

STEERING SYSTEM

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PRECAUTIONS

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

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

NGST0001

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger in certain types of collisions. The Supplemental Restraint System consists of a driver air bag module (located in the center of the steering wheel), a front passenger air bag module (located on the instrument panel on the passenger side), seat belt pre-tensioners, a diagnosis sensor unit, a crash zone sensor (4WD models), a warning lamp, wiring harness and spiral cable.

Information necessary to service the system safely is included in the **RS section** of this Service Manual.

- **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 should be performed by an authorized NISSAN 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, refer to *RS-16*.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. Spiral cable and wiring harnesses (except "SEAT BELT PRE-TENSIONER") covered with yellow insulation, either just before the harness connectors or on the complete harness, are related to the SRS.**

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 power steering fluid* 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.**

*: Genuine Nissan PSF II or equivalent. Refer to *MA-14*, "Fluids and Lubricants", "RECOMMENDED FLUIDS AND LUBRICANTS".

PREPARATION

Special Service Tools

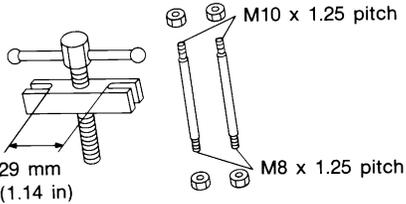
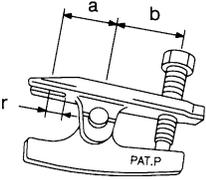
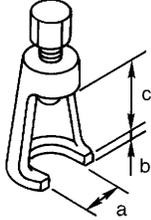
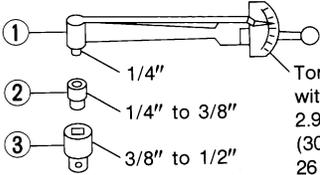
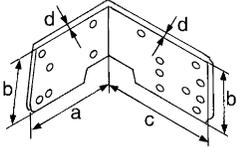
Special Service Tools

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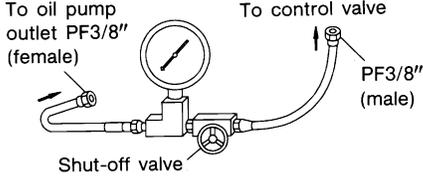
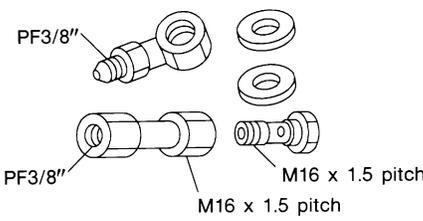
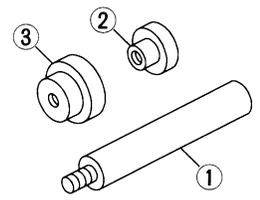
POWER STEERING

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

Tool number (Kent-Moore No.) Tool name	Description	
ST27180001 (J25726-A) Steering wheel puller	 <p>M10 x 1.25 pitch M8 x 1.25 pitch 29 mm (1.14 in)</p> <p>NT544</p>	Removing steering wheel MA EM LC EC
HT72520000 (J25730-B) Ball joint remover	 <p>a b r PAT.P</p> <p>NT546</p>	Removing ball joint and swivel joint a: 33 mm (1.30 in) b: 50 mm (1.97 in) r: R11.5 mm (0.453 in) FE CL MT
ST29020001 (J24319-01) Steering gear arm puller	 <p>a b c</p> <p>NT694</p>	Removing pitman arm a: 34 mm (1.34 in) b: 6.5 mm (0.256 in) c: 61.5 mm (2.421 in) AT TF PD
KV48100700 (J26364) Torque adapter	 <p>NT169</p>	Adjusting worm bearing preload AX SU
ST3127S000 (see J25765-A) 1: GG91030000 (J25765-A) Torque wrench 2: HT62940000 () Socket adapter 3: HT62900000 () Socket adapter	 <p>① 1/4" ② 1/4" to 3/8" ③ 3/8" to 1/2"</p> <p>Torque wrench with range of 2.9 N·m (30 kg-cm, 26 in-lb)</p> <p>NT541</p>	Measuring turning torque BR ST RS BT
KV48100301 () Strut & steering gearbox attachment	 <p>a b c d</p> <p>NT688</p>	Steering gear installation. a: 162 mm (6.38 in) b: 110 mm (4.33 in) c: 190 mm (7.48 in) d: 9 mm (0.35 in) HA SC EL

PREPARATION

Special Service Tools (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description	
KV48103500 (J26357 or J26357-10) Pressure gauge	 <p> To oil pump outlet PF3/8" (female) To control valve PF3/8" (male) Shut-off valve </p> <p>NT547</p>	Measuring oil pressure
KV48102500 (—) Pressure gauge adapter	 <p> PF3/8" PF3/8" M16 x 1.5 pitch M16 x 1.5 pitch </p> <p>NT542</p>	Measuring oil pressure (Use with KV48103500)
KV481009S0 (—) Oil seal drift set 1: KV48100910 (—) Drift 2: KV48100920 (J26367) Adapter 3: KV48100930 (J26367) Adapter	 <p>NT174</p>	Installing oil seal

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

NVH Troubleshooting Chart

NGST0004S01

Symptom	STEERING	SUSPECTED PARTS (Possible cause)																					
		Fluid level	Air in hydraulic system	Tie rod ball joint swinging force	Tie rod ball joint rotating torque	Tie rod ball joint end play	Steering gear fluid leakage	Steering wheel play	Steering gear turning force	Drive belt looseness	Improper steering wheel	Improper installation or looseness of tilt lock lever	Steering column deformation or damage	Improper installation or looseness of steering column	Steering linkage looseness	PROPELLER SHAFT	DIFFERENTIAL	DRIVE SHAFT	AXLE	SUSPENSION	TIRES	ROAD WHEEL	BRAKES
Reference page		ST-7	ST-8	ST-29	ST-29	ST-29	ST-8	ST-6	ST-8	MA-17, MA-26	—	ST-13	ST-13	ST-10	ST-27	PD-40, NVH	PD-40, NVH	AX-3, NVH	AX-3	SU-3, NVH	SU-3, NVH	SU-3, NVH	BR-5, NVH
Noise		X	X	X	X	X	X	X	X	X						X	X	X	X	X	X	X	X
Shake											X	X				X		X	X	X	X	X	X
Vibration											X	X	X	X		X		X	X	X	X		
Shimmy											X	X			X				X	X	X	X	X
Judder															X				X	X	X	X	X

X: Applicable

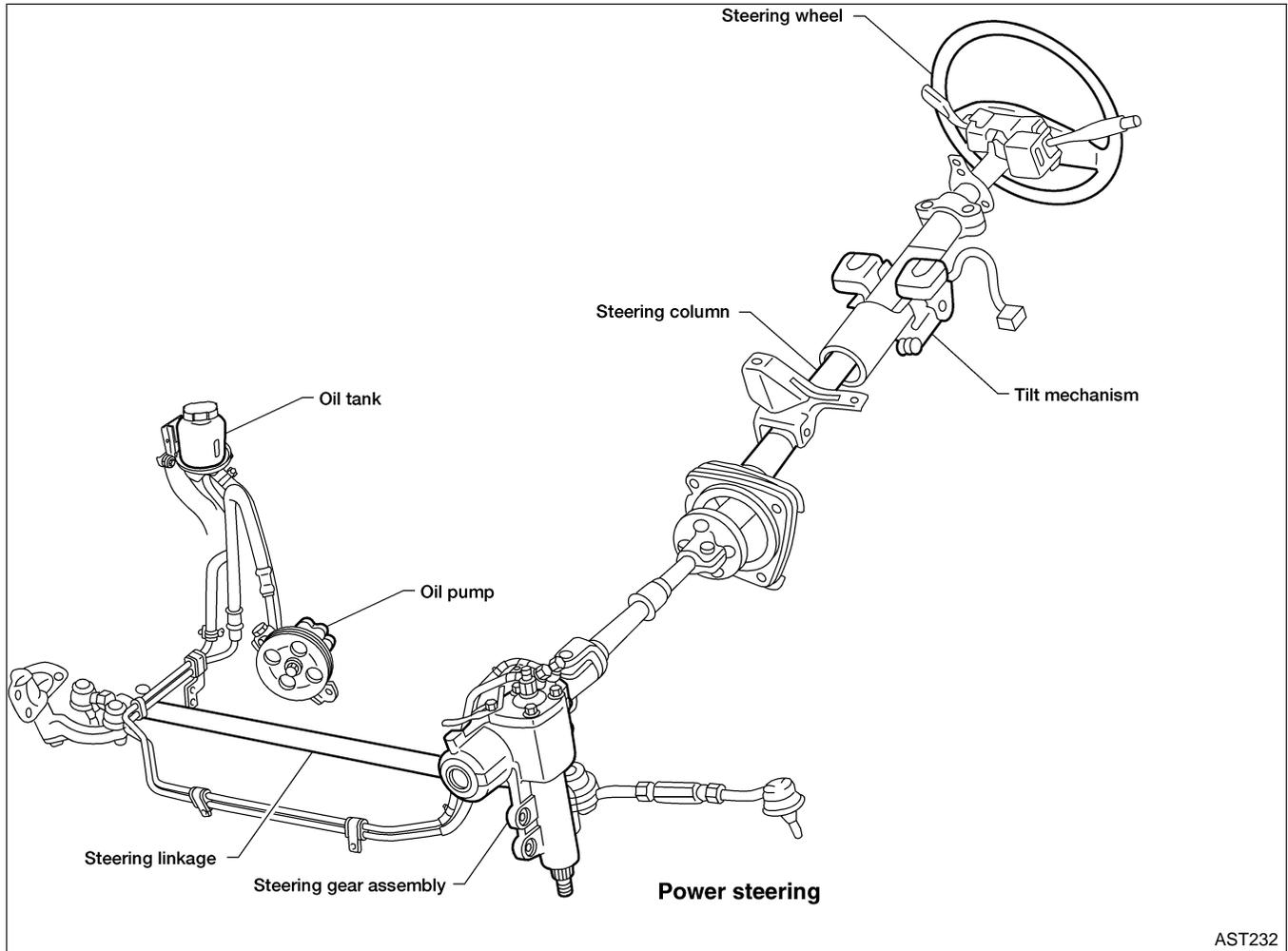
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ON-VEHICLE SERVICE

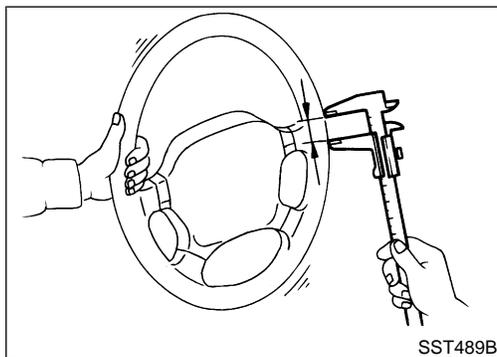
Steering System

Steering System

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AST232



SST489B

Checking Steering Wheel Play

NGST0006

- Place wheels in straight ahead position and check steering wheel play.

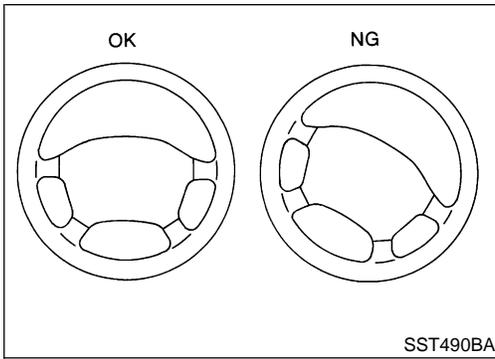
Steering wheel play:

35 mm (1.38 in) or less

- If steering wheel play is not within specification, check the following for loose or worn components.
 - a) Steering column. Refer to ST-11.
 - b) Front suspension and axle. Refer to **AX-3**, "Front Axle Parts" and **SU-7**, "Front Suspension Parts".
 - c) Steering gear. [Refer to ST-14 (PB59K).]

ON-VEHICLE SERVICE

Checking Neutral Position on Steering Wheel



Checking Neutral Position on Steering Wheel

NGST0007

PRE-CHECKING

NGST0007S01

- Make sure that wheel alignment is correct.

Wheel alignment:

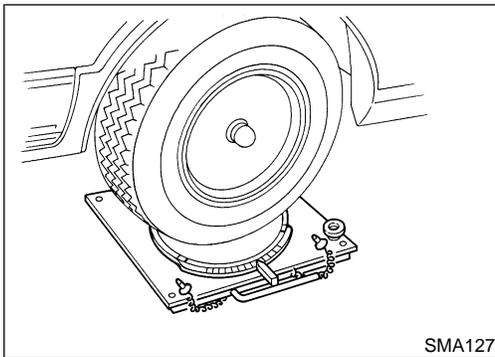
Refer to **SU-20**, “SERVICE DATA AND SPECIFICATIONS”.

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

CHECKING

NGST0007S02

1. Check that the steering wheel is in the neutral position when driving straight ahead.
2. If it is not in the neutral position, remove the steering wheel and reinstall it correctly.
3. If the neutral position is still not correct:
 - a. Loosen tie-rod lock nuts.
 - b. Move tie-rods, in opposite direction, the same amount on both left and right sides.
This will compensate for error in the neutral position.



Checking Front Wheel Turning Angle

NGST0008

1. Rotate steering wheel fully right, then left; measure turning angle.

Turning angle of full turns:

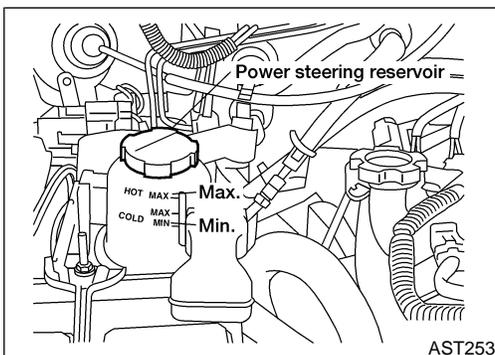
Refer to **SU-20**, “SERVICE DATA AND SPECIFICATIONS”.

2. If it is not within specification, check stopper bolt adjustment. Refer to **SU-20**, “FRONT WHEEL TURNING ANGLE”, “Front Wheel Alignment”.

Checking and Adjusting Drive Belts

NGST0009

Refer to **MA-17** (KA24DE engine) or **MA-26** (VG33E engine), “Checking Drive Belts”, “ENGINE MAINTENANCE”.



Checking Fluid Level

NGST0010

Check fluid level with engine off.

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

Use “HOT” range for fluid temperatures of 50 to 80°C (122 to 176°F). Use “COLD” range for fluid temperatures of 0 to 30°C (32 to 86°F).

CAUTION:

- Do not overfill.
- Recommended fluid is Genuine Nissan PSF II or equivalent. Refer to **MA-14**, “Fluids and Lubricants”, “RECOMMENDED FLUIDS AND LUBRICANTS”.

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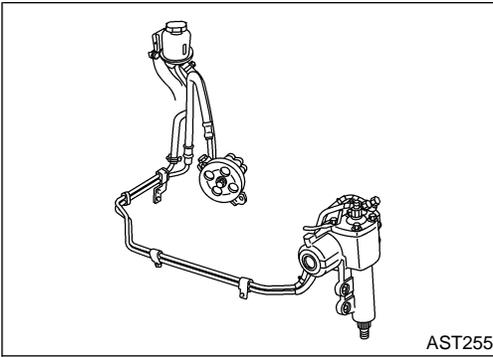
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ON-VEHICLE SERVICE

Checking Fluid Leakage



Checking Fluid Leakage

NGST0011

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

1. Run engine between idle speed and 1,000 rpm.
 - **Make sure temperature of fluid in reservoir 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 5 seconds and carefully check for fluid leakage.

CAUTION:

Do not hold steering wheel at lock position for more than 15 seconds.

4. If fluid leakage from any line is noticed, loosen flare nut and then retighten.

Do not overtighten connector as this can damage O-ring, washer and connector.

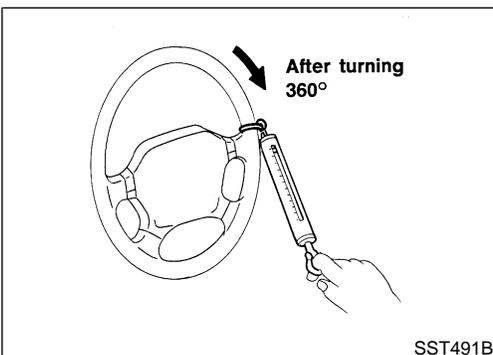
5. If fluid leakage from power steering pump is noticed, check power steering pump. Refer to ST-24.
6. If fluid leakage from power steering gear is noticed, check power steering gear. Refer to ST-14 (PB59K).

Bleeding Hydraulic System

NGST0012

1. Raise front end of vehicle until wheels are clear of the ground.
2. Add fluid to reservoir tank to specified level. Quickly turn steering wheel fully to right and left and lightly touch steering stoppers. Repeat steering wheel operation until fluid level no longer decreases.
3. Start engine. Repeat step 2 above.
 - Incomplete air bleeding will cause the following to occur:
 - a) Air bubbles in reservoir tank
 - b) Clicking noise in power steering pump
 - c) Excessive buzzing in power steering pumpWhen this happens, bleed air again.

Fluid noise may occur in the valve or power steering 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.



Checking Steering Wheel Turning Force

NGST0013

1. Park vehicle on a level, dry surface and set parking brake.
2. Start engine and run at idle speed or 1,000 rpm.
3. 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 to normal pressure.

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

Steering wheel turning force:

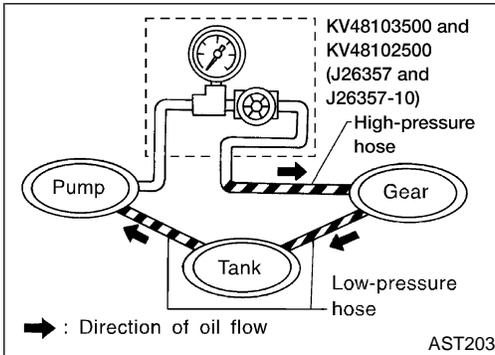
ON-VEHICLE SERVICE

Checking Steering Wheel Turning Force (Cont'd)

PB59K-type

39 N (4 kg, 9 lb) or less

5. If steering wheel turning force is out of specification, check the following:
 - a. Hydraulic system. Refer to "Checking Hydraulic System", ST-9.
 - b. Steering Column. Refer to ST-11.
 - c. Front suspension and axle. Refer to **AX-3**, "Front Axle Parts" and **SU-7**, "Front Suspension Parts".
 - d. Steering gear turning torque. Refer to "TURNING TORQUE MEASUREMENT", ST-16 (PB59K).



Checking Hydraulic System

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

1. Set Tool. Open shut-off valve, then bleed air. Refer to "Bleeding Hydraulic System", ST-8.
2. Run engine at idle speed or 1,000 rpm.
 - Make sure fluid temperature in reservoir 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 the power steering pump increases to maximum. This will raise fluid temperature abnormally.

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

CAUTION:

Do not hold the steering wheel at full lock position for more than 15 seconds.

Power steering pump maximum operating pressure:
7,649 - 8,238 kPa (78 - 84 kg/cm², 1,109 - 1,194 psi) at idling

- 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 ST-24.
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 "Components", ST-15.
 - If pressure remains below maximum operating pressure, pump is damaged. Refer to "Components", ST-24.
5. After checking hydraulic system, remove Tool and add fluid as necessary. Completely bleed air out of system. Refer to ST-8.

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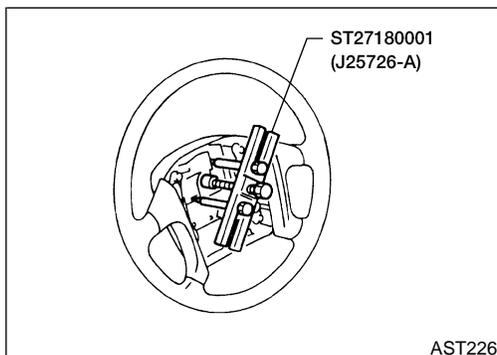
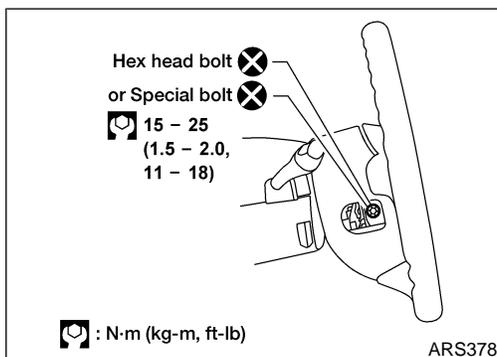
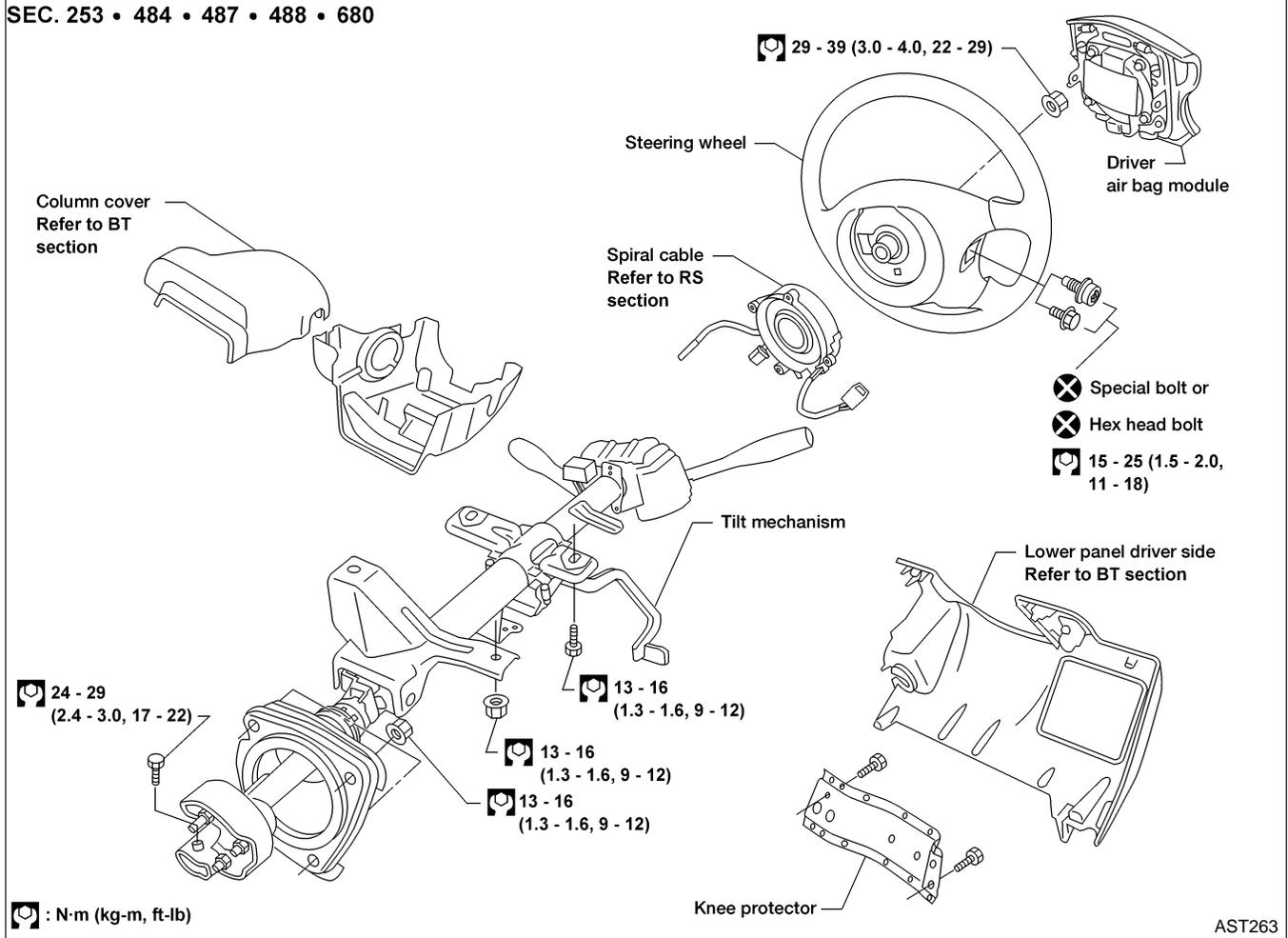
STEERING WHEEL AND STEERING COLUMN

Components

Components

NGST0015

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Removal and Installation

NGST0016

STEERING WHEEL

NGST0016S01

1. Remove air bag module and spiral cable. Refer to **RS-16**, "Air Bag Module and Spiral Cable", "SUPPLEMENTAL RESTRAINT SYSTEM (SRS)".
2. Disconnect horn connector and remove steering wheel nut.
3. Remove steering wheel using Tool.
 - For installation, refer to **RS-16**, "Air Bag Module and Spiral Cable", "SUPPLEMENTAL RESTRAINT SYSTEM (SRS)".

STEERING COLUMN

NGST0016S02

Removal

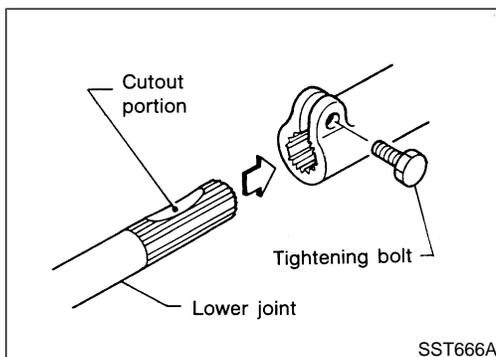
NGST0016S0201

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 removing the steering lower joint to avoid damaging the SRS spiral cable. Refer to ST-10.

1. Remove steering wheel, refer to ST-10.
2. Remove steering column covers.
3. Remove instrument lower panel. Disconnect security lamp indicator.
4. Disconnect combination switch electrical connectors and air bag harness connector.
5. Remove knee protector.
6. Disconnect ignition switch and shift lock solenoid connectors.
7. Disconnect shift cable.
8. Remove bolt from lower joint.
9. Remove two steering column bolts and remove steering column.



Installation

NGST0016S0202

- When installing steering column, finger-tighten all lower bracket and clamp retaining bolts; then tighten them securely. Make sure that undue stress is not applied to steering column.
- When fitting steering lower joint, be sure tightening bolt faces cutout portion.
- Align spiral cable correctly when installing steering wheel. Refer to RS-16, "Air Bag Module and Spiral Cable", "SUPPLEMENTAL RESTRAINT SYSTEM (SRS)".

CAUTION:

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

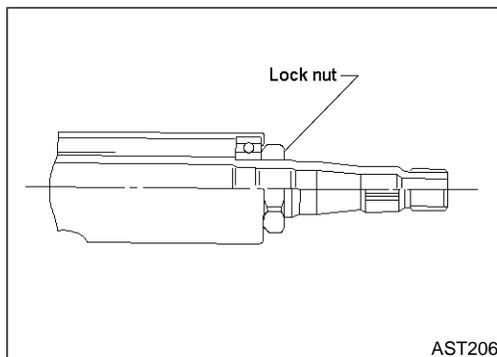
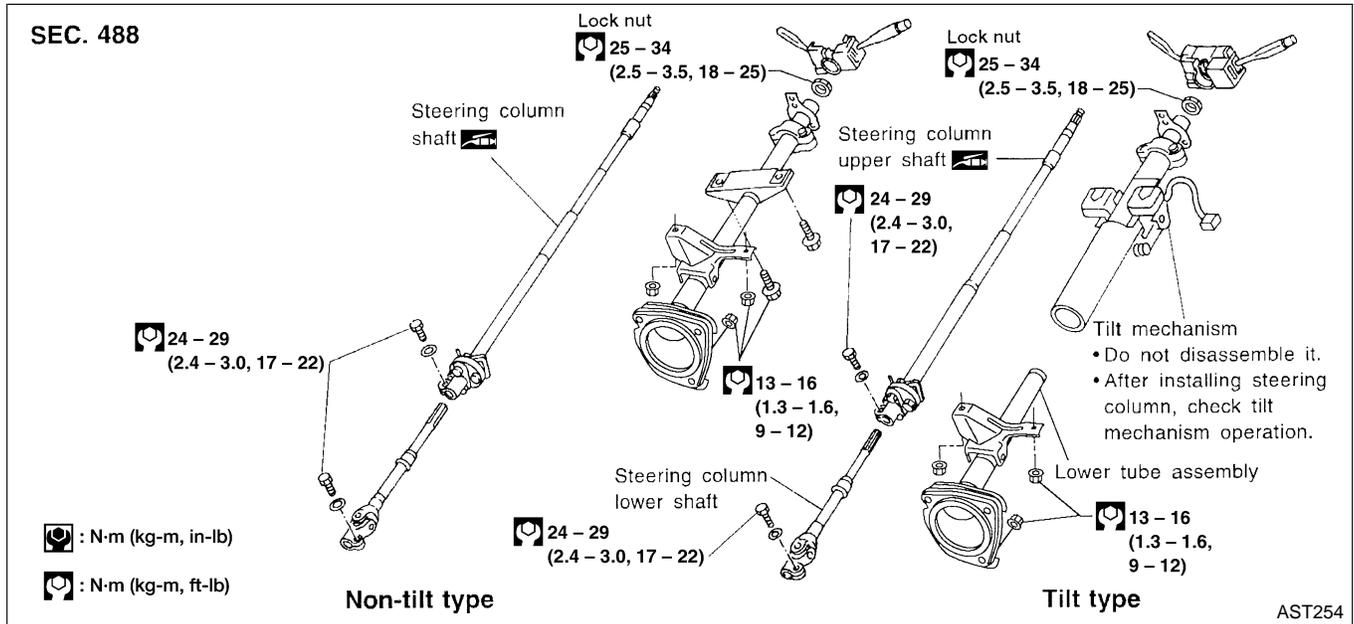
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STEERING WHEEL AND STEERING COLUMN

Disassembly and Assembly

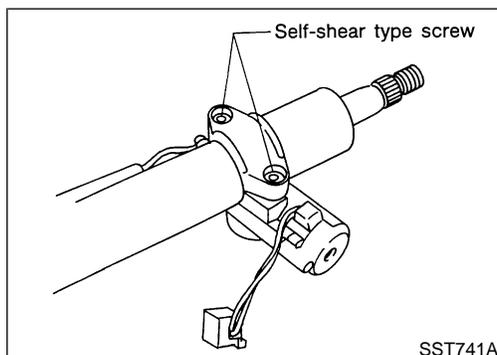
Disassembly and Assembly

NGST0017

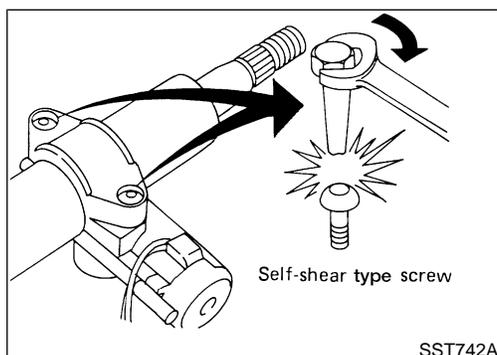


- When disassembling and assembling, unlock steering lock with key.
- Install lock nut on steering column shaft and tighten the nut to specification.

[Torque symbol] : 25 - 34 N·m (2.5 - 3.5 kg·m, 18 - 25 ft. lb)



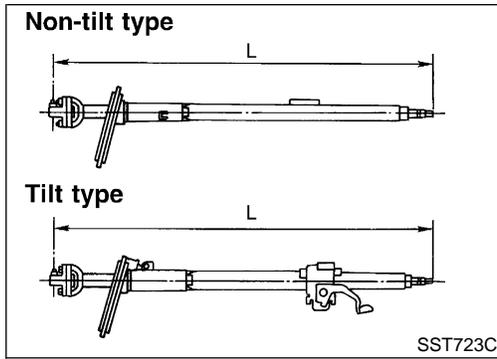
- Steering lock
 - a) Break self-shear type screws using a drill or other appropriate tool.



- b) Install self-shear type screws, then tighten until heads break off.

STEERING WHEEL AND STEERING COLUMN

Inspection



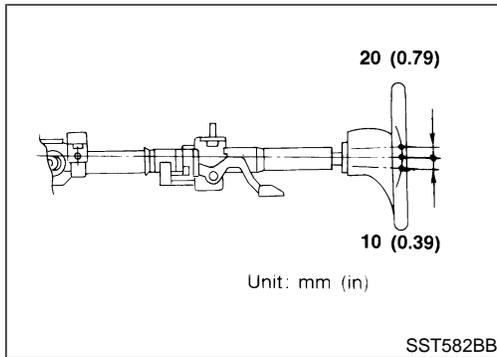
Inspection

NGST0018

- If steering wheel does not turn smoothly, check the steering column as follows and replace damaged parts.
 - a) Check column bearings for damage and unevenness. Lubricate with recommended multi-purpose grease or replace steering column as an assembly, if necessary.
 - b) Check jacket tube for deformation and breakage. Replace if necessary.
- If the vehicle is involved in a light collision, check dimension "L". If it is not within specification, replace steering column as an assembly.

Column length "L":

863.1 - 866.7 mm (33.98 - 34.12 in)



TILT MECHANISM

NGST0018S01

After installing steering column, check tilt mechanism operation.

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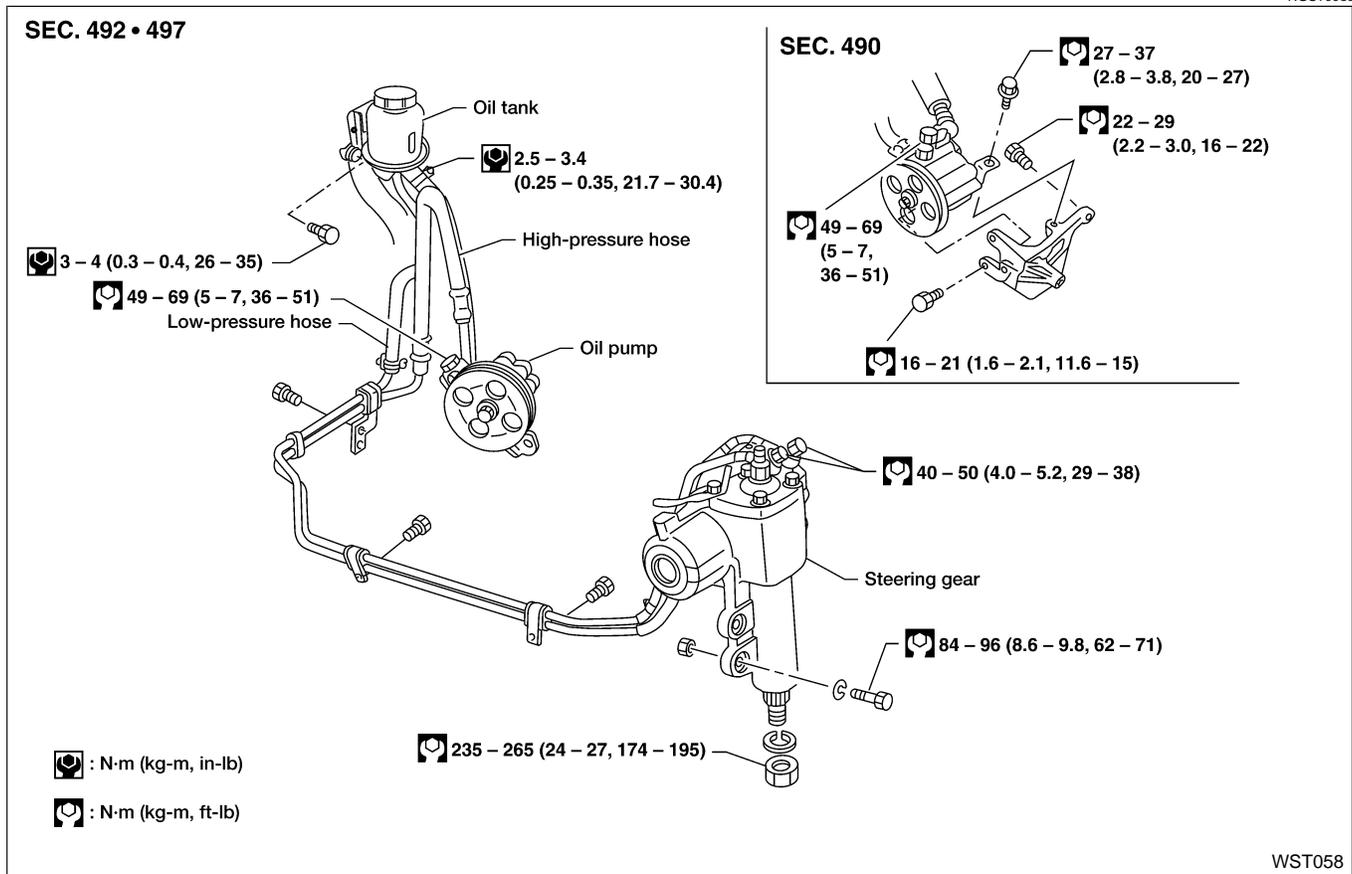
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POWER STEERING GEAR (MODEL: PB59K)

Description

Description

NGST0030



CAUTION:

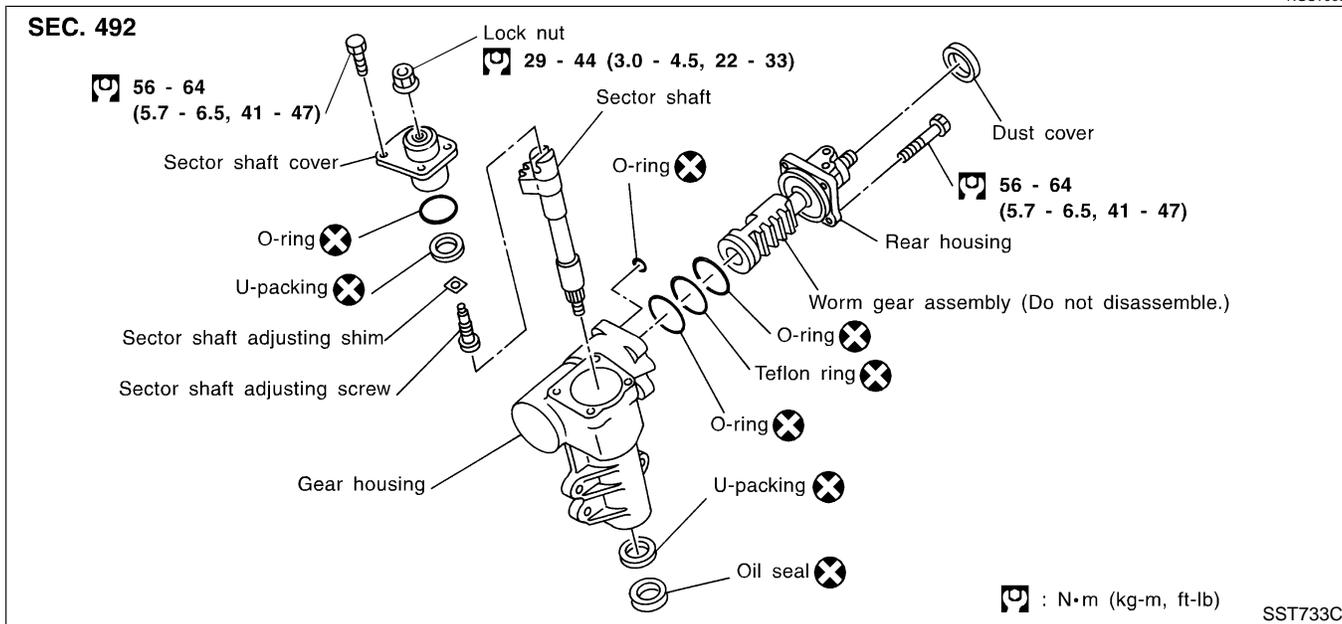
- Parts which can be disassembled are strictly limited. Never disassemble parts other than those specified.
- Disassemble in as clean a place as possible.
- Clean your hands before disassembly.
- Do not use rags; use nylon cloths or paper towels.
- Follow the procedures and cautions indicated in the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

POWER STEERING GEAR (MODEL: PB59K)

Components

Components

NGST0031



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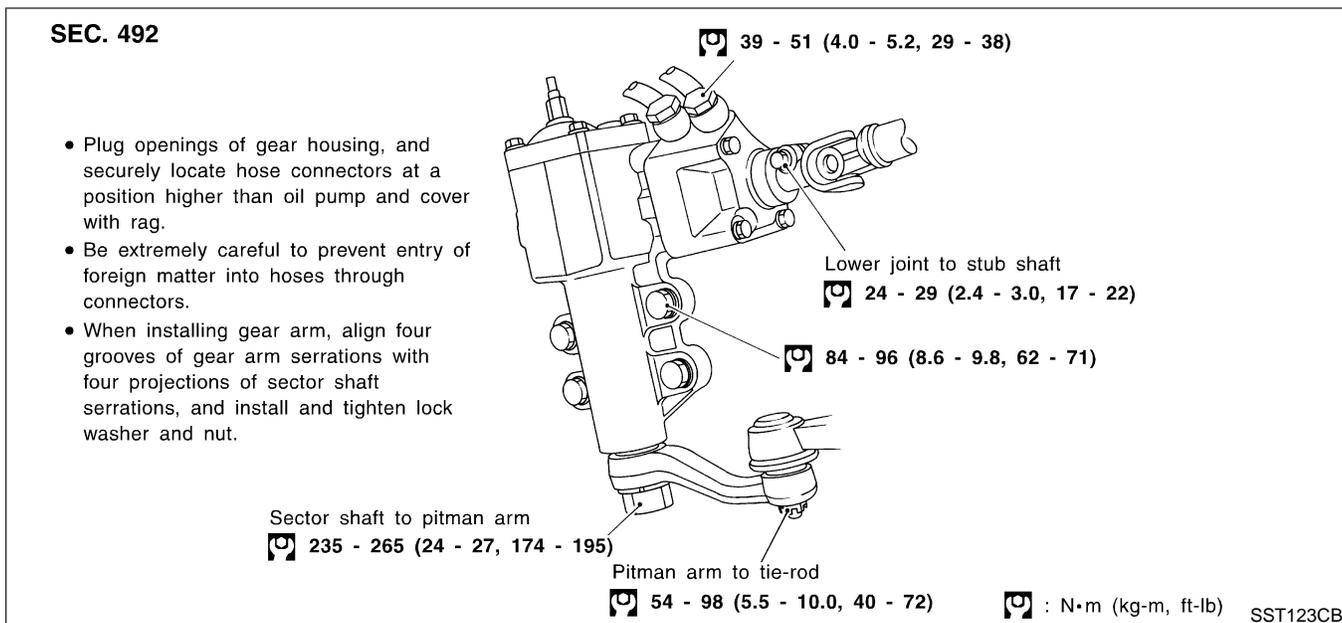
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Removal and Installation

NGST0032

Before removal, clean gear housing and oil pump exteriors using a steam cleaner, then dry with compressed air.



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POWER STEERING GEAR (MODEL: PB59K)

Pre-disassembly Inspection and Adjustment

Pre-disassembly Inspection and Adjustment

Before disassembling power steering gear component parts, make sure there is no oil leakage around sealing portion and check steering turning torque as follows:

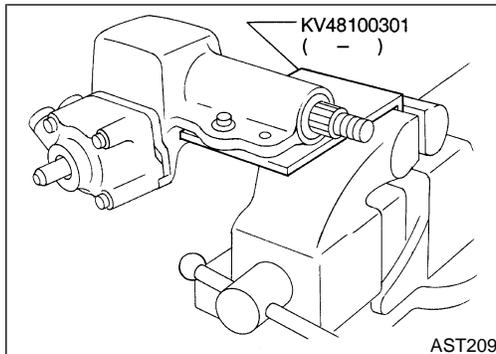
NGST0033

Check sealing portion.

- Sector shaft cover O-ring
- Sector shaft U-packing
- Sector shaft oil seal
- Rear housing O-ring
- Gear housing O-ring

Discard any oil seals and O-rings which have been removed.

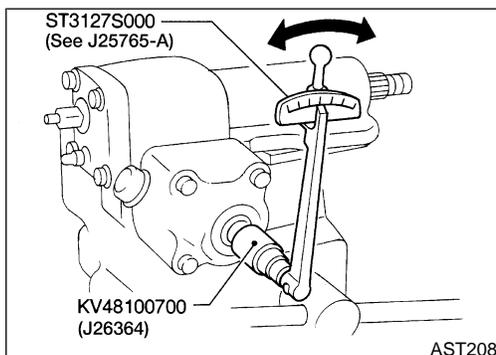
Replace oil seals and O-rings if sealing surface is deformed or cracked.



TURNING TORQUE MEASUREMENT

NGST0033S01

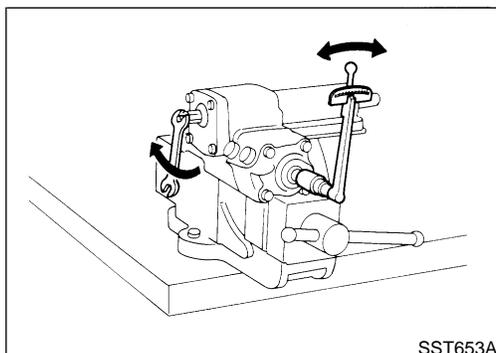
1. Measure turning torque at 360° position.
 - a. Install steering gear on Tool.



- b. Turn stub shaft all the way to right and left several times.
- c. Measure turning torque at 360° position from straight-ahead position with Tools.

Turning torque at 360°:

0.15 - 0.78 N·m (1.5 - 8.0 kg·cm, 1.3 - 6.9 in·lb)



- d. Measure turning torque at straight-ahead position.

Straight-ahead position is a position where stub shaft is turned 2.14 turns (two full turns and 50°) from lock position.

Turning torque at straight-ahead position:

0.25 - 1.32 N·m (2.5 - 13.5 kg·cm, 2.3 - 11.6 in·lb)

higher than turning torque at 360°

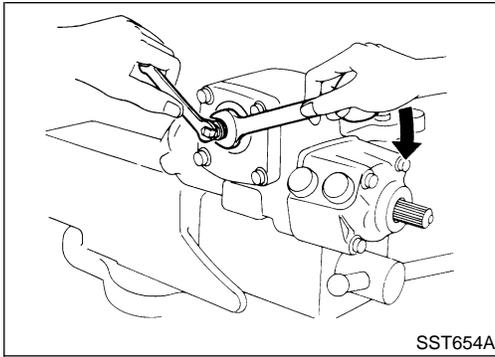
Maximum turning torque:

1.03 - 1.47 N·m (10.5 - 15 kg·cm, 9.2 - 13.0 in·lb)

If turning torque is not within specifications, adjust by turning sector shaft adjusting screw.

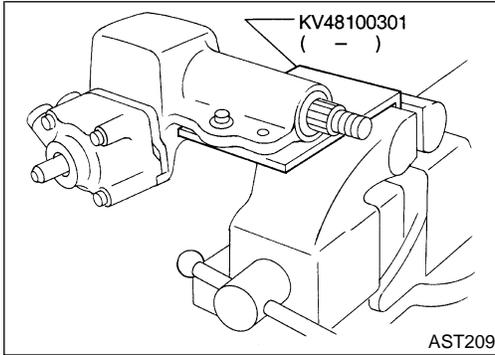
POWER STEERING GEAR (MODEL: PB59K)

Pre-disassembly Inspection and Adjustment (Cont'd)



SST654A

2. Tighten adjusting screw lock nut with tools.



AST209

Disassembly

Before disassembly, measure turning torque.

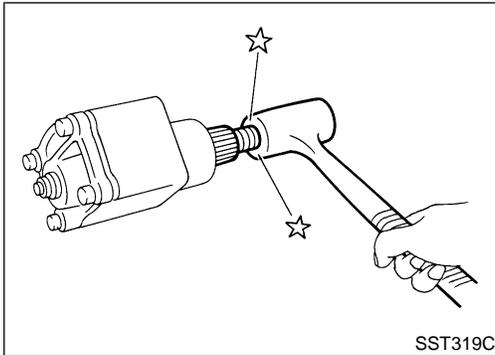
NGST0034

If not within specifications, replace steering gear assembly.

CAUTION:

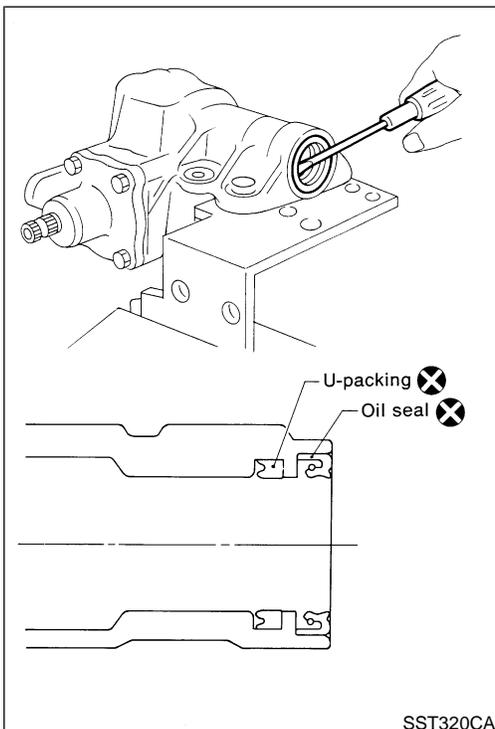
Oil sealing parts and snap ring must not be used again after removal.

1. Place steering gear in a vise with Tool.
2. Set worm gear in straight-ahead position.



SST319C

3. Loosen (do not remove) sector shaft cover bolt.
4. Knock out end of sector shaft with a plastic hammer.
5. Remove sector shaft by hand.



SST320CA

6. Remove oil seal.
7. Remove U-packing.

CAUTION:

When removing oil seal and U-packing, be careful not to scratch gear housing.

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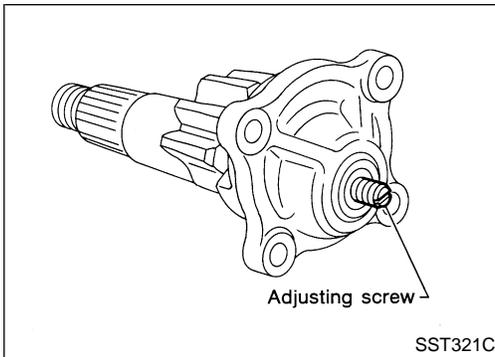
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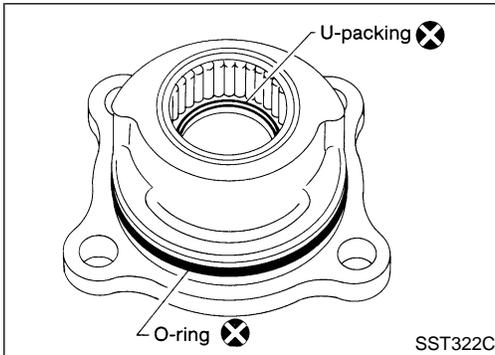
IDX

POWER STEERING GEAR (MODEL: PB59K)

Disassembly (Cont'd)



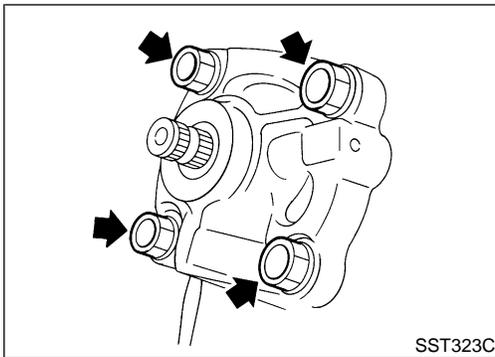
8. Remove lock nut, then loosen adjusting screw using a screwdriver. Separate sector cover and sector shaft.



9. Remove O-ring.
10. Remove U-packing.

CAUTION:

- When removing U-packing, be careful not to scratch sector cover, needle bearing, etc.
- Needle bearing cannot be disassembled. If it is damaged, remove sector cover assembly.

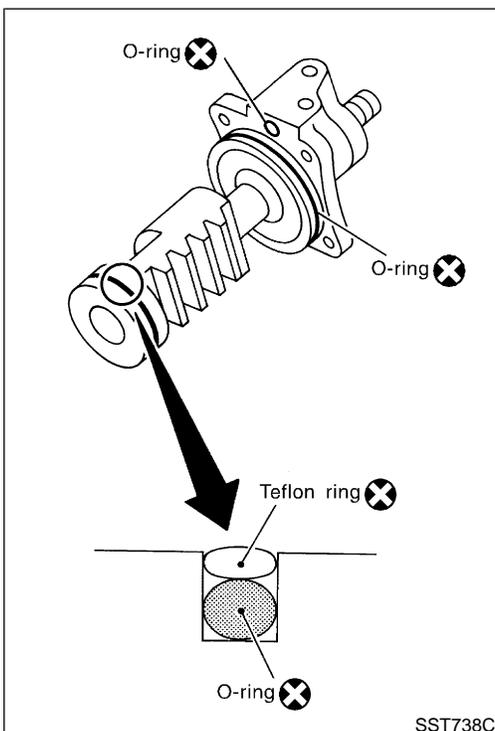


11. Remove dust seal.
12. Remove rear housing bolts.
13. Remove rear housing together with worm gear assembly.

CAUTION:

Worm gear assembly cannot be disassembled. When it is removed, be careful not to disengage worm gear from shaft or allow it to drop.

14. Remove teflon ring and O-ring of worm gear assembly.



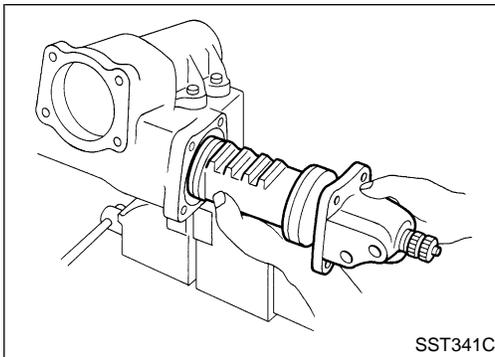
Assembly

NGST0035

1. Install new O-ring on worm gear assembly.
 - **Apply a thin coat of ATF to new O-ring.**
2. Install new teflon ring on worm gear assembly.
 - **Make sure that teflon ring is seated in correct position.**
3. Install new O-rings into rear housing.

POWER STEERING GEAR (MODEL: PB59K)

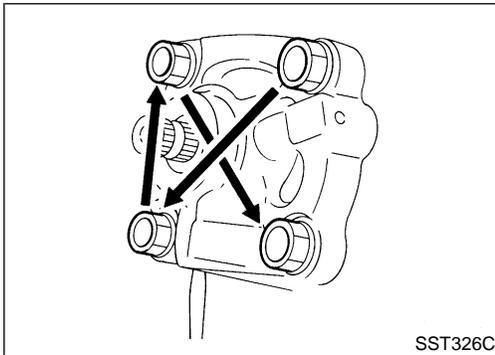
Assembly (Cont'd)



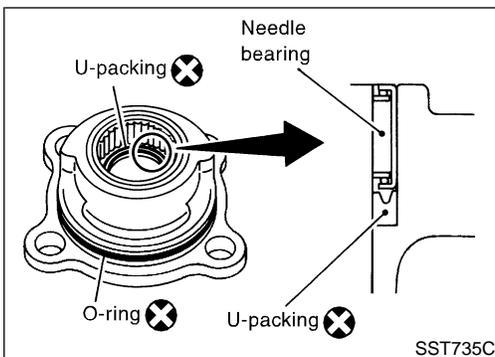
4. Install worm gear assembly with rear housing into the gear housing.

CAUTION:

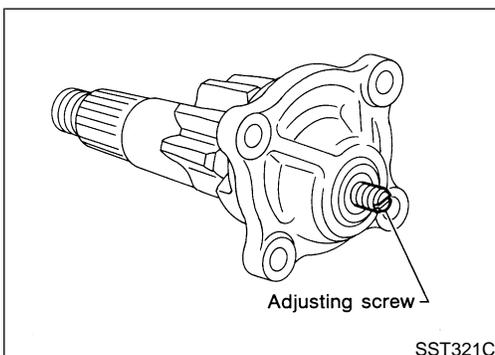
- Apply a thin coat of ATF inside gear housing and piston before insertion.
- Be careful not to damage teflon ring at piston end when inserting worm gear assembly into gear housing.



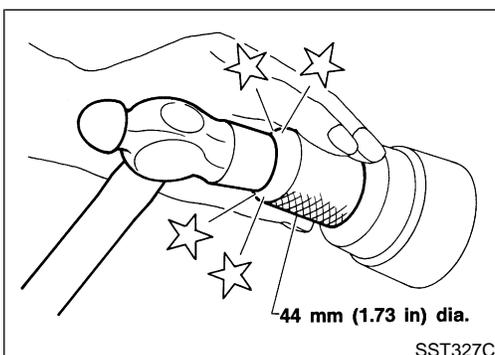
5. Gradually tighten rear housing bolts in a criss-cross fashion.



6. Install new O-ring into sector shaft cover.
 7. Install new U-packing into sector shaft cover.
- Before installing, apply a thin coat of ATF to O-ring.
 - Before installing, apply a thin coat of ATF to U-packing.
 - Direct grooved side of U-packing to needle bearing.



8. Install sector shaft into sector shaft cover. Set adjusting screw to its outermost position.
- Before installing sector shaft, apply multi-purpose grease to adjusting screw and adjusting screw shim.

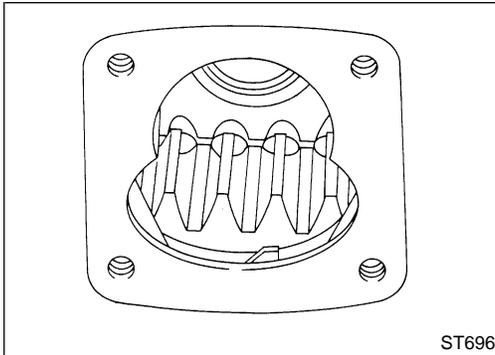


9. Install new oil seal into gear housing with suitable tool.
- Before installing oil seal, apply multi-purpose grease to oil seal lips.

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POWER STEERING GEAR (MODEL: PB59K)

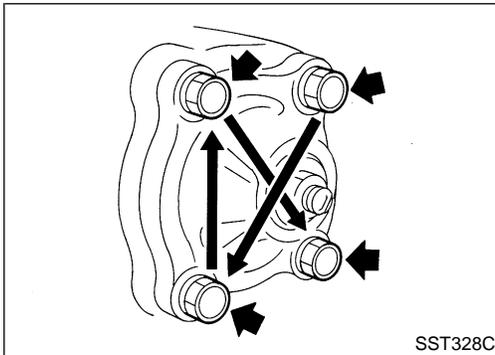
Assembly (Cont'd)



10. Set piston rack at straight-ahead position.

Turn piston rack about 10° to 15° toward yourself with your finger.

This enables smooth insertion of sector gear.



11. Gradually insert sector shaft into gear housing.

12. Tighten sector shaft cover bolts.

13. Set worm gear turning torque by turning sector shaft adjusting screw and locking with lock nut.

Refer to “TURNING TORQUE MEASUREMENT”, “Pre-disassembly and Adjustment”, ST-16.

- **If set and adjusting turning torque is considerably different from the value before disassembly, replace the entire assembly.**

14. Check sector shaft end play in neutral position.

End play:

Less than 0.1 mm (0.004 in)

If not within specification, adjust it with adjusting screw.

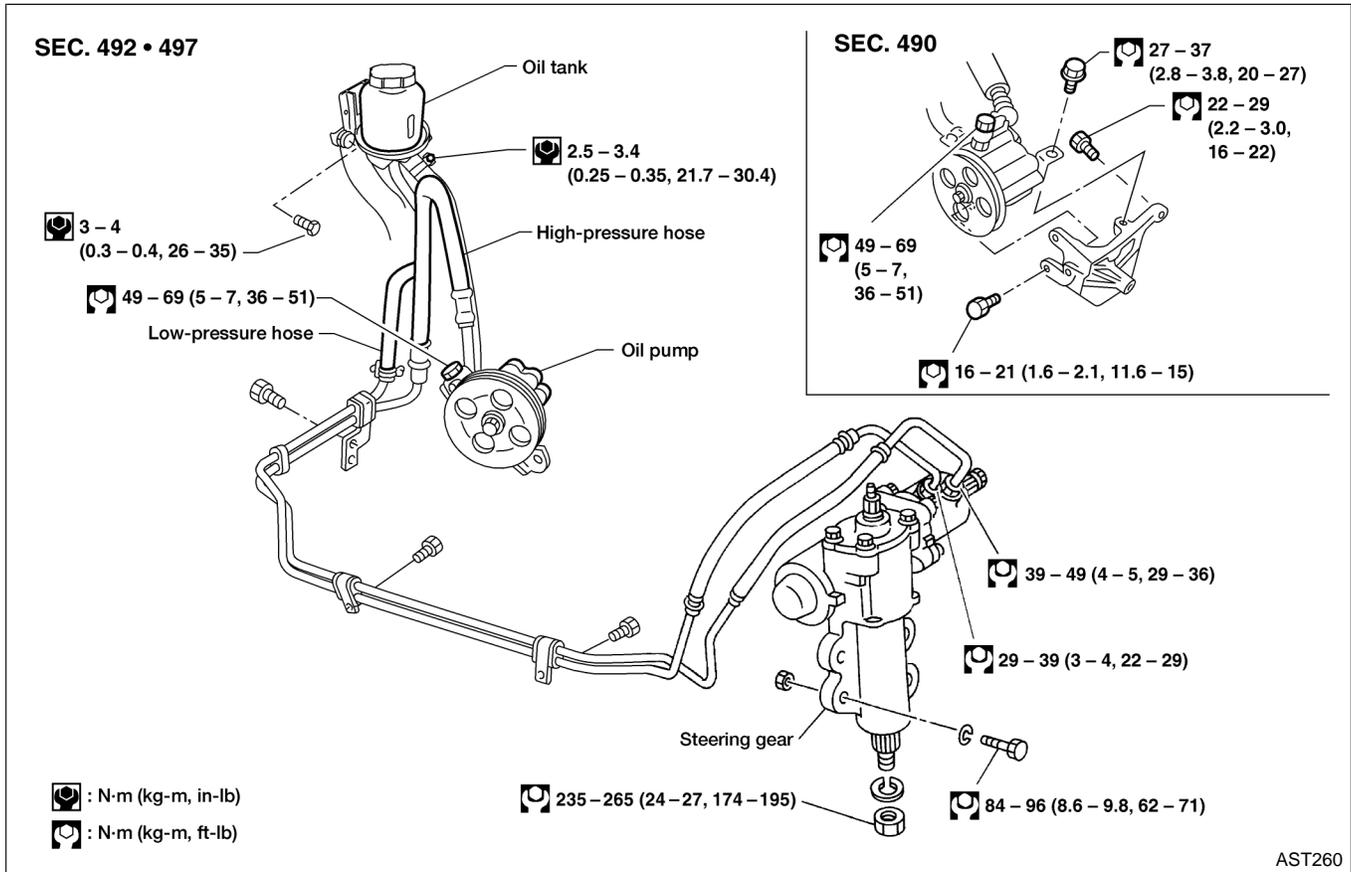
15. Check worm gear preload. If not within specification, readjust it.

POWER STEERING GEAR (MODEL: D600)

Description

Description

NGST0051



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 indicated in the Service Manual.

Removal and Installation

Before removal, clean gear housing and oil pump exteriors using a steam cleaner, then dry with compressed air.

NGST0052

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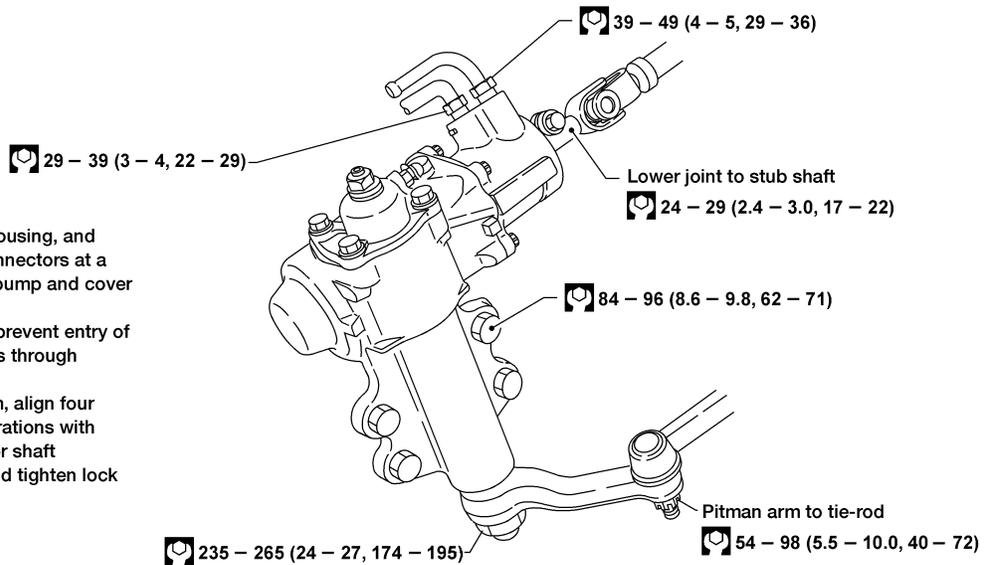
POWER STEERING GEAR (MODEL: D600)

Removal and Installation (Cont'd)

SEC. 492

- Plug openings of gear housing, and securely locate hose connectors at a position higher than oil pump and cover with rag.
- Be extremely careful to prevent entry of foreign matter into hoses through connectors.
- When installing gear arm, align four grooves of gear arm serrations with four projections of sector shaft serrations, and install and tighten lock washer and nut.

 : N·m (kg·m, ft·lb)



AST264

Inspection and Adjustment

NGST0053

Before replacing power steering, make sure there is no oil leakage around sealing portion and check steering turning torque as follows:

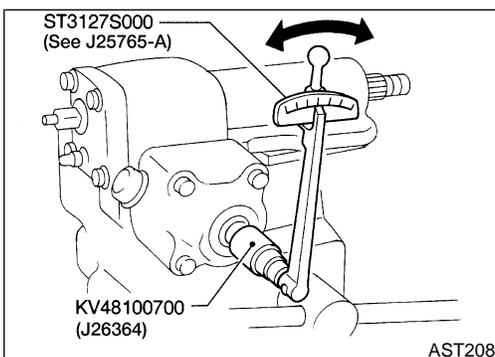
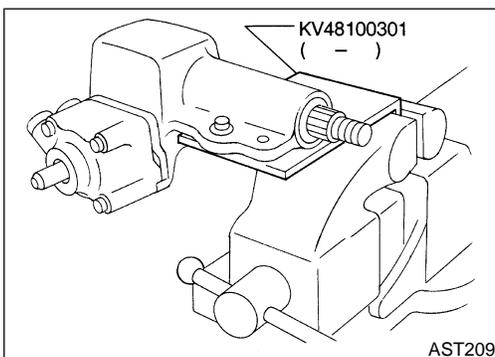
Check sealing portion.

- Sector shaft cover O-ring
- Sector shaft U-packing
- Sector shaft oil seal
- Rear housing O-ring
- Gear housing O-ring

TURNING TORQUE MEASUREMENT

NGST0053S01

1. Measure turning torque at 360° position.
 - a. Install steering gear on Tool.



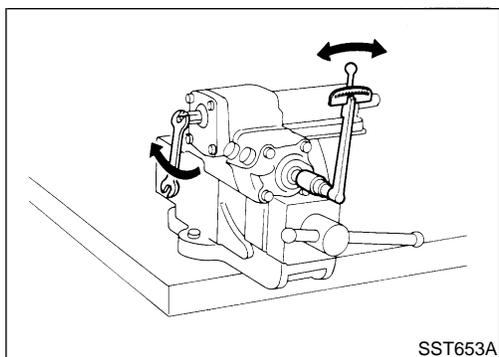
- b. Turn stub shaft all the way to right and left several times.
- c. Measure turning torque at 360° position from straight-ahead position with Tools.

Turning torque at 360°:

0.20 - 0.90 N·m (2.0 - 9.2 kg·cm, 1.8 - 8.0 in·lb)

POWER STEERING GEAR (MODEL: D600)

Inspection and Adjustment (Cont'd)



d. Measure turning torque at straight-ahead position.

Straight-ahead position is a position where stub shaft is turned 1.93 turns (two full turns and 50°) from lock position.

Turning torque at straight-ahead position:

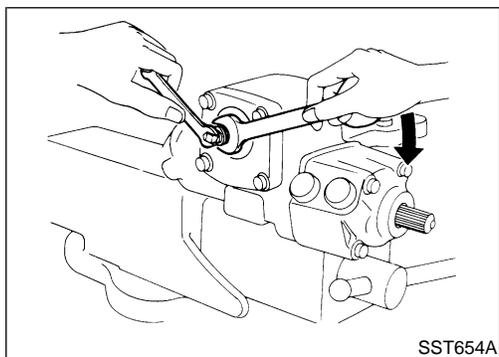
**0.45 - 0.88 N·m (4.6 - 8.2 kg-cm, 4.0 - 7.1 in-lb)
higher than turning torque at 360°**

Maximum turning torque:

1.7 N·m (17.8 kg-cm, 15.0 in-lb)

If turning torque is not within specifications, adjust by turning sector shaft adjusting screw.

2. Tighten adjusting screw lock nut with tools.



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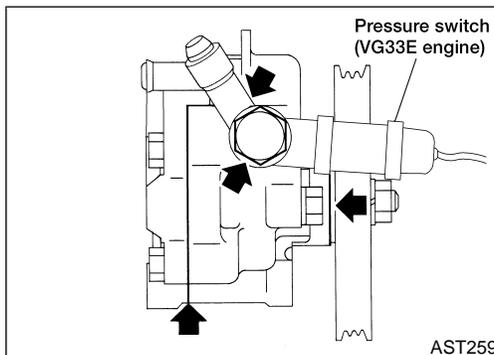
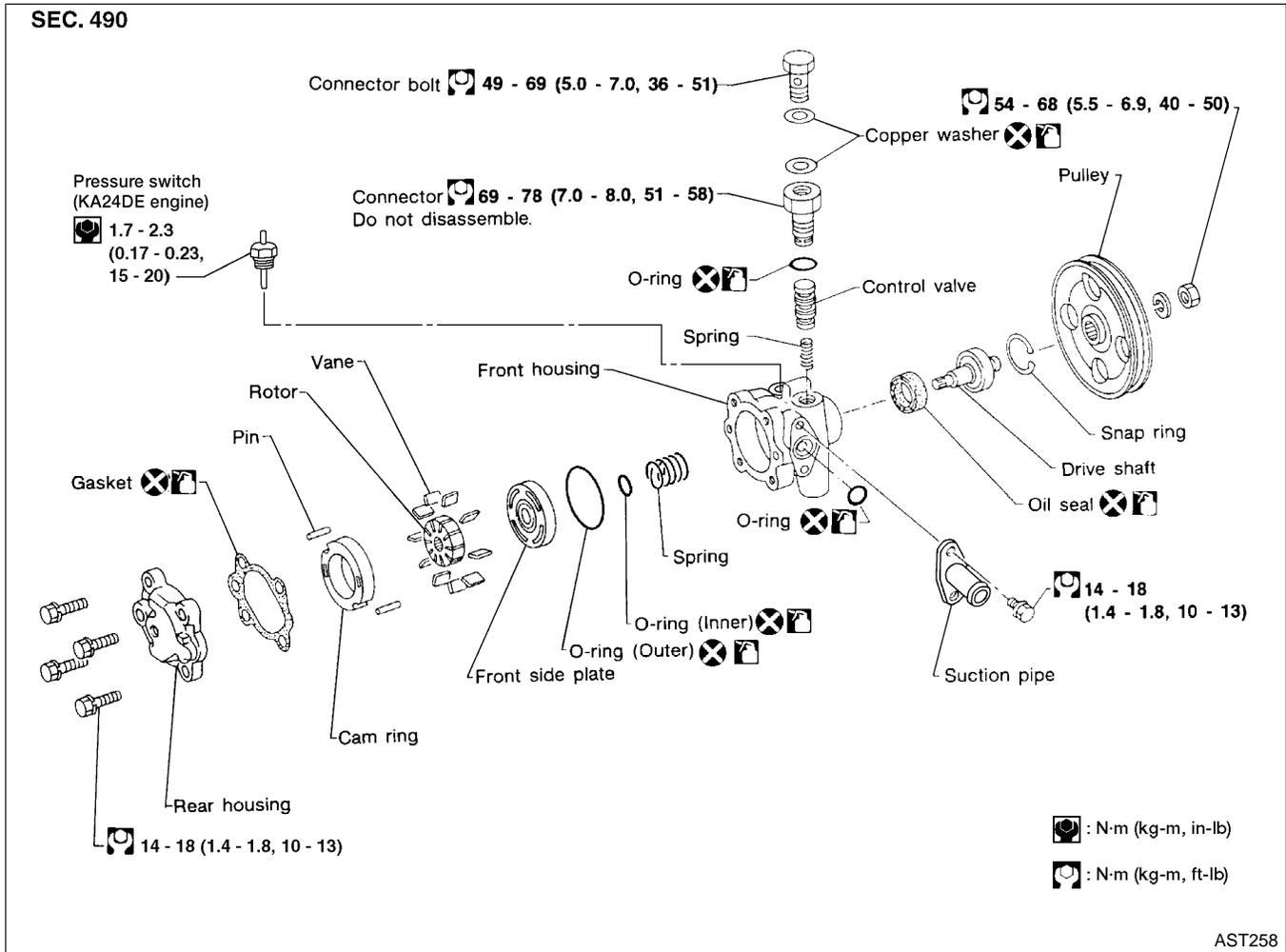
IDX

POWER STEERING OIL PUMP

Components

Components

NGST0036



Pre-disassembly Inspection

NGST0037

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.

Disassembly

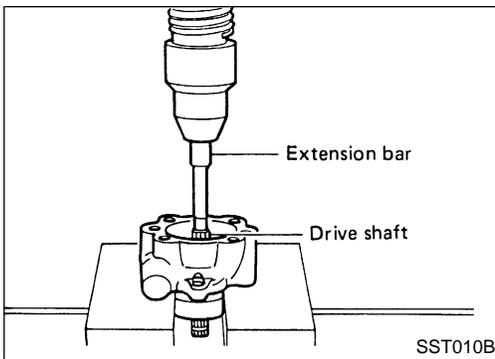
NGST0038

CAUTION:

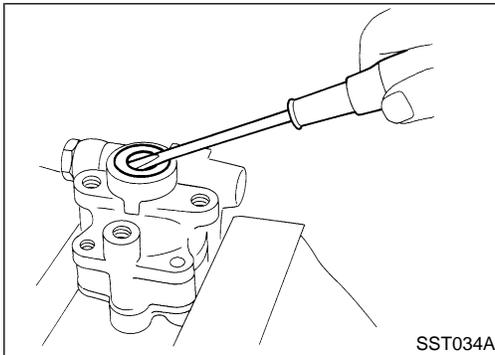
- Parts which can be disassembled are strictly limited. Never disassemble parts other than those specified.
- Disassemble in as clean a place as possible.
- Clean your hands before disassembly.
- Do not use rags; use nylon cloths or paper towels.
- When disassembling and reassembling, do not let foreign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

POWER STEERING OIL PUMP

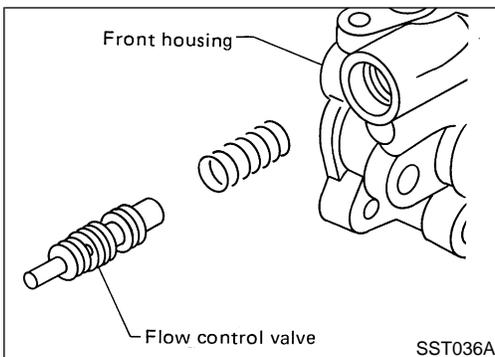
Disassembly (Cont'd)



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



- Remove oil seal.
- **Be careful not to damage front housing.**

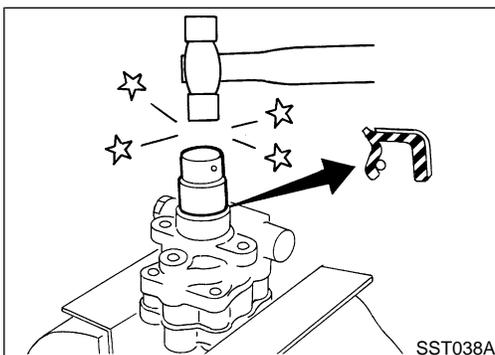


- Remove connector and flow control valve with spring.
- **Be careful not to drop control valve.**

Inspection

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

NGST0039



Assembly

Assemble oil pump, noting the following instructions.

- Make sure O-rings and oil seal are properly installed.
- Always install new O-rings and oil seal.
- Be careful of oil seal direction.
- Cam ring, rotor and vanes must be replaced as a set if necessary.
- When assembling, coat each part with Genuine Nissan PSF II or equivalent.

NGST0040

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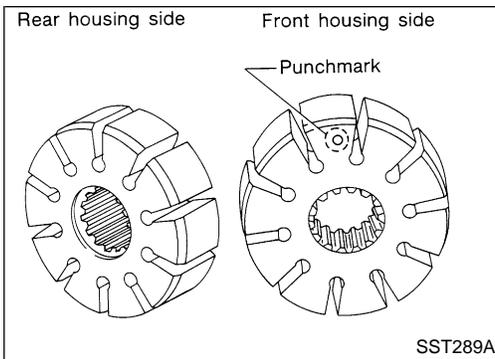
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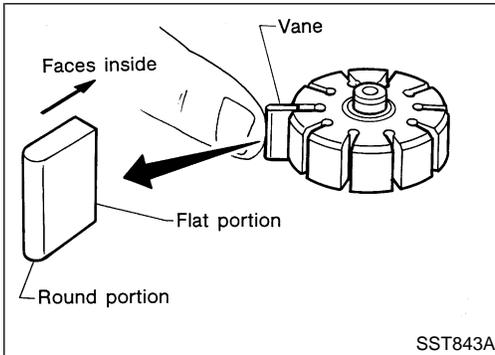
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POWER STEERING OIL PUMP

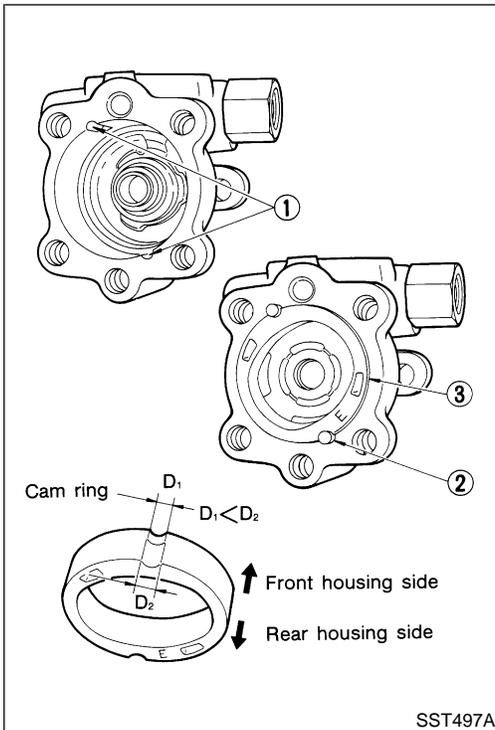
Assembly (Cont'd)



- Pay attention to the direction of rotor.



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



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

Cam ring:

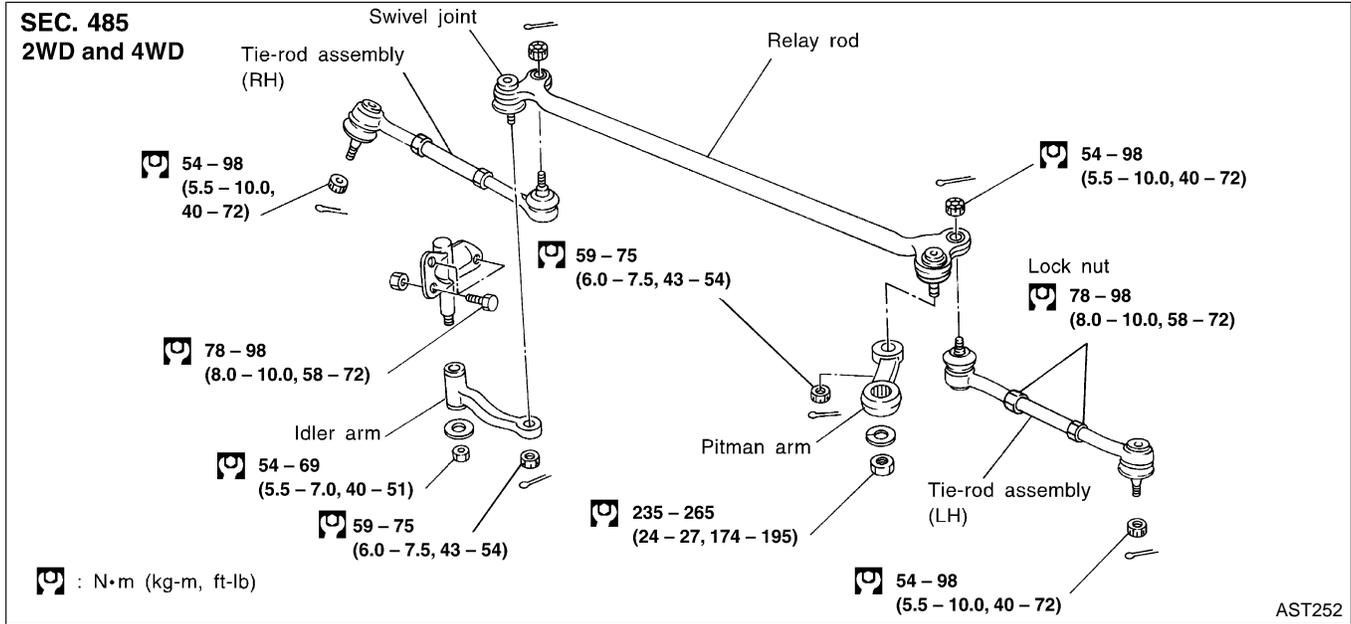
D_1 is less than D_2

STEERING LINKAGE

Components

Components

NGST0041



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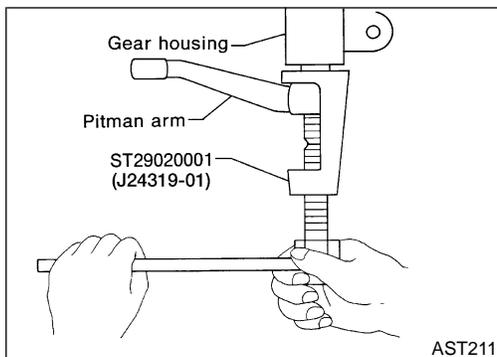
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Removal and Installation

Remove pitman arm with Tool.

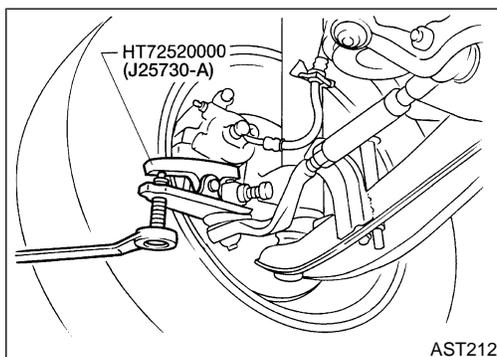
NGST0042

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Remove tie-rod from knuckle arm with Tool.

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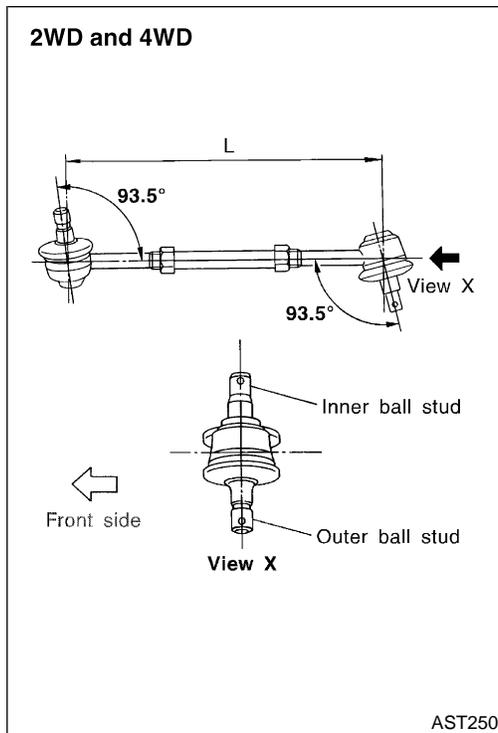
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STEERING LINKAGE

Disassembly and Assembly



Disassembly and Assembly

IDLER ARM ASSEMBLY

NGST0043

NGST0043S01

- Apply coat of multi-purpose grease to bushing.
- Press bushing into idler body, and insert shaft of idler bracket carefully until bushing protrudes.

CROSS ROD AND TIE-ROD

NGST0043S02

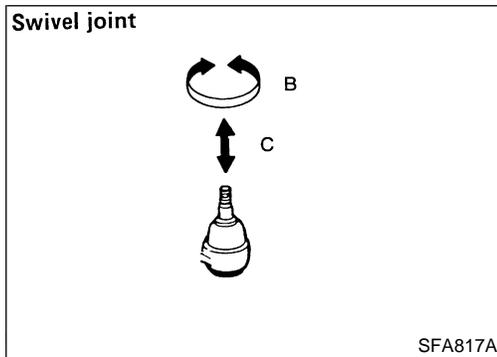
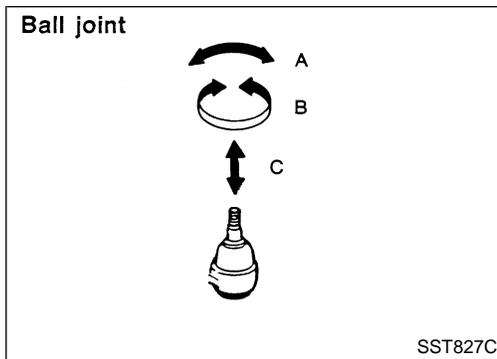
1. When tie-rod ball joints and tie-rod bar are separated, adjust tie-rod length correctly. Adjustment should be done between ball stud centers.
2. Lock tie-rod clamp nut so that ball joint on outer ball stud is as follows with respect to that on inner ball stud.

L: Standard

297.6 mm (11.72 in): 2WD and 4WD

CAUTION:

Make sure that tie-rod bars are screwed into tie-rod tube more than 22 mm (0.87 in): 2WD and 4WD.



Inspection

BALL JOINT AND SWIVEL JOINT

=NGST0044

NGST0044S01

1. Check joints for play. If ball or swivel stud is worn and play in axial direction is excessive, or joint is hard to swing, replace as a complete unit.

Swinging force (Measure point: Cotter pin hole) "A":

Ball joint

15.7 - 147.1 N (1.6 - 15.0 kg, 3.5 - 33.1 lb)

Rotating torque "B":

Ball joint

0.5 - 4.9 N·m (5 - 50 kg-cm, 4.3 - 43.4 in-lb)

Swivel joint

1.0 - 5.9 N·m (10 - 60 kg-cm, 8.7 - 52.1 in-lb)

Axial end play "C":

Ball joint and swivel joint

0 mm (0 in)

2. Check condition of dust cover. If it is cracked excessively, replace as a complete unit.

CAUTION:

Be careful not to apply grease or oil to taper of joint.

IDLER ARM ASSEMBLY

NGST0044S02

- Check rubber bushing of idler arm for breakage, wear or play, and if necessary replace.
- Lubricate idler arm assembly with multi-purpose grease, if necessary.

CROSS ROD AND TIE-ROD

NGST0044S03

Check tie-rod and cross rod for breakage, bends and cracks, and replace with a new one if necessary.

FIXING LOCATION

NGST0044S04

- Check fixing location (nuts and cotter pins) for looseness, play or breakage.
- When looseness or play is found, check for wear on tapered portion of joints, gear arm or idler arm.
- When reassembling each joint, use new cotter pins.

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SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

General Specifications

NGST0045

Steering column type (Collapsible)	Power steering
	2WD, 4WD
Steering gear type	PB59K
Turns of steering wheel on the vehicle (Lock-to-lock)	3.4
Steering gear ratio	15

Steering Wheel

NGST0046
Unit: mm (in)

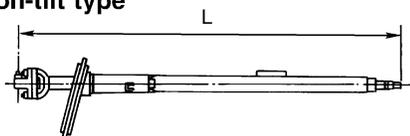
Steering wheel axial play	0 (0)
Steering wheel play	35 (1.38) or less

Steering Column

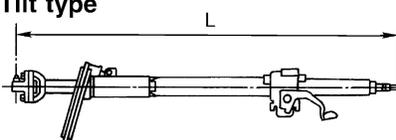
NGST0047
Unit: mm (in)

Dimension "L"	863.1 - 866.7 (33.98 - 34.12)
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Non-tilt type



Tilt type



SST841C

Power Steering Gear

NGST0049

MODEL: PB59K

NGST0049S02

Steering wheel turning force (at 360° from neutral position and circumference of steering wheel)	39 N (4 kg, 9 lb) or less	
Oil pump pressure	7,649 - 8,238 kPa (78 - 84 kg/cm ² , 1,109 - 1,194 psi) at idling	
Fluid capacity	Approximately 1,000 - 1,100 ml (35.2 - 38.7 Imp fl oz)	
Normal operating temperature	60 - 80 °C (140 - 176 °F)	
Steering gear turning torque	360° position from straight-ahead position	0.15 - 0.78 N-m (1.5 - 8.0 kg-cm, 1.3 - 6.9 in-lb)
	Straight-ahead position (As compared with steering wheel turned 360°)	0.25 - 1.32 N-m (2.5 - 13.5 kg-cm, 2.2 - 11.7 in-lb) higher
	Maximum turning torque	1.03 - 1.47 N-m (10.5 - 15 kg-cm, 9.1 - 13.0 in-lb)
Backlash at pitman arm top end (in straight-ahead position)	0 - 0.1 mm (0 - 0.004 in)	
End play (at sector shaft end in neutral position)	0.1 mm (0.004 in) or less	

SERVICE DATA AND SPECIFICATIONS (SDS)

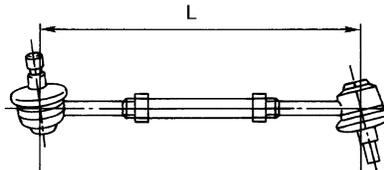
Steering Linkage

Steering Linkage

NGST0050

Applied model		2WD, 4WD
Relay-rod swivel joint	Rotating torque	1.0 - 5.9 N·m (10 - 60 kg-cm, 8.7 - 52.1 in-lb)
	Axial end play	0 mm (0 in)
Tie-rod & relay-rod ball joint	Swinging force at cotter pin hole	15.7 - 147.1 N (1.6 - 15.0 kg, 3.5 - 33.1 lb)
	Rotating torque	0.5 - 4.9 N·m (5 - 50 kg-cm, 4.3 - 43.4 in-lb)
	Axial end play	0 mm (0 in)
Tie-rod standard length (L)		297.6 mm (11.72 in)

2WD and 4WD



AST251

GI

MA

EM

LC

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MT

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AX

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RS

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NOTES