

# STEERING COLUMN

|                                                   |             |                                                                          |              |
|---------------------------------------------------|-------------|--------------------------------------------------------------------------|--------------|
| <b>GENERAL INFORMATION</b>                        | <b>28-3</b> | <b>ON-VEHICLE SERVICE</b>                                                | <b>28-25</b> |
| Description                                       | 28-3        | <b>Steering Wheel Assembly</b>                                           | <b>28-25</b> |
| Specifications                                    | 28-5        | Removal                                                                  | 28-25        |
| Tools                                             | 28-6        | Inspection                                                               | 28-26        |
| Circuit Diagram                                   | 28-7        | Installation                                                             | 28-27        |
| <b>DIAGNOSIS &amp; TESTING</b>                    | <b>28-9</b> | <b>Combination Switch Cover</b>                                          | <b>28-28</b> |
| Problem Symptoms Table                            | 28-9        | Removal                                                                  | 28-28        |
| Diagnostic Help                                   | 28-10       | Inspection                                                               | 28-29        |
| Intermittent DTC Troubleshooting                  | 28-11       | Installation                                                             | 28-29        |
| Ground Inspection                                 | 28-11       | <b>Steering Column with Intermediate Shaft Assembly (w/o EPS)</b>        | <b>28-30</b> |
| Diagnostic Trouble Code (DTC) Chart               | 28-11       | Removal                                                                  | 28-30        |
| B150D-00                                          | 28-12       | Disassembly                                                              | 28-32        |
| B150E-00                                          | 28-12       | Inspection                                                               | 28-33        |
| B150F-00                                          | 28-12       | Assembly                                                                 | 28-34        |
| B1511-00                                          | 28-12       | Installation                                                             | 28-34        |
| B1512-00                                          | 28-12       | <b>Electronic Power Steering Column with Intermediate Shaft Assembly</b> | <b>28-35</b> |
| B1513-00                                          | 28-12       | Removal                                                                  | 28-35        |
| U0329-87                                          | 28-20       | Disassembly                                                              | 28-37        |
| Steering Wheel Free Play Inspection               | 28-24       | Inspection                                                               | 28-37        |
| Steering Wheel Centering/Returnability Inspection | 28-24       | Assembly                                                                 | 28-38        |
|                                                   |             | Installation                                                             | 28-38        |

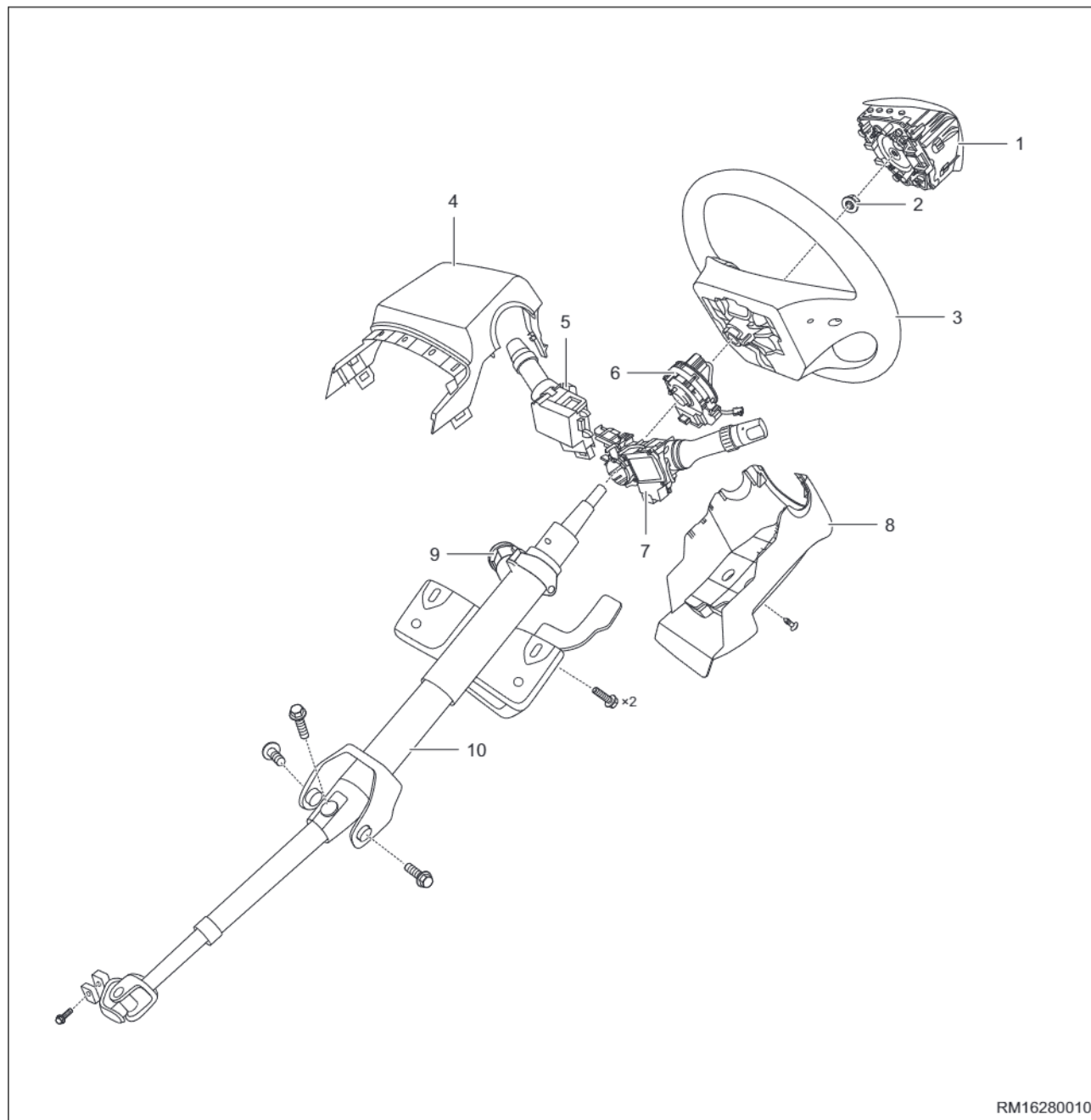


# GENERAL INFORMATION

## Description

### Steering Column

28

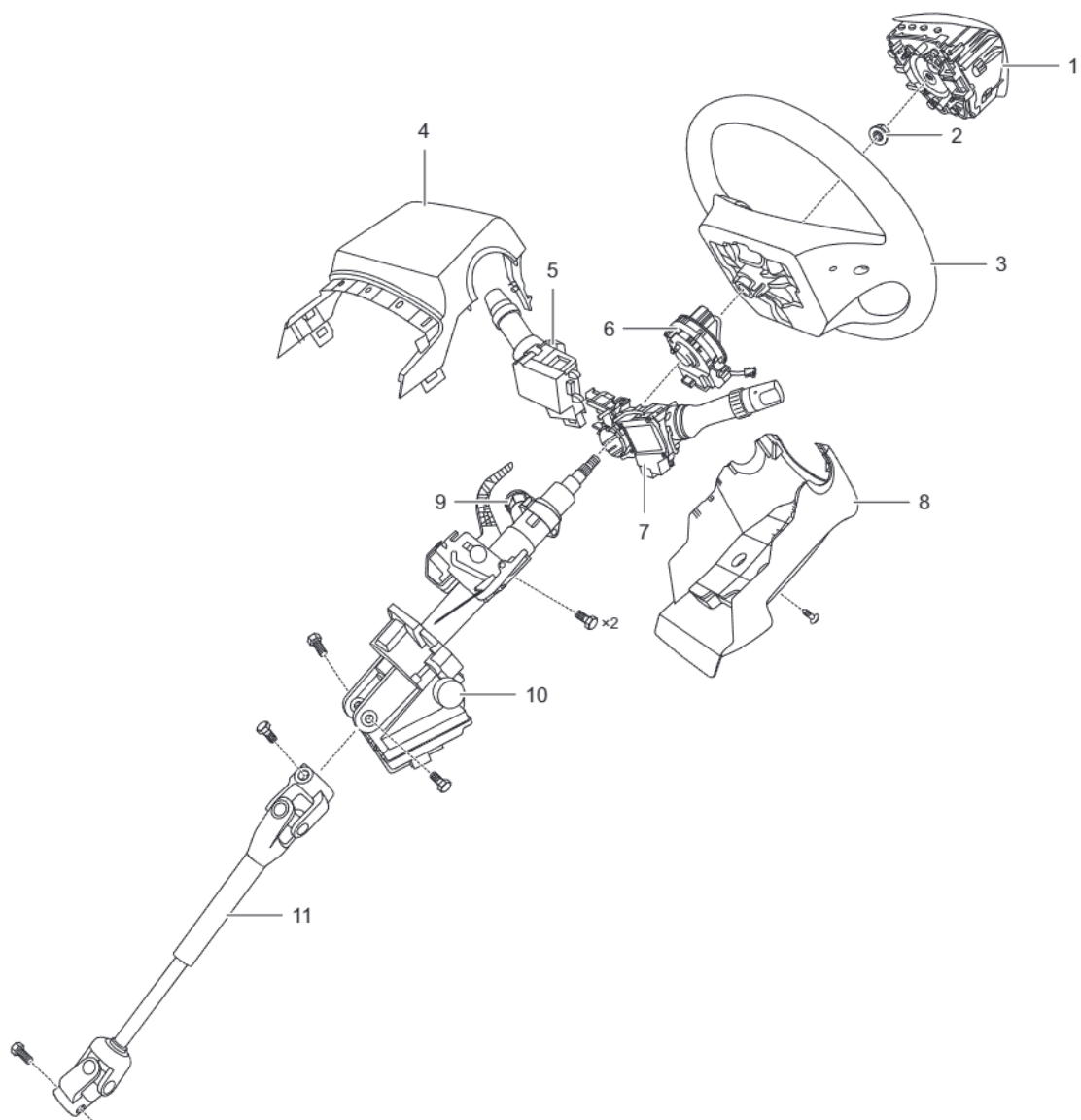


RM16280010

|                             |                                                       |
|-----------------------------|-------------------------------------------------------|
| 1 - Driver Airbag           | 2 - Steering Wheel Assembly Fixing Nut                |
| 3 - Steering Wheel Assembly | 4 - Combination Switch Upper Cover                    |
| 5 - Wiper Switch            | 6 - Spiral Cable                                      |
| 7 - Steering Switch         | 8 - Combination Switch Lower Cover                    |
| 9 - Ignition Switch         | 10 - Steering Column with Intermediate Shaft Assembly |

## Electronic Power Steering Column

28



RM16280011

|                                                    |                                        |
|----------------------------------------------------|----------------------------------------|
| 1 - Driver Airbag                                  | 2 - Steering Wheel Assembly Fixing Nut |
| 3 - Steering Wheel Assembly                        | 4 - Combination Switch Upper Cover     |
| 5 - Wiper Switch                                   | 6 - Spiral Cable                       |
| 7 - Steering Switch                                | 8 - Combination Switch Lower Cover     |
| 9 - Electronic Steering Column Lock (for MT Model) | 10 - Electronic Power Steering Column  |
| 11 - Intermediate Shaft Assembly                   |                                        |

## Specifications

### Torque Specifications

| Description                                                                                                           | Tightening Torque (N·m) |
|-----------------------------------------------------------------------------------------------------------------------|-------------------------|
| Steering Wheel Assembly Fixing Nut                                                                                    | $35 \pm 3$              |
| Combination Switch Cover Fixing Screw                                                                                 | $1.5 \pm 0.5$           |
| Steering Column Assembly Upper Bracket Fixing Bolt                                                                    | $25 \pm 3$              |
| Steering Column Assembly Lower Bracket Fixing Bolt                                                                    | $25 \pm 3$              |
| Coupling Bolt Between Steering Column with Intermediate Shaft Assembly and Steering Gear Input Shaft                  | $30 \pm 3$              |
| Coupling Bolt Between Electronic Power Steering Column with Intermediate Shaft Assembly and Steering Gear Input Shaft | $60 \pm 5$              |
| Ignition Starting Switch Fixing Screw                                                                                 | $13 \pm 2$              |
| Coupling Bolt Between Electronic Power Steering Column and Intermediate Shaft Assembly                                | 50                      |

### Data Specifications

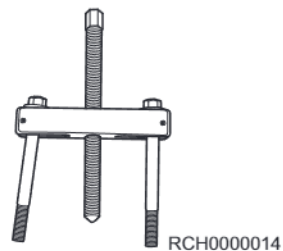
| Description                                             | Standard Value  |
|---------------------------------------------------------|-----------------|
| Steering Wheel Free Play (Rotation Angle)               | $\leq 15^\circ$ |
| Steering Wheel Centering/Returnability (Rotation Angle) | $> 70^\circ$    |

## Tools

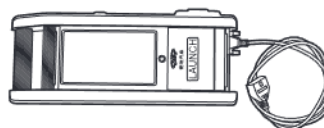
### Special Tools

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Steering Wheel Remover

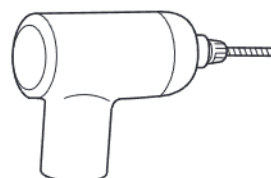


X-431 3G Diagnostic Tester

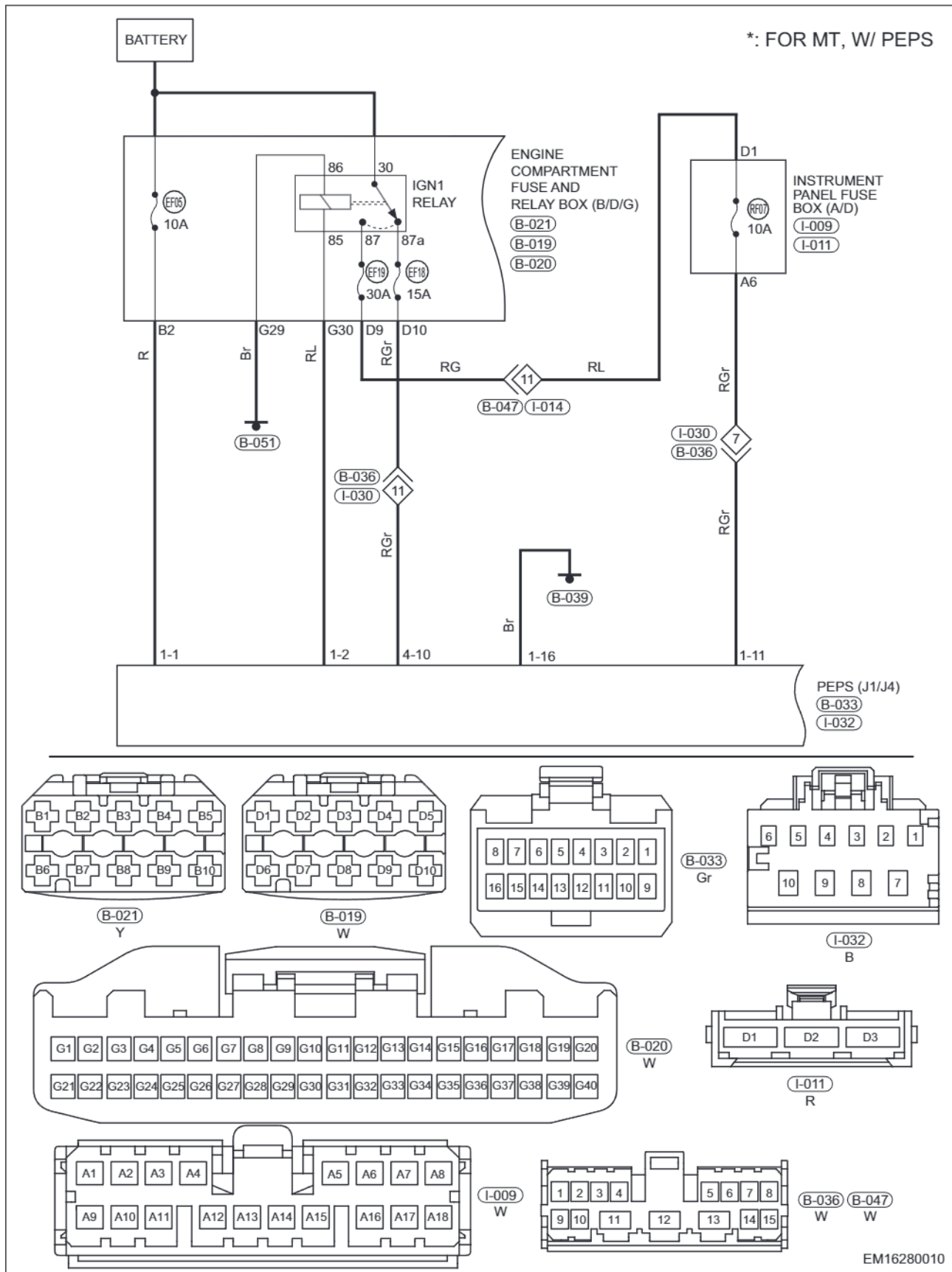


### General Tool

Electric Drill



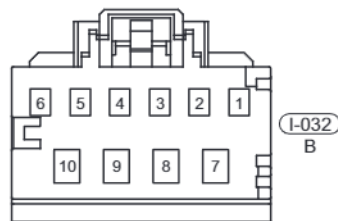
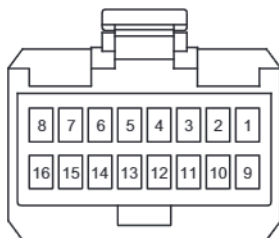
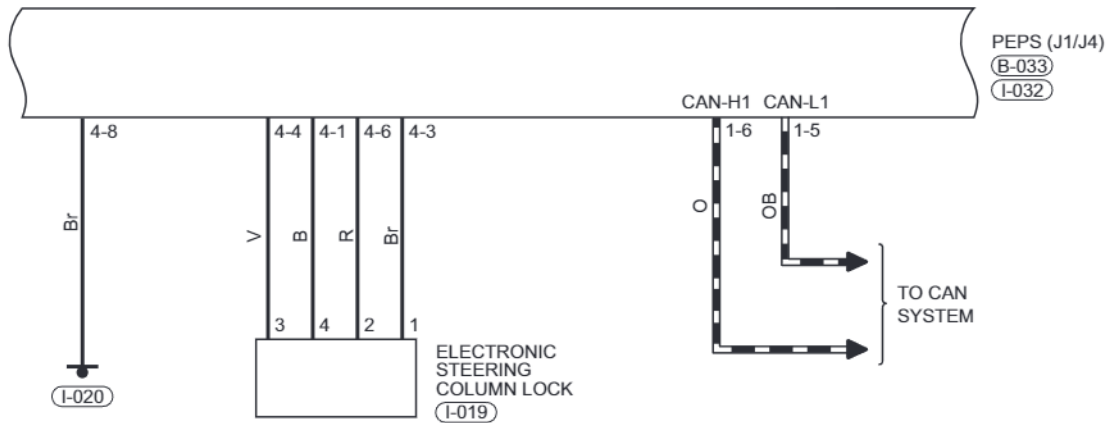
## Electronic Steering Column Lock (Page 1 of 2)



## Electronic Steering Column Lock (Page 2 of 2)

\*: FOR MT, W/ PEPS

28



EM16280020

## DIAGNOSIS & TESTING

### Problem Symptoms Table

#### HINT:

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair or adjust faulty components, or replace as necessary.

#### Electronic Steering Column Lock System

| Symptom                                                                            | Suspected Area                  | See page |
|------------------------------------------------------------------------------------|---------------------------------|----------|
| Steering wheel assembly cannot lock or unlock (w/ electronic steering column lock) | Power supply circuit            | 53-13    |
|                                                                                    | PEPS controller                 | 15-79    |
|                                                                                    | Electronic steering column lock | 28-35    |

#### Steering System

| Symptom                                                            | Suspected Area                                                               | See page       |
|--------------------------------------------------------------------|------------------------------------------------------------------------------|----------------|
| Steering wheel assembly cannot lock or unlock                      | Ignition key cylinder                                                        | 28-32          |
|                                                                    | Ignition switch lock body                                                    | 28-32          |
| Steering wheel assembly has no free play or free play is too large | Front axle hub bearing (seriously worn)                                      | 22-14          |
|                                                                    | Intermediate shaft with universal joint assembly (seriously worn)            | 28-35          |
|                                                                    | Ball pin assembly (worn or loosen)                                           | 29-17          |
|                                                                    | Steering tie rod assembly                                                    | 29-19          |
|                                                                    | Steering gear assembly (improper engagement gap of rack and pinion)          | 29-21<br>30-29 |
| Hard steering                                                      | Front tire (improperly inflated or unevenly worn)                            | 24-7           |
|                                                                    | Front wheel alignment (wrong)                                                | 23-49          |
|                                                                    | Front sub frame welding assembly                                             | 22-17          |
|                                                                    | Intermediate shaft with universal joint assembly (insufficiently lubricated) | 28-35          |
|                                                                    | Ball pin assembly (insufficiently lubricated)                                | 29-17          |
|                                                                    | Steering tie rod assembly                                                    | 29-19          |
|                                                                    | Steering column assembly                                                     | 28-30<br>28-35 |
|                                                                    | Steering gear assembly                                                       | 29-21<br>30-29 |
|                                                                    | Steering column motor                                                        | 28-35          |

| Symptom                                                                                               | Suspected Area                                                                       | See page       |
|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------|
| Poor returnability                                                                                    | Front tire (improperly inflated or unevenly worn)                                    | 24-7           |
|                                                                                                       | Front wheel alignment (wrong)                                                        | 23-49          |
|                                                                                                       | Front suspension                                                                     | 23-12          |
|                                                                                                       | Ball pin assembly (loosen, insufficiently lubricated)                                | 29-17          |
|                                                                                                       | Steering tie rod assembly                                                            | 29-19          |
|                                                                                                       | Intermediate shaft with universal joint assembly (loosen, insufficiently lubricated) | 28-35          |
|                                                                                                       | Steering column assembly (stuck)                                                     | 28-30<br>28-35 |
|                                                                                                       | Steering gear assembly (stuck)                                                       | 29-21<br>30-29 |
|                                                                                                       | Steering column motor                                                                | 28-35          |
| Knocking (or clunking) sound occurs when turning steering wheel while steering system is in operation | Intermediate shaft with universal joint assembly                                     | 28-35          |
|                                                                                                       | Control arm ball pin                                                                 | 23-22          |
|                                                                                                       | Control arm                                                                          | 23-20          |
|                                                                                                       | Steering gear assembly                                                               | 29-21<br>30-29 |
| Friction sound occurs when steering wheel is turned during low speed driving                          | Steering column assembly                                                             | 28-30<br>28-35 |
|                                                                                                       | Steering column motor                                                                | 28-35          |
| High-pitched sound (squealing sound) occurs when steering wheel is turned slowly with vehicle stopped | Steering column motor                                                                | 28-35          |
| Steering wheel vibrates and noise occurs when steering wheel is turned with vehicle stopped           | Steering column assembly                                                             | 28-30<br>28-35 |
|                                                                                                       | Steering column motor                                                                | 28-35          |

## Diagnostic Help

1. Connect diagnostic tester to Data Link Connector (DLC), and make it communicate with vehicle electronic module through data network.
2. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
3. If DTC cannot be deleted, malfunction is current.
4. Only use a digital multimeter to measure voltage of electronic system.
5. Refer to any Technical Bulletin that may apply to malfunction.
6. Visually check related wire harness.
7. Check and clean electronic steering column lock ground related to latest DTC.
8. If multiple trouble codes are set, refer to circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

## Intermittent DTC Troubleshooting

If malfunction is intermittent, perform the followings:

1. Check if connectors are loose.
2. Check if wire harnesses are worn, pierced, pinched or partially broken.
3. Observe diagnostic tester data related to this circuit.
4. Wiggle related wire harnesses and connectors and observe if signal is interrupted in related circuit.
5. If possible, try to duplicate the conditions under which DTC was set.
6. Look for the data that has changed or the DTC to reset during wiggle test.
7. Check for broken, bent, protruded or corroded terminals.
8. Check sensors and mounting areas for damage, foreign matter, etc. that will cause incorrect signals.
9. Use data recorder and/or oscilloscope to help diagnosing intermittent malfunctions.
10. Remove electronic steering column lock from malfunction vehicle, install it to a new vehicle and perform a test. If DTC cannot be cleared, it indicates that electronic steering column lock is malfunctioning. If DTC can be cleared, reinstall electronic steering column lock to original vehicle.

## Ground Inspection

Ground points are very important to proper operation of circuits. Ground points are often exposed to moisture, dirt and other corrosive environments. Corrosion (rust) may increase load resistance. This situation may change the way in which a circuit works.

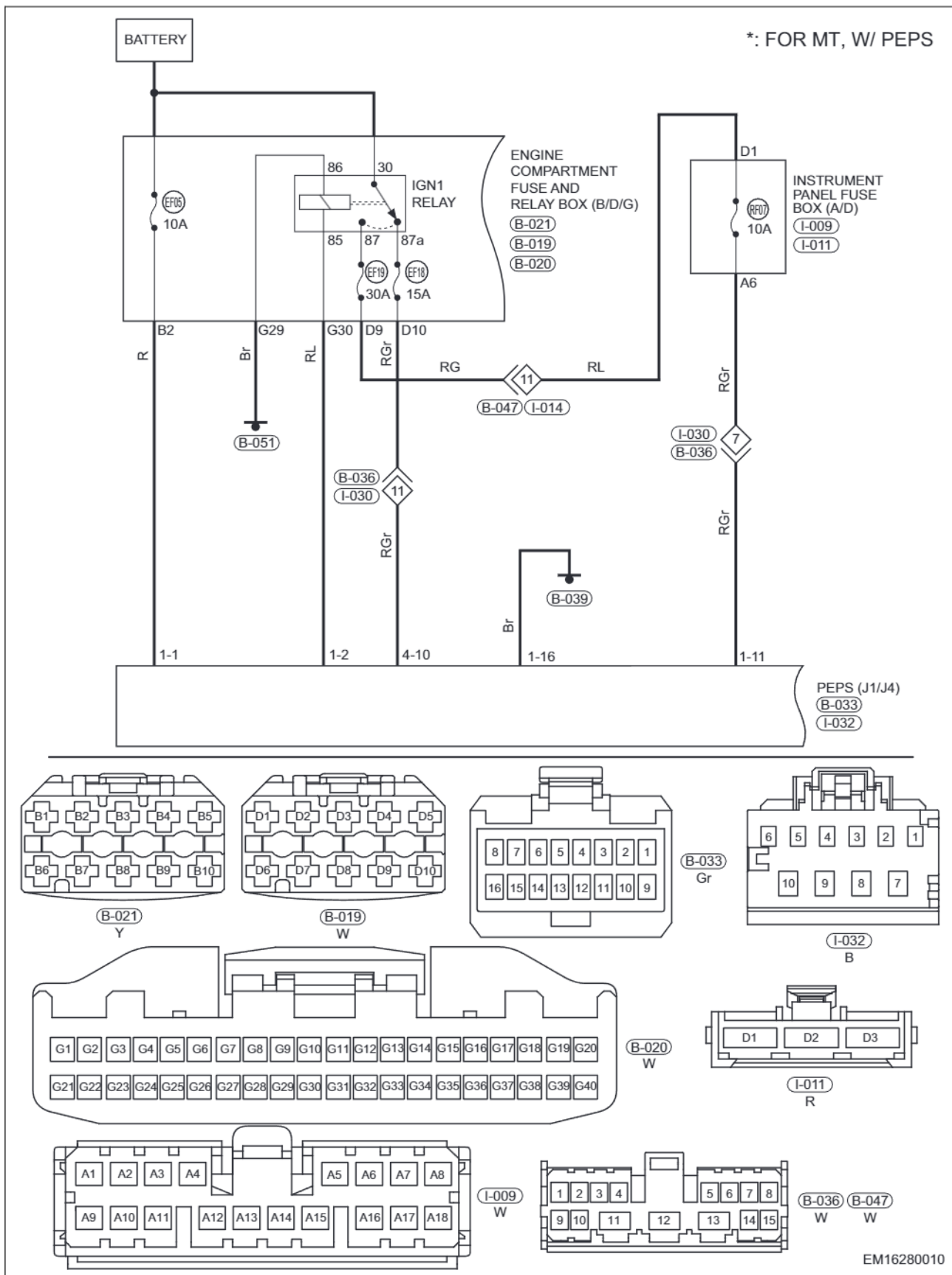
Circuits are very sensitive to proper grounding. A loose or corroded ground can affect control circuit. Check the ground points as follows:

1. Remove the ground bolt or nut.
2. Check all contact surfaces for tarnish, dirt and rust, etc.
3. Clean as necessary to ensure that the contacting is in a good condition.
4. Reinstall the bolt or nut securely.
5. Check if add-on accessories interfere with ground circuit.
6. If several wire harnesses are crimped into one ground eyelet terminal, check if they are installed correctly. Make sure all wire harnesses are clean, securely fastened and providing a good ground path.

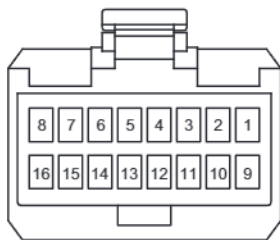
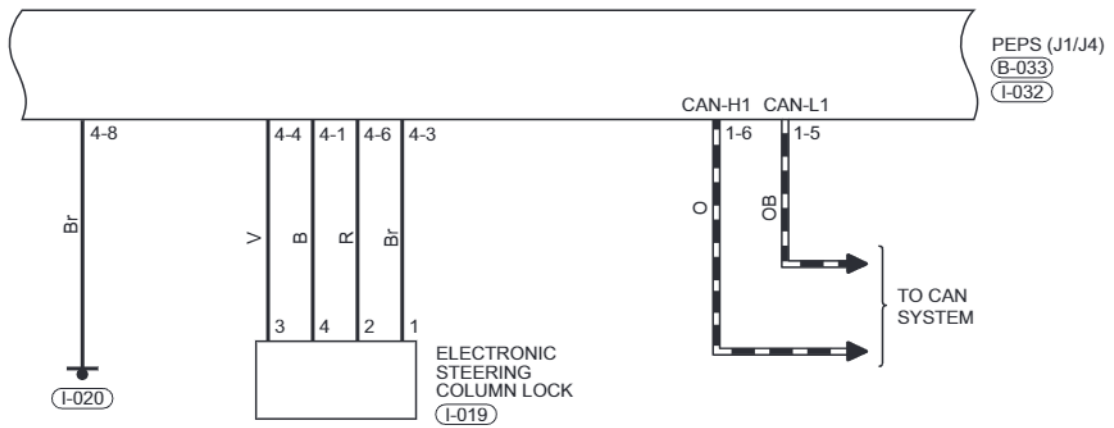
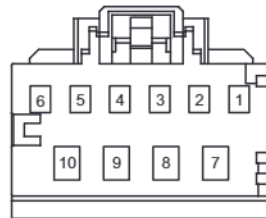
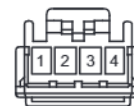
## Diagnostic Trouble Code (DTC) Chart

| DTC Code | DTC Definition                                     |
|----------|----------------------------------------------------|
| B150D-00 | Abnormality on ESCL LCK_GND No Subtype Information |
| B150E-00 | Abnormality on ESCL LCK_PS No Subtype Information  |
| B150F-00 | ESCL Anti-scanning No Subtype Information          |
| B1511-00 | Abnormality in ESCL Lock No Subtype Information    |
| B1512-00 | Abnormality in ESCL Unlock No Subtype Information  |
| B1513-00 | ESCL External Failure No Subtype Information       |
| U0329-87 | Lost Communication with ESCL Missing Message       |

|     |          |                                                    |
|-----|----------|----------------------------------------------------|
| DTC | B150D-00 | Abnormality on ESCL LCK_GND No Subtype Information |
| DTC | B150E-00 | Abnormality on ESCL LCK_PS No Subtype Information  |
| DTC | B150F-00 | ESCL Anti-scanning No Subtype Information          |
| DTC | B1511-00 | Abnormality in ESCL Lock No Subtype Information    |
| DTC | B1512-00 | Abnormality in ESCL Unlock No Subtype Information  |
| DTC | B1513-00 | ESCL External Failure No Subtype Information       |



\*: FOR MT, W/ PEPS

(B-033)  
Gr(I-032)  
B(I-019)  
W

EM16280020

| DTC      | DTC Definition                                     | DTC Detection Condition | Possible Cause                                                                                                                                                                                    |
|----------|----------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B150D-00 | Abnormality on ESCL LCK_GND No Subtype Information | Engine switch ON        | <ul style="list-style-type: none"> <li>• Wire harness or connector damaged</li> <li>• Fuse</li> <li>• IGN1 Relay</li> <li>• Electronic steering column lock</li> <li>• PEPS controller</li> </ul> |
| B150E-00 | Abnormality on ESCL LCK_PS No Subtype Information  |                         |                                                                                                                                                                                                   |
| B150F-00 | ESCL Anti-scanning No Subtype Information          |                         |                                                                                                                                                                                                   |
| B1511-00 | Abnormality in ESCL Lock No Subtype Information    |                         |                                                                                                                                                                                                   |
| B1512-00 | Abnormality in ESCL Unlock No Subtype Information  |                         |                                                                                                                                                                                                   |
| B1513-00 | ESCL External Failure No Subtype Information       |                         |                                                                                                                                                                                                   |

### CAUTION

- When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

### DTC Confirmation Procedure

Confirm that battery voltage is normal before performing following procedures.

- Turn off engine switch.
- Connect X-431 3G diagnostic tester (the latest software) to Data Link Connector (DLC).
- Turn on engine switch.
- Using X-431 3G diagnostic tester, record and clear DTCs stored in PEPS system.
- Turn off engine switch and wait for a few seconds.
- Using X-431 3G diagnostic tester, select Read Code.
- If DTC is detected, malfunction indicated by DTC is current. Go to diagnosis procedure - Step 1.
- If DTC is not detected, malfunction indicated by DTC is intermittent ([See page 28-11](#)).

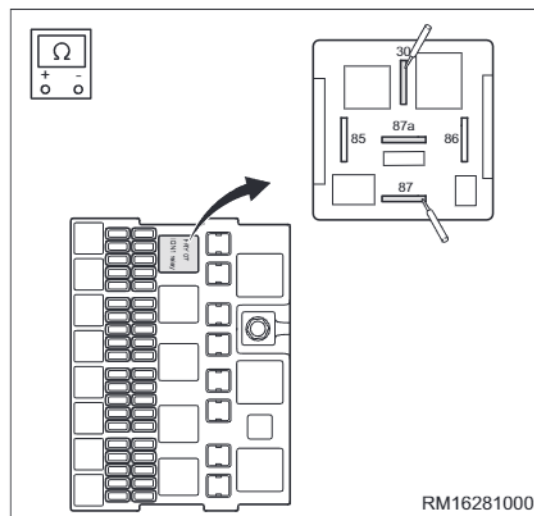
## Diagnosis Procedure

### 1 Check fuse and relay

28

- Turn off all electrical equipment and the engine switch.
- Disconnect the negative battery cable.
- Remove the fuse EF18 (15 A) from engine compartment fuse and relay box.
- Remove the IGN1 relay from engine compartment fuse and relay box, and check the IGN1 relay.

| Multimeter Connection      | Specified Condition                                                       |
|----------------------------|---------------------------------------------------------------------------|
| Terminal 30 - Terminal 87  | No continuity                                                             |
| Terminal 30 - Terminal 87a | Continuity                                                                |
| Terminal 30 - Terminal 87  | Continuity<br>(Battery voltage is applied between terminals 85 and 86)    |
| Terminal 30 - Terminal 87a | No continuity<br>(Battery voltage is applied between terminals 85 and 86) |



- Check if fuse and relay are blown or damaged.

NG

Repair or replace damaged fuse and relay

OK

### 2 Check connector and wire harness

- Check PEPS controller ground point I-020 ([See page 53-29](#)).
- Disconnect PEPS controller connector I-032 and electronic steering column lock connector I-019.
- Disconnect the engine compartment fuse and relay box connector B-019.
- Disconnect the instrument panel wire harness connector and body wire harness connector I-030/B-036.
- Check if wire harnesses are worn, pierced, pinched or partially broken.
- Look for broken, bent, protruded or corroded terminals.
- Check if related connector pins are in good condition.

NG

Repair or replace related wire harness and connector

OK

### 3 Check body wire harness

- a. Check the wire harness between engine compartment fuse and relay box connector B-019 and body wire harness connector B-036.

#### Check for Open

| Multimeter Connection    | Condition | Specified Condition |
|--------------------------|-----------|---------------------|
| B-019 (D10) - B-036 (11) | Always    | Continuity          |

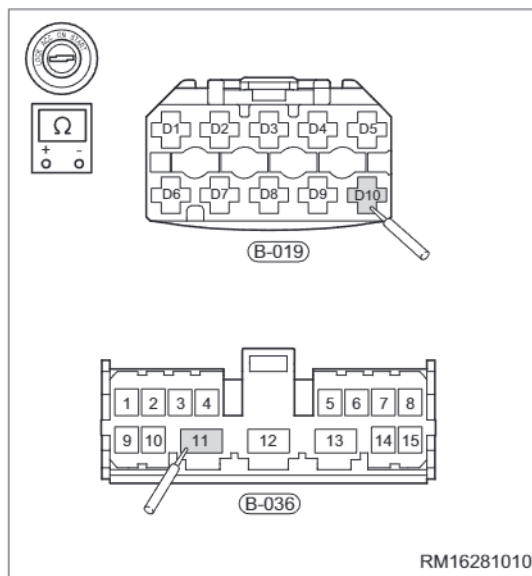
#### Check for Short

| Multimeter Connection                        | Condition | Specified Condition |
|----------------------------------------------|-----------|---------------------|
| B-019 (D10) or B-036 (11) - Body ground      | Always    | No continuity       |
| B-019 (D10) or B-036 (11) - Battery positive | Always    | No continuity       |

NG

Repair or replace body wire harness

OK



### 4 Check instrument panel wire harness

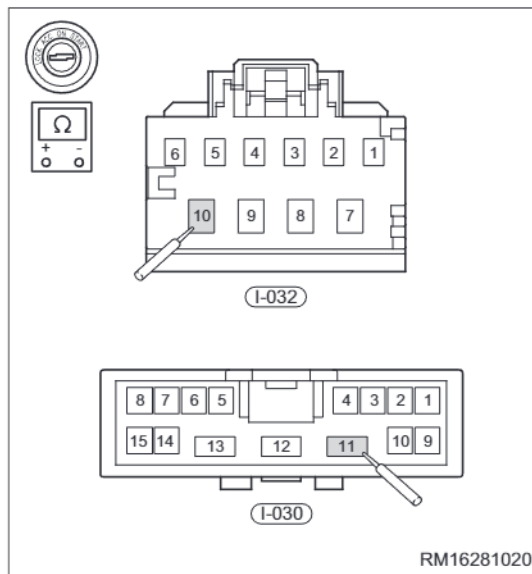
- a. Check the wire harness between instrument panel wire harness connector I-030 and PEPS controller connector I-032.

#### Check for Open

| Multimeter Connection   | Condition | Specified Condition |
|-------------------------|-----------|---------------------|
| I-030 (11) - I-032 (10) | Always    | Continuity          |

#### Check for Short

| Multimeter Connection                       | Condition | Specified Condition |
|---------------------------------------------|-----------|---------------------|
| I-030 (11) or I-032 (10) - Body ground      | Always    | No continuity       |
| I-030 (11) or I-032 (10) - Battery positive | Always    | No continuity       |



- b. Check the wire harness between PEPS controller connector I-032 and electronic steering column lock connector I-019.

**Check for Open**

| Multimeter Connection | Condition | Specified Condition |
|-----------------------|-----------|---------------------|
| I-019 (1) - I-032 (3) | Always    | Continuity          |
| I-019 (2) - I-032 (6) | Always    | Continuity          |

**Check for Short**

| Multimeter Connection                     | Condition | Specified Condition |
|-------------------------------------------|-----------|---------------------|
| I-019 (1) or I-032 (3) - Body ground      | Always    | No continuity       |
| I-019 (2) or I-032 (6) - Body ground      | Always    | No continuity       |
| I-019 (1) or I-032 (3) - Battery positive | Always    | No continuity       |
| I-019 (2) or I-032 (6) - Battery positive | Always    | No continuity       |

NG

Repair or replace instrument panel wire harness

OK

5

Check if electronic steering column lock is locked

- Connect related wire harness connectors.
- Connect the negative battery cable.
- Perform lock and unlock procedures for electronic steering column lock, check if electronic steering column lock can be locked and unlocked.

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Go to next step

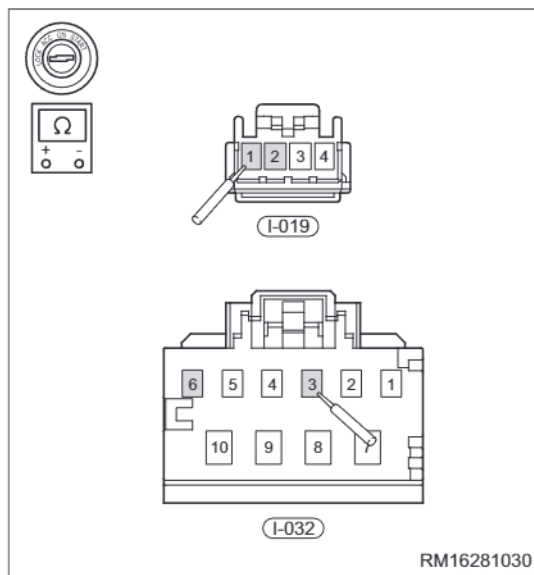
OK

System operates normally

6

Replace PEPS controller

- Remove the PEPS controller ([See page 15-79](#)).
- Replace the PEPS controller.



c. Check if electronic steering column lock can be locked and unlocked.

NG

Repair or replace electronic steering column lock

OK

28

System operates normally

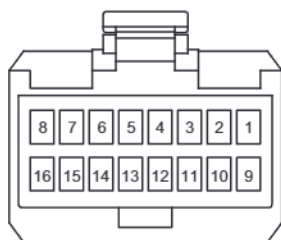
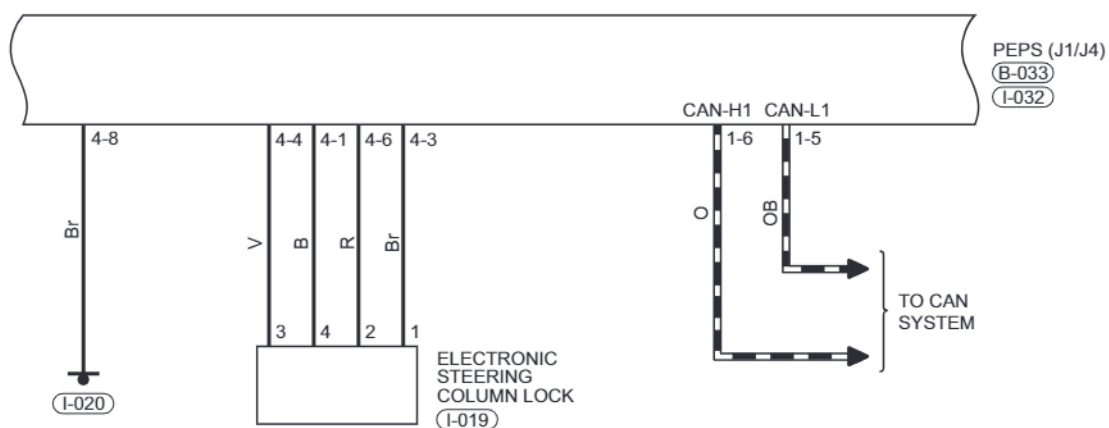
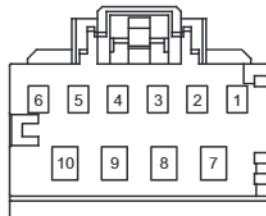
DTC

U0329-87

Lost Communication with ESCL Missing Message

\*: FOR MT, W/ PEPS

28

B-033  
GrI-032  
BI-019  
W

EM16280020

| DTC      | DTC Definition                               | DTC Detection Condition | Possible Cause                                                                                               |
|----------|----------------------------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------|
| U0329-87 | Lost Communication with ESCL Missing Message | Engine switch ON        | <ul style="list-style-type: none"> <li>Wire harness or connector damaged</li> <li>PEPS controller</li> </ul> |

**CAUTION**

- When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

**DTC Confirmation Procedure**

Confirm that battery voltage is normal before performing following procedures.

- Turn off engine switch.
- Connect X-431 3G diagnostic tester (the latest software) to Data Link Connector (DLC).
- Turn on engine switch.
- Using X-431 3G diagnostic tester, record and clear DTCs stored in PEPS system.
- Turn off engine switch and wait for a few seconds.
- Using X-431 3G diagnostic tester, select Read Code.
- If DTC is detected, malfunction indicated by DTC is current. Go to diagnosis procedure - Step 1.
- If DTC is not detected, malfunction indicated by DTC is intermittent ([See page 28-11](#)).

**Diagnosis Procedure****1 Check PEPS controller ground**

- Turn off engine switch.
- Check the PEPS controller ground point I-020 ([See page 53-29](#)).

**NG**

**Repair or replace PEPS controller ground wire harness or ground point**

**OK****2 Check wire harness and connector**

- Disconnect the negative battery cable.
- Disconnect the PEPS controller connector I-032.
- Disconnect the electronic steering column lock connector I-019.
- Check if wire harnesses are worn, pierced, pinched or partially broken.
- Look for broken, bent, protruded or corroded terminals.
- Check if related connector pins are in good condition.

**NG**

**Repair or replace related connector and wire harness**

OK

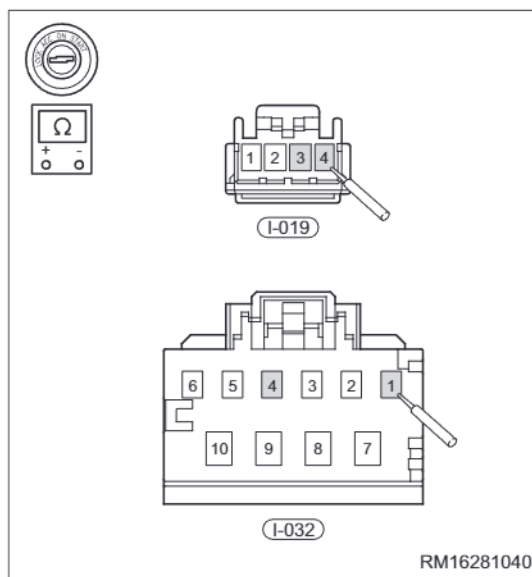
### 3 Check electronic steering column lock control wire

#### 28 Check for Open

| Multimeter Connection | Condition | Specified Condition |
|-----------------------|-----------|---------------------|
| I-019 (3) - I-032 (4) | Always    | Continuity          |
| I-019 (4) - I-032 (1) | Always    | Continuity          |

#### Check for Short

| Multimeter Connection                     | Condition | Specified Condition |
|-------------------------------------------|-----------|---------------------|
| I-019 (3) or I-032 (4) - Body ground      | Always    | Continuity          |
| I-019 (4) or I-032 (1) - Body ground      | Always    | Continuity          |
| I-019 (3) or I-032 (4) - Battery positive | Always    | Continuity          |
| I-019 (4) or I-032 (1) - Battery positive | Always    | Continuity          |



NG

Repair or replace related connector and wire harness

OK

### 4 Replace PEPS controller

- Remove the PEPS controller ([See page 15-79](#)).
- Replace the PEPS controller.
- Connect related wire harness connectors.
- Connect the negative battery cable.
- Turn on engine switch.
- Connect X-431 3G diagnostic tester to Data Link Connector, check if any DTC is detected.

OK

System operates normally

NG

### 5 Replace electronic steering column lock

- a. Disconnect the negative battery cable.
- b. Replace the electronic steering column lock.
- c. Connect the negative battery cable.
- d. Turn on engine switch.
- e. Connect X-431 3G diagnostic tester to Data Link Connector, check if any DTC is detected.

OK

28

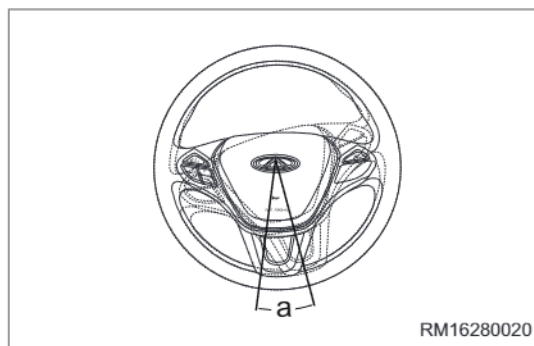
System operates normally

## Steering Wheel Free Play Inspection

1. Stop vehicle and position front wheels straight ahead.
2. Gently turn steering wheel left and right, and check rotation angle of steering wheel when wheels start to rotate.

Standard value of free play (rotation angle):  $\alpha \leq 15^\circ$ .

28



3. If measured value exceeds standard value, check the steering system.

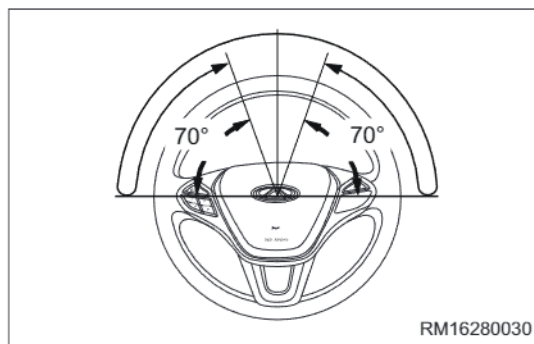
## Steering Wheel Centering/Returnability Inspection

Steering wheel centering/returnability inspection should be performed during road test.

1. Perform slow turn and sharp turn test.

Check for deviation of steering wheel steering force required during left/right turn and centering/returnability.

2. When vehicle speed is between 20 and 30 km/h, turn steering wheel either to left or right by  $90^\circ$  and keep it for 1 or 2 seconds, and then release the steering wheel. If steering wheel turns back more than  $70^\circ$ , it is determined that steering wheel centering/returnability is in good condition.



3. If steering wheel returning angle is not as specified, check tire pressure, steering system and suspension system.

# ON-VEHICLE SERVICE

## Steering Wheel Assembly

### Removal

#### ⚠ WARNING

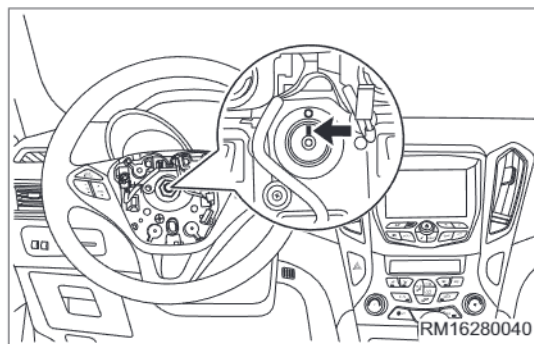
- Be sure to read precautions for SRS airbag before removing steering wheel (See page 32-84).

1. Set the steering wheel to straight-ahead position.
2. Turn off all electrical equipment and the ignition switch.
3. Disconnect the negative battery cable.

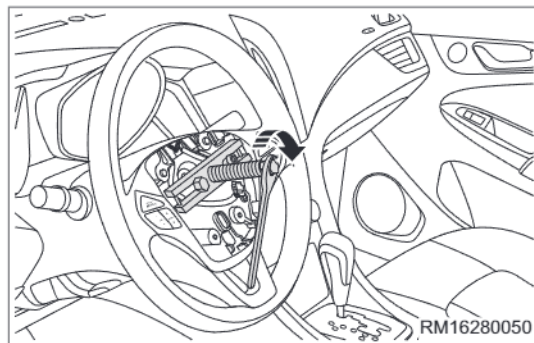
#### 👁 CAUTION

- Wait at least 90 seconds after disconnecting the negative battery cable to prevent airbag and belt pretensioner from being activated.

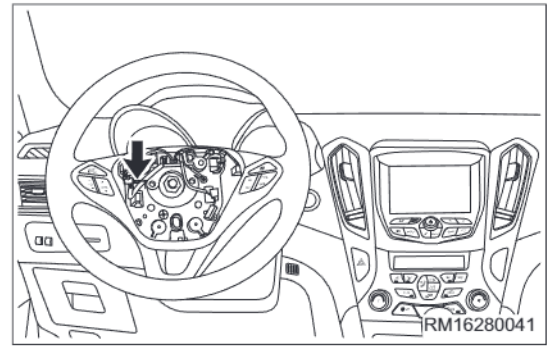
4. Remove the driver airbag assembly (See page 32-84).
5. Remove the steering wheel assembly.
  - a. Secure the steering wheel assembly, and put matchmarks on the steering wheel assembly and steering column assembly, then remove the steering wheel assembly fixing nut.  
(Tightening torque:  $35 \pm 3 \text{ N}\cdot\text{m}$ )



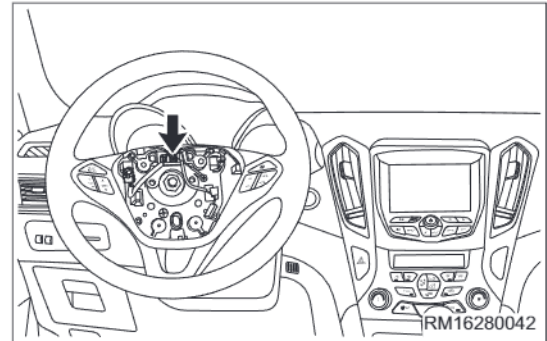
- b. As shown in the illustration, install the steering wheel remover, and then tighten it with a wrench to loosen the steering wheel assembly from steering column assembly.



- c. Cut the wire harness band (arrow).



- d. Disconnect the steering wheel quick button connector (arrow).



- e. Remove the steering wheel assembly.

#### CAUTION

- Be careful when removing steering wheel assembly to prevent damage to airbag connector and horn connector on spiral cable.

## Inspection

1. Check steering wheel assembly body for damage or deformation. Replace steering wheel assembly if necessary.
2. Check spline in steering wheel assembly for damage. Replace steering wheel assembly if necessary.

## Installation

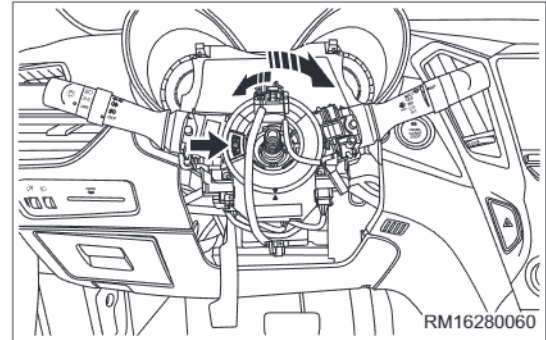
### CAUTION

- Check that front wheels are in straight-ahead position before installing steering wheel assembly.

1. Adjust the spiral cable to correct position.

#### HINT:

Fully turn spiral cable inner circle clockwise when realigning the center, and then turn it counterclockwise to align with ►◄ while yellow ball (arrow) occurs in the clear vertical window. Failure to follow these instructions may affect normal function of airbag system and cause injury to driver.



2. Pass the airbag connector, horn connector through the hole of steering wheel assembly, and connect the steering wheel quick button connector. Then align the matchmarks on steering wheel assembly and steering column assembly to install the steering wheel assembly.
3. Other installation procedures are in the reverse order of removal.

### CAUTION

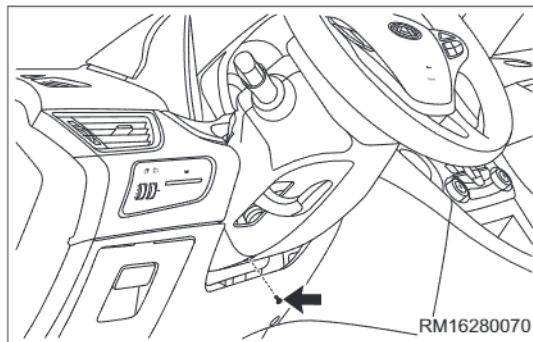
- Tighten steering wheel assembly fixing nut to specified torque.
- Correctly install each connector.
- After repairing, check that airbag system operates normally.

## Combination Switch Cover

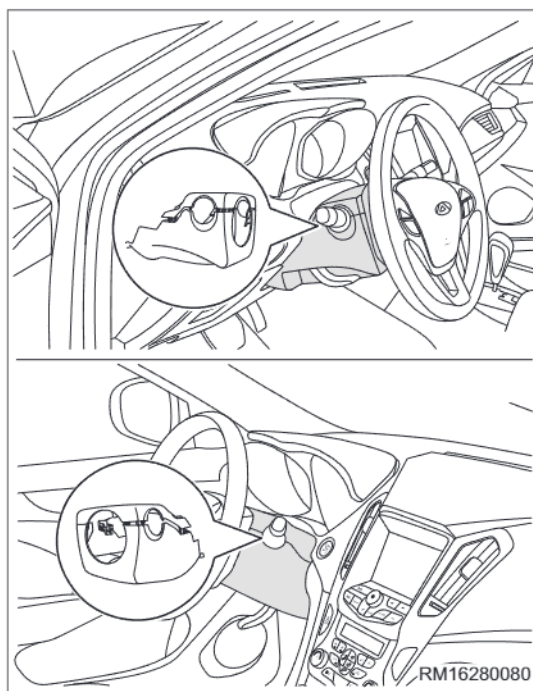
### Removal

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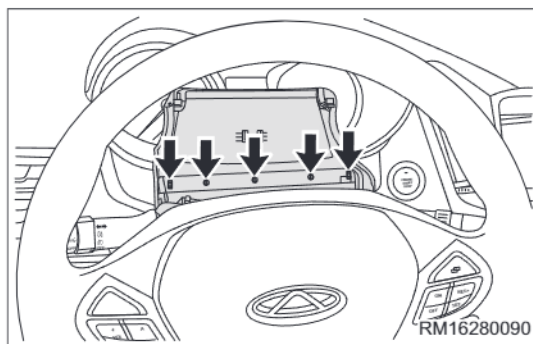
1. Set the steering wheel to straight-ahead position.
2. Turn off all electrical equipment and the ignition switch.
3. Remove the combination switch cover.
  - a. Remove the lower fixing screw (arrow) from combination switch cover.  
(Tightening torque:  $2 \pm 0.5 \text{ N}\cdot\text{m}$ )



- b. Disengage the connecting clip between upper cover and lower cover, and then separate upper cover and lower cover to remove the lower cover.



- c. Separate 5 clips between upper cover and steering column dust gasket, and then remove the upper cover.



 **CAUTION**

- Operate carefully to prevent damage to components during removal.

**28****Inspection**

1. Check combination switch upper and lower covers for damage or deformation. Replace upper and lower covers if necessary.
2. Check if upper and lower cover clips are normal. Replace upper and lower covers if necessary.

**Installation**

1. Loosen the steering wheel adjusting handle, and adjust the steering column assembly to uppermost position, then tighten the adjusting handle to uppermost position.
2. Insert the steering column lower cover from right side of ignition switch at an angle, and then install the adjusting handle into cover hole.
3. After adjusting lower cover, install upper cover and fix upper and lower cover clips in place, then install self-tapping screws.

 **CAUTION**

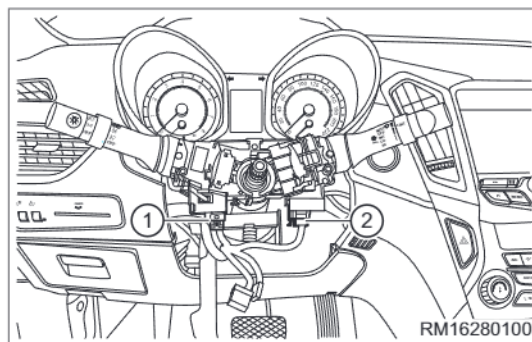
- Tighten self-tapping screws in place.
- Operate carefully to prevent damage to components during installation.

## Steering Column with Intermediate Shaft Assembly (w/o EPS)

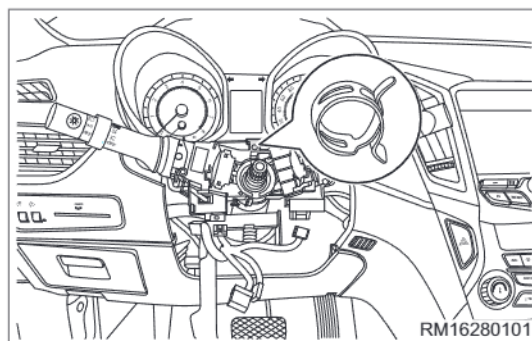
### Removal

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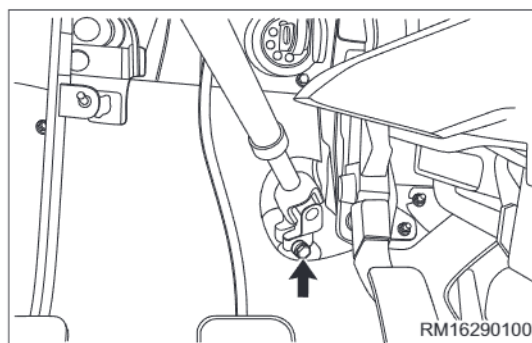
1. Set the steering wheel to straight-ahead position.
2. Turn off all electrical equipment and the ignition switch.
3. Disconnect the negative battery cable.
4. Remove the driver airbag assembly (See page 32-84).
5. Remove the steering wheel assembly (See page 28-25).
6. Remove the combination switch cover (See page 28-28).
7. Remove the spiral cable (See page 32-87).
8. Remove the combination switch assembly.
  - a. Disconnect the combination light switch connector (1) and wiper switch connector (2).



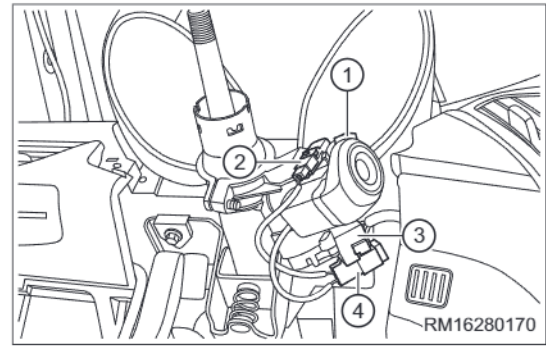
- b. Loosen the combination switch clamp and pull the combination switch outward, then disconnect the combination switch from steering column to remove the combination switch.



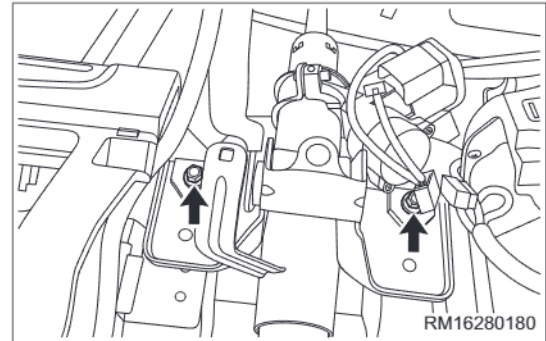
9. Remove the steering column with intermediate shaft assembly.
  - a. Remove the coupling bolt between steering column with intermediate shaft assembly and steering gear input shaft. (Tightening torque:  $30 \pm 3$  N·m)



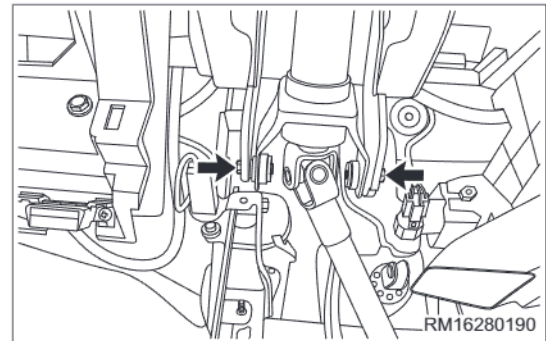
- b. Disconnect the anti-theft module connector (1), ignition key connector (2), ignition switch connector (3) and ignition switch illumination light connector (4).



- c. Remove 2 fixing bolts (arrow) from steering column upper bracket.  
(Tightening torque:  $25 \pm 3$  N·m)



- d. Remove 2 fixing bolts (arrow) from steering column lower bracket.  
(Tightening torque:  $25 \pm 3$  N·m)



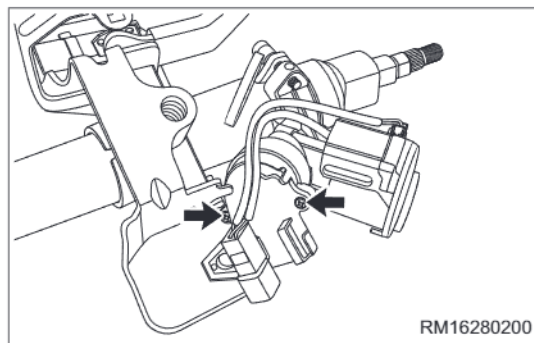
- e. Remove the steering column with intermediate shaft assembly.

**CAUTION**

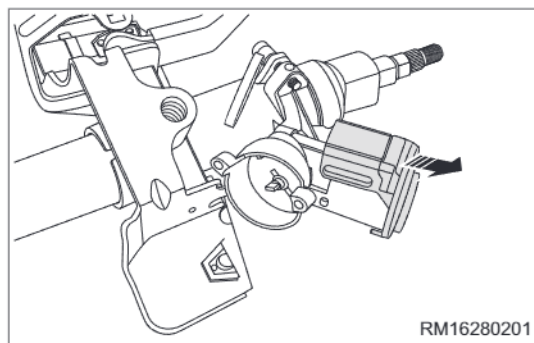
- DO NOT touch interior ornaments when removing steering column with intermediate shaft assembly to avoid scratching the interior ornaments.

## Disassembly

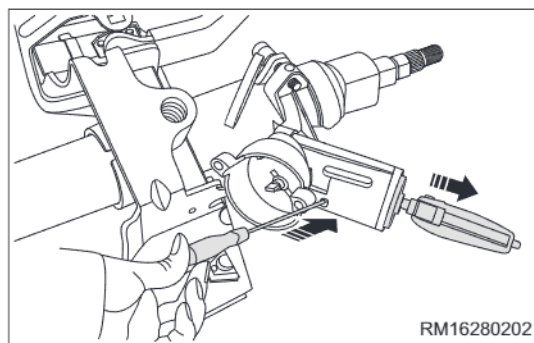
1. Remove the ignition starting switch.
  - a. Remove the fixing screws (arrow) from ignition starting switch, and then remove the ignition starting switch.  
(Tightening torque:  $13 \pm 2$  N·m)



2. Remove the ignition switch illumination light.
  - a. Remove the ignition switch illumination light in direction of arrow from ignition switch lock body.



3. Remove the ignition key cylinder.
  - a. Turn ignition switch key cylinder to ACC with key, and insert a small screwdriver or similar tool into ignition switch lock body hole, then pull out the ignition key cylinder.

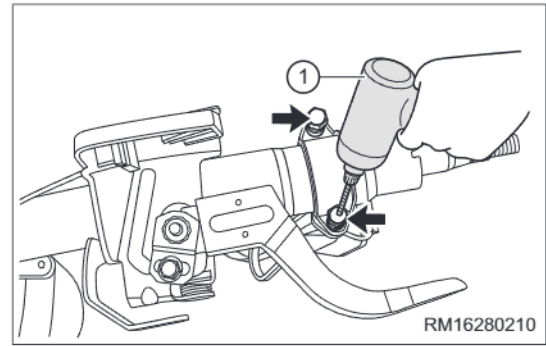


4. Remove the ignition switch lock body.
  - a. Set the steering column assembly onto a vise.

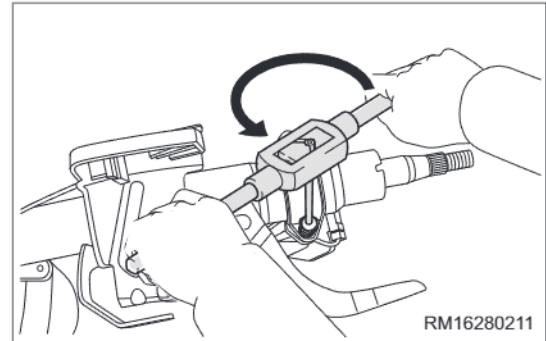
### CAUTION

- DO NOT tighten vise excessively.

- b. Using an electric drill (1), drill a hole on the ignition switch lock body anti-theft bolts (arrow).



- c. Using a screw remover, remove the ignition switch lock body anti-theft bolts.



- d. Remove the ignition switch lock body and ignition switch fixing clamp.

## Inspection

1. Check if ignition switch lock body and key cylinder are normal. Replace ignition switch lock body and key cylinder if necessary.
2. Check steering column assembly for wear, cracks or deformation, and welding or correction is not allowed. Replace steering column assembly if necessary.
3. Check steering column bearing for looseness, wear or sticking. Replace steering column assembly if necessary.

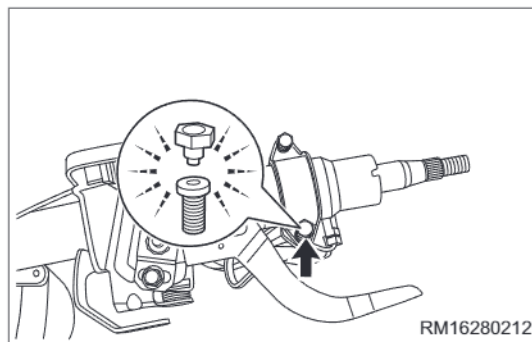
## Assembly

1. Install the ignition switch assembly.
  - a. Set the steering column assembly onto a vise.

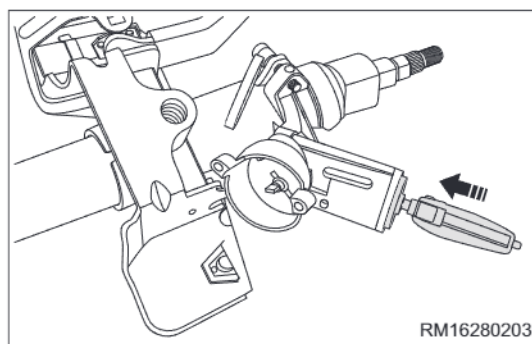
### CAUTION

- DO NOT tighten vise excessively.

- b. Install the ignition switch assembly to steering column assembly with new ignition switch lock anti-theft bolts, and then tighten the anti-theft bolts until the heads are disengaged.



2. Install the ignition key cylinder.
  - a. Push the ignition key cylinder into ignition switch lock body until the ignition key cylinder fixing block locks in place.



- b. Check the ignition key cylinder for proper operation.

When the key is removed, steering lock is locked; when the key is inserted and turn ignition switch to ACC or ON, steering lock is unlocked.

## Installation

Installation is in the reverse order of removal.

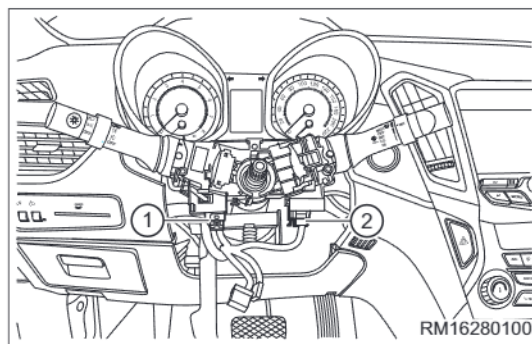
### CAUTION

- Before installing steering column assembly, slide the spline at lower part of steering column assembly onto intermediate shaft upper universal joint first.
- Tighten fixing nuts, bolts and screws in place.
- Correctly install each connector.

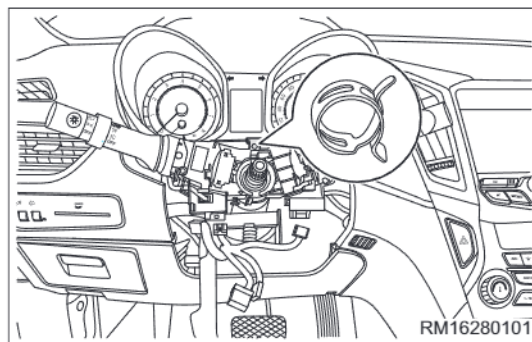
## Electronic Power Steering Column with Intermediate Shaft Assembly

### Removal

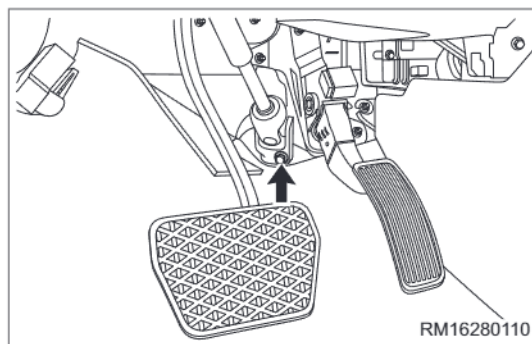
1. Set the steering wheel to straight-ahead position.
2. Turn off all electrical equipment and the engine starting switch.
3. Disconnect the negative battery cable.
4. Remove the driver airbag assembly (See page 32-84).
5. Remove the steering wheel assembly (See page 28-25).
6. Remove the combination switch cover (See page 28-28).
7. Remove the spiral cable (See page 32-87).
8. Remove the combination switch assembly.
  - a. Disconnect the combination light switch connector (1) and wiper switch connector (2).



- b. Loosen the combination switch clamp and pull the combination switch outward, then disconnect the combination switch from steering column to remove the combination switch.

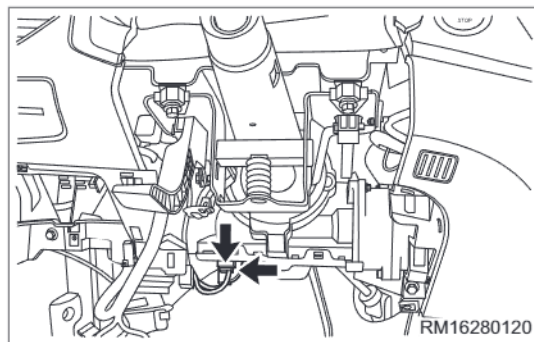


9. Remove the lower left protector assembly (See page 46-22).
10. Remove the coupling bolt (arrow) between steering column with intermediate shaft assembly and steering gear input shaft.  
(Tightening torque:  $60 \pm 5 \text{ N} \cdot \text{m}$ )

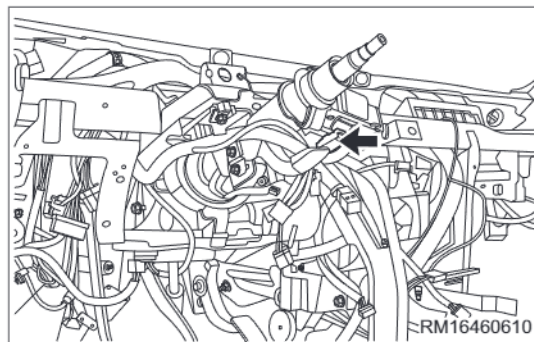


11. Remove the steering column with intermediate shaft assembly.

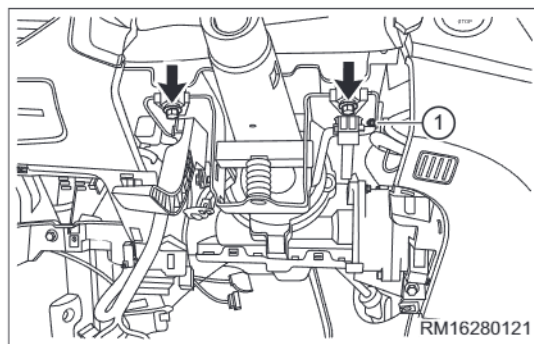
- a. Disconnect 2 connectors (arrow) from electronic controller.



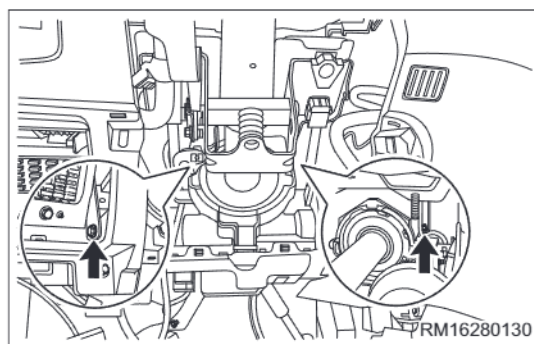
- b. Disconnect the electronic steering column lock connector (arrow) (for MT model).



- c. Remove 2 fixing bolts (arrow) from upper bracket of steering column assembly, and then remove the wire harness fixing clip (1).  
(Tightening torque:  $25 \pm 3$  N·m)



- d. Remove 2 fixing bolts (arrow) from lower bracket of steering column assembly.  
(Tightening torque:  $25 \pm 3$  N·m)



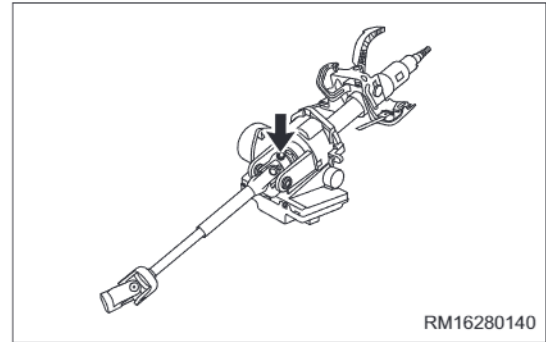
- e. Remove the steering column with intermediate shaft assembly.

### CAUTION

- DO NOT touch interior ornaments when removing steering column with intermediate shaft assembly to avoid scratching interior ornaments.

## Disassembly

1. Remove the coupling bolt (arrow) between electronic power steering column and intermediate shaft assembly.  
(Tightening torque: 50 N·m)

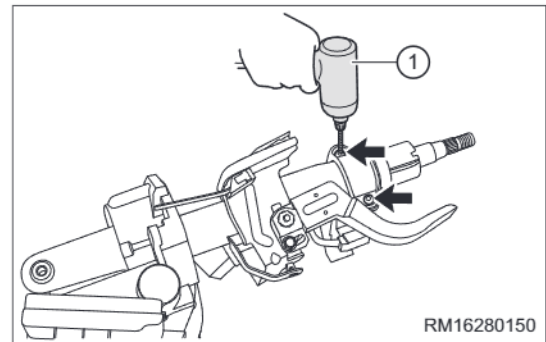


2. Remove the electronic steering column lock body (for MT model).
  - a. Set the steering column assembly onto a vise.

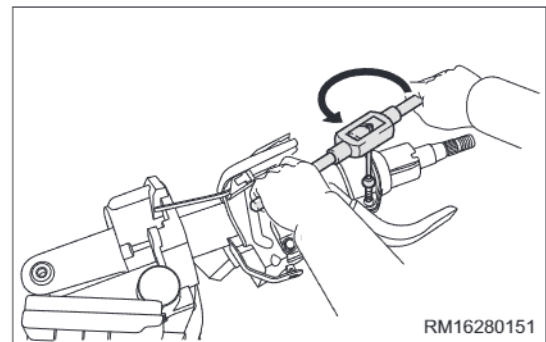
### CAUTION

- DO NOT tighten vise excessively.

- b. Using an electric drill (1), drill a hole on the electronic steering column lock body anti-theft bolts (arrow).



- c. Using a screw remover, remove the electronic steering column lock body anti-theft bolts.



- d. Remove the electronic steering column lock body and steering column lock fixing clamp.

## Inspection

1. Check if electronic steering column lock body is normal. Replace electronic steering column lock body if necessary.
2. Check intermediate shaft with universal joint assembly for rust, wear or deformation and universal joint spline for damage or insufficient lubrication. Apply grease or replace intermediate shaft with universal joint assembly if necessary.
3. Check universal joint for wear or insufficient lubrication, and welding part for breakage. Replace intermediate shaft with universal joint assembly if necessary.

4. Check if intermediate shaft assembly retracts smoothly, if it is stuck or cannot retract, replace intermediate shaft with universal joint assembly.
5. Check if electronic controller is normal. Replace electronic controller if necessary.
6. Check steering column assembly for wear, cracks or deformation, and welding or correction is not allowed. Replace steering column assembly if necessary.
7. Check steering column bearing for looseness, wear or sticking. Replace steering column assembly if necessary.

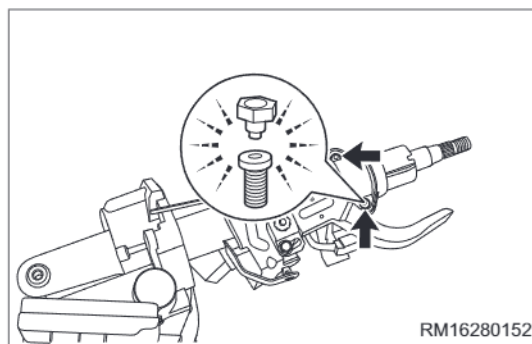
### Assembly

1. Install the electronic steering column lock body (for MT model).
  - a. Set the steering column assembly onto a vise.

#### CAUTION

- DO NOT tighten vise excessively.

- b. Install the electronic steering column lock body to steering column assembly with new electronic steering column lock body anti-theft bolts, and then tighten the anti-theft bolts until the heads are disengaged.



### Installation

Installation is in the reverse order of removal.

#### CAUTION

- Before installing steering column assembly, slide the spline at lower part of steering column assembly onto intermediate shaft upper universal joint first.
- Tighten fixing nuts, bolts and screws in place.
- Correctly install each connector.

