

A
B
C

SECTION PS

POWER STEERING SYSTEM

CONTENTS

<p>PRECAUTIONS 2</p> <p style="padding-left: 20px;">Precautions for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" 2</p> <p style="padding-left: 20px;">Precautions for Steering System 2</p> <p>PREPARATION 3</p> <p style="padding-left: 20px;">Special Service Tools 3</p> <p style="padding-left: 20px;">Commercial Service Tool 4</p> <p>NOISE, VIBRATION, AND HARSHNESS (NVH)</p> <p>TROUBLESHOOTING 5</p> <p style="padding-left: 20px;">NVH Troubleshooting Chart 5</p> <p>POWER STEERING FLUID 6</p> <p style="padding-left: 20px;">Checking Fluid Level 6</p> <p style="padding-left: 20px;">Checking Fluid Leakage 6</p> <p style="padding-left: 20px;">Bleeding Hydraulic System 6</p> <p>STEERING WHEEL 7</p> <p style="padding-left: 20px;">On-Vehicle service 7</p> <p style="padding-left: 40px;">CHECKING STEERING WHEEL PLAY 7</p> <p style="padding-left: 40px;">CHECKING NEUTRAL POSITION ON STEERING WHEEL 7</p> <p style="padding-left: 40px;">CHECKING STEERING WHEEL TURNING FORCE 7</p> <p style="padding-left: 40px;">FRONT WHEEL TURNING ANGLE 8</p> <p style="padding-left: 20px;">Removal and Installation 8</p> <p style="padding-left: 40px;">REMOVAL 8</p> <p style="padding-left: 40px;">INSTALLATION 8</p> <p>STEERING COLUMN 10</p> <p style="padding-left: 20px;">Removal and installation 10</p> <p style="padding-left: 20px;">Disassembly and Assembly 11</p> <p style="padding-left: 20px;">Inspection 12</p> <p>POWER STEERING GEAR AND LINKAGE 13</p> <p style="padding-left: 20px;">On-Vehicle Service 13</p>	<p style="padding-left: 20px;">CHECKING STEERING GEAR 13</p> <p style="padding-left: 20px;">CHECKING STEERING LINKAGE 13</p> <p style="padding-left: 20px;">CHECKING GEAR HOUSING MOVEMENT 13</p> <p style="padding-left: 20px;">Removal and Installation 13</p> <p style="padding-left: 40px;">REMOVAL 14</p> <p style="padding-left: 40px;">Disassembly and Assembly 16</p> <p style="padding-left: 40px;">DISASSEMBLY 17</p> <p style="padding-left: 40px;">INSPECTION AFTER DISASSEMBLY 17</p> <p style="padding-left: 40px;">ASSEMBLY 17</p> <p style="padding-left: 20px;">Adjustment for Rack Sliding Force 18</p> <p style="padding-left: 40px;">DECREASE 18</p> <p style="padding-left: 40px;">INCREASE 19</p> <p>POWER STEERING OIL PUMP 20</p> <p style="padding-left: 20px;">On-Vehicle Service 20</p> <p style="padding-left: 40px;">CHECKING HYDRAULIC SYSTEM 20</p> <p style="padding-left: 20px;">Removal and Installation 20</p> <p style="padding-left: 40px;">REMOVAL 20</p> <p style="padding-left: 40px;">INSTALLATION 20</p> <p style="padding-left: 20px;">Disassembly and Assembly 21</p> <p style="padding-left: 40px;">PRE-DISASSEMBLY INSPECTION 21</p> <p style="padding-left: 40px;">DISASSEMBLY 22</p> <p style="padding-left: 40px;">ASSEMBLY 22</p> <p style="padding-left: 20px;">Inspection After Disassembly 24</p> <p>HYDRAULIC LINE 25</p> <p style="padding-left: 20px;">Removal and Installation 25</p> <p>SERVICE DATA AND SPECIFICATIONS (SDS) 27</p> <p style="padding-left: 20px;">General Specifications 27</p> <p style="padding-left: 20px;">Steering Wheel 27</p> <p style="padding-left: 20px;">Steering Column 27</p> <p style="padding-left: 20px;">Steering Gear and Linkage 27</p> <p style="padding-left: 20px;">Power Steering 28</p>
---	--

F
PS

H
I

J
K

L
M

PRECAUTIONS

PRECAUTIONS

PFP:00001

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

EGS000AP

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

EGS000AQ

- 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 cloths 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 II 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

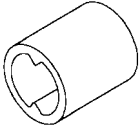
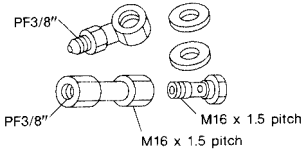
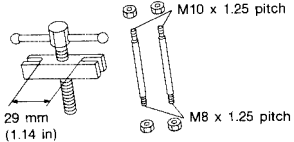
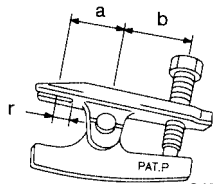
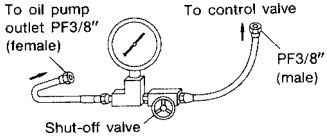
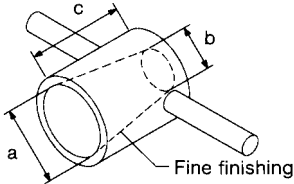
PF0:00002

PREPARATION

Special Service Tools

EGS000AR

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
KV48100700 (J26364) Torque adapter  NT169	Measuring pinion rotating torque
KV48102500 (J33914) Pressure gauge adapter  S-NT542	Measuring oil pressure
ST27180001 (J25726-A) Steering wheel puller  S-NT544	Removing steering wheel
HT72520000 (J25730-B) Ball joint remover  S-NT546	Removing ball joint a: 33 mm (1.30 in) b: 50 mm (1.97 in) r: R11.5 mm (0.453 in)
KV48103500 (J26357 and J26357-10) Pressure gauge  S-NT547	Measuring oil pressure
KV48104400 () Rack seal ring reformer  S-NT550	Reforming teflon ring a: 50 mm (1.97 in) dia. b: 36 mm (1.42 in) dia. c: 100 mm (3.94 in)

A

B

C

D

E

F

PS

H

I

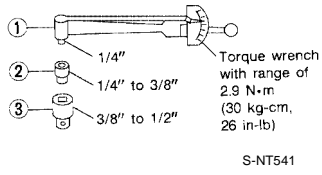
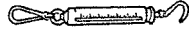
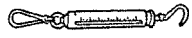
J

K

L

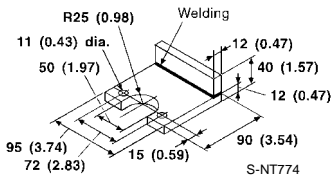
M

PREPARATION

Tool number (Kent-Moore No.) Tool name	Description
ST3127S000 1 GG91030000 (See J25765-A) Torque wrench 2 HT62940000 (—) Socket adapter 3 HT62900000 (—) Socket adapter	Measuring turning torque 
(J-44372) Spring gauge	Measuring steering wheel turning force 
(J-44183-A) Spring gauge	Measuring rack sliding force 

Commercial Service Tool

EGS000AS

Tool number	Description
Oil pump attachment 	Disassembling and assembling oil pump Unit: mm (in)

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

PF0:0003

NVH Troubleshooting Chart

EGS000AT

Use the 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
		Noise	Shake	
		Fluid level		PS-6, "POWER STEERING FLUID"
		Air in hydraulic system		PS-6, "POWER STEERING FLUID"
		Tie-rod ball joint swinging force		FSU-5, "FRONT SUSPENSION ASSEMBLY"
		Tie-rod ball joint rotating torque		FSU-5, "FRONT SUSPENSION ASSEMBLY"
		Tie-rod ball joint end play		FSU-5, "FRONT SUSPENSION ASSEMBLY"
		Steering gear fluid leakage		PS-6, "Checking Fluid Leakage"
		Steering wheel play		PS-7, "Checking Steering Wheel Play"
		Steering gear rack sliding force		PS-18, "Adjustment for Rack Sliding Force"
		Drive belt looseness		EM-13, "Checking Drive Belts" , EC-1139, "Diagnostic Procedure"
		Improper steering wheel		PS-7, "On-Vehicle service"
		Improper installation or looseness or tilt lock lever		PS-12, "Inspection"
		Mounting rubber deterioration		PS-13, "Checking gear housing movement"
		Steering column deformation or damage		PS-12, "Inspection"
		Improper installation or looseness of steering column		PS-12, "Inspection"
		Steering linkage looseness		PS-13, "Checking steering linkage"
		DRIVE SHAFT		FAX-4, "NVH Troubleshooting Chart"
		AXLE		FAX-4, "NVH Troubleshooting Chart"
		SUSPENSION		FSU-4, "NVH Troubleshooting Chart"
		TIRES		WT-2, "NVH Troubleshooting Chart"
		ROAD WHEEL		WT-2, "NVH Troubleshooting Chart"
		BRAKES		BR-5, "NVH Troubleshooting Chart"

x: Applicable

A
B
C
D
E
F
PS
H
I
J
K
L
M

POWER STEERING FLUID

PPF:KLF20

POWER STEERING FLUID

EGS000AU

Checking Fluid Level

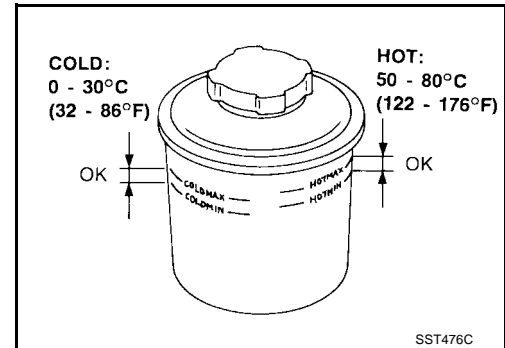
Check fluid level, referring to the scale on reservoir tank.

Use **HOT** range for fluid temperatures of 50° to 80°C (122° to 176°F).

Use **COLD** range for fluid temperatures of 0° to 30°C (32° to 86° F).

CAUTION:

- Do not overfill.
- Recommended fluid is **Genuine NISSAN PSF II** or equivalent.



Checking Fluid Leakage

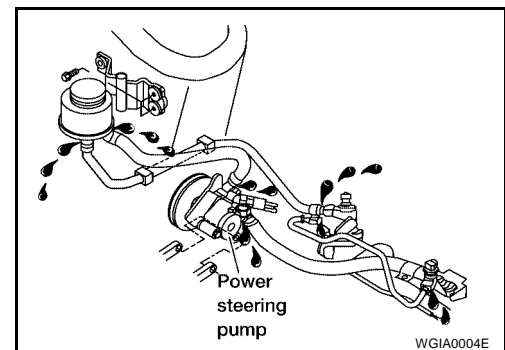
Check the lines for improper attachment and for leaks, cracks, damage, loose connections, chafing and deterioration.

1. Run engine between idle speed and 1,000 rpm. Make sure temperature of fluid in oil tank rises to 60° to 80°C (140° to 176°F).
2. Turn steering wheel right-to-left several times.
3. Hold steering wheel at each lock position for five seconds and carefully check for fluid leakage.

CAUTION:

Do not hold the steering wheel in a locked position for more than 15 seconds.

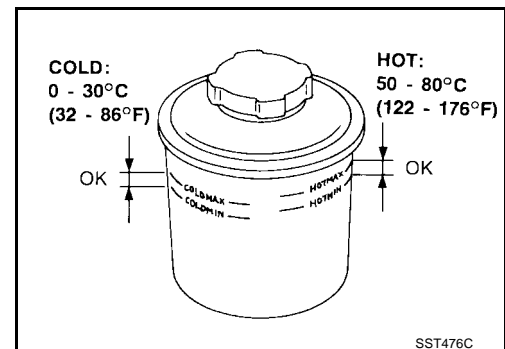
4. If fluid leakage at connectors is noticed, loosen flare nut and then retighten. Do not overtighten connector as this can damage O-ring, washer and connector.
5. If fluid leakage from power steering pump is noticed, check the power steering pump. Refer to [PS-24, "Inspection After Disassembly"](#).
6. Check steering gear boots for accumulation of power steering fluid indicating a steering gear leak.



Bleeding Hydraulic System

EGS000AW

1. Raise the front end of vehicle until the wheels are clear of the ground.
2. Add Genuine NISSAN PSF II or equivalent, into the steering fluid reservoir tank to the specified level. Then quickly turn the steering wheel fully to right and left and lightly touch steering stoppers. Repeat steering wheel operation until the fluid level no longer decreases.



3. Start the engine then repeat step 2 above. Incomplete air bleeding will cause the following symptoms:
 - Air bubbles in reservoir tank
 - Clicking noise in oil pump
 - Excessive buzzing in oil pump

If this happens, bleed out the air repeating step 2 above. Fluid noise may occur in the valve or oil pump. This is common when the vehicle is stationary or while turning the steering wheel slowly. This does not affect the performance or durability of the system.

STEERING WHEEL

PFP:48430

EGS000AX

STEERING WHEEL

On-Vehicle service

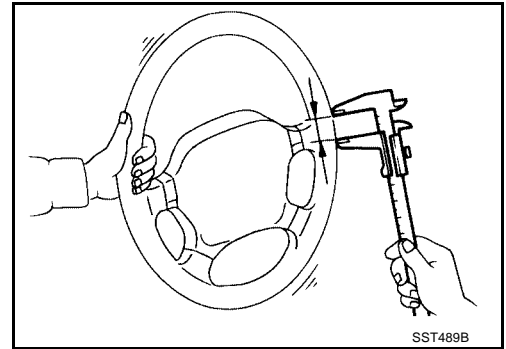
CHECKING STEERING WHEEL PLAY

- With wheels in a straight-ahead position, check steering wheel play.

Steering wheel play : 35 mm (1.38 in) or less

- If it is not within specification, check the following for looseness or worn components.
 - Steering gear assembly
 - Steering column
 - Front suspension and axleCheck steering system for looseness while moving the steering wheel in all directions.

Axial end play : 0 mm (0 in)



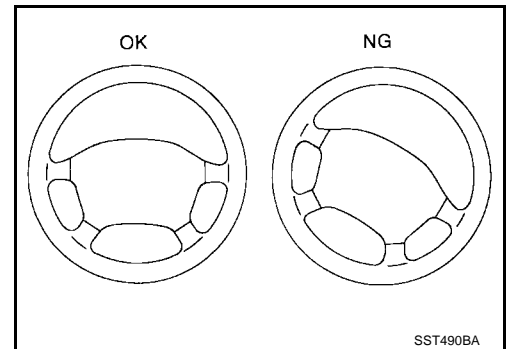
CHECKING NEUTRAL POSITION ON STEERING WHEEL

Pre-checking

- Make sure that wheel alignment is correct. Refer to [FSU-15, "Front Wheel Alignment \(Unladen*1\)"](#).
- Verify that the steering gear is centered before removing the steering wheel.

Checking

- Check that the steering wheel is in neutral position when driving straight ahead.
- If it is not in neutral position, remove the steering wheel and reinstall it correctly.
- If the neutral position is between two teeth, loosen tie-rod lock nuts. Turn the tie-rods by the same amount in opposite directions on both left and right sides.

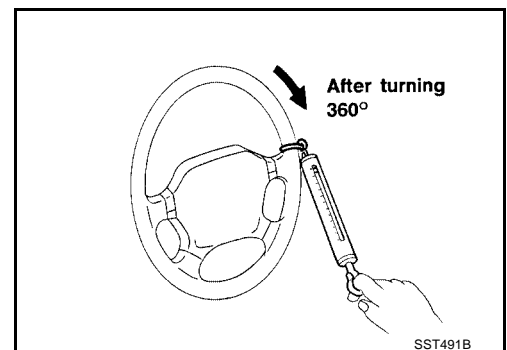


CHECKING STEERING WHEEL TURNING FORCE

- Park vehicle on a level, dry surface and set parking brake.
- Start engine.
- Bring power steering fluid up to adequate operating temperature. Make sure the fluid temperature is approximately 60° to 80°C (140° to 176°F). Tires need to be inflated to normal pressure.
- Check steering wheel turning force when steering wheel has been turned 360° from the neutral position.

Steering wheel turning force : 39 N (4 kg-f, 9 lb-f) or less

- If steering wheel turning force is out of specification, check rack sliding force.
 - Disconnect steering column lower joint and knuckle arms from the gear.
 - Start and run engine at idle to make sure steering fluid has reached normal operating temperature.



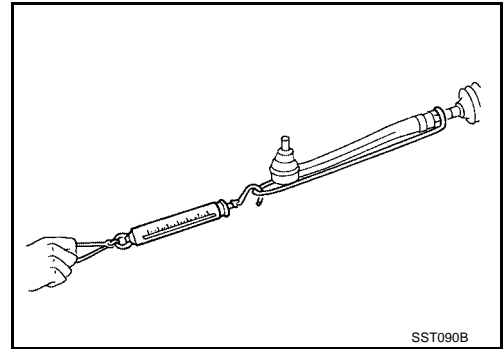
STEERING WHEEL

- c. Pull tie-rod slowly to move it from neutral position to ± 11.5 mm (± 0.453 in) at speed of 3.5 mm (0.138 in)/s. Check that rack sliding force is within specification.

Average rack sliding force : 210.7 - 298.9 N (21.49 - 30.49 kg-f, 47.37 - 67.19 lb-f)
Maximum force deviation : 98 N (10 kg-f, 22 lb-f)

- d. Check sliding force outside the above range.

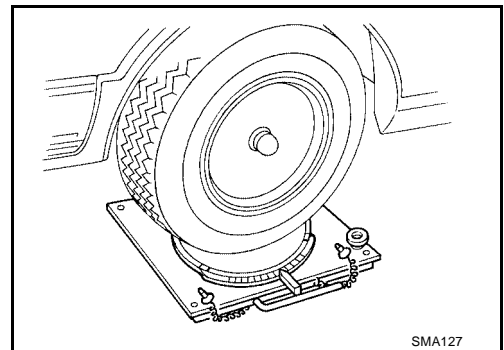
Rack sliding force : Not more than 294 N (30 kg-f, 66 lb-f)



6. If rack sliding force is not within specifications, overhaul steering gear assembly.
7. If rack sliding force is OK, inspect steering column. Refer to [PS-12, "Inspection"](#) .

FRONT WHEEL TURNING ANGLE

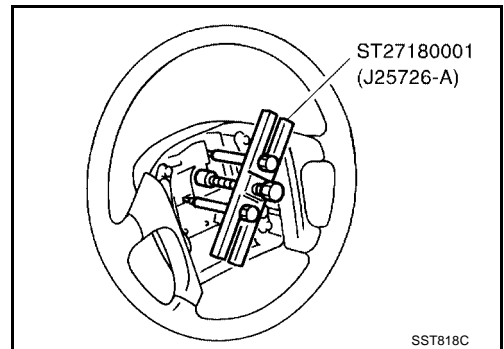
1. Rotate steering wheel all the way right and left; measure turning angle. Refer to [FSU-15, "General Specifications \(Front\)"](#) .
2. If it is not within specifications, check rack stroke. Refer to [PS-27, "Steering Gear and Linkage"](#) .



Removal and Installation

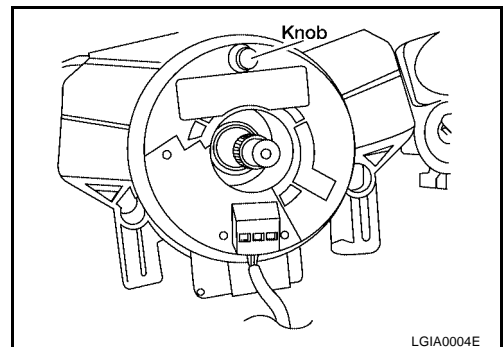
REMOVAL

1. Set the front wheels in the straight-ahead position.
2. Remove the driver air bag module. Refer to [SRS-39, "Removal and Installation"](#) .
3. Remove the steering wheel center nut.
4. Remove the steering wheel with the Tool.
5. Place a piece of tape across the spiral cable so it will not be rotated out of position.



INSTALLATION

1. 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.



STEERING WHEEL

CAUTION:

The spiral cable may snap due to steering operation if the cable is installed in an improper position. Also, 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 up to 2.5 turns from the neutral position to both the right and left.)

Steering wheel center nut : 29 - 39 N·m (3.0 - 4.0 kg-m, 22 - 29 ft-lb)

A
B
C
D
E
F
PS
H
I
J
K
L
M

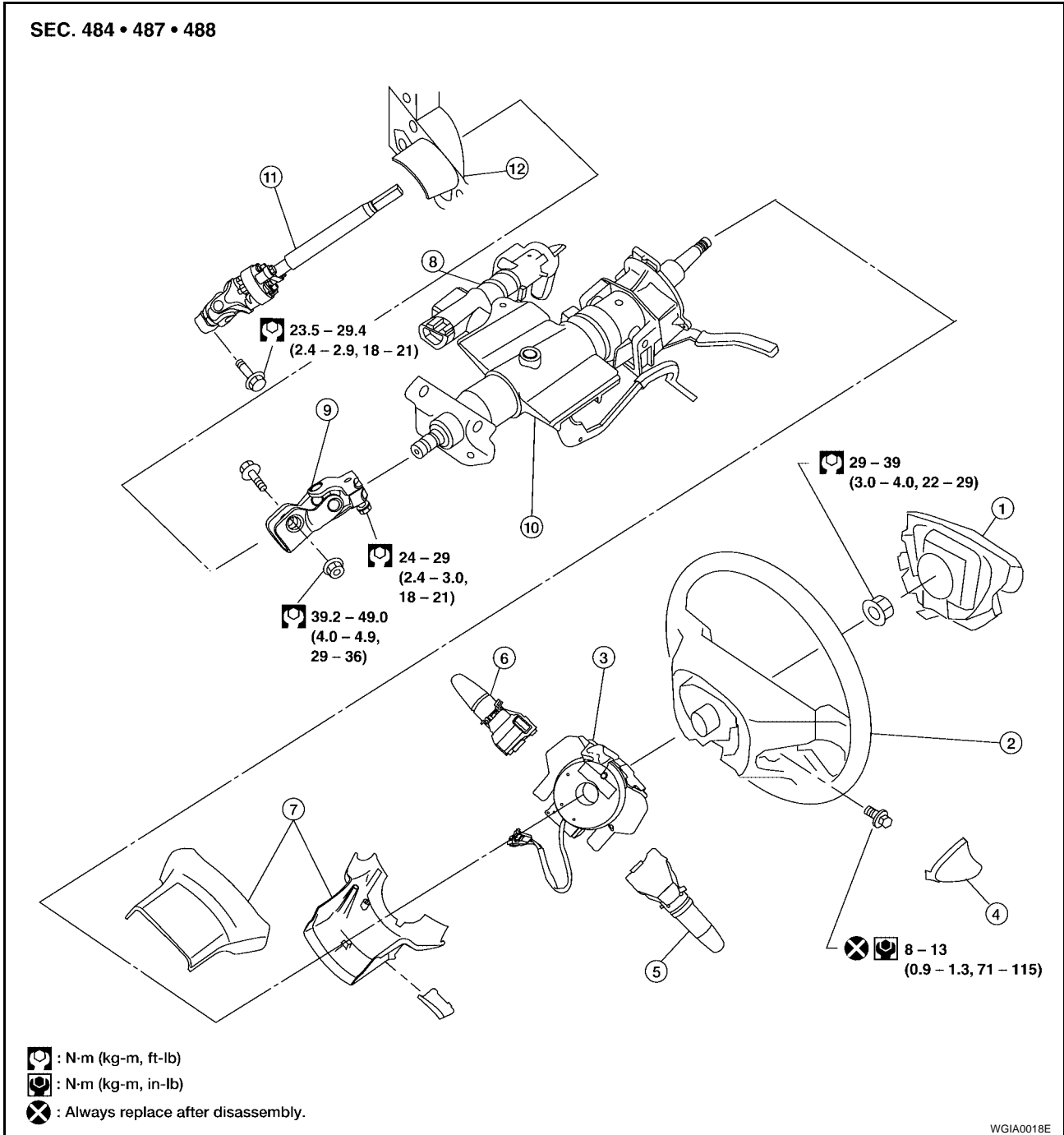
STEERING COLUMN

PF:48810

EGS000AZ

STEERING COLUMN

Removal and installation

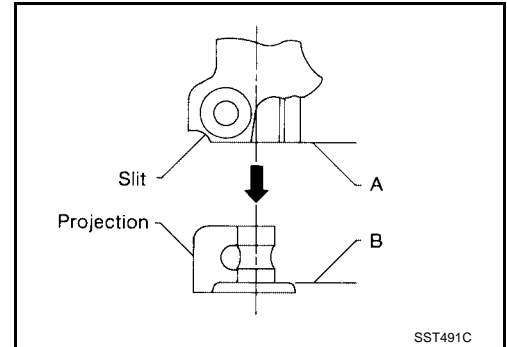


CAUTION:

- The rotation of the spiral cable (SRS air bag component part) is limited. If the steering gear must be removed, set the front wheels in the straight-ahead direction. Do not rotate the steering column while the steering gear is removed.
- Remove the steering wheel before disconnecting the coupling joint to avoid damaging the spiral cable.

STEERING COLUMN

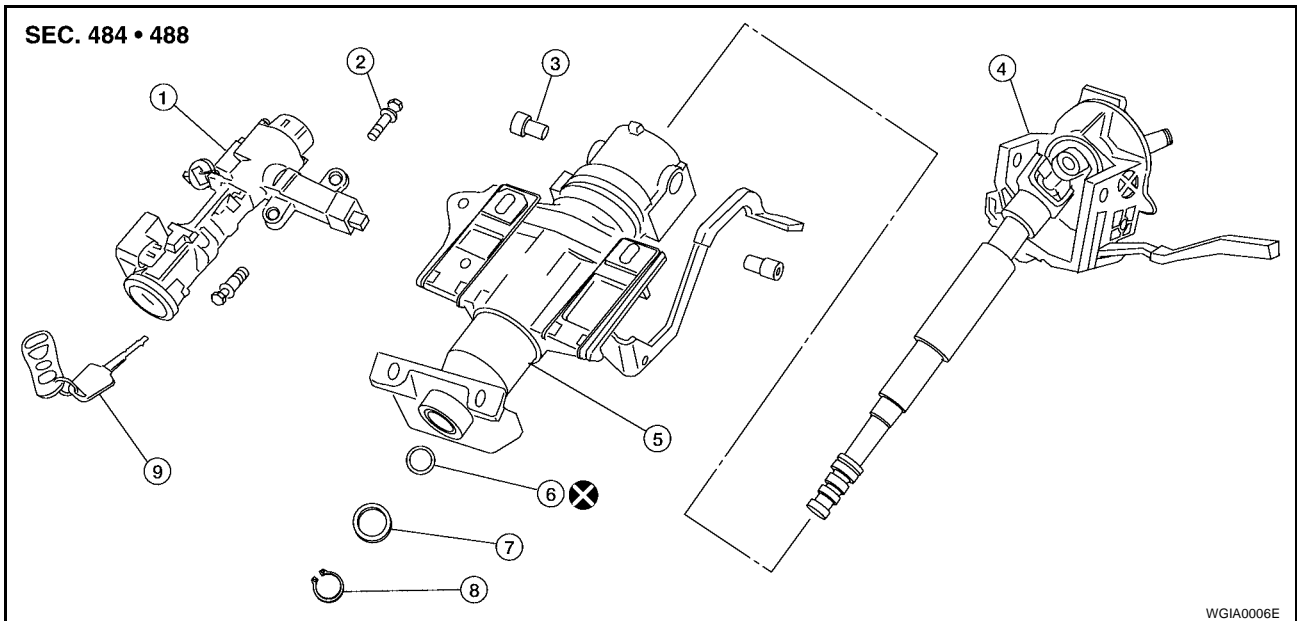
- When installing the steering column, finger-tighten all of the lower bracket and joint retaining bolts; then tighten them to specification. Do not apply undue stress to the steering column.
- Align slit of the coupling joint with projection on dust cover. Insert the joint until surface A contacts surface B.



- After installation, turn steering wheel to make sure it moves smoothly. Ensure the number of turns are the same from the straight-forward position to left and right locks. Be sure that the steering wheel is in a neutral position when driving straight ahead.

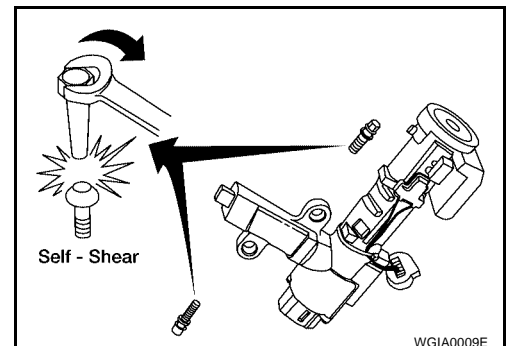
Disassembly and Assembly

EGS000B0



- | | | |
|------------------------------------|--------------------------------------|------------------------------|
| 1. Ignition switch | 2. Tamper resistant self-shear bolt | 3. Tilt knuckle retainer pin |
| 4. Column shaft with tilt assembly | 5. Column tube (tilt/telescope type) | 6. O-ring |
| 7. Washer | 8. Snap ring | 9. Key |

- Remove the tamper resistant self-shear type screws with a drill or other appropriate tool.
- Install new tamper resistant self-shear type screws.



STEERING COLUMN

EGS000B1

Inspection

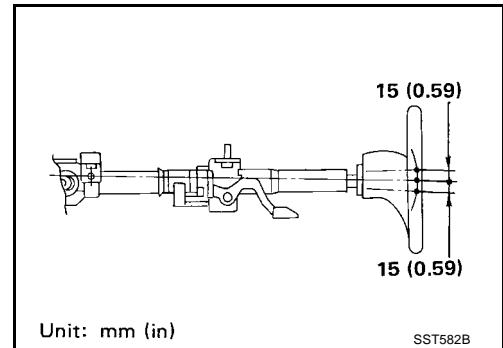
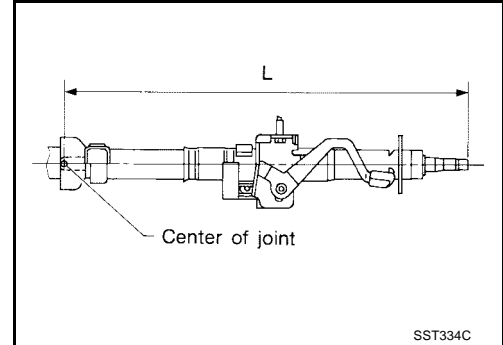
- When the steering wheel does not turn smoothly, check the steering column as follows:
 1. Check the column bearings for damage or unevenness. Lubricate with recommended multi-purpose grease. Replace the steering column as an assembly, if necessary.
 2. Check the column tube for deformation or breakage. Replace the steering column as an assembly, if necessary.
- 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) : 612 - 616 mm
(24.09 - 24.25 in)**

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

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 nut on the upper joint may not be reused.**
- **During lower joint detachment, insert a tool into the yoke groove to prevent gouging damage.**
- **A washer must be used on all fastener bolts.**



POWER STEERING GEAR AND LINKAGE

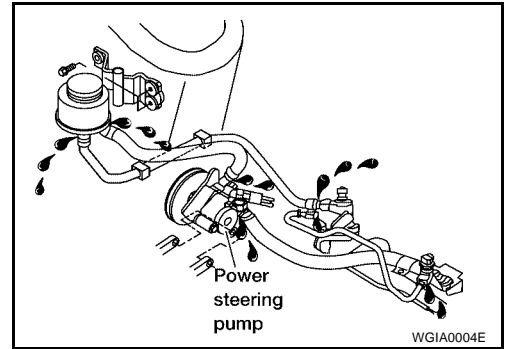
POWER STEERING GEAR AND LINKAGE

PF:49001

On-Vehicle Service CHECKING STEERING GEAR

EGS000B2

- Check gear housing and boots for looseness, damage and fluid leakage.
- Check connection with steering column for looseness.



CHECKING STEERING LINKAGE

- Check ball joint, and other component parts for looseness, wear, and damage.

CHECKING GEAR HOUSING MOVEMENT

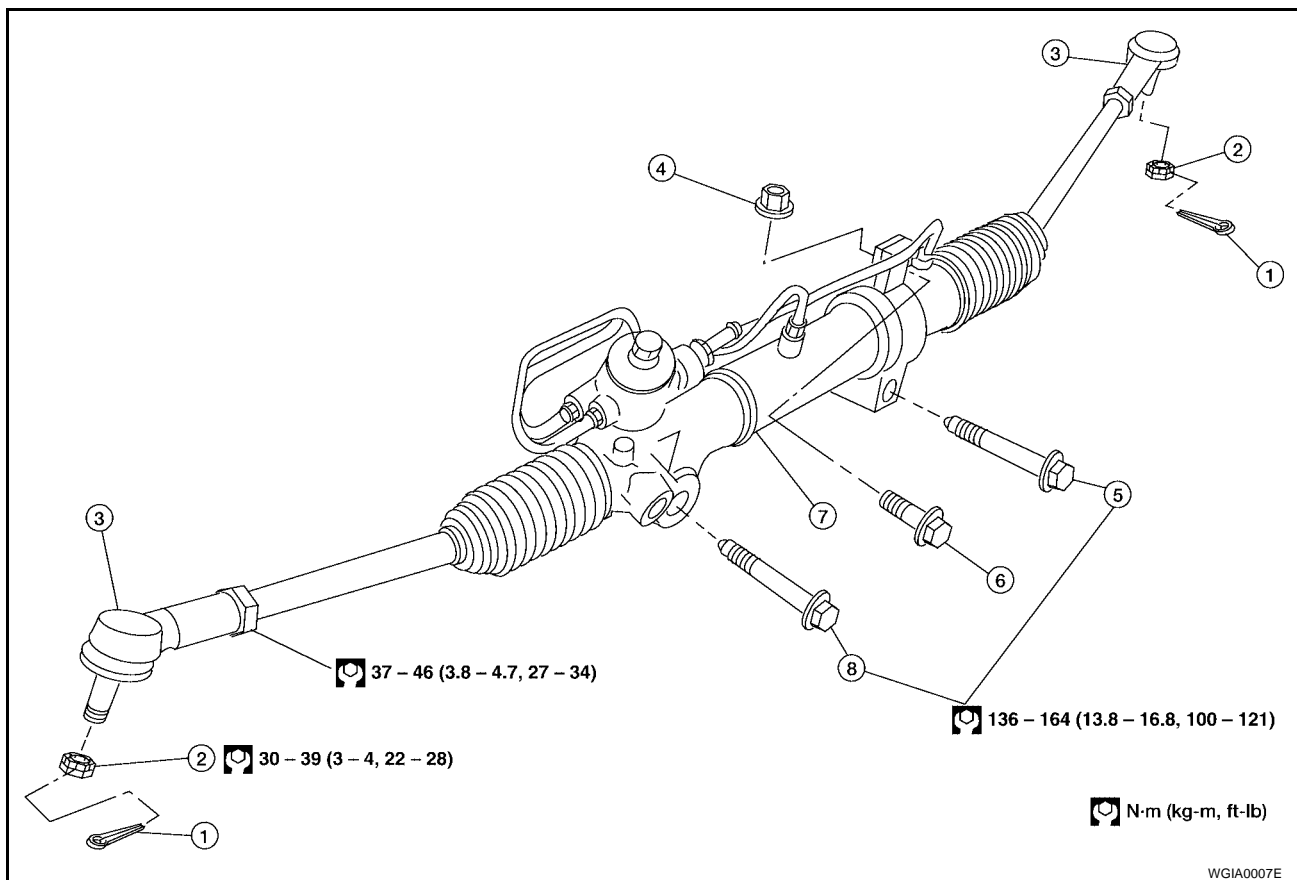
1. Check the movement of steering gear housing during stationary steering on a dry paved surface.
 - Apply a force of 49 N (5 kg, 11 lb) to steering wheel to check the gear housing movement. Turn off ignition key while checking.

Movement of gear housing : ± 2 mm (± 0.08 in) or less

2. If movement exceeds the limit, replace or repair as necessary.

Removal and Installation

EGS000B3



1. Cotter pin

2. Castellated nut

3. Outer tie rod end

POWER STEERING GEAR AND LINKAGE

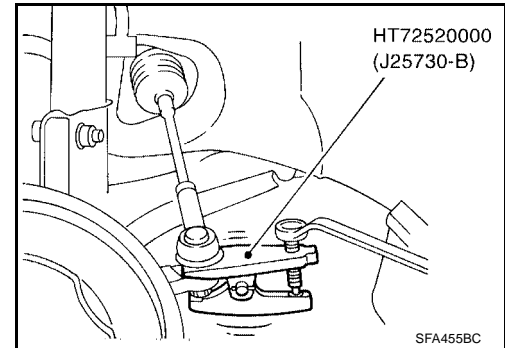
4. Gear housing bracket nut
5. Gear housing mounting bolt
6. Gear housing bracket bolt
7. Power steering gear and linkage assembly
8. Gear housing mounting bolt

REMOVAL

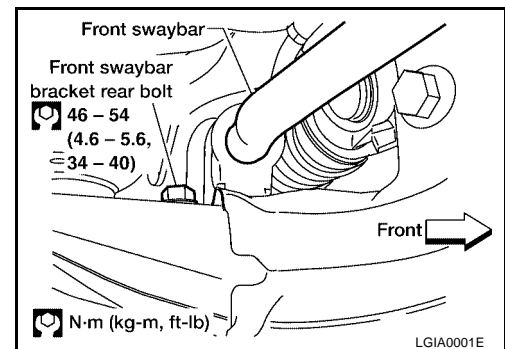
CAUTION:

- The rotation of the driver air bag spiral cable is limited. If the steering gear must be removed, set the front wheels in the straight-ahead direction. Do not rotate the steering column while the steering gear is removed.
- Remove the steering wheel and spiral cable before removing the steering lower joint to avoid damaging the SRS spiral cable.

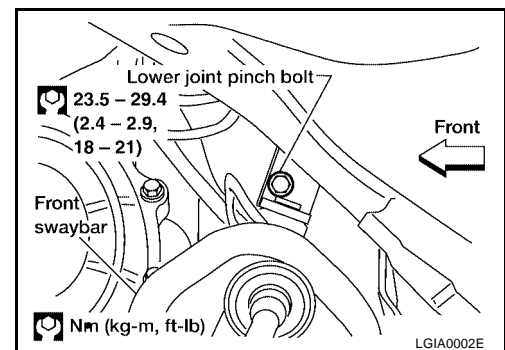
1. Remove the two front tires with power tool.
2. Disconnect the outer tie-rod ends with Tool.
3. Disconnect the outer swaybar ends with power tool.



4. Remove the swaybar bracket rear bolts and loosen the front bolts with power tool.



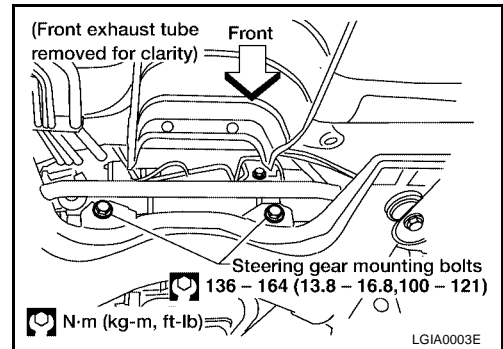
5. Remove the lower joint pinch bolt.



6. Disconnect the power steering high and low pressure lines from the steering gear.
7. Reposition the swaybar up and out of the way.

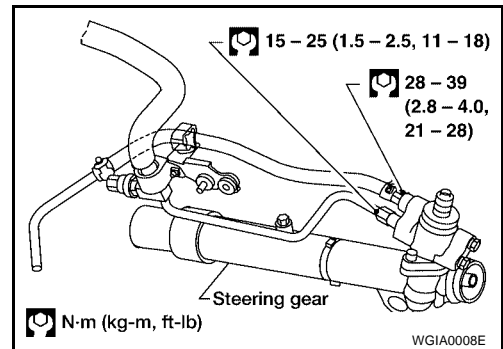
POWER STEERING GEAR AND LINKAGE

8. Remove the two steering gear mounting bolts.
 - Do not remove the steering gear mounting bracket from the gear housing.
9. Remove the power steering gear and linkage assembly.



10. Installation is in the reverse order of removal.

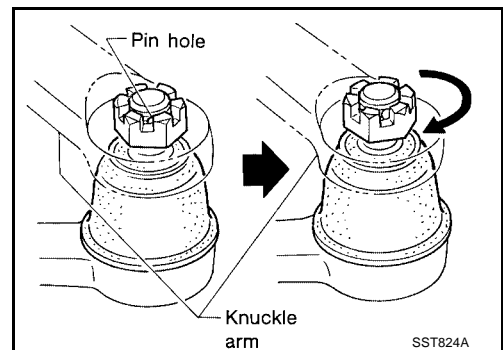
- Install pipe connector.
- Use the specified tightening torque when installing the high-pressure and low-pressure pipe connections. Excessive tightening will damage threads of connection or O-ring.



- The O-ring in low-pressure pipe connector is larger than that in high-pressure connector. Take care to install the proper O-ring.
- Initially, tighten nut on tie-rod outer socket and knuckle arm to specification. Then tighten further to align nut groove with first pin hole so that the cotter pin can be installed.

Outer tie rod grooved nut : 29 - 39 N·m (3 - 4 kg-m, 22 - 29 ft-lb)

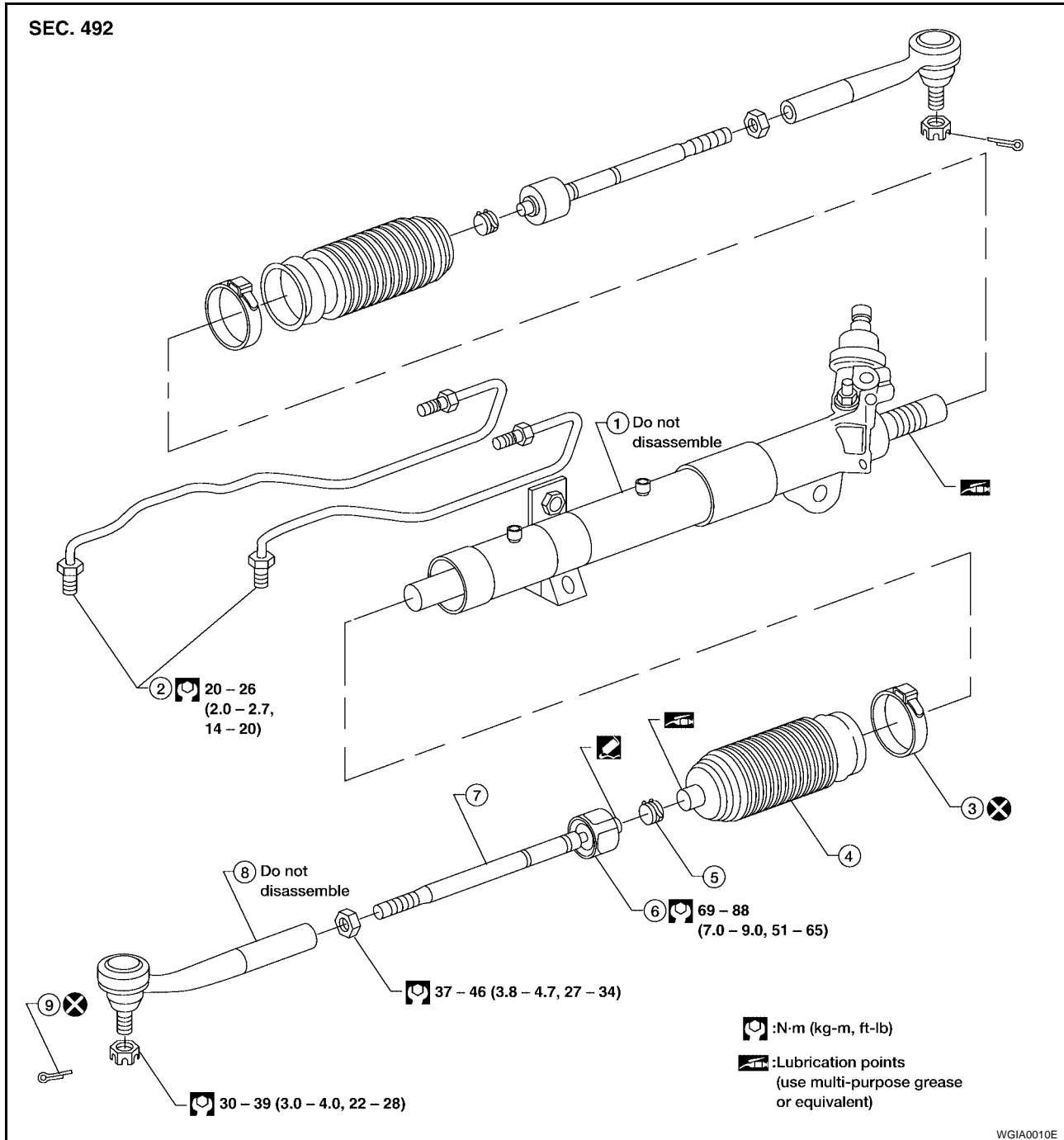
CAUTION:
Tightening torque must not exceed 49 N·m (5 kg-m, 36 ft-lb).



POWER STEERING GEAR AND LINKAGE

Disassembly and Assembly

EGS000B4



1. Steering gear

2. Gear housing fluid tube

3. Boot clamp

4. Dust boot

5. Boot band

6. Tie-rod inner socket

7. Inner tie-rod

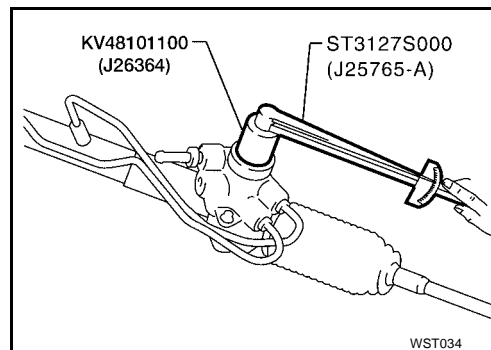
8. Outer tie-rod

9. Cotter pin

POWER STEERING GEAR AND LINKAGE

DISASSEMBLY

1. Prior to disassembling, measure pinion rotating torque. Record the pinion rotating torque. If the rotating torque is not within specifications, replace the steering gear assembly.
 - Before measuring, disconnect gear housing tube and drain fluid.
 - Use soft jaws when holding steering gear housing. Handle gear housing carefully, as it is made of aluminum. Do not grip cylinder in a vise.
2. Remove the outer tie-rod sockets.
3. Remove the inner tie-rod sockets and boots.



INSPECTION AFTER DISASSEMBLY

Thoroughly clean all parts in cleaning solvent or Genuine NISSAN PSF II or equivalent. Blow dry with compressed air.

Boot

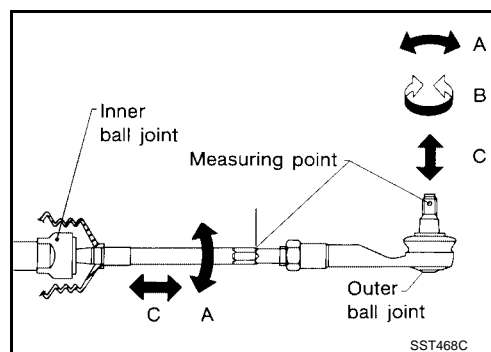
- Check condition of boot. If cracked, replace it.
- Check boots for accumulation of power steering fluid indicating steering gear leak, replace the gear.

Gear

- Thoroughly examine steering gear. If damaged, cracked, leaking, or worn, replace it.

Inner and outer tie-rods

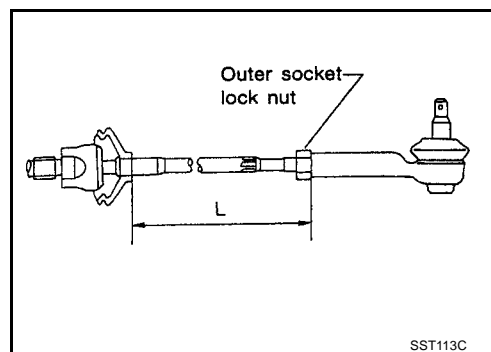
- Check ball joints for swinging force: Tie-rod outer and inner ball joints swinging force A. Refer to [PS-27, "Steering Gear and Linkage"](#).
- Check ball joint for rotating torque: Tie-rod outer ball joint rotating torque B. Refer to [PS-27, "Steering Gear and Linkage"](#).
- Check ball joints for axial end play: Tie-rod outer and inner ball joints axial end play C. Refer to [PS-27, "Steering Gear and Linkage"](#).
- Check condition of dust cover. If cracked, replace outer tie-rod



ASSEMBLY

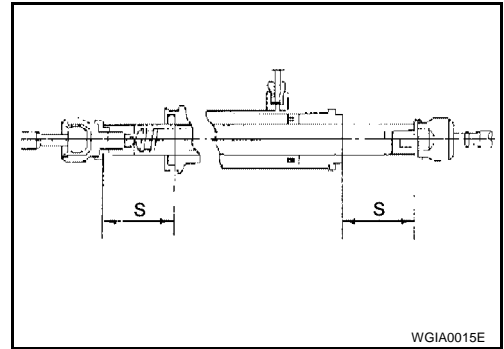
1. Install the inner tie-rods.
2. Install the outer tie-rods to the specified length and tighten the outer socket lock nut. Refer to [PS-27, "Steering Gear and Linkage"](#). Use Genuine High Temperature, High Strength Thread Locking Sealant (Red) or equivalent. Refer to [GI-42, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS"](#).

Outer socket lock nut : 37 - 46 N·m (3.8 - 4.7 kg·m, 27 - 34 ft·lb)

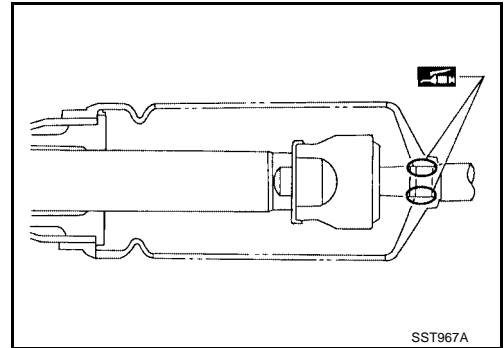


POWER STEERING GEAR AND LINKAGE

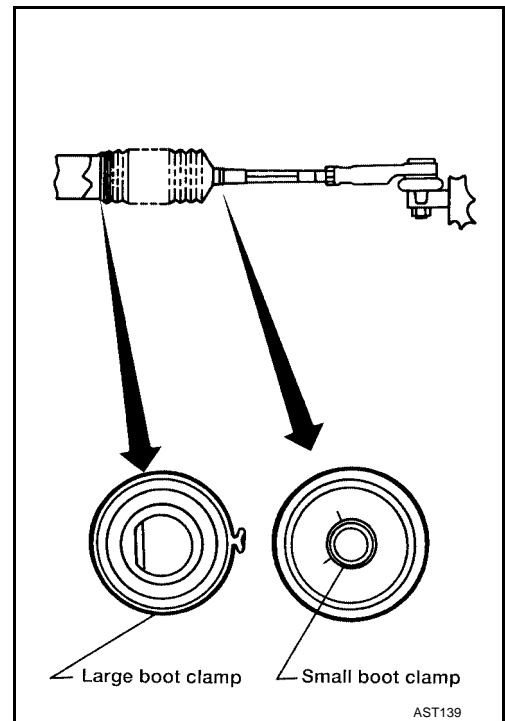
3. Measure rack stroke. Refer to [PS-27, "Steering Gear and Linkage"](#).



4. Before installing boot, coat the contact surfaces between boot and tie-rod with grease.



5. Install the boot clamps and crimp securely.



EGS000J

Adjustment for Rack Sliding Force DECREASE

Decrease rack sliding force as follows:

1. Loosen adjusting screw two rotations counter clockwise.

CAUTION:

- Do not remove adjusting screw.
- Steering gear must be replaced if adjusting screw is removed or loosened more than two rotations.

POWER STEERING GEAR AND LINKAGE

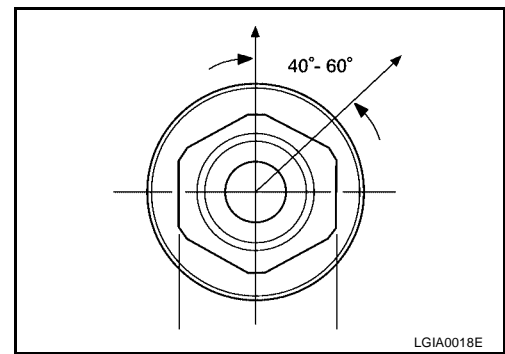
- Tighten adjusting screw in 40° - 60° increments until rack sliding force is within specification.

Average rack sliding force : 210.7 - 298.9 N (21.49 - 30.49 kg-f, 47.37 - 67.19 lb-f)

Maximum force deviation : 98 N (10 kg-f, 22 lb-f)

NOTE:

Steering gear must be replaced if adjusting screw rotation torque is less than 5.0N·m (0.9 kg-m, 44in-lb).



- Verify rack sliding force.
- If rack sliding force is out of specification, adjust rack sliding force again.
- If rack sliding force cannot be adjusted within specification, replace the steering gear.

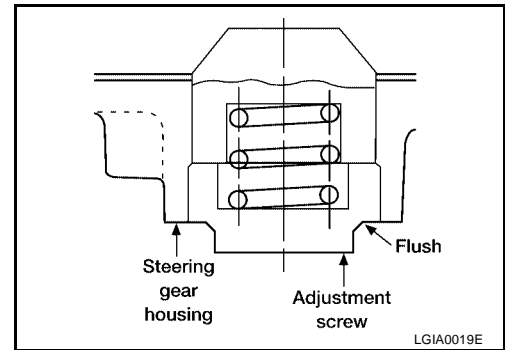
INCREASE

Increase rack sliding force as follows:

- Tighten adjusting screw until it is flush with the housing surface.

CAUTION:

- Do not remove the adjusting screw.
- Steering gear must be replaced if the adjusting screw is removed or loosened more than two rotations.



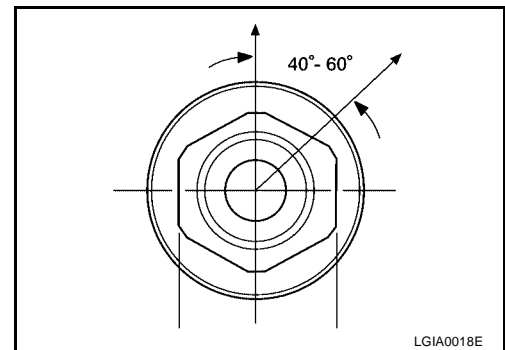
- Loosen adjusting screw in 40° - 60° increments until rack sliding force is within specification.

Average rack sliding force : 210.7 - 298.9 N (21.49 - 30.49 kg-f, 47.37 - 67.19 lb-f)

Maximum force deviation : 98 N (10 kg-f, 22 lb-f)

NOTE:

Steering gear must be replaced if adjusting screw rotation torque is less than 5.0N·m (0.9 kg-m, 44in-lb).



- Verify rack sliding force.
- If rack sliding force is out of specification, adjust rack sliding force again.
- If rack sliding force cannot be adjusted within specification, replace the steering gear.

POWER STEERING OIL PUMP

PFP:49110

POWER STEERING OIL PUMP

On-Vehicle Service CHECKING HYDRAULIC SYSTEM

EGS000B6

Before starting, check belt tension, driving pulley and tire pressure.

1. Set Tool. Open shut-off valve. Then bleed air. Refer to [PS-6, "Bleeding Hydraulic System"](#).
2. Run engine at idle speed or 1,000 rpm.
Make sure temperature of fluid in tank rises to 60 to 80°C (140 to 176°F).

WARNING:

Warm up engine with shut-off valve fully opened. If engine is started with shut-off valve closed, fluid pressure in oil pump increases to maximum. This will raise oil temperature abnormally.

3. Check pressure with steering wheel fully turned to left and right positions with engine idling at 1,000 rpm.

CAUTION:

Do not hold the steering wheel in a locked position for more than 15 seconds.

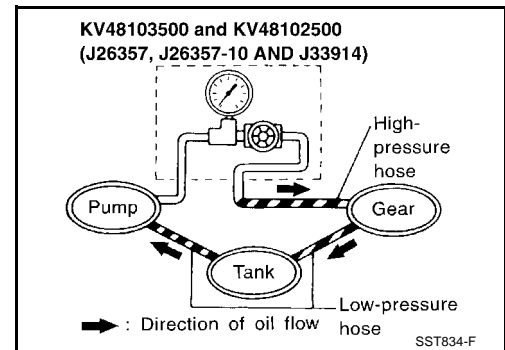
Oil pump maximum standard pressure : 8,000 - 8,800 kPa (82 - 90 kg/cm, 1,160 - 1,276 psi)

- If pressure reaches maximum operating pressure, system is OK.
 - If pressure increases above maximum operating pressure, check power steering pump flow control valve. Refer to [PS-28, "Power Steering"](#).
4. If power steering pressure is below the maximum operating pressure, slowly close shut-off valve and check pressure again.

CAUTION:

Do not close shut-off valve for more than 15 seconds.

- If pressure increases to maximum operating pressure, gear is damaged. Refer to [PS-13, "Removal and Installation"](#).
 - If pressure remains below maximum operating pressure, pump is damaged. Refer to [PS-20, "Removal and Installation"](#).
5. After checking hydraulic system, remove Tool and add fluid as necessary. Then completely bleed air out of system. Refer to [PS-6, "Bleeding Hydraulic System"](#).



Removal and Installation REMOVAL

EGS000B7

1. Loosen adjust screw and oil pump fixing bolt, then remove belt.
2. Remove oil pump union bolts and hose.
3. Remove oil pump bracket fixing bolts.
4. Remove oil pump.

INSTALLATION

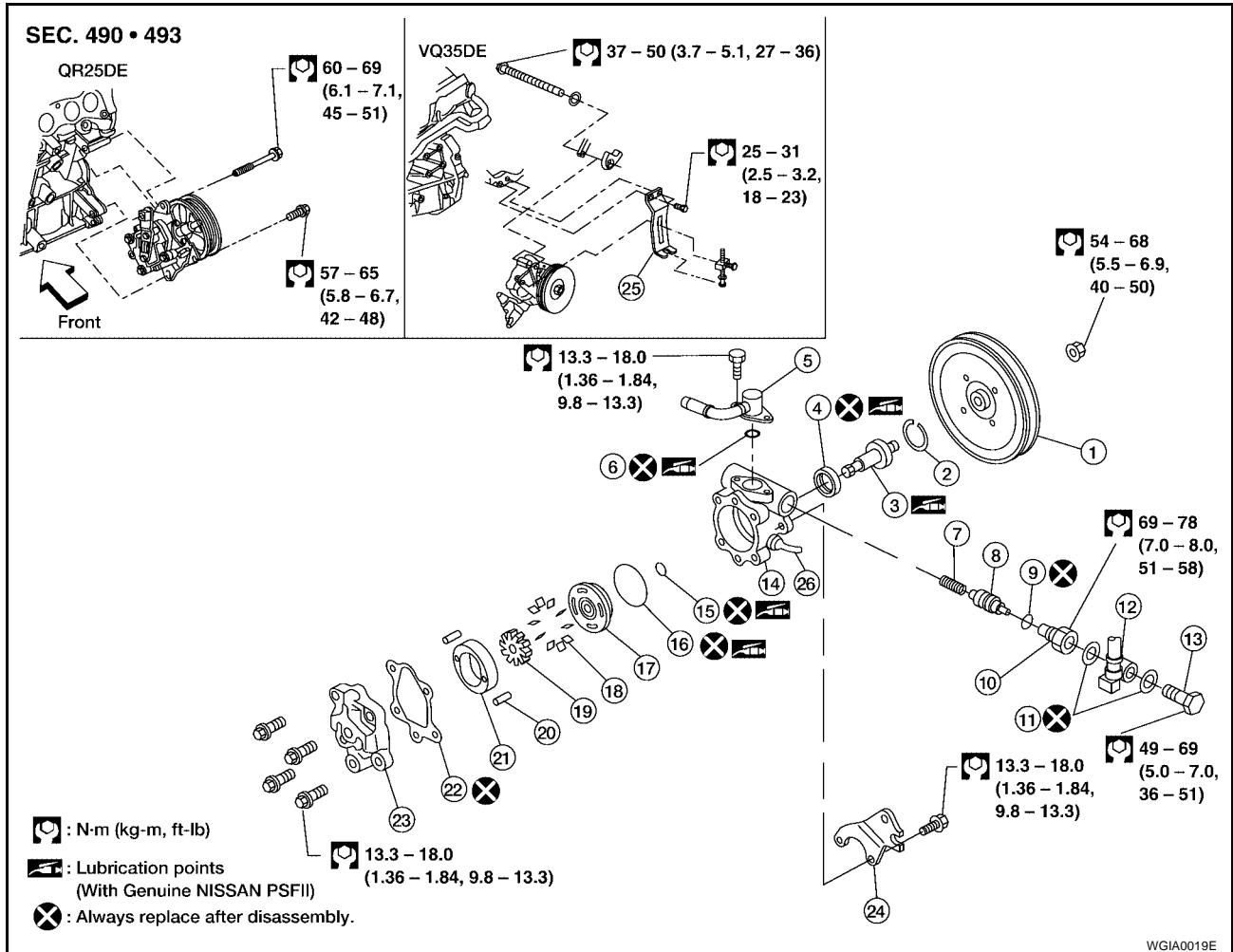
Installation is in the reverse order of removal.

- Adjust belt tension.
Refer to [MA-14, "Checking Drive Belts"](#) (QR25DE), [MA-21, "Checking Drive Belts"](#) (VQ35DE).
- Bleed air after installation.
Refer to [PS-6, "Bleeding Hydraulic System"](#).

POWER STEERING OIL PUMP

Disassembly and Assembly

EGS000B8

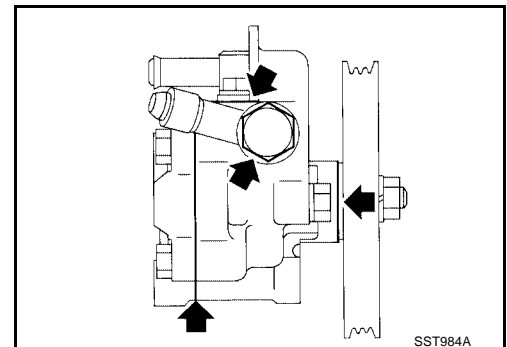


- | | | |
|---------------------------------|------------------------------------|----------------------|
| 1. Pulley | 2. Snap ring | 3. Drive shaft |
| 4. Oil seal | 5. Suction pipe | 6. O-ring |
| 7. Spring | 8. Flow control valve | 9. O-ring |
| 10. Connector | 11. Washer | 12. Joint |
| 13. Connector bolt | 14. Pump case | 15. O-ring |
| 16. O-ring | 17. Front side plate | 18. Vane |
| 19. Rotor | 20. Pin | 21. Cam ring |
| 22. Gasket | 23. Rear cover | 24. Mounting bracket |
| 25. Power steering pump bracket | 26. Power steering pressure switch | |

PRE-DISASSEMBLY INSPECTION

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

- Oil leak from any point shown in the figure
- Deformed or damaged pulley
- Poor performance



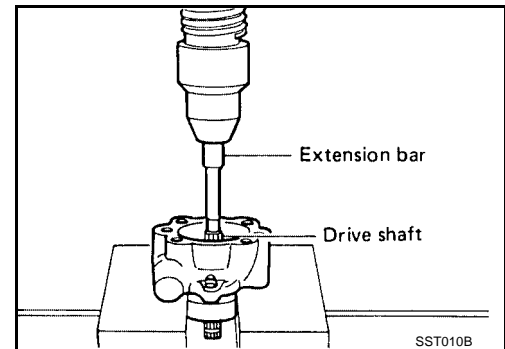
POWER STEERING OIL PUMP

DISASSEMBLY

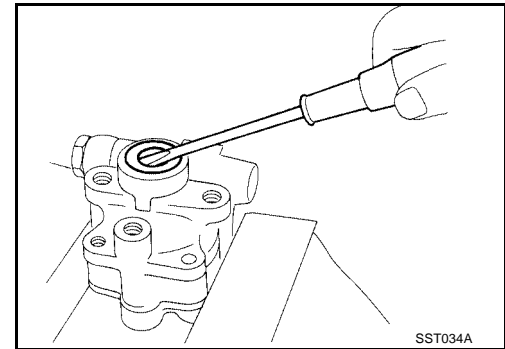
CAUTION:

- Parts which can be disassembled are strictly limited. Never disassemble parts other than those specified.
- Disassemble in as clean a place as possible.
- Clean your hands before disassembly.
- Do not use rags; use nylon cloths or paper towels.
- Follow the procedures and cautions in the Service Manual.
- When disassembling and reassembling, do not let foreign matter enter or contact the parts.

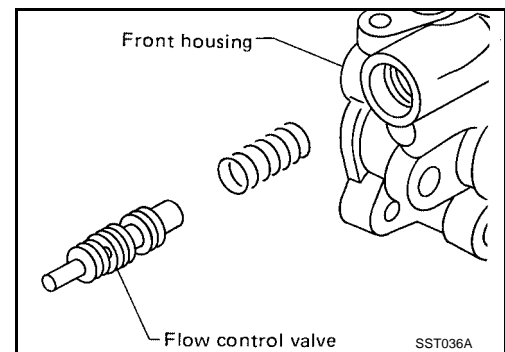
1. Remove snap ring, then draw drive shaft out.
Be careful not to drop drive shaft.



2. Remove oil seal.
Be careful not to damage front housing.



3. Remove connector and flow control valve with spring.
Be careful not to drop flow control valve.



4. Inspect all of the power steering oil pump components, and repair or replace as necessary. Refer to [PS-24, "Inspection After Disassembly"](#).

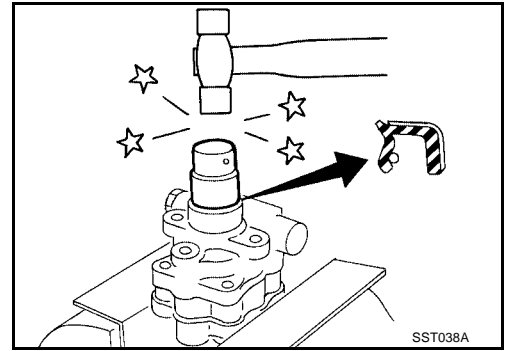
ASSEMBLY

Assembly is in the reverse order of disassembly, noting the following instructions.

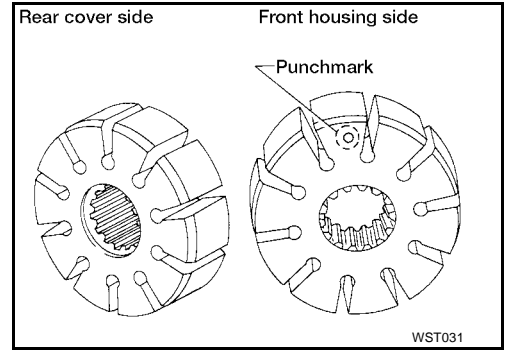
- Make sure O-rings and oil seal are properly installed.
- Always install new O-rings and oil seal.

POWER STEERING OIL PUMP

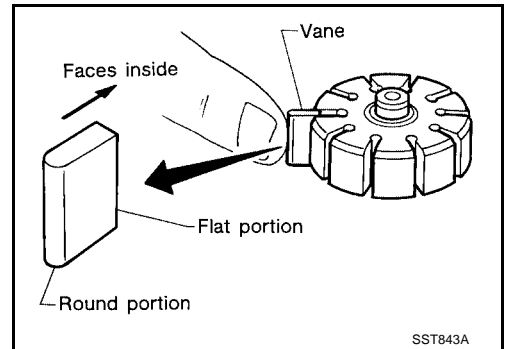
- Be careful of oil seal direction.
- Cam ring, rotor and vanes must be replaced as a set if necessary.
- Coat each part with Genuine NISSAN PSF II when assembling.



- Pay attention to the direction of rotor.



- When assembling vanes to rotor, rounded surfaces of vanes must face cam ring side.

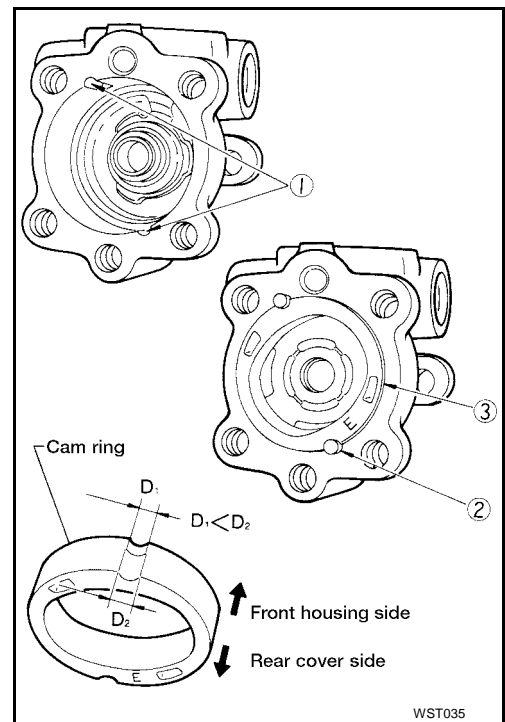


A
B
C
D
E
F
PS
H
I
J
K
L
M

POWER STEERING OIL PUMP

- Insert pin 2 into pin groove 1 of front housing and front side plate. Then install cam ring 3 as shown.

Cam ring : D_1 is less than D_2



Inspection After Disassembly

- If pulley is cracked or deformed, replace it.
- If an oil leak is found around pulley shaft oil seal, replace the seal.
- If the pulley or pulley shaft is deformed or worn, replace it.

EGS000B9

HYDRAULIC LINE

PFP:49721

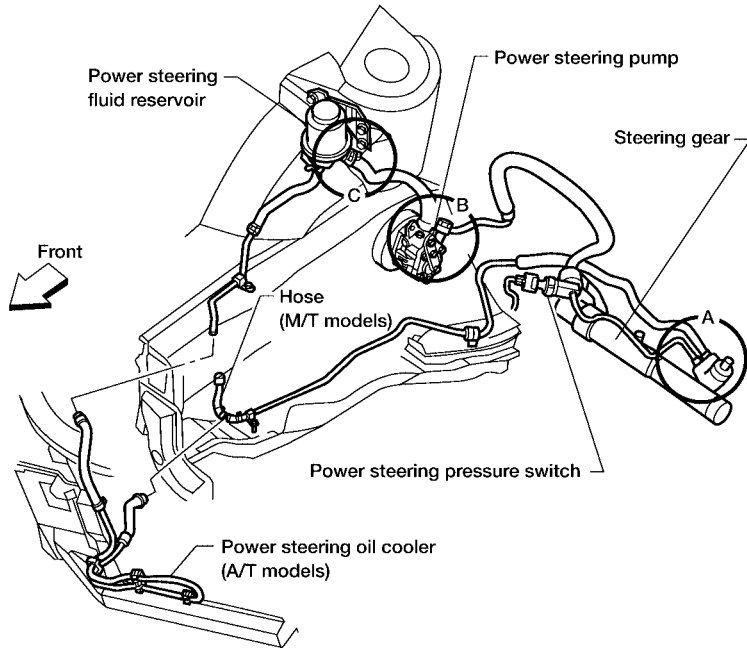
EGS000BA

HYDRAULIC LINE

Removal and Installation

All except VQ35DE with A/T

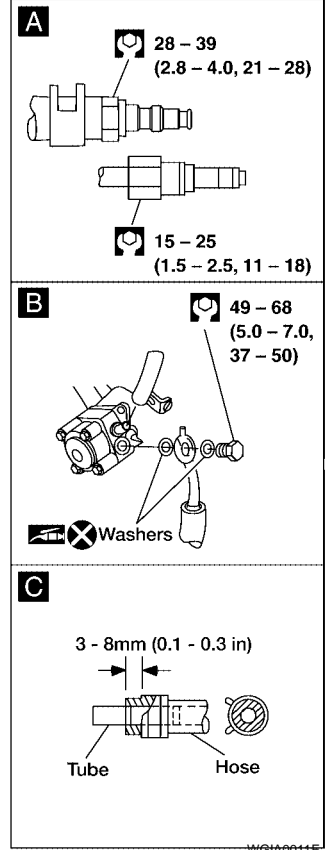
SEC. 497



: Apply Genuine NISSAN PSF II, or equivalent. Refer to GI Section

: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

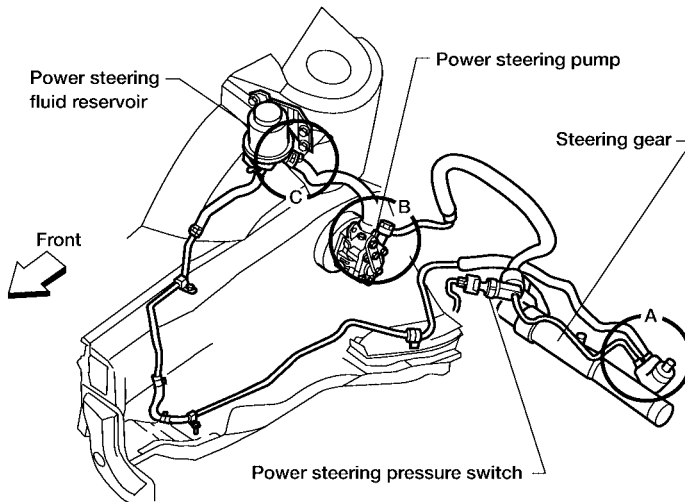


A
B
C
D
E
F
PS
H
I
J
K
L
M

HYDRAULIC LINE

VQ35DE with A/T only

SEC. 497



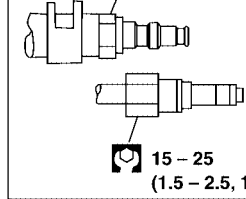
:Apply Genuine NISSAN PSF II, Tor equivalent. Refer to GI Section

:TN-m (kg-m, ft-lb)

:TN-m (kg-m, in-lb)

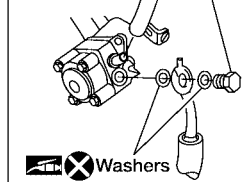
A

28 - 39
(2.8 - 4.0, 21 - 28)



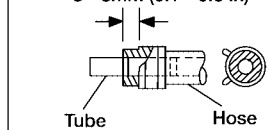
B

49 - 68
(5.0 - 7.0, 37 - 50)



C

3 - 8mm (0.1 - 0.3 in)



WGIA0017E

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00100

General Specifications

EGS000BB

Steering model	Power steering	
	16 inch tire	17 inch tire
Steering gear type	PR26AD	
Steering overall gear ratio	16.6	
Turns of steering wheel (Lock to lock)	2.9	2.6
Steering column type	Collapsible, tilt, non-motorized telescoping	

Steering Wheel

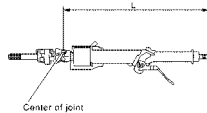
EGS000BC

Steering wheel axial play mm (in)	0 (0)
Steering wheel play mm (in)	35 (1.38) or less
Movement of gear housing mm (in)	±2 (±0.08) or less

Steering Column

EGS000BD

Applied model	All
Steering column length "L" mm (in)	612 - 616 (24.09 - 24.25)



SST855C

Steering Gear and Linkage

EGS000BE

Applied model	All	
Steering gear type	PR26AD	
Tie-rod outer ball joint	Swinging force at cotter pin hole: "A" N (kg-f, lb-f)	6.47 - 64.63 (0.66 - 6.59, 1.46 - 14.53)
	Rotating torque: "B" N·m (kg-cm, in-lb)	0.29 - 2.94 (3.0 - 30.0, 2.6 - 26.0)
	Axial end play: "C" mm (in)	0.4 (0.016) or less
Tie-rod inner ball joint	Swinging force*: "A" N (kg-f, lb-f)	5.69 - 45.60 (0.58 - 4.65, 1.28 - 10.25)
	Axial end play: "C" mm (in)	0.2 (0.008) or less
Tie-rod standard length "L" mm (in)	208.8 (8.220)	

*: Measuring point [l: 172 mm (6.77 in)]

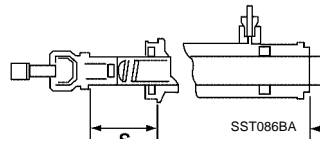


SST867C

Retainer adjustment Adjusting screw	Initial tightening torque N·m (kg-cm, in-lb)	4.9 - 5.9 (50 - 60, 43 - 52)
	Retightening torque after loosening N·m (kg-cm, in-lb)	0.2 (2, 1.7)
	Tightening torque after gear has settled N·m (kg-cm, in-lb)	4.9 - 5.9 (50 - 60, 43 - 52)
	Returning angle degree	60° - 80°
Steering gear type	PR26AD	

SERVICE DATA AND SPECIFICATIONS (SDS)

Rack stroke "S" mm (in)	16 inch tire: 69.5 mm (2.74 in) 17 inch tire: 66.5 mm (2.62 in)
-------------------------	--



Power Steering

EGS000BF

Applied model		All	
Steering gear type		PR26AD	
Pump type		F40	
Rack sliding force N (kg-f, lb-f) Under normal operating oil pressure	Range within ± 11.5 mm (± 0.453 in) from the neutral position at rack speed of 3.5 mm (0.138 in)/s	Average force	210.7 - 298.9 (21.49 - 30.49, 47.37 - 67.19)
	Except for the above range	Maximum force deviation	98 (10, 22)
		Maximum sliding force	294 (30, 66)
		Maximum force deviation	147 (15, 33)
Steering wheel turning force (Measured at one full turn from the neutral position) N (kg-f, lb-f)		39 (4, 9) or less	
Fluid capacity (Approximate) ℓ (qt.)		1.0 (1-1/8)	
Oil pump maximum pressure kPa (kg/cm ² , psi)		8,000 - 8,800 (82 - 90, 1,160 - 1,276)	