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BASIC INSPECTION
DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

DETAILED FLOW

1. COLLECT THE INFORMATION FROM THE CUSTOMER

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet.

>> GO TO 2.

2. PERFORM THE SELF-DIAGNOSIS

Check the DTC display with the self-diagnosis function. Refer to STC-7, "CONSULT-III Function". Is there any DTC displayed?

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

3. PERFORM THE SYSTEM DIAGNOSIS

Perform the diagnosis applicable to the displayed DTC. Refer to STC-23, "DTC Index".

>> GO TO 6.

4. CHECK THE WARNING LAMP FOR ILLUMINATION

Check that the warning lamp illuminate.

Is ON/OFF timing normal?

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

5. PERFORM THE DIAGNOSIS BY SYMPTOM

Perform the diagnosis applicable to the symptom.

>> GO TO 6.

6. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the specified malfunctioning parts.

>> GO TO 7.

7. FINAL CHECK

Perform the self-diagnosis again, and check that the malfunction is repaired completely. After checking, erase the self-diagnosis memory. Refer to STC-7, "CONSULT-III Function". Is no other DTC present and the repair completed?

YES >> INSPECTION END
NO >> GO TO 3.
<FUNCTION DIAGNOSIS>

EPS SYSTEM

System Diagram

System Description

- 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). While activating overload protection control, the assist torque gradually decreases, and the steering wheel turning force becomes heavy. The normal assist torque reactivates by no steering.
- In case of an error in the electrical system, the fail-safe function stops output signals to the EPS motor. Then the previous state is changed to the manual steering state.
- Self-diagnosis can be done with CONSULT-III.
- EPS control unit will decrease assistance under the following 2 conditions.
  - Extensive steering at low speed will cause the ECU and MOTOR to heat up, once temperature reaches critical point ECU will reduce current to reduce heat up. System will recover as temperature lowers (reduced or no assistance).
  - Holding steering on rack-end (full lock) for 1 second will cause the system to engage rack-end protection. This reduces assistance down to 50% in order to prevent heat up. Assistance is immediately returned to 100% when steering released or turned away from rack-end.
Component Parts Location

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

Component Description

<table>
<thead>
<tr>
<th>Components parts</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPS control unit</td>
<td>STC-13, &quot;Description&quot;</td>
</tr>
<tr>
<td>EPS motor</td>
<td>STC-11, &quot;Description&quot;</td>
</tr>
<tr>
<td>Torque sensor</td>
<td>STC-10, &quot;Description&quot;</td>
</tr>
</tbody>
</table>
## EPS SYSTEM

<table>
<thead>
<tr>
<th>Components parts</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction gear</td>
<td>Reduction gear increases the assist torque provided from EPS motor with worm gears, and outputs to the column shaft.</td>
</tr>
<tr>
<td>EPS warning lamp</td>
<td>Turn on when a malfunction occurs in the EPS system, and tells the driver the malfunction.</td>
</tr>
</tbody>
</table>
<FUNCTION DIAGNOSIS>

CONSULT-III Function

CONSULT-III can display each diagnostic item using the diagnostic test modes shown below.

### Diagnostic test mode

<table>
<thead>
<tr>
<th>Diagnostic test mode</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECU identification</td>
<td>Steering column assembly number can be read.</td>
</tr>
<tr>
<td>Self-diagnostic results</td>
<td>Self-diagnostic results can be read and erased quickly.</td>
</tr>
<tr>
<td>Data monitor</td>
<td>Input/Output data in the EPS control unit can be read.</td>
</tr>
</tbody>
</table>

### SELF-DIAG RESULTS MODE

Display Item List
Refer to STC-23, "DTC Index".

### DATA MONITOR MODE

Display Item List

<table>
<thead>
<tr>
<th>Monitor item (Unit)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>BATTERY VOLT (V)</td>
<td>Displays the power supply voltage for EPS control unit.</td>
</tr>
<tr>
<td>TORQUE SENSOR (Nm)</td>
<td>Displays steering wheel turning force detected by torque sensor.</td>
</tr>
<tr>
<td>MOTOR SIG (A)</td>
<td>Displays the current commanded value to EPS motor.</td>
</tr>
<tr>
<td>MOTOR CURRENT (A)</td>
<td>Displays the current value consumed by EPS motor.</td>
</tr>
<tr>
<td>ASSIST TORQUE (Nm)</td>
<td>Displays assist torque being output by the electric power steering.</td>
</tr>
<tr>
<td>C/U TEMP (°C)</td>
<td>Displays the temperature of the EPS control unit.</td>
</tr>
<tr>
<td>ASSIST LEVEL (%)</td>
<td>Normally displays 100%. In case of an excessive stationary steering, the assist curvature gradually falls. However, it return to 100% when left standing.</td>
</tr>
<tr>
<td>VEHICLE SPEED (km/h) or (MPH)</td>
<td>Vehicle speed is displayed from vehicle speed signal via CAN communication.</td>
</tr>
<tr>
<td>WARNING LAMP (On/Off)</td>
<td>EPS warning lamp control status is displayed.</td>
</tr>
<tr>
<td>ENGINE STATUS (STOP/RUN/STALL/CRANK)</td>
<td>Engine speed is displayed from engine status signal via CAN communication.</td>
</tr>
<tr>
<td>MOTOR TEMP (°C)</td>
<td>Displays the temperature of EPS motor.</td>
</tr>
<tr>
<td>VHCL SPD CALC (km/h) or (MPH)</td>
<td>Displays vehicle speeds used for controlling EPS.</td>
</tr>
</tbody>
</table>
C1601 BATTERY POWER SUPPLY

COMPONENT DIAGNOSIS

C1601 BATTERY POWER SUPPLY

Description

Power is supplied from the battery to EPS control unit.

DTC Logic

DTC DETECTION LOGIC

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

<table>
<thead>
<tr>
<th>DTC</th>
<th>Display item</th>
<th>Malfunction detected condition</th>
<th>Possible cause</th>
</tr>
</thead>
</table>
| C1601 | BATTERY VOLT | When the EPS control unit power supply malfunction is detected. | • Harness or connector  
| | | | • EPS control unit |

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results

| | BATTERY VOLT |
|----------------|

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to STC-8, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. 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.
4. Reconnect connector and then perform self-diagnosis.

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2.

NO >> Poor connection of connector terminal. Repair or replace connector.

2. CHECK EPS CONTROL UNIT POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect EPS control unit harness connector.
3. Turn ignition switch ON. (Do not start engine.)
4. Check voltage between EPS control unit harness connector terminals and ground.

<table>
<thead>
<tr>
<th>EPS control unit</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector</td>
<td>Terminal</td>
</tr>
<tr>
<td>M38</td>
<td>1</td>
</tr>
<tr>
<td>M37</td>
<td>3</td>
</tr>
</tbody>
</table>

5. Turn ignition switch OFF.
6. Check voltage between EPS control unit harness connector terminals and ground.
< COMPONENT DIAGNOSIS >

<table>
<thead>
<tr>
<th>EPS control unit</th>
<th>Terminal</th>
<th>—</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>M38</td>
<td>1</td>
<td></td>
<td>Ground</td>
</tr>
<tr>
<td>M37</td>
<td>3</td>
<td></td>
<td>Battery voltage</td>
</tr>
</tbody>
</table>

Is the inspection result normal?
YES >> GO TO 3.
NO >> Repair or replace malfunctioning components.

3. CHECK EPS CONTROL UNIT GROUND CIRCUIT
1. Check continuity between EPS control unit harness connector terminal and ground.

<table>
<thead>
<tr>
<th>EPS control unit</th>
<th>Terminal</th>
<th>—</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>M38</td>
<td>2</td>
<td></td>
<td>Ground</td>
</tr>
</tbody>
</table>

2. Connect EPS control unit harness connector.
Is the inspection result normal?
YES >> GO TO 4.
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK EPS CONTROL UNIT
1. Turn ignition switch OFF.
2. Connect EPS control unit harness connector.
4. Check “BATTERY VOLT” in “DATA MONITOR”.

Voltage : Almost same as battery voltage.

Is the inspection result normal?
YES >> GO TO 5.
NO >> Replace EPS control unit. Refer to STC-34, “Exploded View”.

5. CHECK POWER SUPPLY CIRCUIT
1. Turn head lamp, A/C, blower fan and rear window defogger OFF.
2. Turn steering wheel until it stops.
3. At that time, check “BATTERY VOLT” in “DATA MONITOR”.

Voltage : Almost same as battery voltage.

Is the inspection result normal?
YES >> INSPECTION END
NO >> Power supply circuit is defective. Repair or replace any inoperative parts.

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION
Always perform the neutral position adjustment for the steering angle sensor, when replacing the steering column assembly. Refer to BRC-75, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement". (VDC models)

>> END
C1604 TORQUE SENSOR

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

DTC Logic

DTC DETECTION LOGIC

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

<table>
<thead>
<tr>
<th>DTC</th>
<th>Display item</th>
<th>Malfunction detected condition</th>
<th>Possible cause</th>
</tr>
</thead>
</table>
| C1604| TORQUE SENSOR  | Malfunction of the torque sensor in steering column assembly is detected. | • Harness or connector  
|      |                |                                                                    | • Torque sensor  
|      |                |                                                                    | • EPS control unit                                     |

Diagnostic Procedure

1. 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.
4. Reconnect connectors and then perform the self-diagnosis.

Is the “TORQUE SENSOR” [C1604] displayed?

| YES  | >> Torque sensor is malfunction. Replace steering column assembly. Refer to ST-11, "Exploded View". |
| NO   | >> Poor connection of connector terminal. Repair or replace connector. |

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the steering column assembly. Refer to BRC-75, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement". (VDC models)

>> END
C1606 EPS MOTOR

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

DTC Logic

DTC DETECTION LOGIC

<table>
<thead>
<tr>
<th>DTC</th>
<th>Display item</th>
<th>Malfunction detected condition</th>
<th>Possible cause</th>
</tr>
</thead>
</table>
| 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. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

<table>
<thead>
<tr>
<th>Self-diagnosis results</th>
<th>EPS MOTOR</th>
</tr>
</thead>
</table>

Is above displayed on the self-diagnosis display?

YES  >> Proceed to diagnosis procedure. Refer to STC-11, "Diagnosis Procedure".

NO   >> INSPECTION END

Diagnosis Procedure

1. 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.
4. Reconnect connectors and then perform the self-diagnosis.

Is the “EPS MOTOR” [C1606] displayed?

YES  >> EPS motor malfunctions. Replace steering column assembly. Refer to ST-11, "Exploded View".

NO   >> Poor connection of connector terminal. Repair or replace connector.

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the steering column assembly. Refer to BRC-75, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement". (VDC models)

>> END
C1607 EEPROM

Description

EPS control unit incorporates a memory function.

DTC Logic

DTC DETECTION LOGIC

<table>
<thead>
<tr>
<th>DTC</th>
<th>Display item</th>
<th>Malfunction detected condition</th>
<th>Possible cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1607</td>
<td>EEPROM</td>
<td>When the memory (EEPROM) system malfunction is detected in EPS control unit.</td>
<td>• Harness or connector</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• EPS control unit</td>
</tr>
</tbody>
</table>

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

<table>
<thead>
<tr>
<th>Self-diagnosis results</th>
<th>EEPROM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is above displayed on the self-diagnosis display?</td>
<td></td>
</tr>
<tr>
<td>YES &gt;&gt; Proceed to diagnosis procedure. Refer to STC-12, &quot;Diagnosis Procedure&quot;.</td>
<td></td>
</tr>
<tr>
<td>NO &gt;&gt; INSPECTION END</td>
<td></td>
</tr>
</tbody>
</table>

Diagnosis Procedure

1. 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.
4. Reconnect connectors and then perform the self-diagnosis.

Is the “EEPROM” [C1607] displayed?

| YES >> Replace EPS control unit. Refer to STC-34, "Exploded View". | |
| NO >> Poor connection of connector terminal. Repair or replace connector. |        |

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the steering column assembly. Refer to BRC-75, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement". (VDC models)

>> END
C1608 CONTROL UNIT

Description

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.

DTC Logic

DTC DETECTION LOGIC

<table>
<thead>
<tr>
<th>DTC</th>
<th>Display item</th>
<th>Malfunction detected condition</th>
<th>Possible cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1608</td>
<td>CONTROL UNIT</td>
<td>When the internal malfunction is detected in EPS control unit.</td>
<td>• Harness or connector</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• EPS control unit</td>
</tr>
</tbody>
</table>

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

<table>
<thead>
<tr>
<th>Self-diagnosis results</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTROL UNIT</td>
</tr>
</tbody>
</table>

Is above displayed on the self-diagnosis display?

YES  >> Proceed to diagnosis procedure. Refer to STC-13, "Diagnosis Procedure".
NO   >> INSPECTION END

Diagnosis Procedure

1. 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.
4. Reconnect connectors and then perform self-diagnosis.

Is any item indicated on the self-diagnosis display?

YES  >> GO TO 2.
NO   >> Poor connection of connector terminal. Repair or replace connector.

2. CHECK EPS CONTROL UNIT POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect EPS control unit harness connector.
3. Turn ignition switch ON. (Do not start engine.)
4. Check voltage between EPS control unit harness connector terminals and ground.

<table>
<thead>
<tr>
<th>EPS control unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>M38</td>
</tr>
<tr>
<td>M37</td>
</tr>
</tbody>
</table>

5. Turn ignition switch OFF.
6. Check voltage between EPS control unit harness connector terminals and ground.
< COMPONENT DIAGNOSIS >

C1608 CONTROL UNIT

Is the inspection result normal?
YES >> GO TO 3.
NO >> Repair or replace malfunctioning components.

3. CHECK EPS CONTROL UNIT GROUND CIRCUIT

1. Check continuity between EPS control unit harness connector terminal and ground.

<table>
<thead>
<tr>
<th>EPS control unit</th>
<th></th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector</td>
<td>Terminal</td>
<td>Ground</td>
</tr>
<tr>
<td>M38</td>
<td>1</td>
<td>Ground</td>
</tr>
<tr>
<td>M37</td>
<td>3</td>
<td>Ground</td>
</tr>
</tbody>
</table>

Is the inspection result normal?
YES >> GO TO 4.
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK DTC

Perform EPS control unit self-diagnosis.

Is “C1608 CONTROL UNIT” indicated in self-diagnosis display?
YES >> Replace EPS control unit. Refer to STC-34, "Exploded View".
NO >> INSPECTION END

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the steering column assembly. Refer to BRC-75, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement". (VDC models)

>> END
U1200 VEHICLE SPEED SIGNAL (ABS)

Description
EPS control unit receives the vehicle speed signal from ABS actuator and electric unit (control unit) via CAN communication line.

DTC Logic

DTC DETECTION LOGIC

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Is above displayed on the self-diagnosis display?
YES >> Proceed to diagnosis procedure. Refer to STC-15, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

1. CHECK EPS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SYSTEM

Perform EPS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-15, "CONSULT-III Function" (ABS models), BRC-93, "CONSULT-III Function" (VDC models).

Is any item indicated on the self-diagnosis display?
YES >> Repair or replace malfunctioning components.
NO >> GO TO 2.

2. 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.
4. Reconnect connectors and then perform the self-diagnosis.

Is any item indicated on the self-diagnosis display?
YES >> Replace EPS control unit. Refer to STC-34, "Exploded View".
NO >> Poor connection of connector terminal. Repair or replace connector.

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the steering column assembly. Refer to BRC-75, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement". (VDC models)

>> END

Revision: 2008 August
U14FF VEHICLE SPEED SIGNAL (METER)

Description
EPS control unit receives the vehicle speed signal from combination meter via CAN communication line.

DTC Logic

DTC DETECTION LOGIC

<table>
<thead>
<tr>
<th>DTC</th>
<th>Display item</th>
<th>Malfunction detected condition</th>
<th>Possible cause</th>
</tr>
</thead>
</table>
| U14FF | CAN VHCL SPEED (METER)     | Abnormal vehicle speed signals received via CAN communication are detected. | • Harness or connector  
• CAN communication line  
• EPS control unit  
• Combination meter malfunction  
• Vehicle speed signal error |

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
CAN VHCL SPEED (METER)

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to STC-16, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

1. CHECK COMBINATION METER SYSTEM

Perform combination meter self-diagnosis. Repair or replace items indicated, then perform combination meter self-diagnosis again. Refer to MWI-33, "CONSULT-III Function (METER/M&A)".

Is any item indicated on the self-diagnosis display?

YES >> Repair or replace malfunctioning components.
NO >> GO TO 2.

2. 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.  
4. Reconnect connectors and then perform the self-diagnosis.

Is any item indicated on the self-diagnosis display?

YES >> Replace EPS control unit. Refer to STC-34, "Exploded View".
NO >> Poor connection of connector terminal. Repair or replace connector.

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the steering column assembly. Refer to BRC-75, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement". (VDC models)

>> END
U1000 CAN COMM CIRCUIT

Description

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

DTC Logic

DTC DETECTION LOGIC

<table>
<thead>
<tr>
<th>DTC</th>
<th>Display Item</th>
<th>Malfunction detected condition</th>
<th>Possible cause</th>
</tr>
</thead>
</table>
| U1000  | CAN COMM CIRCUIT  | When EPS control unit is not transmitting or receiving CAN communication signal for 2 seconds or more. | • Harness or connector  
• CAN communication line  
• EPS control unit |

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

<table>
<thead>
<tr>
<th>Self-diagnosis results</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN COMM CIRCUIT</td>
</tr>
</tbody>
</table>

Is above displayed on the self-diagnosis display?

YES  >> Proceed to diagnosis procedure. Refer to STC-17, "Diagnosis Procedure".

NO   >> INSPECTION END

Diagnosis Procedure

1. 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.
4. Reconnect connector and perform self-diagnosis.

Is above displayed on the self-diagnosis display?

YES  >> Go to LAN-24, "CAN System Specification Chart".

NO   >> INSPECTION END

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the steering column assembly. Refer to BRC-75, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement". (VDC models)

>> END
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.

<table>
<thead>
<tr>
<th>Monitor item</th>
<th>Content</th>
<th>Condition</th>
<th>Display value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BATTERY VOLT</td>
<td>Power supply voltage for EPS control unit</td>
<td>Ignition switch: ON</td>
<td>Battery voltage</td>
</tr>
<tr>
<td>TORQUE SENSOR</td>
<td>Steering wheel turning force</td>
<td>Engine running</td>
<td>Steering wheel: Not steering (There is no steering force) approx. 0 Nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Steering wheel: Right turn Negative value (Nm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Steering wheel: Left turn Positive value (Nm)</td>
</tr>
<tr>
<td>MOTOR SIG</td>
<td>Command current to EPS motor</td>
<td>Engine running</td>
<td>Steering wheel: Not steering (There is no steering force) approx. 0 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Steering wheel: Right turn Positive value (A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Steering wheel: Left turn Negative value (A)</td>
</tr>
<tr>
<td>MOTOR CURRENT</td>
<td>Consumption current of EPS motor</td>
<td>Engine running</td>
<td>Steering wheel: Not steering (There is no steering force) approx. 0 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Steering wheel: Right turn Positive value (A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Steering wheel: Left turn Negative value (A)</td>
</tr>
<tr>
<td>ASSIST TORQUE</td>
<td>Displays assist torque being output by the EPS.</td>
<td>Engine running</td>
<td>Steering wheel: Not steering (There is no steering force) approx. 0 Nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Steering wheel: Right turn Positive value (Nm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Steering wheel: Left turn Negative value (Nm)</td>
</tr>
<tr>
<td>C/U TEMP</td>
<td>Displays temperature of the EPS control unit</td>
<td>Ignition switch ON or engine running</td>
<td>Displays temperature of inside of EPS control unit (°C)</td>
</tr>
<tr>
<td>ASSIST LEVEL</td>
<td>Assist available level</td>
<td>Engine running</td>
<td>100% °2</td>
</tr>
<tr>
<td>VEHICLE SPEED</td>
<td>Vehicle speed</td>
<td>Vehicle stopped</td>
<td>0 km/h (0 mph)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>While driving</td>
</tr>
<tr>
<td>MOTOR TEMP</td>
<td>Displays temperature of EPS motor.</td>
<td>Engine running</td>
<td>Displays temperature of inside of EPS motor (°C)</td>
</tr>
<tr>
<td>VHCL SPD CALC</td>
<td>Displays vehicle speeds used for controlling EPS.</td>
<td>Vehicle stopped</td>
<td>0 km/h (0 mph)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>While driving</td>
</tr>
<tr>
<td>WARNING LAMP</td>
<td>EPS warning lamp condition</td>
<td>EPS warning lamp: ON</td>
<td>On</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EPS warning lamp: OFF</td>
</tr>
<tr>
<td>ENGINE STATUS</td>
<td>Engine status</td>
<td>Engine not running</td>
<td>STOP, STALL, CRANK</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Engine running</td>
</tr>
</tbody>
</table>

*1: Almost in accordance with the value of MOTOR SIG. It is not a malfunction though these values are not accorded when steering quickly.
**EPS CONTROL UNIT**

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

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

### TERMINAL LAYOUT

![Terminal Layout Diagram]

### PHYSICAL VALUES

<table>
<thead>
<tr>
<th>Terminal No. (Wire Color)</th>
<th>Description</th>
<th>Condition</th>
<th>Value (Approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>Signal name</td>
<td>Input/Output</td>
<td></td>
</tr>
<tr>
<td>1 (R)</td>
<td>Ground</td>
<td>Battery power supply</td>
<td>Input</td>
</tr>
<tr>
<td>2 (B)</td>
<td>Ground</td>
<td>Ground</td>
<td>Output</td>
</tr>
<tr>
<td>3 (W)</td>
<td>Ground</td>
<td>Ignition power supply</td>
<td>Input</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ignition switch: OFF</td>
</tr>
<tr>
<td>5 (L)</td>
<td>Ground</td>
<td>CAN-H</td>
<td>Input/Output</td>
</tr>
<tr>
<td>7 (P)</td>
<td>Ground</td>
<td>CAN-L</td>
<td>Input/Output</td>
</tr>
</tbody>
</table>
 Fail-Safe

- 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.)
## DTC Index

<table>
<thead>
<tr>
<th>DTC</th>
<th>Items (CONSULT screen terms)</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1601</td>
<td>BATTERY VOLT</td>
<td>STC-8, &quot;DTC Logic&quot;</td>
</tr>
<tr>
<td>C1604</td>
<td>TORQUE SENSOR</td>
<td>STC-10, &quot;DTC Logic&quot;</td>
</tr>
<tr>
<td>C1606</td>
<td>EPS MOTOR</td>
<td>STC-11, &quot;DTC Logic&quot;</td>
</tr>
<tr>
<td>C1607</td>
<td>EEPROM</td>
<td>STC-12, &quot;DTC Logic&quot;</td>
</tr>
<tr>
<td>C1608</td>
<td>CONTROL UNIT</td>
<td>STC-13, &quot;DTC Logic&quot;</td>
</tr>
<tr>
<td>U1200</td>
<td>CAN VHCL SPEED (ABS)</td>
<td>STC-15, &quot;DTC Logic&quot;</td>
</tr>
<tr>
<td>U14FF</td>
<td>CAN VHCL SPEED (METER)</td>
<td>STC-16, &quot;DTC Logic&quot;</td>
</tr>
<tr>
<td>U1000</td>
<td>CAN COMM CIRCUIT</td>
<td>STC-17, &quot;DTC Logic&quot;</td>
</tr>
</tbody>
</table>
SYMPTOM DIAGNOSIS

EPS WARNING LAMP DOES NOT TURN ON

Description

- EPS warning lamp does not turn ON when turning ignition switch ON from OFF.

Diagnosis Procedure

1. CHECK SYSTEM FOR CAN COMMUNICATION LINE

Perform EPS control unit self-diagnosis.

Is the “CAN COMM CIRCUIT [U1000]” displayed?

YES >> Perform trouble diagnosis for CAN communication line.
NO >> GO TO 2.

2. CHECK EPS CONTROL UNIT

Check EPS control unit input/output signal. Refer to STC-18, “Reference Value”.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Check EPS control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

3. CHECK COMBINATION METER SELF-DIAGNOSIS RESULTS

Perform combination meter self-diagnosis. Refer to MWI-33, “CONSULT-III Function (METER/M&A)”.

Is self-diagnosis results indicated?

YES >> Repair or replace malfunctioning components.
NO >> GO TO 4.

4. SYMPTOM CHECK

Check again.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace combination meter.
Description

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

Diagnosis Procedure

1. **CHECK SELF-DIAGNOSIS RESULTS**
   
   Perform EPS control unit self-diagnosis.
   
   **Is any malfunction detected by self-diagnosis?**
   
   **YES** >> Check the malfunctioning system.
   
   **NO** >> GO TO 2.

2. **CHECK EPS CONTROL UNIT POWER SUPPLY CIRCUIT**
   
   Turn ignition switch OFF.
   
   Disconnect EPS control unit harness connector.
   
   Turn ignition switch ON. (Do not start engine.)
   
   Check voltage between EPS control unit harness connector terminals and ground.

<table>
<thead>
<tr>
<th>EPS control unit</th>
<th>Terminal</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>M38</td>
<td>1</td>
<td>Ground Battery voltage</td>
</tr>
<tr>
<td>M37</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

   **Is the inspection result normal?**
   
   **YES** >> GO TO 3.
   
   **NO** >> Repair or replace malfunctioning components.

3. **CHECK EPS CONTROL UNIT GROUND CIRCUIT**
   
   Check continuity between EPS control unit harness connector terminal and ground.

<table>
<thead>
<tr>
<th>EPS control unit</th>
<th>Terminal</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>M38</td>
<td>2</td>
<td>Existed</td>
</tr>
</tbody>
</table>

   **Is the inspection result normal?**
   
   **YES** >> GO TO 4.
   
   **NO** >> Repair open circuit or short to ground or short to power in harness or connectors.

4. **CHECK EPS CONTROL UNIT PIN TERMINAL**
   
   Check EPS control unit pin terminals for damage or loose connection with harness connector.

   **Is the inspection result normal?**
   
   **YES** >> GO TO 5.
   
   **NO** >> Repair or replace damaged parts.

5. **CHECK COMBINATION METER SELF-DIAGNOSIS RESULTS**
< SYMPTOM DIAGNOSIS >

Perform combination meter self-diagnosis. Refer to MWI-33, "CONSULT-III Function (METER/M&A)".

is self-diagnosis results indicated?

YES >> Repair or replace malfunctioning components.

NO >> GO TO 6.

6. CHECK VEHICLE SPEED SIGNAL FROM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Perform ABS actuator and electric unit (control unit) self-diagnosis.

- Without VDC: BRC-15, "CONSULT-III Function".
- With VDC: BRC-93, "CONSULT-III Function".

Is any malfunction detected by self-diagnosis?

YES >> Check the malfunctioning system.

NO >> GO TO 7.

7. CHECK ENGINE STATUS SIGNAL

Perform ECM self-diagnosis.

- For CALIFORNIA: EC-105, "CONSULT-III Function".
- For USA (FEDERAL) and CANADA: EC-576, "CONSULT-III Function".
- For MEXICO: EC-1003, "CONSULT-III Function".

Is the malfunction detected by self-diagnosis?

YES >> Check the malfunctioning system.

NO >> GO TO 8.

8. SYMPTOM CHECK

Check again.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace combination meter. Refer to MWI-86, "Exploded View".
Diagnosis Procedure

1. **CHECK SYSTEM FOR CAN COMMUNICATION LINE**
   Perform EPS control unit self-diagnosis.
   Is the “CAN COMM CIRCUIT [U1000]” displayed.
   - YES >> Perform trouble diagnosis for CAN communication line. Refer to STC-17, "Description".
   - NO >> GO TO 2.

2. **CHECK VEHICLE SPEED SIGNAL FROM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)**
   Perform ABS actuator and electric unit (control unit) self-diagnosis.
   - Without VDC: BRC-15, "CONSULT-III Function".
   - With VDC: BRC-93, "CONSULT-III Function".
   Is any malfunction detected by self-diagnosis?
   - YES >> Check the malfunctioning system.
   - NO >> GO TO 3.

3. **CHECK COMBINATION METER SIGNAL**
   Perform combination meter self-diagnosis. Refer to MWI-33, "CONSULT-III Function (METER/M&A)".
   Is the malfunction detected by self-diagnosis?
   - YES >> Check the malfunctioning system.
   - NO >> GO TO 4.

4. **CHECK ENGINE STATUS SIGNAL**
   Perform ECM self-diagnosis.
   - For CALIFORNIA: EC-105, "CONSULT-III Function".
   - For USA (FEDERAL) and CANADA: EC-576, "CONSULT-III Function".
   - For MEXICO: EC-1003, "CONSULT-III Function".
   Is the malfunction detected by self-diagnosis?
   - YES >> Check the malfunctioning system.
   - NO >> GO TO 5.

5. **CHECK EPS CONTROL UNIT**
   Check EPS control unit input/output signal. Refer to STC-18, "Reference Value".
   Is the inspection result normal?
   - YES >> GO TO 6.
   - NO >> Check EPS control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

6. **CHECK STEERING WHEEL TURNING FORCE**
   Check steering wheel turning force. Refer to ST-8, "Inspection".
   Is the inspection result normal?
   - YES >> GO TO 7.
   - NO >> Repair or replace malfunctioning components.

7. **SYMPTOM CHECK**
   Check again.
   Is the inspection result normal?
   - YES >> INSPECTION END
   - NO >> Check the steering wheel turning force for mechanical malfunction. Refer to ST-8, "Inspection".
<SYMPTOM DIAGNOSIS>

UNBALANCE STEERING WHEEL TURNING FORCE AND RETURN BETWEEN RIGHT AND LEFT

Diagnosis Procedure

1. CHECK EPS WARNING LAMP

Confirm EPS warning lamp during engine running.

Does EPS warning lamp turn OFF?

YES >> GO TO 2.
NO  >> Go to STC-25, "Diagnosis Procedure".

2. CHECK WHEEL ALIGNMENT

Check wheel alignment. Refer to FSU-8, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO  >> Adjust wheel alignment. Refer to FSU-8, "Inspection".

3. CHECK EPS CONTROL UNIT

Check EPS control unit input/output signal. Refer to STC-18, "Reference Value".

Is the inspection result normal?

YES >> GO TO 4.
NO  >> Check EPS control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

4. CHECK STEERING WHEEL TURNING FORCE

Check steering wheel turning force. Refer to ST-8, "Inspection".

Is the inspection result normal?

YES >> GO TO 5.
NO  >> Repair or replace malfunctioning components.

5. SYMPTOM CHECK

Check again.

Is the inspection result normal?

YES >> INSPECTION END
NO  >> Check the steering wheel turning force for mechanical malfunction. Refer to ST-8, "Inspection".
UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)

< SYMPTOM DIAGNOSIS >

Diagnosis Procedure

1. CHECK EPS WARNING LAMP

Confirm EPS warning lamp during engine running.

Does EPS warning lamp turn OFF?

YES >> GO TO 2.

NO    >> Go to STC-25, "Diagnosis Procedure".

2. CHECK STEERING COLUMN INTERMEDIATE SHAFT

Check the connection between intermediate shaft and the mounting part of steering column assembly and steering gear assembly. Refer to ST-11, "Exploded View".

Is the inspection result normal?

YES >> GO TO 3.

NO    >> Repair or replace damaged parts.

3. CHECK EPS CONTROL UNIT

Check EPS control unit input/output signal. Refer to STC-18, "Reference Value".

Is the inspection result normal?

YES >> GO TO 4.

NO    >> Check EPS control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

4. SYMPTOM CHECK

Check again.

Is the inspection result normal?

YES >> INSPECTION END

NO    >> Check the steering wheel turning force for mechanical malfunction. Refer to ST-8, "Inspection".
PRECAUTIONS

PRECAUTION

PRECAUTIONS FOR USA AND CANADA

FOR USA AND CANADA: Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

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

WARNING:
• To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which 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 the “SRS AIRBAG”.
• 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.

FOR USA AND CANADA: Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

NOTE:
• This Procedure is applied only to models with Intelligent Key system and NVIS/IVIS (NISSAN/INFINITI VEHICLE IMMOBILIZER SYSTEM - NATS).
• Remove and install all control units after disconnecting both battery cables with the ignition knob in the “LOCK” position.
• Always use CONSULT-III to perform self-diagnosis as a part of each function inspection after finishing work. If DTC is detected, perform trouble diagnosis according to self-diagnostic results.
• For models equipped with the Intelligent Key system and NVIS/IVIS, an electrically controlled steering lock mechanism is adopted on the key cylinder.
• For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.
• If steering wheel rotation is required when battery power is interrupted, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE
1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Use the Intelligent Key or mechanical key to turn the ignition switch to the “ACC” position. At this time, the steering lock will be released.
3. Disconnect both battery cables. The steering lock will remain released and the steering wheel can be rotated.
4. Perform the necessary repair operation.
5. When the repair work is completed, return the ignition switch to the “LOCK” position before connecting the battery cables. (At this time, the steering lock mechanism will engage.)
6. Perform a self-diagnosis check of all control units using CONSULT-III.

FOR USA AND CANADA: Service Notice or Precautions for EPS System

Check the following item when performing the trouble diagnosis.
PRECAUTIONS

< PRECAUTION >

- Check any possible causes by interviewing the symptom and its 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 no 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.

FOR MEXICO

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

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the “SRS AIRBAG” and “SEAT BELT” of this Service Manual.

WARNING:
- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which 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 the “SRS AIRBAG”.
- Do not 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.

FOR MEXICO : Precaution Necessary for Steering Wheel Rotation After Battery Dis-
NOTE:
- This Procedure is applied only to models with Intelligent Key system and NVIS/IVIS (NISSAN/INFINITI VEHICLE IMMOBILIZER SYSTEM - NATS).
- Remove and install all control units after disconnecting both battery cables with the ignition knob in the “LOCK” position.
- Always use CONSULT-III to perform self-diagnosis as a part of each function inspection after finishing work.
  If DTC is detected, perform trouble diagnosis according to self-diagnostic results.

For models equipped with the Intelligent Key system and NVIS/IVIS, an electrically controlled steering lock mechanism is adopted on the key cylinder.
For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.
If steering wheel rotation is required when battery power is interrupted, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE
1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Use the Intelligent Key or mechanical key to turn the ignition switch to the “ACC” position. At this time, the steering lock will be released.
3. Disconnect both battery cables. The steering lock will remain released and the steering wheel can be rotated.
4. Perform the necessary repair operation.
5. When the repair work is completed, return the ignition switch to the “LOCK” position before connecting the battery cables. (At this time, the steering lock mechanism will engage.)
6. Perform a self-diagnosis check of all control units using CONSULT-III.

FOR MEXICO : Service Notice or Precautions for EPS System

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 no 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”.

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< PRECAUTION >

- 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.
< ON-VEHICLE REPAIR >

ON-VEHICLE REPAIR
EPS CONTROL UNIT

Exploded View

Removal and Installation

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 steering column assembly. Refer to ST-11, "Exploded View".
2. Remove harness bracket.
3. Disconnect EPS motor and torque sensor 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 harness cover.
5. Disconnect EPS control unit connectors.
6. Remove EPS control unit.

INSTALLATION

Note the following, and install in the reverse order of removal.
Check the order of cable colors, red (A), black (B) and white (C), when connecting harness terminals.

Check that harness is not damaged when installing EPS control unit. Also, check that EPS control unit is installed without trapping harness or foreign materials.

Repeat the following operations three times without touching steering wheels (input torque = 0) after replacing EPS control unit:

Turn the key switch ON and wait for 3 seconds ⇒ Turn the key switch OFF and wait for 3 seconds.