SECTION STC
STEERING CONTROL SYSTEM

CONTENTS

PRECAUTION

PRECAUTIONS

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

INFOID:0000000009945951

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:

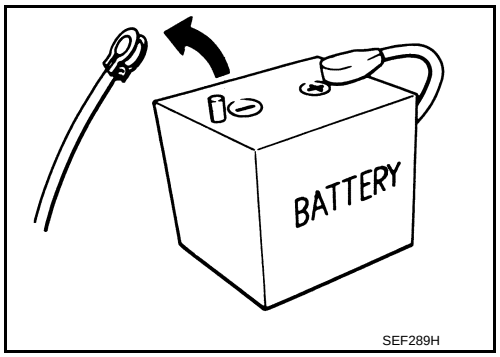
Always observe the following items for preventing accidental activation.

- **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 for Removing of Battery Terminal

INFOID:0000000010195704

- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
  NOTE:
  ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
  NOTE:
  If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.



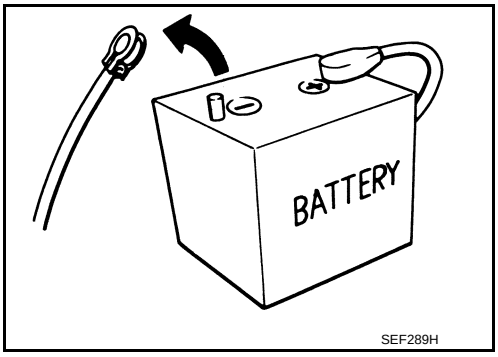
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  NOTE:
  The removal of 12V battery may cause a DTC detection error.

Service Notice and Precautions for EPS System

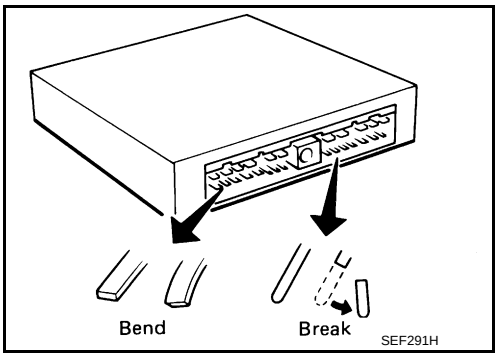
INFOID:0000000009945952

- Check the following item when performing the trouble diagnosis.
- Check any possible causes by interviewing the symptom and it’s condition from the customer if any malfunction, such as EPS warning lamp is turned ON, occurs.

- Check if air pressure and size of tires are proper, the specified part is used for the steering wheel, and control unit is genuine part.
- Check if the connection of steering column assembly and steering gear assembly is proper (there is not looseness of mounting bolts, damage of rods, boots or sealants, and leakage of grease, etc).
- Check if the wheel alignment is adjusted properly.
- Check if there is any damage or modification to suspension or body resulting in increased weight or altered ground clearance.
- Check if installation conditions of each link and suspension are proper.
- Check if the battery voltage is proper.
- Check connection conditions of each connector are proper.
- Before connecting or disconnecting the EPS control unit harness connector, turn ignition switch “OFF” and disconnect battery ground cable. Because battery voltage is applied to EPS control unit even if ignition switch is turned “OFF”.



- When connecting or disconnecting pin connectors into or from EPS control unit, take care not to damage pin terminals (bend or break).
- When connecting pin connectors, make sure that there are no bends or breaks on EPS control unit pin terminal.
- During quick steering, rasping noise may be heard from around the steering wheel. This is not a malfunction. The noise is an operating noise of the EPS system under normal conditions. If the rasping noise occurs during slow steering, this may not be an operating noise of the system. In this case, it is necessary to find out the location of the noise and repair, if necessary.

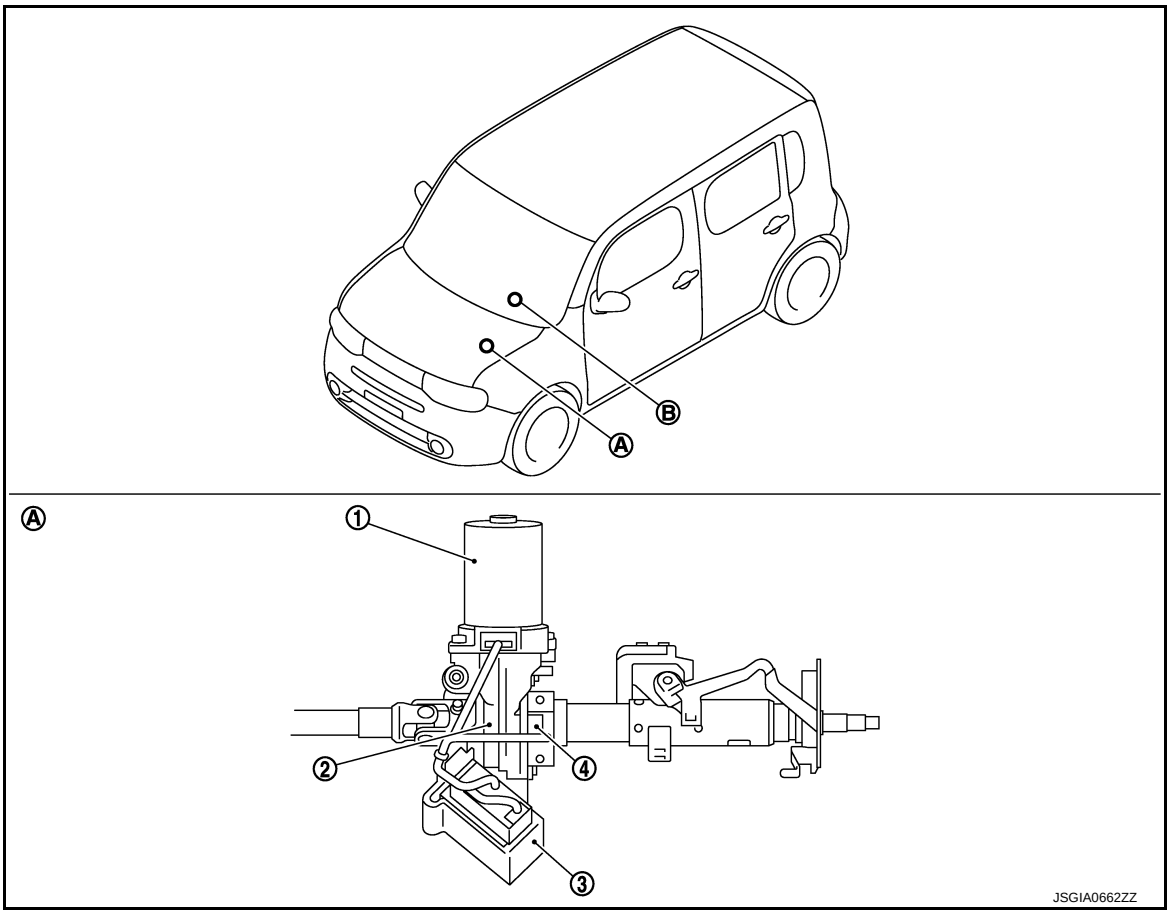


SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000009945953



1. EPS motor
2. Reduction gear
3. EPS control unit
4. Torque sensor
A. Steering column assembly
B. EPS warning lamp (Combination meter)

Component Description

INFOID:0000000009945954

Components parts	Reference
EPS control unit	STC-6, "EPS Control Unit"
EPS motor	STC-6, "EPS Motor"
Torque sensor	STC-6, "Torque Sensor"
Reduction gear	STC-6, "Reduction Gear"
EPS warning lamp	STC-7, "EPS SYSTEM : System Description"
ECM	• Transmits mainly the following signals to EPS control unit via CAN communication. - Engine status signal
ABS actuator and electric unit (control unit)	• Transmits mainly the following signal to EPS control unit via CAN communication. - Vehicle speed signal (ABS)

Components parts	Reference
Combination meter	• Transmits mainly the following signal to EPS control unit via CAN communication. - Vehicle speed signal (Meter)
	• Turns ON the EPS warning lamp according to the signal from EPS control unit via CAN communication.

EPS Control Unit

INFOID:0000000009945955

- EPS control unit performs an arithmetical operation on data, such as steering wheel turning force (sensor signal) from the torque sensor, vehicle speed signal, etc. Then it generates an optimum assist torque signal to the EPS motor according to the driving condition.
- EPS control unit decreases the output signal to EPS motor while extremely using the power steering function (e.g., full steering) consecutively for protecting EPS motor and EPS control unit (Overload protection control).

EPS Motor

INFOID:0000000009945956

EPS motor provides the assist torque by the control signal from EPS control unit.

Torque Sensor

INFOID:0000000009945957

Torque sensor detects the steering torque, and transmit the signal to EPS control unit.

Reduction Gear

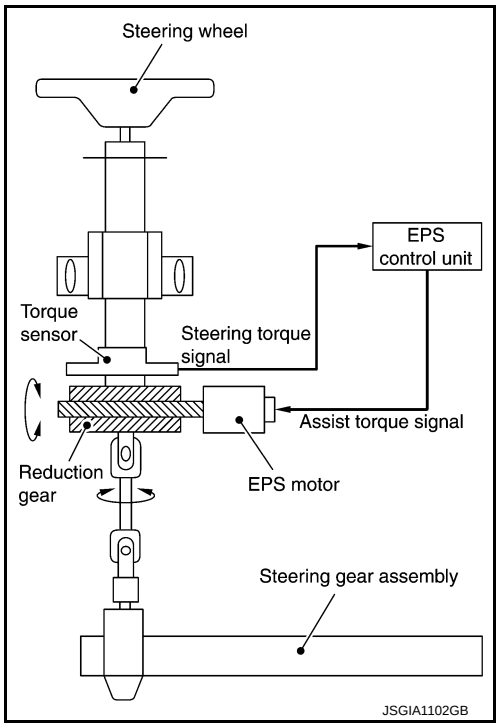
INFOID:0000000009945958

Reduction gear increases the assist torque provided from EPS motor with worm gears, and outputs to the column shaft.

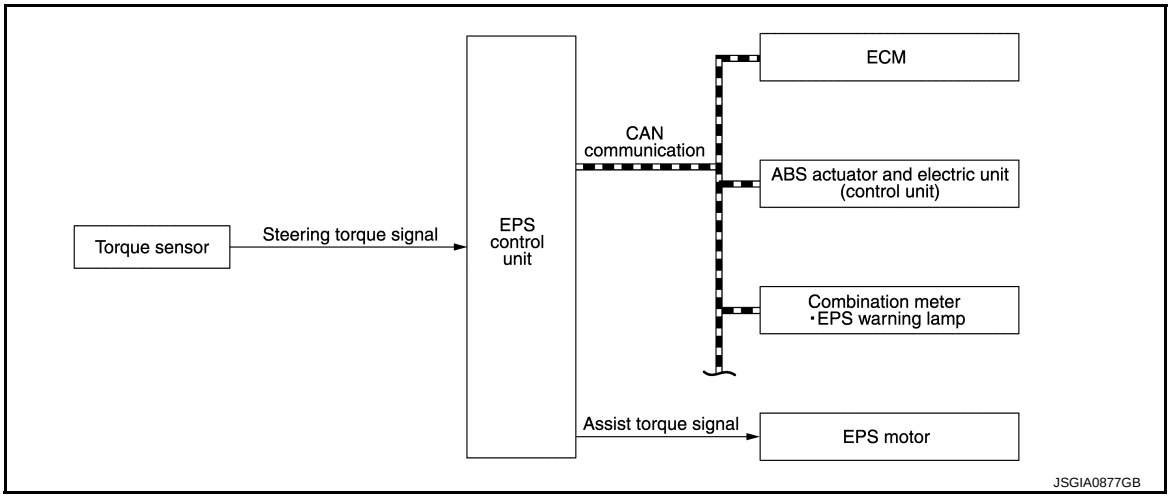
SYSTEM
EPS SYSTEM
EPS SYSTEM : System Description

INFOID:0000000009945959

- EPS control unit performs an arithmetical operation on data, such as steering wheel turning force (sensor signal) from the torque sensor, vehicle speed signal, etc. Then it generates an optimum assist torque signal to the EPS motor according to the driving condition.
- In case of an error in the electrical system, the fail-safe function stops output signals to the EPS motor. Refer to STC-12, "Fail-Safe".
- EPS control unit decreases the output signal to EPS motor while extremely using the power steering function (e.g., full steering) consecutively for protecting EPS motor and EPS control unit (Overload protection control). Refer to STC-13, "Protection Function".
- Extensive steering at low speed will cause the EPS control unit and EPS motor to heat up, once temperature reaches critical point EPS control unit will reduce current to reduce heat up. System will recover as temperature lowers (reduced or no assistance).



SYSTEM DIAGRAM



INPUT/OUTPUT SIGNAL

Communicates the signal from each control unit via CAN communication.

Control unit	Signal status
ECM	• Transmits mainly the following signals to EPS control unit via CAN communication. - Engine status signal
ABS actuator and electric unit (control unit)	• Transmits mainly the following signals to EPS control unit via CAN communication. - Vehicle speed signal (ABS)
Combination meter	• Transmits mainly the following signals to EPS control unit via CAN communication. - Vehicle speed signal (Meter) • Receives mainly the following signals from EPS control unit via CAN communication. - EPS warning lamp signal

EPS WARNING LAMP INDICATION

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

Condition	EPS warning lamp
Ignition switch ON. (Lamp check)	ON
Engine running.	OFF
EPS system malfunction [Other diagnostic item]	ON

CAUTION:
EPS warning lamp also turns ON due to data reception error, CAN communication error etc.

EPS SYSTEM : Fail-Safe

INFOID:0000000009945960

- If any malfunction occurs in the system and control unit detects the malfunction, EPS warning lamp on combination meter turns ON to indicate system malfunction.
- When EPS warning lamp is ON, the system enters into a manual steering state. (Control turning force steering wheel becomes heavy.)
- Under abnormal vehicle speed signal conditions, vehicle speed is judged as constant.

EPS SYSTEM : Protection Function

INFOID:0000000009945961

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

DIAGNOSIS SYSTEM (EPS CONTROL UNIT)

CONSULT Function

INFOID:0000000009945962

FUNCTION

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

Diagnostic test mode	Function
ECU identification	The part number stored in the control unit 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 EPS control unit can be read.

*: The following diagnosis information is erased by erasing.
- DTC
- Freeze frame data (FFD)

ECU IDENTIFICATION

Displays the part number stored in the control unit.

SELF-DIAG RESULTS MODE

Refer to STC-13, "DTC Index".

When “CRNT” is displayed on self-diagnosis result.
- The system is presently malfunctioning.

When “PAST” is displayed on self-diagnosis result.
- System malfunction in the past is detected, but the system is presently normal.

FREEZE FRAME DATA (FFD)

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

Item name	Display item
IGN COUNTER (0 – 39)	The number of times that ignition switch is turned ON after the DTC is detected is displayed. • When “0” is displayed: It indicates that the system is presently malfunctioning. • When except “0” is displayed: It indicates that system malfunction in the past is detected, but the system is presently normal. **NOTE:** Each time when ignition switch is turned OFF to ON, numerical number increases in 1→2→3...38→39. When the operation number of times exceeds 39, the number do not increase and “39” is displayed until self-diagnosis is erased.

DATA MONITOR MODE

NOTE:

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

Monitor item (Unit)	Remarks
BATTERY VOLT (V)	Displays the power supply voltage for EPS control unit.
TORQUE SENSOR (Nm)	Displays steering wheel turning force detected by torque sensor.
MOTOR CURRENT (A)	Displays the current value consumed by EPS motor.*1
MOTOR SIG (A)	Displays the current commanded value to EPS motor.
ASSIST TORQUE (Nm)	Displays assist torque of EPS motor being output by the electric power steering.
C/U TEMP (°C)	Displays the temperature of the EPS control unit.
ASSIST LEVEL (%)	Normally displays 100%. In case of an excessive stationary steering, the assist curvature gradually falls. However, it return to 100% when left standing.*2
VEHICLE SPEED (km/h) or (MPH)	Vehicle speed is displayed from vehicle speed signal via CAN communication.*3
WARNING LAMP (On/Off)	EPS warning lamp control status is displayed.
ENGINE STATUS (Stop/Run)	Engine speed is displayed from engine status signal via CAN communication.

*1: Almost in accordance with the value of “MOTOR SIG”. It is not a malfunction though these values are not accorded when steering quickly.
*2: Normally displays 100%. In case of an excessive stationary steering, the assist curvature gradually falls. However, it returns to 100% when left standing.
*3: It is not a malfunction, though it might not be corresponding just after ignition switch in turned ON.

ECU DIAGNOSIS INFORMATION

EPS CONTROL UNIT

Reference Value

INFOID:0000000009945963

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

The output signal indicates the EPS control unit calculation data. The normal values will be displayed even in the event that the output circuit (harness) is open.

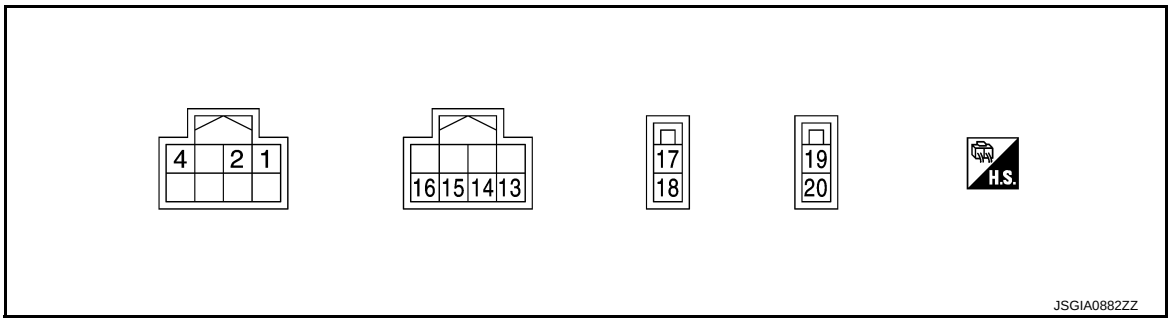
NOTE:

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

Monitor item	Data monitor		
	Condition		Display value
BATTERY VOLT	Ignition switch: ON		Battery voltage
TORQUE SENSOR	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 Nm
		Steering wheel: Right turn	Positive value (Nm)
		Steering wheel: Left turn	Negative value (Nm)
MOTOR CURRENT	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 A
		Steering wheel: Right or left turn	Displays consumption current of EPS motor (A)*1
MOTOR SIG	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 A
		Steering wheel: Right turn	Positive value (A)
		Steering wheel: Left turn	Negative value (A)
ASSIST TORQUE	Engine running		Approx. 0 Nm*2
C/U TEMP	Ignition switch ON or engine running		Displays temperature of inside of EPS control unit (°C)
ASSIST LEVEL	Engine running		100 % *3
VEHICLE SPEED	Vehicle stopped		0 km/h (0 mph)
	While driving		Approximately equal to the indication on speedometer*4 (inside of ±10%)
WARNING LAMP	EPS warning lamp: ON		On
	EPS warning lamp: OFF		Off
ENGINE STATUS	Engine not running		Stop
	Engine running		Run

*1: Almost in accordance with the value of “MOTOR SIG”. It is not a malfunction though these values are not accorded when steering quickly.
*2: A fixed value is indicated regardless of steering turning.
*3: Normally displays 100%. In case of an excessive stationary steering, the assist curvature gradually falls. However, it returns to 100% when left standing.
*4: It is not a malfunction, though it might not be corresponding just after ignition switch in turned ON.

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire Color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/Output			
1 (P)	—	CAN-L	Input/Output	—		—
2 (L)	—	CAN-H	Input/Output	—		—
4 (O)	Ground	Ignition power supply	Input	Ignition switch: ON		9 V – 17.5 V
				Ignition switch: OFF		0 V
13 (–)	Ground	Torque sensor power supply	Output	Ignition switch: ON		5 V
14 (–)	Ground	Torque sensor sub	Input	Ignition switch: ON	Steering wheel: Not steering (There is no steering force)	2.5 V
				Engine running	Steering wheel: steering	1.6 V – 3.4 V (The value is changed according to steering left or right)
15 (–)	Ground	Torque sensor ground	—	Always		0 V
16 (–)	Ground	Torque sensor main	Input	Ignition switch: ON	Steering wheel: Not steering (There is no steering force)	2.5 V
				Engine running	Steering wheel: steering	1.6 V – 3.4 V (The value is changed according to steering left or right)
17 (R)	Ground	Battery power supply	Input	Always		9 V – 17.5 V
18 (B)	Ground	Ground	—	Always		0 V
19 (–)	—	Motor (+)	—	—		—
20 (–)	—	Motor (–)	—	—		—

Fail-Safe

INFOID:0000000009945964

- If any malfunction occurs in the system and control unit detects the malfunction, EPS warning lamp on combination meter turns ON to indicate system malfunction.
- When EPS warning lamp is ON, the system enters into a manual steering state. (Control turning force steering wheel becomes heavy.)
- Under abnormal vehicle speed signal conditions, vehicle speed is judged as constant.

Protection Function

INFOID:0000000009945965

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

DTC Inspection Priority Chart

INFOID:0000000009945966

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

Priority	Priority order item (DTC)
1	U1000 CAN COMM CIRCUIT
2	C1609 CAN VHCL SPEED
3	C1601 BATTERY VOLT
4	Other than the above

DTC Index

INFOID:0000000009945967

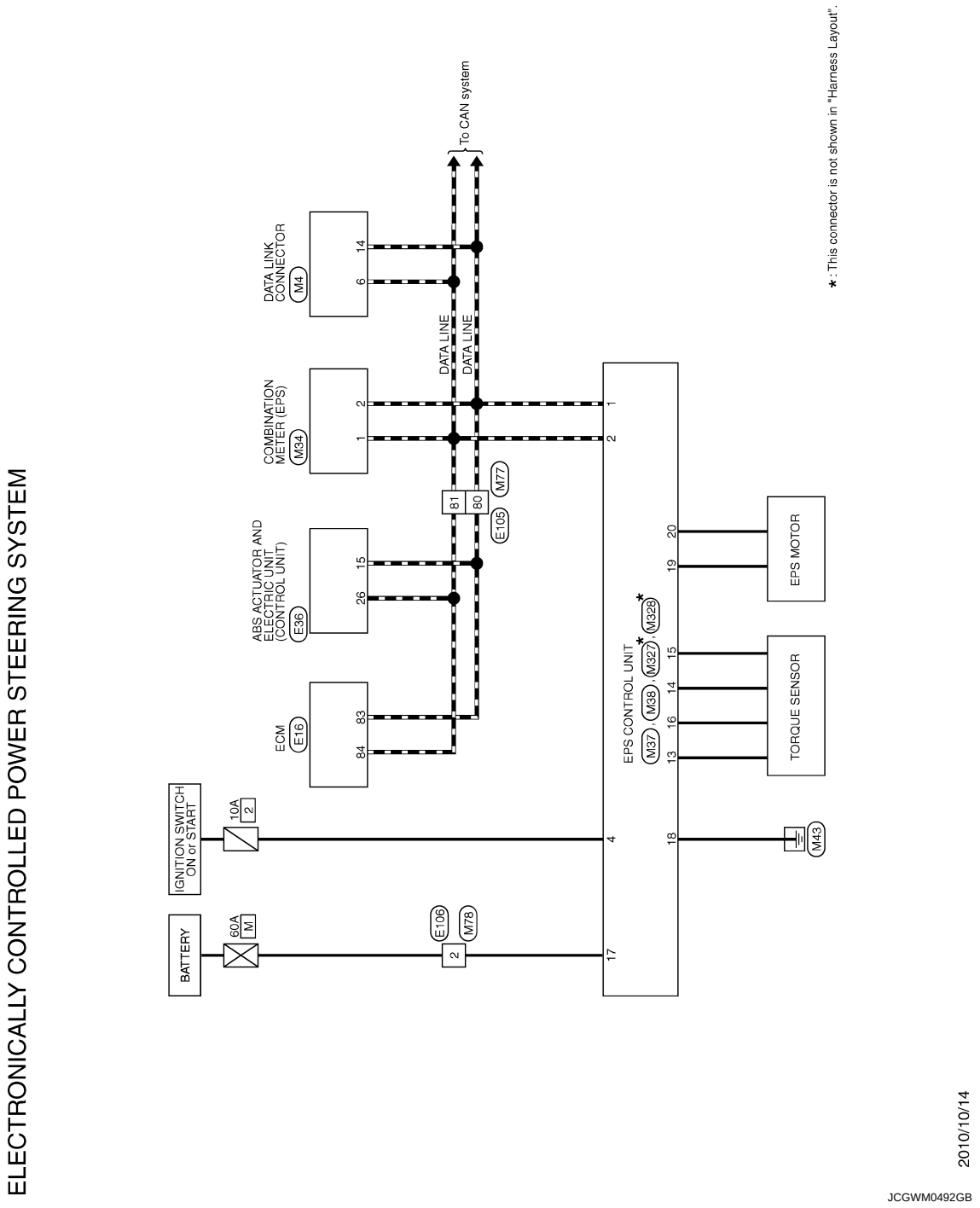
DTC	Items (CONSULT screen terms)	Reference
C1601	BATTERY VOLT	STC-21, "DTC Logic"
C1604	TORQUE SENSOR	STC-23, "DTC Logic"
C1606	EPS MOTOR	STC-25, "DTC Logic"
C1607	EEPROM	STC-27, "DTC Logic"
C1608	CONTROL UNIT	STC-27, "DTC Logic"
C1609	CAN VHCL SPEED	STC-28, "DTC Logic"
U1000	CAN COMM CIRCUIT	STC-29, "DTC Logic"

WIRING DIAGRAM

ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

Wiring Diagram

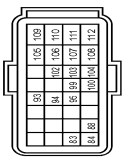
INFOID:0000000009945968



ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

Connector No.	E16
Connector Name	ECM
Connector Type	RH24FB-RZ8-L-RH

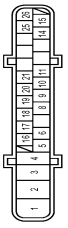
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
83	P	CAN COMMUNICATION LINE
84	L	CAN COMMUNICATION LINE
88	LG	DATA LINK CONNECTOR
93	L	IGNITION SWITCH
94	SB	ASCD STEERING SWITCH
95	BR	SENSOR GROUND
99	W	STOP LAMP SWITCH
100	SB	ASCD BRAKE SWITCH
102	O	SENSOR POWER SUPPLY
103	G	ACCELERATOR PEDAL POSITION SENSOR 2
104	R	SENSOR GROUND
105	G	POWER SUPPLY FOR ECM
106	V	SENSOR POWER SUPPLY
107	B	ECM GROUND
108	B	ECM GROUND
109	B	ECM GROUND
110	BR	ACCELERATOR PEDAL POSITION SENSOR 1
111	Y	SENSOR GROUND
112	B	ECM GROUND

Connector No.	E36
Connector Name	(ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Type	BAA22FB-AHZ4-RH

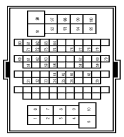
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GND (MTR)
2	Y	BAT (MTR)
3	L	BAT (SOL)
4	B	GND (SOL)
5	Y	DS FL
6	W	DP RL
8	O	DP RR
9	L	DP FR
10	R	DS FR
11	LG	K LINE
14	GR	CAN-L
15	P	CAN-L
16	BR	DP FL
17	G	DS RL
18	V	IGN
19	SB	DS RR
20	W	STOP LAMP SW
21	P	VDC OFF SW
25	R	CAN-H
26	L	CAN-H

Connector No.	E105
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	V	-
2	W	-
3	SB	-
4	G	-
5	P	-
6	L	- [With NAVI]
6	R	- [Without NAVI]
7	Y	-
8	O	-
9	W	-
10	SB	-
31	V	-
32	R	-
33	GR	-
34	P	-
35	Y	-
36	BR	-
39	SB	-
44	R	-
45	V	-
46	P	-
48	L	-
51	B	- [With M/T]
51	BR	- [With CVT]
53	SB	-
54	O	- [With M/T]
54	W	- [With CVT]
57	LG	-
59	L	-
60	O	-
61	G	-
62	W	-
63	L	-
67	GR	- [With CVT]
67	V	- [With M/T]

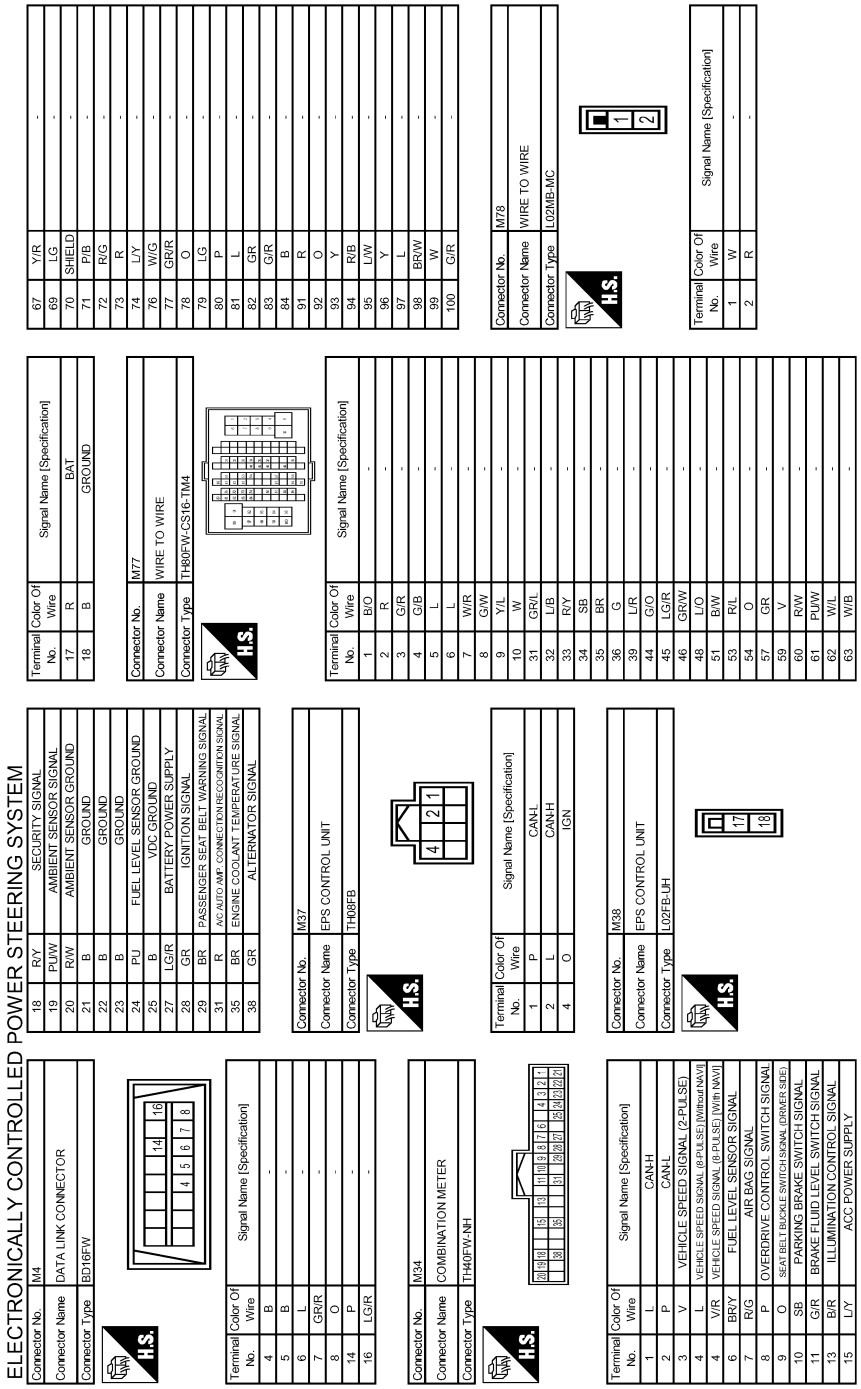
69	P	-
70	SHIELD	-
71	GR	-
72	LG	-
73	P	-
74	V	-
76	Y	-
77	LG	-
78	O	-
79	G	-
80	P	-
81	L	-
82	W	-
83	BR	-
84	B	-
91	W	-
92	Y	-
93	Y	-
94	R	-
95	V	-
96	LG	-
97	R	-
98	SB	-
99	G	-
100	P	-

Connector No.	E106
Connector Name	WIRE TO WIRE
Connector Type	I.I2FB-MC

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	-
2	R	-

JRGWC0908GB



JRGWC0909GB

ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

Connector No.	M327
Connector Name	EPS CONTROL UNIT
Connector Type	TH08FGY

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
13	-	TORQUE SENSOR POWER SUPPLY
14	-	TORQUE SENSOR SUB
15	-	TORQUE SENSOR GND
16	-	TORQUE SENSOR MAIN

Connector No.	M328
Connector Name	EPS CONTROL UNIT
Connector Type	L02FL

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
19	-	MOTOR (+)
20	-	MOTOR (-)

JRGWC0910GB

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000009945969

DETAILED FLOW

1.INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing STC-19, "Diagnostic Work Sheet" and reproduce symptoms as well as fully understand it. Ask customer about his/her complaints carefully. Check symptoms by driving vehicle with customer, if necessary.

CAUTION:

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

>> GO TO 2.

2.CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained by interview. Also check that the symptom is not caused by protection function. Refer to STC-13, "Protection Function".

CAUTION:

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

>> GO TO 3.

3.PERFORM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis.

Is any DTC detected?

YES >> Record or print DTC and freeze frame data (FFD). GO TO 4.
NO >> GO TO 6.

4.RECHECK SYMPTOM

With CONSULT

1. Erase self-diagnostic results.
2. Perform DTC confirmation procedures for the error detected system.

NOTE:

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on STC-13, "DTC Inspection Priority Chart".

Is any DTC detected?

YES >> GO TO 5.
NO >> Check harness and connectors based on the information obtained by interview. Refer to GI-40, "Intermittent Incident".

5.REPAIR OR REPLACE ERROR-DETECTED PARTS

- Repair or replace error-detected parts.
- Reconnect part or connector after repairing or replacing.
- When DTC is detected, erase self-diagnostic results for “EPS”.

>> GO TO 7.

6.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?

YES >> GO TO 7.
NO >> Check harness and connectors based on the information obtained by interview. Refer to GI-40, "Intermittent Incident".

7. FINAL CHECK

With CONSULT

1. Check the reference value for EPS control unit.
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:0000000009945970

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	
		Vehicle type		VIN	
Storage date		Engine		Mileage	km (Mile)
Symptom		☐The steering wheel position (center) is in the wrong position.			
		☐EPS warning lamp turns on.			
		☐Noise ☐Vibration			
		☐Others ( )			
First occurrence		☐Recently ☐Others ( )			
Frequency of occurrence		☐Always ☐Under a certain conditions of ☐Sometimes (time(s)/day)			
Climate conditions		☐Irrelevant			
	Weather	☐Fine ☐Cloud ☐Rain ☐Snow ☐Others ( )			
	Temperature	☐Hot ☐Warm ☐Cool ☐Cold ☐Temperature Approx. °C (°F)			
	Relative humidity	☐High ☐Moderate ☐Low			
Road conditions		☐Urban area ☐Suburb area ☐High way ☐Mounting road (uphill or down hill) ☐Rough road			
Operation conditions, etc.		☐Irrelevant ☐When engine starts ☐During idling ☐During driving ☐During acceleration ☐At constant speed driving ☐During deceleration ☐During cornering (right curve or left curve) ☐During steering			

Interview sheet					
Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Engine		Mileage	km (Mile)
Other conditions					
Memo					

DTC/CIRCUIT DIAGNOSIS

C1601 BATTERY POWER SUPPLY

DTC Logic

INFOID:0000000009945971

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1601	BATTERY VOLT	When a power supply voltage to the EPS control unit is maintained at 17.5 V or more or at less than 9 V continuously for five second or more.	• Harness or connector • EPS control unit • Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform “EPS” self-diagnosis.

Is DTC “C1601” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-21, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009945972

1. CHECK EPS CONTROL UNIT GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect EPS control unit harness connector.
3. Check continuity between EPS control unit harness connector terminal and ground.

EPS control unit		—	Continuity
Connector	Terminal		
M38	18	Ground	Existed

4. Connect EPS control unit harness connector.

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 EPS CONTROL UNIT POWER SUPPLY CIRCUIT (1)

1. Check voltage between EPS control unit harness connector terminals and ground.

EPS control unit		—	Voltage
Connector	Terminal		
M37	4	Ground	Approx. 0 V

2. Turn ignition switch ON.

CAUTION:
Never start the engine.

3. Check voltage between EPS control unit harness connector and ground.

EPS control unit		—	Voltage
Connector	Terminal		
M37	4	Ground	9 – 17.5 V

Is the inspection result normal?

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

3. CHECK EPS CONTROL UNIT POWER SUPPLY CIRCUIT (2)

1. Turn ignition switch OFF.
2. Check the 10A fuse (#2).
3. Check the harness for open or short between EPS control unit harness connector No.4 terminal and the 10A fuse (#2).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-33, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

4. CHECK EPS CONTROL UNIT POWER SUPPLY CIRCUIT (3)

1. Turn ignition switch OFF.
2. Check voltage between EPS control unit harness connector terminals and ground.

EPS control unit		—	Voltage
Connector	Terminal		
M38	17	Ground	9 – 17.5 V

3. Turn ignition switch ON.
   CAUTION:
   Never start the engine.
4. Check voltage between EPS control unit harness connector and ground.

EPS control unit		—	Voltage
Connector	Terminal		
M38	17	Ground	9 – 17.5 V

Is the inspection result normal?

YES >> GO TO 6.
NO >> GO TO 5.

5. CHECK EPS CONTROL UNIT POWER SUPPLY CIRCUIT (4)

1. Turn ignition switch OFF.
2. Check the 60A fusible link (#M).
3. Check the harness for open or short between EPS control unit harness connector No.17 terminal and the 60A fusible link (#M).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

6. CHECK TERMINALS AND HARNESS CONECTORS

Check the EPS control unit pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace EPS control unit. Refer to STC-38, "Removal and Installation".
NO >> Repair or replace error-detected parts.

C1604 TORQUE SENSOR

DTC Logic

INFOID:0000000009945973

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1604	TORQUE SENSOR	When torque sensor output signal is malfunctioning.	• Harness or connector • Torque sensor • EPS control unit

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform “EPS” self-diagnosis.

Is DTC “C1604” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-23, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009945974

1.CHECK TORQUE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between EPS control unit harness connector terminals and ground.

CAUTION:
Steering wheel is neutral position. (There is no steering force.)

EPS control unit		—	Voltage
Connector	Terminal		
M327	13	Ground	Approx. 5 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> Perform the trouble diagnosis for battery power supply circuit. Refer to STC-21, "Diagnosis Procedure".

2.CHECK TORQUE SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between EPS control unit harness connector terminal and ground.

CAUTION:
Steering wheel is neutral position. (There is no steering force.)

EPS control unit		—	Continuity
Connector	Terminal		
M327	15	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

1. Turn ignition switch OFF to ON.
2. Check Voltage between EPS control unit harness connector terminal and ground.
   CAUTION:
   Steering wheel is neutral position. (There is no steering force.)

EPS control unit		—	Voltage
Connector	Terminal		
M327	14	Ground	Approx. 2.5 V
	16		

3. Start the engine.
4. Check Voltage between EPS control unit harness connector terminal and ground.
   CAUTION:
   Steering wheel is right or left turn.

EPS control unit		—	Voltage
Connector	Terminal		
M327	14	Ground	Approx. 1.6 V – 3.4 V (The value is changed according to steering left or right)
	16		

Is the inspection result normal?

YES >> GO TO 4.
NO >> Torque sensor is malfunction. Replace steering column assembly. Refer to ST-11, "Removal and Installation".

4.CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect EPS control unit harness connector.
3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.

Is the inspection result normal?

YES >> Replace EPS control unit. Refer to STC-38, "Exploded View".
NO >> Repair or replace error-detected parts.

C1606 EPS MOTOR

DTC Logic

INFOID:0000000009945975

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1606	EPS MOTOR	When the motor driver malfunction of EPS control unit or EPS motor malfunction is detected.	• Harness or connector • EPS motor • EPS control unit

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT
1. Turn the ignition switch OFF to ON.
2. Perform “EPS” self-diagnosis.

Is DTC “C1606” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-25, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009945976

1.CHECK EPS MOTOR

Check the EPS motor. Refer to STC-25, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 2.
NO >> EPS motor is malfunction. Replace steering column assembly. Refer to ST-11, "Removal and Installation".

2.CHECK EPS MOTOR HARNESS CONNECTOR

Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.

Is the inspection result normal?

YES >> Replace EPS control unit. Refer to STC-38, "Exploded View".
NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:0000000009945977

1.CHECK EPS MOTOR

1. Turn the ignition switch OFF.
2. Disconnect EPS control unit harness connector.
3. Check resistance between EPS control unit connector terminals.

EPS control unit		Resistance (Approx.)
Terminal		
19	20	0.1 Ω or less

Is the inspection result normal?

YES >> INSPECTION END

NO >> EPS motor is malfunction. Replace steering column assembly. Refer to ST-11, "Exploded View".

C1607, C1608 EPS CONTROL UNIT

DTC Logic

INFOID:0000000009945978

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1607	EEPROM	When the memory (EEPROM) system malfunction is detected in EPS control unit.	EPS control unit
C1608	CONTROL UNIT	When the internal malfunction is detected in EPS control unit.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform “EPS” self-diagnosis.

Is DTC “C1607” or “C1608” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-27, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009945979

1.CHECK TERMINALS AND HARNESS CONNECTORS

Check EPS control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace error-detected parts.

Is the inspection result normal?

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

2.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Erase self-diagnostic results for “EPS”.
2. Turn the ignition switch OFF, and then wait 10 seconds and more.
3. Perform self-diagnosis for “EPS”.

Is DTC “C1607” or “C1608” detected?

YES >> Replace EPS control unit. Refer to STC-38, "Removal and Installation".
NO >> Check intermittent incident. Refer to GI-40, "Intermittent Incident".

C1609 VEHICLE SPEED SIGNAL

DTC Logic

INFOID:0000000009945980

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1609	CAN VHCL SPEED	• Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) via CAN communication. • ABS actuator and electric unit (control unit) input signal error is detected.	• Harness or connector (CAN communication line) • EPS control unit • ABS malfunction - Vehicle speed signal error

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform “EPS” self-diagnosis.

Is DTC “C1609” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-28, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009945981

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

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform “ABS” self-diagnosis.

Is any DTC detected?

YES >> Check the DTC. Refer to BRC-98, "DTC Index".
NO >> GO TO 2.

2.CHECK TERMINALS AND HARNESS CONNECTORS

Check EPS control unit pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

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

3.PERFORM SELF-DIAGNOSIS

With CONSULT

Perform “EPS” self-diagnosis.

Is DTC “C1609” detected?

YES >> Replace EPS control unit. Refer to STC-38, "Removal and Installation".
NO >> Check intermittent incident. Refer to GI-40, "Intermittent Incident".

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000009945982

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 Logic

INFOID:0000000009945983

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
U1000	CAN COMM CIRCUIT	EPS control unit is not transmitting/receiving CAN communication signal for 2 seconds or more.	• CAN communication error • EPS control unit

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform “EPS” self-diagnosis.

Is DTC “U1000” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-29, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009945984

Proceed to LAN-13, "Trouble Diagnosis Flow Chart".

EPS WARNING LAMP

Component Function Check

INFOID:0000000009945985

1.CHECK THE ILLUMINATION OF THE EPS WARNING LAMP

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Perform trouble diagnosis. Refer to STC-30, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009945986

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform “EPS” self-diagnosis.

Is any DTC detected?

YES >> Check the DTC. Refer to STC-13, "DTC Index".
NO >> GO TO 2.

2.CHECK EPS WARNING LAMP SIGNAL

With CONSULT

1. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
2. Select “DATA MONITOR” of “EPS” and select “WARNING LAMP”.
3. Check that the EPS warning lamp is turned ON.
4. Start the engine.
   CAUTION:
   Never drive the vehicle.
5. Check that the EPS warning lamp is turned OFF.

Is the inspection result normal?

YES >> Perform the trouble diagnosis for combination meter power supply circuit. Refer to MWI-39, "COMBINATION METER : Diagnosis Procedure".
NO >> Replace EPS control unit. Refer to STC-38, "Removal and Installation".

SYMPTOM DIAGNOSIS

EPS WARNING LAMP DOES NOT TURN ON

Description

INFOID:0000000009945987

EPS warning lamp does not turn ON when turning ignition switch ON from OFF. (Check the illumination of the EPS warning lamp.)

Diagnosis Procedure

INFOID:0000000009945988

1.CHECK EPS WARNING LAMP

Perform the trouble diagnosis of EPS warning lamp. Refer to STC-30, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Check that there is no malfunction in each harness connector pin terminal or disconnection.
NO >> Repair or replace the specific malfunctioning part.

EPS WARNING LAMP DOES NOT TURN OFF

Description

INFOID:0000000009945989

EPS warning lamp does not turn OFF several seconds after engine started.

Diagnosis Procedure

INFOID:0000000009945990

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform “EPS” self-diagnosis.

Is any DTC detected?

YES >> Check the DTC. Refer to STC-13, "DTC Index".
NO >> GO TO 2.

2.CHECK EPS WARNING LAMP

Perform the trouble diagnosis of EPS warning lamp. Refer to STC-30, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the specific malfunctioning part.

3.CHECK EPS CONTROL UNIT POWER SUPPLY AND GROUND CIRCUIT

Perform the trouble diagnosis of EPS control unit power supply and ground. Refer to STC-21, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Check that there is no malfunction in each harness connector pin terminal or disconnection.
NO >> Repair or replace the specific malfunctioning part.

STEERING WHEEL TURNING FORCE IS HEAVY OR LIGHT

Description

INFOID:0000000009945991

Steering wheel turning force is heavy or light.

Diagnosis Procedure

INFOID:0000000009945992

1.PERFORM SELF-DIAGNOSIS

With CONSULT
1. Turn the ignition switch OFF to ON.
2. Perform “EPS” self-diagnosis.

Is any DTC detected?

YES >> Check the DTC. Refer to STC-13, "DTC Index".
NO >> GO TO 2.

2.CHECK THE ILLUMINATION OF THE EPS WARNING LAMP

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Perform trouble diagnosis of EPS warning lamp. Refer to STC-30, "Diagnosis Procedure".

3.CHECK EPS CONTROL UNIT SIGNAL (1)

With CONSULT
1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Select “ASSIST LEVEL” in “DATA MONITOR” in “EPS”.

Dose the item in “DATA MONITOR” indicate “100%”?

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

4.CHECK EPS CONTROL UNIT SIGNAL (2)

With CONSULT
Select “BATTERY VOLT” in “DATA MONITOR” in “EPS”.

Dose the item in “DATA MONITOR” indicate “10 V” or more?

YES >> GO TO 5.
NO >> Perform trouble diagnosis of EPS control unit power supply and ground. Refer to STC-27, "Diagnosis Procedure".

5.CHECK EPS CONTROL UNIT SIGNAL (3)

With CONSULT
1. Select “ASSIST LEVEL” in “DATA MONITOR” in “EPS”.
2. Stop the EPS system until the item in “DATA MONITOR” becomes “100%”.
   NOTE:
   While stopping the EPS system, do not turn steering wheel.
3. Check that the symptom continues.

Dose the symptom continue?

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

6.CHECK EPS CONTROL UNIT SIGNAL (4)

With CONSULT
1. Start the engine.
   CAUTION:

Never drive the vehicle.

2. Turn steering wheel from full left stop to full right stop.
3. Select “TORQUE SENSOR” in “DATA MONITOR” in “EPS”.

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

Is the inspection result normal?

YES >> GO TO 8.
NO >> GO TO 7.

7. CHECK EPS MOTOR

Perform the trouble diagnosis of EPS motor. Refer to STC-25, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair or replace the specific malfunctioning part.

8. CHECK STEERING WHEEL TURNING FORCE

Check the steering wheel turning force. Refer to ST-7, "Inspection".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Check the steering wheel turning force for mechanical malfunction. Refer to ST-18, "Inspection".

UNBALANCE STEERING WHEEL TURNING FORCE AND RETURN BETWEEN RIGHT AND LEFT

Description

INFOID:0000000009945993

Unbalance steering wheel turning force and return between right and left.

Diagnosis Procedure

INFOID:0000000009945994

1.CHECK THE ILLUMINATION OF THE EPS WARNING LAMP

Check the EPS warning lamp while engine is running.

Does the EPS warning lamp turn OFF?

YES >> GO TO 2.
NO >> Refer to STC-32, "Diagnosis Procedure".

2.CHECK WHEEL ALIGNMENT

Check the wheel alignment. Refer to ST-7, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Adjustment of wheel alignment. Refer to ST-18, "Inspection".

3.CHECK EPS CONTROL UNIT SIGNAL

With CONSULT

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Turn steering wheel from full left stop to full right stop.
3. Select “DATA MONITOR” of “EPS” and select “TORQUE SENSOR”.
4. Perform the torque sensor inspection.

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

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 4.

4.CHECK EPS MOTOR

Perform the trouble diagnosis of EPS motor. Refer to STC-25, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace the specific malfunctioning part.

5.CHECK STEERING WHEEL TURNING FORCE

Check the steering wheel turning force. Refer to ST-7, "Inspection".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Check the steering wheel turning force for mechanical malfunction. Refer to ST-18, "Inspection".

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)

Description

INFOID:0000000009945995

Unbalance steering wheel turning force (torque variation).

Diagnosis Procedure

INFOID:0000000009945996

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform “EPS” self-diagnosis.

Is any DTC detected?

YES >> Check the DTC. Refer to STC-13, "DTC Index".
NO >> GO TO 2.

2.CHECK THE ILLUMINATION OF THE EPS WARNING LAMP

Check the EPS warning lamp while the engine is started.

Does the EPS warning lamp turn OFF?

YES >> GO TO 3.
NO >> Refer to STC-30, "Diagnosis Procedure".

3.CHECK STEERING COLUMN AND STEERING GEAR

Check the steering column assembly and steering gear assembly.

- Steering column assembly. Refer to ST-11, "Exploded View".
- Steering gear assembly. Refer to ST-14, "Exploded View".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace the specific malfunctioning part.

4.CHECK EPS CONTROL UNIT SIGNAL (1)

With CONSULT

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Turn steering wheel from full left stop to full right stop.
3. Select “ASSIST LEVEL” in “DATA MONITOR” in “EPS”.

Dose the item in “DATA MONITOR” maintain “100%”?

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

5.CHECK EPS CONTROL UNIT SIGNAL (2)

With CONSULT

Select “BATTERY VOLT” in “DATA MONITOR” in “EPS”.

Dose the item in “DATA MONITOR” indicate “10 V” or more?

YES >> GO TO 6.
NO >> Perform trouble diagnosis of EPS control unit power supply and ground. Refer to STC-21, "Diagnosis Procedure".

6.CHECK EPS CONTROL UNIT SIGNAL (3)

With CONSULT

1. Select “ASSIST LEVEL” in “DATA MONITOR” in “EPS”.
2. Stop the EPS system until the item in “DATA MONITOR” becomes “100%”.
   NOTE:
   While stopping the EPS system, do not turn steering wheel.
3. Check that the symptom continues.

Dose the symptom continue?

YES >> GO TO 7.
NO >> The assist torque decreases because of protection function. This is not malfunction. INSPECTION END

7. CHECK EPS CONTROL UNIT SIGNAL (4)

With CONSULT

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Turn steering wheel from full left stop to full right stop.
3. Select “TORQUE SENSOR” in “DATA MONITOR” in “EPS”.
4. Perform the torque sensor inspection.

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

Is the inspection result normal?

YES >> GO TO 9.
NO >> GO TO 8.

8. CHECK EPS MOTOR

Perform the trouble diagnosis of EPS motor. Refer to STC-25, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 9.
NO >> Repair or replace the specific malfunctioning part.

9. CHECK STEERING WHEEL TURNING FORCE

Check the steering wheel turning force. Refer to ST-7, "Inspection".

Is the inspection result normal?

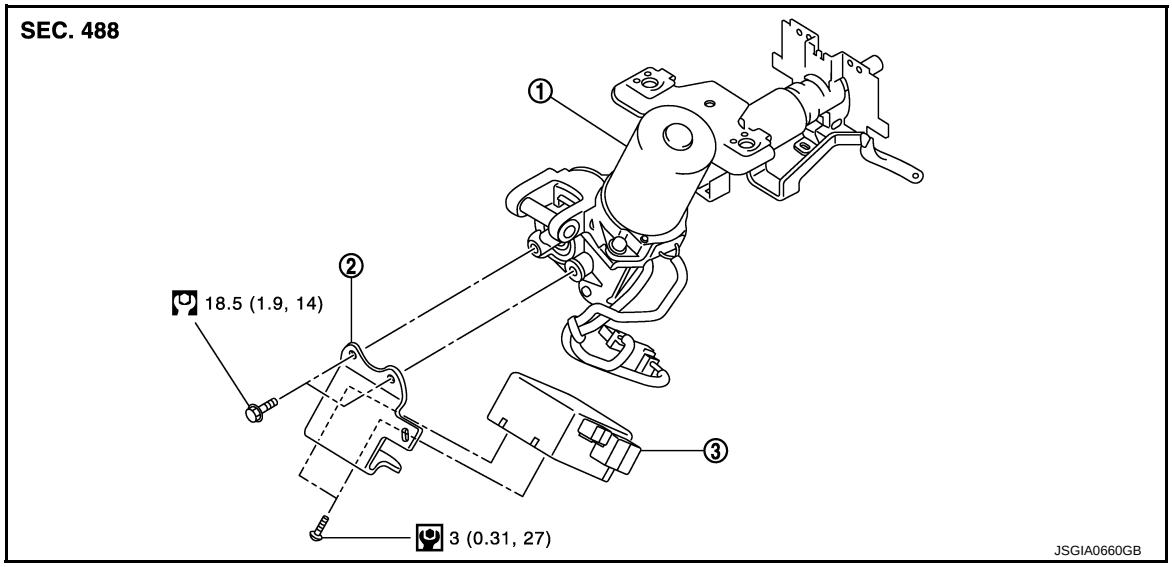
YES >> INSPECTION END
NO >> Check the steering wheel turning force for mechanical malfunction. Refer to ST-18, "Inspection".

REMOVAL AND INSTALLATION

EPS CONTROL UNIT

Exploded View

INFOID:0000000009945997



1. Steering column assembly
2. Bracket
3. EPS control unit

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000009945998

REMOVAL

CAUTION:

- **Disconnect battery negative terminal before starting operations.**
- **Never shock EPS control unit, e.g. drop or hit.**
- **Never get EPS control unit wet with water or other liquid. Also, do not give EPS control unit a radical temperature change to avoid getting water drops.**
- **Never disassemble or remodel EPS control unit, EPS motor, torque sensor, harness and connectors.**

1. Remove instrument lower panel LH. Refer to IP-13, "Exploded View".
2. Remove knee protector.
3. Disconnect EPS control unit connectors.
   CAUTION:
   Hold and pull the connector housing, not pulling harness, when disconnecting connectors. Also, do not grip, collapse or apply excessive force to the connector.
4. Remove EPS control unit from steering column assembly.

INSTALLATION

Note the following, and install in the reverse order of removal.

- Check that harness is not damaged when installing EPS control unit. Also, check that EPS control unit is installed without trapping harness of foreign materials.
- After installing steering column assembly, perform self-diagnosis with CONSULT to ensure correct operation. Refer to STC-9, "CONSULT Function".