

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

SECTION PS

POWER STEERING SYSTEM

CONTENTS

PRECAUTIONS	2	DISASSEMBLY	13
Precautions for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"	2	ASSEMBLY	14
Precautions for Steering System	2	Inspection	14
PREPARATION	3	POWER STEERING GEAR AND LINKAGE	15
Special Service Tools	3	Removal and Installation	15
NOISE, VIBRATION AND HARSHNESS (NVH)		REMOVAL	15
TROUBLESHOOTING	5	INSTALLATION	15
NVH Troubleshooting Chart	5	Component	17
POWER STEERING FLUID	6	Disassembly and Assembly	18
Checking Fluid Level	6	DISASSEMBLY	18
Checking Fluid Leakage	6	PINION ROTATING TORQUE ADJUSTMENT ...	19
Bleeding Hydraulic System	6	INSPECTION AFTER DISASSEMBLY	19
STEERING WHEEL	7	ASSEMBLY	20
On-Vehicle Service	7	POWER STEERING OIL PUMP	23
CHECKING STEERING WHEEL PLAY	7	On-Vehicle Service	23
CHECKING NEUTRAL POSITION ON STEERING WHEEL	7	CHECKING HYDRAULIC SYSTEM	23
CHECKING STEERING WHEEL TURNING FORCE	7	CHECKING AND ADJUSTING DRIVE BELTS (FOR POWER STEERING)	23
FRONT WHEEL TURNING ANGLE	8	Removal and Installation	23
Removal and Installation	8	REMOVAL	23
REMOVAL	8	INSTALLATION	23
INSTALLATION	9	Disassembly and Assembly	24
STEERING COLUMN	11	PRE-DISASSEMBLY INSPECTION	24
Removal and Installation	11	DISASSEMBLY	24
REMOVAL OF LOWER SHAFT AND HALL COVER	11	INSPECTION AFTER DISASSEMBLY	25
INSTALLATION OF LOWER JOINT AND HALL COVER	12	ASSEMBLY	25
REMOVAL OF STEERING COLUMN	12	SERVICE DATA AND SPECIFICATIONS (SDS)	28
INSTALLATION OF STEERING COLUMN	12	Steering Wheel	28
Disassembly and Assembly	13	Steering Angle	28
		Steering Column	28
		Steering Linkage	28
		Steering Gear	29
		Oil Pump	29
		Steering Fluid	29

PRECAUTIONS

PRECAUTIONS

PFP:00001

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

EGS00071

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

EGS00087

- Before disassembly, thoroughly clean the outside of 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.
- Place disassembled parts in order, on a parts rack, for easier and proper assembly.
- Use nylon cloths or paper towels to clean 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. Vaseline 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

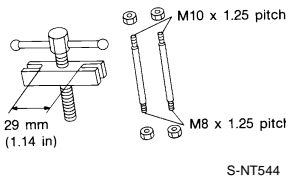
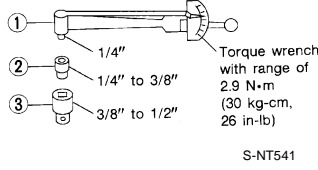
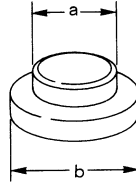
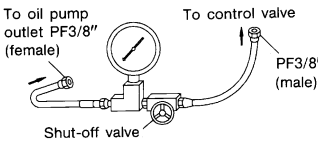
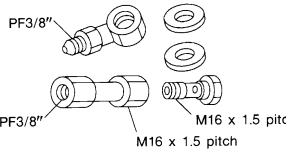
PREPARATION

PF0:00002

Special Service Tools

EGS0006V

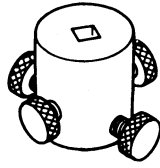
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent - Moore No.) Tool name	Description
<p>ST27180001 (J25726 -A) Steering wheel puller</p> 	<p>Removal of steering wheel</p>
<p>ST3127S000 (See J25765 - A) Preload gauge 1.GG9103000. (J25765 - A) Torque wrench 2.HT62940000 (-) Socket adapter 3.HT62900000 (-) Socket adapter</p> 	<p>Inspection of sliding torque, steering torque, and rotational torque for ball joint</p>
<p>ST35300000 Drift a: 45.1mm (1.78 in) dia. b: 59 mm (2.32 in) dia.</p> 	<p>Installation drive shaft for power steering pump.</p>
<p>KV48103500 (J26357 and J26357-10) Pressure gauge</p> 	<p>Measurement oil pump relief pressure</p>
<p>KV4802500 (J33914) Pressure gauge adapter</p> 	<p>Measurement oil pump relief pressure</p>

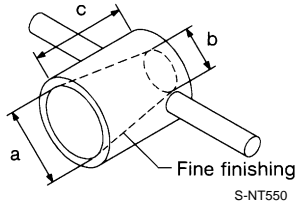
A
B
C
D
E
F
PS
H
I
J
K
L
M

PREPARATION

Tool number (Kent - Moore No.) Tool name	Description
KV48103404 (-) Torque adapter	Inspection rotational torque
KV48104400 (-) Teflon ring correcting tool a: 50 mm (1.97 in) dia. b: 36 mm (1.46 in) dia. c: 100 mm (3.94 in) dia.	Installation of rack Teflon ring



ZZA0824D



S-NT550

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

EGS00081

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																						
			PS-6	PS-6	PS-20	PS-20	PS-20	PS-6	PS-7	—	EM-12.	—	PS-14	—	PS-14	PS-14	PS-15	NVH in PR section	NVH in RFD section	NVH in FAX, RAX, FSU and RSU section	NVH in WT section	NVH in WT section	NVH in RAX section	BR-5	
STEERING	Noise	Fluid level	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Shake	Air in hydraulic system																							
	Vibration	Tie-rod ball joint swinging force																							
	Shimmy	Tie-rod ball joint rotating torque																							
	Judder	Tie-rod ball joint end play																							
		Steering gear fluid leakage																							
		Steering wheel play																							
		Steering gear rack sliding force																							
		Drive belt looseness																							
		Improper steering wheel																							
		Improper installation or looseness or tilt lock lever																							
		Mounting rubber deterioration																							
		Steering column deformation or damage																							
		Improper installation or looseness of steering column																							
		Steering linkage looseness																							
		PROPELLER SHAFT																							
		DIFFERENTIAL																							
		AXLE AND SUSPENSION																							
		TIRES																							
		ROAD WHEEL																							
		DRIVE SHAFT																							
		BRAKES																							

x: Applicable

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

POWER STEERING FLUID

POWER STEERING FLUID

PFP:KLF20

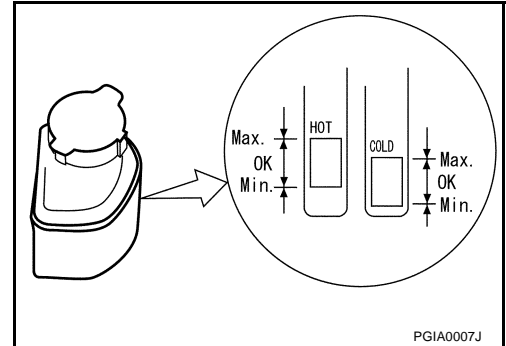
Checking Fluid Level

EGS0006W

- Check fluid level with dipstick on reservoir cap. Use "HOT" range at fluid temperatures from 50 to 80°C (122 to 176°F). Use "COLD" range at fluid temperatures from 0 to 30°C (32 to 86°F).

CAUTION:

- Do not overfill.
- Recommended fluid is Genuine Nissan PSF or equivalent.



Checking Fluid Leakage

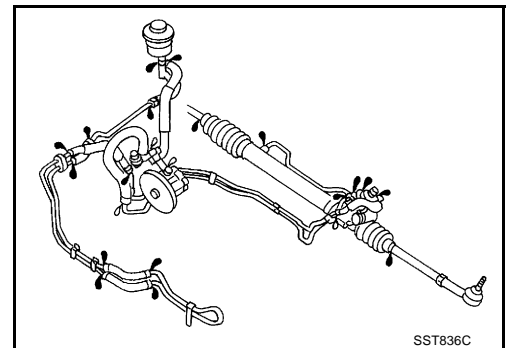
EGS0006X

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

1. Run engine at idle speed or 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 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 power steering pump. Refer to [PS-23](#), "[CHECKING HYDRAULIC SYSTEM](#)".
6. Check rack boots for accumulation of power steering fluid.

Bleeding Hydraulic System

EGS0006Y

1. Raise front end of vehicle until wheels clear ground.
Add fluid into oil tank to specified level. Meanwhile, quickly turn steering wheel fully to right and left and lightly touch steering stoppers.
Repeat steering wheel operation until fluid level no longer decreases.
2. Start engine.
Repeat step 2 above.
 - Incomplete air bleeding will cause the following to occur. When this happens, bleed air again.
 - a. Generation of air bubbles in reservoir tank
 - b. Generation of clicking noise in oil pump
 - c. Excessive buzzing in oil pump

Fluid noise may occur in valve or oil pump. This is common when vehicle is stationary or while turning steering wheel slowly. This does not affect performance or durability of system.

STEERING WHEEL

STEERING WHEEL

PFP:48430

On-Vehicle Service

EGS0006Z

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 following for loose or worn components.

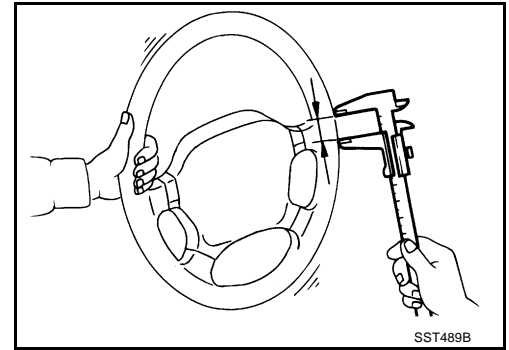
Steering gear assembly

Steering column

Front suspension and axle

- Check steering wheel for vertical, horizontal or axial play

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



CHECKING NEUTRAL POSITION ON STEERING WHEEL

Pre-Checking

- Make sure that wheel alignment is correct.

Wheel alignment : Refer to [FSU-6. "On-Vehicle Inspection and Service"](#)

- Verify that steering gear is centered before removing steering wheel.

Checking

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

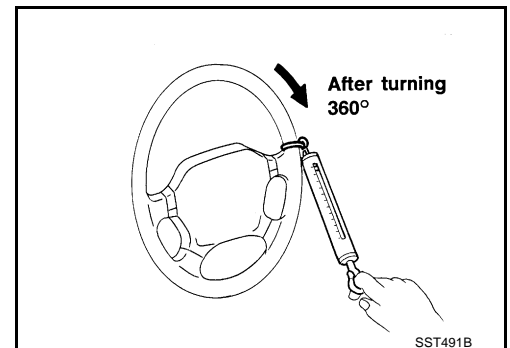
CHECKING STEERING WHEEL TURNING FORCE

- Park vehicle on a level, dry surface and set parking brake.
- Start engine.
- Bring power steering fluid up to adequate operating temperature. [Make sure temperature of fluid is approximately 60 to 80°C (140 to 176°F).]

Tires need to be inflated normal pressure.

- Check steering wheel turning force when steering wheel has been turned 360° from neutral position.

Steering wheel turning force : 36 N (3.7kg, 8.2lb) or less



- If steering wheel turning force is out of specification, check rack sliding force.

- Disconnect steering column lower joint and knuckle arms from gear.

- Start and run engine at idle to make sure steering fluid has reached normal operating temperature.

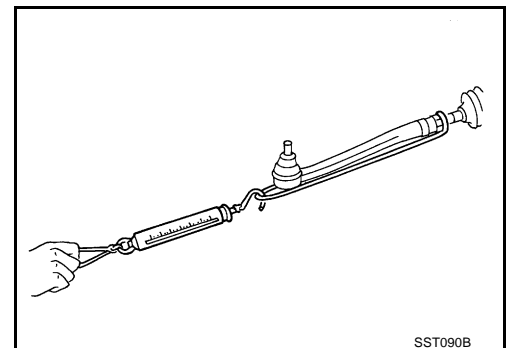
- While pulling tie-rod slowly in the ± 11.5 mm (± 0.453 in) range from neutral position, make sure rack sliding force is within specification.

Rack sliding force : 255- 294 N (26-30 kg, 57 - 66 lb)

- Check sliding force outside above range.

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

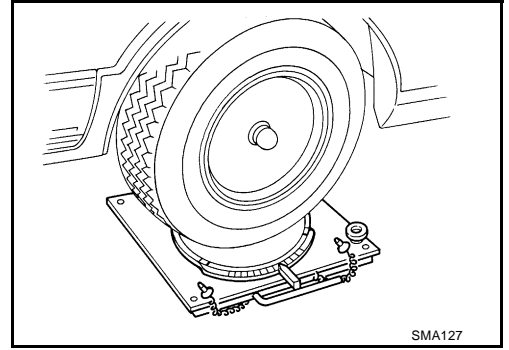
- If rack sliding force is not within specification, overhaul steering gear assembly.



STEERING WHEEL

FRONT WHEEL TURNING ANGLE

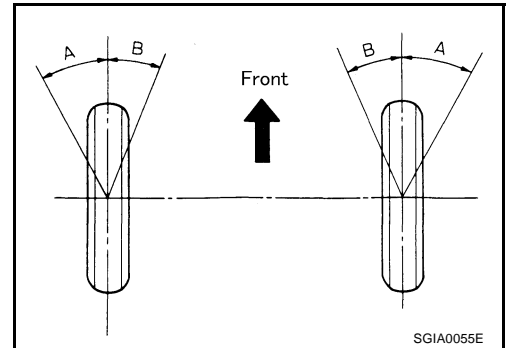
Check front wheel turning angle after toe-in inspection, Place the front wheels on turning radius gauges and rear wheels on stands so that vehicle can be level. Check maximum inner and outer wheel turning angles for LH and RH road wheels.



- Start engine. With engine at idle, rotate steering wheel all the way right and left; measure turning angle.

Turning angle of full turns:

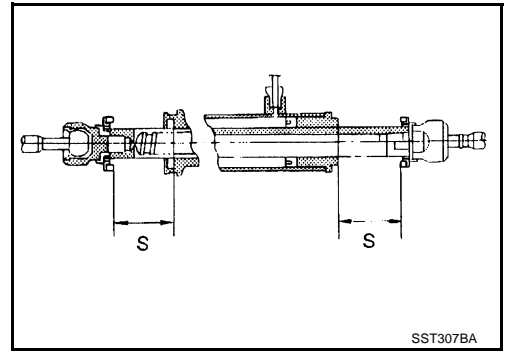
Inner wheel (Angle: A)	Minimum	: 41°45''(41.74°)
	Nominal	: 42°45'(42.75°)
	Maximum	: 45°45'(45.75°)
Outer wheel (Angle: B)	Nominal	: 33°50'(33.83°)



- If it is not within specification, measure the rack stroke.

Rack stroke : 68.5 mm (2.697 in)

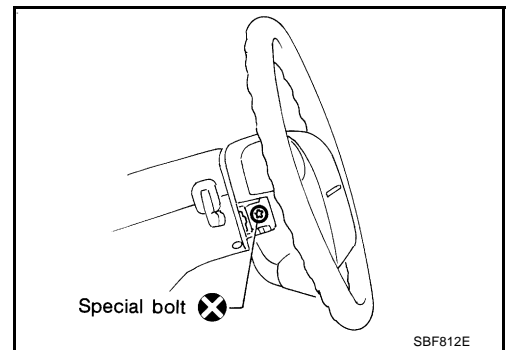
- If the rack stroke is outside of specification, disassemble steering gear to check rack stroke.
- Turning angles are not adjustable. If any of steering angles is not within specification, check following components for wear or damage.
 - Steering gear
 - Steering column
 - Front suspension components



Removal and Installation

REMOVAL

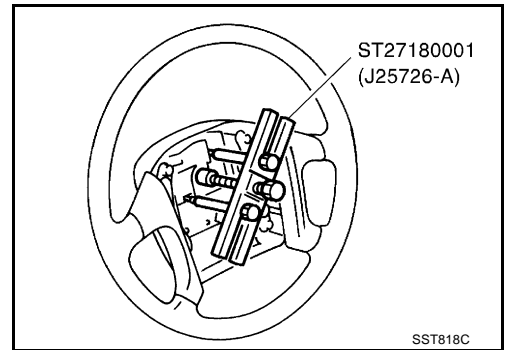
1. Remove air bag module. Refer to [SRS-34, "DRIVER AIR BAG MODULE"](#).
2. Remove horn connector.
3. Remove steering wheel mounting nut paint mating marks on the top of column shaft steering wheel.



EGS00070

STEERING WHEEL

4. Remove steering wheel with tool.



INSTALLATION

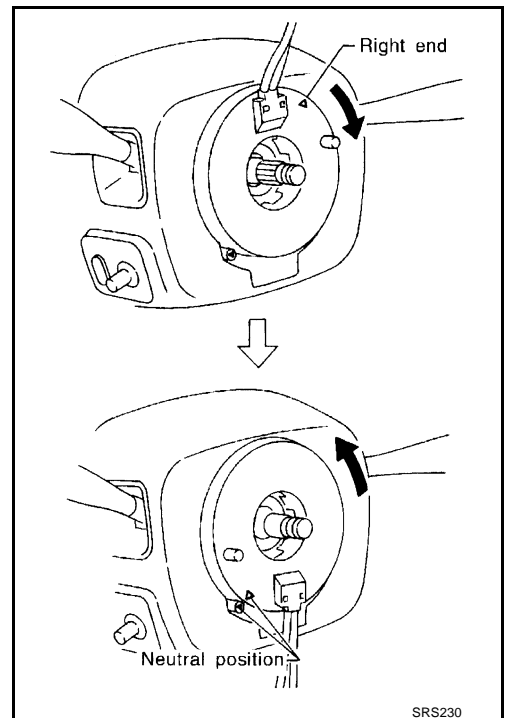
Paying attention to the following items, install in reverse order of removal.

- Align spiral cable correctly when installing steering wheel.
 - a. Set the front wheels in the straight-ahead position.
 - b. Make sure that spiral cable is in neutral position.

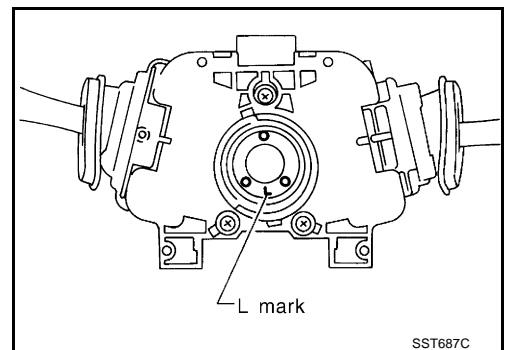
The neutral position is detected by turning left about 2.5 or 3.5 revolutions from right end position. Align the two marks (▲▽).

(The spiral cable can be turned up to about 2.5 or 3.5 turns from neutral position to both right and left. The number of turns depends on spiral cable type. Always confirm the number indicated on the caution label attached to spiral cable before starting work.)

- Always work from side of air bag module.



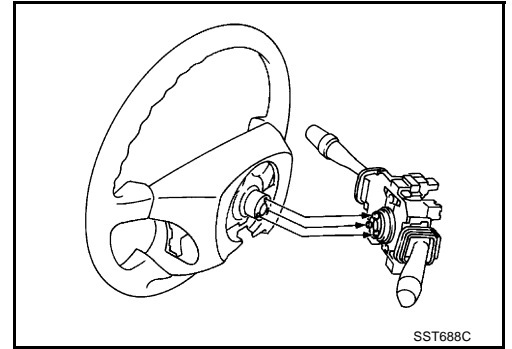
Place combination switch assembly with the L-mark side facing down.



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

STEERING WHEEL

Align the protruding portions of combination switch assembly with their corresponding holes in steering wheel, then install steering wheel. Refer to figure at right.



STEERING COLUMN

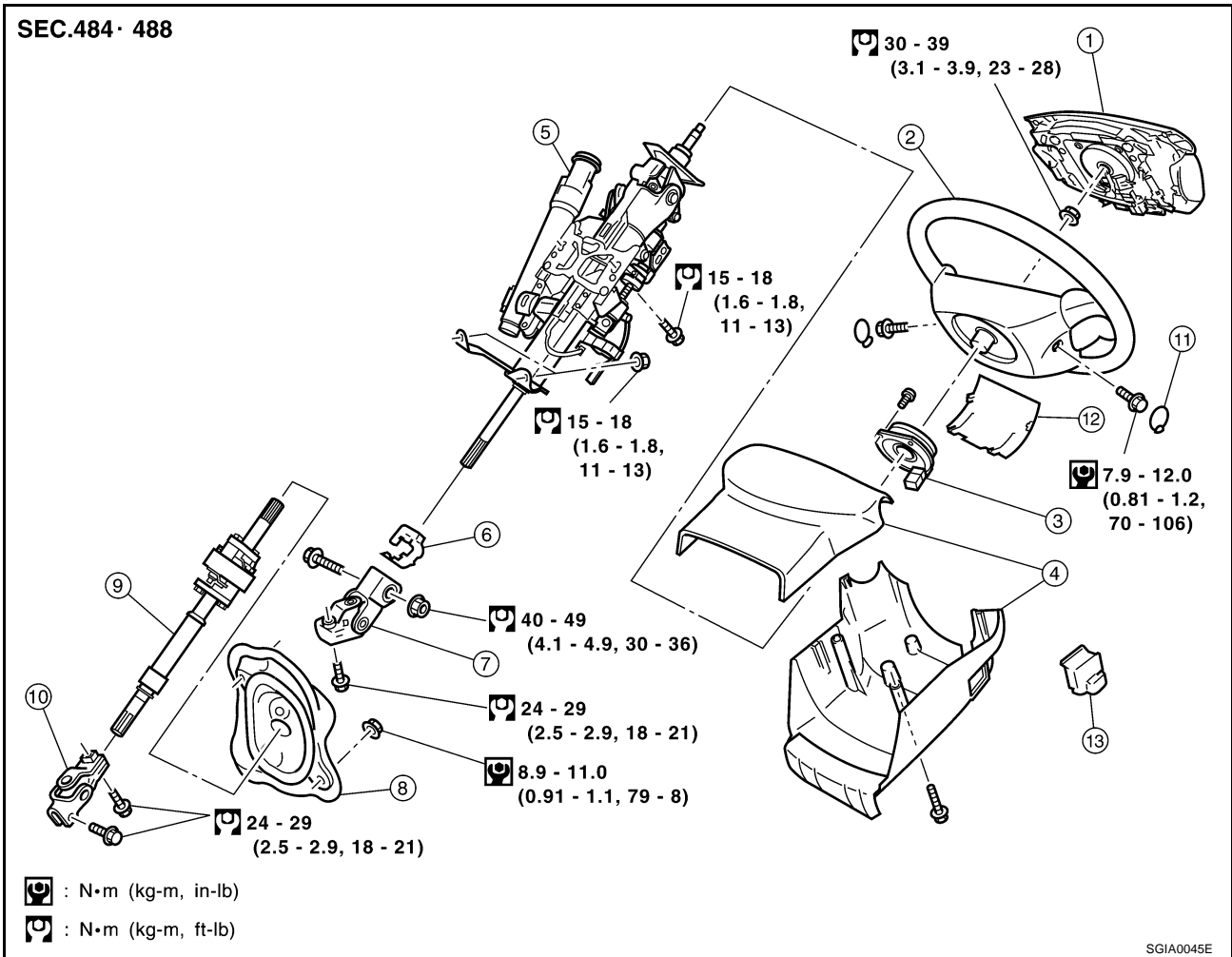
PFP:48810

STEERING COLUMN

Removal and Installation

EGS00071

SEC.484· 488



- | | | |
|-------------------|-----------------------------|---------------------------|
| 1. Air bag module | 2. Steering wheel | 3. Spiral cable |
| 4. Column cover | 5. Steering column assembly | 6. Steering column collar |
| 7. Upper joint | 8. Hole cover | 9. Lower shaft |
| 10. Lower joint | | |

CAUTION:

Care must be taken not to give axial impact to steering column assembly during removal and installation.

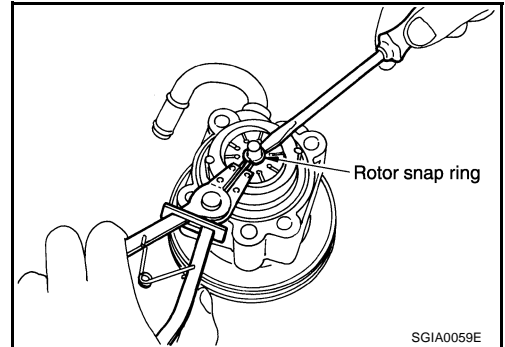
REMOVAL OF LOWER SHAFT AND HALL COVER

1. Raise vehicle with front wheels in the straight-ahead position.
2. Remove pinch bolt at lower-side of lower joint.
3. Loosen pinch bolt at lower shaft-side of upper joint.
4. Remove clip, mounting bolts, and nuts at steering column-side of upper joint.
5. Remove hall cover mounting nuts, and remove upper joint, lower joint, lower shaft, and hall cover from vehicle.
6. Remove pinch bolt, and remove lower joint from lower shaft.
7. Remove pinch bolt, and remove upper joint from lower shaft.
8. Remove lower shaft from hall cover.

STEERING COLUMN

INSTALLATION OF LOWER JOINT AND HALL COVER

- Install in the reverse order of removal.
- Install lower joint to power steering gear in the following procedure.
 1. Align the projection on rear cover cap with the groove A on sub-gear assembly.
 2. Lock steering wheel by turning steering wheel clockwise by 60° from neutral position.
Do not align lower-side slit on lower joint to projection on rear cover cap.
 3. Install lower joint to power steering gear.
 4. Unlock steering wheel, and turning steering wheel to neutral position. Check that projection on rear cover cap and the groove A on sub-gear assembly are positioned as shown in the figure.



REMOVAL OF STEERING COLUMN

CAUTION:

When removing and installing steering column assembly, avoid impact to axial direction.

1. Remove steering wheel. Refer to [PS-8, "REMOVAL"](#) .
2. Remove column cover, steering lock escutcheon, and driver-side lower instrument panel.
3. Remove spiral cable. Refer to [SRS-37, "Removal and Installation"](#) .
4. Loosen pinch bolt at lower shaft-side of upper joint.
5. Remove clip, mounting bolts and nuts at steering column-side of upper joint. Then remove upper joint from steering column assembly.
6. Remove clamps and disconnect connectors.
7. Remove steering column assembly from vehicle.

INSTALLATION OF STEERING COLUMN

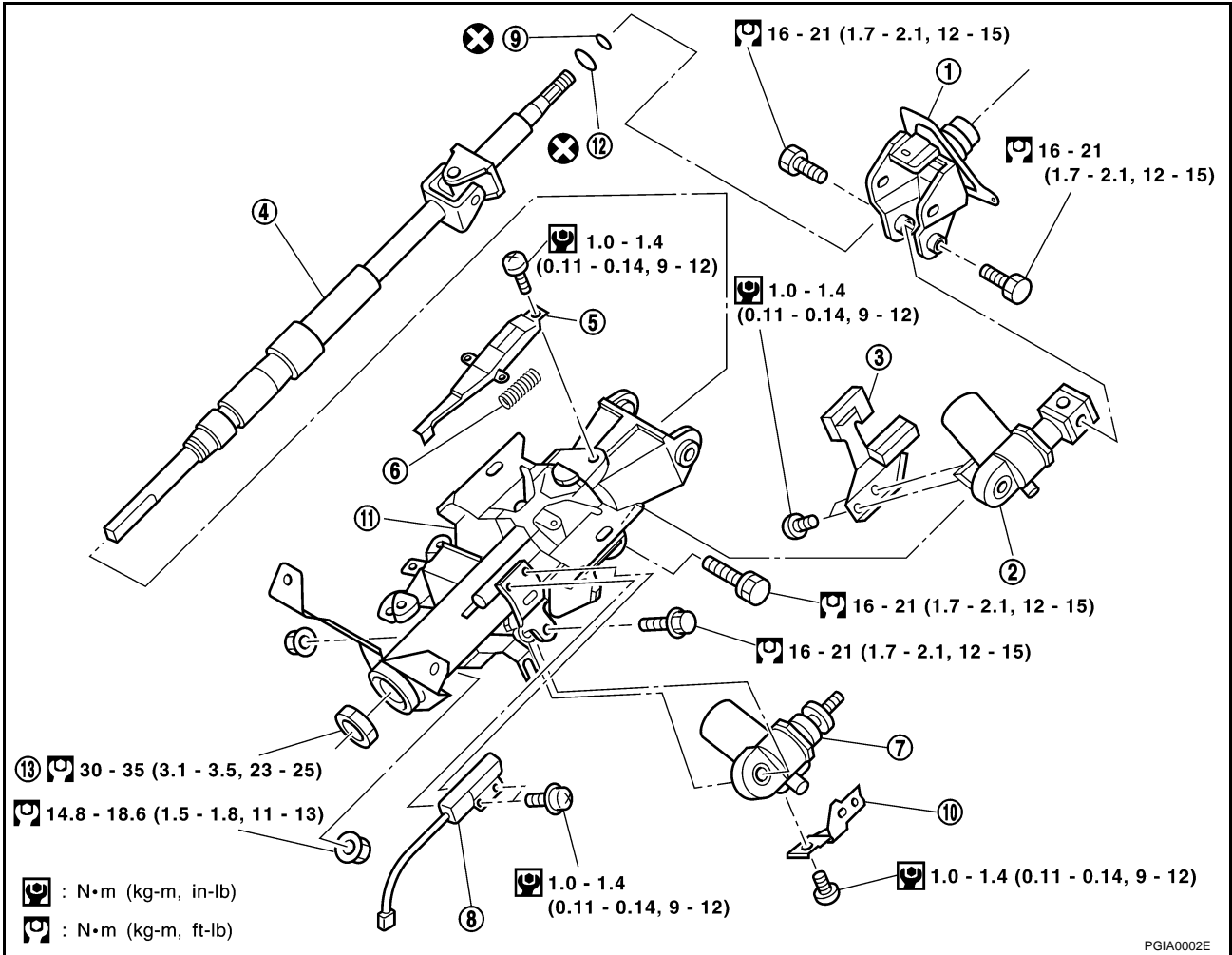
- Install in the reverse order of removal with steering lock unlocked.
- After installation, turn steering wheel and check for distortion, binding, noise, and excessive steering effort.

STEERING COLUMN

EGS00072

Disassembly and Assembly DISASSEMBLY

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

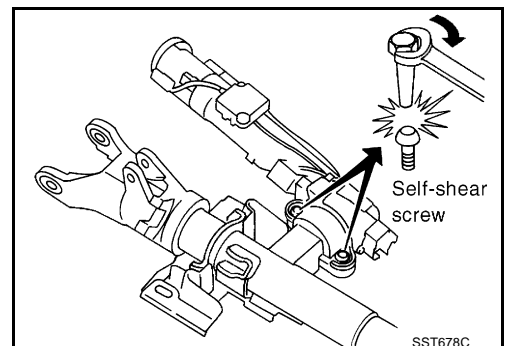


- | | | |
|--------------------------------|----------------------|----------------|
| 1. Upper jacket tube | 2. Tilt motor | 3. Tilt sensor |
| 4. Steering column upper shaft | 5. Tilt lever | 6. Spring |
| 7. Telescopic motor | 8. Telescopic sensor | |

- Remove combination switch from upper jacket tube.
- Remove tilt motor and sensor from jacket tube assembly.
- Remove telescopic motor and sensor from jacket tube assembly.
- Remove snap ring from steering column upper shaft.
- Remove upper jacket tube.
- Remove mounting nuts, and remove steering column upper shaft from jacket tube assembly.

Steering Lock

- Break self-shear type screws with a drill or other appropriate tool.
- Install new self-shear type screws and then cut off self-shear type screw heads.



STEERING COLUMN

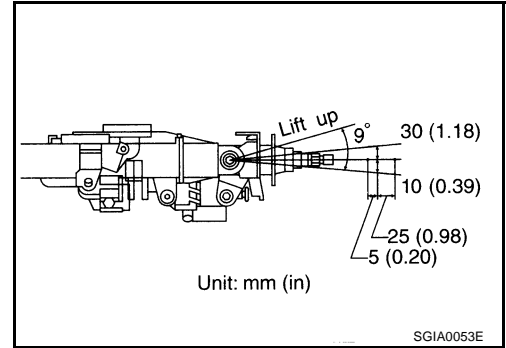
ASSEMBLY

- Refer to component parts diagram for tightening torque and reverse disassembly procedure for assembly.

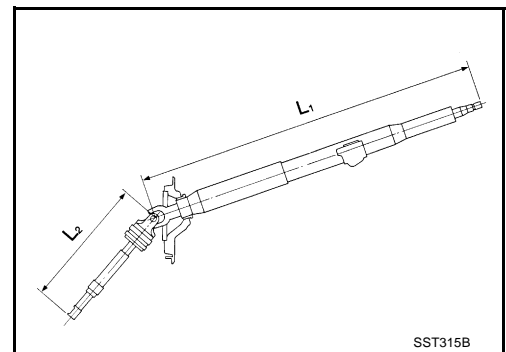
Inspection

- After installing steering column, check tilt mechanism operation.

EGS00086



- When steering wheel does not turn smoothly, check steering column as follows and replace damaged parts.
 1. Check column bearings for damage or unevenness. Lubricate with recommended multi-purpose grease or replace steering column as an assembly, if necessary.
 2. Check steering column lower shaft for deformation or breakage. Replace if necessary.
- When the vehicle is involved in a light collision, check steering column length "L1" and steering column lower shaft length "L2". If it is not within specifications, replace steering column as an assembly.



Steering column length "L1" : 638 - 668 mm (25.12 - 26.30 in)
Steering column lower shaft length "L2" : 379.8 mm (14.95 in)

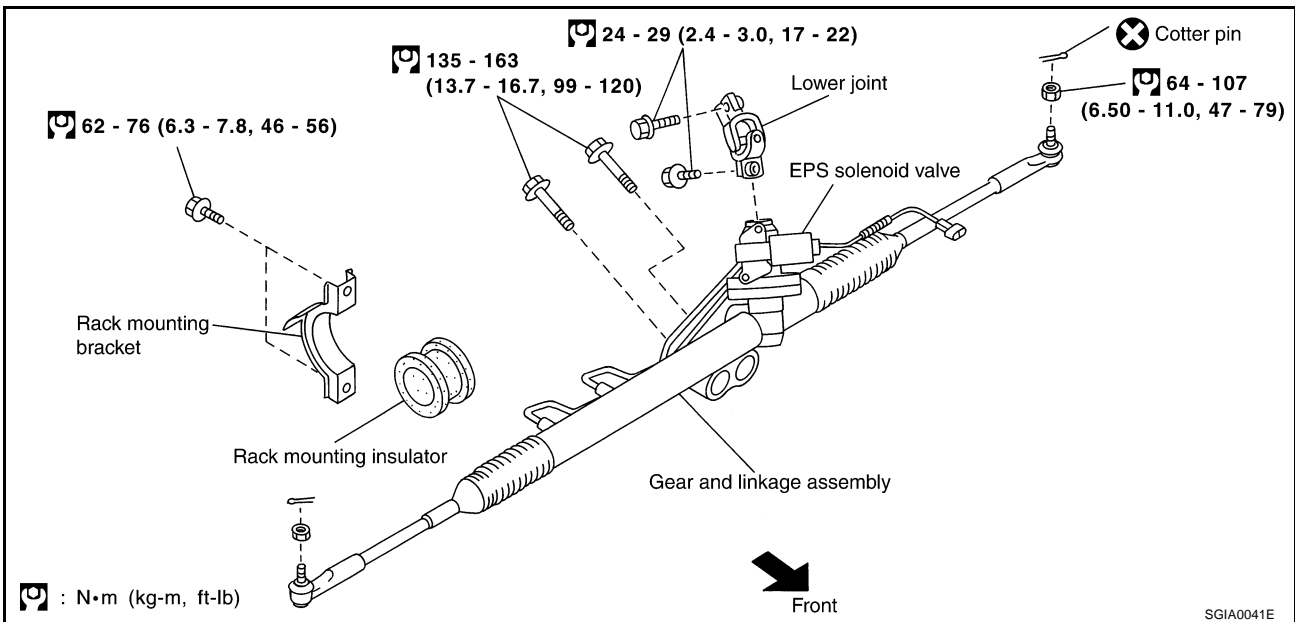
POWER STEERING GEAR AND LINKAGE

POWER STEERING GEAR AND LINKAGE

PFP:49001

Removal and Installation

EGS00073



REMOVAL

CAUTION:

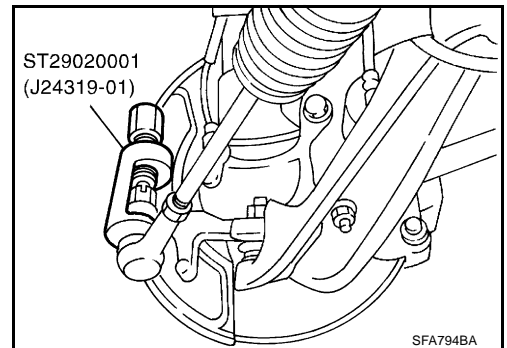
The rotation of spiral cable (SRS " Air bag " component part) is limited. If steering gear must be removed, set front wheels in the straight-ahead direction. Do not rotate steering column while steering gear is removed.

1. Remove under cover.
2. Remove and tires cotter pin and remove tie rod outer socket from knuckle arms with Tool.

CAUTION:


- Be careful not to damage tie rod ball joint dust boot.


3. Remove pinch bolt on lower side of lower joint.
4. Loosen pinch bolt on upper side of lower joint.
5. Remove high-pressure side and low-pressure side hydraulic pipes from power steering gear.
6. Remove gear and linkage assembly mounting bolts.
7. Remove rack mount bracket and rack mount insulator from vehicle.
8. Disconnect EPS solenoid valve connector.
9. Remove power steering gear from vehicle.

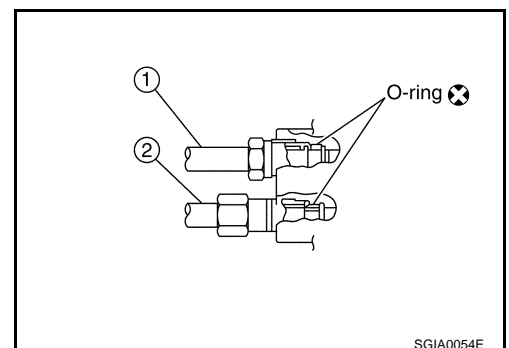


INSTALLATION

- Install in the reverse order of removal.
- Install pipe connector.

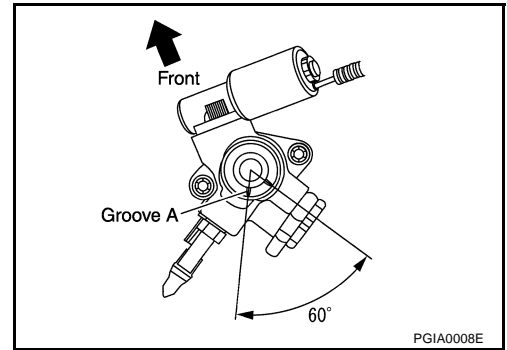
Lower-pressure side  : 27.5 - 39.2 N·m (2.8 - 3.9 kg-m, 21 - 28 ft-lb)

High-pressure side  : 14.8 - 24.5 N·m (1.5 - 2.4kg-m, 11 - 28 ft-lb)



POWER STEERING GEAR AND LINKAGE

- After installation, bleed system. Refer to [PS-6, "Bleeding Hydraulic System"](#) .
- Follow the procedure below to install lower joint to power steering gear:
 1. Set rear cover cap projection into slot A in the gear sub-assembly.
 2. Lock steering wheel by turning steering wheel clockwise by 60° from neutral position.
 3. Install lower joint to power steering gear while keeping position shown at steps 1 and 2. Keep slit in lower section of lower joint off rear cover cap projection.
 4. Unlock steering and set steering wheel in the neutral position.
 5. Check that rear cover cap projection is correctly positioned relative to slot A in the gear sub-assembly as shown in the illustration.



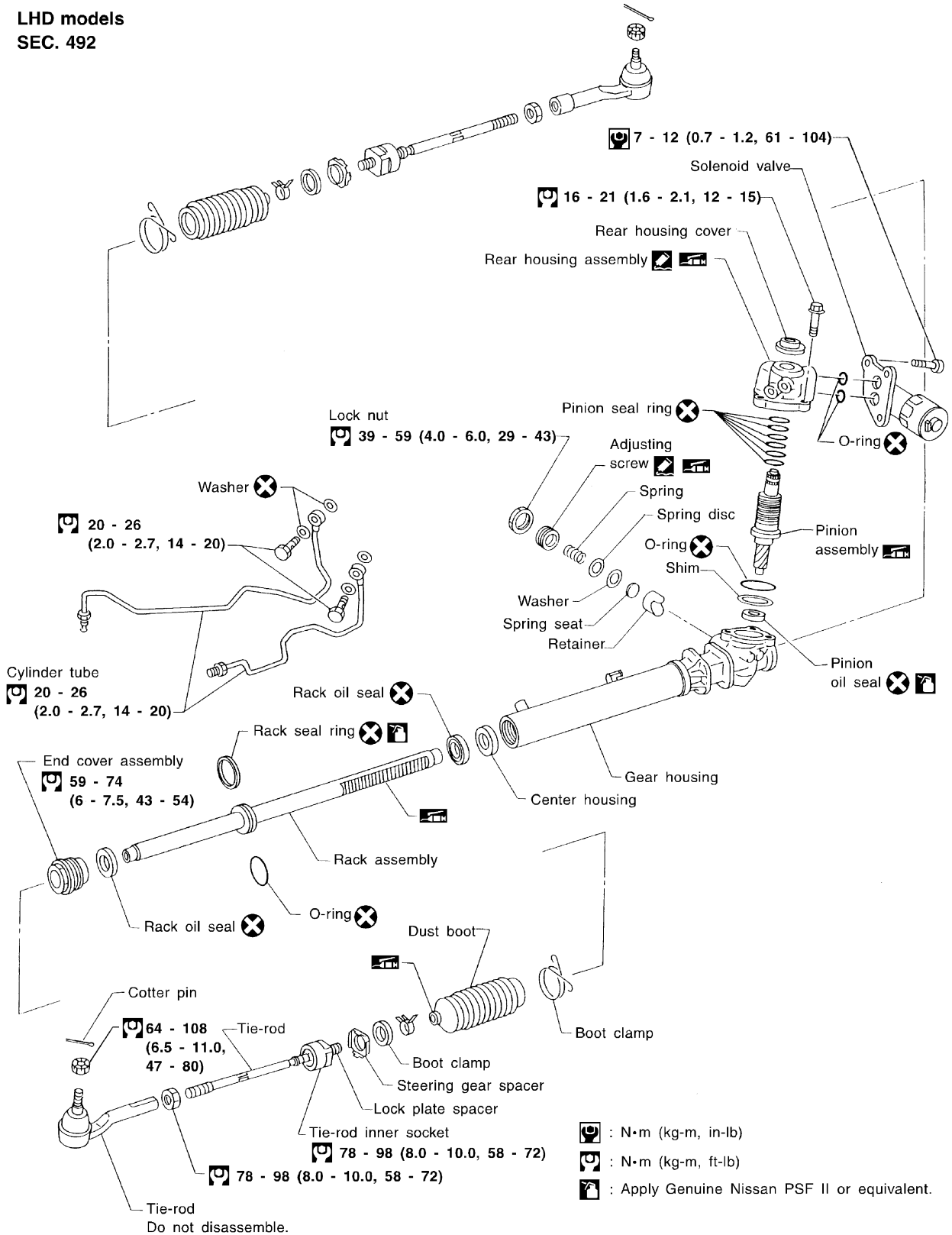
POWER STEERING GEAR AND LINKAGE

EGS00074

Component

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

LHD models
SEC. 492



SST682CB

POWER STEERING GEAR AND LINKAGE

EGS00075

Disassembly and Assembly DISASSEMBLY

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

1. Remove EPS solenoid valve assembly.

CAUTION:

Do not attempt to disassemble EPS solenoid valve.

2. Remove cylinder tube from gear housing assembly.
3. Remove rear cover cap from gear sub-assembly.
4. Remove adjusting screw and lock nut along with spring and retainer from gear housing assembly.
5. Remove gear sub-assembly from gear housing assembly.

CAUTION:

Do not attempt to disassemble gear sub-assembly.

6. Remove nuts, outer socket and boot.

CAUTION:

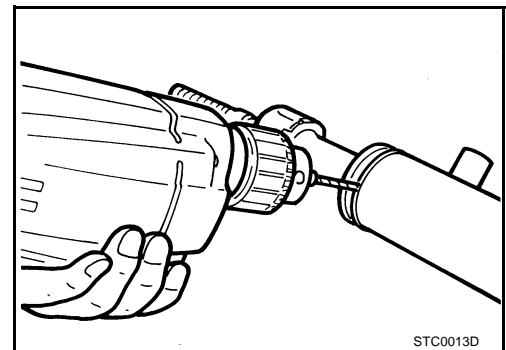
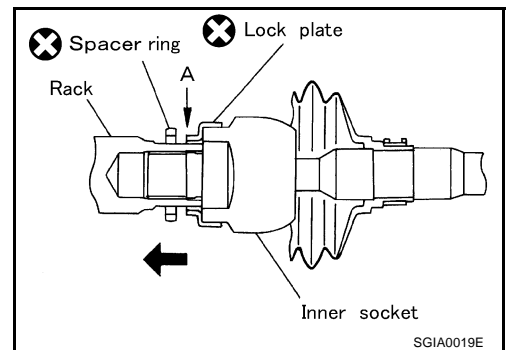
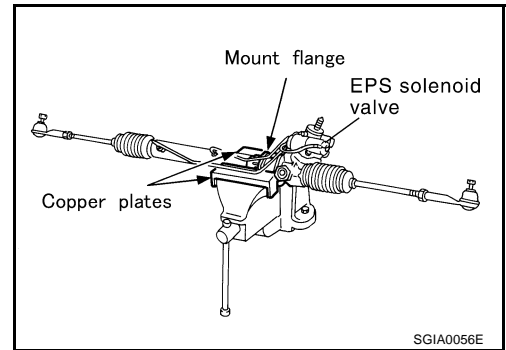
When removing boot, be careful not to scratch or damage inner socket or gear housing assembly. If any damage is found, replace inner socket and gear housing assembly. Otherwise, oil leaks may result.

7. Move spacer ring to rack and raise two crimped areas (at point A) of lock plate. Loosen and remove inner socket from rack.

CAUTION:

When removing lock plate from rack, be careful not to damage the rack surface. If it is damaged, replace rack. Otherwise, oil leaks may result.

8. Remove lock plate and spacer ring from rack.
9. Use a 3-mm drill bit to remove punch-crimped area on end cover assembly installation side of gear housing assembly. Scoop out the area approximately 1.5 mm deep.



10. Using a 42 mm (1.65 in) open head wrench, remove end cover assembly.
11. Remove rack and rack oil seal (outer) from gear housing assembly.

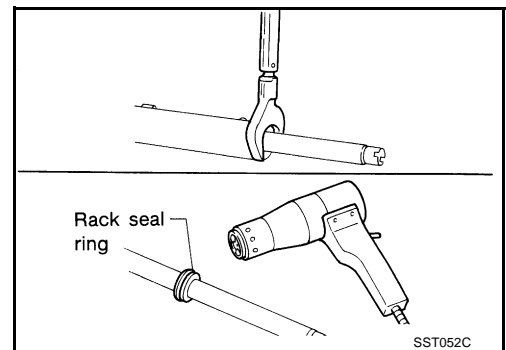
CAUTION:

Be careful not to damage inner surface of gear housing assembly and rack. If any damage is given, replace gear housing assembly and rack. Otherwise, oil leaks may result.

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

CAUTION:

Be careful not to damage rack. If it is damaged, replace rack. Otherwise, oil leaks may result.



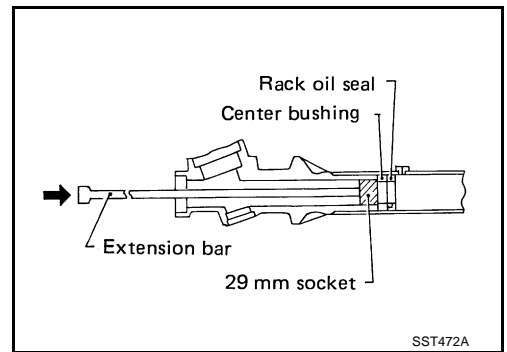
POWER STEERING GEAR AND LINKAGE

13. Push the inside of center bushing with a brass bar to remove center bushing and rack oil seal (inner) from gear housing assembly.

CAUTION:

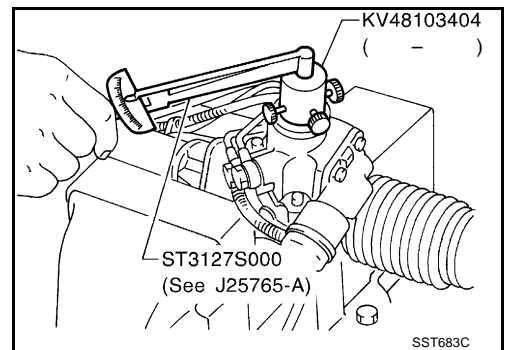
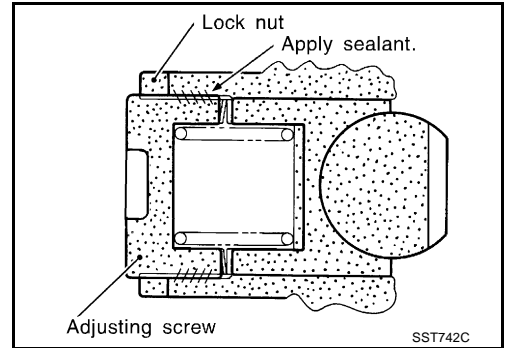
Be careful not to damage the inside of gear housing assembly. If it is damaged, replace gear housing assembly. Otherwise, oil leaks may result.

INSPECTION AFTER DISASSEMBLY



PINION ROTATING TORQUE ADJUSTMENT

1. Set gears in the neutral position with out fluid in gear.
2. Cost adjusting screw with locking sealant and screw it in.
3. Lightly tighten lock nut.
4. Tighten adjusting screw to a torque of 5.0 to 5.8 N·m (0.5 to 0.6 kg·m, 45 to 51 in·lb).
5. Move rack over its entire stroke ten times.
6. Measure pinion rotating torque within the range of 180 degrees from neutral position, using Tools. Stop gear at the point of maximum torque.
7. Loosen adjusting screw and retighten it to 5.0 to 5.8 N·m (0.5 to 0.6 kg·m, 45 to 51 in·lb). Then, loosen adjusting screw 60 to 80 degrees.



INSPECTION AFTER DISASSEMBLY

Boot

Check condition of boot. If it is torn or deformed, replace boot.

Rack

Check rack for wear or damage. Replace if necessary.

Gear Sub-Assembly

- Check pinion gear for damage or wear. Replace gear sub-assembly, if necessary.
- Check bearing while rotating it. If bearing ball lace is dented, worn out, or damaged, replace gear sub-assembly.

Gear Housing Cylinder

Check gear housing cylinder for damage or internal scratch. Replace gear housing assembly.

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

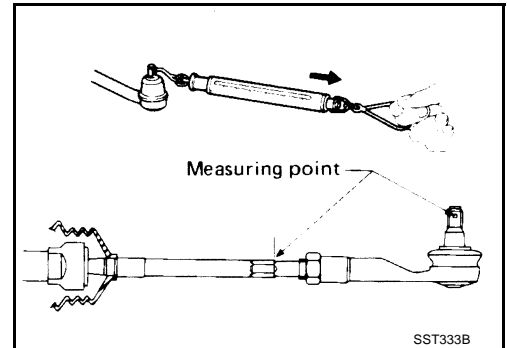
POWER STEERING GEAR AND LINKAGE

Tie Rod Inner And Outer Sockets

- Check ball joint for swinging force.

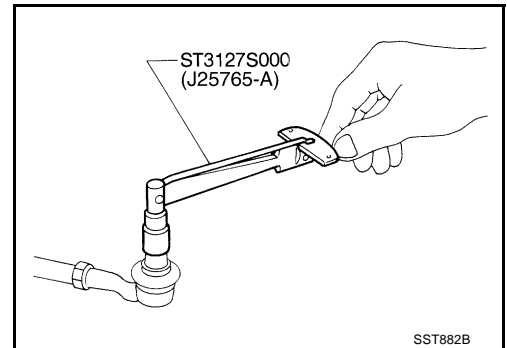
Hook a spring balance at the point shown in the figure. Confirm that reading observed when ball stud and inner socket start moving is within the specification. If reading is outside the specification, replace socket.

	Outer socket	Inner socket
Swinging force	4.81 - 45.7 N (0.49 - 4.67 kg, 1.08 - 10.32 lb)	8.9 - 64 N·m (0.91 - 6.5 kg·m, 79 - 655 in·lb) (point indicated by arrow)



- Check ball joint for rotating torque.
- Using Tool, confirm that reading is within the specification shown below. If it is outside the specification, replace socket.

Outer socket	
Rotating torque	: 0.30 - 2.90 N·m (0.03 - 0.29 kg·m, 3 - 25 in·lb)



- Check ball joint for axial end play.
- Apply pressure of 490 N (50 kg, 110 lb) to ball stud axially and measure distance that stud travels. If the reading is outside the specification shown below, replace socket.

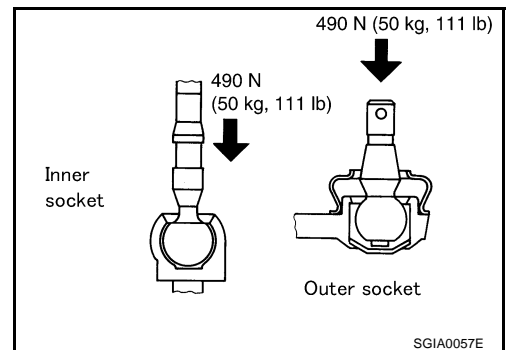
Outer socket : 0.5 mm (0.02 in) or less

Inner socket : 0.2 mm (0.008 in) or less

- Check condition of dust cover. If cracked excessively, replace socket.

Cylinder tubes

Check cylinder tubes for scratches or other damage. Replace if necessary.



ASSEMBLY

1. Install O-ring.

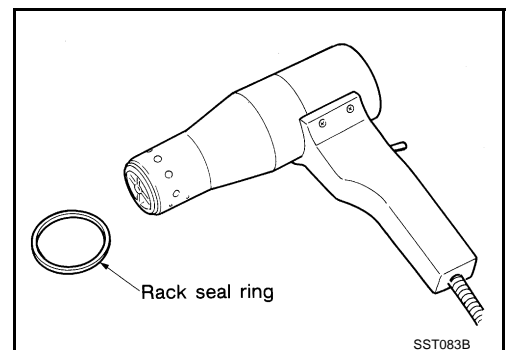
CAUTION:

Always use a new O-ring.

2. Heat a new rack Teflon ring to 40°C (104°F) with a heat gun.

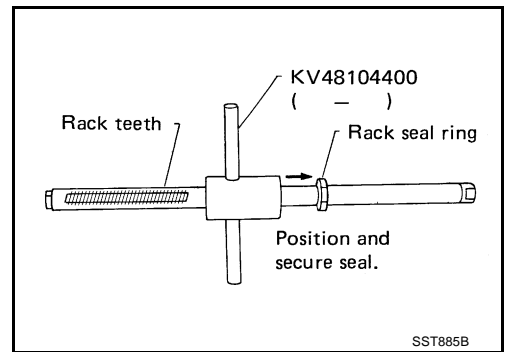
CAUTION:

Always use a new rack Teflon ring.



POWER STEERING GEAR AND LINKAGE

3. Using tool, compress rack Teflon ring securely on rack.
Bold→Always insert tool from rack gear side.

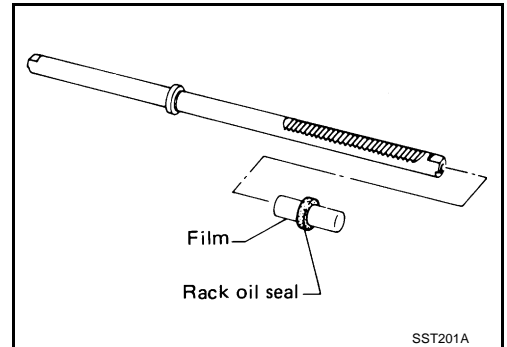


4. Remove rack oil seal.

CAUTION:

Do not use old rack oil seal is not reusable. Always use a new rack oil seal.

- a. To prevent inner rack oil seal from being damaged, wrap a place plastic film around the rack teeth surface and place the oil seal around sheet. Pull the sheet with oil seal around it until the seal passes the rack teeth surface.



- b. Install center bushing to rack. Be careful not to damage the inside of gear housing assembly with rack. If damaged, replace gear housing assembly. Otherwise, oil leaks may result.

CAUTION:

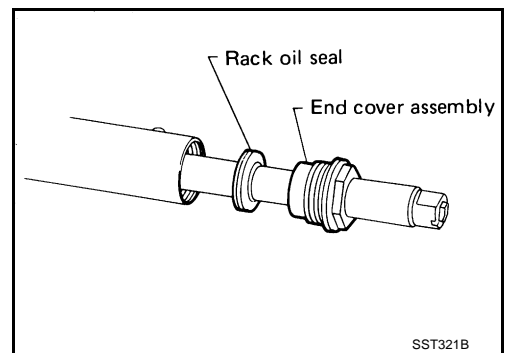
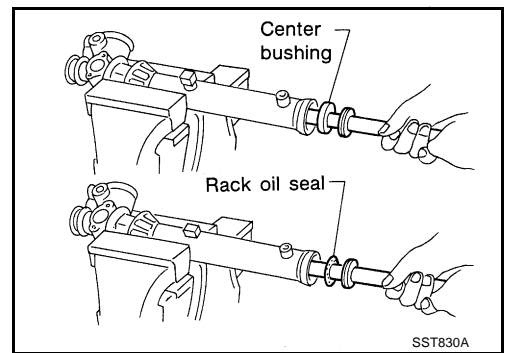
Be careful not to damage the inside of gear housing assembly with rack. If damaged, replace gear housing assembly. Otherwise, oil leaks may result.

- c. Insert rack oil seal (inner) into rack piston. Move rack in the gear housing assembly so that rack oil seal (inner) can be pressed against center bushing.

CAUTION:

Be careful not to damage the inside of gear housing assembly with rack. If damaged, replace gear housing assembly. Otherwise, oil leaks may result.


- d. To prevent the rack oil seal (outer) from being damaged, wrap a place plastic film around the end of rack and place the oil seal around the sheet. Pull the sheet with oil seal around it until the oil seal passes the end of rack. Then, install rack oil seal in place with end cover assembly.



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

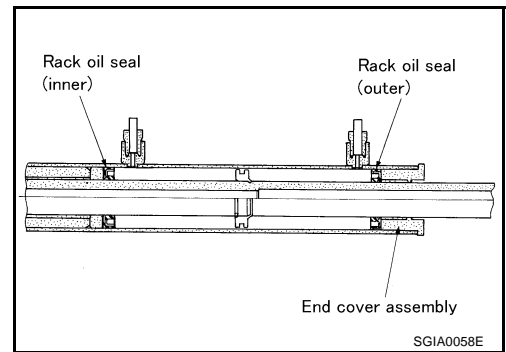
POWER STEERING GEAR AND LINKAGE

- e. The rack oil seal must be installed with the lips of inner and outer seals facing each other.
5. Using a 42 mm (1.65 in) open head (special service tool), tighten end cover assembly to specified torque.

 : 59 - 74 N·m (6.1 - 7.5 kg·m, 44 - 54 ft·lb)

CAUTION:

Do not damage the surface of rack. If damaged, replace rack assembly. Otherwise, oil leaks may result.



6. Tighten end cover assembly and then crimp cylinder at the point shown in the figure to prevent assembly from loosening.
7. Install shims and an O-ring to gear subassembly.
 - Whether or not gear subassembly is replaced, install as many shims as originally attached.

CAUTION:

Do not use old O-ring. Always use a new O-ring.

8. Install gear subassembly to gear housing assembly.
9. Install lock plate to rack.

CAUTION:

Do not use old lock plate. Always use a new lock plate.

- a. Attach a spacer ring to rack temporarily.

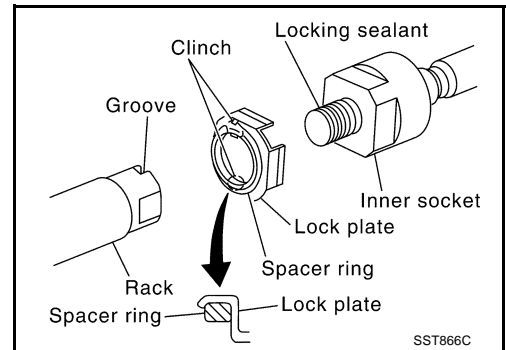
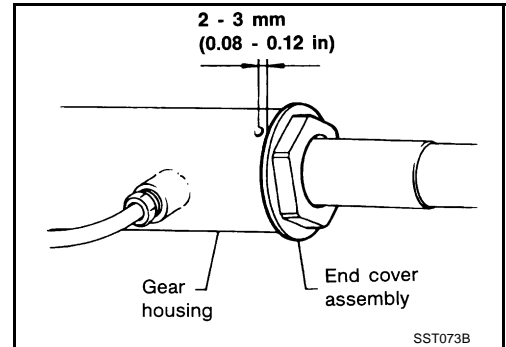
CAUTION:

Do not use old ring. Always use a new spacer ring.

- b. Install lock plate to inner socket.
- c. Apply a coat of locking sealant to the thread of inner socket, screw the socket into rack and then tighten to specified torque.
- d. Crimp lock plate at two slots in the rack.
- e. Install spacer ring to lock plate as shown in the figure.

CAUTION:

When installing spacer ring, be careful not to scratch ring.



POWER STEERING OIL PUMP

POWER STEERING OIL PUMP

PFP:49110

On-Vehicle Service

EGS00076

CHECKING HYDRAULIC SYSTEM

Before starting work, confirm belt tension is proper.

1. Raise vehicle. Connect oil pressure gauge (special service tool) and oil pressure gauge adapter (special service tool) between the oil pump discharge connector and high pressure hose and then bleed hydraulic circuit.
2. Start engine. Allow engine to run until tank temperature reaches 60 - 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 power steering pump increases to maximum. This will raise fluid temperature abnormally.

3. With engine idling, close oil pressure gauge valve (special service tool) and read the relief oil pressure.

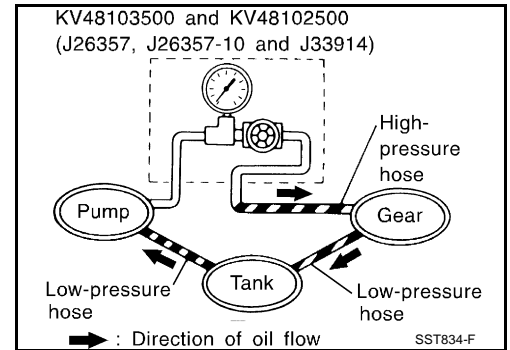
Relief pressure specification : 8,630 - 9,219 kPa (88 - 94 kg/cm² , 1,251 - 1,337 psi)

4. After measurement, open valve slowly.

CAUTION:

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

- If relief pressure is outside specification, disassemble and service oil pump. Refer to [PS-24, "Disassembly and Assembly"](#) .
5. After inspection, remove oil pressure gauge (special service tool) and oil pressure gauge adapter (special service tool) from hydraulic circuit, add fluid and bleed hydraulic circuit thoroughly. Refer to [PS-6, "Bleeding Hydraulic System"](#) .



CHECKING AND ADJUSTING DRIVE BELTS (FOR POWER STEERING)

Refer to MA section, [EM-12, "Checking Drive Belts"](#) .

Removal and Installation

EGS00077

REMOVAL

1. Remove battery and radiator reservoir tank from vehicle.
2. Drain power steering fluid.
3. Loosen adjusting screw and bolts for oil pump attaching bracket and remove belt.
4. Remove oil pump union bolt and hose.
5. Remove oil pump bolts and oil pump attaching bracket.
6. Remove oil pump from vehicle.

INSTALLATION

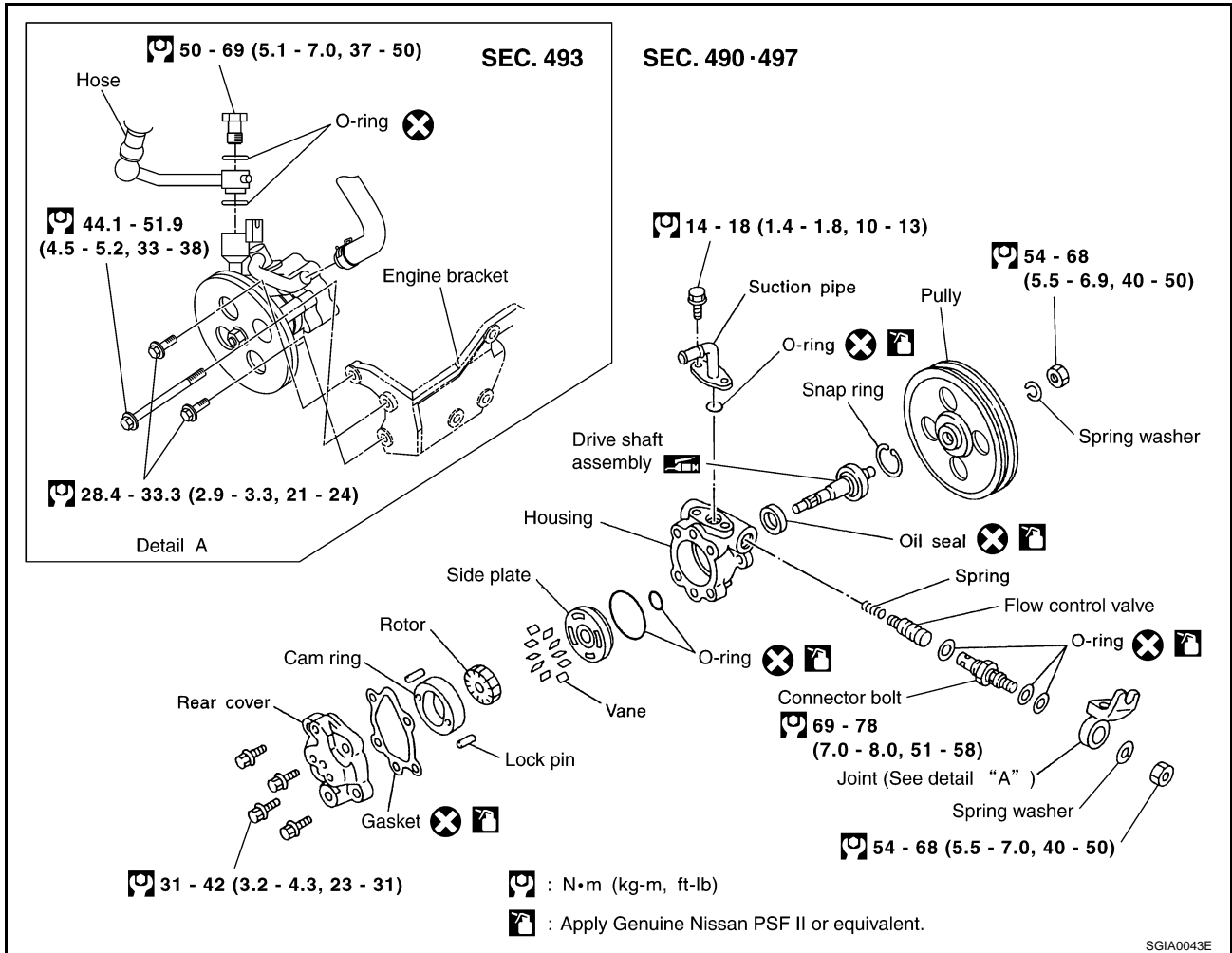
Paying attention to following items, install in reverse order of removal.

- After installation, adjust belt tension. Refer to [EM-12, "Tension Adjustment"](#) .
- After installation, bleed circuit. Refer to [PS-6, "Bleeding Hydraulic System"](#) .

POWER STEERING OIL PUMP

EGS00078

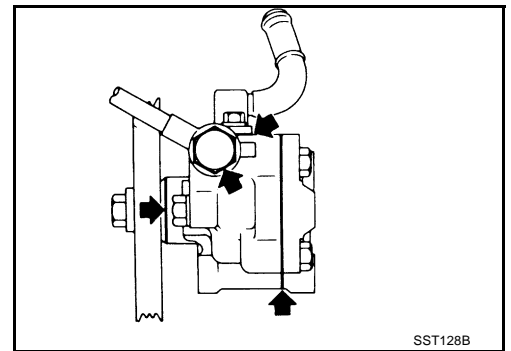
Disassembly and Assembly



PRE-DISASSEMBLY INSPECTION

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

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



DISASSEMBLY

1. Secure power steering pump in a vise.

CAUTION:

Be sure to place aluminum plates or something similar between surface of the steering pump and the vise to prevent scratches or damage to the pump surface.

2. Unscrew the two front bracket bolts and remove casing from front bracket.
3. Unscrew the four rear body bolts and remove casing from rear body.
4. Remove rear body seal from casing.
5. Remove side plate (rear side) from cartridge and remove side plate inner and outer seals from side plate (rear side).

POWER STEERING OIL PUMP

6. Remove rotor snap ring with snap ring pliers, and remove pulley from the casing.

CAUTION:

When removing rotor snap ring, be careful not to damage the pulley shaft.

7. Remove cartridge, rotor, vane, side plate (front), flow control A valve, flow control valve spring and flow control B valve assembly from the casing.

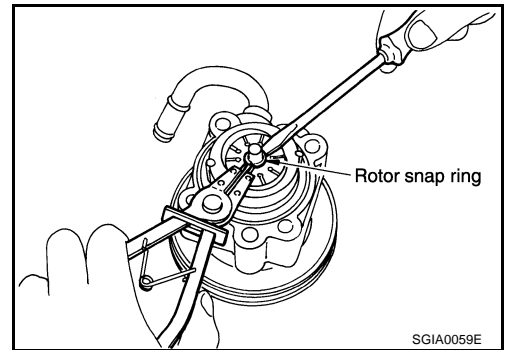
CAUTION:

Be careful not to drop and deform either the flow control A valve or flow control B valve assembly.

8. Remove inlet connector attaching bolt and remove inlet connector from the casing.
9. Remove inlet connector seal from inlet connector.
10. Using a screwdriver, remove drive shaft seal from the casing.

CAUTION:

Be careful not to damage casing surface with the screwdriver.



INSPECTION AFTER DISASSEMBLY

Casing And Rear Body Inspection

- Check casing and inside the rear body for damage. If rear body is found damaged, replace it. If casing is damaged, replace power steering pump assembly.

Cartridge Inspection

- Check cartridge for damage. If any damage is found, replace cartridge, rotor and vane as a unit.

Side Plate Inspection

- Check side plates (front and rear) for damage. If any damage is found, replace front and rear side plates as a unit.

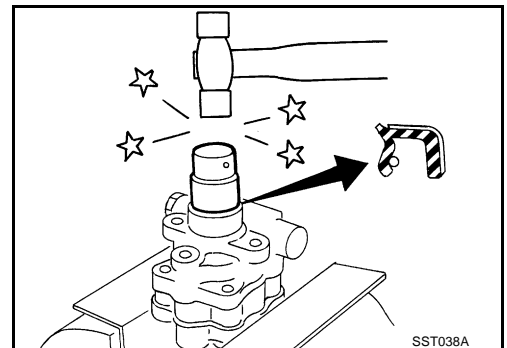
ASSEMBLY

1. Apply a coat of Multi-purpose grease to the drive shaft seal lip. Using a drift (special service tool), install drive shaft seal to the casing.

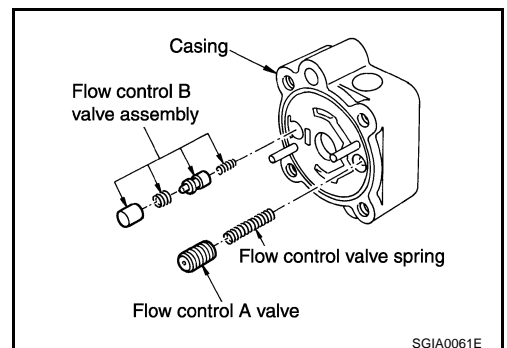
CAUTION:

Do not use old drive shaft. Always use a new drive shaft seal.

2. If the dowel pin has been removed, insert it into the casing by hand. If it cannot be inserted by hand, lightly tap with a hammer.



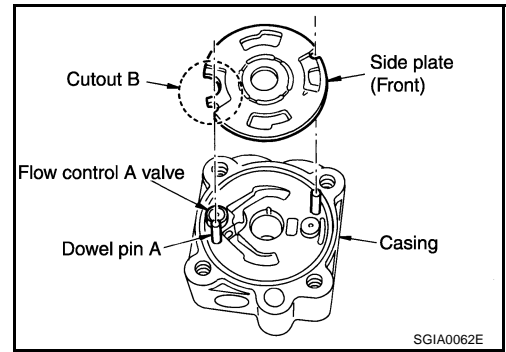
3. Install flow control A valve, flow control valve spring and flow control B valve assembly to locations shown in the figure.



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

POWER STEERING OIL PUMP

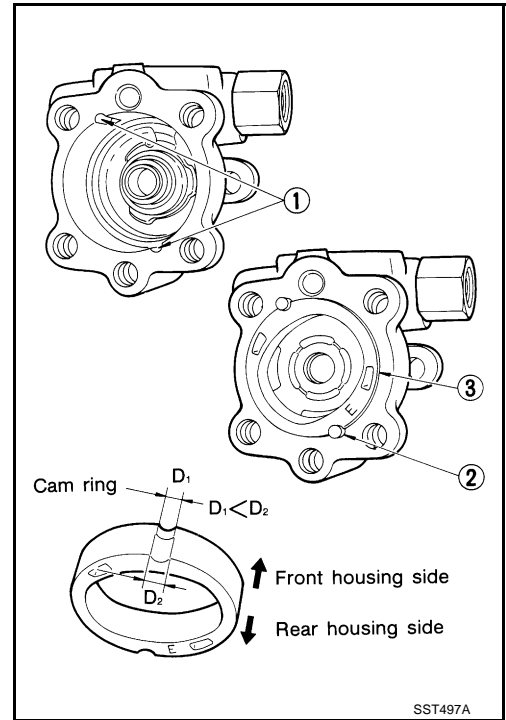
4. Match dowel pin A on flow control A valve, shown in the figure, with cutout B of the side plate (front) and then install side plate (front) to the casing.



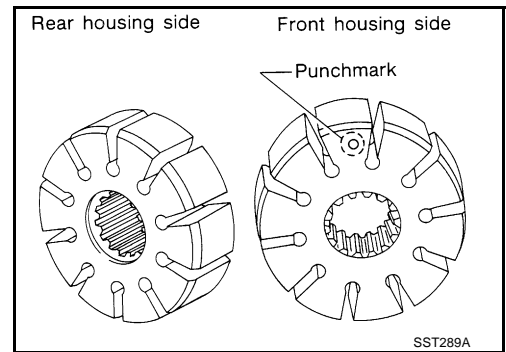
5. Install the cartridge on top of the side plate (front) with smaller slot in the cartridge facing the casing.
6. Install pulley to the casing.

CAUTION:

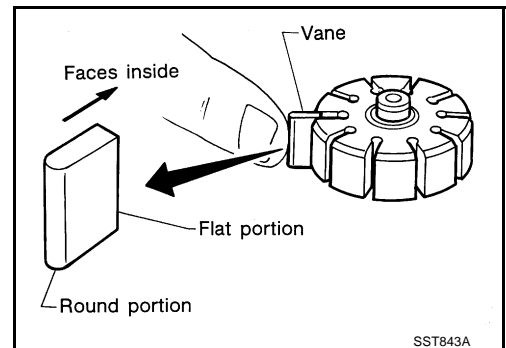
When installing pulley, be careful not to scratch the drive shaft seal.



7. Install rotor to the pulley shaft with punch mark on the rotor facing the casing.



8. Install vane to the rotor with arc of the vane in contact with the cartridge.

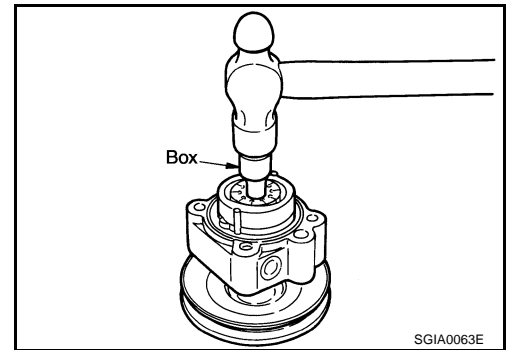


POWER STEERING OIL PUMP

9. Using a hammer and a 10-mm box, install rotor snap ring to the slot in the pulley shaft.

CAUTION:

- Do not use old snap ring. Always use a new rotor snap ring.
- Be careful not to damage rotor and pulley shaft.
- If rotor is damaged, replace power steering pump assembly.

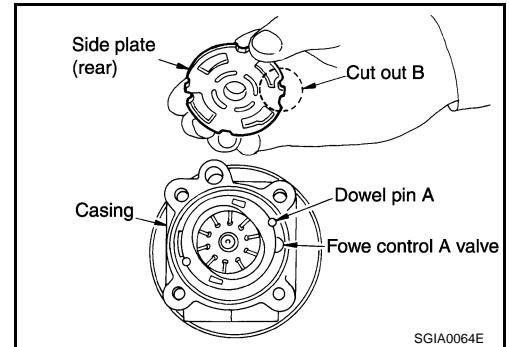


10. Match dowel pin A on flow control A valve, shown in the figure, with cutout B of the side plate (rear) and install side plate (rear) to the cartridge.

11. Apply a coat of Genuine Nissan PSF or equivalent to the new body seal and install it to the casing.

CAUTION:

Do not use old body seal. Always use a new body seal.



12. Apply a coat of Genuine Nissan PSF or equivalent to the new side plate inner and outer seals and install them to the side plate (rear).

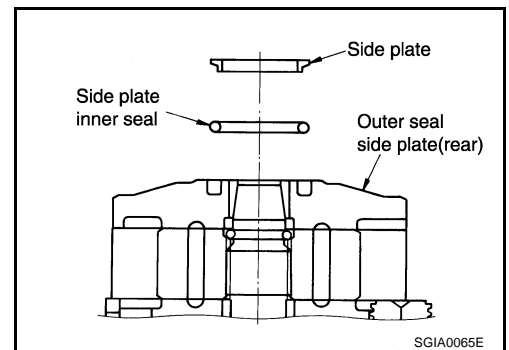
CAUTION:

Do not use old side plate inner and outer seals. Always use new side plate inner and outer seals.

13. Secure power steering pump in a vise.

CAUTION:

Be sure to place aluminum plates or something similar between surface of the steering pump and the vise to prevent scratches or damage to the pump surface.



14. Position rear body on the casing and tighten the four bolts, working diagonally, to specified torque.

15. Position front bracket to the casing and tighten the two bolts to specified torque.

16. Set inlet connector seal into the inlet connector slot and install inlet connector to the casing with the bolts.

CAUTION:

Do not use old inlet connector seal. Always use a new inlet connector.

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

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Steering Wheel

EGS0007A

Steering wheel axial end play:	0 mm (0 in)
Steering wheel free play	0 - 35 mm (0 - 1.38 in)

Steering Angle

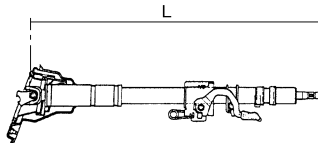
EGS0007B

Drive type	2WD	
1 Inner wheel Degree minute (Decimal degree)	Minimum	41°45' (41.75°)
	Nominal	42° 45' (42.75°)
	Maximum	45°45' (45.75°)
Outer wheel Degree mine (Decimal degree)	Nominal	33°50' (33.83°)

Steering Column

EGS0007C

Steering column length, Length "L"	642 - 644 mm (25.28 - 25.35 in)
	638±1 (Most contracted position of telescopic steering.) To
	668±1 (Most extended position of telescopic steering.)

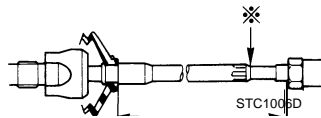


STC1136D

Steering Linkage

EGS0007D

Steering gear type		PR26AF
Tie rod ball joint outer socket	Oscillating torque	0.30 - 2.90 N·m (0.03 - 0.29 kg-m)
	Spring balance reading (Measuring point: stud bolt hole)	4.81 - 45.7 N (0.49 - 4.67 kg, 1.08 - 10.32 lb)
	Sliding torque	0.30 - 2.90 N·m (0.03 - 0.29 kg-m, 3 - 25 in-lb)
	Axial end play	0.5 mm (0.02 in) or less
Tie rod ball joint inner socket	Oscillating torque	1.0 - 7.8 N·m (0.1 - 0.8 kg-m, 9 - 69 in-lb)
	Measured value of spring scale (measuring point: mark)	8.9 - 64 N (0.91 - 6.5 kg, 79 - 566 in)
	Axial end play	0.2 mm (0.08 in) or less
Tie rod length, Length L		160.0 mm (6.30 in)



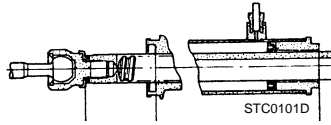
STC1006D

SERVICE DATA AND SPECIFICATIONS (SDS)

Steering Gear

EGS0007E

Steering gear model	PR26AF
Rack neutral position, dimension L	68.5 mm (2.697 in)



Retainer adjustment	Screw lock nut Tightening torque		40 - 58 N·m (4.0 - 6.0 kg-m, 29 -43 ft-lb)
	Primary tightening torque		4.9 N·m (0.5 kg-m, 4 in-lb)
	Re-tightening torque after tightening		4.9 N·m (0.5 kg-m, 4 in-lb)
	Loosen Adjusting screws.		60 - 80°
Rack sliding torque:	Range within ± 11.5 mm from neutral position ((at power ON)	Area average value	245.2 - 294.2 N (25 - 30 kg, 55 -66 lb)
		Allowable variation	58 N (6.0 kg, 13 lb) or less
	Whole area (at power OFF)	Peak value	294 N (30.0 kg, 66 lb) or less
		Allowable variation	147 N (15.0 kg, 33 lb) or less

Oil Pump

EGS0007F

Oil pump relief hydraulic pressure	8,630 - 9,219 kPa (88 -94 kg/cm ² , 1,251 - 1,337 psi)
------------------------------------	---

Steering Fluid

EGS0007G

Fluid capacity	approx. 1.0 ℓ (1-1/8 us qt, 7/8 Imp qt)
----------------	---

SERVICE DATA AND SPECIFICATIONS (SDS)
