ Steering ar 	CAUSE rque sensor cuit (between steering angle main control in ngle main control module	module and steering torque sensor) is open or short.
FAIL-SAFE • Mode 3 (W • Mode 2 (W NOTE: For details	hen control module detects a malfunction hen control module detects a malfunction of fail-safe mode, refer to <u>STC-47, "DIRE</u>	at startup.) except during startup.) CT ADAPTIVE STEERING : Fail-safe".
DTC CONF	IRMATION PROCEDURE	
1.PRECON	DITIONING	
If "DTC CON wait at least	FIRMATION PROCEDURE" has been pre 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and st.
>> (GO TO 2.	
2.DTC REP	RODUCTION PROCEDURE	
With CON 1. Start the NOTE: Never dr	SULT engine. ive the vehicle.	
 Turn the Perform Is DTC "C13" 	steering wheel. self-diagnosis for "DAST 1". DD-00" detected?	
YES >> F NO-1 >> 7 NO-2 >> (Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep Confirmation after repair: INSPECTION El	<u>STC-343, "DAST 1 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND
DAST 1 : I	Diagnosis Procedure	INFOID:000000009785210
1.снеск т	ORQUE SENSOR POWER SUPPLY CIR	CUIT
With CON 1. Turn the 2. On the C 3. Check th	SULT ignition switch ON. CONSULT screen, select "DAST 1" >> "DA ne value	ATA MONITOR" >> "TORQUE SEN VOLTAGE".
	Monitor item	Standard value (Approx.)

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform the trouble diagnosis for battery power supply circuit. Refer to <u>PG-12</u>, "Wiring Diagram - <u>BATTERY POWER SUPPLY -"</u>.

STC-343

< DTC/CIRCUIT DIAGNOSIS >

2. CHECK TORQUE SENSOR GROUND CIRCUIT

- 1. Disconnect steering angle main control module harness connector.
- 2. Check the continuity between control module harness connector and ground.

Steering angle ma	ain control module		Continuity
Connector	Terminal		Continuity
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 1", and "TORQUE SEN SUB".
- 4. Check the value

Monitor item	Condition	Standard value (Approx.)
TORQUE SEN MAIN 1	Steering wheel: Steering	1.3 – 3.7 V
TORQUE SEN SUB	Steering wheel: Steering	1.3 – 3.7 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK TORQUE SENSOR CIRCUIT

- 1. Disconnect steering angle main control module harness connector.
- 2. Check the continuity between steering angle main control module harness connector and steering torque sensor harness connector.

Steering angle m	ain control module	Steering to	rque sensor	Continuity
Connector	Terminal	Connector	Terminal	Continuity
	8		2	
E26	1	EOF	4	Evistod
EZO	3	E90	3	EXISIED
	7		1	

3. Check the continuity between control module harness connector and ground.

Steering angle ma	ain control module		Continuity
Connector	Terminal		Continuity
	8		
E26	1	Ground	Not existed
EZO	3	Giodila	NOT EXISTED
	7		

Is the inspection result normal?

- YES >> Torque sensor is malfunction. Replace steering gear assembly. Refer to <u>ST-98, "Removal and</u> <u>Installation"</u>
- NO >> Repair open circuit or short to ground or short to power in harness or connectors.

STC-344

C13DD-00 STEERING TORQUE SENSOR

[DIRECT ADAPTIVE STEERING]

< DTC/	CIRCUIT DIAGNOSIS >	[DIRECT ADAPTIVE STEERING]
5. CHE	CK INTERMITTTENT INCIDENT	Δ
Refer to	OGI-46, "Circuit Inspection".	^
<u>Is the ir</u>	spection result normal?	
YES NO	 >> Replace steering angle main control module. Refer to <u>STC-4</u> >> Repair or replace error-detected part. 	28. "Removal and Installation". B
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		E
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C13DE-00 TEMPERATURE SENSOR EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785211

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-50, "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-346, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785212

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.

	Force motor angle sensor		
Connector	Terr	minal	Voltage (Approx.)
	+	_	
M73	3	7	5 V

Is the inspection result normal?

YES >> GO TO 7.

C13DE-00 TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

2.CHECK TEMPERATURE SENSOR POWER SUPPLY (2)

Check the voltage between force motor angle sensor harness connector pin terminals.

Force	motor angle sensor				
Connector	Termin	nal		—	Voltage (Approx.)
Connector	+			_	
M73	3		(Ground	5 V
Is the inspection result YES >> GO TO 3 NO >> GO TO 5 3. CHECK TEMPER 1. Turn the ignition 3	It normal? ATURE SENSOR GR switch OFF.				
 Disconnect steer Check the continistensor harness continues 	ing force control modi iuity between steerin ionnector.	ule harness g force cont	connector. trol module	harness connecto	or and force motor ang
Steering force	control module		Force motor	angle sensor	Continuity
Connector	Terminal	Conr	nector	Terminal	Continuity
M71	29	М	173	7	Existed
4. CHECK CONTRO	L MODULE GROUNI	D CIRCUIT			
4.CHECK CONTRO Check the continuity Steerin Connector M71 M72 Is the inspection resu YES >> GO TO 8 NO >> Repair or	L MODULE GROUNI between steering forc g force control module Termin 30 33 <u>It normal?</u>	D CIRCUIT	odule harne	ss connector and g Ground er in harness or con	Continuity Existed
4.CHECK CONTRO Check the continuity Steerin Connector M71 M72 Is the inspection resu YES >> GO TO 8 NO >> Repair of 5.CHECK TEMPER 1. Turn the ignition 2. Disconnect steer 3. Check the contir sensor harness of	L MODULE GROUNI between steering forc g force control module Termin 30 33 It normal?	D CIRCUIT e control mo nal ground or sh WER SUPP ule harness g force cont	odule harnes	ss connector and g 	Continuity Existed
4.CHECK CONTRO Check the continuity Steerin Connector M71 M72 Is the inspection resu YES >> GO TO 8 NO >> Repair of 5.CHECK TEMPER 1. Turn the ignition 2. Disconnect steer 3. Check the contir sensor harness of Steering force	L MODULE GROUNI between steering forc g force control module Termin 30 33 <u>It normal?</u> Sen circuit or short to ATURE SENSOR PO switch OFF. ing force control module uity between steerin onnector.	D CIRCUIT e control mo nal ground or sh WER SUPP ule harness g force cont	odule harnes	ss connector and g Ground er in harness or con T harness connecto	continuity Existed
4.CHECK CONTRO Check the continuity Steerin Connector M71 M72 Is the inspection resu YES >> GO TO 8 NO >> Repair op 5.CHECK TEMPER 1. Turn the ignition 2. Disconnect steer 3. Check the contir sensor harness of Steering force Connector	L MODULE GROUNI between steering forc g force control module Termin 30 33 It normal? Den circuit or short to ATURE SENSOR PO switch OFF. ing force control module inity between steerin connector.	D CIRCUIT e control mo nal ground or sh WER SUPP ule harness g force cont	odule harnes	ss connector and g	ground. Continuity Existed nnectors. or and force motor ang Continuity
4.CHECK CONTRO Check the continuity Steerin Connector M71 M72 Is the inspection resu YES >> GO TO 8 NO >> Repair of 5.CHECK TEMPER 1. Turn the ignition 2. Disconnect steer 3. Check the contir sensor harness contents Steering force Connector M71	L MODULE GROUNI between steering forc g force control module Termin 30 33 <u>It normal?</u> Den circuit or short to ATURE SENSOR PO switch OFF. ing force control module switch OFF. ing force control module control module Terminal 31	D CIRCUIT e control mo nal ground or sh WER SUPP ule harness g force cont cont Cont M	odule harnes	ss connector and g	ground. Continuity Existed nnectors. or and force motor ang Continuity Existed
4.CHECK CONTRO Check the continuity Steerin Connector M71 M72 Is the inspection resu YES >> GO TO 8 NO >> Repair op 5.CHECK TEMPER 1. Turn the ignition 2. Disconnect steer 3. Check the contin sensor harness of Steering force Connector M71 4. Check the contin	L MODULE GROUNI between steering forc g force control module Termin 30 33 It normal?	D CIRCUIT e control mo nal ground or sh WER SUPP ule harness g force contro Conr force contro	odule harnes	ss connector and g	ground. Continuity Existed Continuity Continuity Continuity Existed Ind ground.
4.CHECK CONTRO Check the continuity Steerin Connector M71 M72 Is the inspection resu YES >> GO TO 8 NO >> Repair of 5.CHECK TEMPER 1. Turn the ignition 2. Disconnect steer 3. Check the contin sensor harness content Steering force Connector M71 4. Check the contin Steerin Connector	L MODULE GROUNI between steering forc g force control module Termin 30 33 It normal? Den circuit or short to ATURE SENSOR PO switch OFF. ing force control module switch OFF. ing force control module Terminal 31 uity between steering g force control module Termin	D CIRCUIT e control mo nal ground or sh WER SUPP ule harness g force contro M force contro	odule harnes	ss connector and g	ground. Continuity Existed nnectors. or and force motor ang Continuity Existed ind ground. Continuity

YES >> GO TO 6.

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C13DE-00 TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

6.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT

Check the power supply circuit for steering force control module. Refer to <u>STC-407, "Diagnosis Procedure"</u>. Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected part.

7.CHECK TEMPERATURE SENSOR

Check the force motor temperature sensor. Refer to STC-348, "EPS/DAST 3 : Component Inspection".

Is the inspection result normal?

- YES >> GO TO 8.
- NO >> Force motor temperature sensor is malfunction. Replace steering column assembly. Refer to <u>ST-</u> 87, "Removal and Installation".

8.CHECK INTERMITTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering force control module. Refer to STC-427, "Removal and Installation".

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:000000009785213

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 Terminal		Condition	Resistance (Approx.)
		Condition	
		0°C	34.8 kΩ
3	7	25°C	10.0 kΩ
		40°C	5.2 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Force motor temperature sensor is malfunction. Replace steering column assembly. Refer to <u>ST-</u> 87, "Removal and Installation".

DAST 1

DAST 1 : DTC Description

INFOID:000000009785214

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 < -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-50. "DIRECT ADAPTIVE STEERING : Protection Function".

STC-348

C13DE-00 TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >	[DIRECT ADAPTIVE STEERING]
DTC CONFIRMATION PROCEDURE	
1.PRECONDITIONING	
If "DTC CONFIRMATION PROCEDURE" has been previously conducte wait at least 10 seconds before conducting the next test.	d, always turn ignition switch OFF and
>> GO TO 2.	
2.DTC REPRODUCTION PROCEDURE	
With CONSULT	
1. Start the engine.	
Never drive the vehicle.	
 Turn the steering wheel. Perform self-diagnosis for "DAST 1" 	
<u>Is DTC "C13DE-00" detected?</u>	
YES >> Proceed to diagnosis procedure. Refer to <u>STC-349, "DAST</u> NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43</u> NO-2 >> Confirmation after repair: INSPECTION END	<u>1 : Diagnosis Procedure"</u> . 3. "Intermittent Incident".
DAST 1 : Diagnosis Procedure	INFOID:00000009785215
1. CHECK THE TEMPERATURE OF CONTROL MODULE	
 With CONSULT Start the engine. CAUTION: Never drive the vehicle. On the CONSULT agreen polect "DAST 1" >> "DATA MONITOP" >> 	
 Wait with the ignition switch OFF until the data monitor indication I 150°C (302°F). 	becomes between -40°C (-40°F) and
Does the temperature become between -40°C (-40°C) and 150°C (302	<u>°F)?</u>
NO >> Replace steering angle main control module. Refer to <u>STC-</u>	428, "Removal and Installation".
2.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. 	
4. Start the engine. CAUTION:	
Never drive the vehicle.	
Is DTC "C13DE-00" detected?	
YES >> Replace steering angle main control module. Refer to <u>STC-</u> NO >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent</u> DAST 2	428. "Removal and Installation". Incident".
DAST 2 · DTC Description	
	INFOID:00000009785216
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 < -40°C (-40°F), 150°C (302°F) < Temperature

< DTC/CIRCUIT DIAGNOSIS >

POSSIBLE CAUSESteering angle sub control module

FAIL-SAFE

Protection mode

NOTE:

For details of protection functions, refer to STC-50, "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.
 Turn the steering wheel.
- Perform self-diagnosis for "DAST 2".

Is DTC "C13DE-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-350, "DAST 2 : Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000009785217

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 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 <u>STC-429. "Removal and Installation"</u>.

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 "C13DE-00" detected?

- YES >> Replace steering angle sub control module. Refer to <u>STC-429, "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to <u>GI-43. "Intermittent Incident"</u>.

C13DF-00 CONTROL MODULE DAST 1

DAST 1 : DTC Description

DTC DETECTION LOGIC

			C
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	C
C13DF-00	CONTROL MODULE (Control module)	The malfunction of internal processing the torque sensor signal voltage is detected.	D
POSSIBLE	CAUSE		
 Steering a 	angle main control module		E
FAIL-SAFE			
 Mode 3 (V Mode 2 (V NOTE: 	When control module detects a malfunction When control module detects a malfunction	at startup.) except during startup.)	F
For details	s of fail-safe mode, refer to STC-47, "DIREC	CT ADAPTIVE STEERING : Fail-safe".	
	FIRMATION PROCEDURE		ST
1.PRECO	NDITIONING		
If "DTC CO wait at least	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next tes	viously conducted, always turn ignition switch OFF and st.	Н
>> 2 DTC RE	GO TO 2.		I
1. Start the NOTE:	NSULI e engine.		J
2. Perform	n self-diagnosis for "DAST 1".		k
Is DTC "C13	3DF-00" detected?		T \
YES >> NO-1 >> NO-2 >>	Proceed to diagnosis procedure. Refer to To check malfunction symptom before repar- Confirmation after repair: INSPECTION EN	<u>STC-351, "DAST 1 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND	L
DAST 1 :	Diagnosis Procedure	INFOID:000000009785219	
1. PERFOR	RM SELF-DIAGNOSIS		M
With CO 1. Turn the	NSULT e janition switch ON.		Ν
2. Erase s	self-diagnosis for "DAST 1".		
 Turn the Start the NOTE: 	e ignition switch OFF and wait for at least 1 e engine.	0 seconds.	С
Never of 5. Perform	drive the vehicle. n self-diagnosis for "DAST 1".		P
Is DTC "C1	<u>3DF-00" detected?</u>		
YES >> NO >>	Replace steering angle main control modu Check the intermittent incident. Refer to <u>G</u>	le. Refer to <u>STC-428, "Removal and Installation"</u> . I-43, "Intermittent Incident".	

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INFOID:000000009785218

C13E0-00 ST CLUTCH COMMAND CIRCUIT EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785220

[DIRECT ADAPTIVE STEERING]

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-47, "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

(B) With CONSULT

- 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-352, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785221

1.CHECK THE STEERING CLUTCH

Check the steering clutch. Refer to <u>STC-353</u>, "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 <u>ST-91, "Removal and</u> <u>Installation"</u>.

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 ADAPTIVE STEERING]

Connector	Steering force control module		Steering clutch		
CONTECTO	Terminal	Conn	ector	Terminal	Continuity
M71 -	26 28	M1	56	1 3	Existed
3. Check the continu	ity between contr	ol module harne	ess conne	ctor and ground.	
Steering	force control module				Continuity
Connector	Те	erminal		—	Continuity
M71		26		Ground	Not existed
		28		Ground	Not existed
Refer to <u>GI-43</u> , "Interm Is the inspection result YES >> Replace s NO >> Repair or i EPS/DAST 3 : CC 1.CHECK THE STEE 1. Turn the ignition s 2. Disconnect steerir	ittent Incident". inormal? teering force cont replace error-dete omponent Insp RING CLUTCH witch OFF. ng clutch harness	trol module. Ref ected part. Dection	er to <u>STC</u>	-427, "Removal and	d Installation". INFOID:00000009785222
	between steering		'i pin tenni	nale	
K	Steering clutcl	n motor		nais.	
	Steering clutcl Termina	n motor			Continuity
1	Steering clutcl Termina	h motor	3	nais.	Continuity
1 <u>Is the inspection result</u> YES >> INSPECTI NO >> Steering c <u>Installation</u>	Steering clutch Termina <u>t normal?</u> ION END clutch is malfuncti <u>1"</u> .	n motor al con. Replace ste	3 eering clute	ch assembly. Refe	Continuity Existed
1 Is the inspection result YES >> INSPECTI NO >> Steering c Installation	Steering clutch Termina t normal? ION END Iutch is malfuncti <u>n"</u> .	n motor al	3 Deering clute	ch assembly. Refe	Continuity Existed

< DTC/CIRCUIT DIAGNOSIS >

C13E1-00 STEERING CLUTCH EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785223

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.

FAIL-SAFE

- MODE 2
- NOTE:

For details of fail-safe mode, refer to STC-47, "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 "C13E1-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-354, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785224

1.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.

Steering force	ontrol module Steering clutch		Continuity		
Connector	Terminal	Connector	Terminal	Continuity	
M71	26	M156	1	Existed	
	28	WITSO	3	EXISIEU	

3. Check the continuity between control module harness connector and ground.

C13E1-00 STEERING CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

Steering for	rce control module		Continuity	Α
Connector	Terminal		Continuity	
N71	26	Cround	Not ovisted	_
1017-1	28	Ground	not existed	В
Is the inspection result ne	ormal?			
YES >> GO TO 2.				С
NO >> Repair or rep	blace error-detected part.			
Z.CHECK THE STEER	NG CLUTCH			
Check the steering clutch	n. Refer to <u>STC-355, "EPS</u>	/DAST 3 : Component Inspect	<u>tion"</u> .	D
Is the inspection result ne	ormal?			
YES >> Check the in	termittent incident. Refer to	o <u>STC-427, "Removal and Ins</u>	tallation".	Е
Installation".	ich is maliunction. Replace	e steering clutch assembly. Re	eler to <u>ST-91, Removal and</u>	
	popont Increation			
EFS/DASTS.CON	iponent inspection		INFOID:00000009785225	F
1.CHECK THE STEERI	NG CLUTCH			
1. Turn the ignition swit	tch OFF.			STO
2. Disconnect steering	clutch harness connector.			010
3. Check continuity bet	ween steering clutch conne	ector pin terminals.		
	Stearing clutch motor			Н
			Continuity	
1	Terminal	3	Evisted	1
le the inerestion result of	ormol2	5		
NO >> Steering clut Installation".	ich is malfunction. Replace	e steering clutch assembly. Re	efer to <u>ST-91, "Removal and</u>	J
				K
				1

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C13E2-00 FRONT WHEEL SENSOR SIGNAL EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785226

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-356, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43</u>, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785227

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

With CONSULT

- Turn the ignition switch ON.
- 2. Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>BRC-57, "DTC Index"</u>.

NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

- 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-299, "EPS/DAST 3 : DTC Description".
- YES-2 >> C13E2-00 is detected: Replace steering force control module. Refer to <u>STC-427, "Removal and</u> <u>Installation"</u>.
- NO >> Check the intermittent incident. Refer to GI-43, "Intermittent Incident".

STC-356

C13E3-00 SPIRAL CABLE PROTECTION EPS/DAST 3

EPS/DAST 3 : DTC Description

DTC DETECTION LOGIC

		· · · · · · · · · · · · · · · · · · ·	0
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	C
C13E3-00	SPIRAL CABLE PROTECTION (Spiral cable protection)	Spiral cable protection function is active by steering the steering wheel over the limit angle.	D
POSSIBLE • Steering • Steering	E CAUSE the steering wheel over the limit angle force control module		E
FAIL-SAFI • Protectio NOTE: For detail	E n mode Is of protection mode, refer to <u>STC-50, "DIR</u>	RECT ADAPTIVE STEERING : Protection Function"	F
DTC CON	FIRMATION PROCEDURE		ST
1.PRECO	NDITIONING		
If "DTC CC wait at leas	NFIRMATION PROCEDURE" has been pre to the the test test to be the test test to be the test test test test test test test	eviously conducted, always turn ignition switch OFF and st.	Н
>> 2.dtc re	GO TO 2. PRODUCTION PROCEDURE		Ι
With CC Start th CAUT Never 2. Perform	NSULT ne engine. ON: drive the vehicle. m self-diagnosis for "EPS/DAST 3".		J
Is DTC "C1	<u>3E3-00" detected?</u>		K
YES >> NO >>	 Proceed to diagnosis procedure. Refer to Spiral cable protection function is active to angle. This is not system malfunction. 	<u>STC-357, "EPS/DAST 3 : Diagnosis Procedure"</u> . emporarily by steering the steering wheel over the limit	L
EPS/DA	ST 3 : Diagnosis Procedure	INFOID:000000009785229	
1.perfo	RM SELF-DIAGNOSIS		M
With CC 1. Turn th 2. Erase	NSULT le ignition switch ON. self-diagnosis for "EPS/DAST 3".		Ν
 Turn th Start th CAUT 	ne ignition switch OFF and wait for at least 1 ne engine. ON:	I0 seconds.	0
5. Turn th 6. Perform	arive the vehicle. The steering wheel to the straight-ahead posi m self-diagnosis for "EPS/DAST 3".	tion. (There is no steering force)	Ρ
VEQ	<u>3E3-UU" detected?</u>	sfer to STC-427 "Removal and Installation"	
NO >>	 Spiral cable protection function is active by not system malfunction. 	y steering the steering wheel over the limit angle. This is	

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INFOID:000000009785228

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:000000009785230

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

FAIL-SAFE

 Protection mode NOTE:

For details of protection mode, refer to STC-50, "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.
- 2. Perform self-diagnosis for "EPS/DAST 3".
- Is DTC "C13E4-00" detected?
- YES >> Proceed to diagnosis procedure. Refer to <u>STC-358, "EPS/DAST 3 : Diagnosis Procedure"</u>.
- NO >> Steering clutch protection function is active temporarily by overloading the steering wheel. This is not system malfunction.

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785231

1.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.

Steering force	control module	Steering clutch		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
M71	26	M156	1	Existed	
1017 1	28		3	LAISIEU	

3. Check the continuity between control module harness connector and ground.

C13E4-00 ST CLUTCH RELEASE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module			
Connector Terminal			Continuity
M71	26 28	Ground	Not existed
Is the inspection result norm YES >> GO TO 2. NO >> Repair or repla 2.CHECK THE STEERING Check the steering clutch. F Is the inspection result norm YES >> GO TO 3. NO >> Steering clutch Installation". 3.PERFORM SELF-DIAGI With CONSULT 1. Turn the ignition switch 2. Erase self-diagnosis fo 3. Turn the engine. CAUTION: Never drive the vehicl 5. Perform self-diagnosis Is DTC "C13E4-00" detecte	nal? ce error-detected part. G CLUTCH Refer to <u>STC-359, "EPS/D</u> nal? is malfunction. Replace s NOSIS ON. r "EPS/DAST 3". OFF and wait for at least le. for "EPS/DAST 3".	AST 3 : Component Inspectionsteering clutch assembly. Re	on". fer to <u>ST-91, "Removal and</u>
NO >> Steering clutch malfunction. 4.CHECK DATA MONITO	protection function is activ	ve by overloading the steerin	g wheel. This is not system
 with CONSULT Start the engine. CAUTION: Never drive the vehicl On the CONSULT scree "TORQUE SEN MAIN 2 Check the value. CAUTION: Never steer the steeri 	l e. en, select "EPS/DAST 3" 2". ng wheel	>>» "DATA MONITOR" >> "1	ORQUE SEN MAIN 1" and
Monito	or item	Standa	rd value
TORQUE SEN MAIN 1 TORQUE SEN MAIN 2		1.3 – 3.7 V	
Is the inspection result norn YES >> Replace steerir NO >> Replace steerir	n <u>al?</u> ng force control module. R ng clutch assembly. Refer	efer to <u>STC-427, "Removal a</u> to <u>ST-91, "Removal and Inst</u>	and Installation". allation".
EPS/DAST 3 : Compo	onent Inspection		INFOID:000000009785232
1. CHECK THE STEERING	CLUTCH 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 ADAPTIVE STEERING]

Steerin	Continuity	
Terr		
1	3	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to <u>ST-91, "Removal and</u> <u>Installation"</u>.
C13E5-00 ST CLUTCH RELEASE PROTECTION [DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

C13E5-00 ST CLUTCH RELEASE PROTECTION **EPS/DAST 3**

EPS/DAST 3 : DTC Description

INFOID:000000009785233

DTC DETECTION LOGIC

DTC		Display item (Trouble diagnosis content	t)		Malfunction detected	condition
C13E5-00	ST CLUTC (Steering c	H RELEASE PROTECTION	N	When steeri spite of tryin	ng clutch is released, steeri g to release it many times.	ng clutch is not released in
POSSIBLE • When stee • Steering c • Steering f	E CAUSE ering clutc clutch orce contro	h is released, overload ol module	ding steering	g wheel.		
AIL-SAFE MODE 2 NOTE: For details	s of fail-sat	fe mode, refer to <u>STC-</u>	-47, "DIREC		VE STEERING : Fail-	safe".
DTC CON	FIRMATIC	ON PROCEDURE				
1.PRECO	NDITIONI	١G				
If "DTC COI wait at least	NFIRMATI t 10 secon	ON PROCEDURE" had before conducting to the set of the s	the next tes	/iously con t.	ducted, always turn ig	nition switch OFF and
>>	GO TO 2.					
2. DTC RE	PRODUC	TION PROCEDURE				
With CO Start the CAUTIC Never C C. Perform Is DTC "C1;	NSULT e engine. ON: drive the v n self-diagi 3E5-00" de	vehicle. nosis for "EPS/DAST (<u>etected?</u>	3".			
YES >> NO >>	Proceed t Steering on not syster	o diagnosis procedure clutch protection functi n malfunction.	e. Refer to <u>S</u> on is active	TC-361, " temporari	EPS/DAST 3 : Diagno ly by overloading the s	<u>sis Procedure"</u> . steering wheel. This is
EPS/DAS	ST 3 : Di	agnosis Procedu	re			INFOID:000000009785234
1. Discon 2. Check ness co	nect steeri the continu	ng force control modul uity between steering	le. force contro	ol module	harness connector ar	nd steering clutch har-
St	teering force	control module		Steering clutch		Continuity
Conne	ector	Terminal	Conn	ector	Terminal	Continuity
M7	71	26	M1	56	1	Existed
		28			3	

3. Check the continuity between control module harness connector and ground.

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C13E5-00 ST CLUTCH RELEASE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

Steering force	control module		Continuity	
Connector	Terminal			
N/71	26	Ground Not existed		
	28	Ground	NUL EXISIEU	

Is the inspection result normal?

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

2. CHECK THE STEERING CLUTCH

Check the steering clutch. Refer to STC-362, "EPS/DAST 3 : Component Inspection".

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to <u>ST-91. "Removal and</u> <u>Installation"</u>.

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. Start the engine.
- CAUTION: Never drive the vehicle.

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

Is DTC "C13E5-00" detected?

YES >> GO TO 4.

NO >> Steering clutch protection function is active by overloading the steering wheel. This is not system malfunction.

4.CHECK DATA MONITOR

() with CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

- On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "TORQUE SEN MAIN 1" and "TORQUE SEN MAIN 2".
- 3. Check the value.

CAUTION:

Never steer the steering wheel

Monitor item	Standard value	
TORQUE SEN MAIN 1	1.3 – 3.7 V	
TORQUE SEN MAIN 2		

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to STC-427, "Removal and Installation".
- NO >> Replace steering clutch. Refer to <u>ST-91, "Removal and Installation"</u>.

EPS/DAST 3 : Component Inspection

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.

C13E5-00 ST CLUTCH RELEASE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

	Steerin					
	Terr	Continuity				
	1	3	Existed	R		
Is the ir	nspection result normal?					
YES	>> INSPECTION END					
NO	NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to <u>ST-91, "Removal and</u>					
	Installation".		-	0		

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< DTC/CIRCUIT DIAGNOSIS >

C13E6-00 HEAT PROTECTION EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785236

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

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-50, "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-364, "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:000000009785237

1.CHECK THE TEMPERATURE OF CONTROL MODULE

With CONSULT

- Start the engine.
 CAUTION:
 Never drive the vehicle.
- 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 $140^{\circ}C$ ($284^{\circ}F$) or less.

Does the temperature drop to 140°C (284°F) or less?

YES \rightarrow GO TO 2. NO \rightarrow GO TO 3. **2.** PERFORM SELF-DIAGNOSIS

DTC/CIRCUIT DIAGNO		[DIRECT ADAPTIVE STEERING]			
With CONSULT . Turn the ignition switc . Erase self-diagnosis for . Turn the ignition switc . Start the engine.	h ON. or "EPS/DAST 3". h OFF and wait for a	it least 10 secor	ds.		
Never drive the vehic Perform self-diagnosis	cle. s for "EPS/DAST 3".				
YES >> Replace steer NO >> The rise of st This is not a s	ed? ing force control mo eering force motor in ystem malfunction. I	dule. Refer to <u>S</u> nternal tempera NSPECTION EI	<u>FC-427, "Removal a</u> ture caused the pro ND	nd Installation". tection function to operate.	
Turn the ignition switc Disconnect force moto Turn the ignition switc Check the voltage bet	te SENSOR POWE h OFF. or angle sensor harn h ON. ween force motor ar	R SUPPLY (1) ess connector. ngle sensor harn	ess connector pin te	erminals.	
	Force motor angle	sensor			
Connector		Terminal		Voltage (Approx.)	
Connector	+	+ –			
M73	3		7	5 V	
neck the voltage betwee	n force motor angle	sensor harness	connector pin termir	nals.	
Force moto	r angle sensor				
Connector	ierminai			voltage (Approx.)	
M73			Ground	5 V	
the inspection result nor (ES >> GO TO 5. NO >> GO TO 7. CHECK TEMPERATUR Turn the ignition switc Disconnect steering for Check the continuity	mal? RE SENSOR GROU h OFF. proce control module h	ND CIRCUIT	or.	nter and force mater angle	
Sensor harness conne	ctor.	Force m	btor angle sensor		
Connector	Terminal	Connector	Terminal	Continuity	
M71	29	M73	7	Existed	
the inspection result nor YES >> GO TO 6. NO >> Repair open c	mal? ircuit or short to grou	und or short to p	ower in harness or c	connectors.	

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

< DTC/CIRCUIT DIAGNOSIS >

Steering angle ma	ain control module		Continuity	
Connector	Terminal			
M71	30	Ground	Existed	
M72	33	Ground	LXISIEU	

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	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		Continuity	
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 <u>STC-407, "Diagnosis Procedure"</u>. 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-348, "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 <u>ST-</u> <u>87. "Removal and Installation"</u>.

10.CHECK INTERMITTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering force control module. Refer to STC-427. "Removal and Installation".

- NO >> Repair or replace error-detected part.
- EPS/DAST 3 : Component Inspection

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.

STC-366

INFOID:000000009785238

< DTC/CIRCUIT DIAGNOSIS >

	Force motor	angle sensor	Condition	Resistance (Approx.)
	Terr	ninal	Condition	
			0°C	34.8 kΩ
	3	7	25°C	10.0 kΩ
			40°C	5.2 kΩ
YES >> NO >> DAST 1	INSPECTION E Force motor te STC-427, "Ren	END END Emperature sensor is mal <u>noval and Installation"</u> .	function. Replace steering	column assembly. Refer to
DAST 1 :	DTC Descri	ption		INFOID:00000009785239
NOTE: The DTC "C • Starting th • Repeating DTC DETE	C13E6-00" may the direct adaptive the engine idlire CTION LOGIC	be detected due to the hig e steering system after idling and sports driving in the C	h temperature of engine in t ing the engine for a long tim e circuit	he following condition. e
DTC	(Trout	Display item le diagnosis content)	Malfunction d	etected condition
C13E6-00	HEAT PROTECTI (Heat protection)	ON	The internal temperature of ste reaches 85°C (185°F) or more, operates.	ering angle main control module and then the protection function
 Continuing Steering for FAIL-SAFE Protection NOTE: For details 	g the overloadin orce motor mode s of protection m	g steering (Sports driving i node, refer to <u>STC-50, "DII</u>	in the circuit etc,)	IG : Protection Function".
DTC CON	FIRMATION PI	ROCEDURE		
1.PRECO	NDITIONING			
If "DTC CO wait at leas	NFIRMATION P t 10 seconds be	ROCEDURE" has been pr fore conducting the next te	eviously conducted, always est.	turn ignition switch OFF and
>> 2. dtc re	GO TO 2. PRODUCTION	PROCEDURE		
With CO 1. Start th CAUTIO Never	NSULT e engine. ON: drive the vehic	e.		
2. Perform	n selt-diagnosis 3E6-00" detecto	tor "DAST 1". d2		
YES >> NO >>	Proceed to diag The temporary tion function to	<u>یں:</u> gnosis procedure. Refer to rise of steering angle mair operate. This is not a syst	STC-367, "DAST 1 : Diagn control module internal ten em malfunction. INSPECTI	osis Procedure". nperature caused the protec- ON END
DAST 1 :	Diagnosis F	rocedure		INFOID:000000009785240
1. CHECK	THE TEMPERA	TURE OF CONTROL MO	DULE	

< DTC/CIRCUIT DIAGNOSIS >

With CONSULT

1. Start the engine.

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 80°C (176°C) or less?

YES >> GO TO 2.

- NO >> Replace steering angle main control module. Refer to <u>STC-428, "Removal and Installation"</u>.
- 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 <u>STC-428, "Removal and Installation"</u>.
- 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:000000009785241

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

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 85°C (185°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-50, "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.

< DTC/CIRCUIT DIAGNOSIS > [DIRECT ADAPTIVE STEERING]	
CAUTION: Never drive the vehicle. 2. Perform self-diagnosis for "DAST 2". Is DTC "C13E6-00" detected?	A
 YES >> Proceed to diagnosis procedure. Refer to <u>STC-369</u>, "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 	В
DAST 2 : Diagnosis Procedure	С
1. CHECK THE TEMPERATURE OF CONTROL MODULE	
With CONSULT Start the engine	D
 CAUTION: Never drive the vehicle. On the CONSULT screen, select "DAST 2" >> "DATA MONITOR" >> "C/M TEMPERATURE". 	E
 Wait with the ignition switch OFF until the data monitor indication becomes 80°C (176°C) or less. <u>Does the temperature drop to 80°C (176°C) or less?</u> YES >> GO TO 2. 	F
NO >> Replace steering angle sub control module. Refer to <u>STC-429, "Removal and Installation"</u> . 2 REFERENCE SET FOR A SET FOR	STO
 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 	Н
 CAUTION: Never drive the vehicle. 5. Perform self-diagnosis for "DAST 2". 	
Is DTC "C13E6-00" detected? VES _>> Replace steering angle sub control module. Refer to STC-429. "Removal and Installation"	J
 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 	K
	L
	M

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Ρ

C13E7-00 LOW VOLTAGE PROTECTION EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785243

[DIRECT ADAPTIVE STEERING]

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 $\leq 9.1 \text{ V}$

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fusible link
- Power supply circuit
- Steering force control module

FAIL-SAFE

 Protection mode NOTE:

For details of protection mode, refer to STC-50, "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 <u>STC-370, "EPS/DAST 3 : Diagnosis Procedure"</u>.

NO >> Protection function is active temporarily by low battery voltage. This is not system malfunction.

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785244

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) А 1. Turn the ignition switch ON. Check the voltage between control module harness connector and ground. 2. Steering force control module Continuity Connector Terminal M72 34 Ground 10.5 - 16.0 V Is the inspection result normal? >> GO TO 4. YES NO >> GO TO 3. D **3.**CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2) 1. Turn the ignition switch OFF. Е Check the 60A fusible link (#G). 2. Check the harness for open or short between steering force control module harness connector No.34 ter-3. minal and the 60A fusible link (#G). F Is the inspection result normal? YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to PG-12, "Wiring Diagram -BATTERY POWER SUPPLY -". STC NO >> Repair or replace error-detected parts. 4. CHECK INTERMITTTENT INCIDENT Refer to GI-43, "Intermittent Incident". Н Is the inspection result normal? >> Replace steering force control module. Refer to STC-427, "Removal and Installation". YES NO >> Repair or replace error-detected part. DAST 1 DAST 1 : DTC Description INFOID:000000009785245 DTC DETECTION LOGIC K Display item DTC Malfunction detected condition (Trouble diagnosis content) The power supply voltage of control module is following condition L LOW VOLTAGE PROTECTION for 1 second or more continuously, and then protection function is C13E7-00 (Low voltage protection) active. Power supply voltage ≤ 9.1 V M POSSIBLE CAUSE · Harness and connector

- Battery
- Fusible link
- Power supply circuitSteering angle main control module

FAIL-SAFE

Protection mode
 NOTE:
 For details of protection mode, refer to <u>STC-50, "DIRECT ADAPTIVE STEERING : Protection Function"</u>.
 P

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.

Ν

< DTC/CIRCUIT DIAGNOSIS >

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

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 <u>STC-372, "DAST 1 : Diagnosis Procedure"</u>.
- NO >> Protection function is active temporarily by low battery voltage. This is not system malfunction.

DAST 1 : Diagnosis Procedure

INFOID:000000009785246

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		Continuity	
E27	33	Ground	Existed	
E28	39	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)

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 <u>PG-12, "Wiring Diagram -</u> <u>BATTERY POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

4. CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to STC-428. "Removal and Installation".
- NO >> Repair or replace error-detected part.

DAST 2

C13E7-00 LOW VOLTAGE PROTECTION [DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

DAST 2 : DTC Description

DTC DETECTION LOGIC

А

DTC	Display item (Trouble diagnosis content)	Malfunction de	tected condition	
C13E7-00	LOW VOLTAGE PROTECTION (Low voltage protection)	 The power supply voltage of corfor 1 second or more continuous active. Power supply voltage ≤ 9.1 V 	ntrol module is following condition ly, and then protection function is	
POSSIBLE • Harness a	CAUSE and connector			
 Battery Fusible lir Power su Steering a 	nk pply circuit angle sub control module			
FAIL-SAFE • Protection NOTE:	n mode		O . Desta stien Frenstien "	
For detail	S OF PROTECTION MODE, REFER TO <u>STC-50, "D</u>	VIRECT ADAPTIVE STEERING	<u>G : Protection Function</u> .	S
1.PRECO	NDITIONING			
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been p t 10 seconds before conducting the next	previously conducted, always t test.	turn ignition switch OFF and	
>>	GO TO 2.			
2.DTC RE	PRODUCTION PROCEDURE			
With CO Start th	NSULT e engine.			
2. Perform	drive the vehicle. n self-diagnosis for "DAST 2".			
YES >> NO >>	 Proceed to diagnosis procedure. Refer t Protection function is active temporarily 	to <u>STC-373, "DAST 2 : Diagno</u> by low battery voltage. This is	osis Procedure". not system malfunction.	
DAST 2 :	Diagnosis Procedure		INFOID:00000009785248	
1. CHECK	CONTROL MODULE GROUND CIRCUI	Т		
 Turn th Discon Check 	e ignition switch OFF. nect steering angle sub control module h the continuity between control module ha	arness connector. arness connector and ground.		
	Steering angle sub control module	_	Continuity	
Co	nnector Terminal		Continuity	

Is the inspection result normal?

E30

E31

YES >> GO TO 2.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

33

39

2.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch ON. Ground

Existed

Ρ

C13E7-00 LOW VOLTAGE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

2. Check the voltage between control module harness connector and ground.

Steering angle st	ub 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 power supply circuit. Refer to <u>PG-12, "Wiring Diagram BAT-</u> <u>TERY POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

4.CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to STC-429, "Removal and Installation".
- NO >> Repair or replace error-detected part.

< DTC/CIRCUIT DIAGNOSIS >

C13E8-00 CURB STONE PROTECTION EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785249

А

В

DTC DETECTION LOGIC

			~
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	С
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.	D
 POSSIBLE Steering v influence Steering g Steering f 	E CAUSE wheel is operated under a condition where of curbstones or other substances. gear is out of neutral position. (Large) orce control module	e the steering angle is physically restricted due to the	E
FAIL-SAFE • Protection NOTE: For details	n mode s of protection mode, refer to <u>STC-50. "DIR</u>	ECT ADAPTIVE STEERING : Protection Function".	STO
DTC CONI	FIRMATION PROCEDURE		Н
1.PRECO	NDITIONING		
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next tee	eviously conducted, always turn ignition switch OFF and st.	I
>>	GO TO 2.		
2.DTC RE	PRODUCTION PROCEDURE		J
With CO Start th CAUTI Never	NSULT e engine. ON: drive the vehicle.		K
2. Turn th NOTE:	e steering wheel from full left stop to full rig	ht stop.	L
Perforn 3. Return 4. Perforn Is DTC "C1	n the work at the place where curbstones o the steering wheel to the straight-ahead po n self-diagnosis for "EPS/DAST 3". 3E8-00" detected?	r other substances does not interfere with tire. sition.	M
YES >> NO >>	Proceed to diagnosis procedure. Refer to Protection function is active by operating angle is physically restricted due to the in system malfunction. Since this may caus and steering component.	STC-375, "EPS/DAST 3 : Diagnosis Procedure". steering wheel under a condition where the steering fluence of curbstones or other substances. This is not e mechanical malfunction, check the suspension, axle	N
EPS/DAS	ST 3 : Diagnosis Procedure	INFOID:000000009785250	U
1.PERFOR	RM SELF-DIAGNOSIS		P
 With CO 1. Turn th 2. Erase s 3. Turn th 4. Start th 	NSULT e ignition switch ON. self-diagnosis for "EPS/DAST 3". e ignition switch OFF and wait for at least 1 e engine.	0 seconds.	Ľ

CAUTION: Never drive the vehicle.

C13E8-00 CURB STONE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

- 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 <u>STC-427, "Removal and Installation"</u>.
- 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:000000009785251

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-50, "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 <u>STC-376, "DAST 1 : Diagnosis Procedure"</u>.
- 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 : Diagnosis Procedure

INFOID:000000009785252

1.PERFORM SELF-DIAGNOSIS

C13E8-00 CURB STONE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

With CONSULT	
1. Turn the ignition switch ON.	А
2. Erase self-diagnosis for "DAST 1".	
3. Turn the ignition switch OFF and wait for at least 10 seconds.	
4. Start the engine.	R
CAUTION:	D
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".	C
Is DTC "C13E8-00" detected?	
 YES >> Replace steering angle main control module. Refer to <u>STC-428. "Removal and Installation"</u>. 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 avatable mathematical mathmatic	D
and steering component.	Е
DASTZ	
DAST 2 : DTC Description	F
DTC DETECTION LOGIC	

TO DETECTION LOGIC

			STC
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.	Н
 POSSIBLE Steering of the steering of the ste	ECAUSE wheel is operated under a condition where of curbstones or other substances. gear is out of neutral position. (Large) angle sub control module	e the steering angle is physically restricted due to the	l
FAIL-SAFE • Protection NOTE: For details	n mode s of protection mode, refer to <u>STC-50, "DIR</u>	ECT ADAPTIVE STEERING : Protection Function".	K
DTC CON	FIRMATION PROCEDURE		
1.PRECO	NDITIONING		L
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next tes	eviously conducted, always turn ignition switch OFF and st.	M
>> 2. dtc re	GO TO 2. PRODUCTION PROCEDURE		Ν
With CO Start th CAUTI Never	NSULT e engine. ON: drive the vehicle.		0
2. Turn th NOTE: Perform	e steering wheel from full left stop to full rig n the work at the place where curbstones o	ht stop. r other substances does not interfere with tire.	Ρ
3. Return	the steering wheel to the straight-ahead po	sition.	

4. Perform self-diagnosis for "DAST 2".

Is DTC "C13E8-00" detected?

YES >> Proceed to diagnosis procedure. Refer to STC-378, "DAST 2 : Diagnosis Procedure".

C13E8-00 CURB STONE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

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:000000009785254

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 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 <u>STC-429</u>, "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.

	C13E9-00 BOOTING		
< DTC/CIR C13E9-(CUIT DIAGNOSIS > 00 BOOTING ANGLE PROCE	SSING	
DAST 1			А
DAST 1 :	DTC Description	INFOID:00000009785257	В
NOTE: During engi	ne start, the DTC "C13E9-00" may be dete	cted due to temporary low voltage.	
DTC DETE	ECTION LOGIC		С
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	D
C13E9-00	BOOTING ANGLE PROCESSING (Booting angle processing)	The malfunction of processing to acquire angle information is de- tected when control module is starting.	
POSSIBLE	CAUSE		Е
 The malfu 	inction of processing information		
FAIL-SAFE • Mode 2 NOTE: For fail-sa	ife mode, refer to STC-47, "DIRECT ADAP	TIVE STEERING : Fail-safe".	F
DTC CON	FIRMATION PROCEDURE		STC
1.PRECO	NDITIONING		
If "DTC CO wait at least	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next tes	eviously conducted, always turn ignition switch OFF and st.	Н
>>	GO TO 2.		
2.dtc re	PRODUCTION PROCEDURE		
With CO 1. Start th CAUTI	NSULT e engine. ON:		J

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13E9-00" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>STC-379, "DAST 1 : Diagnosis Procedure"</u>. NO >> INSPECTION END

DAST 1 : Diagnosis Procedure

1.AUTO ADJUSTING MODE

 Start the engine.
 Drive straight ahead at 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 2.

2. Check the illumination of the power steering warning LAMP

1. Turn the ignition switch OFF.

2. Start the engine.

Κ

Μ

Ν

0

Ρ

INFOID:000000009785258

C13E9-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

CAUTION:

- Never drive the vehicle.
- 3. Check that the power steering warning lamp turns OFF.

Does the power steering warning lamp turn OFF?

YES >> GO TO 3. NO >> GO TO 1.

3. COMPLETION WORK

()With CONSULT

- Turn the steering wheel to left/right 90 degree or more from center position 2 times.
 Erase the self-diagnostic result for "DAST 1" and "DAST 2".

>> INSPECTION END

C13EA-00 BOOTING ANGLE PROCESSING EPS/DAST 3

EPS/DAST 3 : DTC Description

А

В

INFOID:000000009785261

DTC DETECTION LOGIC

			\sim
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	C
C13EA-00	BOOTING ANGLE PROCESSING (Booting angle processing)	The malfunction of processing to acquire angle information is de- tected when control module is starting.	D
POSSIBLE • The malfu	CAUSE nction of processing information		_
FAIL-SAFE • Mode 2 NOTE: For fail-sa	fe mode, refer to <u>STC-47, "DIRECT ADAP</u>	<u>TIVE STEERING : Fail-safe"</u> .	F
DTC CON	FIRMATION PROCEDURE		
1.PRECON	NDITIONING		ST
If "DTC COI wait at least	NFIRMATION PROCEDURE" has been pre 10 seconds before conducting the next tee	eviously conducted, always turn ignition switch OFF and st.	Н
>> 2.dtc re	GO TO 2. PRODUCTION PROCEDURE		
With CO Start the CAUTIO	NSULT e engine. ON:		J
2. Perform <u>Is DTC "C13</u> YES >> NO-1 >>	n self-diagnosis for "EPS/DAST 3". <u>3EA-00" detected?</u> Proceed to diagnosis procedure. Refer to To check malfunction symptom before repa	STC-381, "EPS/DAST 3 : Diagnosis Procedure". air: Refer to <u>GI-43, "Intermittent Incident"</u> .	K
NO-2 >>	Confirmation after repair: INSPECTION E	ND	L
EPS/DAS	ST 3 : Diagnosis Procedure	INF0/D:00000009785262	
1.PERFOR	RM SELF-DIAGNOSIS		M
With CO 1. Turn the 2. Erase s 3. Turn the	NSULT e ignition switch ON. elf-diagnosis for "EPS/DAST 3". e ignition switch OFF and wait for at least 1	0 seconds.	Ν
4. Start the CAUTIO While c	e engine and the vehicle at approx. 40 km/l <mark>ON:</mark> Iriving the vehicle, keep the steering wh	h (25 MPH) or more for approx. 1 minute. eel straight-ahead position.	С
5. Stop the	e vehicle. a self-diagnosis for "EPS/DAST 3"		
Is DTC "C1	<u>3EA-00" detected?</u>		Ρ
YES >> NO >>	Perform "DAST CALIBRATION (MODE1)" <u>"Work Procedure"</u> . INSPECTION END	' for steering force control module. Refer to STC-135,	

C13EB-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

C13EB-00 BOOTING ANGLE PROCESSING DAST 1

DAST 1 : DTC Description

INFOID:000000009785263

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 de- tected when control module is starting.

POSSIBLE CAUSE

• The malfunction of processing information

FAIL-SAFE

- Mode 2
- NOTE:

For fail-safe mode, refer to STC-47, "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.
- 2. Perform self-diagnosis for "DAST 1".

Is DTC "C13EB-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-382. "DAST 1 : Diagnosis Procedure".
- NO >> INSPECTION ĔND

DAST 1 : Diagnosis Procedure

INFOID:000000009785264

1.AUTO ADJUSTING MODE

- 1. Start the engine.
- 2. Drive straight ahead at 30 km/h (19 MPH) or more for more than 5 seconds.
 - 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 2.

2.CHECK THE ILLUMINATION OF THE POWER STEERING WARNING LAMP

1. Turn the ignition switch OFF.

2. Start the engine.

C13EB-00 BOOTING ANGLE PROCESSING

< DTC/CIR	CUIT DIAGNOSIS >	[DIRECT ADAPTIVE STEERING]	
CAUTIC Never of 3. Check t	ION: drive the vehicle. At that the power steering warning lamp turns OFF.		
YES >> NO >>	GO TO 3. GO TO 1.	В	
3.COMPLE	ETION WORK		
With CO 1. Turn the 2. Erase the	NSULT e steering wheel to left/right 90 degree or m ne self-diagnostic result for "DAST 1" and "	ore from center position 2 times. DAST 2".	
DAST 2	INSPECTION END	E	
DAST 2 :	DTC Description	INFOID:00000009785265	
NOTE: During engi	ne start, the DTC "C13EB-00" may be dete	cted due to temporary low voltage.	
DTC DETE	CTION LOGIC	ST	
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. $\hfill \hfill \$	
POSSIBLE	CAUSE		
FAIL-SAFE • Mode 2 NOTE: For fail-sa	fe mode refer to STC-47 "DIRECT ADAP"	J	
DTC CONF	FIRMATION PROCEDURE		
1.PRECON	1. PRECONDITIONING		
If "DTC COI wait at least	NFIRMATION PROCEDURE" has been pre 10 seconds before conducting the next tes	viously conducted, always turn ignition switch OFF and ${}_{\mbox{\tiny L}}$	
>> 2. DTC RE	GO TO 2. PRODUCTION PROCEDURE	N	
With CO Start the CAUTIC	NSULT e engine. DN: drive the vehicle.	Ν	
2. Perform	self-diagnosis for "DAST 2".	C	
IS DTC "C1: YES >>	<u>3EB-00" detected?</u> Proceed to diagnosis procedure. Refer to <u>s</u> INSPECTION END	STC-383, "DAST 2 : Diagnosis Procedure".	
DAST 2 :	DAST 2 : Diagnosis Procedure		
1. AUTO A	DJUSTING MODE		

Start the engine.
 Drive straight ahead at 30 km/h (19 MPH) or more for more than 5 seconds.

CAUTION:

C13EB-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

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 2.

 $2. {\sf CHECK THE ILLUMINATION OF THE POWER STEERING WARNING LAMP}$

1. Turn the ignition switch OFF.

2. Start the engine. CAUTION:

Never drive the vehicle.

3. Check that the power steering warning lamp turns OFF.

Does the power steering warning lamp turn OFF?

YES >> GO TO 3. NO >> GO TO 1.

3.COMPLETION WORK

With CONSULT

- 1. Turn the steering wheel to left/right 90 degree or more from center position 2 times.
- 2. Erase the self-diagnostic result for "DAST 1" and "DAST 2".

>> INSPECTION END

C13EC-00 BOOTING ANGLE PROCESSING EPS/DAST 3

EPS/DAST 3 : DTC Description

А

В

INFOID:000000009785267

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EC-00	BOOTING ANGLE PROCESSING (Booting angle processing)	The malfunction of processing to acquire angle information is de- tected when control module is starting.
POSSIBLE • The malfu	CAUSE	
DTC CON	FIRMATION PROCEDURE	
1.PRECON	NDITIONING	
If "DTC COI wait at least	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and est.
>> 2 DTC RE		
1. Start the	e engine.	
2 Perform	ON: drive the vehicle. a self-diagnosis for "EPS/DAST 3"	
<u>Is DTC "C1:</u>	<u>3EC-00" detected?</u>	
YES >> NO-1 >> NO-2 >>	Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep Confirmation after repair: INSPECTION F	<u>STC-385, "EPS/DAST 3 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND
EPS/DAS	ST 3 : Diagnosis Procedure	INF01D:000000009785268
1.PERFOR	RM SELF-DIAGNOSIS	
With CO	NSULT	
 1. Turn the 2. Erase s 3. Turn the 4. Start the 	e ignition switch ON. self-diagnosis for "EPS/DAST 3". e ignition switch OFF and wait for at least 7 e engine and the vehicle at approx. 40 km/	10 seconds. /h (25 MPH) or more for approx. 1 minute.
5 Stop the	driving the vehicle, keep the steering whe vehicle	neel straight-ahead position.
6. Perform	n self-diagnosis for "EPS/DAST 3".	
Is DTC "C1: YES >>	<u>3EC-00" detected?</u> Perform "DAST CALIBRATION (MODE1) "Work Procedure"	" for steering force control module. Refer to STC-135.
NO >> DAST 1	INSPECTION END	
DAST 1 :	DTC Description	INFOID:00000009785269
DTC DETE	CTION LOGIC	

C13EC-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EC-00	BOOTING ANGLE PROCESSING (Booting angle processing)	The malfunction of processing to acquire angle information is de- tected when control module is starting.

POSSIBLE CAUSE

• The malfunction of processing information

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 "C13EC-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-386. "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

INFOID:000000009785270

DAST 1 : Diagnosis Procedure

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.
- Start the engine and the vehicle at approx. 40 km/h (25 MPH) or more for approx. 1 minute. CAUTION:

While driving the vehicle, keep the steering wheel straight-ahead position.

- 5. Stop the vehicle.
- 6. Perform self-diagnosis for "DAST 1".

Is DTC "C13EC-00" detected?

- YES >> Perform "DAST CALIBRATION (MODE1)" for steering force control module. Refer to <u>STC-135</u>, <u>"Work Procedure"</u>.
- NO >> INSPECTION END

DAST 2

DAST 2 : DTC Description

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EC-00	BOOTING ANGLE PROCESSING (Booting angle processing)	The malfunction of processing to acquire angle information is de- tected when control module is starting.

POSSIBLE CAUSE

The malfunction of processing information

DTC CONFIRMATION PROCEDURE

INFOID:000000009785271

C13EC-00 BOOTING ANGLE PROCESSING

[DIRECT ADAPTIVE STEERING]

1.preconditioning	Δ
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	В
 With CONSULT Start the engine. 	С
Never drive the vehicle. 2. Perform self-diagnosis for "DAST 2".	D
<u>Is DTC "C13EC-00" detected?</u> YES >> Proceed to diagnosis procedure. Refer to <u>STC-387, "DAST 2 : Diagnosis Procedure"</u> . NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u> . NO-2 >> Confirmation after repair: INSPECTION END	E
DAST 2 : Diagnosis Procedure	F
1.PERFORM SELF-DIAGNOSIS	STO
 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 and the vehicle at approx. 40 km/h (25 MPH) or more for approx. 1 minute. 	Н
While driving the vehicle, keep the steering wheel straight-ahead position. 5. Stop the vehicle.	
 b. Perform self-diagnosis for DAST 2 . <u>Is DTC "C13EC-00" detected?</u> YES >> Perform "DAST CALIBRATION (MODE1)" for steering force control module. Refer to <u>STC-135.</u> "Work Procedure" 	J
NO >> INSPECTION END	Κ
	L
	M
	Ν
	0

< DTC/CIRCUIT DIAGNOSIS >

Ρ

C13ED-00 ENGINE STATUS EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000009785273

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition		
C13ED-00	ENGINE STATUS (Engine status)	Engine is stalled.		
POSSIBLE Engine syst	CAUSE em			
 FAIL-SAFE Protection NOTE: For details 	mode s of protection mode, refer to <u>STC-50. "DIR</u>	ECT ADAPTIVE STEERING : Protection	Function".	
DTC CON	FIRMATION PROCEDURE			
1.PRECO	NDITIONING			
If "DTC CON wait at least	NFIRMATION PROCEDURE" has been pre 10 seconds before conducting the next tes	viously conducted, always turn ignition sw st.	itch OFF and	
>> 2.dtc re	GO TO 2. PRODUCTION PROCEDURE			
 With CONSULT Start the engine. CAUTION: Never drive the vehicle. Perform self-diagnosis for "EPS/DAST 3". <u>Is DTC "C13ED-00" detected?</u> YES >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>. NO >> NSPECTION END 				
EPS/DAS	ST 3 : Diagnosis Procedure		INFOID:000000009785274	
1.PERFORM ECM SELF-DIAGNOSIS				
with CO Perform self <u>Is any DTC</u> YES >> NO >> DAST 1	NSULT ⁽⁻ diagnosis for "ENGINE". <u>detected?</u> Check the DTC. Refer to <u>EC-106, "DTC In</u> Check the intermittent incident. Refer to <u>G</u>	<u>dex"</u> . I-43, "Intermittent Incident".		
DAST 1 :	DAST 1 : DTC Description			
DTC DETECTION LOGIC				

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13ED-00	ENGINE STATUS (Engine status)	Engine is stalled.

C13ED-00 ENGINE STATUS

< DTC/CIR	CUIT DIAGNOSIS >	[DIRECT ADAPTIVE STEERING]	
Engine syst	em		
 FAIL-SAFE Protection NOTE: For details 	n mode s of protection mode, refer to STC-50, "DIR	A RECT ADAPTIVE STEERING : Protection Function".	
DTC CON	FIRMATION PROCEDURE		
1.PRECO	NDITIONING	C	
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and st.	
>>	GO TO 2.		
2.DTC RE	PRODUCTION PROCEDURE	E	
With CO Start th CAUTIC Never C. Perform Is DTC "C1: YES >> NO >>	NSULT e engine. ON: drive the vehicle. n self-diagnosis for "DAST 1". <u>3ED-00" detected?</u> Proceed to diagnosis procedure. Refer to INSPECTION END	F STC-389. "DAST 1 : Diagnosis Procedure".	
DAST 1 :	Diagnosis Procedure	INFOID:00000009785276	
1 .PERFOR	RM ECM SELF-DIAGNOSIS		
with CO Perform sel	With CONSULT Perform self-diagnosis for "ENGINE".		
YES >> NO >>	Check the DTC. Refer to <u>EC-106, "DTC Ir</u> Check the intermittent incident. Refer to <u>G</u>	udex". I-43, "Intermittent Incident".	
	DTC Description	K	
DASTZ.	DIC Description	INFOID:00000009785277	
DTC DETE	ECTION LOGIC	L	
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	
C13ED-00	ENGINE STATUS (Engine status)	Engine is stalled.	
POSSIBLE Engine syst	E CAUSE rem	Ν	
FAIL-SAFE • Protectior NOTE:	n mode	0	
For details of protection mode, refer to <u>STC-50, "DIRECT ADAPTIVE STEERING : Protection Function"</u> .			
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and st.	

< DTC/CIRCUIT DIAGNOSIS >

2.DTC REPRODUCTION PROCEDURE

() With CONSULT

- Start the engine.
 CAUTION: Never drive the vehicle.
- 2. Perform self-diagnosis for "DAST 2".
- Is DTC "C13ED-00" detected?
- YES >> Proceed to diagnosis procedure. Refer to STC-390, "DAST 2 : Diagnosis Procedure".
- NO >> INSPECTION ĔND

DAST 2 : Diagnosis Procedure

INFOID:000000009785278

1.PERFORM ECM SELF-DIAGNOSIS

() with CONSULT

Perform self-diagnosis for "ENGINE".

Is any DTC detected?

- YES >> Check the DTC. Refer to EC-106. "DTC Index".
- NO >> Check the intermittent incident. Refer to GI-43, "Intermittent Incident".

C13EE-00 INCOMP CONFIG EPS/DAST 3

EPS/DAST 3 : DTC Description

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	С
C13EE-00	(Trouble diagnosis content)	Configuration of control module is incomplete	
01322-00	(Incomplete config)		D
POSSIBLEIncomplet	ECAUSE e of configuration for steering force control	module	
FAIL-SAFE			E
 Mode 3 NOTE: 			
For fail-sa	fe mode, refer to <u>STC-47, "DIRECT ADAP</u>	TIVE STEERING : Fail-safe"	F
DTC CON	FIRMATION PROCEDURE		
1.PRECO	NDITIONING	s	бΤС
If "DTC CO	NFIRMATION PROCEDURE" has been pre	eviously conducted, always turn ignition switch OFF and	
wait at least	t 10 seconds before conducting the next te	st.	Н
>>	GO TO 2		
2.DTC RE	PRODUCTION PROCEDURE		I
With CO	NSULT		
1. Start er	igine.		
CAUTI Never	ON: drive the vehicle		J
2. Perform	n self-diagnosis for "EPS/DAST 3".		
<u>Is DTC "C1</u>	<u>3EE-00" detected?</u>		Κ
YES >>	Proceed to diagnosis procedure. Refer to	STC-391, "EPS/DAST 3 : Diagnosis Procedure".	
NO-1 >> NO-2 >>	Confirmation after repair: INSPECTION E	air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND	
EPS/DAS			-
	51 5. Diagnosis i locedure	INFOID:00000009785280	
1.PERFOR	RM CONFIGURATION		M
Perform cor	nfiguration for control module. Refer to STC	C-140, "Work Procedure".	
>>	GO TO 2		Ν
2.PERFOR	RM SELF-DIAGNOSIS		
(P)With CO	NSULT		0
1. Turn the	e ignition switch ON.		
2. Erase s	e ignition switch OFF and wait for at least 1	I0 seconds	P
4. Start er	ngine.		I
	ON: drive the vehicle		
5. Perform self-diagnosis for "EPS/DAST 3".			
Is DTC "C1	<u>3EE-00" detected?</u>		
YES >> NO >>	Replace steering force control module. Re INSPECTION END	efer to STC-427, "Removal and Installation".	

STC-391

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В

INFOID:000000009785279

DAST 1

DAST 1 : DTC Description

INFOID:000000009785281

[DIRECT ADAPTIVE STEERING]

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EE-00	INCOMP CONFIG (Incomplete config)	Configuration of control module is incomplete.

POSSIBLE CAUSE

• Incomplete of configuration for steering angle main control module

FAIL-SAFE

Mode 3

NOTE:

For fail-safe mode, refer to STC-47, "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 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-392, "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009785282

1.PERFORM CONFIGURATION

Perform configuration for control module. Refer to STC-142, "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.
- 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 <u>STC-428, "Removal and Installation"</u>.

NO >> INSPECTION END

DAST 2

C13EE-00 INCOMP CONFIG

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 2 :	DTC Description	INF0ID:000000009785283	Δ
DTC DETE	ECTION LOGIC		A
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	В
C13EE-00	INCOMP CONFIG (Incomplete config)	Configuration of control module is incomplete.	С
POSSIBLE • Incomplet	ECAUSE e of configuration for steering angle sub co	ntrol module	D
FAIL-SAFE • Mode 3 NOTE: For fail-sa	ife mode, refer to <u>STC-47, "DIRECT ADAP</u>	TIVE STEERING : Fail-safe"	E
DTC CON	FIRMATION PROCEDURE		
1.PRECO	NDITIONING		F
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next tee	viously conducted, always turn ignition switch OFF and st.	STO
2.DTC RE			
	NSULT		П
1. Start er CAUTI Never	ngine. ON: drive the vehicle.		I
Is DTC "C1	3EE-00" detected?		
YES >> NO-1 >> NO-2 >>	Proceed to diagnosis procedure. Refer to To check malfunction symptom before repair: INSPECTION EI	<u>STC-393, "DAST 2 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND	V
DAST 2 :	Diagnosis Procedure	INFOID:000000009785284	n
1 .PERFOR	RM CONFIGURATION		L
Perform co	nfiguration for control module. Refer to STC	-144, "Work Procedure".	
			M
2.PERFOR	RM SELF-DIAGNOSIS		
With CO 1. Turn th	NSULT e ignition switch ON.		Ν
 Erases Turn th Start er 	e ignition switch OFF and wait for at least 1 ngine.	0 seconds.	0
5. Perform	drive the vehicle. n self-diagnosis for "DAST 2". 3EE-00" detected?		Ρ
YES >> NO >>	Replace steering angle sub control module INSPECTION END	e. Refer to STC-429. "Removal and Installation".	

< DTC/CIRCUIT DIAGNOSIS >

C13EF-00 CONFIG CHECK RESULT EPS/DAST 3

EPS/DAST 3 : DTC Description

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-47, "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 <u>STC-394, "EPS/DAST 3 : Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43</u>, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785286

1.PERFORM CONFIGURATION

Perform configuration for control module. Refer to STC-140, "Work Procedure".

>> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

BWith 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.

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

Is DTC "C13EF-00" detected?

YES >> Replace steering force control module. Refer to STC-427, "Removal and Installation".

STC-394

INFOID:000000009785285

Is DTC "C13EF-00" detected?

C13EF-00 CONFIG CHECK RESULT

< DTC/CIRCUIT DIAGNOSIS > NO >> INSPECTION END

DAST 1

DAST 1 : DTC Description

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.
POSSIBLEIncompletMistake oIncomplet	E CAUSE e of configuration for steering angle main of f configuration for steering angle main cont e of configuration for steering angle main c	control module rol module control module
FAIL-SAFE • Mode 3 NOTE: For fail-sa	fe mode, refer to <u>STC-47, "DIRECT ADAP</u>	TIVE STEERING : Fail-safe"
DTC CON	FIRMATION PROCEDURE	S
1.PRECO	NDITIONING	
If "DTC CO wait at least	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next te	viously conducted, always turn ignition switch OFF and st.
>>	GO TO 2.	
2.DTC RE	PRODUCTION PROCEDURE	
With CO Start er CAUTIO Never	NSULT ngine. ON: drive the vehicle.	
2. Perform	n self-diagnosis for "DAST 1".	
YES >> NO-1 >> NO-2 >>	Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep Confirmation after repair: INSPECTION EI	<u>STC-395, "DAST 1 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND
DAST 1 :	Diagnosis Procedure	INFOID:000000009785288
1.PERFOR	RM CONFIGURATION	
Perform cor	nfiguration for control module. Refer to STC	-142, "Work Procedure".
>>	GO TO 2.	
2.PERFOR	RM SELF-DIAGNOSIS	(
 With CO 1. Turn the 2. Erase s 3. Turn the 4. Start er CAUTION 	NSULT e ignition switch ON. self-diagnosis for "DAST 1". e ignition switch OFF and wait for at least 1 ngine. ON:	0 seconds.
5. Perform	drive the vehicle. n self-diagnosis for "DAST 1".	

STC-395

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INFOID:000000009785287

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< DTC/CIRCUIT DIAGNOSIS >

YES >> Replace steering angle main control module. Refer to <u>STC-428. "Removal and Installation"</u>. NO >> INSPECTION END

DAST 2

DAST 2 : DTC Description

INFOID:000000009785289

[DIRECT ADAPTIVE STEERING]

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-47, "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-393, "DAST 2 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000009785290

1.PERFORM CONFIGURATION

Perform configuration for control module. Refer to STC-144, "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?
< DTC/	CIRCUIT DIAGNOSIS >	[DIRECT ADAPTIVE STEERING]
YES NO	 >> Replace steering angle sub control module. >> INSPECTION END 	Refer to STC-429. "Removal and Installation".
		\$

C13EF-00 CONFIG CHECK RESULT

C13F0-00 INCOMP DAST CALIBRATION EPS/DAST 3

EPS/DAST 3 : DTC Description

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-47. "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-398, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000009785292

1.PERFORM CALIBRATION

Perform "DAST CALIBRATION (MODE1)" for steering force control module. Refer to <u>STC-135, "Work Proce-dure"</u>.

>> 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 <u>STC-427, "Removal and Installation"</u>.

NO >> INSPECTION END

DAST 1

STC-398

INFOID:000000009785291

C13F0-00 INCOMP DAST CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 :	DTC Description	INFOID:000000009785293	Δ
DTC DETE	ECTION LOGIC		A
DTC	Display item (Trouble diagnosis content)	Malfunction detected condition	В
C13F0-00	INCOMP DAST CALIBRATION (Incomplete direct adaptive steering calibration)	Initial learning of direct adaptive steering is incomplete.	С
POSSIBLE • Incomplet	E CAUSE te of direct adaptive steering initial learning		
FAIL-SAFE • Mode 2 NOTE: For fail-sa	afe mode, refer to <u>STC-47, "DIRECT ADAP</u>	TIVE STEERING : Fail-safe".	E
DTC CON	FIRMATION PROCEDURE		
1.PRECO	NDITIONING		F
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and st.	ST
>> 2.dtc re	GO TO 2. PRODUCTION PROCEDURE		ŀ
Bwith CO 1. Turn th 2. Perform Is DTC "C1	NSULT e ignition switch ON. n self-diagnosis for "DAST 1". <u>3F0-00" detected?</u>		
YES >> NO-1 >> NO-2 >>	 Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep Confirmation after repair: INSPECTION El 	<u>STC-399, "DAST 1 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND	J
DAST 1 :	Diagnosis Procedure	INFOID:00000009785294	k
1.PERFO	RM CALIBRATION		Г
Perform "D dure".	AST CALIBRATION (MODE1)" for steering	force control module. Refer to STC-135, "Work Proce-	L
>> 2.PERFOI	GO TO 2. RM SELF-DIAGNOSIS		N
With CO 1. Turn th 2. Erases	NSULT e ignition switch ON. self-diagnosis for "DAST 1".		Ν
 Turn th Turn th Perform Is DTC "C1 	e ignition switch OFF and wait for at least 1 e ignition switch ON. n self-diagnosis for "DAST 1". 3E0-00" detected?	I0 seconds.	C
YES >> NO >> DAST 2	Replace steering angle main control modu INSPECTION END	Ile. Refer to STC-428, "Removal and Installation".	F
DAST 2 :	DTC Description	INF0ID:00000009785295	
	ECTION LOGIC		

C13F0-00 INCOMP DAST CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

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-47, "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

- Turn the ignition switch ON.
- 2. Perform self-diagnosis for "DAST 2".

Is DTC "C13F0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>STC-400, "DAST 2 : Diagnosis Procedure"</u>.

- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000009785296

1.PERFORM CALIBRATION

Perform "DAST CALIBRATION (MODE1)" for steering force control module. Refer to <u>STC-135, "Work Proce-</u> <u>dure"</u>.

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

- 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-429, "Removal and Installation".
- NO >> INSPECTION END

C13F1-00 INCOMP ST ANG SEN ADJST EPS/DAST 3

EPS/DAST 3 : DTC Description

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 In complet 	CAUSE te of steering angle sensor neutral position	adjustment
FAIL-SAFE • Mode 2 NOTE: For fail-sa	fe mode, refer to <u>STC-47, "DIRECT ADAP</u> "	TIVE STEERING : Fail-safe".
DTC CONF	FIRMATION PROCEDURE	
1.PRECON	NDITIONING	
If "DTC COI wait at least	NFIRMATION PROCEDURE" has been pre 10 seconds before conducting the next tes	eviously conducted, always turn ignition switch OFF and st.
	PRODUCTION PROCEDURE	
With COI 1. Turn the 2. Perform Is DTC "C13 YES NO-1 NO-2	NSULT e ignition switch ON. n self-diagnosis for "EPS/DAST 3". <u>3F1-00" detected?</u> Proceed to diagnosis procedure. Refer to g To check malfunction symptom before repair Confirmation after repair: INSPECTION EF	<u>STC-401, "EPS/DAST 3 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND
EPS/DAS	ST 3 : Diagnosis Procedure	INF0ID:00000009785298
1. PERFOR	RM CALIBRATION	
Perform DA <u>dure"</u> .	ST CALIBRATION (MODE1) for steering	force control module. Refer to STC-135, "Work Proce-
>>	GO TO 2.	
2.adjust	MENT OF STEERING ANGLE SENSOR N	IEUTRAL POSITION
Adjust neutr	al position of steering angle sensor. Refer	to BRC-70, "Work Procedure".
>>	GO TO 3.	
3.PERFOR	RM SELF-DIAGNOSIS	
With COI 1. Turn the 2. Erase s 3. Turn the 4. Turn the 5. Perform	NSULT e ignition switch ON. elf-diagnosis for "EPS/DAST 3". e ignition switch OFF and wait for at least 1 e ignition switch ON. n self-diagnosis for "EPS/DAST 3".	0 seconds.

Is DTC "C13F1-00" detected?

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INFOID:000000009785297

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

- >> Replace steering force control module. Refer to <u>STC-427, "Removal and Installation"</u>.
 >> INSPECTION END YES
- NO

U1000-01 CAN COMM CIRCUIT EPS/DAST 3

EPS/DAST 3 : DTC Description

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	Е
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		F
CAN comCAN com	munication error munication line		STC
FAIL-SAFE	E		
 System c 	ontinue normal control.		Ц
DTC CON	FIRMATION PROCEDURE		
1.PRECO	NDITIONING		
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been pr t 10 seconds before conducting the next te	reviously conducted, always turn ignition switch OFF and est.	I
>>	GO TO 2.		J
2.DTC RE	PRODUCTION PROCEDURE		
With CO	NSULT		Κ
 1. Turn th 2. Perforn 	e ignition switch ON. n self-diagnosis for "EPS/DAST 3".		
Is DTC "U1	000-01" detected?		1
YES >> NO-1 >>	Proceed to diagnosis procedure. Refer to To check malfunction symptom before re Confirmation after repair: INSPECTION E	9 <u>STC-403, "EPS/DAST 3 : Diagnosis Procedure"</u> . pair: Refer to <u>GI-43, "Intermittent Incident"</u> .	
			M
EPS/DAS	51 3 : Diagnosis Procedure	INFOID:00000009785301	
Proceed to DAST 1	LAN-26, "Trouble Diagnosis Flow Chart".		Ν
DAST 1 :	DTC Description	INFOID:00000009785303	0
CAN (Contr	oller Area Network) is a serial communica	ation line for real time application. It is an on-vehicle mul-	

tiplex 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

STC-403

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INFOID:000000009785300

U1000-01 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

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-404, "DAST 1 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009785304

Proceed to LAN-26, "Trouble Diagnosis Flow Chart".

U1010-49 CONTROL UNIT (CAN) EPS/DAST 3

EPS/DAST 3 : DTC Description

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 f 	orce control module internal error	
FAIL-SAFE		
System c	ontinue normal control.	
DTC CON	FIRMATION PROCEDURE	
1.PRECO	NDITIONING	
If "DTC CO wait at leas	NFIRMATION PROCEDURE" has been pre t 10 seconds before conducting the next te	eviously conducted, always turn ignition switch OFF and st.
>>	GO TO 2.	
2.DTC RE	PRODUCTION PROCEDURE	
With CO With CO I. Turn th C. Perforn Is DTC "U1	NSULT e ignition switch ON. n self-diagnosis for "EPS/DAST 3". 010-49" detected?	
YES >> NO-1 >> NO-2 >>	Proceed to diagnosis procedure. Refer to To check malfunction symptom before rep Confirmation after repair: INSPECTION E	<u>STC-403, "EPS/DAST 3 : Diagnosis Procedure"</u> . air: Refer to <u>GI-43, "Intermittent Incident"</u> . ND
EPS/DAS	ST 3 : Diagnosis Procedure	INFOID:00000009785307
1.PERFOR	RM SELF-DIAGNOSIS	
(B) With CO 1. Turn th 2. Erase s	NSULT e ignition switch ON. self-diagnosis for "EPS/DAST 3".	
 Turn th Turn th Perform 	e ignition switch OFF and wait for at least 1 e ignition switch ON. n self-diagnosis for "EPS/DAST 3".	10 seconds.
YES >> NO >> DAST 1	010-49 ^{ed} detected? Replace steering force control module. Re Check the intermittent incident. Refer to <u>G</u>	efer to <u>STC-427, "Removal and Installation"</u> . SI-43, "Intermittent Incident".

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 elec-

STC-405

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U1010-49 CONTROL UNIT (CAN)

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

tronic 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

(B) With CONSULT

- Turn the ignition switch ON.
- 2. Perform self-diagnosis for "DAST 1".

Is DTC "U1010-49" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-403</u>, "EPS/DAST 3 : Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000009785310

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 <u>STC-428, "Removal and Installation"</u>.
- NO >> Check the intermittent incident. Refer to GI-43, "Intermittent Incident".

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

POWER SUPPLY AND GROUND CIRCUIT

А DTC Description INFOID:000000009785311 **Diagnosis** Procedure INFOID:000000009785312 1. CHECK STEERING FORCE CONTROL MODULE GROUND CIRCUIT 1. Turn the ignition switch OFF. Disconnect steering force control module harness connector. 2. 3. Check the continuity between control module harness connector and ground. Steering force control module Continuity Connector Terminal E M72 33 Existed Ground Is the inspection result normal? YES >> GO TO 2. F 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. STC 2. Check the continuity between control module harness connector and ground. Steering angle main control module Н Continuity Connector Terminal F27 33 Ground Existed E28 39 Is the inspection result normal? YES >> GO TO 3. NO >> Repair open circuit in harness or connectors. ${f 3.}$ CHECK STEERING ANGLE SUB CONTROL MODULE GROUND CIRCUIT Disconnect steering angle sub control module harness connector. Κ 1 2. Check the continuity between control module harness connector and ground. Steering angle sub control module Continuity Connector Terminal E30 33 Ground Existed Μ E31 39 Is the inspection result normal? YES >> GO TO 4. Ν 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

Is the inspection result normal?

M72

YES >> GO TO 6.

NO >> GO TO 5.

Ground

34

10.5 - 16.0 V

< DTC/CIRCUIT DIAGNOSIS >

5.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 <u>PG-12, "Wiring Diagram -</u> <u>BATTERY POWER SUPPLY -"</u>.
- 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 ma	ain control module		Continuity
Connector	Terminal		Continuity
E27	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 7.

1.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 <u>PG-12, "Wiring Diagram -</u> <u>BATTERY POWER SUPPLY -"</u>.
- 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 s	ub control module		Continuity
Connector	Terminal		Continuity
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 <u>PG-12</u>, "Wiring Diagram <u>BATTERY POWER SUPPLY -</u>".
- 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.

STC-408

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle n	naın control module		_	Continuity
Connector	Terminal			
E26 Turn the ignition switch Check the voltage bet	h ON. ween steering angl	e control module ha	Ground	o v
Steering angle n	nain control module			
Connector	Terminal		—	Continuity
E26	25		Ground	10.5 – 16.0 V
YES >> INSPECTION NO >> GO TO 11. 1.CHECK IGNITION PC Turn the ignition switc Disconnect steering an Check the continuity b sub control module ha	END. DWER SUPPLY Cli h OFF. ngle sub control mo petween steering al rness connector.	RCUIT (1) odule harness conne ngle main control m	ector. lodule harness con	nector and steering
Steering angle main co	ntrol module	Steering angles	sub control module	
Connector	Terminal	Connector	Terminal	Continuity
Connector				
E26 the inspection result nor (ES >> GO TO 12. NO >> Repair or replace 2. CHECK INTERNAL (Check the continuity between the continu	25 mal? ace error-detected CIRCUIT IN STEER een steering angle s	E29 parts. RING ANGLE SUB (sub control module	27 CONTROL MODUL	.E s.
E26 S the inspection result nor YES >> GO TO 12. NO >> Repair or repla 2.CHECK INTERNAL O heck the continuity between Steen	25 mal? ace error-detected CIRCUIT IN STEER een steering angle s	E29 parts. RING ANGLE SUB (sub control module	27 CONTROL MODUL connector terminals	E Existed
E26 S the inspection result nor YES >> GO TO 12. NO >> Repair or repla 2.CHECK INTERNAL (Stee Stee	25 mal? ace error-detected CIRCUIT IN STEER een steering angle s ring angle sub control n Terminal	E29 parts. RING ANGLE SUB (sub control module	27 CONTROL MODUL connector terminals	E Existed
E26 S the inspection result nor YES >> GO TO 12. NO >> Repair or repla 2.CHECK INTERNAL (Stee 25 Stee inspection result nor	25 mal? ace error-detected CIRCUIT IN STEER een steering angle s ring angle sub control n Terminal	E29 parts. RING ANGLE SUB (sub control module nodule 27	27 CONTROL MODUL connector terminals	E Existed Continuity Existed
E26 S the inspection result nor YES >> GO TO 12. NO >> Repair or repla 2.CHECK INTERNAL (C) Check the continuity betwo Stee 25 S the inspection result nor YES >> GO TO 13. NO >> Replace steer 3.CHECK IGNITION PO Check the voltage betwo Steering angle s	25 mal? ace error-detected CIRCUIT IN STEER een steering angle s ring angle sub control n Terminal mal? ing angle sub contr OWER SUPPLY FC ween steering angle	E29 parts. RING ANGLE SUB (sub control module nodule 27 rol module. Refer to DR STEERING ANC e sub control modul	27 CONTROL MODUL connector terminals STC-429, "Remove GLE SUB CONTRO e harness connected	E E S. Continuity Existed
E26 E26 E26 E26 E26 E26 E27 E28 E28 E28 E29 E29 E25 E25 E25 E25 E25 E25 E25 E25	25 mal? ace error-detected CIRCUIT IN STEER een steering angle se ring angle sub control n Terminal mal? ing angle sub contr OWER SUPPLY FC ween steering angle sub control module Terminal	E29 parts. RING ANGLE SUB (sub control module 27 rol module. Refer to DR STEERING ANC e sub control modul	27 CONTROL MODUL connector terminals STC-429, "Remove GLE SUB CONTROL harness connected	E E Continuity Existed
E26 the inspection result nor ES >> GO TO 12. O >> Repair or repla 2.CHECK INTERNAL O heck the continuity betwee 25 the inspection result nor ES >> GO TO 13. O >> Replace steer 3.CHECK IGNITION PO Check the voltage betwee Steering angles Connector E29	25 mal? ace error-detected CIRCUIT IN STEER een steering angle s ring angle sub control n Terminal mal? ing angle sub contro OWER SUPPLY FC ween steering angle sub control module Terminal 25	E29 parts. RING ANGLE SUB (sub control module 27 rol module. Refer to DR STEERING ANC e sub control modul	27 CONTROL MODUL connector terminals STC-429, "Remova GLE SUB CONTRO harness connecte Ground	E Existed Continuity Existed All and Installation". DL MODULE or and ground. Continuity 0 V
E26 E26 E26 E26 E26 E27 E28 E28 E28 E29 E28 E28 E25 E25 E25 E25 E25 E25 E25 E25	25 mal? ace error-detected CIRCUIT IN STEER een steering angle sub ring angle sub control n Terminal mal? ing angle sub contro OWER SUPPLY FC ween steering angle sub control module Terminal 25 h ON. ween steering angle	E29 parts. RING ANGLE SUB (sub control module 27 rol module. Refer to DR STEERING ANC e sub control modul e control module ha	27 CONTROL MODUL connector terminals STC-429, "Remove GLE SUB CONTRO harness connector ar Ground	E Existed S. Continuity Existed Al and Installation". DL MODULE or and ground. Continuity 0 V and ground.
E26 Sthe inspection result nor YES >> GO TO 12. NO >> Repair or replation 2. CHECK INTERNAL Content Content Stee 25 Sthe inspection result nor Stee 25 Stee 3. CHECK IGNITION PO . Check the voltage bet Steering angle s Connector E29 . Turn the ignition switch Check the voltage bet Steering angle s Steering angle s Connector Steering angle s	25 mal? ace error-detected CIRCUIT IN STEER een steering angle sub ring angle sub control n Terminal mal? ing angle sub control OWER SUPPLY FO ween steering angle sub control module Terminal 25 h ON. ween steering angle sub control module Terminal	E29 parts. RING ANGLE SUB (sub control module 27 rol module. Refer to DR STEERING ANG e sub control modul e control module ha	27 CONTROL MODUL connector terminals STC-429, "Remove GLE SUB CONTRO harness connector ar Ground free harness connector ar	E E Continuity Existed al and Installation". DL MODULE or and ground. Continuity 0 V and ground.

< DTC/CIRCUIT DIAGNOSIS >

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 so	ub control module	Steering force control module		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
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	Continuity
Tern	Continuity
25	Existed

Is the inspection result normal?

YES >> GO TO 16.

NO >> Replace steering force control module. Refer to <u>STC-427, "Removal and Installation"</u>.

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		Continuity	
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		Continuity	
M71	25	Ground	10.5 – 16.0 V	

Is the inspection result normal?

YES >> Perform intermittent incident. Refer to GI-43, "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	Steering force control module		Fuse block (J/B)	
Connector	Terminal	Connector	Terminal	Continuity
M71	25	M133	20C	Existed

5. Check the continuity between steering force control module connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module			Continuity	A	
	Connector	Terminal		Continuity	
	M71	25	Ground	Not existed	
Is the ins	spection result norr	<u>mal?</u>			В
YES	YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to <u>PG-54</u> , "Wiring Diagram -				

NO >> Repair or replace error-detected parts.

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< DTC/CIRCUIT DIAGNOSIS >

POWER STEERING WARNING LAMP

Component Function Check

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 <u>STC-407, "Diagnosis Procedure"</u>

Diagnosis Procedure

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "EPS/DAST 3", "DAST 1" and "DAST 2".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>STC-80, "DTC Index"</u> (EPS/DAST 3), <u>STC-95, "DTC Index"</u> (DAST 1) and <u>STC-110, "DTC Index"</u> (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 <u>MWI-104</u>. <u>"COMBINATION METER : Diagnosis Procedure"</u>.
- NO >> Replace steering force control module. Refer to <u>STC-427, "Removal and Installation"</u>.

INFOID:000000009785313

INFOID:000000009785314

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS SYSTEM SYMPTOM

Symptom Table

INFOID:000000009800738

Symptom		Warning Iamp	Possible cause	Diagnosis method	Priority	C
	The vehicle	ON	Fail safe mode 2 For fail-safe mode, refer to <u>STC-47, "DIRECT ADAP-</u> <u>TIVE STEERING : Fail-</u> <u>safe"</u> .	Perform self-diagnosis	1	C
While driving the vehicle, steer- ing wheel is off-center.	one direction.	OFF [*]	Protection mode For protection function, refer to <u>STC-50, "DIRECT ADAP-</u> <u>TIVE STEERING : Protec-</u> <u>tion Function"</u> .	Perform self-diagnosis NOTE: When DTC is detected as "PAST", this is control in nor- mal condition.	2	F
	The vehicle pulls to one direction.	OFF	 Steering wheel is off-center slightly. Steering wheel is off-center temporarily. 	Perform symptom diagnosis "THE VEHICLE PULLS TO ONE SIDE" Refer to <u>STC-416, "Diagno-</u> sis Procedure".	1	ST
When turning the steering wheel from full left stop to full right stop.	The vehicle pulls to one direction.	OFF	 Steering wheel is off-center slightly. Steering wheel is off-center temporarily. 	Perform symptom diagnosis "THE VEHICLE PULLS TO ONE SIDE" Refer to <u>STC-416, "Diagno-</u> sis Procedure".	1	F
 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 does not pull to one direction.	OFF	The neutral position of the vehicle's alignment and the neutral position of the steer- ing rack are off-center.	Perform "TOE-IN ADJUST- MENT" with alignment tester. Refer to <u>ST-81, "ALIGN- MENT TESTER : Inspection</u> and Adjustment". CAUTION: Be sure to use alignment tester for the symptom.	1	, K
	1	ON	Fail safe mode 2 or 3 For fail-safe mode, refer to <u>STC-47, "DIRECT ADAP-</u> <u>TIVE STEERING : Fail-</u> <u>safe"</u> .	Perform self-diagnosis	1	L
 Steering gear ratio changes Steering wheel turning force is heavy 		OFF [*]	Protection mode For protection function, refer to <u>STC-50, "DIRECT ADAP-</u> <u>TIVE STEERING : Protec-</u> <u>tion Function"</u> .	Perform self-diagnosis NOTE: When DTC is detected as "PAST", this is control in nor- mal condition.	2	N
		OFF	Steering mode is except "Normal". For steering mode, refer to <u>STC-40, "DIRECT ADAP-</u> <u>TIVE STEERING : System</u> <u>Description"</u> .	Not required NOTE: Since the steering mode is except "Normal", steering characteristic is changed. This is control in normal condition.	3	C

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SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Symptom	Warning Iamp	Possible cause	Diagnosis method	Priority
	ON	Fail safe mode 2 For fail-safe mode, refer to STC-47, "DIRECT ADAP- <u>TIVE STEERING : Fail-</u> <u>safe"</u> .	Perform self-diagnosis	1
Steering wheel turning force is light	OFF [*]	Protection mode For protection function, refer to <u>STC-50, "DIRECT ADAP-</u> <u>TIVE STEERING : Protec-</u> <u>tion Function"</u> .	Perform self-diagnosis NOTE: When DTC is detected as "PAST", this is control in nor- mal condition.	2
	OFF	Steering mode is except "Normal". For steering mode, refer to <u>STC-40. "DIRECT ADAP-</u> <u>TIVE STEERING : System</u> <u>Description"</u> .	Not required NOTE: Since the steering mode is except "Normal", steering characteristic is changed. This is control in normal condition.	3
	ON	Fail safe mode 2 (Operation sound of steering clutch) For fail-safe mode, refer to <u>STC-47, "DIRECT ADAP-</u> <u>TIVE STEERING : Fail-</u> <u>safe"</u> .	Perform self-diagnosis	1
Vibration / Noise occurs	OFF [*]	Protection mode (Operation sound of steering clutch) For protection function, refer to <u>STC-50, "DIRECT ADAP-</u> <u>TIVE STEERING : Protec-</u> <u>tion Function"</u> .	Perform self-diagnosis NOTE: When DTC is detected as "PAST", this is control in nor- mal condition.	2
	OFF	Operating sound of steering force actuator	Not required NOTE:	
	OFF	Operating sound of steering angle actuator	This is an operating sound in normal condition of direct adaptive steering.	3
	ON	Malfunction of steering clutch (When sound is ab- normal sound.)	Perform self-diagnosis	
When start the engine, sound is heard.	OFF	Operating sound of steering clutch	Not required NOTE: This is an operating sound in normal condition of direct adaptive steering.	1
Unbalance steering wheel turning force (torque	ON	Fail safe mode 2 For fail-safe mode, refer to <u>STC-47, "DIRECT ADAP-</u> <u>TIVE STEERING : Fail-</u> <u>safe"</u> .	Perform self-diagnosis	1
variation)	OFF [*]	Protection mode For protection function, refer to <u>STC-50. "DIRECT ADAP-</u> <u>TIVE STEERING : Protec-</u> <u>tion Function"</u> .	Perform self-diagnosis NOTE: When DTC is detected as "PAST", this is control in nor- mal condition.	2

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Symptom	Warning Iamp	Possible cause	Diagnosis method	Priority	A
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	B
	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
When turning quickly, the vehicle follows slowly compared with turning normally.	ON	Fail safe mode 1 For fail-safe mode, refer to <u>STC-47, "DIRECT ADAP-</u> <u>TIVE STEERING : Fail-</u> <u>safe"</u> .	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	H
*· Except (13E5-00					

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THE VEHICLE PULLS TO ONE SIDE

< SYMPTOM DIAGNOSIS >

THE VEHICLE PULLS TO ONE SIDE

Description

When driving the vehicle, the vehicle pulls to one direction.

Diagnosis Procedure

INFOID:000000010102690

INFOID:000000010102689

 $1. \mathsf{CHECK} \text{ THE ILLUMINATION OF THE POWER STEERING WARNING LAMP}$

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-80, "DTC Index".
 - DAST 1: Refer to <u>STC-95, "DTC Index"</u>.
 - DAST 2: Refer to <u>STC-110, "DTC Index"</u>.

2.AUTO ADJUSTING MODE

1. Turn the steering wheel to left/right 90 degree or more from center position 2 times.

- 2. Drive straight ahead at 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.

>> 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.CHECK SUSPENSION AND STEERING PARTS INSTALLATION CONDITION

Check suspension and steering parts installation condition.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Install suspension and steering parts properly. Then perform the toe-in adjustment.

5.TOE-IN ADJUSTMENT

Adjust toe-in. Refer to ST-81, "ALIGNMENT TESTER : Inspection and Adjustment".

>> GO TO 6.

6.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 5.

POWER STEERING WARNING LAMP DOSE NOT TURN ON < SYMPTOM DIAGNOSIS > [DIRECT ADAPTIVE STEERING]

POWER STEERING WARNING LAMP DOSE NOT TURN ON А Description INFOID:000000009728518 Power steering warning lamp does not illuminate when the ignition switch is turned ON (lamp check). В **Diagnosis** Procedure INFOID:000000009728519 1. CHECK THE POWER STEERING WARNING LAMP С Perform trouble diagnosis for power steering warning lamp system. Refer to STC-412, "Diagnosis Procedure". Is the check result normal? D YES >> Check the intermittent incident. Refer to GI-43, "Intermittent Incident". NO >> Repair or replace the malfunctioning parts.

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POWER STEERING WARNING LAMP DOSE NOT TURN OFF < SYMPTOM DIAGNOSIS > [DIRECT ADAPTIVE STEERING]

POWER STEERING WARNING LAMP DOSE NOT TURN OFF

Description

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

Diagnosis Procedure

INFOID:000000009728521

INFOID:000000009728520

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-80, "DTC Index".
- DAST 1: Refer to STC-95, "DTC Index".
- DAST 2: Refer to STC-110, "DTC Index".

NO >> GO TO 2.

2.CHECK THE POWER STEERING WARNING LAMP

Perform trouble diagnosis for power steering warning lamp system. Refer to <u>STC-412, "Diagnosis Procedure"</u>. <u>Is the check result normal?</u>

YES >> GO TO 3.

NO >> Repair or replace the malfunctioning parts.

 $\mathbf{3}$. Check the direct adaptive steering power and ground circuit

Perform trouble diagnosis for the direct adaptive steering power and ground circuit. Refer to <u>STC-407, "Diagnosis Procedure"</u>.

Is the check result normal?

- YES >> Check the intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO >> Repair or replace the malfunctioning parts.

< SYMPTOM DIAGNOSIS >

SYSTEM IS NOT DISPLAYED ON CONSULT

Description

"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	Poforonco		
DAST 1	DAST 2	EPS/DAST 3	r ussible cause	Reference	С
System is not dis- played on CON- SULT	System is not dis- played on CON- SULT	System is not dis- played on CON- SULT	 Battery power supply circuit Ignition power supply circuit Power supply circuit for steering force control module Steering force control module harness connector 	TYPE 1: Re- fer to <u>STC-</u> <u>419</u> .	D
System is not dis- played on CON- SULT	C13BE-00, C13C0- 00 or C13C2-00	C13BE-00, C13C0- 00 or C13C2-00	FlexRay communication lineSteering angle main control module	TYPE 2: Re- fer to <u>STC-</u> <u>421</u> .	
System is not dis- played on CON- SULT	System is not dis- played on CON- SULT	C13C1-00 and C13C4-00	 FlexRay communication line Steering force control module Steering angle main control module Steering angle sub control module 	TYPE 3: Re- fer to <u>STC-</u> <u>421</u> .	F
C13C0-00, C13C2- 00 or System is not displayed on CON- SULT	System is not dis- played on CON- SULT	C13BE-00, C13C0- 00 or C13C3-00	FlexRay communication lineSteering angle sub control module	TYPE 4: Re- fer to <u>STC-</u> <u>422</u> .	Н
System is not dis- played on CON- SULT	C13C0-00 and C13C2-00	C13C0-00 and C13C2-00	 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: Re- fer to <u>STC-</u> <u>423</u> .	l
System is not dis- played on CON- SULT	System is not dis- played on CON- SULT	C13C0-00, C13C2- 00 and C13C3-00	 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: Re- fer to <u>STC-</u> <u>424</u> .	K
C13C0-00 and C13C2-00	System is not dis- played on CON- SULT	C13C0-00 and C13C3-00	Steering angle sub control module harness con- nector	TYPE 7: Re- fer to <u>STC-</u> <u>425</u> .	L
System is not dis- played on CON- SULT	System is not dis- played on CON- SULT	C13BE-00, C13C1- 00 or C13C4-00	FlexRay communication lineSteering force control module	TYPE 8: Re- fer to <u>STC-</u> <u>425</u> .	N

TYPE 1

TYPE 1 : Diagnosis Procedure

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		Continuity	
M72	33	Ground	Not existed	

Is the inspection result normal?

YES >> GO TO 2.

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[DIRECT ADAPTIVE STEERING]

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< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

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		Continuity	
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 <u>PG-12, "Wiring Diagram -</u> <u>BATTERY POWER SUPPLY -"</u>.
- 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
Terr	ninal	Continuity
25	27	Existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace steering force control module. Refer to <u>STC-427, "Removal and Installation"</u>.

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		Continuity
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		Continuity
M71	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> Perform intermittent incident. Refer to GI-43, "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).

STC-420

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force	control module	Fuse	e block (J/B)	Continuity
Connector	Terminal	Connector	Terminal	Continuity
M71	25	M133	20C	Existed
. Check the continu	uity between steering f	orce control module	e connector and ground	J.
Steering	g force control module		_	Continuity
Connector	Termina	al		
M71	25		Ground	Not existed
s the inspection result YES >> Perform t <u>BATTER\</u> NO >> Repair or TYPE 2	It normal? he trouble diagnosis for <u>POWER SUPPLY -"</u> replace error-detected	or ignition power su d parts.	pply circuit. Refer to <u>P</u>	<u>G-12, "Wiring Diagram -</u>
YPE 2 : Diagno	sis Procedure			INFOID:000000009785370
CHECK FLEXRAY	COMMUNICATION C	IRCUIT		
Disconnect each Check the continu	control module harnes uity between each con	s connector. trol module harness	s connector.	
Steering angle ma	ain control module	Steering angl	e sub control module	Continuity
Connector	Terminal	Connector	Terminal	
E26	19	E29	19 Exi	
	20		20	
3. Check the continu	uity between control m	odule harness con	nector and ground.	
Steering a	ngle main control module			Oractionsity
Connector	Termina	al	—	Continuity
F26	19		Ground	Not existed
220	20		Cround	Not oxisted
s the inspection result YES >> GO TO 2 NO >> Repair or CHECK INTERMIT	It normal? replace error-detected ITTENT INCIDENT	d part.		
Refer to <u>GI-43, "Interr</u> <u>s the inspection resul</u> YES >> Replace s NO >> Repair or TYPE 3	<u>nittent Incident"</u> . I <u>t normal?</u> steering angle main co replace error-detected	ntrol module. Refe d part.	to <u>STC-428, "Remova</u>	I and Installation".
FYPE 3 : Diagno	sis Procedure			INFOID:000000009785371
1.CHECK FLEXRAY	COMMUNICATION C	IRCUIT		
 Disconnect each Check the continut 	control module harnes uity between each con	s connector. trol module harness	s connector.	
Steering angle ma	ain control module	Steering and	e sub control module	
Connector	Terminal	Connector	Terminal	Continuity
	19		19	
E26		E29		Existed

20

20

< SYMPTOM DIAGNOSIS >

SIS >	[DIRECT ADAPTIVE STEERING]

Steering force	control module	Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M71	19	E26	19	Existed
IVI7 I	20	L20	20	LAISIEU

3. Check the continuity between control module harness connector and ground.

Steering angle main control module			Continuity
Connector	Terminal		Continuity
E26	19	Ground	Not existed
LZO	20	Ground	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2. CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "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 <u>STC-428</u>, "<u>Removal and Installation</u>", <u>STC-429</u>, "<u>Removal and Installation</u>", <u>STC-429</u>, "<u>Removal and Installation</u>".
- NO >> Repair or replace error-detected part.

TYPE 4

TYPE 4 : Diagnosis Procedure

INFOID:000000009785372

1. CHECK FLEXRAY COMMUNICATION CIRCUIT

- 1. Disconnect each control module harness connector.
- 2. Check the continuity between each control module harness connector.

Steering angle	sub control module	Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E20	19	E26	19	Existed
E29	20	E20	20	Existed

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module			Continuity
Connector	Terminal	_	Community
E20	19	Ground	Not existed
	20	Giodila	Not existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2. CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to STC-429, "Removal and Installation".

NO >> Repair or replace error-detected part.

TYPE 5

< SYMPTOM DIAGNOSIS >

TYPE 5 : Diagnosis Procedure

[DIRECT ADAPTIVE STEERING]

 Turn the ignition switch C Disconnect steering angle Check the continuity betw 	DFF. e main control module ha veen control module harı	arness connector. ness connector and ground.	
Steering angle main	control module		Continuity
Connector	Terminal		Continuity
E27	33	Ground	Not existed
YES >> GO TO 2. NO >> Repair open circu CHECK STEERING ANGL . Turn the ignition switch C Disconnect steering and	uit or short to ground or s E MAIN CONTROL MO FF. e main control module ha	short to power in harness or DULE POWER SUPPLY CII	connectors. RCUIT (1)
3. Check the voltage betwee	en steering angle main c	ontrol module harness conn	ector and ground.
Steering angle main	Control module		Continuity
F97	34	Ground	10.5 - 16.0 \/
s the inspection result norma YES >> GO TO 4. NO >> GO TO 3. 3.CHECK STEERING ANGL 1. Check the 100A fusible lin 2. Check the harness for control of the 100 sector of the 100	<u>I?</u> LE MAIN CONTROL MO nk (#J). open or short between s	DULE POWER SUPPLY CI	RCUIT (2) module harness connector
strice inspection result norma YES >> GO TO 4. NO >> GO TO 3. 3.CHECK STEERING ANGL . Check the 100A fusible ling. . Check the harness for constant of the inspection result normal and the 10 sthe inspection result norma YES >> Perform the trout BATTERY POWE NO >> Repair or replace 4.CHECK IGNITION POWE . Turn the ignition switch Construct steering angle . Check the voltage between	<u>LE MAIN CONTROL MO</u> nk (#J). open or short between s 00A fusible link (#J). <u>I?</u> ole diagnosis for battery <u>ER SUPPLY -"</u> . error-detected parts. R SUPPLY FOR STEER OFF. e main control module ha en steering angle main c	DULE POWER SUPPLY CII steering angle main control power supply circuit. Refer t ING ANGLE MAIN CONTRO arness connector. ontrol module harness conn	RCUIT (2) module harness connector to <u>PG-12, "Wiring Diagram -</u> OL MODULE
strice inspection result norma YES >> GO TO 4. NO >> GO TO 3. 3.CHECK STEERING ANGL 1. Check the 100A fusible ling. 2. Check the harness for constant to the inspection result norma YES >> Perform the trout BATTERY POWE NO >> Repair or replace 4. CHECK IGNITION POWE 1. Turn the ignition switch Constant to the voltage betwee 3. Check the voltage betwee	<u>I?</u> <u>E MAIN CONTROL MO</u> nk (#J). open or short between so 00A fusible link (#J). <u>I?</u> ole diagnosis for battery <u>ER SUPPLY -"</u> . error-detected parts. R SUPPLY FOR STEER OFF. e main control module has en steering angle main control module has en steering angle main control module has	DULE POWER SUPPLY CII steering angle main control power supply circuit. Refer t ING ANGLE MAIN CONTRO arness connector. ontrol module harness conn	RCUIT (2) module harness connector to <u>PG-12, "Wiring Diagram -</u> OL MODULE rector and ground.
strice inspection result norma YES >> GO TO 4. NO >> GO TO 3. 3.CHECK STEERING ANGL 1. Check the 100A fusible ling. 2. Check the harness for constant of the inspection result norma YES >> Perform the trout BATTERY POWE NO >> Repair or replace 1. CHECK IGNITION POWE 2. Disconnect steering angle 3. Check the voltage betweet Steering angle main Connector	<u>LE MAIN CONTROL MO</u> nk (#J). open or short between s 00A fusible link (#J). <u>J?</u> ole diagnosis for battery <u>ER SUPPLY -"</u> . e error-detected parts. R SUPPLY FOR STEER OFF. e main control module ha en steering angle main c <u>control module</u> <u>Terminal</u>	DULE POWER SUPPLY CII steering angle main control power supply circuit. Refer to ING ANGLE MAIN CONTRO arness connector. ontrol module harness conn	RCUIT (2) module harness connector to <u>PG-12, "Wiring Diagram -</u> OL MODULE ector and ground.
Strie inspection result norma YES >> GO TO 4. NO >> GO TO 3. Incheck STEERING ANGL Check the 100A fusible line. Check the harness for construction result normal and the 10 sthe inspection result norma YES >> Perform the trout BATTERY POWE NO >> Repair or replace Incheck the voltage betweet Steering angle main Connector E26	LE MAIN CONTROL MO nk (#J). open or short between s 00A fusible link (#J). <u>I?</u> ole diagnosis for battery <u>ER SUPPLY -"</u> . e error-detected parts. R SUPPLY FOR STEER OFF. e main control module ha en steering angle main c control module <u>Terminal</u> 25	DULE POWER SUPPLY CII steering angle main control power supply circuit. Refer to ING ANGLE MAIN CONTRO arness connector. ontrol module harness conn Ground	RCUIT (2) module harness connector to PG-12, "Wiring Diagram - OL MODULE ector and ground. Continuity 0 V
strice inspection result norma YES >> GO TO 4. NO >> GO TO 3. 3.CHECK STEERING ANGL 1. Check the 100A fusible ling. 2. Check the harness for constant to the inspection result norma YES >> Perform the trout BATTERY POWE NO >> Repair or replace 4. CHECK IGNITION POWE 1. Turn the ignition switch C 2. Disconnect steering angle 3. Check the voltage betwee Steering angle main Connector E26 4. Turn the ignition switch C 5. Check the voltage betwee Steering angle main	<u>IP</u> <u>E MAIN CONTROL MO</u> nk (#J). open or short between so 00A fusible link (#J). <u>IP</u> ole diagnosis for battery <u>ER SUPPLY -"</u> . error-detected parts. R SUPPLY FOR STEER OFF. e main control module has en steering angle main control module has control module <u>Terminal</u> 25 N. en steering angle control control module	DULE POWER SUPPLY CII steering angle main control power supply circuit. Refer to ING ANGLE MAIN CONTRO arness connector. ontrol module harness connector Ground module harness connector	RCUIT (2) module harness connector to PG-12, "Wiring Diagram - OL MODULE ector and ground. Continuity 0 V and ground.
strice inspection result norma YES >> GO TO 4. NO >> GO TO 3. 3.CHECK STEERING ANGL 1. Check the 100A fusible ling 2. Check the 100A fusible ling 2. Check the harness for or NO.34 terminal and the 10 s the inspection result norma YES >> Perform the trout BATTERY POWE NO >> Repair or replace 4.CHECK IGNITION POWE 1. Turn the ignition switch O 2. Disconnect steering angle 3. Check the voltage betwee Steering angle main Connector E26 4. Turn the ignition switch O 5. Check the voltage betwee Steering angle main Connector E26 4. Turn the ignition switch O 5. Check the voltage betwee	IP LE MAIN CONTROL MO nk (#J). open or short between s 00A fusible link (#J). IP ole diagnosis for battery IP IP IP orror-detected parts. R SUPPLY FOR STEER OFF. e main control module had an steering angle main control module 25 ON. en steering angle control control module Control module Terminal 25	DULE POWER SUPPLY CII steering angle main control power supply circuit. Refer to ING ANGLE MAIN CONTRO arness connector. ontrol module harness connector Ground module harness connector	RCUIT (2) module harness connector to PG-12, "Wiring Diagram - OL MODULE ector and ground. Continuity 0 V and ground.

5. CHECK IGNITION POWER SUPPLY CIRCUIT

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

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 m	ain control module	Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
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 <u>STC-407</u>, "Diagnosis Procedure".

NO >> Repair or replace error-detected parts.

TYPE 6

TYPE 6 : Diagnosis Procedure

INFOID:000000009785374

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
Terr	ninal	Continuity
25	27	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace steering angle sub control module. Refer to <u>STC-429, "Removal and Installation"</u>.

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		Continuity	
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		Continuity	
E29	25	Ground	10.5 – 16.0 V	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 4.

 ${f 3.}$ CHECK INTERMITTTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering force control module and steering angle sub control module. Refer to <u>STC-427</u>, <u>"Removal and Installation"</u>, <u>STC-429</u>, "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.

STC-424

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle su	b control module	Steering force	Steering force control module	
Connector	Terminal	Connector	Terminal	Continuity
E29	25	M71	27	Existed
Is the inspection result YES >> Check the <u>nosis Proc</u> NO >> Repair or TYPE 7	normal? ignition power supply <u>edure"</u> . replace error-detected	circuit for steering fo I parts.	rce control module.	Refer to <u>STC-239, "Diag-</u>
TYPE 7 : Diagnos	is Procedure			INFOID:000000009785375
1. CHECK STEERING	ANGLE SUB CONT	ROL MODULE GRO	UND CIRCUIT	
 Turn the ignition s Disconnect steerir Check the continu 	witch OFF. Ig angle sub control m ity between control m	nodule harness conne odule harness conne	ector. ctor and ground.	
Steering a	gle sub control module			Continuity
Connector	Termina	1		,
E30	33		Ground	Not existed
3. Check the voltage Steering a	between steering ang	gle sub control modul	e harness connecto	or and ground.
Connector	Termina	l	—	Continuity
E30	34		Ground	10.5 – 16.0 V
Is the inspection result YES >> Perform ir NO >> GO TO 3. 3.CHECK STEERING	normal? termittent incident. Re ANGLE SUB CONT	efer to <u>GI-43, "Interm</u> ROL MODULE POW	ittent Incident". ER SUPPLY CIRCI	 JIT (2)
 Check the 100A ft Check the harness terminal and the 1 	isible link (#H). s for open or short bet 00A fusible link (#H).	ween steering angle	sub control module	harness connector No.34
Is the inspection result YES >> Perform th BATTERY NO >> Repair or	<u>normal?</u> ie trouble diagnosis fo <u>POWER SUPPLY -"</u> . replace error-detectec	or battery power supp I parts.	bly circuit. Refer to <u>l</u>	PG-12, "Wiring Diagram -
TYPE 8 TYPE 8 · Diagnos	sis Procedure			INEOID-20202020279552
1.CHECK FLEXRAY	COMMUNICATION C	IRCUIT		INI-0112:000000009785376
1. Disconnect each o	ontrol module harnes	s connector.		

2. Check the continuity between each control module harness connector.

SYSTEM IS NOT DISPLAYED ON CONSULT DSIS > [DIRECT ADAPTIVE STEERING]

< SYMPTOM DIAGNOSIS >

Steering force control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	Continuity
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	—	Continuity	
M71	19	Ground	Not existed	
	20	Ground	NOT EXISTED	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2. CHECK INTERMITTENT INCIDENT

Refer to GI-43, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace steering force control module. Refer to <u>STC-427, "Removal and Installation"</u>.

NO >> Repair or replace error-detected part.

STEERING ANGLE MAIN CONTROL MODULE

< REMOVAL AND INSTALLATION >

[DIRECT ADAPTIVE STEERING]

INFOID:000000009728523

STEERING ANGLE MAIN CONTROL MODULE

Removal and Installation

REMOVAL

- 1. Remove front bumper. Refer to EXT-14, "Removal and Installation"
- 2. Remove washer tank. Refer to WW-60, "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.



INSTALLATION

Note following, and install in the reverse order of removal.

CAUTION:

Perform additional service when replacing steering angle main control module. Refer to <u>STC-126</u>, <u>"Special Repair Requirement"</u>.

STEERING ANGLE SUB CONTROL MODULE

< REMOVAL AND INSTALLATION >

[DIRECT ADAPTIVE STEERING]

STEERING ANGLE SUB CONTROL MODULE

Removal and Installation

REMOVAL

- Remove front bumper. Refer to EXT-14, "Removal and Installation" 1.
- 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.



INSTALLATION Note following, and install in the reverse order of removal. STC **CAUTION:** Perform additional service when replacing steering angle sub control module. Refer to STC-126, "Special Repair Requirement". Н

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