SECTION STC
STEERING CONTROL SYSTEM

CONTENTS

PRECAUTION

PRECAUTIONS

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

INFOID:0000000009750346

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:

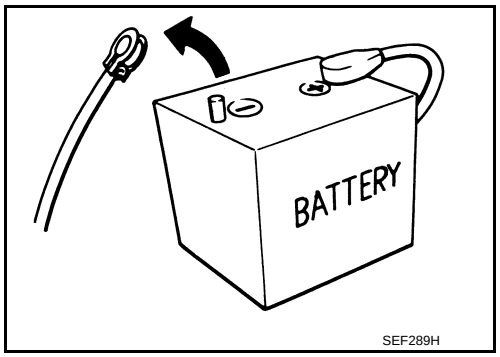
Always observe the following items for preventing accidental activation.

- **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:0000000010200452

- 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.



SEF289H

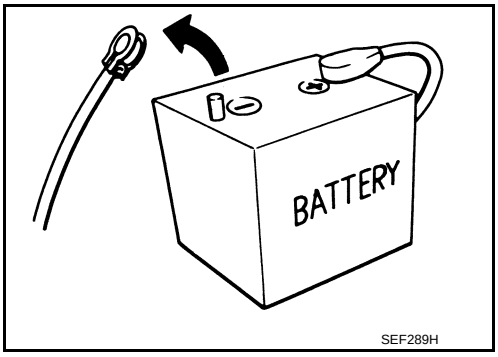
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  NOTE:
  The removal of 12V battery may cause a DTC detection error.

Service Notice or Precautions for EPS System

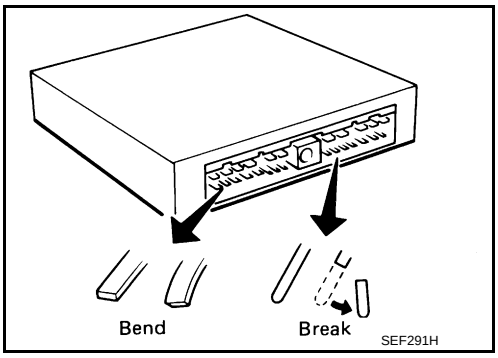
INFOID:0000000009750347

- 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

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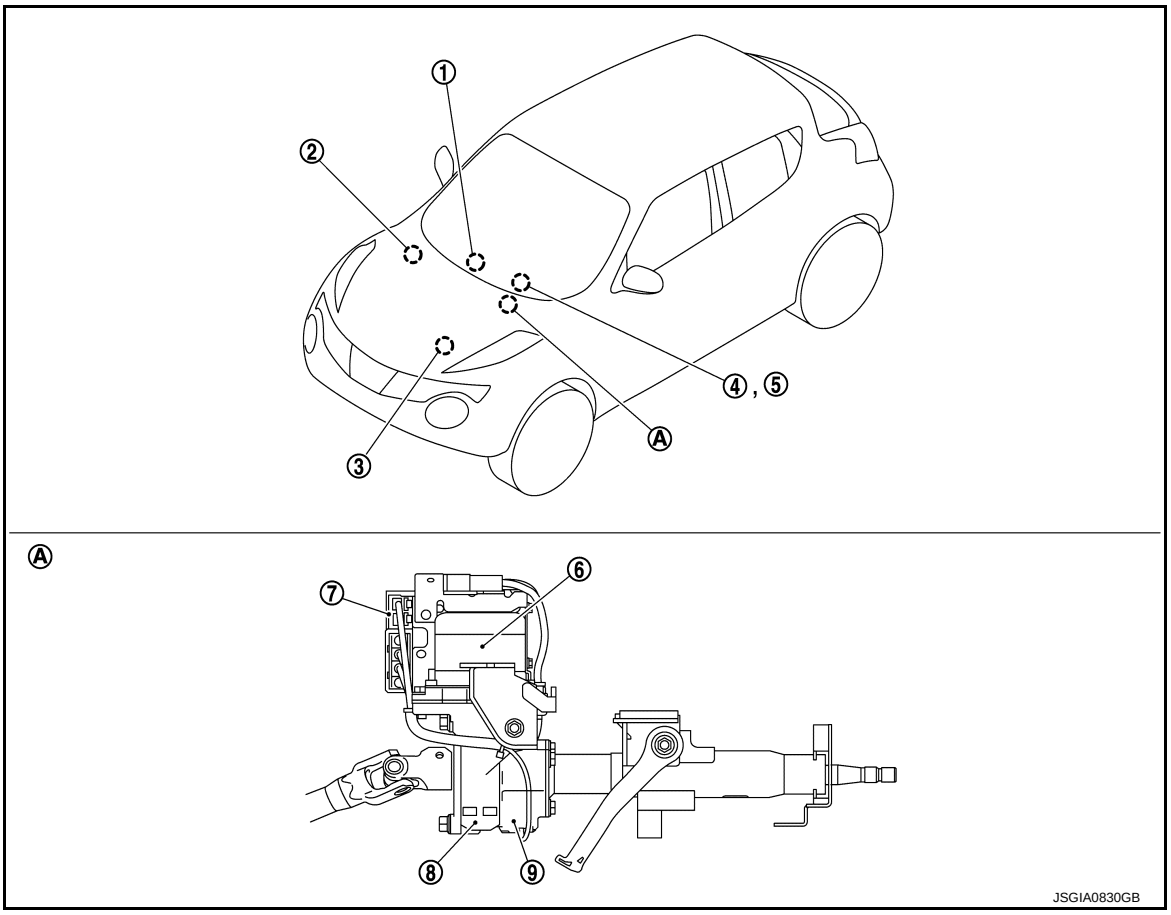


1. Multi display unit* Refer to DMS-3, "Component Parts Location".
2. ABS actuator and electric unit (control unit) Refer to BRC-9, "Component Parts Location"
3. ECM Refer to EC-14, "ENGINE CONTROL SYSTEM : Component Parts Location"
4. Combination meter Refer to MWI-5, "METER SYSTEM : Component Parts Location".
5. EPS warning lamp (In combination meter)
6. EPS motor
7. EPS control unit
8. Reduction gear
9. Torque sensor

A. Steering column assembly

*: Models with Integrated Control System

Component Description

INFOID:0000000009750349

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"

Components parts	Reference
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
Combination meter	• Transmits mainly the following signal to EPS control unit via CAN communication. - Vehicle speed signal
	• Turns ON the EPS warning lamp according to the signal from EPS control unit via CAN communication.
Multi display unit*	• Transmits mainly the following signals to EPS control unit via CAN communication. - ECO mode signal - NORMAL mode signal - SPORT mode signal

*: Models with Integrated Control System

EPS Control Unit

INFOID:0000000009750350

- 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).
- In SPORT mode, changes the steering assist characteristic to enhance a stable steering feel according to the mode signals from multi display unit via CAN communication. (Models with Integrated Control System)

EPS Motor

INFOID:0000000009750351

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

Torque Sensor

INFOID:0000000009750352

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

Reduction Gear

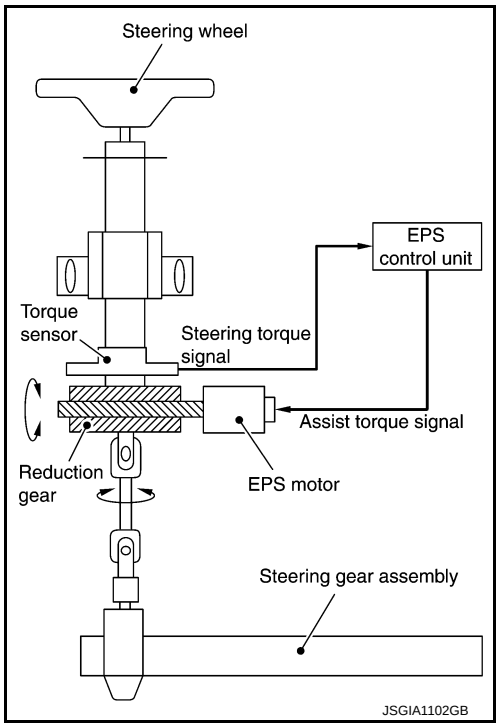
INFOID:0000000009750353

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

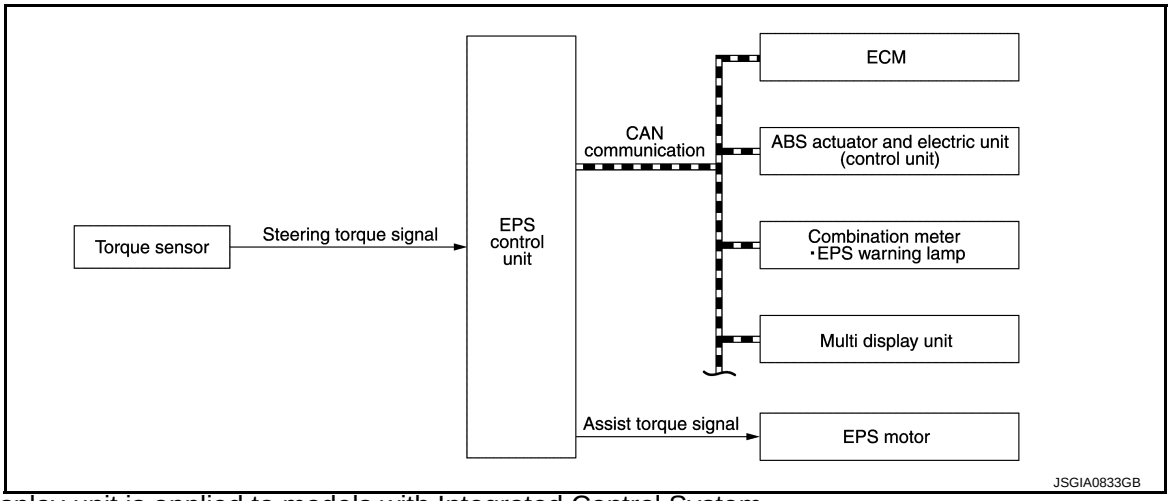
SYSTEM
EPS SYSTEM
EPS SYSTEM : System Description

INFOID:0000000009750354

- 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-8, "EPS SYSTEM : 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-8, "EPS SYSTEM : 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).
- In SPORT mode, changes the steering assist characteristic to enhance a stable steering feel according to the mode signals from multi display unit via CAN communication. (Models with Integrated Control System)



SYSTEM DIAGRAM



Multi display unit is applied to models with Integrated Control System.

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

Control unit	Signal status
Combination meter	• Transmits mainly the following signals to EPS control unit via CAN communication. - Vehicle speed signal • Receives mainly the following signals from EPS control unit via CAN communication. - EPS warning lamp signal
Multi display unit*	• Transmits mainly the following signals to EPS control unit via CAN communication. - ECO mode signal - NORMAL mode signal - SPORT mode signal

*: Models with Integrated Control System

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:0000000009750355

- 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, enters into a manual steering state. (Control turning force steering wheel becomes heavy.)

EPS SYSTEM : Protection Function

INFOID:0000000009750356

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:0000000009750357

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) or (°F)	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.

Monitor item (Unit)	Remarks
ENGINE STATUS (Stop/Run)	Engine speed is displayed from engine status signal via CAN communication.
STEERING MODE (NORMAL/SPORT)*4	Display the driving mode of Integrated Control System received through 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.
*4: Displays NORMAL in models without Integrated Control System.

ECU DIAGNOSIS INFORMATION

EPS CONTROL UNIT

Reference Value

INFOID:0000000009750358

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:

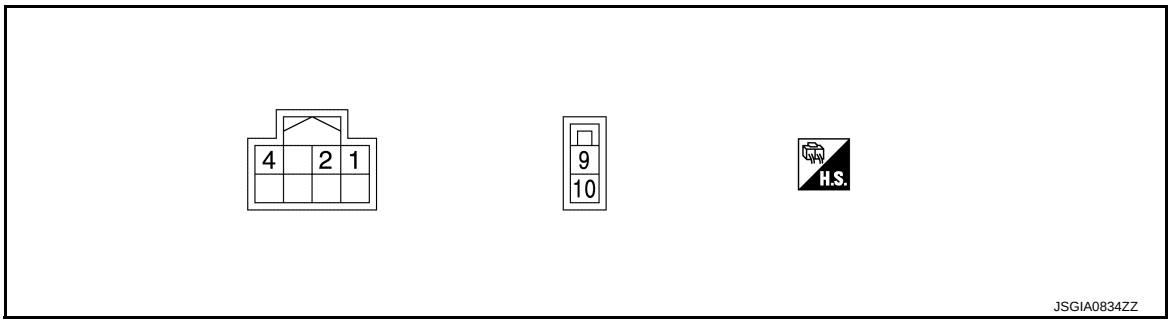
The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

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	Steering wheel: Not steering (There is no steering force)	Approx. 0 Nm
		Steering wheel: Right or left turn	Displays assist torque of EPS motor (Nm)
C/U TEMP	Ignition switch ON or engine running		Displays temperature of inside of EPS control unit [°C (°F)]
ASSIST LEVEL	Engine running		100 % *2
VEHICLE SPEED	Vehicle stopped		0 km/h (0 mph)
	While driving		Approximately equal to the indication on speedometer*3 (inside of ±10%)
WARNING LAMP	EPS warning lamp: ON		On
	EPS warning lamp: OFF		Off
ENGINE STATUS	Engine not running		Stop
	Engine running		Run
STEERING MODE*4	Engine running	Driving mode of Integrated Control System: Except SPORT	NORMAL
		Driving mode of Integrated Control System: SPORT	SPORT

*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.

*4: Displays NORMAL in models without Integrated Control System.

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 (LG)	Ground	Ignition power supply	Input	Ignition switch: ON	9 – 18.2 V
				Ignition switch: OFF	0 V
9 (R)	Ground	Battery power supply	Input	Always	9 – 18.2 V
10 (B)	Ground	Ground	—	Always	0 V

Fail-Safe

INFOID:0000000009750359

- 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, enters into a manual steering state. (Control turning force steering wheel becomes heavy.)

Protection Function

INFOID:0000000009750360

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:0000000009750361

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 VEHICLE SPEED SIGNAL
3	C1601 BATTERY POWER SUPPLY
4	Other than the above

DTC Index

INFOID:0000000009750362

DTC	Items (CONSULT screen terms)	Reference
C1601	BATTERY VOLT	STC-20, "DTC Logic"
C1604	TORQUE SENSOR	STC-22, "DTC Logic"
C1606	EPS MOTOR	STC-23, "DTC Logic"
C1607	EEPROM	STC-24, "DTC Logic"
C1608	CONTROL UNIT	STC-24, "DTC Logic"
C1609	CAN VHCL SPEED	STC-25, "DTC Logic"
U1000	CAN COMM CIRCUIT	STC-26, "DTC Logic"

WIRING DIAGRAM

ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

Wiring Diagram

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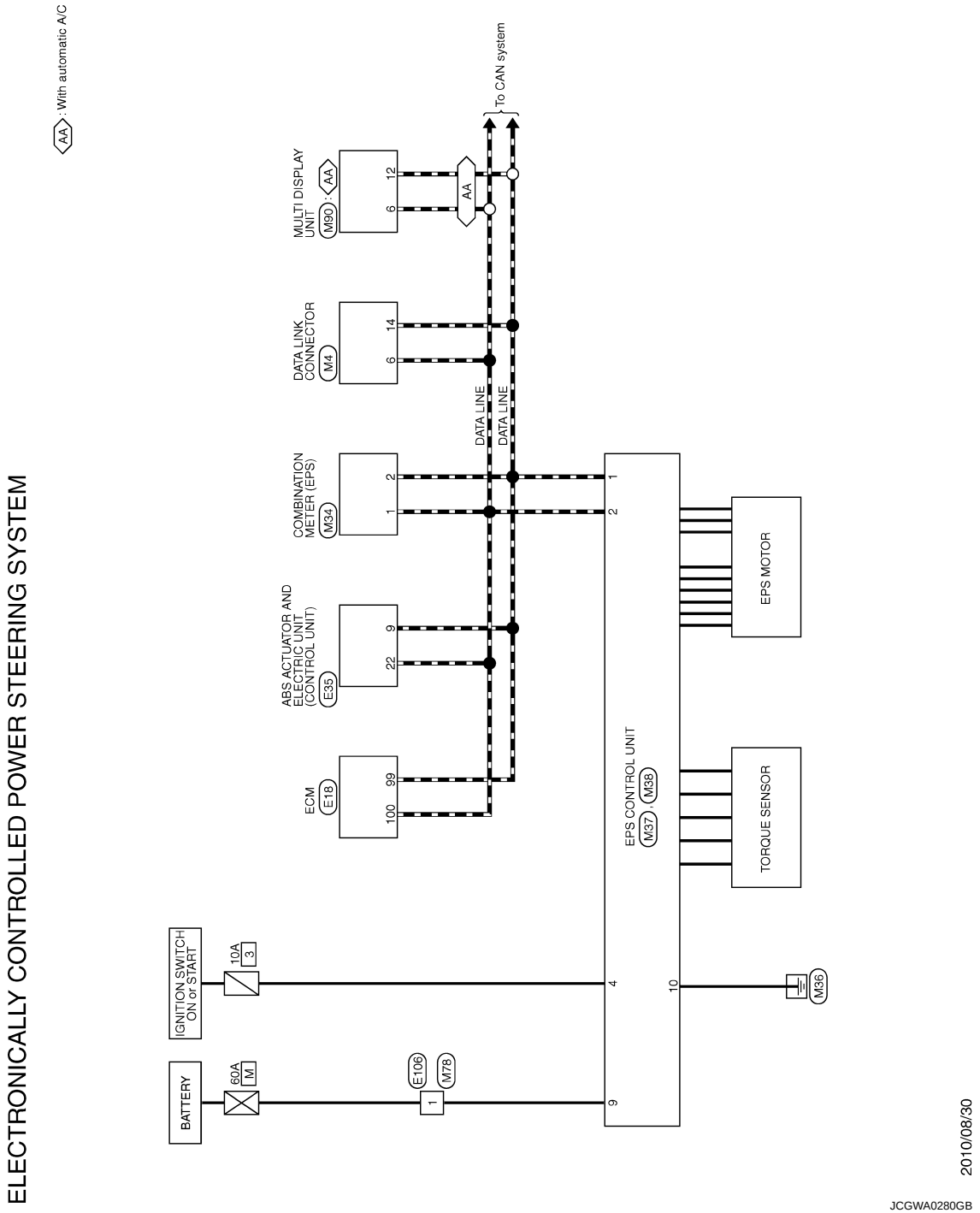
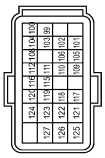


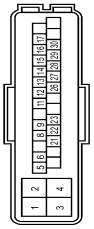
ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

Connector No.	E18
Connector Name	ECM
Connector Type	RH24FGY-RZ8-R-RH



Terminal No.	Color Of Wire	Signal Name [Specification]
99	P	CAN COMMUNICATION LINE (CAN-L)
100	L	CAN COMMUNICATION LINE (CAN-H)
101	V	SENSOR POWER SUPPLY
102	R	ACCELERATOR PEDAL POSITION SENSOR 1
103	BR	PNP SIGNAL
104	R	DATA LINK CONNECTOR
105	GR	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 1)
106	Y	POWER SUPPLY FOR ECM (BACKUP)
108	GR	CLUTCH PEDAL POSITION SWITCH
109	O	IGNITION SWITCH
110	P	ASCD STEERING SWITCH
111	B	SENSOR GROUND
112	BR	ECM RELAY (SELF SHUT-OFF)
115	SB	STOP LAMP SWITCH
116	G	BRAKE PEDAL POSITION SWITCH
117	Y	FUEL PUMP RELAY
118	O	SENSOR POWER SUPPLY
119	BR	ACCELERATOR PEDAL POSITION SENSOR 2
120	Y	SENSOR GROUND
121	G	POWER SUPPLY FOR ECM
122	GR	THROTTLE CONTROL MOTOR POWER SUPPLY
123	B/Y	ECM GROUND
124	B/Y	ECM GROUND
125	L	A/F SENSOR 1 HEATER
126	W	HEATED OXYGEN SENSOR 2 HEATER
127	B/Y	ECM GROUND

Connector No.	E35
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Type	RH28FB-NU4-UH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	BAT (MTR)
2	L	BAT (SOL)
3	B	GND (SOL)
4	B	GND (MTR)
5	GR	VDC OFF SW
6	GR	BRAKE PEDAL POSITION SW
8	SB	STOP LAMP SW
9	P	CAN-L
11	BR	DP RR
12	W	DS FR
13	G	VCC
14	R	SERIAL+
15	Y	DS RR
16	V	IGN
17	W	REVERSE SIGNAL
21	Y	DP FR
22	L	CAN-H
23	LG	DP FL
26	SB	DP RL
27	BR	DS FL
28	B	GND
29	W	SERIAL-
30	O	DS RL

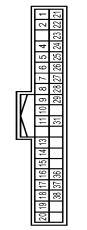
Connector No.	E108
Connector Name	WIRE TO WIRE
Connector Type	L02FB-MC

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

Connector No.	M4
Connector Name	DATA LINK CONNECTOR
Connector Type	BD16FW

Terminal No.	Color Of Wire	Signal Name [Specification]
4	B	–
5	B	–
6	L	–
7	W	–
8	LG	–
14	P	–
16	Y	–

Connector No.	M34
Connector Name	COMBINATION METER
Connector Type	TH40FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	CAN-H
2	P	CAN-L
4	V	VEHICLE SPEED SIGNAL (8-PULSE) [With Front fog lamp]
4	Y	VEHICLE SPEED SIGNAL (8-PULSE) [Without Front fog lamp]
5	G	PADDLE SHIFTER UP SWITCH SIGNAL
6	BR	FUEL LEVEL SENSOR SIGNAL
7	R	AIR BAG SIGNAL
8	P	– [Without Front fog lamp]
8	Y	– [With Front fog lamp]
9	O	SEAT BELT BUCKLE SWITCH SIGNAL (DRIVER SIDE) [With Front fog lamp]
9	W	SEAT BELT BUCKLE SWITCH SIGNAL (DRIVER SIDE) [Without Front fog lamp]
10	SB	PARKING BRAKE SWITCH SIGNAL
11	G	BRAKE FLUID LEVEL SWITCH SIGNAL
13	B	ILLUMINATION CONTROL SIGNAL [With Front fog lamp]
13	GR	ILLUMINATION CONTROL SIGNAL [Without Front fog lamp]
14	R	MANUAL MODE SHIFT DOWN SIGNAL
14	V	MANUAL MODE SHIFT UP SIGNAL [With Front fog lamp]
15	L	ACC POWER SUPPLY
16	O	MANUAL MODE SHIFT DOWN SIGNAL [With Front fog lamp]
16	W	MANUAL MODE SHIFT DOWN SIGNAL [Without Front fog lamp]
17	G	WASHER LEVEL SWITCH SIGNAL [Without Front fog lamp]
17	W	WASHER LEVEL SWITCH SIGNAL [With Front fog lamp]
18	R	SECURITY SIGNAL
19	GR	AMBIENT SENSOR SIGNAL
20	LG	AMBIENT SENSOR GROUND [With Front fog lamp]
20	R	AMBIENT SENSOR GROUND [Without Front fog lamp]
21	B	GROUND
22	B	GROUND
23	B	GROUND
24	L	FUEL LEVEL SENSOR GROUND
25	B	VDC GROUND
26	V	PADDLE SHIFTER DOWN SWITCH SIGNAL
27	LG	BATTERY POWER SUPPLY
28	GR	IGNITION SIGNAL
29	LG	PASSENGER SEAT BELT WARNING SIGNAL [With Front fog lamp]

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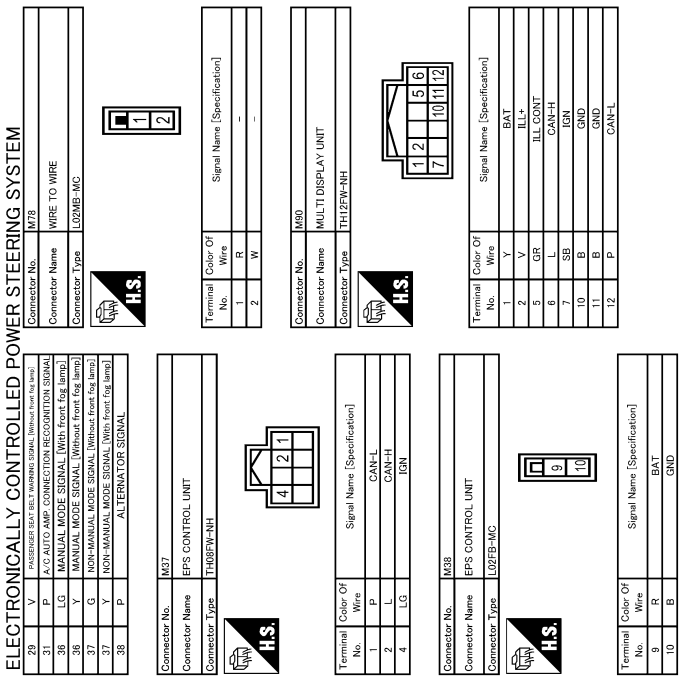

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BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000009750364

DETAILED FLOW

1.INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing STC-18, "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-12, "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 for “EPS”.
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-12, "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-46, "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-46, "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:0000000009750365

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:0000000009750366

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 18.2 V or more or at less than 9 V continuously for five second or more.	• Harness or connector • EPS control unit • Fuse • Power supply system • 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-20, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009750367

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	10	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 – 18.2 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 (#3).
3. Check the harness for open or short between EPS control unit harness connector No.4 terminal and the 10A fuse (#3).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-41, "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	9	Ground	9 – 18.2 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	9	Ground	9 – 18.2 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.9 terminal and the 60A fusible link (M).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to PG-11, "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 >> EPS control unit is malfunctioning. Replace steering column assembly. Refer to ST-11, "Removal and Installation".
NO >> Repair or replace error-detected parts.

C1604 TORQUE SENSOR

DTC Logic

INFOID:0000000009750368

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-22, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009750369

1.CHECK TERMINALS AND HARNESS CONECTORS

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 “C1604” detected?

YES >> Torque sensor is malfunctioning. Replace steering column assembly. Refer to ST-11, "Removal and Installation".
NO >> Check intermittent incident. Refer to GI-46, "Intermittent Incident".

C1606 EPS MOTOR

DTC Logic

INFOID:0000000009750370

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-23, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009750371

1.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 “C1606” detected?

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

C1607, C1608 EPS CONTROL UNIT

DTC Logic

INFOID:0000000009750372

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-24, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009750373

1.CHECK TERMINALS AND HARNESS CONECTORS

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 >> EPS control unit is malfunctioning. Replace steering column assembly. Refer to ST-11, "Removal and Installation".
NO >> Check intermittent incident. Refer to GI-46, "Intermittent Incident".

C1609 VEHICLE SPEED SIGNAL

DTC Logic

INFOID:0000000009750374

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-25, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009750375

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.
NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

Perform “EPS” self-diagnosis.

Is DTC “C1609” detected?

YES >> EPS control unit is malfunctioning. Replace steering column assembly. Refer to ST-11, "Removal and Installation".
NO >> Check EPS control unit pin terminals for damage or loose connection with harness connector. If any item are damaged, repair or replace error-detected parts.

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000009750376

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:0000000009750377

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-26, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009750378

Proceed to LAN-15, "Trouble Diagnosis Flow Chart".

EPS WARNING LAMP

Component Function Check

INFOID:0000000009750379

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-27, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009750380

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-50, "COMBINATION METER : Diagnosis Procedure".
NO >> EPS control unit is malfunctioning. Replace steering column assembly. Refer to ST-11, "Removal and Installation".

SYMPTOM DIAGNOSIS

EPS WARNING LAMP DOES NOT TURN ON

Description

INFOID:0000000009750381

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:0000000009750382

1.CHECK EPS WARNING LAMP

Perform the trouble diagnosis of EPS warning lamp. Refer to STC-27, "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:0000000009750383

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

Diagnosis Procedure

INFOID:0000000009750384

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-27, "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-20, "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:0000000009750385

Steering wheel turning force is heavy or light.

Diagnosis Procedure

INFOID:0000000009750386

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-27, "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-20, "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-23, "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-8, "Inspection".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Check the steering wheel turning force for mechanical malfunction. Refer to ST-19, "Inspection".

UNBALANCE STEERING WHEEL TURNING FORCE AND RETURN BETWEEN RIGHT AND LEFT

Description

INFOID:0000000009750387

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

Diagnosis Procedure

INFOID:0000000009750388

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-29, "Diagnosis Procedure".

2.CHECK WHEEL ALIGNMENT

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Adjustment of wheel alignment. Refer to FSU-7, "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-23, "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-5, "Inspection".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Check the steering wheel turning force for mechanical malfunction. Refer to ST-19, "Inspection".

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)

Description

INFOID:0000000009750389

Unbalance steering wheel turning force (torque variation).

Diagnosis Procedure

INFOID:0000000009750390

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-29, "Diagnosis Procedure".

3.CHECK STEERING COLUMN AND STEERING GEAR

Check the steering column assembly and steering gear assembly.
- Steering column assembly. Refer to ST-10, "Exploded View".
- Steering gear assembly. Refer to ST-16, "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-20, "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-23, "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-8, "Inspection".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Check the steering wheel turning force for mechanical malfunction. Refer to ST-19, "Inspection".

REMOVAL AND INSTALLATION

EPS CONTROL UNIT

Removal and Installation

INFOID:0000000009750391

CAUTION:

Disconnect battery negative terminal before starting operations.

Never remove EPS control unit from steering column assembly. When replacing EPS control unit, replace steering column assembly. Refer to ST-11, "Removal and Installation".