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# SECTION PS

## POWER STEERING SYSTEM

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# PRECAUTIONS

## PRECAUTIONS

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### Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

NGS0003A

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

NGS0003B

- In case of removing steering gear assembly, make the final tightening with grounded and unloaded vehicle condition, and then check wheel alignment.
- Observe the following precautions when disassembling.
  - 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.
  - Do not reuse non-reusable parts.
  - Before assembling, apply the specified grease to the directed parts.

# PREPARATION

## PREPARATION

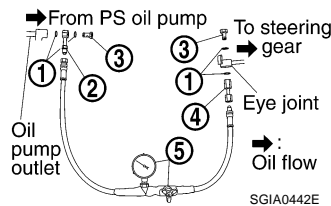
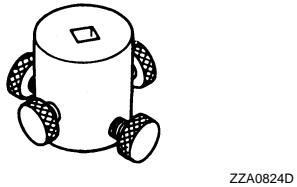
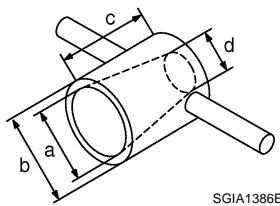
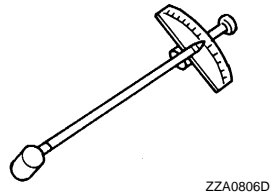
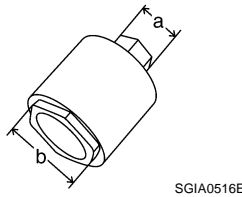
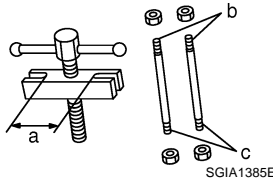
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### Special Service Tools

NGS000BJ

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

Tool number (Kent-Moore No.) Tool name	Description
ST27180001 (J-25726-A) Steering wheel puller a: 29 mm (1.14 in) b: M10 × 1.25P c: M8 × 1.25P	Removing steering wheel
KV48104400 (J-46213) Rear cover wrench a: 19 mm (0.75 in) b: 34.9 mm (1.374 in)	Removing rear cover
ST3127S000 ( — )	<ul style="list-style-type: none"> <li>● Inspecting sliding torque</li> <li>● Inspecting steering torque</li> <li>● Inspecting rotating torque for ball joint</li> </ul>
KV48104400 ( — ) Teflon ring correcting tool a: 50 mm (1.97 in) dia. b: 58 mm (2.28 in) dia. c: 100 mm (3.94 in) d: 36 mm (1.42 in) dia.	Installing rack Teflon ring
KV48103400 ( — ) Torque adapter	Inspecting pinon rotating torque
1. KV48102500-04 ( — ) Washer 2. KV48102500-01 ( — ) Eye joint 3. KV48102500-03 ( — ) Bolt 4. KV48102500-02 ( — ) Flare Joint 5. KV48103500 (J-26357 and J-26357-10) Oil pressure gauge	Measuring power steering oil pump relief pressure

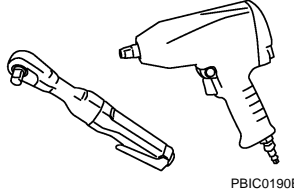


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# PREPARATION

## Commercial Service Tools

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Tool name	Description
Power tool  PBIC0190E	Loosening nuts and bolts

# NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

## NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

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### NVH Troubleshooting Chart

NGS0003E

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

Symptom	STEERING	Possible cause and suspected parts													Reference page											
		Fluid level	Air in hydraulic system	Tie-rod ball joint swinging force	Tie-rod ball joint rotating torque	Tie-rod ball joint end play	Steering fluid leakage	Steering wheel play	Steering gear rack sliding force	Drive belt looseness	Improper steering wheel	Improper installation or looseness of tilt lock lever	Mounting rubber deterioration	Steering column deformation or damage		Improper installation or looseness of steering column	Steering linkage looseness	PROPELLER SHAFT	DIFFERENTIAL	AXLE and SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES		
Noise	STEERING	Noise	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	PS-6	
		Shake																								PS-7
		Vibration																								PS-23
		Shimmy																								PS-23
		Judder																								PS-6
Shake	STEERING	Noise																							PS-8	
		Shake																								PS-9
		Vibration																								EM-13
		Shimmy																								PS-8
		Judder																								PS-11
Vibration	STEERING	Noise																								PS-15
		Shake																								PS-15
		Vibration																								PS-13
		Shimmy																								PS-11
		Judder																								PS-15
Shimmy	STEERING	Noise																								NVH in PR section
		Shake																								NVH in RFD section
		Vibration																								NVH in FAX, RAX, FSU, RSU section
		Shimmy																								NVH in WT section
		Judder																								NVH in WT section
Judder	STEERING	Noise																								NVH in FAX section
		Shake																								NVH in BR section
		Vibration																								
		Shimmy																								
		Judder																								

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# POWER STEERING FLUID

## POWER STEERING FLUID

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### Checking Fluid Level

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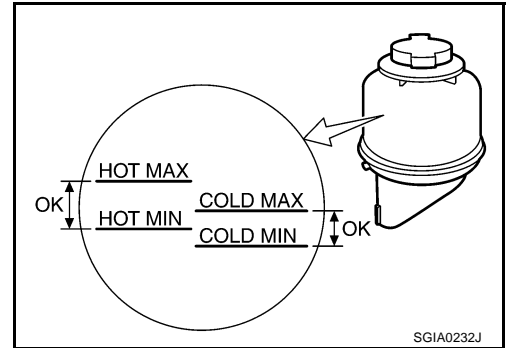
1. Check fluid level with engine stopped.
2. Make sure that fluid level is between MIN and MAX.
3. Fluid levels at HOT and COLD are different. Do not confuse them.

**HOT** : Fluid temperature 50 - 80 °C (122 - 176°F)

**COLD** : Fluid temperature 0 - 30°C (32 - 86°F)

#### CAUTION:

- The fluid level should not exceed the MAX line. Excessive fluid will cause fluid leakage from the cap.
- Do not reuse drained power steering fluid.
- Recommended fluid is Genuine Nissan PSF or equivalent.



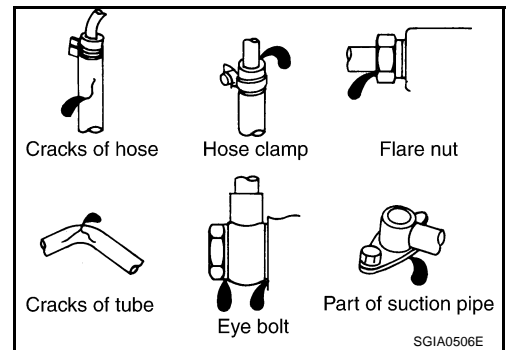
### Checking Fluid Leakage

NGS0003G

1. Check the lines for improper attachment and for leaks, cracks, damage, loose connections, chafing or deterioration.
2. Run engine until fluid temperature reaches 50 to 80° C (122 to 176°F) in reservoir tank. Keep engine speed idle.
3. Turn steering wheel right-to-left several times.
4. 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.)**



5. If 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.
6. If fluid leakage from oil pump is noticed, check oil pump. Refer to [PS-29, "POWER STEERING OIL PUMP"](#) .
7. Check steering gear boots for accumulation of power steering fluid indicating a steering gear leak.

# POWER STEERING FLUID

## Air Bleeding Hydraulic System

NGS0003H

1. Turn steering wheel several times from full left stop to full right stop with engine off.
  - CAUTION:**
    - Turn steering wheel while filling reservoir tank with fluid so as not to lower fluid level below the MIN line.
    - When air bleeding is incomplete, the following phenomena occur. Although a fluid sound can be heard from the gear and pump when turning the steering wheel all the way or slowly, this is not a malfunction.
      - Bubbles are created in reservoir tank.
      - Clicking noise can be heard from power steering oil pump.
      - Excessive buzzing in the power steering oil pump.
2. Start engine and hold steering wheel at each lock position for 3 seconds at idle to check for fluid leakage.
3. Repeat step 2 above several times at approximately 3 second intervals.
  - CAUTION:**  
Do not hold the steering wheel in a locked position for more than 10 seconds. (There is the possibility that power steering oil pump may be damaged.)
4. Check fluid for bubbles and white contamination.
5. Stop engine if bubbles and white contamination do not drain out. Perform steps 2 and 3 above after waiting until bubbles and white contamination drain out.
6. Stop the engine, and then check fluid level.

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# STEERING WHEEL

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NGS000BL

## STEERING WHEEL

### On-Vehicle Service

#### CONDITION OF INSTALLATION

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

**Steering wheel axial end play : 0 mm (0 in)**

3. Check the following items when steering wheel axial end play is out of the standard.
  - a. Check the mounting nut and bolt of steering column assembly. Refer to [PS-15, "COMPONENT"](#) .
  - b. Check steering column. Refer to [PS-13, "INSPECTION AFTER REMOVAL"](#) .
4. Check steering gear assembly mounting bolts and nut for looseness. Refer to [PS-11, "COMPONENT"](#) .

#### STEERING WHEEL PLAY

1. Set tires to the 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 : 0 - 35 mm (0 - 1.37 in)**

2. Check the following items when steering wheel play is out of the standard.
  - a. Check backlash for each joint of steering column.
  - b. Check installation condition of steering gear assembly.

#### NEUTRAL POSITION ON STEERING WHEEL

1. Make sure that steering gear assembly, steering column assembly and steering wheel are installed in the correct position.
2. Perform neutral position inspection after wheel alignment. Refer to [FSU-5, "Wheel Alignment Inspection"](#) .
3. Set vehicle to the straight-ahead position and confirm steering wheel is in the neutral position.
4. Loosen outer socket lock nut and turn inner socket to left and right equally to make fine adjustments if steering wheel is not in the neutral position.

#### STEERING WHEEL TURNING FORCE

1. Park vehicle on a level and dry surface, set parking brake.
2. Tires need to be inflated normal pressure.
3. Start engine.
4. Bring power steering fluid up to adequate operating temperature. [Make sure temperature of fluid is approximately 50 to 80°C (122 to 176°F).]
5. Check steering wheel turning force when steering wheel has been turned 540° from neutral position.

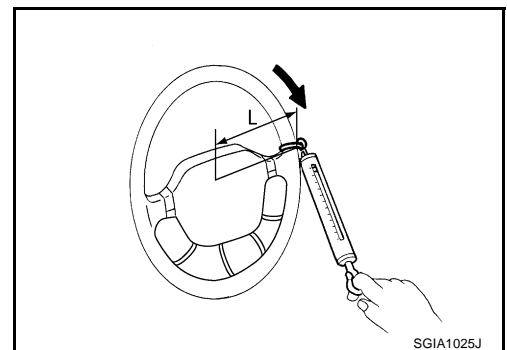
**Steering wheel turning force:**

**7.45 N·m (0.76 kg-m, 66 in-lb) or less**

#### NOTE:

Multiply the distance (L) from the hook of spring scale to the center of steering wheel by the measurement value with a spring scale.

6. Check the following items when steering wheel turning force is more than the standard.
  - a. Check relief oil pressure of power steering oil pump. Refer to [PS-29, "RELIEF OIL PRESSURE"](#) .





# STEERING WHEEL

## RACK SLIDING FORCE

1. Start engine.
2. Bring power steering fluid up to adequate operating temperature. [Make sure temperature of fluid is approximately 50 to 80°C (122 to 176°F).]
3. Disconnect lower joint and steering knuckle from steering gear assembly. Refer to [PS-11, "COMPONENT"](#).
4. While pulling outer socket slowly in  $\pm 11.5$  mm ( $\pm 0.453$  in) range from neutral position, make sure rack sliding force is within specification.

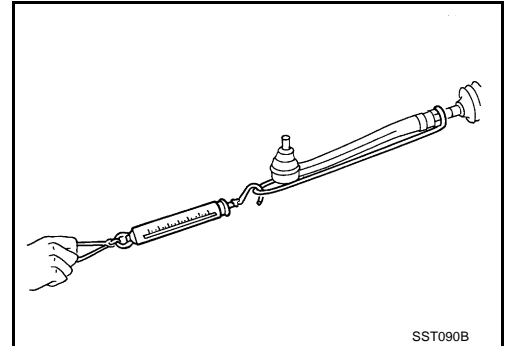
### Rack sliding force (2WD)

: 215.8 - 274.6 N (22.1 - 28.0 kg, 48.6 - 61.7 lb)

### Rack sliding force (AWD)

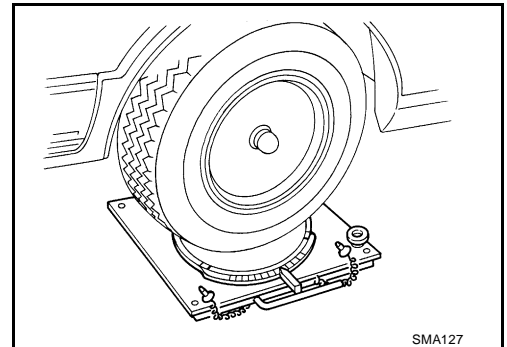
: 225.4 - 284.2 N (23.0 - 28.9 kg, 50.7 - 63.8 lb)

5. If rack sliding force is not within specification, overhaul steering gear assembly. Refer to [PS-20, "Disassembly and Assembly"](#).



## FRONT WHEEL TURNING ANGLE

1. Check toe-in. Refer to [FSU-5, "Wheel Alignment Inspection"](#).
2. Place front wheels on turning radius gauges and rear wheels on stands so that vehicle can be level. Check the maximum inner and outer wheel turning angles for LH and RH road wheels.



3. Start engine and run at idle, turn steering wheel all the way right and left, measure the turning angle.

### Inner wheel (Angle: A)

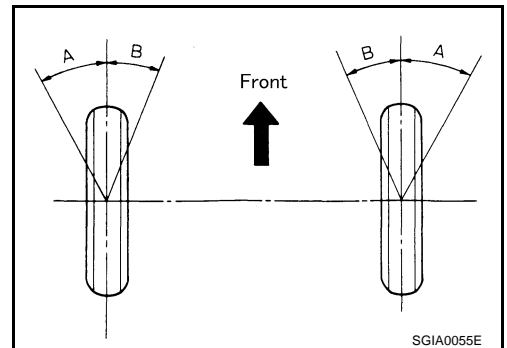
**Minimum** : 34°30' (34.5°)

**Nominal** : 38°00' (38.0°)

**Maximum** : 39°00' (39.0°)

### Outer wheel (Angle: B)

**Nominal** : 31°30' (31.5°)



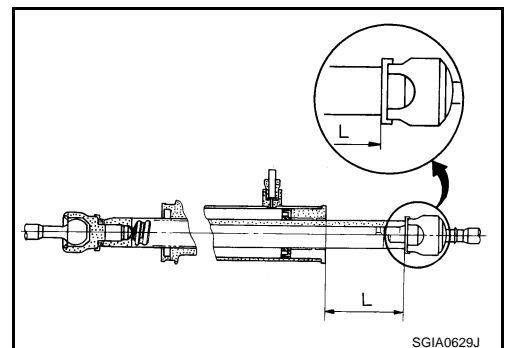
4. Check the following items when turning angle is out of the standard.

- a. Check rack stroke.

**Rack stroke "L"** : 71.5 mm (2.815 in)

- b. Disassemble steering gear assembly to check the cause that rack stroke is outside of the standard. Refer to [PS-20, "Disassembly and Assembly"](#).

- c. Steering angles are not adjustable. Check steering gear assembly, steering column assembly and front suspension components for wear or damage if any of the turning angles are different from the specified value. Replace any of them, if any non-standard condition exists.



# STEERING WHEEL

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## Removal and Installation

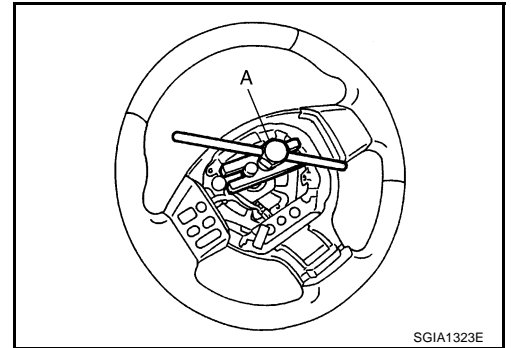
### REMOVAL

#### NOTE:

When reconnecting spiral cable, fix cable with a tape so that fixing case and rotating part keep aligned. This will omit neutral position alignment procedure during spiral cable installation.

1. Set vehicle to the straight-ahead position.
2. Remove driver air bag module. Refer to [SRS-39, "DRIVER AIR BAG MODULE"](#) .
3. Remove steering wheel lock nut after steering is locked.
4. Remove steering wheel with the steering wheel puller (A).

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



### INSTALLATION

Note the following, and installation is in the reverse order of removal.

- When installing the steering wheel, tighten lock nut to the specified torque.

**Steering wheel lock nut : 34.3 N·m (3.5 kg-m, 25 in-lb)**

#### CAUTION:

Check the spiral cable neutral position after replacing or rotating spiral cable. Refer to [SRS-41, "INSTALLATION"](#) .

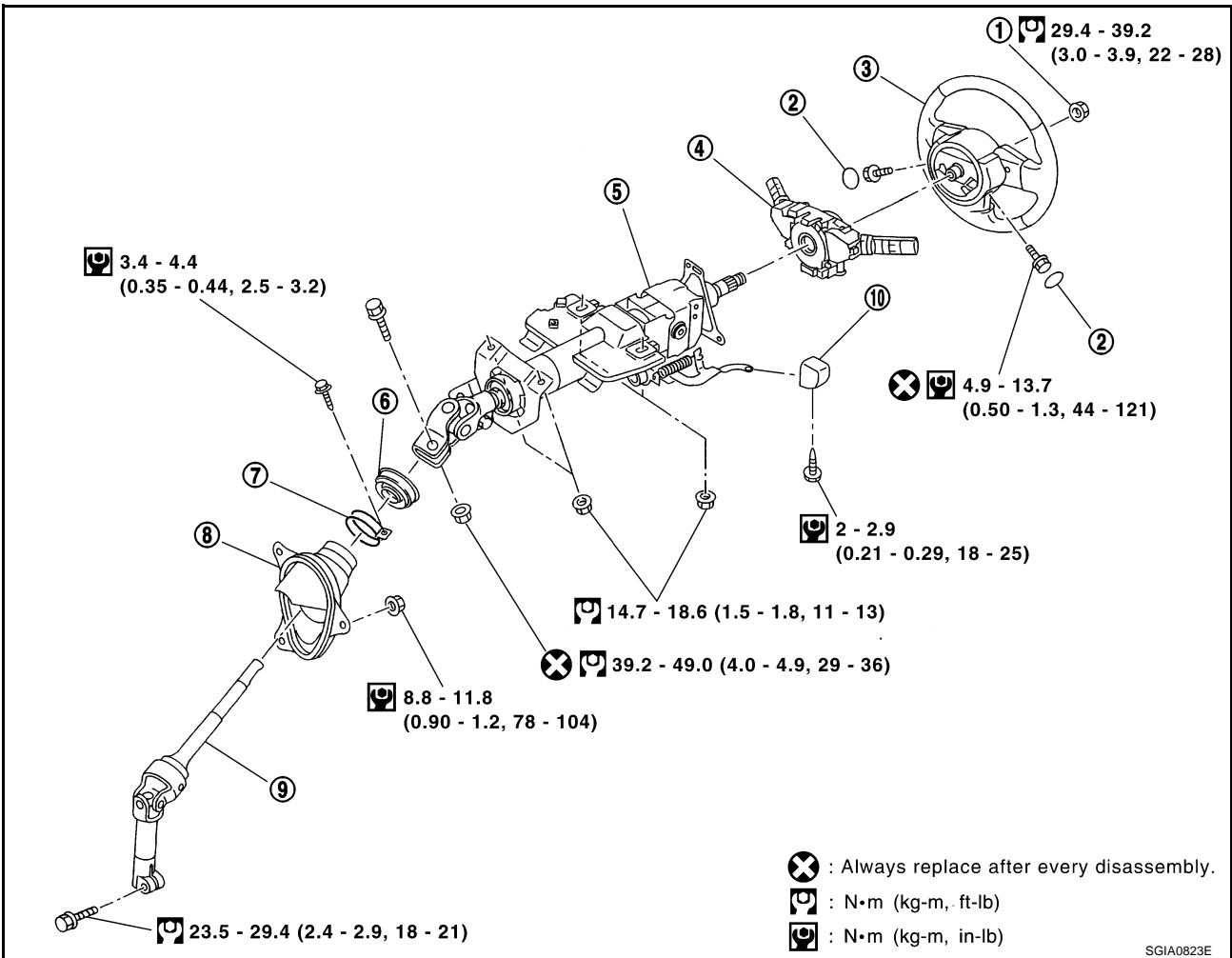
# STEERING COLUMN

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## STEERING COLUMN

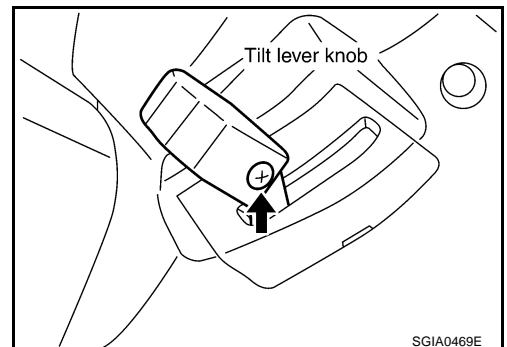
### Removal and Installation COMPONENT



- |  |                             |                    |
|--|-----------------------------|--------------------|
| 1. Steering wheel lock nut             | 2. Lid                      | 3. Steering wheel  |
| 4. Combination switch and spiral cable | 5. Steering column assembly | 6. Hole cover seal |
| 7. Clamp                               | 8. Hole cover               | 9. Lower shaft     |
| 10. Tilt lever knob                    |                             |                    |

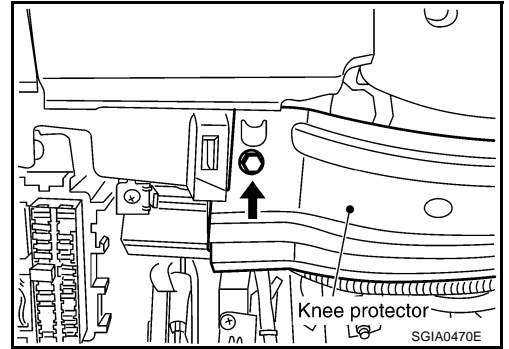
### REMOVAL

1. Set vehicle to the straight ahead-direction.
2. Remove driver air bag module from steering wheel. Refer to [SRS-39, "DRIVER AIR BAG MODULE"](#).
3. Disconnect steering switch connector, remove steering wheel lock nut, then remove steering wheel. Refer to [SRS-41, "SPIRAL CABLE"](#).
4. Remove fixing screw of tilt lever knob, then remove tilt lever knob from tilt lever.
5. Remove instrument driver lower panel. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#).
6. Remove steering column cover and ignition key finisher. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#).
7. Remove NATS antenna amp. Refer to [BL-258, "How to Replace NATS Antenna Amp."](#)

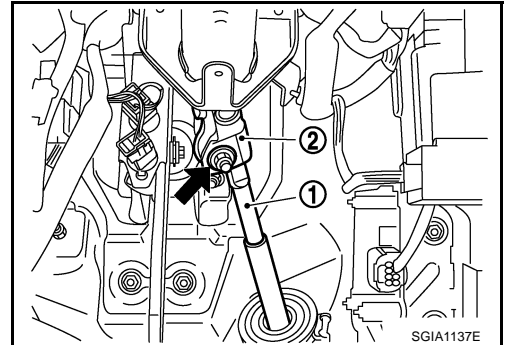


## STEERING COLUMN

8. Remove fixing screws of knee protector, then remove knee protector from vehicle.
9. Remove combination switch and spiral cable from steering column assembly. Refer to [SRS-41, "SPIRAL CABLE"](#) .
10. Disconnect harness connector from each switch on steering column shaft, then separate vehicle side harness from it.



11. Remove lock nut and bolt, then separate lower shaft (1) from upper joint (2).

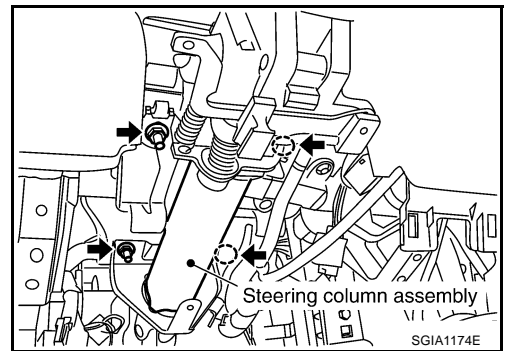


12. Remove mounting nuts from steering member, remove steering column assembly from steering member.

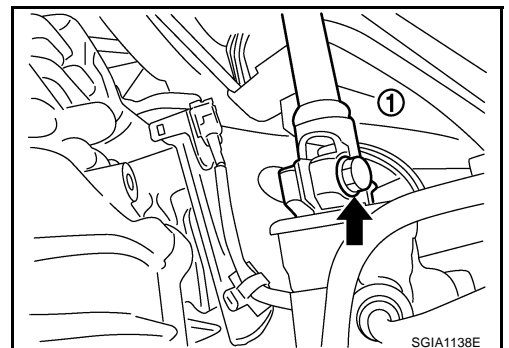
**CAUTION:**

- Do not give axial impact to steering column assembly during removal.
- Do not move steering gear assembly when removing steering column assembly.

13. Loosen clamp, and then remove hole cover seal from hole cover.
14. Remove mounting nuts of hole cover, and then remove clamp and hole cover from dash panel.



15. Raise vehicle, and then remove mounting bolt (lower side) of lower shaft (1) and remove lower shaft (1) from vehicle.



# STEERING COLUMN

## INSPECTION AFTER REMOVAL

- Check each part of steering column assembly, hole cover seal, clamp, hole cover and lower shaft for damage or other malfunctions. Replace if there are.
- Measure the length "L1" or "L2" as shown in the figure if vehicle has been involved in a minor collision. Replace steering column assembly if outside the standard.

### Steering column length

**L1: 182 mm (7.17 in)**

**L2: 242.6 mm (9.55 in)**

- Measure steering column rotating torque using preload gauge. Replace steering column assembly if outside the standard.

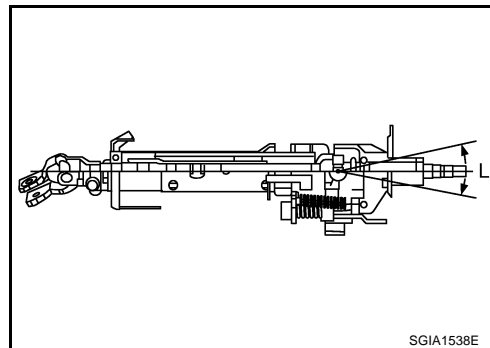
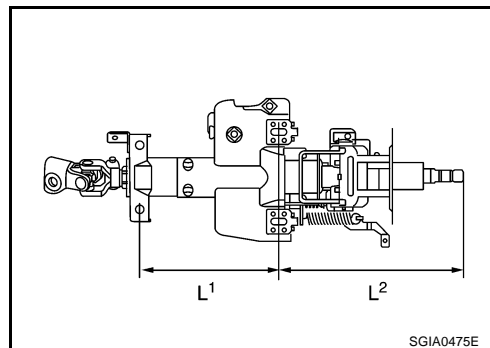
**Turning torque : 0 - 0.2 N·m (0 - 0.02 kg-m, 0 - 2 in-lb)**

- Check tilt mechanism operating range "L" as shown in the figure.

**Operating range "L" : 49.4 mm (1.945 in)**

### CAUTION:

**Measure the operating range "L" at the end of the shaft.**



## INSTALLATION

Note the following, and installation is in the reverse order of removal.

- Refer to [PS-11, "COMPONENT"](#) about each tightening torque.
- When installing steering column assembly to steering member, install mounting nuts from front side of vehicle with tilt neutral position.

### CAUTION:

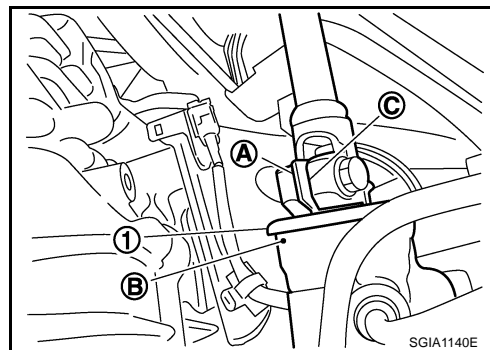
**Do not give axial impact to steering column assembly during installation.**

- When installing lower shaft to steering gear assembly, follow the procedure listed below.
  - Set rack of steering gear in the neutral position.

### NOTE:

To get the neutral position of rack, turn sub-gear assembly and measure the distance of inner socket, and then measure the intermediate position of the distance.

- Align rear cover cap projection (A) with the marking position (B) of gear housing assembly.
- Install slit part of lower shaft (C) aligning with the projection (A) of rear cover cap (1). Make sure that the slit part of lower shaft (C) is aligned with both the projection (A) of rear cover cap (1) and the marking position (B) of gear housing assembly.



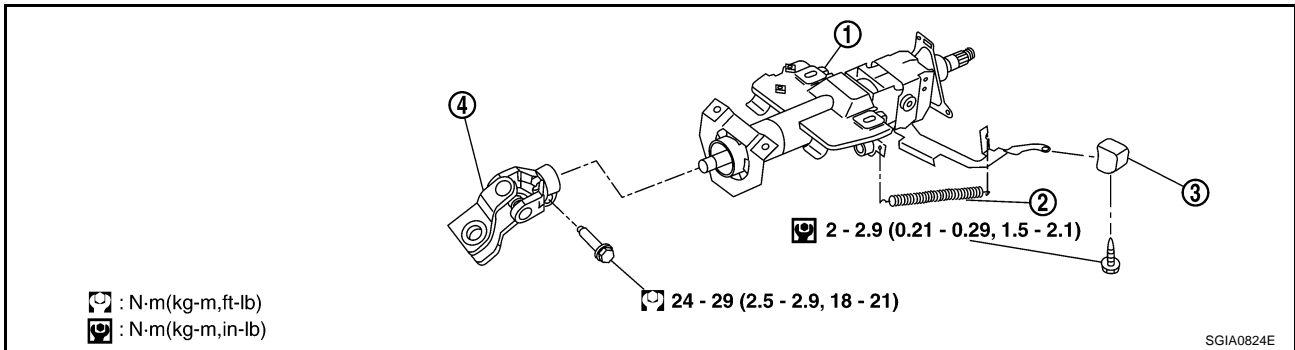
## INSPECTION AFTER INSTALLATION

- Make sure that steering wheel operates smoothly by turning several times from full left stop to full right stop.

# STEERING COLUMN

NGS0003L

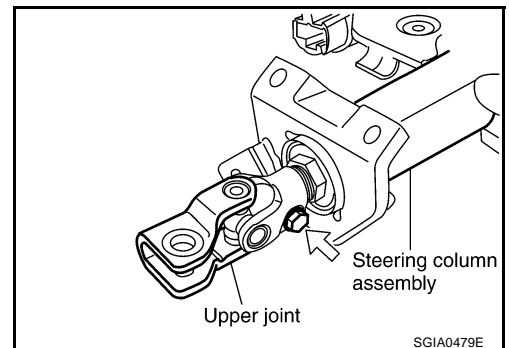
## Disassembly and Assembly COMPONENT



1. Steering column assembly
2. Spring
3. Tilt lever knob
4. Upper joint

### DISASSEMBLY

1. Remove spring from steering column assembly and tilt lever.
2. Remove fixing bolt of upper joint, then remove upper joint from steering column assembly.



### ASSEMBLY

Note the following, and assembly is in the reverse order of disassembly.

- Refer to [PS-14, "COMPONENT"](#) about each tightening torque.

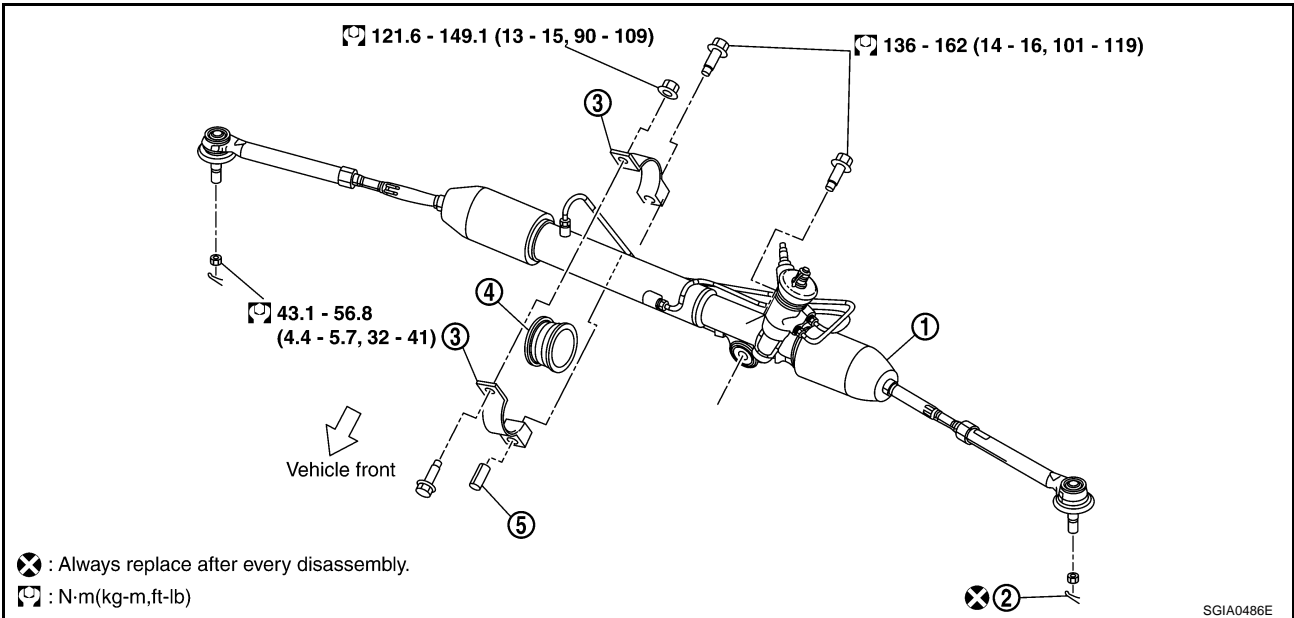
# POWER STEERING GEAR

## POWER STEERING GEAR

PPF:49001

### Removal and Installation COMPONENT

NGS0003M

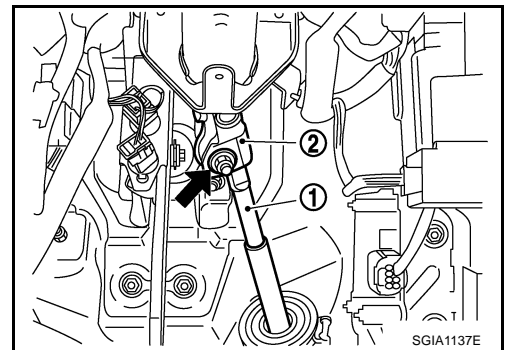


- |                            |               |                          |
|----------------------------|---------------|--------------------------|
| 1. Steering gear assembly  | 2. Cotter pin | 3. Rack mounting bracket |
| 4. Rack mounting insulator | 5. Sleeve     |                          |

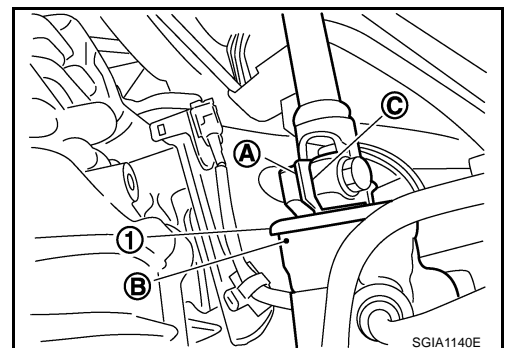
## REMOVAL

### 2WD

1. Set vehicle to the straight-ahead position.
2. Remove lock nut and bolt, then separate lower shaft (1) from upper joint (2).
3. Remove tires from vehicle with power tool.



4. Confirm slit of lower shaft (C) fits with the projection (A) on rear cover cap (1), furthermore marking position (B) on steering gear assembly nearly fits with the projection (A) on rear cover cap (1).
5. Remove cotter pin at steering knuckle, then loosen mounting nut.

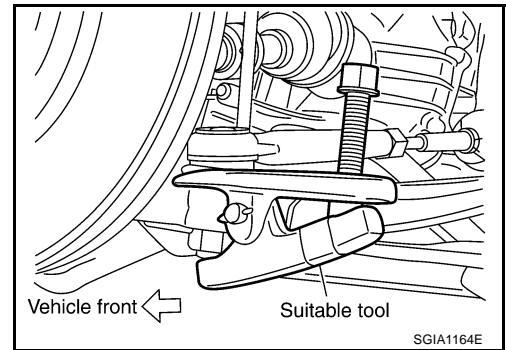


## POWER STEERING GEAR

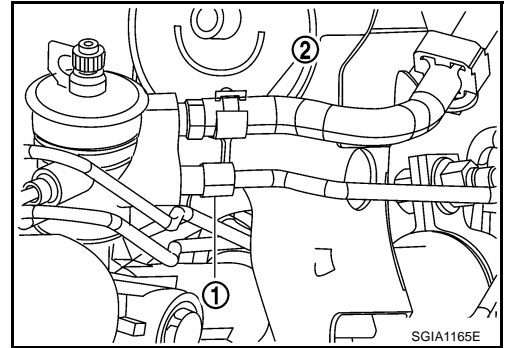
6. Remove steering outer socket from steering knuckle so as not to damage ball joint boot using the ball joint remover [suitable tool].

**CAUTION:**

Temporarily tighten the nut to prevent damage to threads and to prevent the ball joint remover [suitable tool] from suddenly coming off.



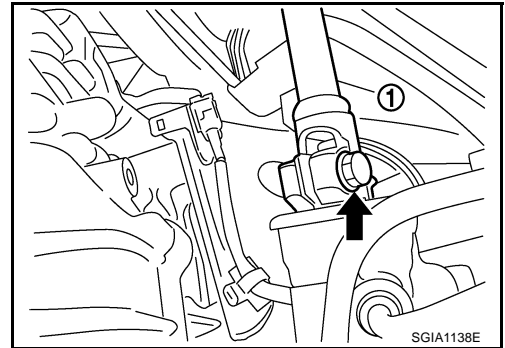
7. Remove high-pressure piping (1) and low-pressure hose (2) of hydraulic piping, and then drain power steering fluid. Refer to [PS-34, "Removal and Installation"](#).



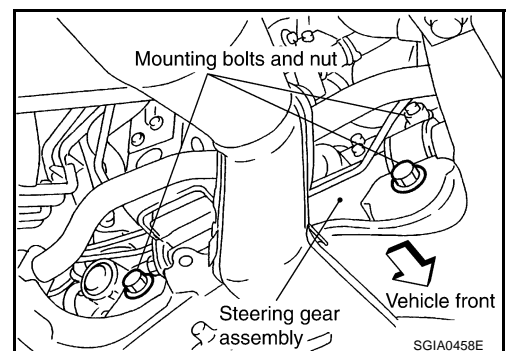
8. Remove mounting bolt (lower side) of lower shaft (1).

**CAUTION:**

Spiral cable may snap due to steering operation if steering column is separated from steering gear assembly. Therefore fix steering wheel with a string to avoid turns.



9. Remove mounting bolts and nut of steering gear assembly, and then remove steering gear assembly, rack mounting bracket, rack mounting insulator and sleeve from vehicle.

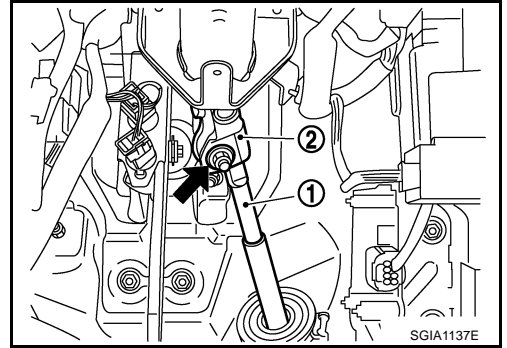




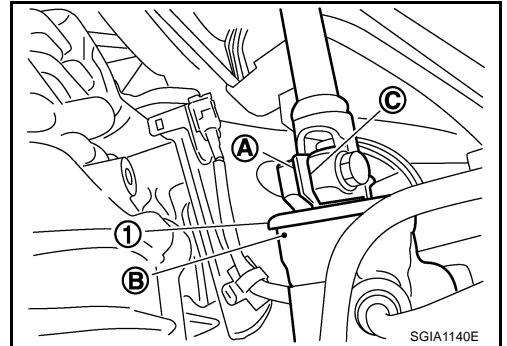
# POWER STEERING GEAR

## AWD

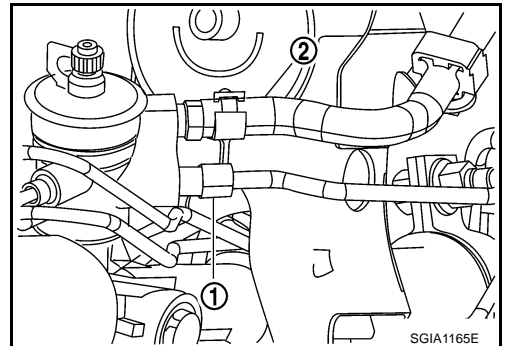
1. Set vehicle to the straight-ahead position.
2. Remove lock nut and bolt, then separate lower shaft (1) from upper joint (2).
3. Remove tires from vehicle with power tool.
4. Remove undercover from vehicle with power tool.



5. Confirm slit of lower shaft (C) fits with the projection (A) on rear cover cap (1), furthermore marking position (B) on steering gear assembly nearly fits with the projection (A) on rear cover cap (1).



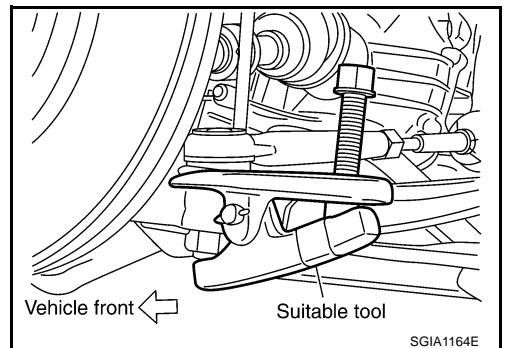
6. Remove high-pressure piping (1) and low-pressure hose (2) of hydraulic piping, and then drain power steering fluid. Refer to [PS-34, "Removal and Installation"](#).
7. Remove cotter pin at steering knuckle, then loosen mounting nut.



8. Remove steering outer socket from steering knuckle so as not to damage ball joint boot using the ball joint remover [suitable tool].

### **CAUTION:**

**Temporarily tighten the nut to prevent damage to threads and to prevent the ball joint remover [suitable tool] from suddenly coming off.**



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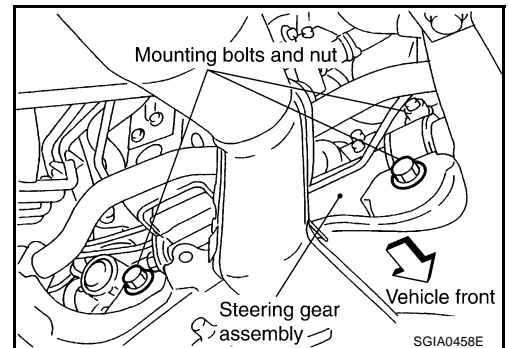
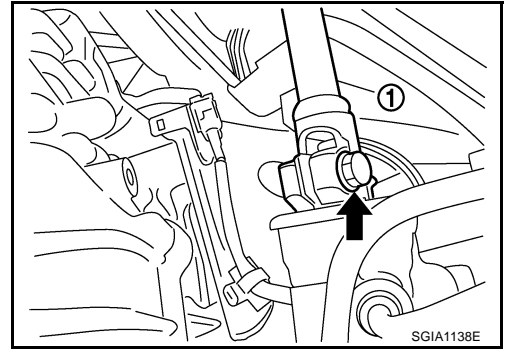
## POWER STEERING GEAR

9. Remove mounting bolt (lower side) of lower shaft (1).

**CAUTION:**

**Spiral cable may snap due to steering operation if steering column is separated from steering gear assembly. Therefore fix steering wheel with a string to avoid turns.**

10. Remove front exhaust tube with power tool. Refer to [EX-3, "EXHAUST SYSTEM"](#).
11. Remove rear propeller shaft. Refer to [PR-4, "REAR PROPELLER SHAFT"](#).
12. Remove mounting nuts on lower position of stabilizer connecting rod with power tool.
13. Remove mounting bolts of stabilizer clamp and hang stabilizer on vehicle with power tool.
14. Remove steering hydraulic piping bracket from front suspension member. Refer to [PS-34, "HYDRAULIC LINE"](#).
15. Disconnect electrical rear engine mounting actuator harness connector. Refer to [EM-108, "ENGINE ASSEMBLY"](#).
16. Set jack under engine and front suspension member.
17. Remove mounting bolts of rear engine mounting insulator with power tool. Refer to [EM-108, "ENGINE ASSEMBLY"](#).
18. Loosen mounting nuts of front suspension member (front side).
19. Remove mounting bolts of member stay (body side) with power tool, then loosen mounting nuts of member stay (front suspension member side).
20. Move jack down slowly (front suspension member side) to remove rear engine mounting insulator from engine and front suspension member.
21. Remove mounting bolts and nut of steering gear assembly, and then remove steering gear assembly, rack mounting bracket, rack mounting insulator and sleeve from vehicle.



# POWER STEERING GEAR

## INSTALLATION

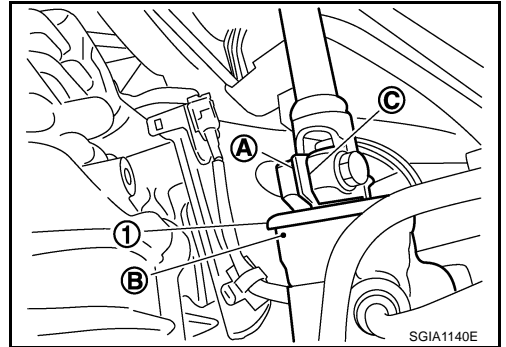
Note the following, and install is in the reverse order of removal.

- Refer to [PS-15, "COMPONENT"](#) about each tightening torque.
- When installing lower shaft to steering gear assembly, follow the procedure listed below.
  - Set rack of steering gear in the neutral position.

### NOTE:

To get the neutral position of rack, turn sub-gear assembly and measure the distance of inner socket, and then measure the intermediate position of the distance.

- Align rear cover cap projection (A) with the marking position (B) of gear housing assembly.
- Install slit part of lower shaft (C) aligning with the projection (A) of rear cover cap (1). Make sure that the slit part of lower shaft (C) is aligned with both the projection (A) of rear cover cap (1) and the marking position (B) of gear housing assembly.
- After installation, bleed air from the steering hydraulic system. Refer to [PS-7, "Air Bleeding Hydraulic System"](#).
- Perform final tightening of nuts and bolts on each part under unladen conditions with tires on level ground when removing steering gear assembly. Check wheel alignment. Refer to [FSU-5, "Wheel Alignment Inspection"](#).
- Adjust neutral position of steering angle sensor after checking wheel alignment. Refer to [SRS-41, "INSTALLATION"](#).



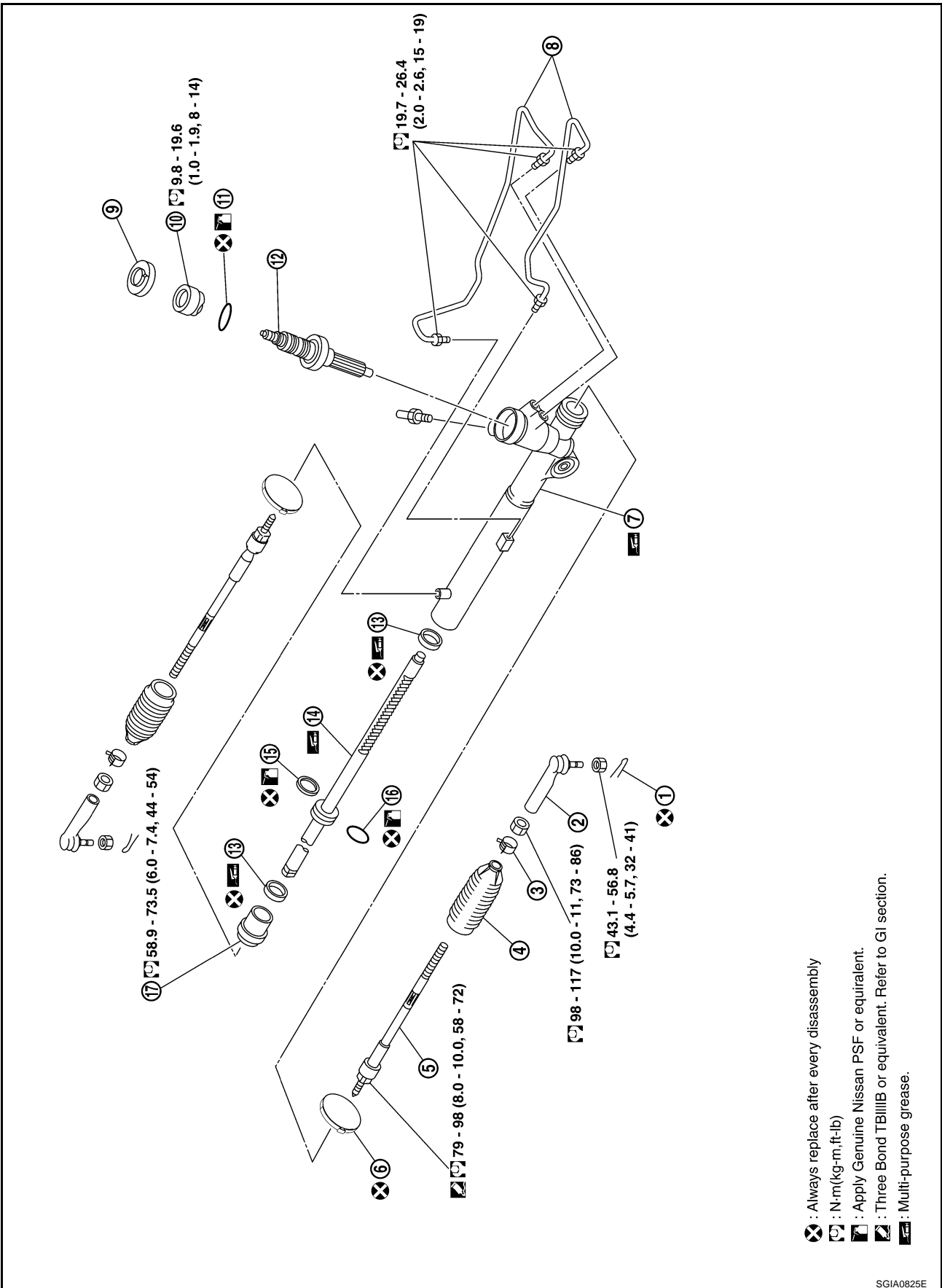
## INSPECTION AFTER INSTALLATION

- Make sure that steering wheel operates smoothly by turning several times from full left stop to full right stop.

# POWER STEERING GEAR

NGS0003N

## Disassembly and Assembly COMPONENT



SGIA0825E

# POWER STEERING GEAR

- |                          |                        |                       |
|--------------------------|------------------------|-----------------------|
| 1. Cotter pin            | 2. Outer socket        | 3. Boot clamp         |
| 4. Boot                  | 5. Inner socket        | 6. Boot clamp         |
| 7. Gear housing assembly | 8. Cylinder tubes      | 9. Rear cover cap     |
| 10. Rear cover           | 11. O-ring             | 12. Sub-gear assembly |
| 13. Rack oil seal        | 14. Rack assembly      | 15. Rack Teflon ring  |
| 16. O-ring               | 17. End cover assembly |                       |

## DISASSEMBLY

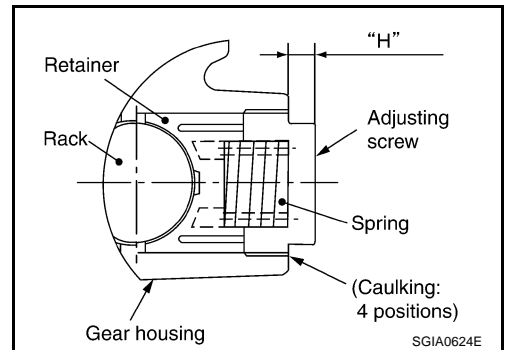
### CAUTION:

- Disassemble steering gear assembly by securing the mounting area in a vise using copper plates.
- Clean steering gear assembly with kerosene before disassembling. Be careful to avoid splashing or applying any kerosene over connector of discharge port or return port.

1. Remove cylinder tubes from gear housing assembly.
2. Remove rear cover cap from gear housing assembly.
3. Measure adjusting screw height "H", and loosen adjusting screw.

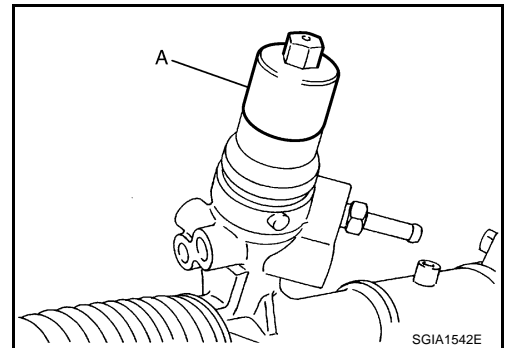
### CAUTION:

- Do not loosen adjusting screw 2 turns or more.
- Replace steering gear assembly if adjusting screw is loosened 2 turns or more and it is removed.



5. Use a Tool (A) to remove rear cover from sub-gear assembly.

**Tool number A: KV48104400 (J-46213)**



6. Remove O-ring with a flat-bladed screwdriver, and pull out rear cover.
7. Remove sub-gear assembly from gear housing assembly.

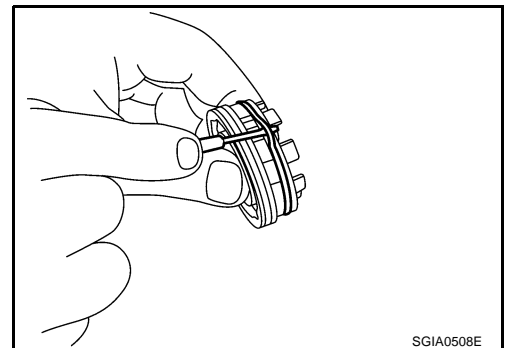
### CAUTION:

**In order to protect oil seal from any damage, pull sub-gear assembly out straightly.**

8. Loosen lock nut of outer socket, and remove outer socket.
9. Remove boot clamp, and then remove boot from inner socket.

### CAUTION:

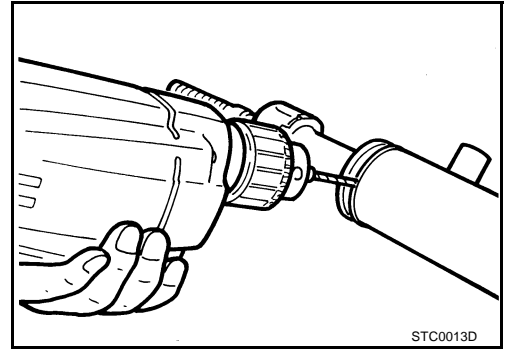
- Do not damage inner socket and gear housing assembly when removing boot.
- Inner socket and gear housing assembly must be replaced if inner socket and gear housing assembly are damaged because it may cause foreign material interfusion.



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## POWER STEERING GEAR

10. Drill out the clinching part of gear housing assembly (end cover assembly side) outer rim with a 3 mm (0.12 in) drill bit. [Drill for approximately 1.5 mm (0.059 in) depth.]



11. Remove end cover assembly with a 45 mm (1.77 in) open head (suitable tool).

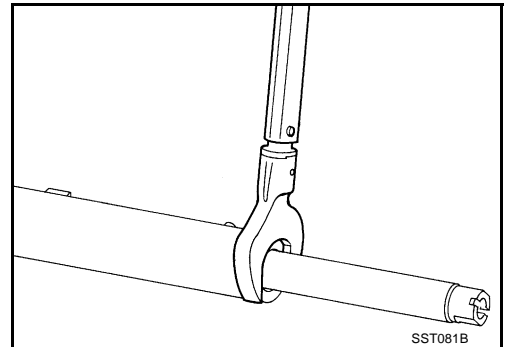
**CAUTION:**

- Do not damage rack assembly surface when removing.
- Rack assembly must be replaced if damaged because it may cause fluid leakage.

12. Pull rack assembly together with rack oil seal (outer side) out from gear housing assembly.

**CAUTION:**

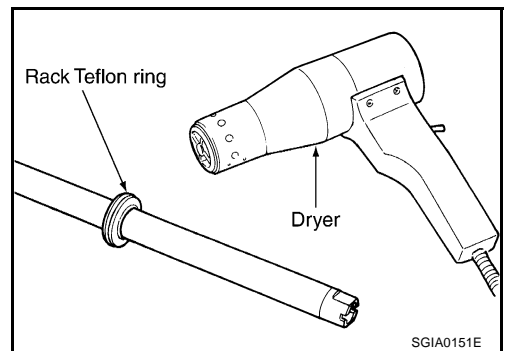
- Do not damage cylinder inner wall when removing rack assembly.
- Gear housing assembly must be replaced if damaged because it may cause fluid leakage.



13. Heat rack Teflon ring to approximately 40°C (104°F) with a dryer, then remove it and O-ring from rack.

**CAUTION:**

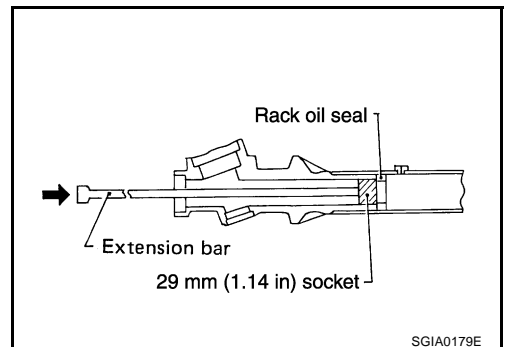
- Do not damage rack assembly. Rack assembly must be replaced if damaged because it may cause fluid leakage.



14. Push rack oil seal inside with a 29 mm (1.14 in) socket and an extension bar to push out rack oil seal (inner side) from gear housing assembly.

**CAUTION:**

- Do not damage gear housing assembly and cylinder inner wall.
- Gear housing assembly must be replaced if damaged because it may cause fluid leakage.



# POWER STEERING GEAR

## INSPECTION AFTER DISASSEMBLY

### Boot

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

### Rack

Check rack for damage and wear. Replace it, if necessary.

### Sub-Gear Assembly

- Check pinion gear for damage and wear. Replace it, if necessary.
- Rotate pinion and check for torque variation or rattle. Replace if there are.

### Gear Housing Assembly

Check gear housing assembly for damage and scratches (inner wall). Replace it, if necessary.

### Outer Socket and Inner Socket

#### Swing Torque

- Hook a spring balance at the point shown in the figure and pull the spring balance. Make sure that the spring balance reads the specified value when ball stud and inner socket start to move. Replace outer socket and steering gear assembly if they are outside the standard.

#### Swing torque

#### Measuring point:

**Outer socket: Cotter pin hole of stud**

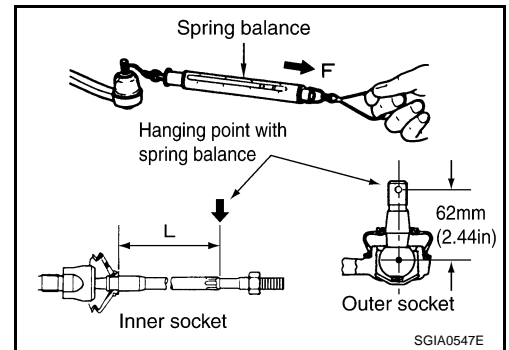
**Inner socket: ["L" = 83.2 mm (3.276 in)]**

#### Outer socket:

**4.84 - 46.7 N (0.50 - 4.7 kg, 1.09 - 10.4 lb)**

#### Inner socket:

**12.1 - 93.7 N (1.3 - 9.5, kg, 2.8 - 21.0 lb)**



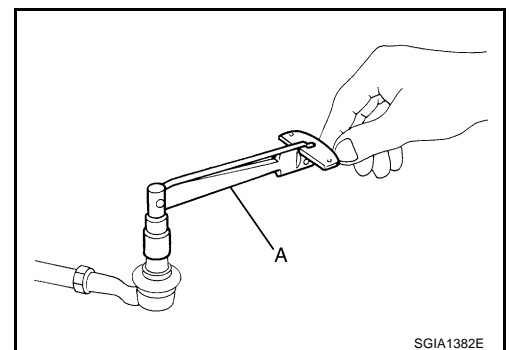
#### Rotating Torque

- Make sure that the reading is within the following specified range using Tool. Replace outer socket if the reading is outside the specified value.

**Tool number A: ST3127S000 ( — )**

#### Outer socket:

**0.3 - 2.9 N·m (0.03 - 0.29 kg·m, 3 - 25 in-lb)**

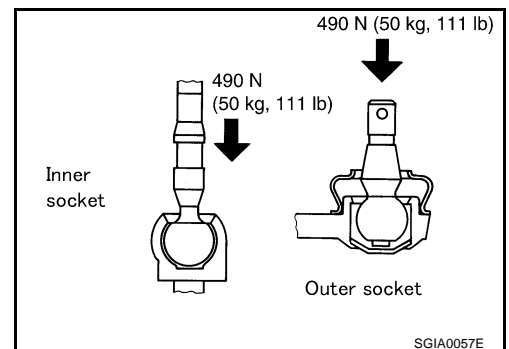


#### Axial End Play

- Apply an axial load of 490 N (50 kg, 111 lb) to ball stud using a dial gauge. Measure amount of stud movement, and then make sure that the value is within the following specified range. Replace outer socket and inner socket if the measured value is outside the standard.

**Outer socket : 0.5 mm (0.02 in) or less**

**Inner socket : 0.2 mm (0.008 in) or less**



# POWER STEERING GEAR

## ASSEMBLY

### CAUTION:

Assemble steering gear assembly by securing the mounting area in a vise using copper plates.

1. Apply Nissan PSF or equivalent to O-ring. Put an O-ring into rack Teflon ring.

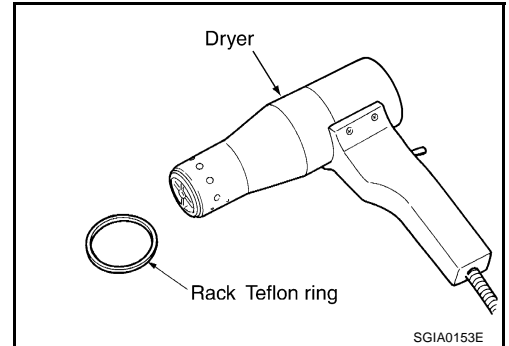
### CAUTION:

Do not reuse O-ring.

2. Heat rack Teflon ring to approximately 40°C (104°F) with a dryer. Assemble it to mounting groove of rack assembly.

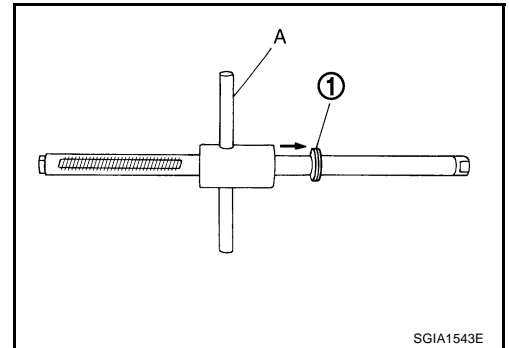
### CAUTION:

Do not reuse rack Teflon ring.



3. Install the Tool (A) from tooth side of rack to fit rack Teflon ring (1) on rack. Compress the ring with tool.

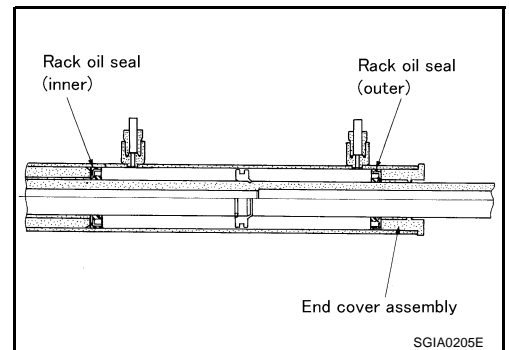
Tool number A: KV48104400 ( — )



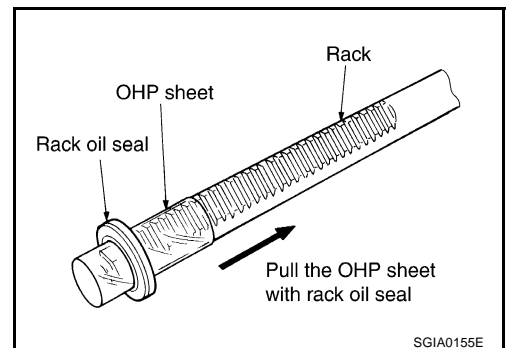
4. Apply multi-purpose grease to rack oil seal. And install rack oil seal in the following procedure. Then assemble rack assembly to gear housing assembly.

### CAUTION:

- Do not reuse rack oil seal.
- Install rack oil seal in a direction so that the lip of inner oil seal and the lip of outer oil seal face each other.
- Do not damage retainer sliding surface by rack assembly. Replace gear housing assembly if damaged.
- Do not damage gear housing assembly inner wall by rack assembly. Gear housing assembly must be replaced if damaged because it may cause fluid leakage.



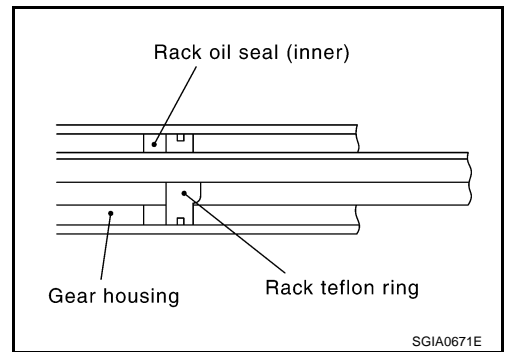
- a. Wrap an OHP sheet [approximately 70 mm (2.76 in) × 100 mm (3.94 in).] Around rack assembly teeth to avoid damaging rack oil seal (inner). Install rack oil seal over sheet. Then, pull oil seal along with OHP sheet until they pass rack assembly teeth, and remove OHP sheet.



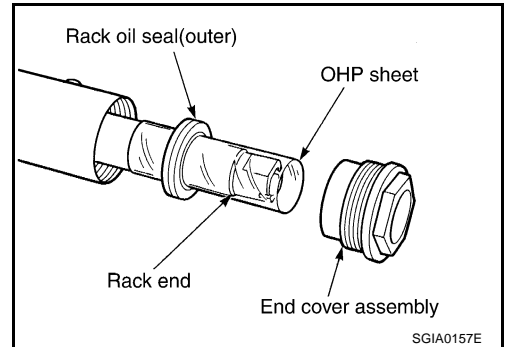


# POWER STEERING GEAR

- b. Insert rack oil seal (inner) into rack assembly piston (rack Teflon ring).
- c. Push retainer to adjusting screw side by hand, and move the rack assembly inside the gear housing assembly so that the rack oil seal (inner) can be pressed against the gear housing assembly.



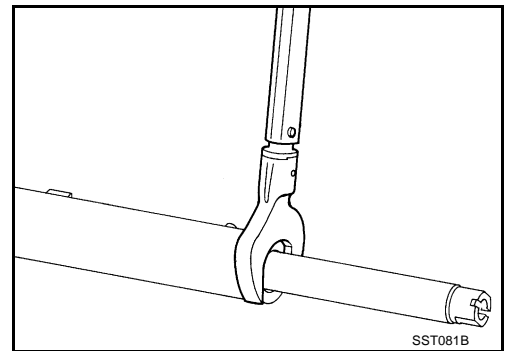
- d. Wrap an OHP sheet [approximately 70 mm (2.76 in) × 100 mm (3.94 in).] Around the edge to avoid damaging rack oil seal (outer). Install rack oil seal over sheet. Then, pull oil seal along with OHP sheet until they pass rack edge, and remove OHP sheet.
- e. Install end cover assembly to rack edge, and move rack oil seal (outer) until it contacts with gear housing assembly.



5. Tighten end cover assembly to specified torque using a 45 mm (1.77 in) open head (suitable tool).

**CAUTION:**

**Do not damage rack assembly. Replace it if damaged because it may cause fluid leakage.**



6. Crimp gear housing assembly at one point using a punch as shown in the figure so as to prevent end cover assembly from getting loose after tightening end cover assembly.

7. Install sub-gear assembly to gear housing assembly.

**CAUTION:**

**In order to protect oil seal from any damage, insert sub-gear assembly out straightly.**

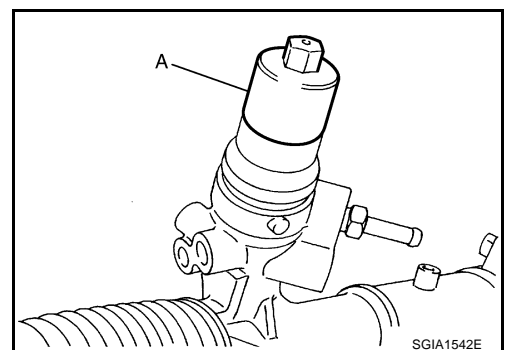
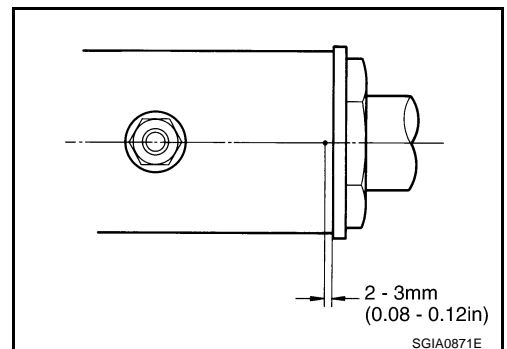
8. Apply Nissan PSF or equivalent to O-ring. Install O-ring to rear cover.

**CAUTION:**

**Do not reuse O-ring.**

9. Using a Tool (A), install rear cover to gear housing assembly.

**Tool number A: KV48104400 (J-46213)**



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# POWER STEERING GEAR

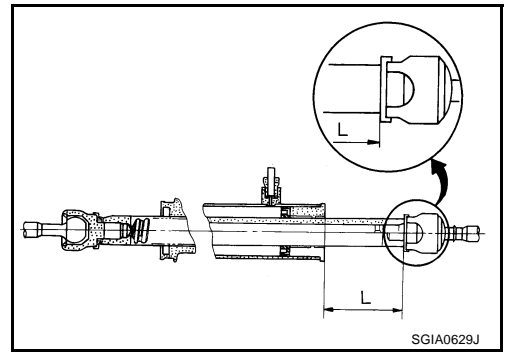
10. Decide on the neutral position for the rack.

**Rack stroke "L" : 71.5 mm (2.815 in)**

11. Install rear cover cap to gear housing assembly.

**CAUTION:**

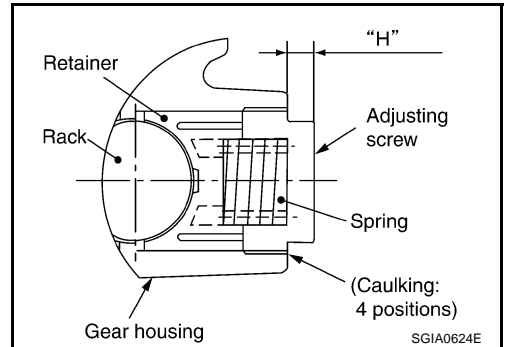
**Make sure that the projection of rear cover cap is aligned with the marking position of gear housing assembly.**



12. Apply Three Bond TB1111 or equivalent to the thread (2 turns thread), and then screw in the adjusting screw until it reaches height "H" from gear housing assembly measured before disassembling.

**CAUTION:**

- Do not turn adjusting screw more than twice.
- Replace steering gear assembly when adjusting screw is removed or more than twice.

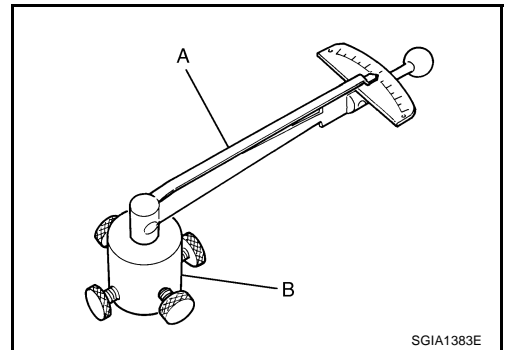


13. Adjust pinion rotating torque with the following procedure.

a. Measure pinion rotating torque within  $\pm 180^\circ$  of neutral position of the rack assembly using Tools. Stop the gear at the point where highest torque is read.

**Tool number A: ST3127S000 (J-25765-A)**  
**B: KV48103400 ( — )**

b. After loosening adjusting screw once, tighten it again with torque of 4.9 - 5.9 N·m (0.50 - 0.60 kg·m, 44 - 52 in·lb). Furthermore loosen it within from  $20^\circ$  to  $40^\circ$ .



c. Measure pinion rotating torque using Tools to make sure that the measured value is within the standard. Readjust if the value is outside the standard. Replace steering gear assembly if the value is outside the standard after readjusting or adjusting screw rotating torque is 5 N·m (0.51 kg·m, 44 in·lb) or less.

**Pinion rotating torque**

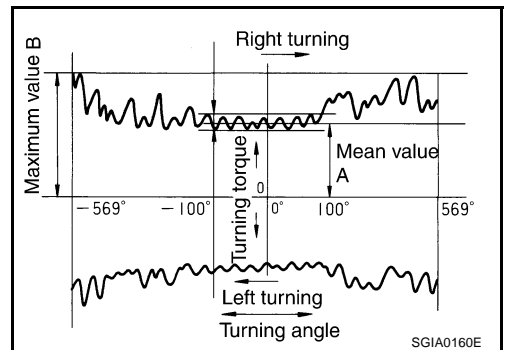
**Maximum variation "B":**

**2.3 N·m (0.23 kg·m, 20 in·lb)**

**Around neutral position (without  $\pm 100^\circ$ ) fluctuation**

**Average "A":**

**0.8 - 2.0 N·m (0.09 - 0.20 kg·m, 7 - 17 in·lb)**



d. Turn pinion fully to the end of the left with inner socket to gear housing assembly.

# POWER STEERING GEAR

- e. Install dial indicator (B) at 5mm (L) from the edge of housing (2), and tooth point.
- f. Measure vertical movement of rack assembly when pinion is turned counterclockwise with torque of 4.9 N·m (0.5 kg-m, 43 in-lb), using Tool.

**Tool number**     **A: ST3127S000 ( — )**

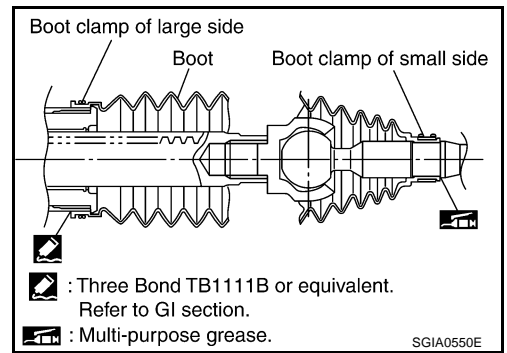
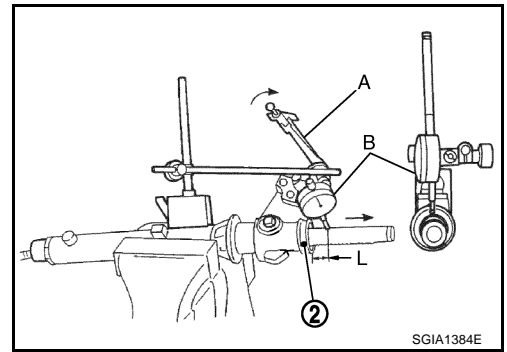
**Vertical movement**     **: 0.265 mm (0.0104 in)**

- If reading is outside of the specification, readjust screw angle with adjusting screw.

**CAUTION:**

- If reading is still out side of specification, or if the rotating torque of adjusting screw is less than 5 N·m (0.51 kg-m, 44 in-lb), replace steering gear assembly.
- Do not turn adjusting screw more than twice.
- Replace steering gear assembly when adjusting screw is removed or more than twice.

14. Install large side of boot to gear housing assembly.
15. Install small side of boot to the mounting groove of inner socket boot.
16. Install boot clamp to the small side of boot.



17. Install boot clamp to the large side of boot with the following procedure.

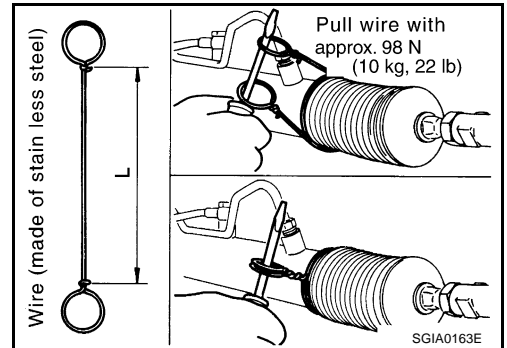
**CAUTION:**

**Do not reuse boot clamp.**

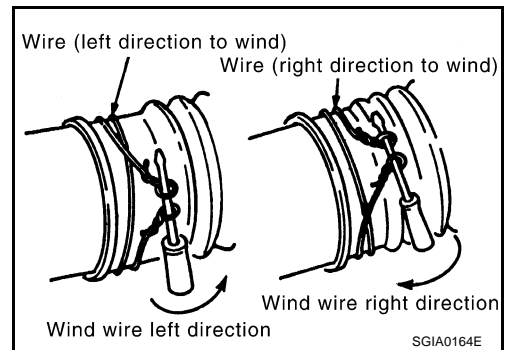
- a. Tighten large side of RH/LH boot with boot clamp (stainless steel wire).

**Wire length "L"**     **: 390 mm (15.35 in)**

- b. After wrapping clamp around boot groove for two turns, insert screwdriver in loop on both ends of wire. Twist 4 to 4.5 turns while pulling with a force of approx. 98 N (10 kg, 22.1 lb).



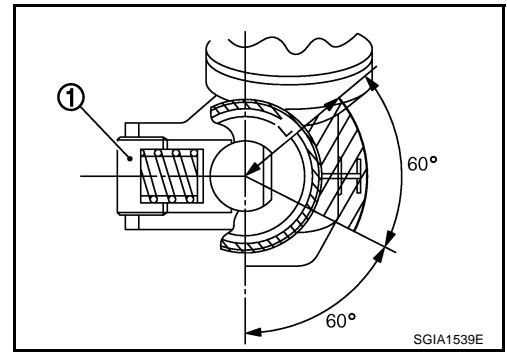
- c. Twist boot clamp as shown in the figure, pay attention to relationship between winding and twisting directions.



# POWER STEERING GEAR

- d. Twisted point of clamp is in the opposite side of adjusting screw (1) as shown in the hatched area in the figure (to prevent contact with other parts).

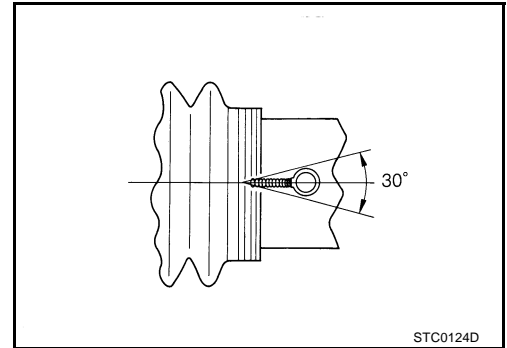
**Wire length "L" : 40 mm (1.57 in) or less**



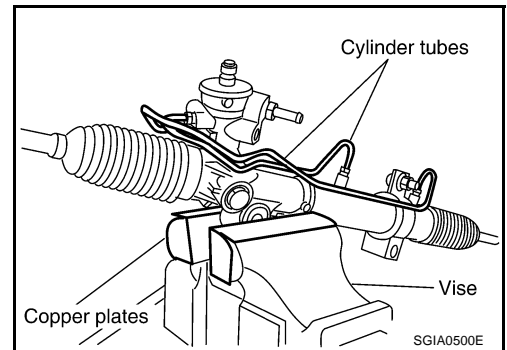
- e. Bent cut end of the wire toward rack axial as shown in the figure after twisting the wire 4 to 4.5 turns so that cut end does not contact with boot.

**CAUTION:**

**Keep gap from cylinder tube 5 mm (0.20 in) or more.**



18. Install cylinder tubes to gear housing assembly. Tighten the bolts to the specified torque. Refer to [PS-20, "COMPONENT"](#) .
19. Install lock nut and outer socket to inner socket.

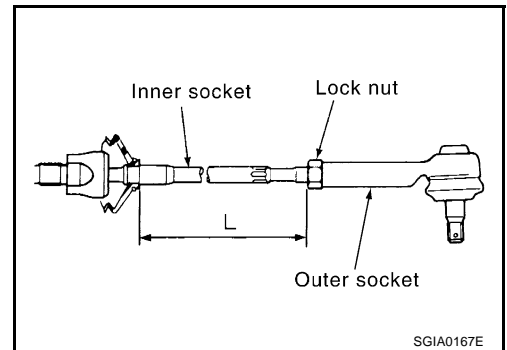


20. Adjust inner socket to standard length "L", and then tighten lock nut to the specified torque. Refer to [PS-20, "COMPONENT"](#) . Check length of inner socket "L" again after tightening lock nut. Make sure that the length is the standard.

**Inner socket length "L" : 147.7 mm (5.81 in)**

**CAUTION:**

**Adjust toe-in after this procedure. Length achieved after toe-in adjustment is not necessary the above value.**



# POWER STEERING OIL PUMP

## POWER STEERING OIL PUMP

PFP:49110

### On-Vehicle Service RELIEF OIL PRESSURE

NGS000BM

#### CAUTION:

Before starting work, confirm belt tension is proper.

1. Connect pressure gauge (SST) and pressure gauge adapter (SST) between power steering oil pump discharge connector and high pressure hose. Bleed air from the hydraulic circuit while opening valve fully. Refer to [PS-7, "Air Bleeding Hydraulic System"](#).

**Tool number** : KV48103500 (J-26357 and J-26357-10)

2. Start engine. Allow engine to run until tank temperature reaches 50 to 80°C (122 to 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 pump increases to maximum. This will raise fluid temperature excessively.
- Be careful not to contact hose with belt when engine is started.

3. Fully close the pressure gauge [SST] valve with engine at idle and measure the relief oil pressure.

**Tool number** : KV48103500 (J-26357 and J-26357-10)

**Relief oil pressure:**

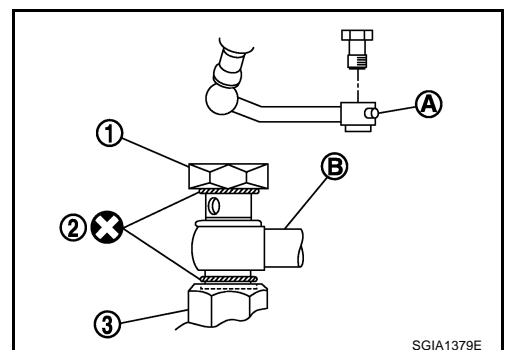
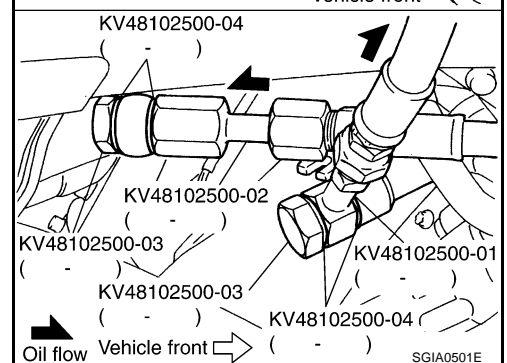
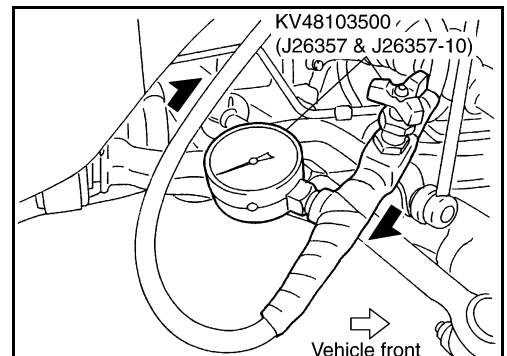
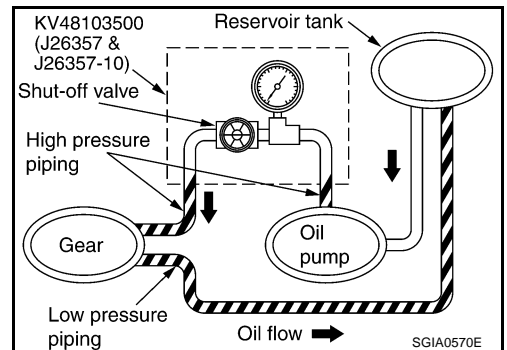
**8,500 - 9,300 kPa (88 - 94 kg/cm<sup>2</sup> , 1,251 - 1,337 psi)**

#### CAUTION:

Never keep valve closed for 10 seconds or longer.

4. Open the valve slowly after measuring. Repair power steering oil pump is the relief oil pressure is outside the standard. Refer to [PS-30, "Disassembly and Assembly"](#).

5. Apply Genuine Nissan PSF or equivalent to around O-ring (2), then install eye-bolt (1). Install eye-bolt (1) with eye-joint (assembled to high pressure hose) (B) protrusion (A) facing with pump side cutout, and then tighten it to the specified torque after tightening by hand. Refer to [PS-34, "Removal and Installation"](#).
6. After inspection, disconnect the pressure gauge [SST] from hydraulic circuit, then add fluid and bleed air. Refer to [PS-7, "Air Bleeding Hydraulic System"](#).



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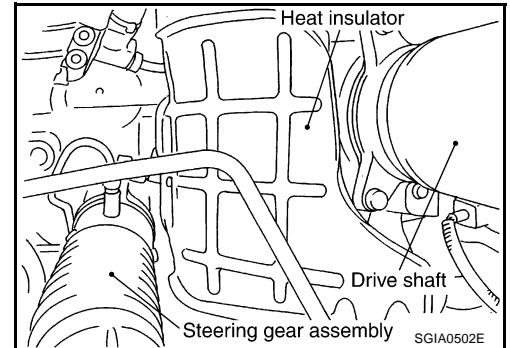
# POWER STEERING OIL PUMP

NGS0003P

## Removal and Installation

### REMOVAL

1. Drain power steering fluid from reservoir tank.
2. Remove tires with power tool.
3. Remove side splash guard from vehicle with power tool.
4. Remove heat insulator from vehicle.
5. Loosen adjust screw and oil pump fixing bolt, then remove belt from oil pump pulley. Refer to [EM-108, "ENGINE ASSEMBLY"](#).
6. Remove piping of high pressure and low pressure (drain fluid from their pipings). Refer to [PS-34, "Removal and Installation"](#).
7. Remove mounting bolts, then remove power steering pump.



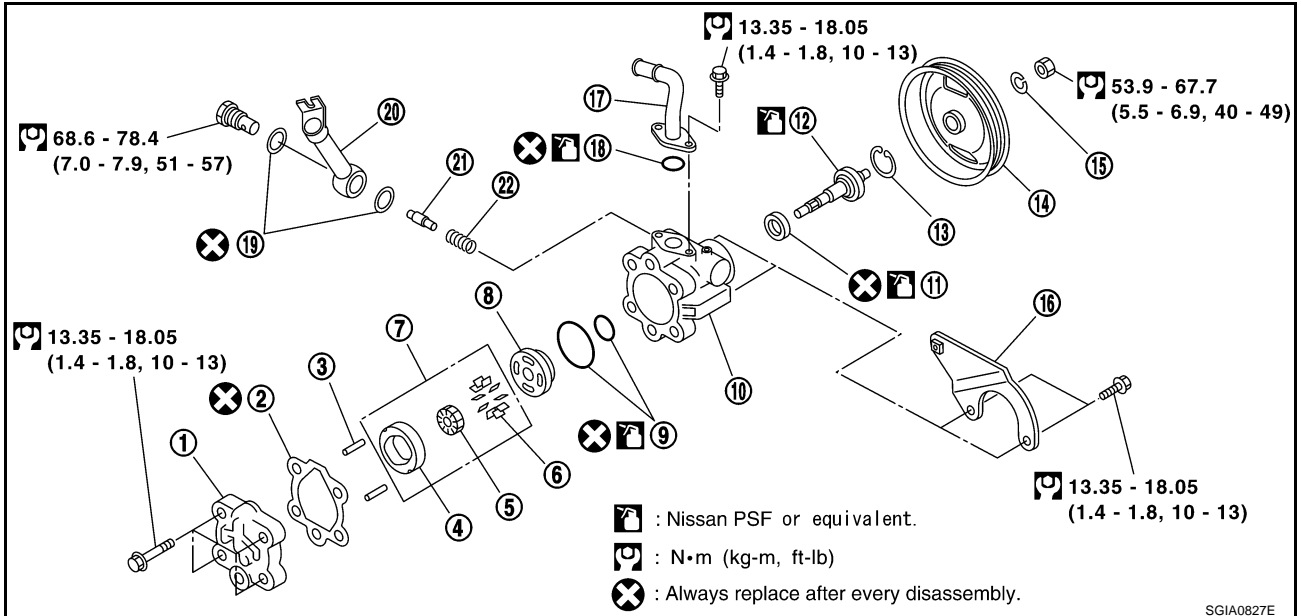
### INSTALLATION

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

- Refer to [PS-34, "Removal and Installation"](#) about each tightening torque.
- Install eye-bolt, high pressure hose and suction hose. Refer to [PS-34, "Removal and Installation"](#).
- Perform the following procedure after installing.
  - Adjust belt tension. Refer to [EM-13, "DRIVE BELTS"](#).
  - Bleed air. Refer to [PS-7, "Air Bleeding Hydraulic System"](#).

## Disassembly and Assembly COMPONENT

NGS0003Q



- |                   |                  |                          |
|-------------------|------------------|--------------------------|
| 1. Rear cover     | 2. Gasket        | 3. Dowel pin             |
| 4. Cam ring       | 5. Rotor         | 6. Vane                  |
| 7. Cartridge      | 8. Side plate    | 9. O-ring                |
| 10. Body assembly | 11. Oil seal     | 12. Drive shaft assembly |
| 13. Snap ring     | 14. Pulley       | 15. Spring washer        |
| 16. Bracket       | 17. Suction pipe | 18. O-ring               |
| 19. Washer        | 20. Joint        | 21. Flow control valve   |
| 22. Spring        |                  |                          |

# POWER STEERING OIL PUMP

## DISASSEMBLY

### NOTE:

Secure oil pump in a vise if necessary.

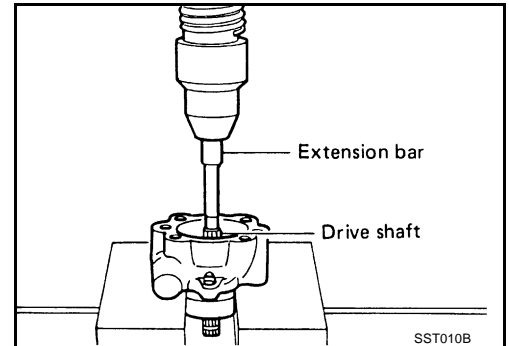
### CAUTION:

**When retaining drive shaft in a vise, always use copper or aluminum plates between vise and shaft.**

1. Remove rear cover mounting bolts and then remove rear cover from body assembly.
2. Remove gasket from body assembly.
3. Remove dowel pin, cartridge and side plate from body assembly.
4. Remove pulley mounting nut and then remove pulley from drive shaft.
5. Remove bracket mounting bolts and then remove bracket from body assembly.
6. Remove snap ring from drive shaft assembly and press out it.

### CAUTION:

**When removing snap ring, be careful not to damage drive shaft assembly.**

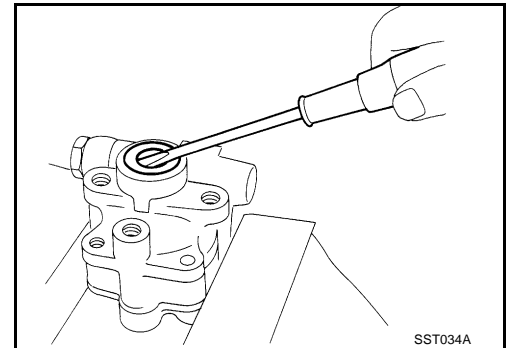


7. Remove oil seal from body assembly using a flat-bladed screwdriver.

### CAUTION:

**Do not damage body assembly.**

8. Remove O-ring from body assembly.

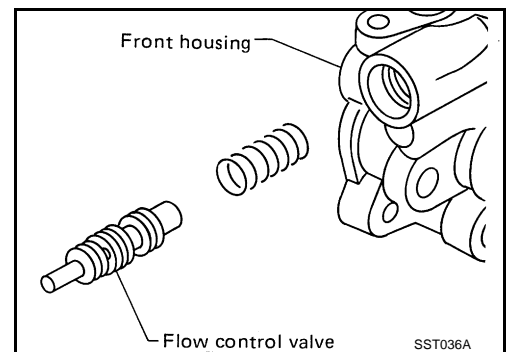


9. Loosen eye bolt and remove joint and washer, then pull out flow control valve and spring from body assembly.

### CAUTION:

**Be careful not to drop and deform the flow control valve.**

10. Remove suction pipe from body assembly.
11. Remove O-ring for suction pipe.



## INSPECTION AFTER DISASSEMBLY

### Body Assembly and Rear Cover Inspection

Check body assembly and the inside of rear cover for damage. If any damage is found, replace with new part for rear cover, and replace with new power steering pump assembly for body assembly.

### Cartridge Assembly Inspection

Check cam ring, side plate, rotor and vane for damage. If any damage is found, replace cartridge assembly with new one.

### Side Plate Inspection

Check side plate for damage. Replace side plate if there are.

# POWER STEERING OIL PUMP

## Flow Control Valve Inspection

Check flow control valve and spring for damage. Replace if there are.

## ASSEMBLY

### NOTE:

Secure oil pump in a vise if necessary.

### CAUTION:

Use copper plates when securing in a vise.

1. Apply multi purpose grease to oil seal lips (1). Apply Genuine Nissan PSF or equivalent to around oil seal, and then install oil seal to body assembly.

### CAUTION:

Do not reuse oil seal

2. Apply Genuine Nissan PSF or equivalent to drive shaft, and press drive shaft into body assembly, then install snap ring.

### CAUTION:

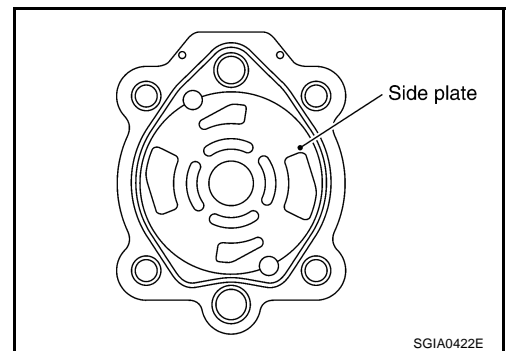
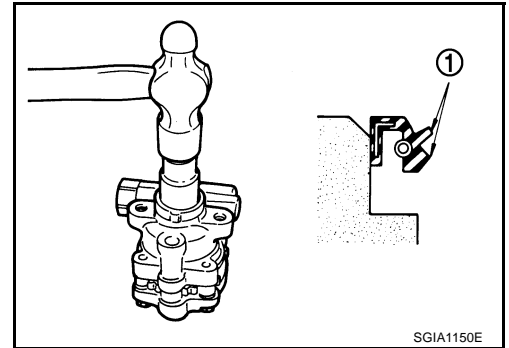
Do not reuse snap ring.

3. Apply Genuine Nissan PSF or equivalent to O-ring, and install O-ring into body assembly.

### CAUTION:

Do not reuse O-ring.

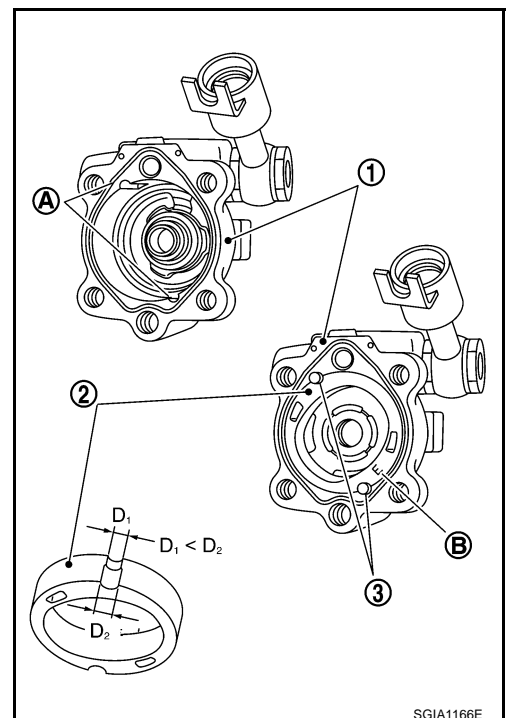
4. Install side plate to body assembly.



5. Install dowel pin (3) into dowel pin hole (A), and install cam ring (2) pointing it's D1 side toward the body assembly (1) side as shown in the figure.

### CAUTION:

- When installing cam-ring, turn carved face with a letter E (B) of it to rear cover.
- Do not confuse the assembling direction of cam ring. If cam ring is installed facing the incorrect direction, it may cause pump operation malfunction.



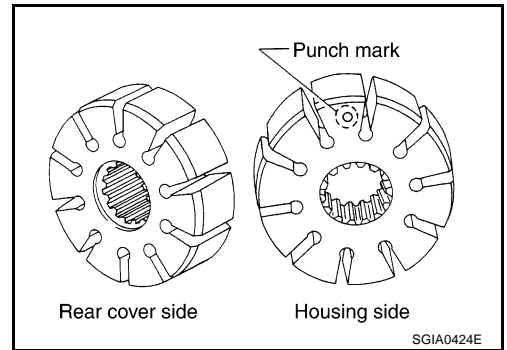


# POWER STEERING OIL PUMP

6. Install rotor to body assembly.

**CAUTION:**

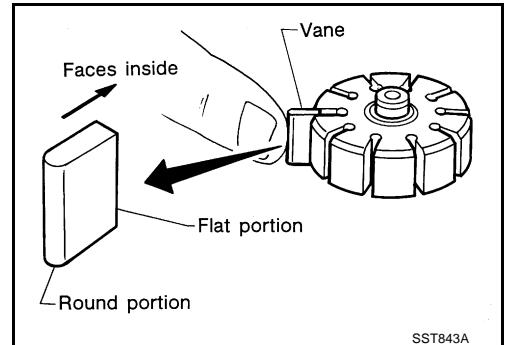
**When installing rotor, turn punch mark face on rotor to body assembly.**



7. Install vane to rotor with arc of vane in contact with cam ring.  
8. Check if drive shaft assembly turns smoothly.  
9. Install gasket to body assembly.

**CAUTION:**

**Do not reuse gasket.**



10. Install rear cover to body assembly and tighten bolts to the specified torque.  
11. Install bracket to body assembly, and tighten the two mounting bolts to the specified torque.  
12. Install pulley to drive shaft assembly, then tighten lock nut to the specified torque.  
13. Install spring, flow control valve, washer, joint and eye bolt to body assembly. Then tighten eye bolt to the specified torque.

**CAUTION:**

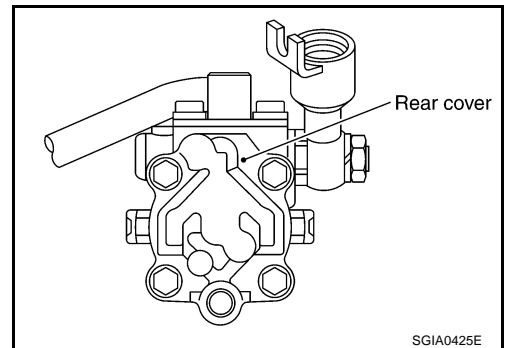
**Does not reuse spring and washer.**

14. Apply a coat of Nissan PSF or equivalent to O-ring and Install O-ring to suction pipe.

**CAUTION:**

**Do not reuse O-ring.**

15. Install suction pipe to body assembly.



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# HYDRAULIC LINE

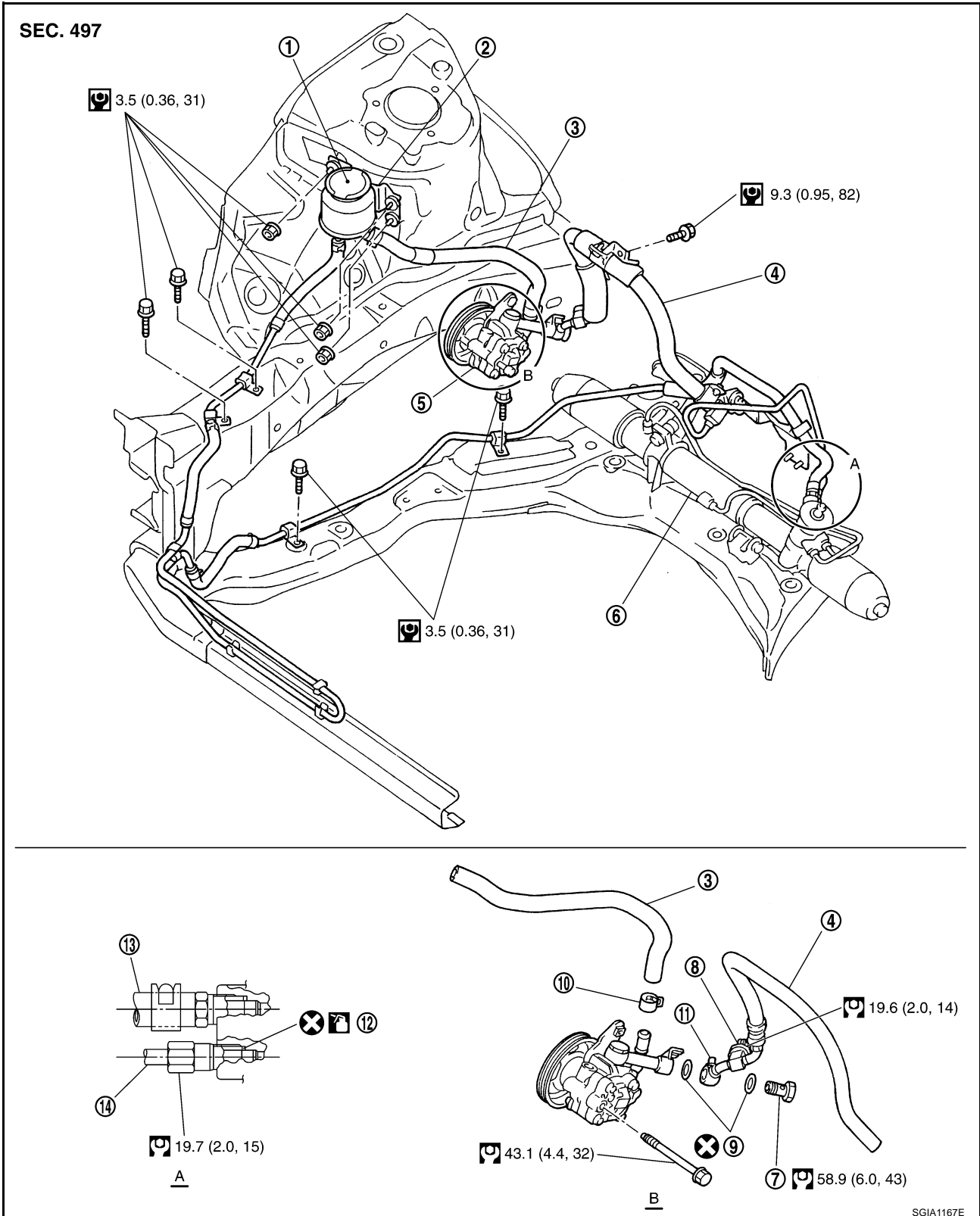
PFP:49721

NGS0003R

## HYDRAULIC LINE

### Removal and Installation

Refer to the figure for tightening torque. Install in the reverse order of removal.



SGIA1167E

- |                       |                           |                           |
|-----------------------|---------------------------|---------------------------|
| 1. Reservoir tank     | 2. Reservoir tank bracket | 3. Suction hose           |
| 4. High-pressure hose | 5. Oil pump assembly      | 6. Steering gear assembly |
| 7. Eye-bolt           | 8. Pressure sensor        | 9. Copper washer          |

# HYDRAULIC LINE

10. Clamp

11. Eye-joint

12. O-ring

13. Low pressure piping

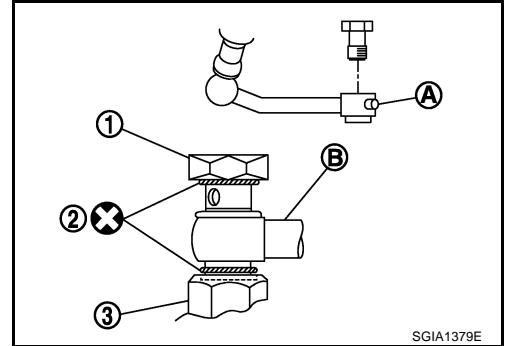
14. High pressure piping

Refer to [GI-10, "Components"](#) and the followings for the symbols in the figure.

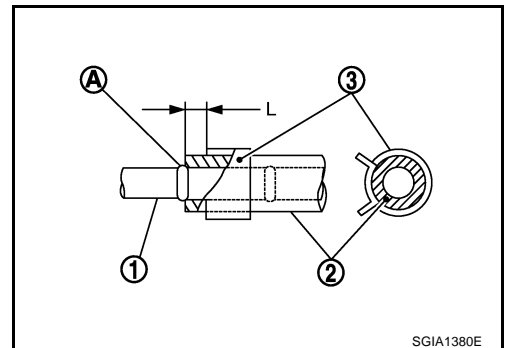
: Nissan PSF or equivalent.

## CAUTION:

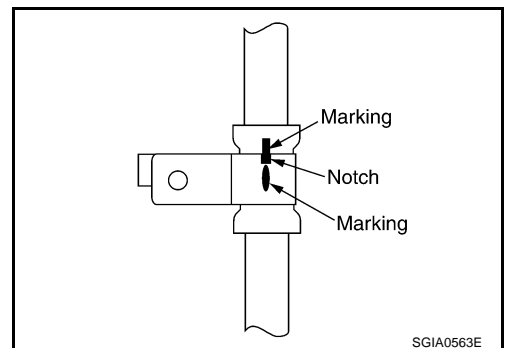
- Securely insert harness connector to pressure sensor.
- Do not reuse O-ring (2)
- Apply Genuine Nissan PSF or equivalent to around O-ring (2), then install eye-bolt (1).
- Install eye-bolt (1) with eye-joint (assembled to high pressure hose) (B) protrusion (A) facing with pump side cutout, and then tighten it to the specified torque after tightening by hand. Refer to [PS-34, "Removal and Installation"](#).



- Do not apply fluid to hose (2) and tube (1).
- Insert hose (2) securely until it contacts spool (A) of tube (1).
- Install clamp (3) to hose (2) at 3 to 8 mm (L) from the edge of the hose (2).



- Confirm with mating marking that if it is in phase with hose and clamp, then correct if needs.



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# SERVICE DATA AND SPECIFICATIONS (SDS)

## SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

### General Specifications

NGS000BF

Applied model		VQ35DE
Steering gear model		PR26AM
Fluid capacity (Approx.)	ℓ (US qt, Imp qt)	1.0 (1-1/8, 7/8)
Relief oil pressure	kPa (kg/cm <sup>2</sup> , psi)	8,500 - 9,300 (88 - 94, 1,251 - 1,337)

### Inspection and Adjustment

NGS000BG

#### STEERING WHEEL AXIAL END PLAY AND PLAY

Unit: mm (in)

Item		Standard
End play of the axial direction for steering wheel		0 (0)
Steering wheel play on the outer circumference		0 - 35 (0 - 1.37)

#### STEERING WHEEL TURNING FORCE

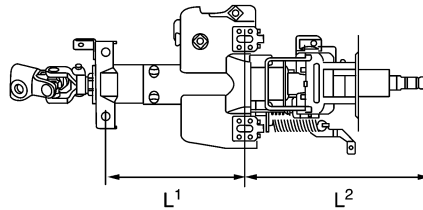
Unit: N·m (kg·m, in·lb)

Item		Standard
Steering wheel turning force		7.45 (0.76, 66) or less

#### STEERING COLUMN LENGTH

Unit: mm (in)

Item		Standard
Steering column length "L1"		182 mm (7.17 in)
Steering column length "L2"		242.6 mm (9.55 in)



SGIA0475E

#### STEERING ANGLE

Unit: Degree minute (Decimal degree)

Item		Standard
Inner wheel	Minimum	34°30' (34.5°)
	Nominal	38°00' (38.0°)
	Maximum	39°00' (39.0°)
Outer wheel	Nominal	31°30' (31.5°)

# SERVICE DATA AND SPECIFICATIONS (SDS)

## RACK SLIDING FORCE

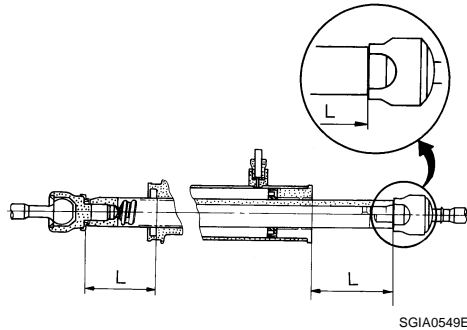
Unit: N (kg, lb)

Item	Standard	
	2WD	AWD
Rack sliding force	215.8 - 274.6 (22.1 - 28.0, 48.6 - 61.7)	225.4 - 284.2 (23.0 - 28.9, 50.7 - 63.8)

## RACK STROKE

Unit: mm (in)

Item	Standard
Rack neutral position, dimension "L"	71.5 (2.815)

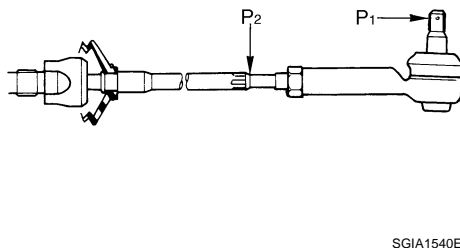


## SOCKET SWING TORQUE AND ROTATING TORQUE

### Swing Torque

Unit: N (kg, lb)

Item	Measuring value
Outer socket "P1 "	4.84 - 46.7 (0.50 - 4.7, 1.09 - 10.4)
Inner socket "P2 "	12.1 - 93.7 (1.3 - 9.5, 2.8 - 21.0)



### Rotating Torque

Unit: N·m (kg·m, in·lb)

Item	Standard
Outer socket	0.3 - 2.9 (0.03 - 0.29, 3 - 25)

## SOCKET AXIAL END PLAY

Unit: mm (in)

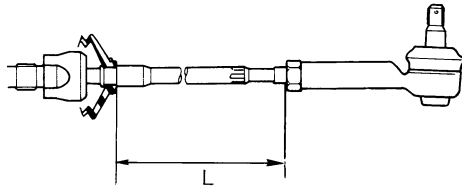
Item	Standard
Outer socket	0.5 (0.02) or less
Inner socket	0.2 (0.008) or less

# SERVICE DATA AND SPECIFICATIONS (SDS)

## INNER SOCKET LENGTH

Unit: mm (in)

Item	Standard
Inner socket length "L"	147.7 (5.81)



SGIA1512E