

SECTION **ST**  
STEERING SYSTEM

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# PRECAUTIONS

< PRECAUTION >

## PRECAUTION

### PRECAUTIONS

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

INFOID:000000007306668

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 SR and SB section 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 SR section.**
- **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.**

#### PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

#### **WARNING:**

- **When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

#### Precaution for Steering System

INFOID:000000007306669

- Before disassembly, thoroughly clean the outside of the unit.
- Disassembly should be done in a clean work area. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- For easier and proper assembly, place disassembled parts in order on a parts rack.
- Use nylon cloth or paper towels to clean the parts; common shop rags can leave lint that might interfere with their operation.
- Before inspection or reassembly, carefully clean all parts with a general purpose, non-flammable solvent.
- Before assembly, apply a coat of recommended Genuine NISSAN PSF or equivalent to hydraulic parts. Petroleum jelly may be applied to O-rings and seals. Do not use any grease.
- Replace all gaskets, seals and O-rings. Avoid damaging O-rings, seals and gaskets during installation. Perform functional tests whenever designated.

# PREPARATION

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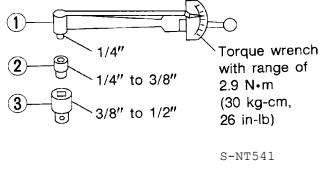
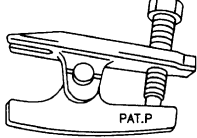
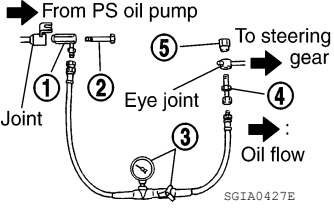
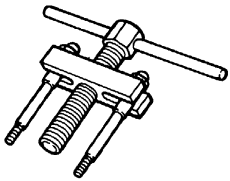
## PREPARATION

### PREPARATION

#### Special Service Tool

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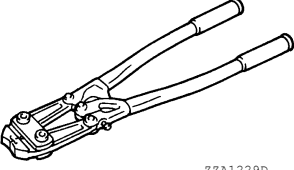
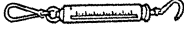
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

| Tool number<br>(Kent-Moore No.)<br>Tool name  | Description  |
|---|--|
| ST3127 S000<br>(See J-25765-A)<br>Preload gauge<br>1. GG9103000<br>(J-25765-A)<br>Torque wrench<br>2. HT62940000<br>( — )<br>Socket adapter<br>3. HT62900000<br>( — )<br>Socket adapter   | Inspecting of pinion rotating torque and rotational torque for ball joint<br> |
| HT72520000<br>(J-25730-A)<br>Ball joint remover   | Removing steering outer socket<br>   |
| 1. KV48105300-4 and 5295262U10<br>( — )<br>Connector A and O-ring<br>2. KV48105300-3 and 5295262U00<br>( — )<br>Eye-bolt and O-ring<br>3. KV48103500<br>(J-26357 and J-26357-10)<br>Pressure gauge and shut-off valve<br>4. KV48105300-1 and 5295262U00<br>( — )<br>Connector B and O-ring<br>5. KV48105300-2<br>( — )<br>Nut | Measuring oil pump relief pressure<br>                                      |
| ST27180001<br>(J-25726-A)<br>Steering wheel puller  | Removing steering wheel<br>   |

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# PREPARATION

## < PREPARATION >

| Tool number<br>(Kent-Moore No.)<br>Tool name   | Description                            |
|--|--|
| KV40107300<br>( — )  | Crimping boot bands                    |
| <br><small>ZZA1229D</small> |  |
| —<br>(J-44372)<br>Spring gauge   | Measuring steering wheel turning force |
| <br><small>LST024</small>   |  |

## Commercial Service Tool

INFOID:000000007306671

| Tool name  | Description                      |
|--|----------------------------------|
| Power tool   | Loosening nuts, screws and bolts |
| <br><small>PIIB1407E</small> |                                  |

# NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

## SYMPTOM DIAGNOSIS

### NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

#### NVH Troubleshooting Chart

INFOID:000000007306672

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

| Symptom | Possible cause and suspected parts |       | Reference page  |
|---------|------------------------------------|-------|---|
|         | Noise                              | Shake |   |
|         | x                                  |       | <a href="#">SI-6</a>  |
|         | x                                  |       | <a href="#">SI-6</a>  |
|         | x                                  |       | <a href="#">SI-32</a>   |
|         | x                                  |       | <a href="#">SI-32</a>   |
|         | x                                  |       | <a href="#">SI-32</a>   |
|         | x                                  |       | <a href="#">SI-6</a>  |
|         | x                                  |       | <a href="#">SI-8</a>  |
|         | x                                  |       | <a href="#">SI-8</a>  |
|         | x                                  |       | <a href="#">EM-14, "Checking Drive Belts"</a>                                 |
|         |                                    | x     | <a href="#">SI-8</a>  |
|         |                                    | x     | <a href="#">SI-23</a>   |
|         |                                    | x     | <a href="#">SI-17</a>   |
|         |                                    | x     | <a href="#">SI-12</a>   |
|         |                                    | x     | <a href="#">SI-12</a>   |
|         |                                    | x     | <a href="#">SI-17</a>   |
|         |                                    |       | <a href="#">DLN-130 (2F1310),<br/>DLN-139 (2S1410),<br/>DLN-148, (3S1410)</a> |
|         |                                    |       | <a href="#">DLN-163, "NVH Troubleshooting Chart"</a>                          |
|         |                                    |       | <a href="#">FAX-4, "NVH Troubleshooting Chart"</a>                            |
|         |                                    |       | <a href="#">FSU-4, "NVH Troubleshooting Chart"</a>                            |
|         |                                    |       | <a href="#">WT-45, "NVH Troubleshooting Chart"</a>                            |
|         |                                    |       | <a href="#">WT-45, "NVH Troubleshooting Chart"</a>                            |
|         |                                    |       | <a href="#">FAX-4, "NVH Troubleshooting Chart"</a>                            |
|         |                                    |       | <a href="#">BR-5, "NVH Troubleshooting Chart"</a>                             |
|         | x                                  |       | PROPELLER SHAFT   |
|         | x                                  |       | FRONT FINAL DRIVE   |
|         | x                                  |       | WHEEL HUB   |
|         | x                                  |       | SUSPENSION  |
|         | x                                  |       | TIRES   |
|         | x                                  |       | ROAD WHEEL  |
|         | x                                  |       | DRIVE SHAFT   |
|         | x                                  |       | BRAKES  |

x: Applicable

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# POWER STEERING FLUID

< PERIODIC MAINTENANCE >

## PERIODIC MAINTENANCE

### POWER STEERING FLUID

#### Checking Fluid Level

INFOID:000000007306673

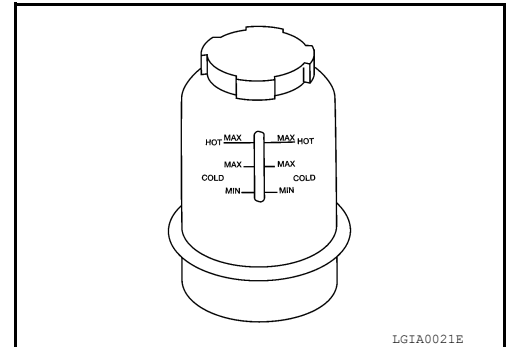
Check fluid level, referring to the scale on reservoir tank.

Use HOT range for power steering fluid temperatures of 50° – 80°C (122° – 176°F).

Use COLD range for power steering fluid temperatures of 0° – 30°C (32° – 86°F).

#### CAUTION:

- Do not overfill.
- Do not reuse any used power steering fluid.
- Recommended power steering fluid is Genuine NISSAN PSF or equivalent. Refer to [MA-16, "FOR NORTH AMERICA : Fluids and Lubricants"](#) North America, [MA-17, "FOR MEXICO : Fluids and Lubricants"](#) Mexico.



#### Checking Fluid Leakage

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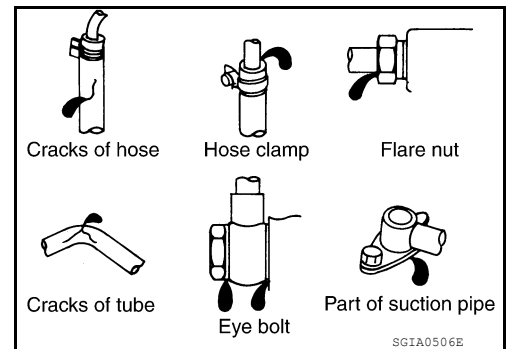
Check the hydraulic piping lines for improper attachment and for leaks, cracks, damage, loose connections, chafing or deterioration.

1. Run engine until power steering fluid temperature reaches 50° – 80°C (122° – 176°F) in reservoir tank. Keep engine speed idle.
2. Turn steering wheel right-to-left several times.
3. Hold steering wheel at each "lock" position for five seconds to check fluid leakage.

#### CAUTION:

**Do not hold steering wheel in a locked position for more than 10 seconds. (There is the possibility that oil pump may be damaged.)**

4. If power steering fluid leakage at connections is noticed, then loosen flare nut and then retighten. Do not over tighten connector as this can damage O-ring, washer and connector.
5. If power steering fluid leakage from oil pump is noticed, check power steering oil pump. Refer to [ST-10](#).
6. Check steering gear boots for accumulation of power steering fluid indicating a leak from the power steering gear.



#### Air Bleeding Hydraulic System

INFOID:000000007306675

Incomplete air bleeding causes the following. When this happens, bleed air again.

- Air bubbles in reservoir tank.
- Clicking noise in power steering oil pump.
- Excessive buzzing in power steering oil pump.

#### NOTE:

When vehicle is stationary or while steering wheel is being turned slowly, some noise may be heard from power steering oil pump or the power steering gear. This noise is normal and does not affect any system.

1. Stop engine, and then turn steering wheel fully to right and left several times.

#### CAUTION:

**Do not allow steering fluid reservoir tank to go below the MIN level line. Check tank frequently and add power steering fluid as needed.**

2. Run engine at idle speed. Turn steering wheel fully right and then fully left, hold for about three seconds. Then check for power steering fluid leakage.
3. Repeat step 2 several times at about three second intervals.

#### CAUTION:

**Do not hold steering wheel in the locked position for more than 10 seconds. (There is the possibility that the power steering oil pump may be damaged.)**

4. Check for air bubbles or cloudy fluid.

# POWER STEERING FLUID

## < PERIODIC MAINTENANCE >

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5. If air bubbles or cloudiness still exists, stop engine, perform steps 2 and 3 again until air bubbles or cloudiness does not exist.
6. Stop engine, check power steering fluid level.

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# STEERING WHEEL

< REMOVAL AND INSTALLATION >

## REMOVAL AND INSTALLATION

### STEERING WHEEL

#### On-Vehicle Inspection and Service

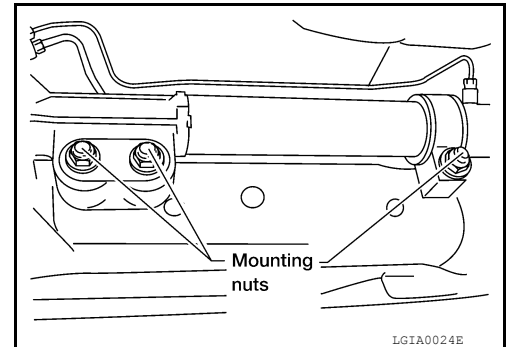
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#### CHECKING CONDITION OF INSTALLATION

- Check installation condition of power steering gear assembly, front suspension, axle and steering column.
- Check if movement exists when steering wheel is moved up and down, to the left and right and to the axial direction.

**End play of the axial direction for steering wheel** : Refer to [ST-31, "Steering Wheel"](#)

- Check if the nuts for power steering gear assembly are loose. Refer to [ST-17](#).



#### CHECKING STEERING WHEEL PLAY

1. Turn tires straight ahead, start engine, then turn steering wheel to the left and right lightly, and measure steering wheel movement on the outer circumference when steering wheel is turned up to the point where tires start moving.

**Steering wheel play on the outer circumference** : Refer to [ST-31, "Steering Wheel"](#)

#### CHECKING NEUTRAL POSITION ON STEERING WHEEL

- Check neutral position on steering wheel after confirming that front wheel alignment is correct. Refer to [FSU-5, "Front Wheel Alignment"](#).
1. Turn tires straight ahead, check if steering wheel is in the neutral position.
  2. If it is not in the neutral position, remove steering wheel and reinstall it correctly.
  3. If the neutral position cannot be attained by repositioning the steering wheel two teeth or less on steering stem, loosen tie-rod lock nuts of steering outer sockets, then adjust tie-rods by the same amount in the opposite direction.

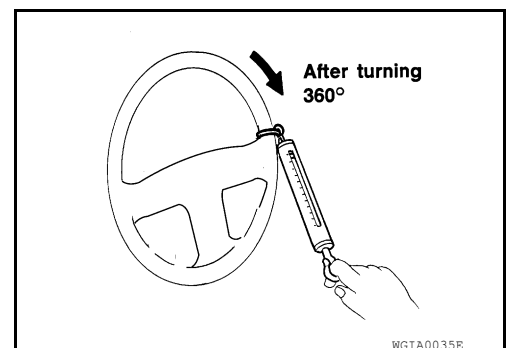
#### CHECKING STEERING WHEEL TURNING FORCE

1. Park vehicle on a level, dry surface and set parking brake.
2. Start engine.
3. Bring power steering fluid up to operating temperature of 60°– 80°C (140°– 176°F).
4. Tires need to be inflated to specified pressure. Refer to [WT-53, "Tire"](#).
5. Check steering wheel turning force using Tool when steering wheel has been turned 360° from the neutral position.

**Tool number** : (—) (J-44372)

**Steering wheel turning force** : Refer to [ST-31, "Steering Wheel"](#)

6. If steering wheel turning force is out of specification, inspect steering column. Refer to [ST-12, "Removal and Installation"](#).





## STEERING WHEEL

### < REMOVAL AND INSTALLATION >

7. If steering column meets specification, repair steering gear. Refer to [ST-23, "Disassembly and Assembly"](#).

### CHECKING FRONT WHEEL TURNING ANGLE

When checking front wheel turning angle, refer to [FSU-5, "Front Wheel Alignment"](#).

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# POWER STEERING OIL PUMP

< REMOVAL AND INSTALLATION >

## POWER STEERING OIL PUMP

### On-Vehicle Inspection and Service

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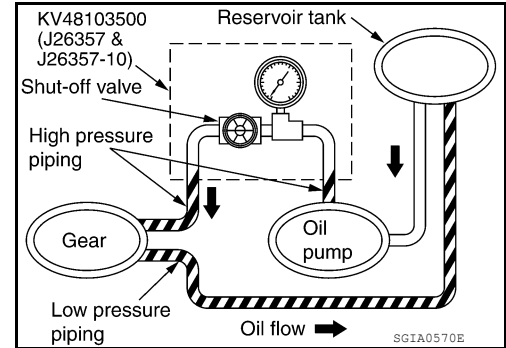
#### CHECKING RELIEF OIL PRESSURE

##### CAUTION:

Before starting work, confirm belt tension is proper.

1. Connect Tool between power steering oil pump discharge connector and high pressure hose and then bleed air from the hydraulic circuit.

| Tool number:                      |                        |  |
|-----------------------------------|------------------------|--|
| Pressure gauge and shut-off valve |                        | KV48103500<br>(J-26357 and J-26357-10) |
| Power steering oil pump side      | Connector A and O-ring | KV48105300-4 and<br>5295262U10 ( — )   |
|                                   | Eye-bolt and O-ring    | KV48105300-3 and<br>5295262U00 ( — )   |
| High pressure piping side         | Connector B and O-ring | KV48105300-1 and<br>5295262U00 ( — )   |
|                                   | Nut                    | KV48105300-2 ( — )                     |



2. Start engine. Allow engine to run until tank temperature reaches 50°– 80°C (122°– 176°F).

##### CAUTION:

- Warm up engine with shut-off valve fully opened. If engine is started with shut-off valve closed, fluid pressure in power steering oil pump increases to maximum. This will raise power steering fluid temperature excessively.
- Be careful not to contact hose with belt when engine is started.

3. With engine at idle, close shut-off valve and read the relief oil pressure.

Relief oil pressure : Refer to [ST-32, "Power Steering Oil Pump"](#)

##### CAUTION:

Do not close shut-off valve of pressure gauge for more than 10 seconds.

4. After measurement, open shut-off valve slowly.
  - If relief oil pressure is outside the specification, disassemble and repair power steering oil pump. Refer to [ST-27, "Disassembly and Assembly"](#).
5. After inspection, disconnect oil pressure gauge and oil pressure gauge adapter from hydraulic circuit, connect power steering oil pump discharge connector and high pressure hose and copper sealing washers. Add power steering fluid and bleed air from hydraulic circuit thoroughly. Refer to [ST-6, "Air Bleeding Hydraulic System"](#).

##### CAUTION:

DO not reuse copper sealing washers.

# STEERING WHEEL

< UNIT REMOVAL AND INSTALLATION >

## UNIT REMOVAL AND INSTALLATION

### STEERING WHEEL

#### Removal and Installation

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#### REMOVAL

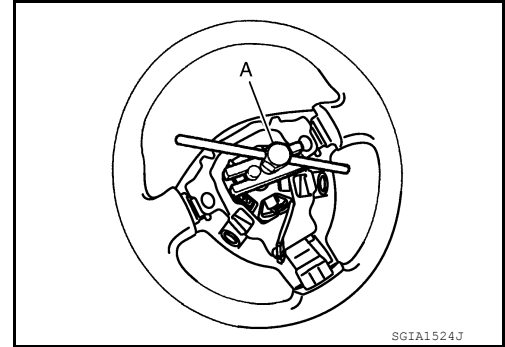
1. Set the front wheels in the straight-ahead position.
2. Remove the driver air bag module. Refer to [SR-4, "Removal and Installation"](#).
3. Disconnect steering wheel switches.
4. Remove the steering wheel center nut.
5. Remove the steering wheel using Tools.

**Tool number A: ST27180001 (J-25726-A)**

#### CAUTION:

Place a piece of tape across the spiral cable so it will not be rotated out of position.

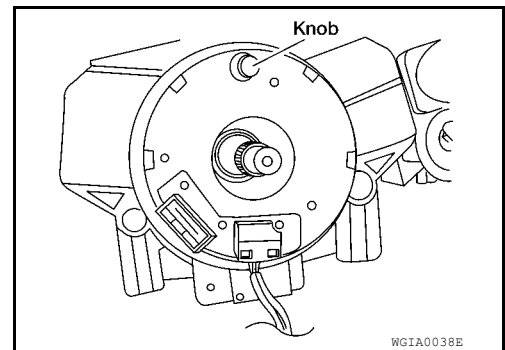
6. Inspect the steering wheel near the puller holes for damage. If damaged, replace the steering wheel.
  - Remove steering wheel rear cover and steering wheel switches, if required.



#### INSTALLATION

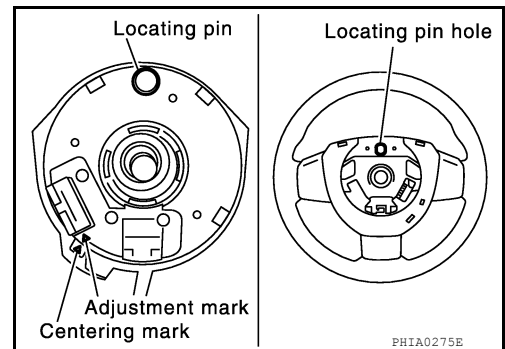
Installation is in the reverse order of removal.

- Align spiral cable correctly when installing steering wheel. Make sure that the spiral cable is in the neutral position. The neutral position is detected by turning left 2.5 revolutions from the right end position and ending with the knob at the top.
- Refer to [BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#) for steering angle sensor adjustment.
- After the work is completed, perform self-diagnosis to make sure no malfunction is detected. Refer to [SRC-13, "SRS Operation Check"](#).
- Tighten steering wheel center nut to specification. Refer to [ST-12, "Removal and Installation"](#).



#### CAUTION:

- The spiral cable may snap due to steering operation if the cable is not installed in the correct position.
- With the steering linkage disconnected, the cable may snap by turning the steering wheel beyond the limited number of turns. The spiral cable can be turned counterclockwise about 2.5 turns from the neutral position.



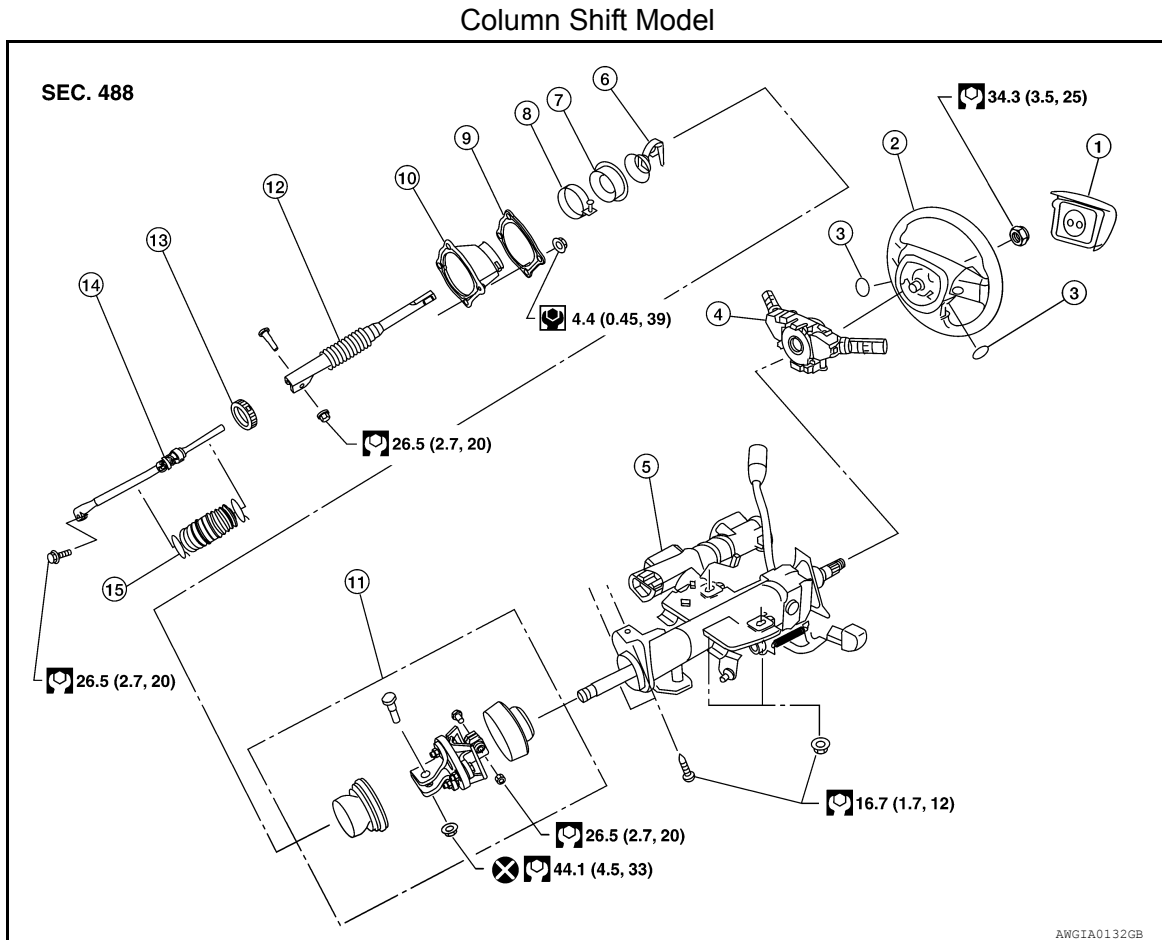
# STEERING COLUMN

< UNIT REMOVAL AND INSTALLATION >

## STEERING COLUMN

### Removal and Installation

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- |  |                             |                              |
|--|-----------------------------|------------------------------|
| 1. Driver air bag module               | 2. Steering wheel           | 3. Steering wheel side cover |
| 4. Combination switch and spiral cable | 5. Steering column assembly | 6. Collar                    |
| 7. Hole cover seal                     | 8. Clamp                    | 9. Hole cover mounting plate |
| 10. Hole cover                         | 11. Upper joint             | 12. Upper shaft              |
| 13. Boot clamp                         | 14. Lower joint shaft       | 15. Boot and clips (plastic) |

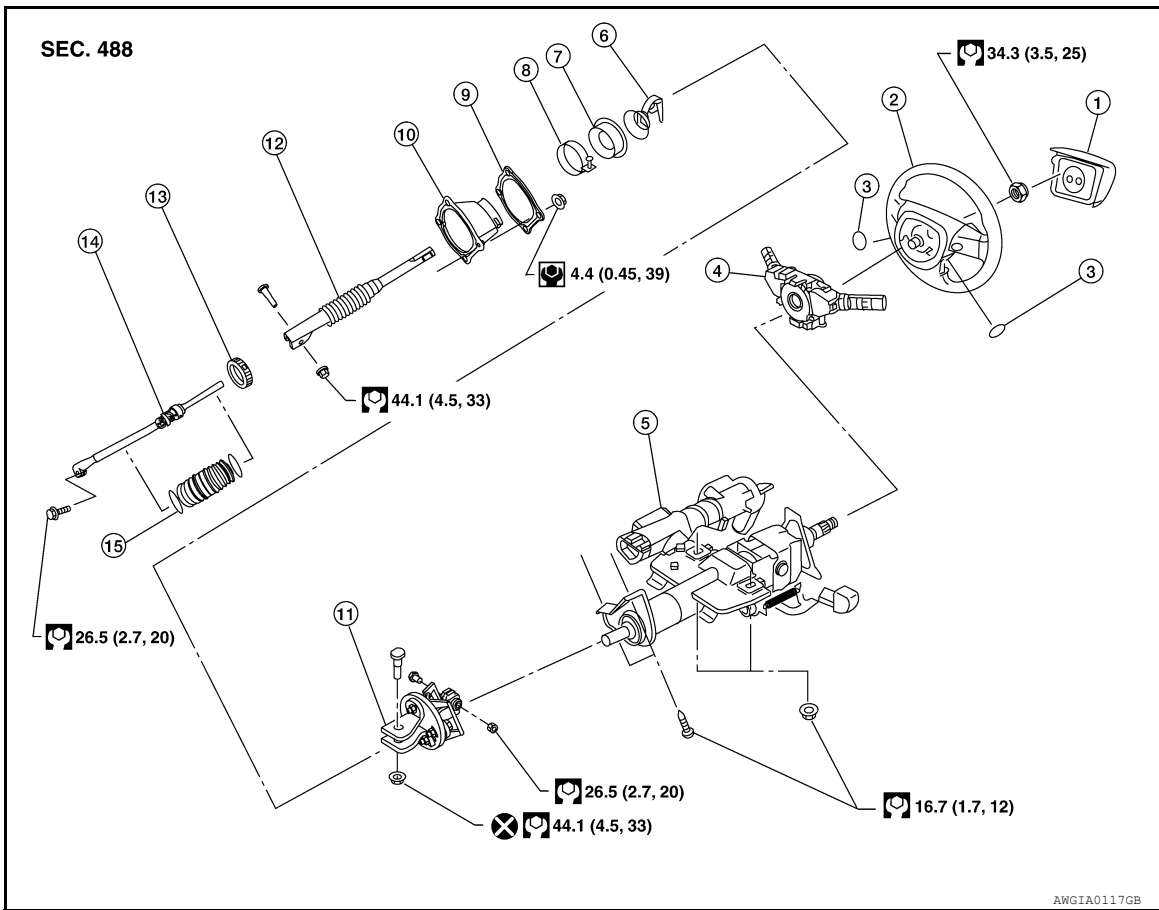
#### CAUTION:

- Any time the ignition switch has been disconnected, removed or installed, the keys must be re-registered in the BCM. Refer to Consult operations IVIS/NVIS.
- Care must be taken not to give axial impact to steering column assembly during removal and installation.
- Care must be taken not to move steering gear during removal of steering column assembly.

# STEERING COLUMN

## < UNIT REMOVAL AND INSTALLATION >

### Floor Shift Model



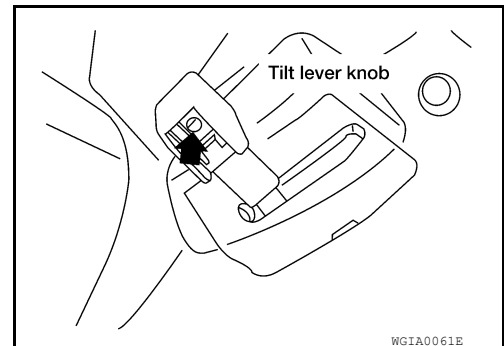
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|--|-----------------------------|------------------------------|
| 1. Driver air bag module               | 2. Steering wheel           | 3. Steering wheel side cover |
| 4. Combination switch and spiral cable | 5. Steering column assembly | 6. Collar                    |
| 7. Hole cover seal                     | 8. Clamp                    | 9. Hole cover mounting plate |
| 10. Hole cover                         | 11. Upper joint             | 12. Upper shaft              |
| 13. Boot clamp                         | 14. Lower joint shaft       | 15. Boot and clips (plastic) |

### CAUTION:

- Any time the ignition switch has been disconnected, removed or installed, the keys must be re-registered in the BCM. Refer to Consult operations IVIS/NVIS.
- Care must be taken not to give axial impact to steering column assembly during removal and installation.
- Care must be taken not to move steering gear during removal of steering column assembly.

### REMOVAL

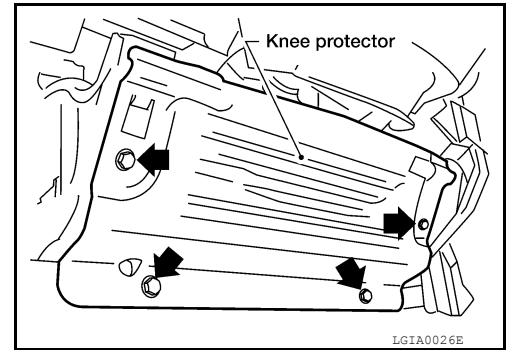
1. Remove spiral cable from steering column assembly with combination switches attached. Refer to [SR-6, "Removal and Installation"](#).
2. Remove tilt lever knob from tilt lever by inserting a suitable tool into slot of tilt lever knob, then depress tab and withdraw tilt lever knob.



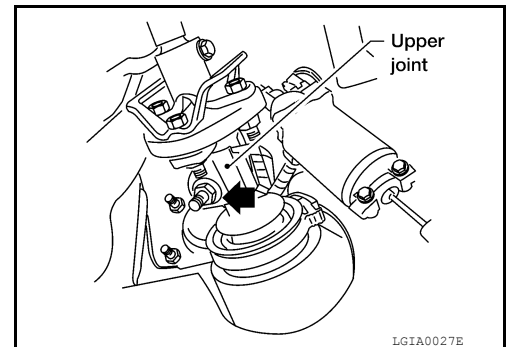
## STEERING COLUMN

### < UNIT REMOVAL AND INSTALLATION >

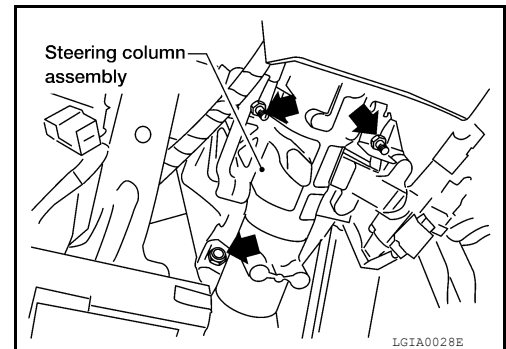
3. Remove lower driver instrument panel. Refer to [IP-17, "Removal and Installation"](#).
4. Remove steering column cover and ignition key finisher. Refer to [IP-11, "Removal and Installation"](#).
5. Remove knee protector screws, then remove knee protector from vehicle.



6. Disconnect the following:
  - Sonar switch
  - Adjustable pedal switch
  - Wiper switch
  - Headlamp switch
  - Immobilizer
  - Ignition switch
  - Spiral cable
7. On models equipped with column shift, disconnect shift cable from steering column. Refer to [TM-186, "A/T Shift Selector Removal and Installation"](#).
8. Remove lock nut and bolt, then separate lower joint from upper joint.



9. Remove steering member nuts, then remove steering column assembly from steering member.

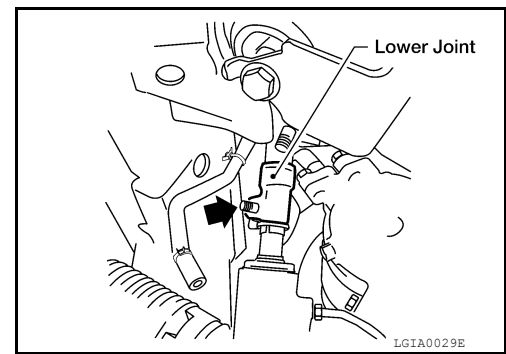


10. Remove hole cover seal and clamp.
11. Remove nuts, then remove hole cover from the lower dash.

# STEERING COLUMN

## < UNIT REMOVAL AND INSTALLATION >

12. Remove bolt (lower side) of lower joint and remove lower joint from vehicle.



## INSPECTION AFTER REMOVAL

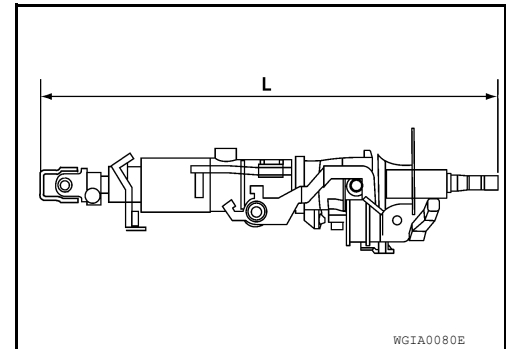
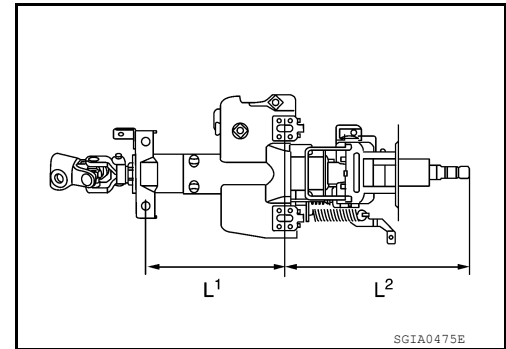
- Check for damage to steering column jacket tube. If damage is found, replace steering column with new one.
- If the vehicle has been involved in a collision, or if noise and rattles are heard during a turn, check the length (L, L<sup>1</sup> and L<sup>2</sup>) of the column. If out of specification, replace the steering column as an assembly.

### Steering column length

L : Refer to [ST-31, "Steering Column"](#)

L<sup>1</sup> : Refer to [ST-31, "Steering Column"](#)

L<sup>2</sup> : Refer to [ST-31, "Steering Column"](#)



- Check for proper lubrication, apply grease as necessary.

## INSTALLATION

Installation is in the reverse order of removal.

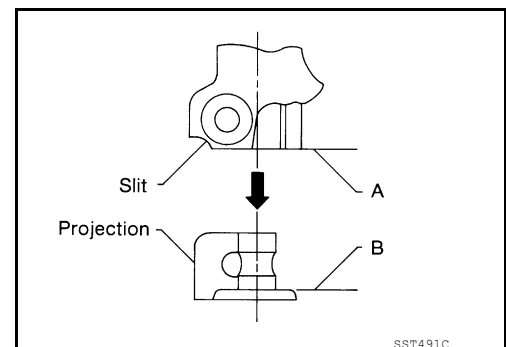
### CAUTION:

**When installing the steering column, finger-tighten all of the lower bracket and joint retaining bolts; then tighten them to specification. Do not apply undue stress to the steering column.**

### NOTE:

Align slit of the coupling joint with projection on dust cover. Insert the joint until surface (A) contacts surface (B).

- After installation, turn steering wheel to make sure it moves smoothly. Make sure the number of turns are the same from the straight-forward position to left and right locks. Make sure that the steering wheel is in a neutral position when driving straight ahead.
- When installing steering column to steering member, install nut from front side of vehicle.



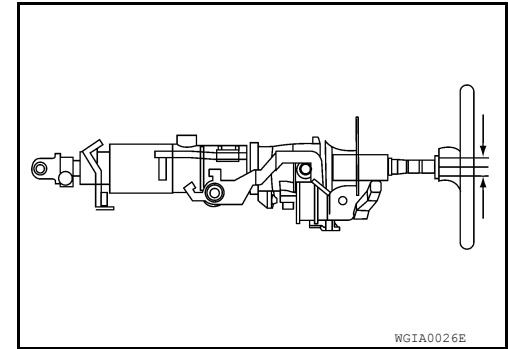
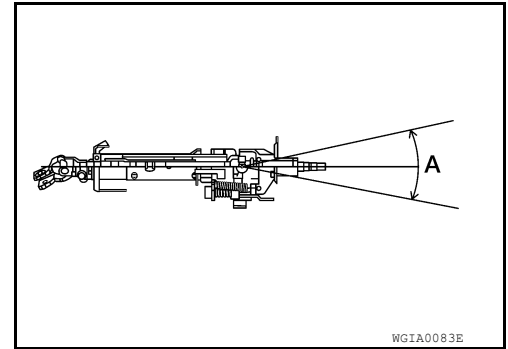
## INSPECTION AFTER INSTALLATION

- After installing the steering column, check the tilt mechanism for proper operation.

# STEERING COLUMN

< UNIT REMOVAL AND INSTALLATION >

Range (A) : Refer to [ST-31, "Steering Column"](#)



- Check if steering wheel operation can turn to the end of the left and right stops smoothly.



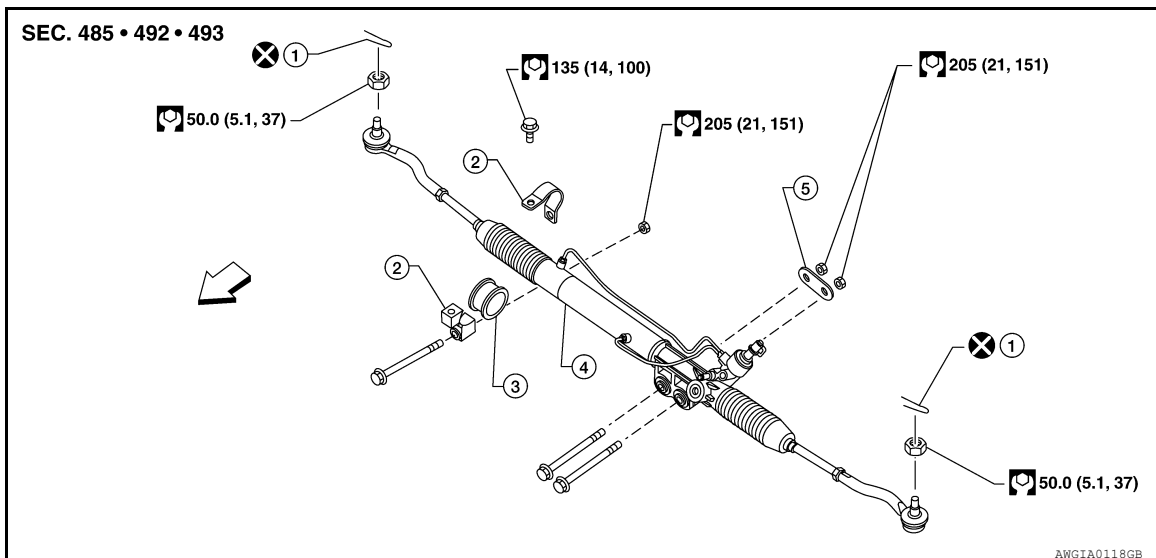
# POWER STEERING GEAR AND LINKAGE

< UNIT REMOVAL AND INSTALLATION >

## POWER STEERING GEAR AND LINKAGE

### Removal and Installation

INFOID:000000007306680



- |                                 |                                |                                  |
|---------------------------------|--------------------------------|----------------------------------|
| 1. Cotter pin                   | 2. Power steering gear bracket | 3. Power steering gear insulator |
| 4. Power steering gear assembly | 5. Washer                      | ⇐ Front                          |

#### CAUTION:

Spiral cable may snap due to steering operation if steering column is separated from steering gear assembly. Therefore secure steering wheel to avoid turning.

#### NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

#### REMOVAL

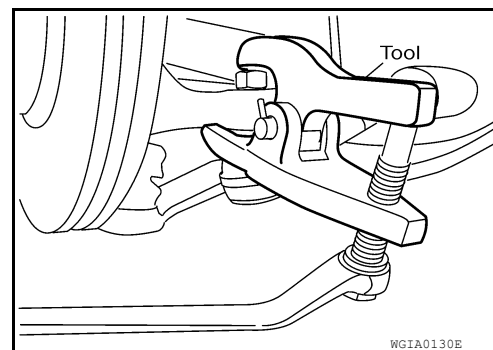
1. Turn wheels to the straight-ahead position.
2. Remove both front wheels and tires from vehicle using power tool.
3. Remove under cover using power tool.
4. On 4WD model, remove front final drive, then support drive shafts with wire. Refer to [DLN-169. "Removal and Installation"](#).

5. Remove cotter pin at steering outer socket and discard, then loosen nut.
6. Remove steering outer socket from steering knuckle using Tool. Be careful not to damage ball joint boot.

#### CAUTION:

Temporarily tighten nut to prevent damage to threads and to prevent Tool from coming off.

Tool number : HT72520000 (J-25730-A)

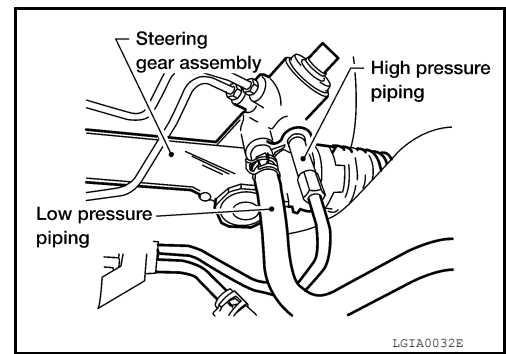


7. On 2WD model, remove stabilizer bar bolts and reposition stabilizer bar. Refer to [FSU-18. "Removal and Installation"](#).

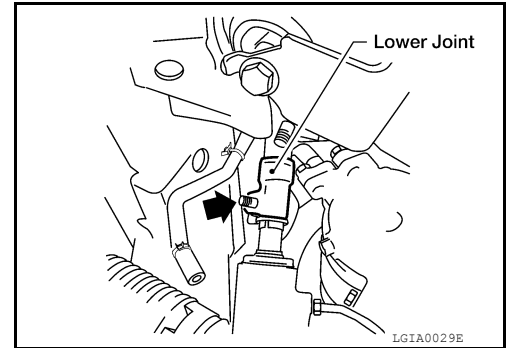
# POWER STEERING GEAR AND LINKAGE

## < UNIT REMOVAL AND INSTALLATION >

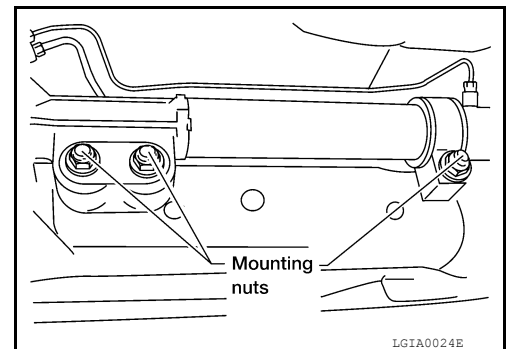
8. Remove oil piping (high pressure side and low pressure side) and O-ring from steering gear assembly, then drain fluid from piping.  
**CAUTION:**  
Do not reuse O-ring.



9. Remove lower joint bolt on lower shaft.



10. Remove steering gear assembly bolts and nuts using power tool, and then remove steering gear assembly from vehicle.



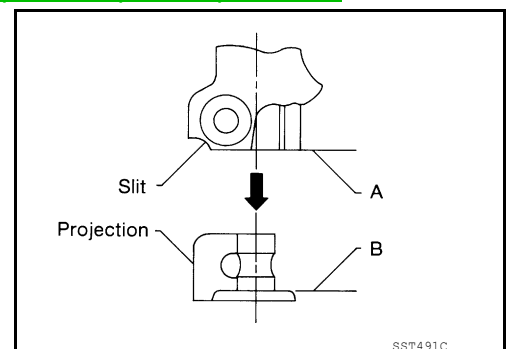
## INSTALLATION

Installation is in the reverse order of removal.

### **CAUTION:**

**Do not reuse O-ring.**

- After removing/installing or replacing steering components, check wheel alignment. Refer to [FSU-5. "Front Wheel Alignment"](#).
- After adjusting wheel alignment, adjust neutral position of steering angle sensor. Refer to [BRC-8. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#).
- With steering wheel in straight ahead position, make sure slit of lower joint (A) fits with the projection on rear cover cap (B), while checking that mark on steering gear assembly aligns with mark on rear cover cap.



- After installation, bleed the air from the steering hydraulic system. Refer to [BR-16. "Bleeding Brake System"](#).

## INSPECTION AFTER INSTALLATION

# POWER STEERING GEAR AND LINKAGE

## < UNIT REMOVAL AND INSTALLATION >

---

Check if steering wheel turns smoothly when it is turned several times fully to the left and right lock positions.

A

B

C

D

E

F

**ST**

H

I

J

K

L

M

N

O

P

# POWER STEERING OIL PUMP

< UNIT REMOVAL AND INSTALLATION >

## POWER STEERING OIL PUMP

---

### Removal and Installation

INFOID:000000007306681

#### **NOTE:**

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

#### REMOVAL

1. Drain power steering fluid from reservoir tank.
2. Remove engine room cover. Refer to [EM-25, "Removal and Installation"](#).
3. Remove air duct assembly. Refer to [VTL-25, "Removal and Installation"](#).
4. Remove power steering reservoir tank.
5. Remove serpentine drive belt from auto tensioner and power steering oil pump. Refer to [EM-14, "Removal and Installation"](#).
6. Disconnect pressure sensor electrical connector.
7. Remove high pressure and low pressure piping and copper sealing washers from power steering oil pump. Refer to [ST-21](#).

#### **CAUTION:**

**Do not reuse copper sealing washers.**

8. Remove bolts, then remove power steering oil pump.

#### INSTALLATION

Installation is in the reverse order of removal. Refer to [ST-20](#) for tightening torque.

- After installation, bleed air. Refer to [BR-16, "Bleeding Brake System"](#).

#### **CAUTION:**

**Do not reuse copper sealing washers.**

#### **NOTE:**

Belt tension is automatic and requires no adjustment.

# HYDRAULIC LINE

< UNIT REMOVAL AND INSTALLATION >

## HYDRAULIC LINE

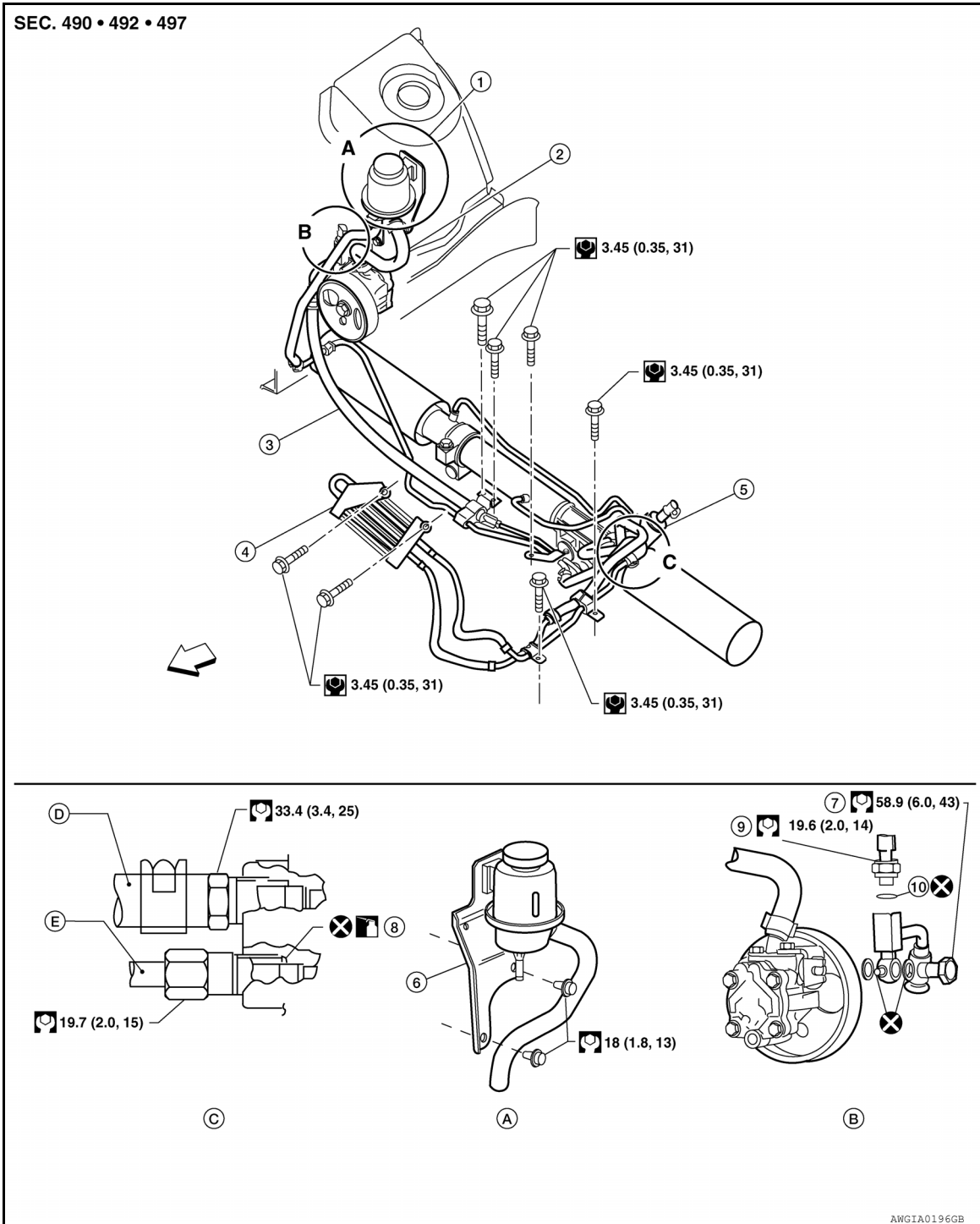
### Removal and Installation

INFOID:000000007306682

Refer to the following illustration for hydraulic line removal.

**NOTE:**

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling



- |                   |                           |                                   |
|-------------------|---------------------------|-----------------------------------|
| 1. Reservoir tank | 2. Suction hose           | 3. High pressure hose             |
| 4. Oil cooler     | 5. Steering gear assembly | 6. Reservoir tank bracket         |
| 7. Eye bolt       | 8. O-rings                | 9. Power steering pressure sensor |

# HYDRAULIC LINE

## < UNIT REMOVAL AND INSTALLATION >

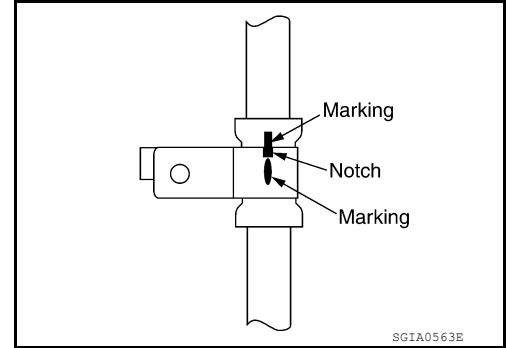
- |                                   |                          |                               |
|-----------------------------------|--------------------------|-------------------------------|
| 10. O-ring                        | A. Reservoir tank detail | B. Power steering pump detail |
| C. Steering gear connector detail | D. Low pressure piping   | E. High pressure piping       |
| ⇐ Front                           |                          |                               |

Installation is in the reverse order of removal.

### CAUTION:

#### Do not reuse O-rings.

- Confirm mating marks are aligned with hose and clamp, then correct if needed.

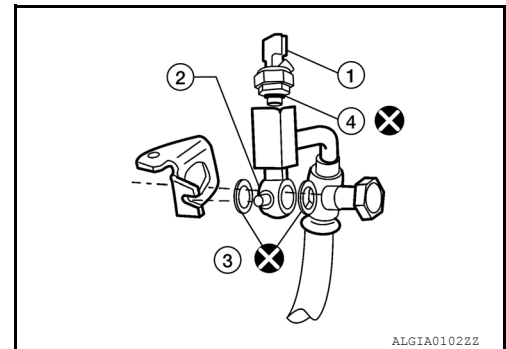


- To install eye joint, align projection (2) of eye joint with notch of power steering pump, and attach eye joint to power steering pump properly. Tighten eye bolt by hand fully, then torque to specification.

- 1: Pressure sensor
- 3: Copper sealing washers
- 4: O-ring

### CAUTION:

#### Do not reuse O-rings or copper sealing washers.



# STEERING COLUMN

< UNIT DISASSEMBLY AND ASSEMBLY >

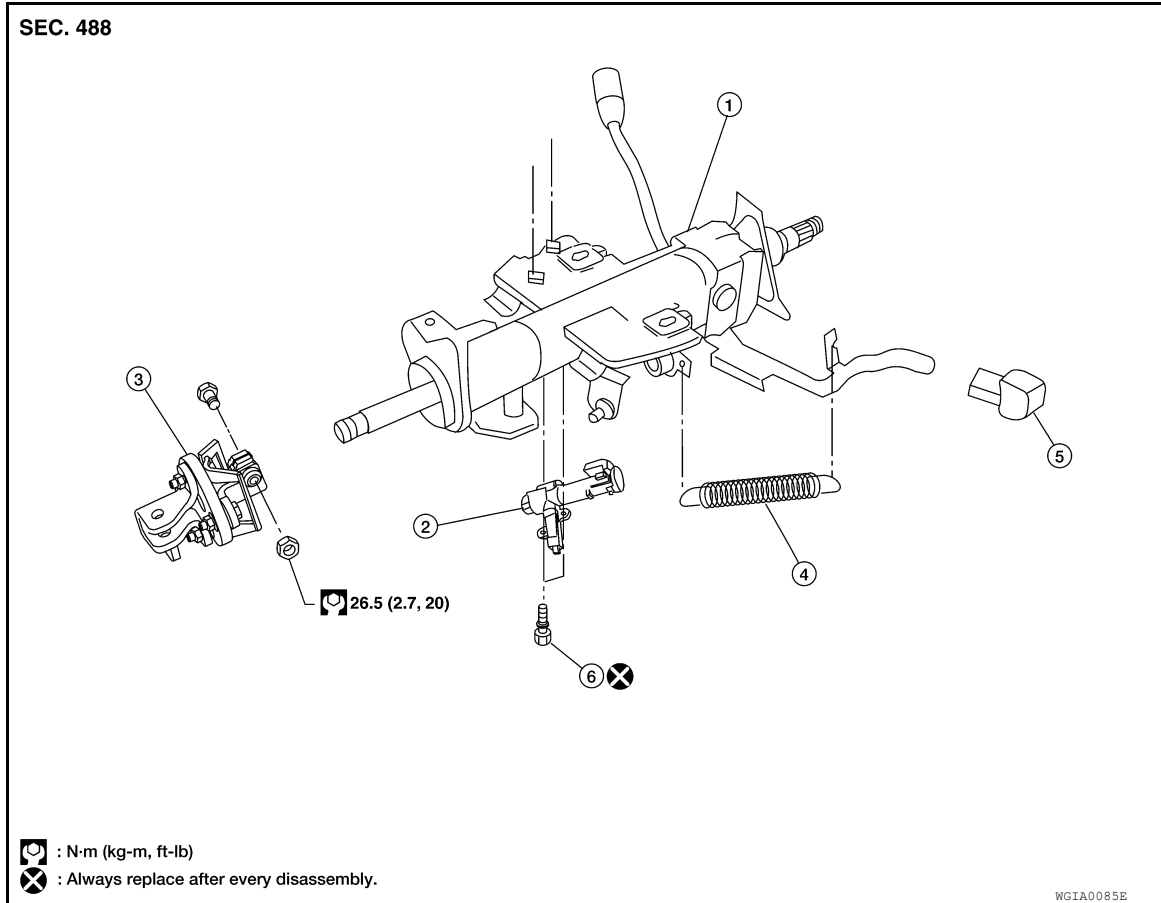
## UNIT DISASSEMBLY AND ASSEMBLY

### STEERING COLUMN

Disassembly and Assembly

INFOID:000000007306683

Column Shift Model



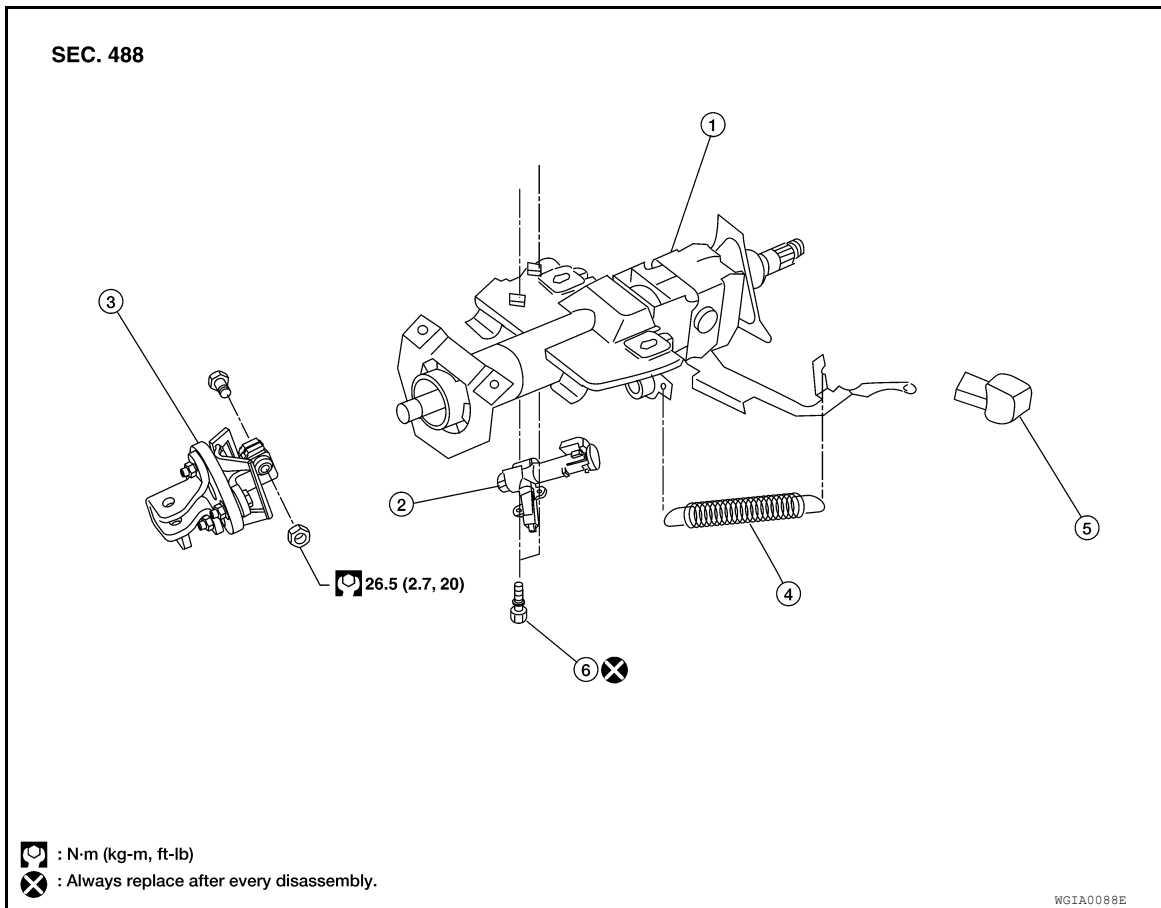
#### CAUTION:

- Any time the ignition switch has been disconnected, removed or installed, the keys must be re-registered in the BCM. Refer to Consult operations IVIS/NVIS.
- Care must be taken not to give axial impact to steering column assembly during removal and installation.
- Care must be taken not to move power steering gear during removal of steering column assembly.

# STEERING COLUMN

< UNIT DISASSEMBLY AND ASSEMBLY >

Floor Shift Model



- |                             |                    |                     |
|-----------------------------|--------------------|---------------------|
| 1. Steering column assembly | 2. Ignition switch | 3. Upper joint      |
| 4. Spring                   | 5. Tilt lever knob | 6. Self-shear screw |

## CAUTION:

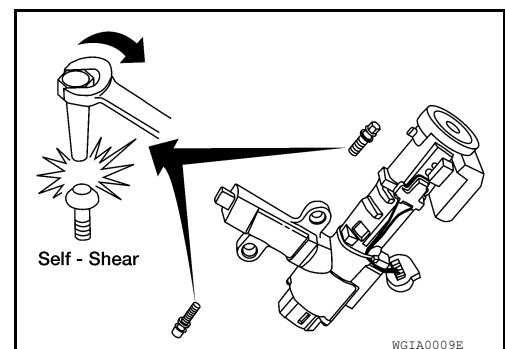
- Any time the ignition switch has been disconnected, removed or installed, the keys must be re-registered in the BCM. Refer to Consult operations IVIS/NVIS.
- Care must be taken not to give axial impact to steering column assembly during removal and installation.
- Care must be taken not to move power steering gear during removal of steering column assembly.

## DISASSEMBLY

1. Remove spring from steering column assembly and tilt lever.
2. Remove upper joint bolt, then remove upper joint from steering column assembly.
3. Remove ignition switch tamper resistant self-shear type screws with a drill or other appropriate tool.

## ASSEMBLY

- Assembly is in the reverse order of disassembly.
- Install new tamper resistant self-shear type screws.
- Any time the ignition switch has been disconnected, removed or installed, the keys must be re-registered in the BCM. Refer to Consult operations IVIS/NVIS.



## INSPECTION AFTER ASSEMBLY



# STEERING COLUMN

## < UNIT DISASSEMBLY AND ASSEMBLY >

When the steering wheel does not turn smoothly, check the steering column as follows:

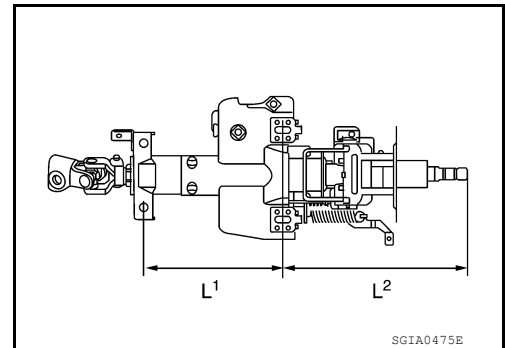
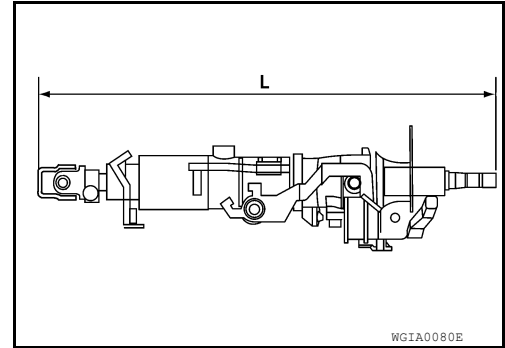
1. Check the column bearings for damage or unevenness. Lubricate with recommended multi-purpose grease. Replace the steering column as an assembly, if necessary.
2. Check the column tube for deformation or breakage. Replace the steering column as an assembly, if necessary.
3. If the vehicle has been involved in a collision, or if noise and rattles are heard during a turn, check the length (L) of the column. If out of specification, replace the steering column as an assembly.

### Steering column length L

L : Refer to [ST-31, "Steering Column"](#)

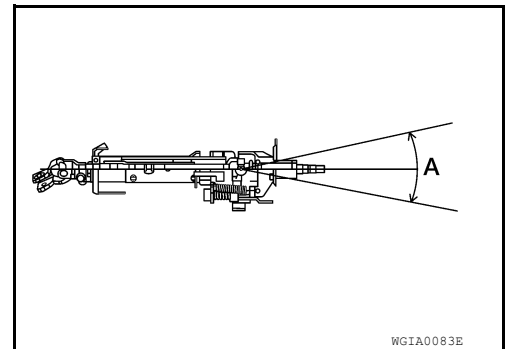
L<sup>1</sup> : Refer to [ST-31, "Steering Column"](#)

L<sup>2</sup> : Refer to [ST-31, "Steering Column"](#)



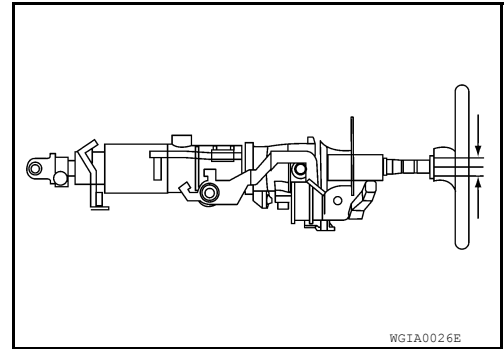
4. Check for proper lubrication, apply grease as necessary.
5. Check for wear around the seal edges, replace as necessary.
6. Check for corrosion or pitting around the seal sliding area.
7. Replace the seal and shaft in case of seal edge wear or damage.
8. After installing the steering column, check the tilt mechanism for proper operation.

Range (A) : Refer to [ST-31, "Steering Column"](#)



## STEERING COLUMN

< UNIT DISASSEMBLY AND ASSEMBLY >



### CAUTION:

- Do not exert any load or impact in the axial direction immediately before or after column removal.
- After installation, check for smooth steering wheel rotation, without any catches or noise.
- Replace the column if it is depleted of grease, worn, damaged, or if any scratches or coating separation is present on the shaft seal area.
- The lower nut on the upper joint may not be reused.
- During lower joint detachment, insert a tool into the yoke groove to prevent gouging damage.

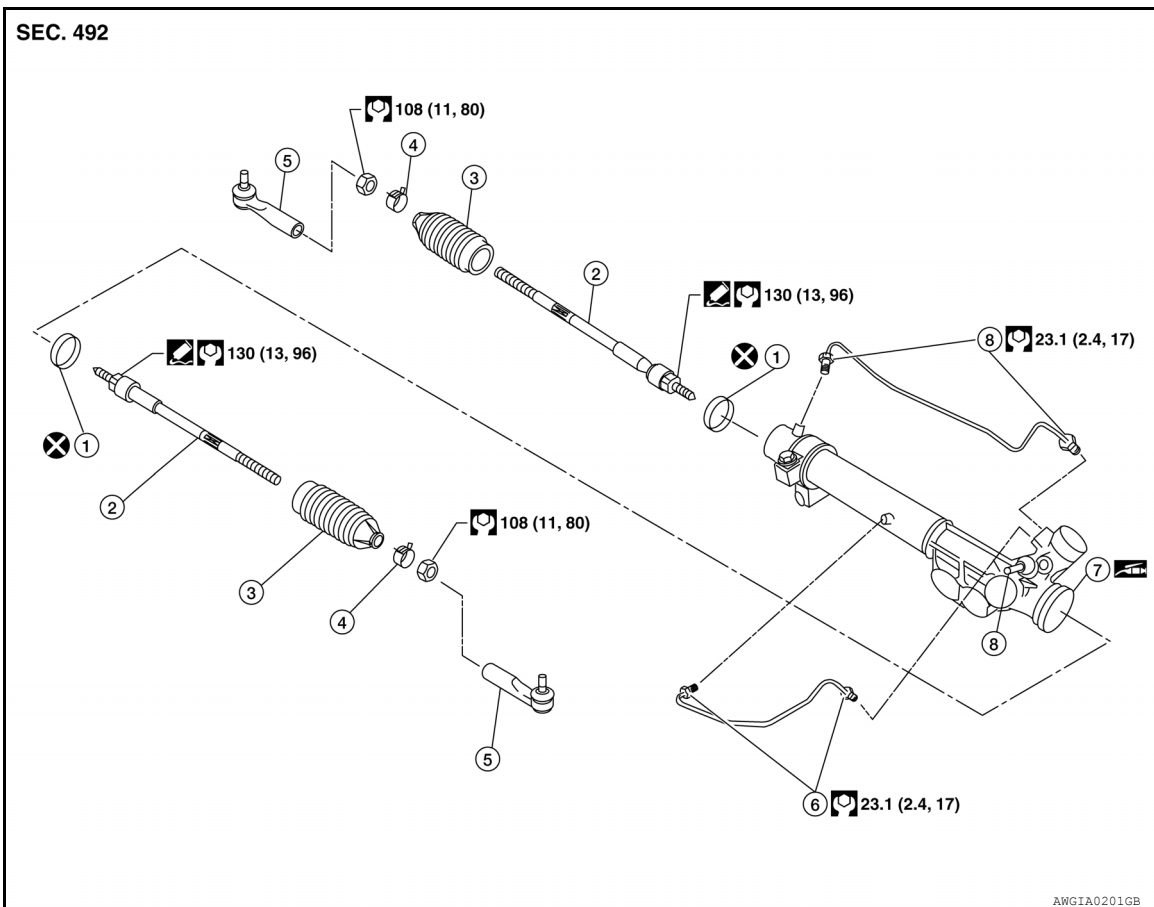
# POWER STEERING GEAR AND LINKAGE

< UNIT DISASSEMBLY AND ASSEMBLY >

## POWER STEERING GEAR AND LINKAGE

### Disassembly and Assembly

INFOID:000000007306684



- |   |                          |                   |
|---|--------------------------|-------------------|
| 1. Boot clamp                           | 2. Steering inner socket | 3. Boot           |
| 4. Boot clamp                           | 5. Steering outer socket | 6. Cylinder tubes |
| 7. Power steering gear housing assembly | 8. Connector             |                   |

#### CAUTION:

- Secure power steering gear assembly with a vise, using copper plates or something similar to prevent it from being damaged. Do not grip cylinder with a vise.
- Before performing disassembly, clean power steering gear assembly with kerosene. Be careful not to bring any kerosene into contact with the discharge and return port connectors.

#### DISASSEMBLY

1. Remove cylinder tubes from power steering gear housing assembly.
2. Loosen lock nuts of steering outer sockets, and remove steering outer sockets.
3. Remove boot clamps of the small diameter side and the large diameter side, then remove boot.

#### CAUTION:

When removing boots, be careful not to damage steering inner socket and power steering gear housing assembly. If they are damaged, change them to avoid power steering fluid leaks.

4. Remove inner sockets.

#### INSPECTION AFTER DISASSEMBLY

##### Boot

Check boot for tears, cracks and deformation. Replace if necessary.

# POWER STEERING GEAR AND LINKAGE

## < UNIT DISASSEMBLY AND ASSEMBLY >

### Power steering Gear Housing Assembly

Check power steering gear housing assembly for dents, cracks or damage. Replace as an assembly if necessary.

### Steering Outer Socket and Steering Inner Socket

#### SWING TORQUE

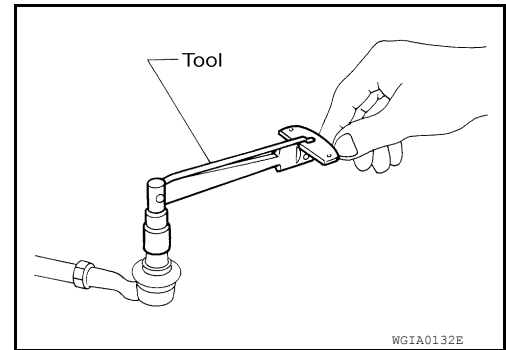
- Measure the swing torque, using Tool. When ball stud and steering inner socket start moving the measured value must be within the specification. If the reading is outside the specification, replace the socket. Refer to [ST-32, "Steering Outer Socket and Steering Inner Socket"](#).

#### ROTATING TORQUE

- Measure the rotating torque, using Tool. If the value is outside the specification, replace the steering outer sockets.

**Tool number** : ST3127S000 (J-25765-A)

**Rotating torque** : Refer to [ST-32, "Steering Outer Socket and Steering Inner Socket"](#)

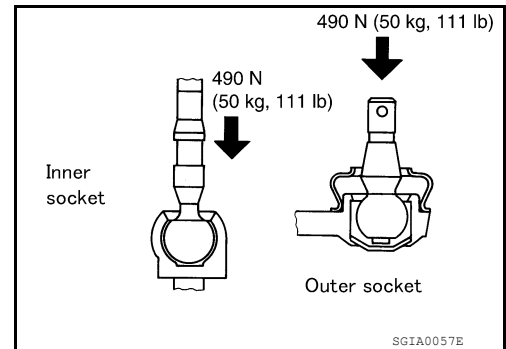


#### AXIAL END PLAY

- Apply a load of 490 N (50 kg-f, 110 lb-f) to the ball stud axially. Use a dial gauge to measure the amount of the movement that the stud makes. If the value is outside the specification, replace the sockets.

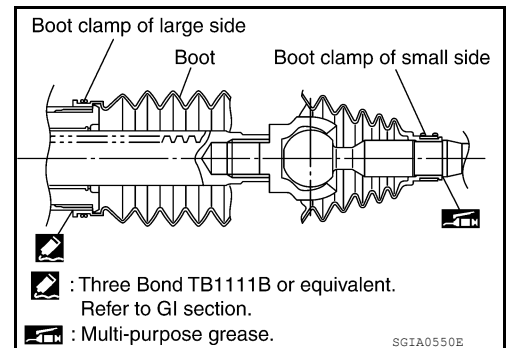
**Outer socket** : Refer to [ST-32, "Steering Outer Socket and Steering Inner Socket"](#)

**Inner socket** : Refer to [ST-32, "Steering Outer Socket and Steering Inner Socket"](#)



## ASSEMBLY

1. Install the steering inner sockets.
2. Install the large-diameter side of the boots to the power steering gear housing assembly.
3. Install the small-diameter side of the boots to the groove of the steering inner sockets.



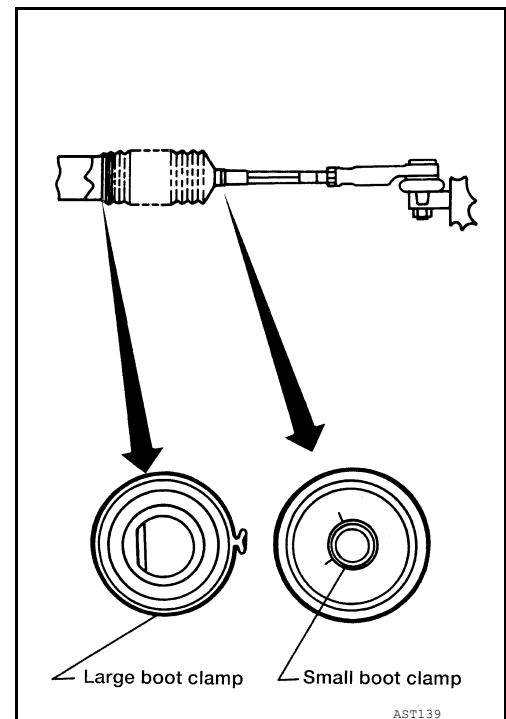
# POWER STEERING GEAR AND LINKAGE

## < UNIT DISASSEMBLY AND ASSEMBLY >

4. Install the boot clamps to the boots, as shown.

**CAUTION:**

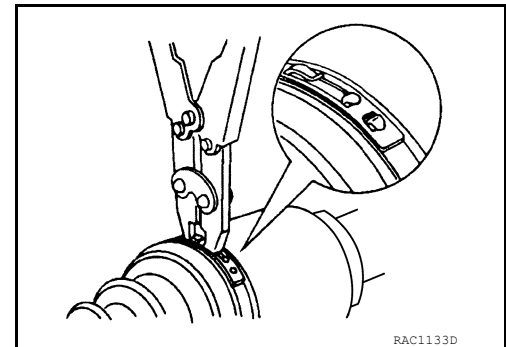
**Do not reuse the large-diameter boot clamps.**



5. Crimp the large-diameter boot clamps, using Tool.

**Tool number : KV40107300 ( — )**

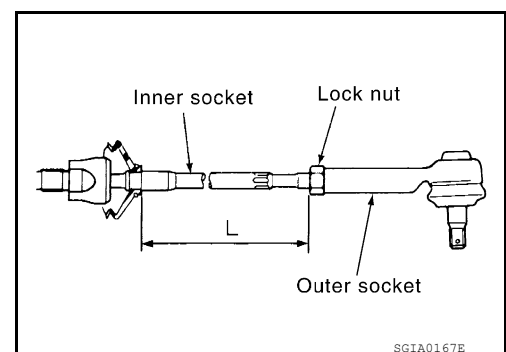
6. Install the cylinder tubes to the power steering gear housing assembly.
7. Install the lock nuts and steering outer sockets to the steering inner sockets.



8. Thread the steering outer sockets onto the steering inner sockets to the specified length (L), then tighten the lock nuts to the specification. Reconfirm that the tie-rod length (L) is within specification.

**Maximum steering inner socket length (L)**

**: Refer to [ST-32, "Steering Outer Socket and Steering Inner Socket"](#)**



A  
B  
C  
D  
E  
F  
ST  
H  
I  
J  
K  
L  
M  
N  
O  
P

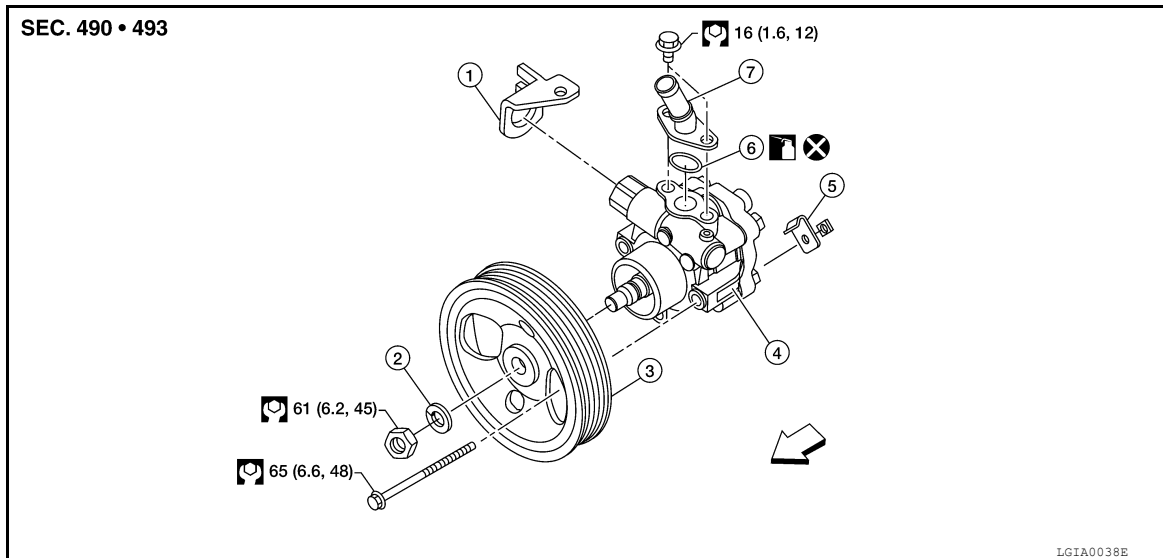
# POWER STEERING OIL PUMP

< UNIT DISASSEMBLY AND ASSEMBLY >

## POWER STEERING OIL PUMP

### Disassembly and Assembly

INFOID:000000007306685



- |                        |                               |           |
|------------------------|-------------------------------|-----------|
| 1. Bracket             | 2. Spring washer              | 3. Pulley |
| 4. Power steering pump | 5. High pressure hose bracket | 6. O-ring |
| 7. Suction pipe        | ⇐ Front                       |           |

### INSPECTION BEFORE DISASSEMBLY

Disassemble the power steering oil pump only if the following items are found.

- Deformed or damaged pulley, bracket, connector or suction pipe.
- Oil leakage from the suction pipe or connector.

### DISASSEMBLY

#### NOTE:

Mount the power steering oil pump in a vise as needed.

1. Remove the connector bolt, connector and copper sealing washers.

#### CAUTION:

**Do not reuse copper sealing washers.**

2. Remove the suction pipe and O-ring.

#### CAUTION:

**Do not reuse O-ring.**

3. Remove the pulley nut and pulley.
4. Remove the bracket bolts and bracket.

### INSPECTION AFTER DISASSEMBLY

#### Body Assembly Inspection

Check the power steering oil pump body assembly for damage. If any damage is found, replace with a new power steering oil pump assembly.

### ASSEMBLY

Assembly is in the reverse order of disassembly.

#### CAUTION:

- **Do not reuse copper sealing washers.**
- **Do not reuse O-ring. Apply a coat of Genuine Nissan PSF or equivalent to the O-ring.**

# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

## SERVICE DATA AND SPECIFICATIONS (SDS)

### SERVICE DATA AND SPECIFICATIONS (SDS)

#### Steering Wheel

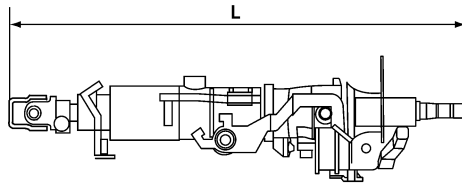
INFOID:000000007306686

|  |                               |
|--|-------------------------------|
| End play of the axial direction for steering wheel | 0 mm (0 in)                   |
| Steering wheel play on the outer circumference     | 0 – 35 mm (0 – 1.38 in)       |
| Steering wheel turning force                       | 39 N (4 kg-f, 9 lb-f) or less |

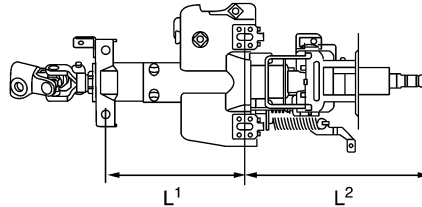
#### Steering Column

INFOID:000000007306687

Unit: mm (in)



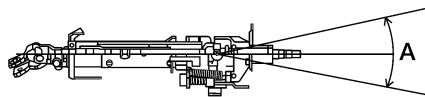
WGIA0080E



SGIA0475E

|  |              |
|--|--------------|
| Steering column length (L)               | 567 (22.32)  |
| Steering column length (L <sup>1</sup> ) | 165.1 (6.50) |
| Steering column length (L <sup>2</sup> ) | 258 (10.16)  |

#### Inspection After Installation



WGIA0083E

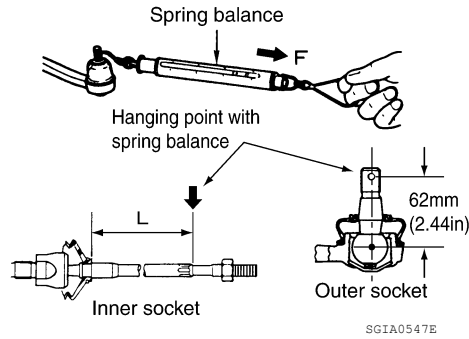
|           |     |
|-----------|-----|
| Range (A) | 18° |
|-----------|-----|

# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

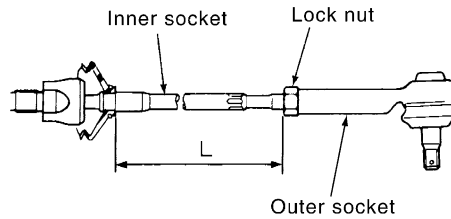
## Steering Outer Socket and Steering Inner Socket

INFOID:000000007306688



|  |  |  |
|--|--|--|
| Tie-rod ball joint steering outer socket | Swinging torque (F)  | 0.3 – 2.9 N·m (0.03 – 0.29 kg-m, 3 – 25 in-lb) |
|  | Measurement on spring balance<br>• Measuring point: cotter pin hole of stud                    | 4.84 – 46.7 N (0.50 – 4.7 kg-f, 4 – 34 lb-f)   |
|  | Rotating torque  | 0.3 – 2.9 N·m (0.03 – 0.29 kg-m, 3 – 25 in-lb) |
|  | Axial end play   | 0.5 mm (0.020 in) or less                      |
| Tie-rod ball joint steering inner socket | Swinging torque  | 1.0 – 7.8 N·m (0.11 – 0.79 kg-m, 9 – 69 in-lb) |
|  | Measurement on spring balance<br>• Measuring point: L mark see above,<br>L=83.2 mm (3.276 in). | 12.1 – 93.7 N (1.3 – 9.5 kg-f, 9 – 69 lb-f)    |
|  | Axial end play   | 0.2 mm (0.008 in) or less                      |

Unit: mm (in)



|                         |              |
|-------------------------|--------------|
| Inner socket length (L) | 102.2 (4.02) |
|-------------------------|--------------|

## Power Steering Gear

INFOID:000000007306689

|                           |                         |  |
|---------------------------|-------------------------|--|
| Power steering gear model | PR26AM                  |  |
| Rack sliding force        | Standard                | 308 ± 45 N (31.4 ± 4.6 kg-f, 69.2 ± 10.1 lb-f) |
|                           | Service limit (minimum) | 240 N (24.5 kg-f, 54.0 lb-f)                   |

## Power Steering Oil Pump

INFOID:000000007306690

|                     |  |
|---------------------|--|
| Relief oil pressure | 9.0 – 9.8 mPa (91.77 – 99.93 kg/cm <sup>2</sup> , 1305.34 – 1421.37 psi) |
|---------------------|--|



# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

## Power Steering Fluid

INFOID:000000007306691

|                               |   |
|-------------------------------|---|
| Power steering fluid capacity | Approx. 1.0 ℓ (1-1/8 US qt, 7/8 Imp qt) |
|-------------------------------|---|

A

B

C

D

E

F

**ST**

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