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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”

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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

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- 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 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

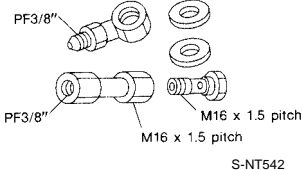
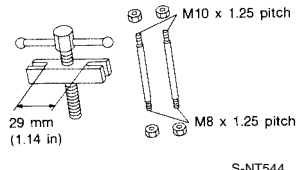
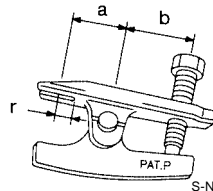
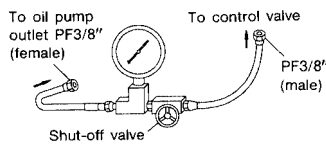
PREPARATION

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Special Service Tools

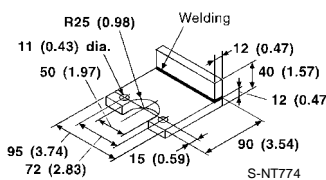
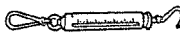
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The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV48102500 (J33914) Pressure gauge adapter <div style="text-align: center;">  <p>PF3/8" M16 x 1.5 pitch M16 x 1.5 pitch S-NT542</p> </div>	Measuring oil pressure
ST27180001 (J25726-A) Steering wheel puller <div style="text-align: center;">  <p>29 mm (1.14 in) M10 x 1.25 pitch M8 x 1.25 pitch S-NT544</p> </div>	Removing steering wheel
HT72520000 (J25730-A) Ball joint remover <div style="text-align: center;">  <p>a b r PAT.P S-NT546</p> </div>	Removing ball joint a: 33 mm (1.30 in) b: 60 mm (2.36 in) r: 9 mm (0.35 in) radius
KV48103500 (J26357 and J26357-10) Pressure gauge <div style="text-align: center;">  <p>To oil pump outlet PF3/8" (female) To control valve PF3/8" (male) Shut-off valve S-NT547</p> </div>	Measuring oil pressure

Commercial Service Tool

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Tool number	Description
Oil pump attachment <div style="text-align: center;">  <p>R25 (0.98) Welding 11 (0.43) dia. 12 (0.47) 50 (1.97) 40 (1.57) 12 (0.47) 95 (3.74) 15 (0.59) 90 (3.54) 72 (2.83) S-NT774</p> </div>	Disassembling and assembling oil pump Unit: mm (in)
Spring gauge <div style="text-align: center;">  <p>S-NT025</p> </div>	Measuring steering wheel turning force or rack sliding force

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

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NVH Troubleshooting Chart

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

Symptom	Possible cause and SUSPECTED PARTS		Reference page	
Noise	Fluid level	PS-5, "POWER STEERING FLUID"		
	Air in hydraulic system	PS-5, "POWER STEERING FLUID"		
	Tie-rod ball joint swinging force	ESU-5, "FRONT SUSPENSION ASSEMBLY"		
	Tie-rod ball joint rotating torque	ESU-5, "FRONT SUSPENSION ASSEMBLY"		
	Tie-rod ball joint end play	ESU-5, "FRONT SUSPENSION ASSEMBLY"		
Shake	Steering gear fluid leakage	PS-5, "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-15, "Checking Drive Belts"		
	Improper steering wheel	PS-20, "On-Vehicle Service"		
Vibration	Improper installation or looseness or tilt lock lever	PS-10, "INSPECTION AFTER REMOVAL"		
	Mounting rubber deterioration	PS-12, "CHECKING GEAR HOUSING MOVEMENT"		
	Steering column deformation or damage	PS-10, "INSPECTION AFTER REMOVAL"		
	Improper installation or looseness of steering column	PS-10, "INSPECTION AFTER REMOVAL"		
	Steering linkage looseness	PS-12, "CHECKING STEERING LINKAGE"		
Shimmy	DRIVE SHAFT	FAX-4, "NVH Troubleshooting Chart"		
	WHEEL HUB	FAX-4, "NVH Troubleshooting Chart"		
	SUSPENSION	FSU-4, "NVH Troubleshooting Chart"		
	TIRES	WT-2, "NVH Troubleshooting Chart"		
	ROAD WHEEL	WT-2, "NVH Troubleshooting Chart"		
Judder	BRAKES	BR-5, "NVH Troubleshooting Chart"		

x: Applicable

POWER STEERING FLUID

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POWER STEERING FLUID

Checking Fluid Level

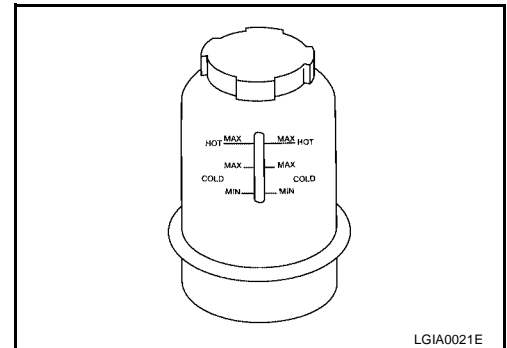
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Check fluid level, referring to the scale on reservoir tank.
Use HOT range for fluid temperatures of 50° to 80°C (122° to 176°F).

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

CAUTION:

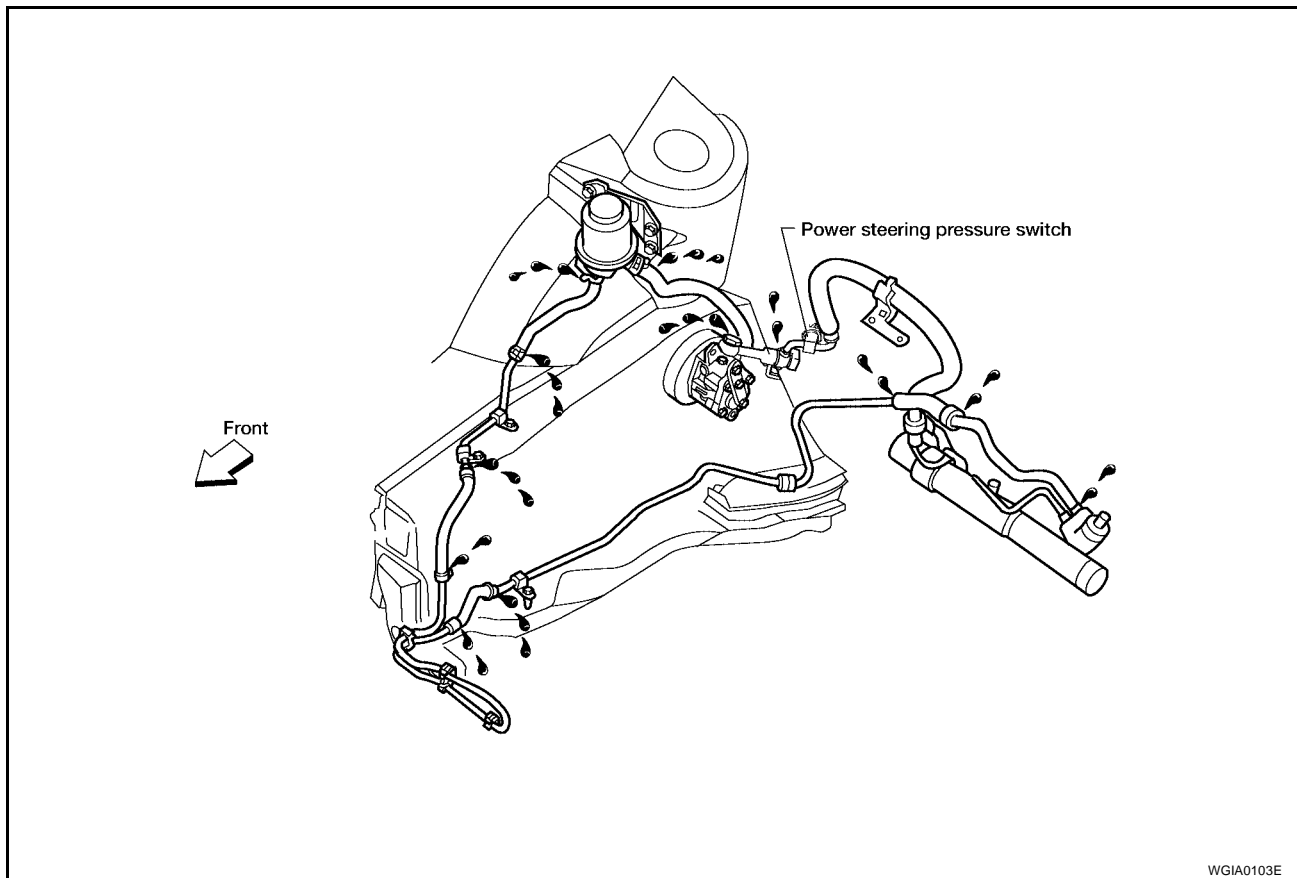
- Do not overfill.
- Recommended fluid is Genuine NISSAN PSF or equivalent. Refer to [MA-12, "RECOMMENDED FLUIDS AND LUBRICANTS"](#).



Checking Fluid Leakage

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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-16, "INSPECTION AFTER DISASSEMBLY"](#).
6. Check steering gear boots for accumulation of power steering fluid indicating a steering gear leak.

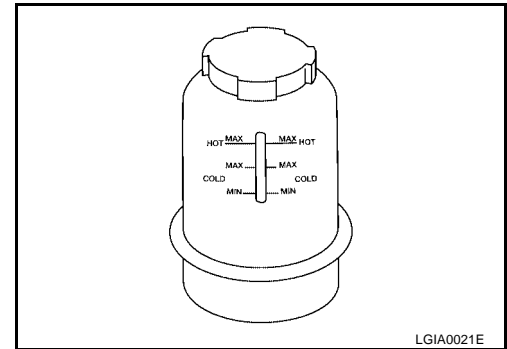
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POWER STEERING FLUID

Bleeding Hydraulic System

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1. Raise the front end of vehicle until the wheels are clear of the ground.
2. Add Genuine NISSAN PSF 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.



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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

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STEERING WHEEL

On-Vehicle Service

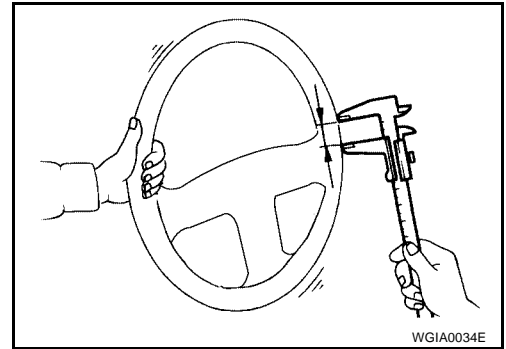
CHECKING STEERING WHEEL PLAY

- 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 axle
Check steering system for looseness while moving the steering wheel in all directions.

Axial end play : 0 mm (0 in)



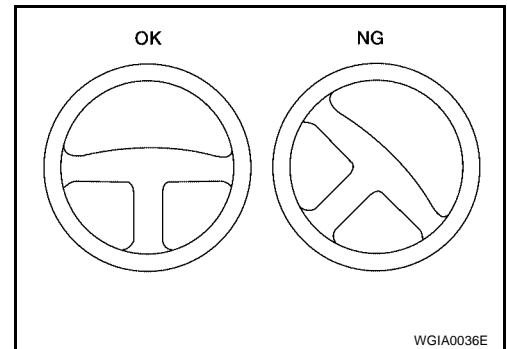
CHECKING NEUTRAL POSITION ON STEERING WHEEL

Pre-checking

- Make sure that wheel alignment is correct. Refer to [FSU-18, "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.

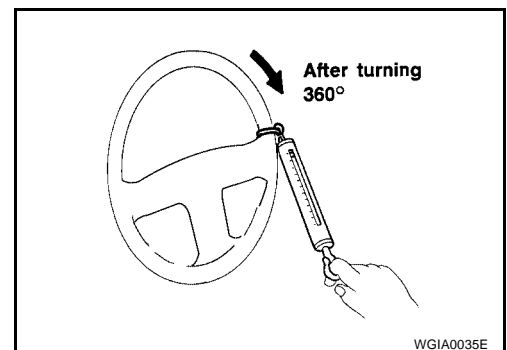


CHECKING STEERING WHEEL TURNING FORCE

- 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 force

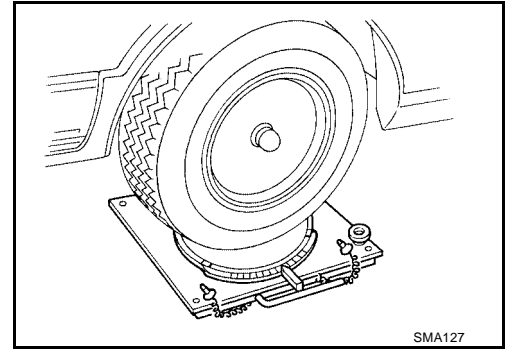
- If steering wheel turning force is out of specification, check rack sliding force. Refer to [PS-12, "CHECKING RACK SLIDING FORCE"](#).
- If rack sliding force is not within specifications, adjust rack sliding force. Refer to [PS-18, "Adjustment for Rack Sliding Force"](#).
- If rack sliding force is OK, inspect steering column. Refer to [PS-10, "INSPECTION AFTER REMOVAL"](#).



STEERING WHEEL

FRONT WHEEL TURNING ANGLE

1. Rotate steering wheel all the way right and left; measure turning angle. Refer to [FSU-18, "General Specifications \(Front\)"](#) .
2. If it is not within specifications, check rack stroke. Refer to [PS-27, "Steering Gear and Linkage"](#) .



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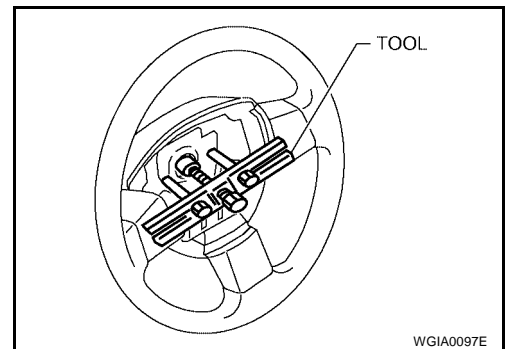
Removal and Installation

REMOVAL

1. Set the front wheels in the straight-ahead position.
2. Remove the driver air bag module.
Refer to [SRS-43, "Removal and Installation"](#) .
3. Remove the steering wheel center nut.
4. Remove the steering wheel with the Tool.

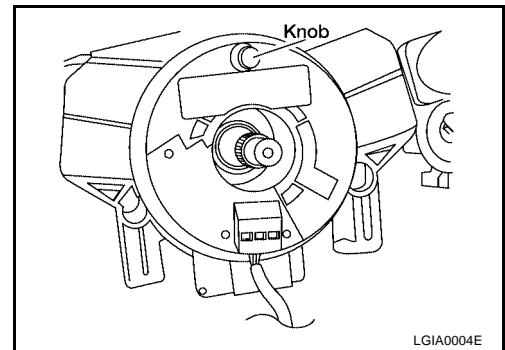
Tool number : ST27180001 (J25726-A)

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.



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)

STEERING COLUMN

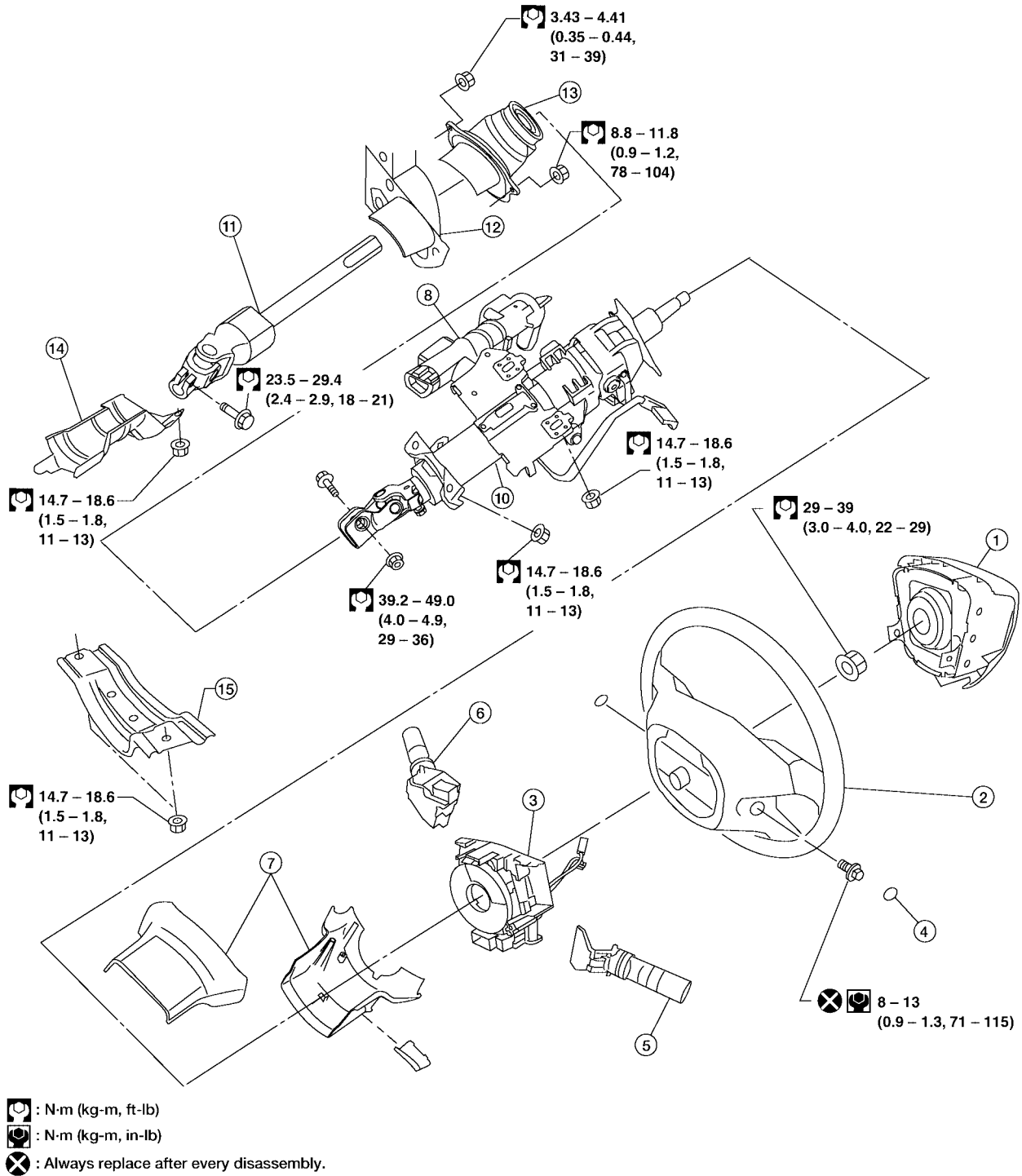
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STEERING COLUMN

Removal and installation

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|----------------------------------|------------------------|--------------------|
| 1. Driver air bag module | 2. Steering wheel | 3. Spiral cable |
| 4. Steering wheel side cover | 5. Wiper/washer switch | 6. Headlamp switch |
| 7. Upper and lower column covers | 8. Ignition switch | 9. Upper joint |

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STEERING COLUMN

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|--|------------------------------------|--------------------------|
| 10. Steering column (manual tilt/telescope type) | 11. Lower joint and shaft assembly | 12. Cowl panel |
| 13. Hole cover | 14. Shaft lower cover | 15. Lower knee protector |

REMOVAL

CAUTION:

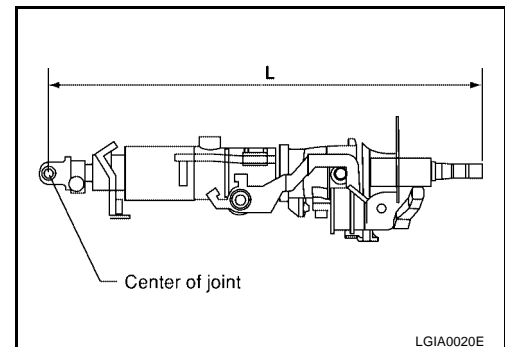
- The rotation of the spiral cable (SRS air bag component part) is limited. If the steering gear must be removed, set the front wheels in the straight-ahead direction. Do not rotate the steering column while the steering gear is removed.
 - Remove the steering wheel before disconnecting the coupling joint to avoid damaging the spiral cable.
1. Disconnect battery negative terminal.
 2. If necessary, remove the steering wheel. Refer to [PS-8, "Removal and Installation"](#).
 3. Remove the instrument column cover and lower driver instrument panel. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#).
 4. Remove the combination meter. Refer to [IP-13, "Combination Meter"](#).
 5. Remove the cluster lid and center console assembly. Refer to [IP-11, "Removal and Installation"](#).
 6. Remove the instrument panel screws from the LH side of the instrument panel to allow the ignition switch to clear the instrument panel during removal.
 7. Remove lower knee protector.
 8. Disconnect the following:
 - Headlamp switch
 - Wiper switch
 - Spiral cable
 - Key switch and key lock solenoid
 - NATS antenna amplifier
 - Illumination lamp
 - Ignition switch
 - Column harness clips, position aside
 9. Remove the shaft lower cover.
 10. Remove the pinch bolt.
 11. Remove the steering column nuts and steering column.

INSPECTION AFTER REMOVAL

- 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. On models equipped with telescopic feature, make sure the column is in the forward most position before measuring. If out of specification, replace the steering column as an assembly.

Steering column length (L) : 496 mm (19.53 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.



STEERING COLUMN

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

Tilt mechanism range : 3° per notch at 7 steps

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 are 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.

INSTALLATION

Installation is in the reverse order of removal.

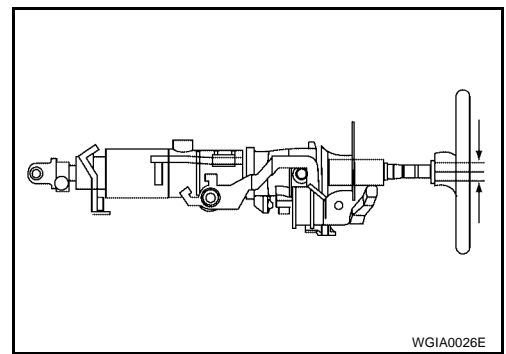
CAUTION:

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

NOTE:

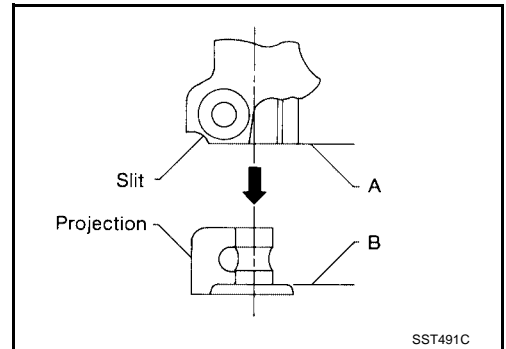
Align slit of the coupling joint with projection on dust cover. Insert the joint until surface A contacts surface B.

- After installation, turn steering wheel to make sure it moves smoothly. 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.



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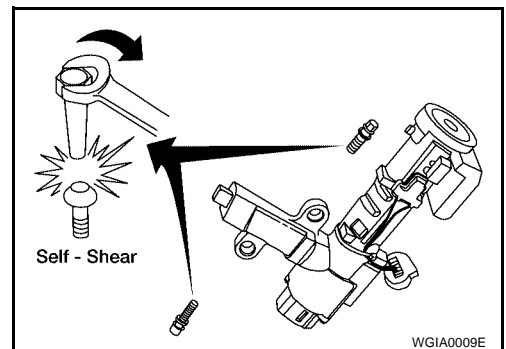
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Disassembly and Assembly

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



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POWER STEERING GEAR AND LINKAGE

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POWER STEERING GEAR AND LINKAGE

On-Vehicle Service

CHECKING STEERING GEAR

- Check gear housing and boots for looseness, damage and fluid leakage. Refer to [PS-5, "Checking Fluid Leakage"](#).
- Check connection with steering column for looseness.
- Prior to removing the steering gear from the vehicle, check rack sliding force. Refer to [PS-12, "CHECKING RACK SLIDING FORCE"](#).
- If rack sliding force is not within specification, adjust rack sliding force. Refer to [PS-18, "Adjustment for Rack Sliding Force"](#).

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.

CHECKING RACK SLIDING FORCE

1. Disconnect steering column lower joint and knuckle arms from the gear.
2. Start and run engine at idle to make sure steering fluid has reached normal operating temperature.
3. 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)

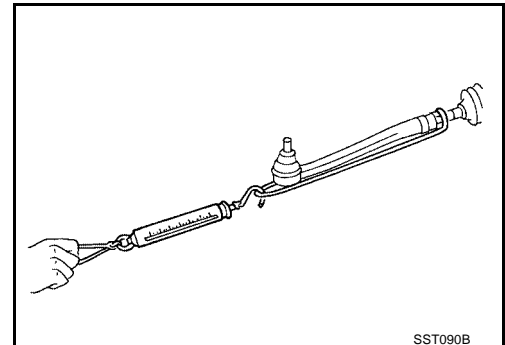
Maximum force deviation : 98 N (10 kg-f, 22 lb-f)

4. Check sliding force outside the above range at rack speed 40 mm (1.57 in)/s.

Rack sliding force

Maximum : Not more than 294 N (30 kg-f, 66 lb-f)

Maximum deviation : 147 N (15 kg-f, 33 lb-f)

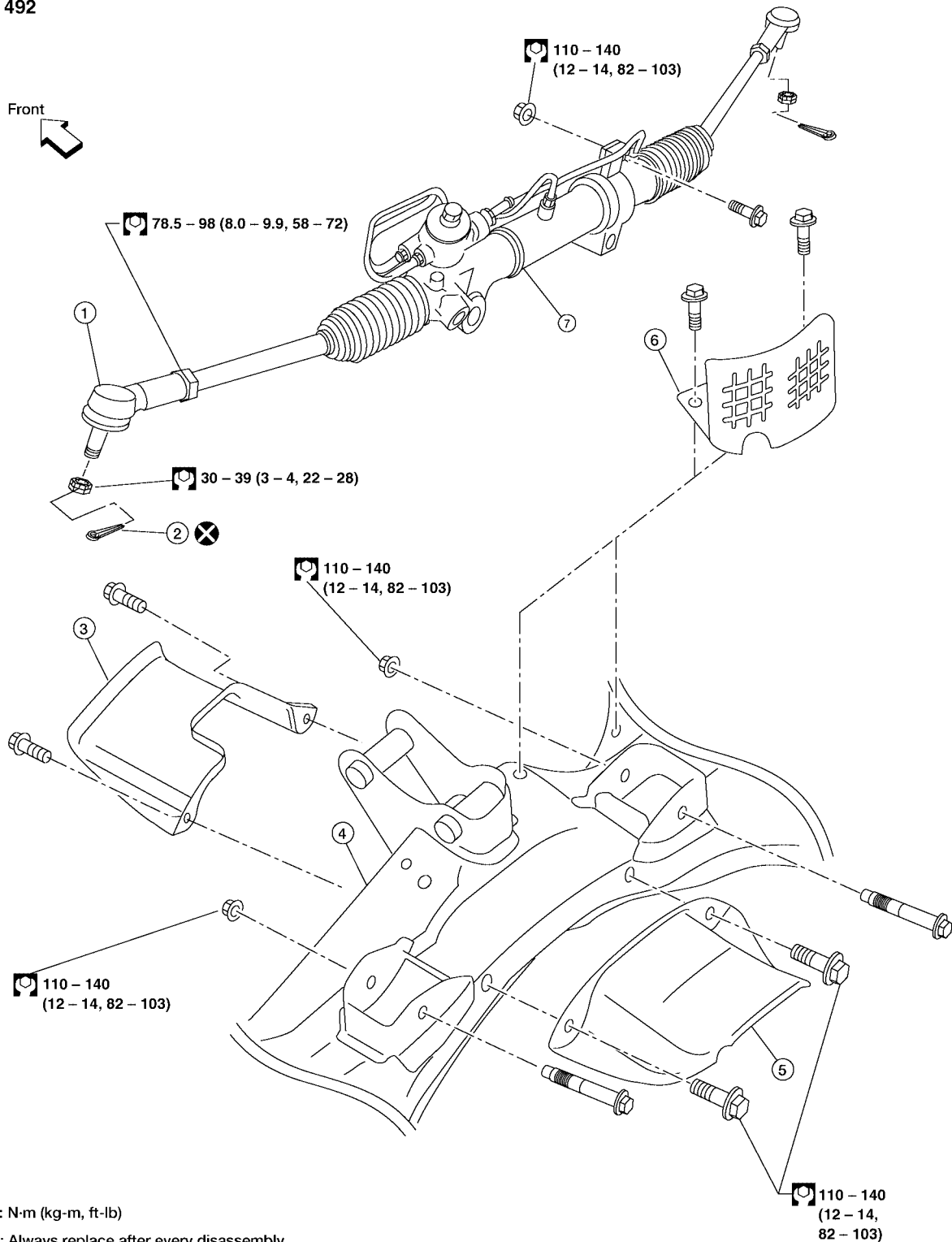


POWER STEERING GEAR AND LINKAGE

Removal and Installation

EGS0000Y

SEC. 492



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

: Always replace after every disassembly.

- | | | |
|---|--|---|
| 1. Outer tie-rod end | 2. Cotter pin | 3. Steering gear front insulator (QG25DE) |
| 4. Suspension member | 5. Steering gear rear insulator (QG25DE) | 6. Steering gear insulator (VQ35DE) |
| 7. Power steering gear and linkage assembly | | |

WGIA0108E

POWER STEERING GEAR AND LINKAGE

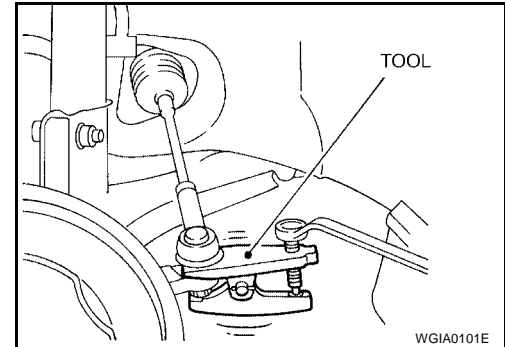
REMOVAL

CAUTION:

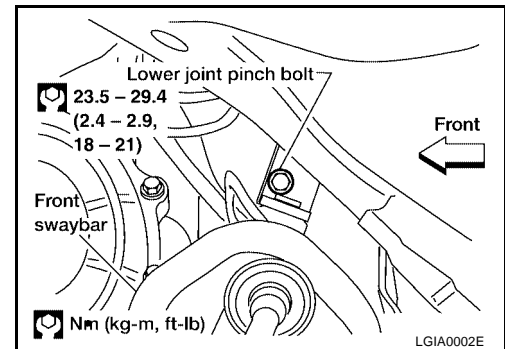
- The rotation of the driver air bag spiral cable is limited. If the steering gear must be removed, set the front wheels in the straight-ahead direction. Do not rotate the steering column while the steering gear is removed.
- Remove the steering wheel and spiral cable before removing the steering lower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

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

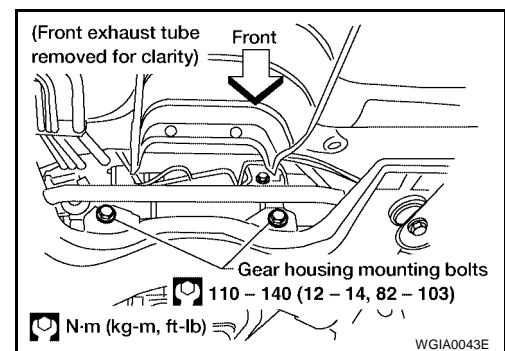
Tool number : HT72520000 (J25730-A)



3. Remove the lower joint pinch bolt.



4. Disconnect the power steering high and low pressure lines from the steering gear.
5. Remove the two power steering gear mounting bolts.
 - Remove steering gear insulators to gain access.
 - Do not remove the steering gear mounting bracket from the gear housing.
6. Remove the power steering gear and linkage assembly.

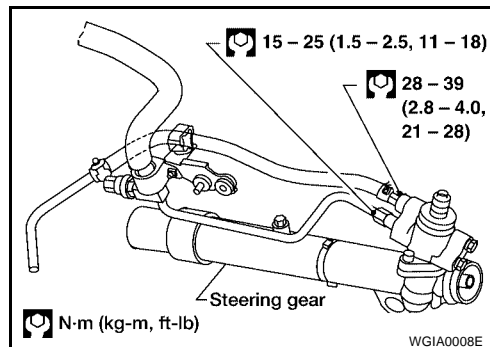


POWER STEERING GEAR AND LINKAGE

INSTALLATION

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.

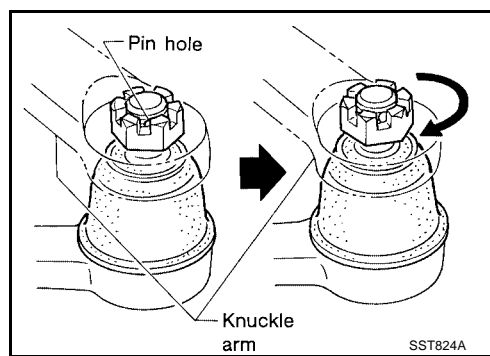


- The O-ring in low-pressure pipe connector is larger than that in high-pressure connector. Take care to install the proper O-ring.
- Initially, tighten nut on tie-rod outer socket and knuckle arm to specification. Then tighten further to align nut groove with first pin hole so that the cotter pin can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

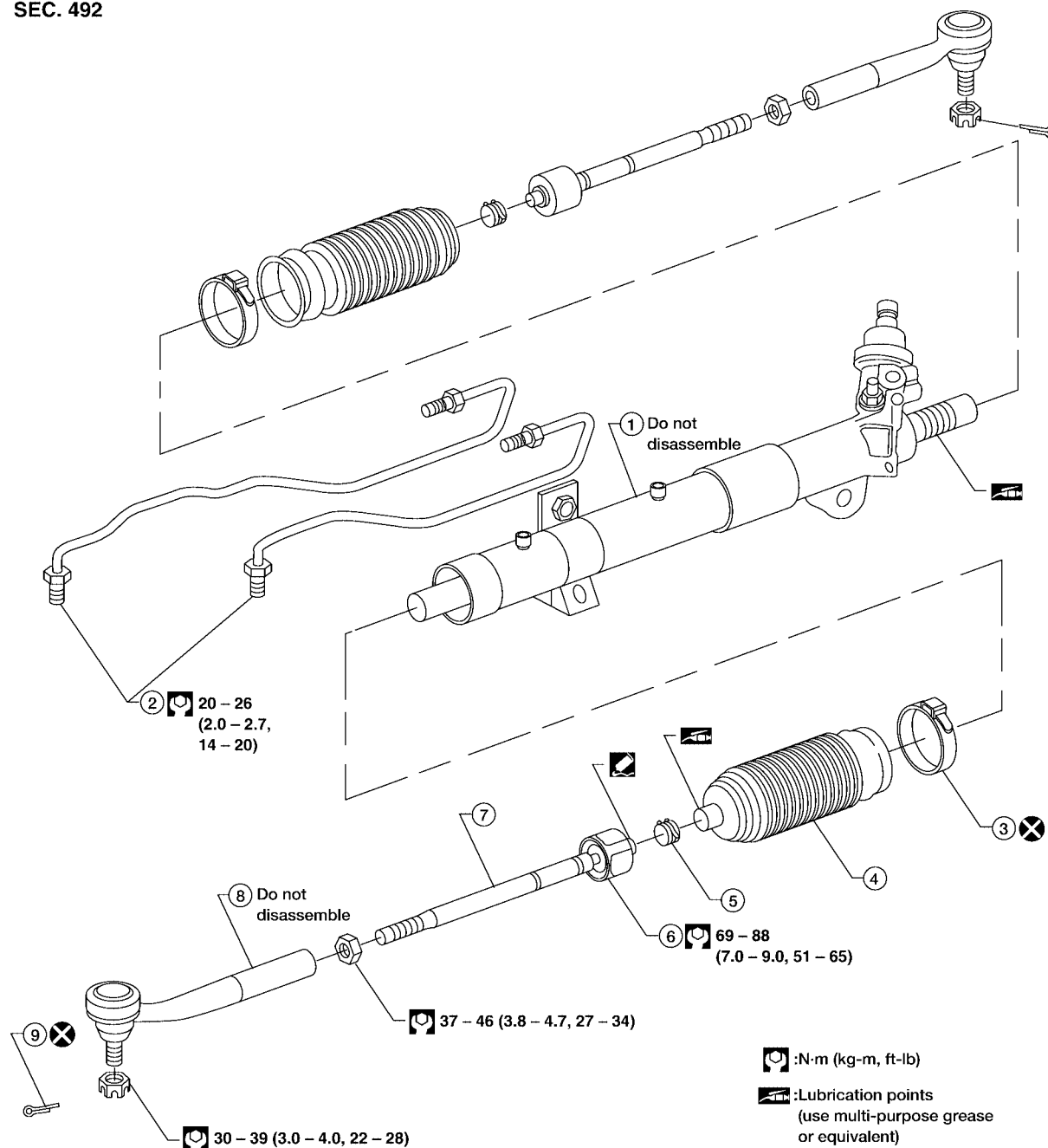


POWER STEERING GEAR AND LINKAGE

Disassembly and Assembly

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- | | | |
|------------------|----------------------------|-------------------------|
| 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 |

DISASSEMBLY

CAUTION:

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.

1. Remove the outer tie-rod sockets.
2. Remove the inner tie-rod sockets and boots.

INSPECTION AFTER DISASSEMBLY

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

WGIA0010E

POWER STEERING GEAR AND LINKAGE

Boot

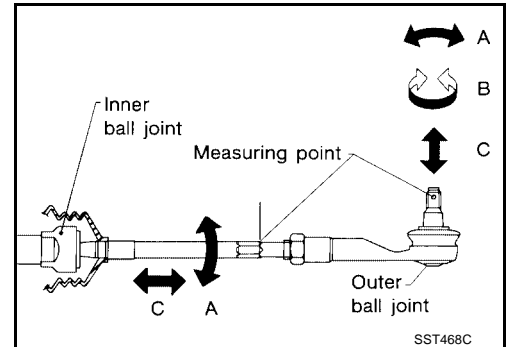
- Check condition of boot. If cracked, replace it.
- Check boots for accumulation of power steering fluid indicating steering gear leak, replace the gear.

Gear

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

Inner and outer tie-rods

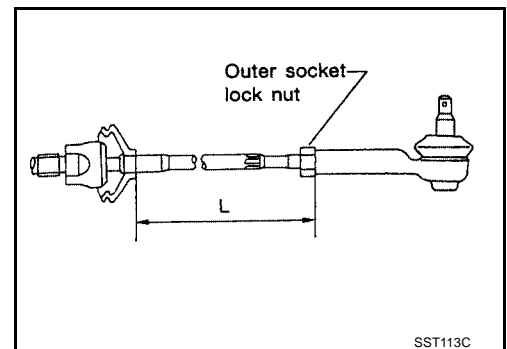
- Check ball joints for swinging force:
Tie-rod outer and inner ball joints swinging force A. Refer to [PS-27, "Steering Gear and Linkage"](#).
- Check ball joint for rotating torque:
Tie-rod outer ball joint rotating torque B. Refer to [PS-27, "Steering Gear and Linkage"](#).
- Check ball joints for 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.



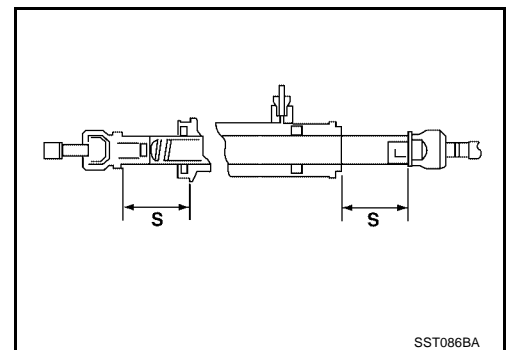
ASSEMBLY

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-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS"](#).

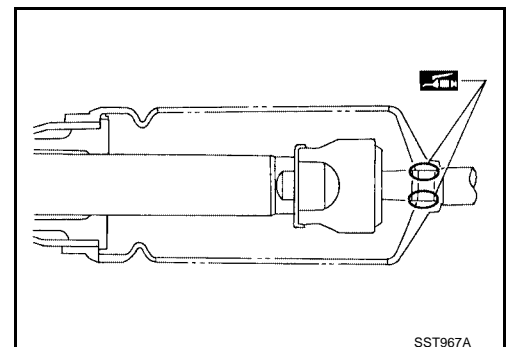
Outer socket lock nut : 37 - 46 N·m (3.8 - 4.7 kg·m, 27 - 34 ft·lb)



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

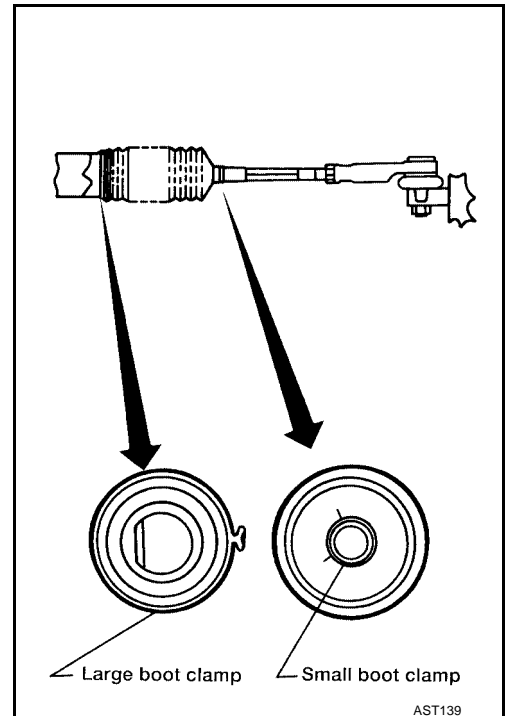


4. Before installing boot, coat the contact surfaces between boot and tie-rod with grease.



POWER STEERING GEAR AND LINKAGE

5. Install the boot clamps and crimp securely.



EGS000R0

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.

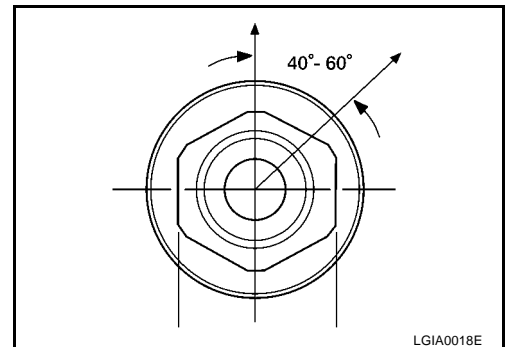
2. Tighten adjusting screw in 40° - 60° increments until rack sliding force is within specification.

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 5.0 N·m (0.9 kg-m, 44 in-lb).



3. Verify rack sliding force. Refer to [PS-12, "CHECKING RACK SLIDING FORCE"](#).
4. If rack sliding force is out of specification, adjust rack sliding force again.
5. If rack sliding force cannot be adjusted within specification, replace steering gear. Refer to [PS-13, "Removal and Installation"](#).

POWER STEERING GEAR AND LINKAGE

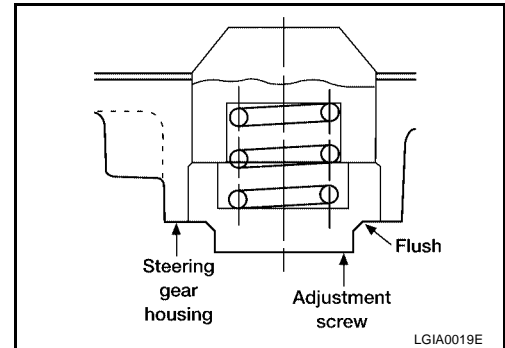
INCREASE

Increase rack sliding force as follows:

1. Tighten adjusting screw until it is flush with housing surface.

CAUTION:

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



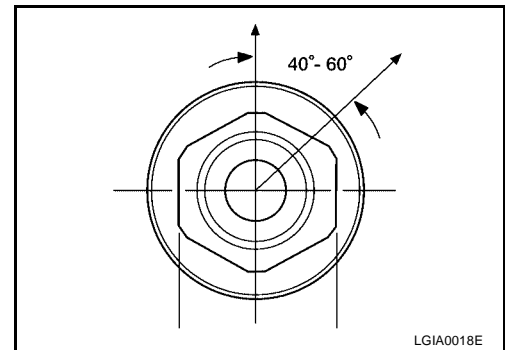
2. Loosen adjusting screw in 40° - 60° increments until rack sliding force is within specification.

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 5.0 N·m (0.9 kg-m, 44 in-lb).



3. Verify rack sliding force. Refer to [PS-12. "CHECKING RACK SLIDING FORCE"](#).
4. If rack sliding force is out of specification, adjust rack sliding force again.
5. If rack sliding force cannot be adjusted within specification, replace steering gear.

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POWER STEERING OIL PUMP

PFP:49110

POWER STEERING OIL PUMP

On-Vehicle Service CHECKING HYDRAULIC SYSTEM

EGS000R1

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

1. Set Tools. Open shut-off valve. Then bleed air. Refer to [PS-6, "Bleeding Hydraulic System"](#).

Tool numbers : KV48102500 (J33914), KV48103500 (J26357 and J26357-10)

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.

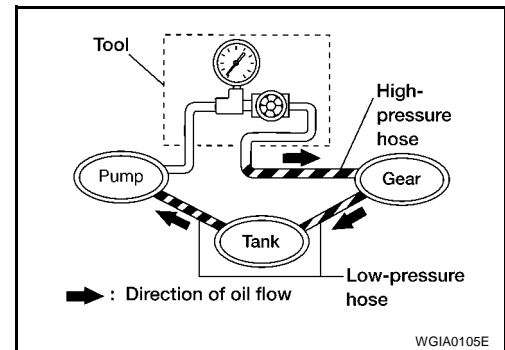
Oil pump maximum standard pressure : 8,000 - 8,800 kPa (82 - 90 kg/cm, 1,160 - 1,276 psi)

- 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-20, "On-Vehicle Service"](#).
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 Tools and add fluid as necessary. Then completely bleed air out of system. Refer to [PS-6, "Bleeding Hydraulic System"](#).



Removal and Installation

REMOVAL

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

INSTALLATION

Installation is in the reverse order of removal.

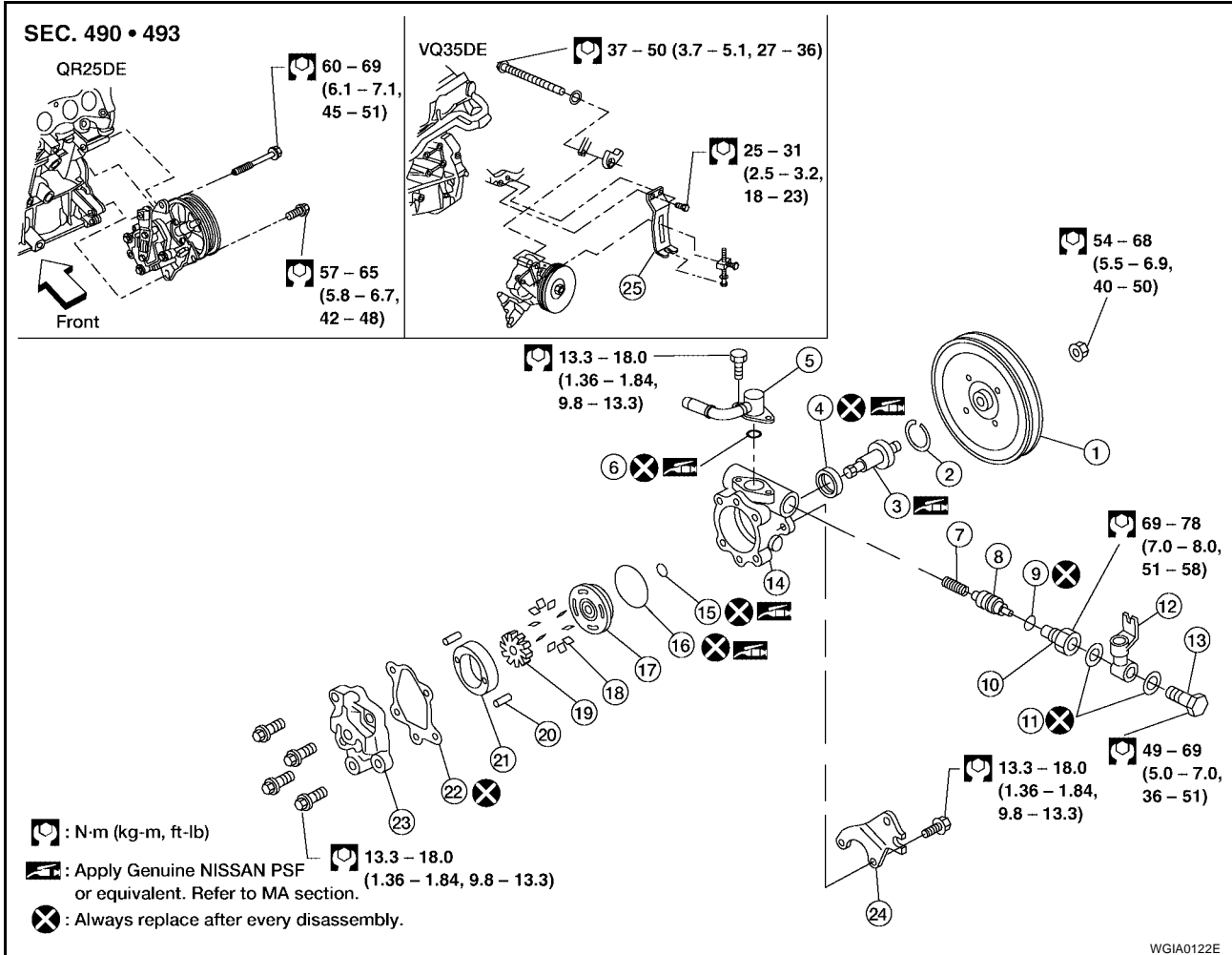
- Adjust belt tension. Refer to [MA-15, "Checking Drive Belts"](#) (QR25DE), [MA-22, "Checking Drive Belts"](#) (VQ35DE).
- Bleed air after installation. Refer to [PS-6, "Bleeding Hydraulic System"](#).

EGS000R2

POWER STEERING OIL PUMP

Disassembly and Assembly

EGS000R3

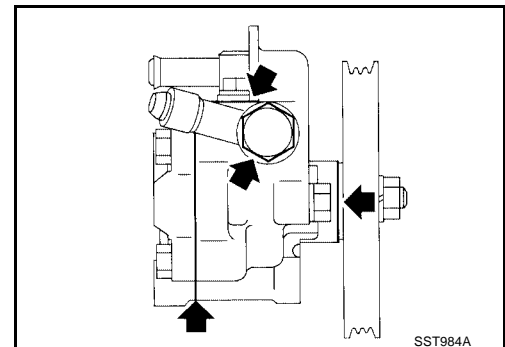


- | | | |
|----------------------|-----------------------|----------------------|
| 1. Pulley | 2. Snap ring | 3. Drive shaft |
| 4. Oil seal | 5. Suction pipe | 6. O-ring |
| 7. Spring | 8. Flow control valve | 9. O-ring |
| 10. Connector | 11. Washer | 12. Joint |
| 13. Connector bolt | 14. Pump case | 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. Oil pump bracket | | |

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



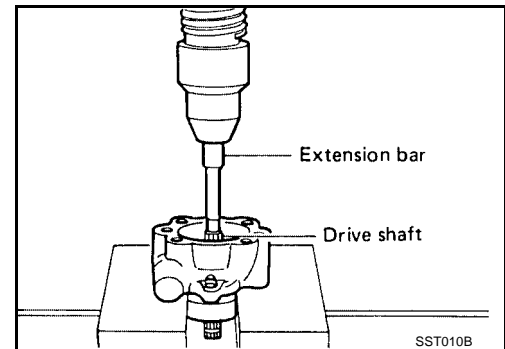
POWER STEERING OIL PUMP

DISASSEMBLY

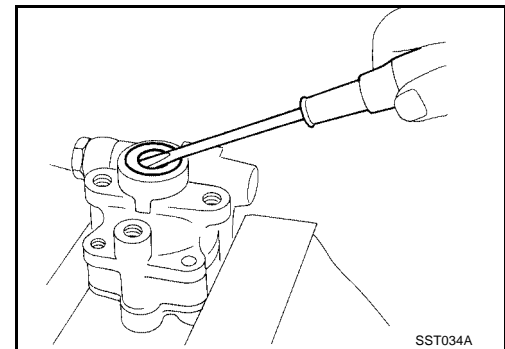
CAUTION:

- 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.

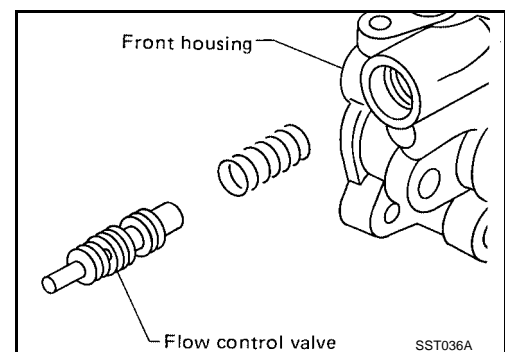
1. Remove snap ring, then draw drive shaft out using press. Be careful not to drop drive shaft.



2. Remove oil seal using a flat blade screwdriver as shown. 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-16, "INSPECTION AFTER DISASSEMBLY"](#).

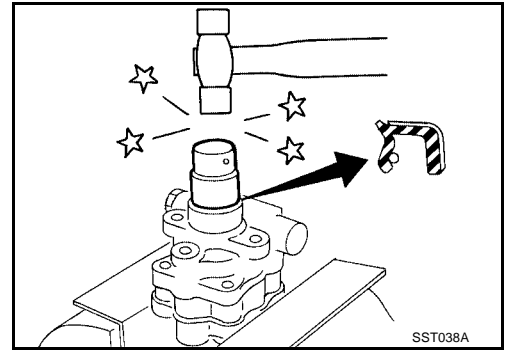
ASSEMBLY

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

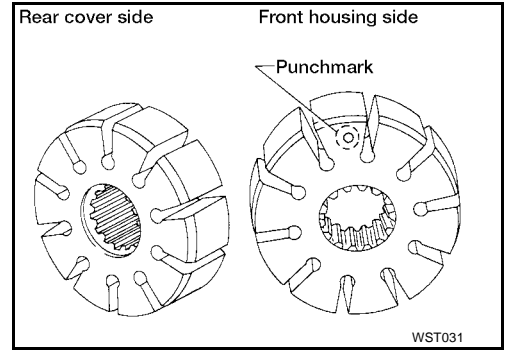
- Install new O-rings and make sure they are properly installed.

POWER STEERING OIL PUMP

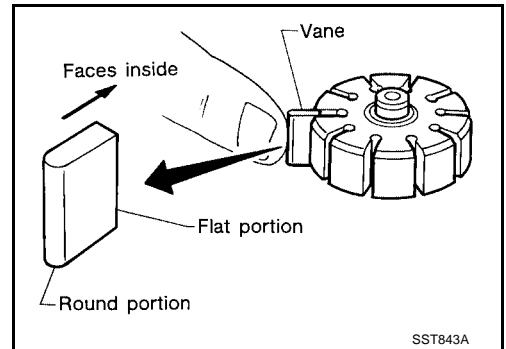
- Install new oil seal using a drift, and make sure oil seal direction is as shown.
- Cam ring, rotor and vanes must be replaced as a set if necessary.
- Coat each part with Genuine NISSAN PSF when assembling.



- Pay attention to the direction of rotor.



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

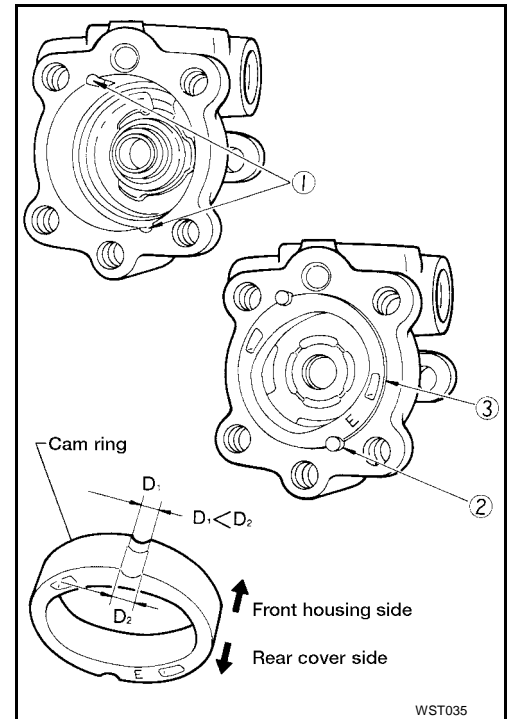


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POWER STEERING OIL PUMP

- 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.

EGS000R4

HYDRAULIC LINE

PFP:49721

EGS000R5

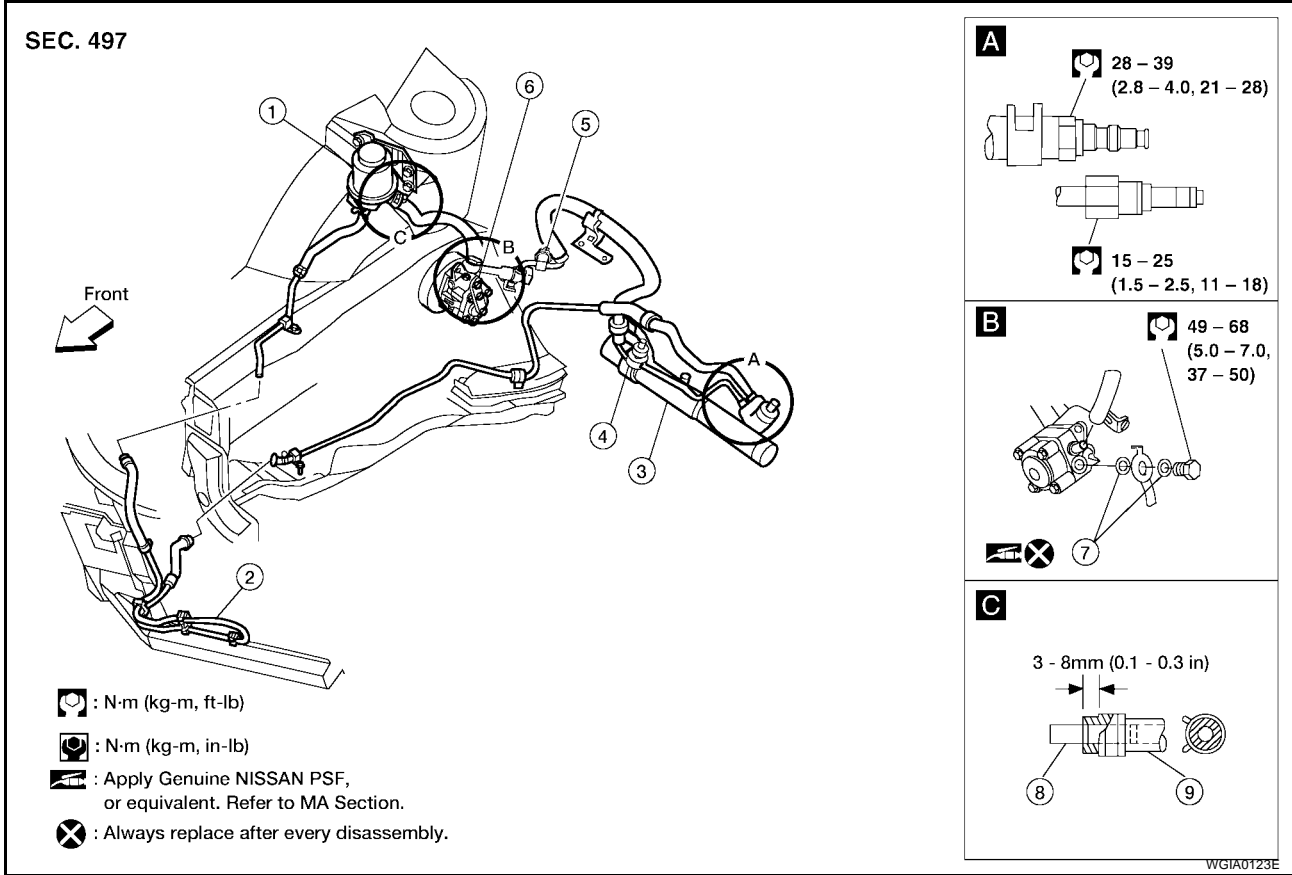
HYDRAULIC LINE

Removal and Installation

Refer to the illustration for hydraulic line routing. Remove any components to access lines.

CAUTION:

Be careful not to kink or bend lines.



- | | | |
|--|--|----------------------------|
| 1. Power steering fluid reservoir | 2. Power steering oil cooler | 3. Power steering gear |
| 4. Power steering pressure switch (QR25DE) | 5. Power steering pressure switch (VQ35DE) | 6. Power steering oil pump |
| 7. Washer | 8. Tube | 9. Hose |

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00100

General Specifications

EGS000R6

Steering model	Power steering	
	QR25DE	VQ35DE
Steering gear type	PR26AD	
Steering overall gear ratio	16.1 : 1	
Turns of steering wheel (Lock to lock)	2.8	2.6 (SE, SE-R), 2.8 (S, SL)
Steering column type	Collapsible, tilt, non-motorized telescoping	

Steering Wheel

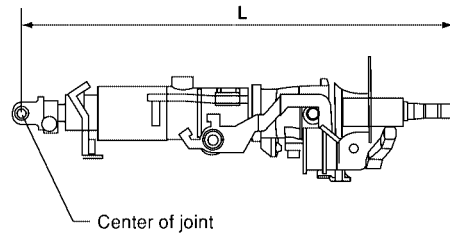
EGS000R7

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

EGS000R8

Applied model	All
Steering column length "L" mm (in)*	496 (19.53)



LGIA0020E

*: On models equipped with telescopic feature, make sure the column is in the forward most position before measuring.

Power Steering

EGS000R9

Applied model	All
Steering gear type	PR26AD
Pump type	F40
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 (US pt., Imp pt.)	1.0 (2 1/8, 1 3/4)
Oil pump maximum pressure kPa (kg/cm ² , psi)	8,000 - 8,800 (82 - 90, 1,160 - 1,276)

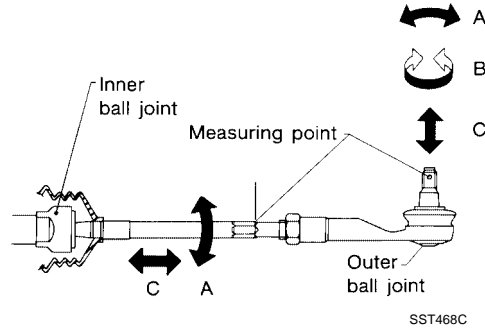
SERVICE DATA AND SPECIFICATIONS (SDS)

Steering Gear and Linkage

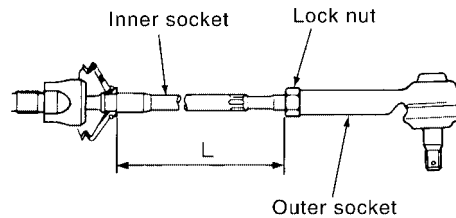
EGS000RA

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

*: Measuring point: 172 mm (6.77 in)



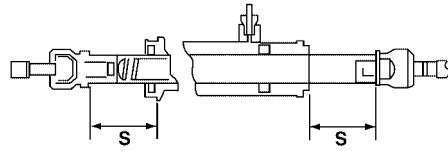
Tie-rod standard length "L" mm (in)	208.8 (8.220)
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Retainer adjustment Adjusting screw	Initial tightening torque N·m (kg-cm, in-lb)	4.9 - 5.9 (50 - 60, 43 - 52)	
	Retightening torque after loosening N·m (kg-cm, in-lb)	0.2 (2, 1.7)	
	Tightening torque after gear has settled N·m (kg-cm, in-lb)	4.9 - 5.9 (50 - 60, 43 - 52)	
	Returning angle degree	60° - 80°	
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)
		Maximum force deviation	98 (10, 22)
	Except for the above range	Maximum sliding force	294 (30, 66)
		Maximum force deviation	147 (15, 33)

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)
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SST086BA