

# STEERING SYSTEM

# SECTION ST

GI  
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## PRECAUTIONS

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

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

NEST0051

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 a frontal collision. The Supplemental Restraint System consists of air bag modules (located in the center of the steering wheel and in the instrument panel on the passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness, and spiral cable.

The vehicle (except Crew Cab model) is equipped with a passenger air bag deactivation switch. Because no rear seat exists where a rear-facing child restraint can be placed, the switch is designed to turn off the passenger air bag so that a rear-facing child restraint can be used in the front passenger seat. The switch is located in the center of the instrument panel, near the ashtray. When the switch is turned to the ON position, the passenger air bag is enabled and could inflate in a frontal collision. When the switch is turned to the OFF position, the passenger air bag is disabled and will not inflate in a frontal collision. A passenger air bag OFF indicator on the instrument panel lights up when the passenger air bag is switched OFF. The driver air bag always remains enabled and is not affected by the passenger air bag deactivation switch.

#### **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 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.
- 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 harness connectors.
- The vehicle (except Crew Cab model) is equipped with a passenger air bag deactivation switch which can be operated by the customer. When the passenger air bag is switched OFF, the passenger air bag is disabled and will not inflate in a frontal collision. When the passenger air bag is switched ON, the passenger air bag is enabled and could inflate in a frontal collision. After SRS maintenance or repair, make sure the passenger air bag deactivation switch is in the same position (ON or OFF) as when the vehicle arrived for service.

### Precautions for Steering System

NEST0002

- 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-13, "RECOMMENDED FLUIDS AND LUBRICANTS".

# PREPARATION

Special Service Tools

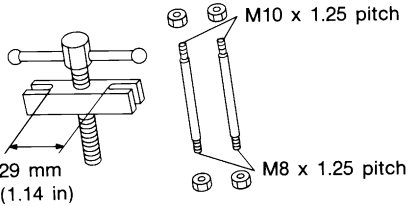
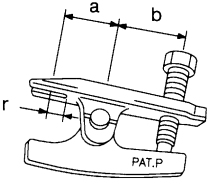
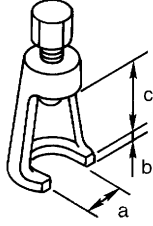
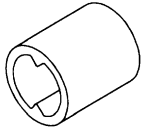
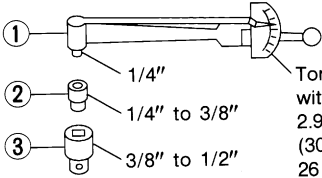
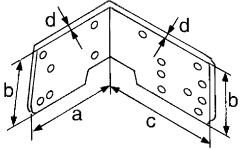
## Special Service Tools

NEST0003

NEST0003S02

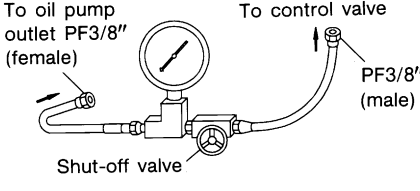
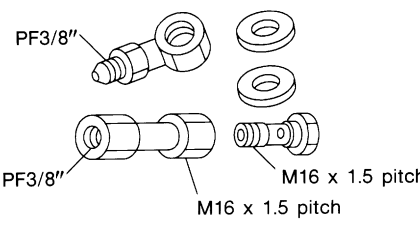
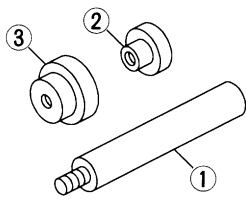
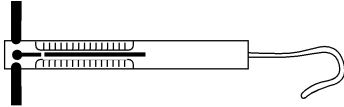
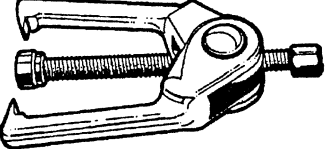
### POWER STEERING

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: 11.5 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 <b>ST</b> 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 style="text-align: center;">NT547</p>	Measuring oil pressure
KV48102500 ( — ) Pressure gauge adapter	 <p style="text-align: center;">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 style="text-align: center;">NT174</p>	Installing oil seal
(J44372) 5-60 Pound pull gauge		Measuring steering wheel turning force
(J-24319-B) Tie rod puller	 <p style="text-align: center;">LST092</p>	Remove outer tie rod

# NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

## NVH Troubleshooting Chart

NEST0004S01

Symptom	STEERING	SUSPECTED PARTS (Possible cause)																	Reference page						
		Fluid level	Air in hydraulic system	Tie-rod ball joint swinging force	Tie-rod ball joint rotating torque	Tie-rod ball joint end play	Steering gear fluid leakage	Steering wheel play	Steering gear turning force	Drive belt looseness	Improper steering wheel	Improper installation or looseness of tilt lock lever (if equipped)	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	
Noise		X	X	X	X	X	X	X	X	X					X	X	X	X	X	X	X	X	X	X	ST-7
Shake											X	X			X		X	X	X	X	X	X	X	X	ST-8
Vibration											X	X	X	X	X		X	X	X	X	X	X			ST-23
Shimmy											X	X			X				X	X	X	X	X	X	ST-23
Judder															X				X	X	X	X	X	X	ST-8
																									ST-6
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																									ST-14
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																									ST-11
																									ST-21
																									Refer to PD-4, NVH.
																									Refer to PD-4, NVH.
																									Refer to AX-4, NVH.
																									Refer to AX-4, NVH.
																									Refer to SU-3, NVH.
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																									Refer to SU-3, NVH.
																									Refer to BR-8, NVH.

X: Applicable

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**ST**

RS

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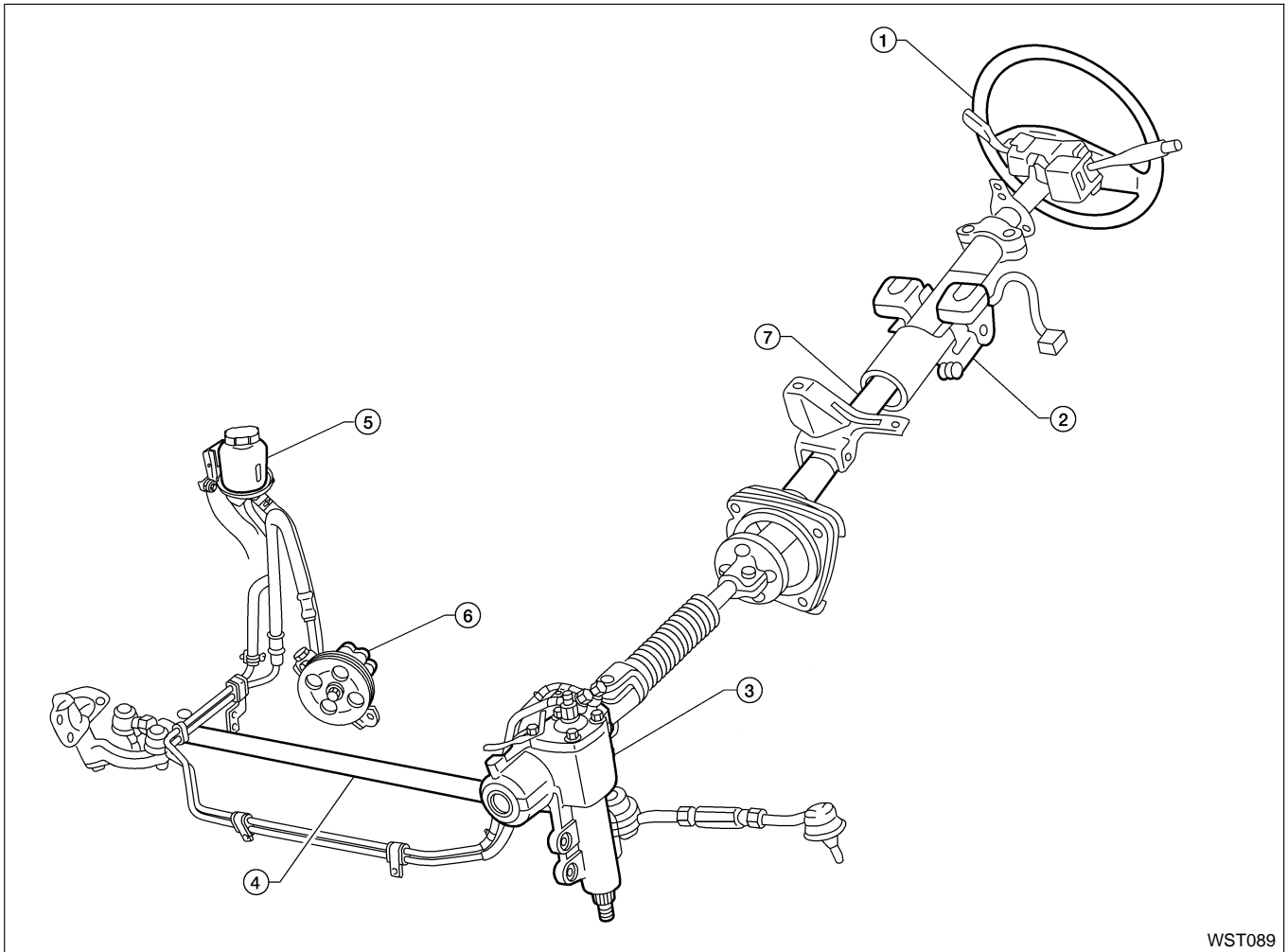
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# ON-VEHICLE SERVICE

Steering System

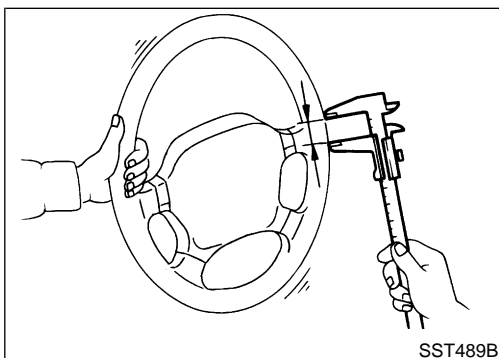
## Steering System

NEST0005



WST089

- |                                 |                            |                            |
|---------------------------------|----------------------------|----------------------------|
| 1. Steering wheel               | 4. Steering linkage        | 6. Power steering oil pump |
| 2. Tilt mechanism (if equipped) | 5. Power steering oil tank | 7. Steering column         |
| 3. Steering gear assembly       |                            |                            |



SST489B

### Checking Steering Wheel Play

NEST0006

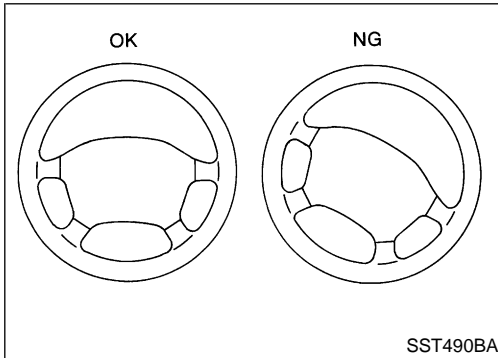
- Place wheels in straight ahead position and check steering wheel play.

#### 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 "STEERING COLUMN", ST-12.
  - b) Front suspension and axle. Refer to **AX-4**, "Front Axle Parts" and **SU-7**, "Front Suspension Parts".

- c) Steering gear. Refer to "Description", ST-15.



## Checking Neutral Position on Steering Wheel

NEST0007

### PRE-CHECKING

NEST0007S01

- Make sure that wheel alignment is correct.

#### Wheel alignment:

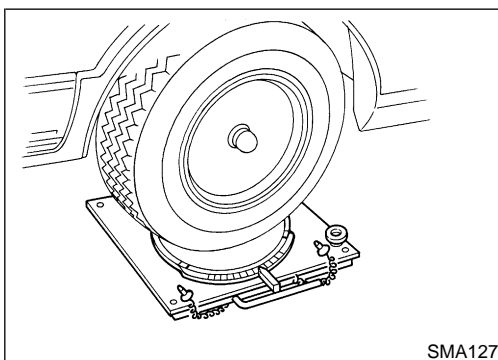
Refer to **SU-21**, "Wheel Alignment (Unladen\*1)".

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

### CHECKING

NEST0007S02

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

NEST0008

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

#### Turning angle of full turns:

Refer to **SU-11**, "Front Wheel Turning Angle".

2. If it is not within specification, check stopper bolt adjustment. Refer to **SU-11**, "Front Wheel Turning Angle".

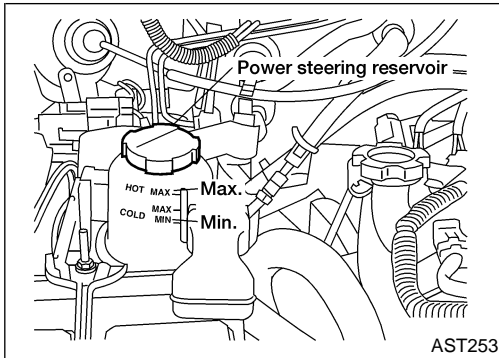
## Checking and Adjusting Drive Belts

NEST0009

Refer to **MA-16**, "Checking Drive Belts" (KA24DE) or **MA-26**, "Checking Drive Belts" (VG33E and VG33ER).

# ON-VEHICLE SERVICE

## Checking Fluid Level



## Checking Fluid Level

NEST0010

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-13, "RECOMMENDED FLUIDS AND LUBRICANTS".

## Checking Fluid Leakage

NEST0011

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.

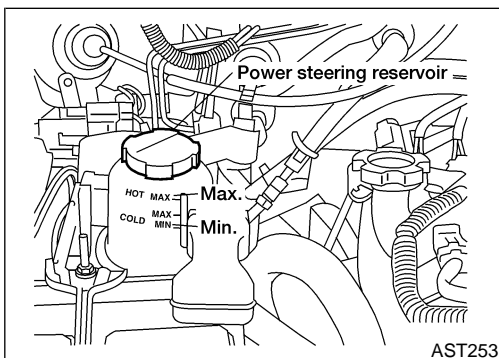
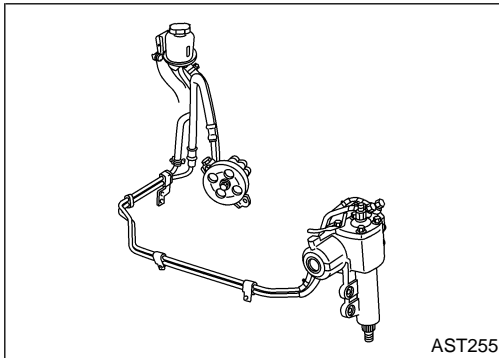
**Do not overtighten connector as this can damage O-ring, washer and connector.**

5. If fluid leakage from power steering pump is noticed, check power steering pump. Refer to "Pre-disassembly Inspection", ST-18.
6. If fluid leakage from power steering gear is noticed, check power steering gear. Refer to "Inspection and Adjustment", ST-16.

## Bleeding Hydraulic System

NEST0012

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.

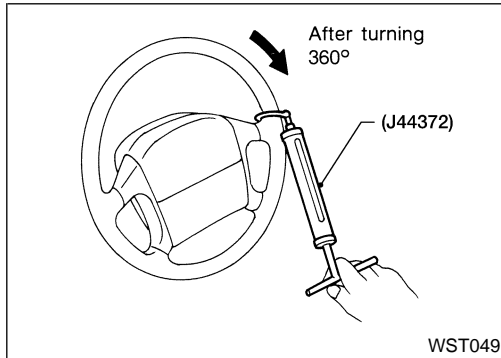
● Incomplete air bleeding will cause the following to occur:

- a) Air bubbles in reservoir tank
- b) Clicking noise in power steering pump
- c) Excessive buzzing in power steering pump



When 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

NEST0013

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).]

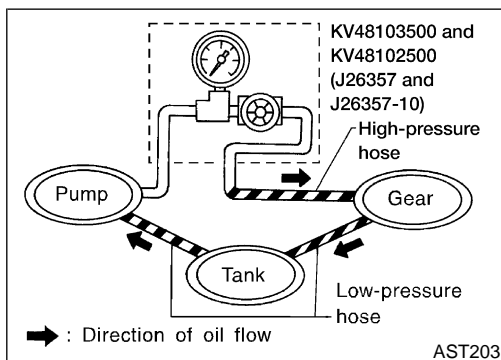
**Tires need to be inflated to normal pressure.**

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

**Steering wheel turning force:**

**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 "Inspection", ST-14.
  - c. Front suspension and axle. Refer to **AX-4**, "Front Axle Parts" and **SU-7**, "Front Suspension Parts".
  - d. Steering gear turning torque. Refer to "TURNING TORQUE MEASUREMENT", ST-16.



## Checking Hydraulic System

NEST0014

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:**

**7,551 - 8,336 kPa (77 - 85 kg/cm<sup>2</sup>, 1,095 - 1,209 psi) at idle**

- If pressure reaches maximum operating pressure, system is OK.

## ON-VEHICLE SERVICE

### Checking Hydraulic System (Cont'd)

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- If pressure increases above maximum operating pressure, check power steering pump flow control valve. Refer to “Components”, ST-18.
- 4. If power steering pressure is below the maximum operating pressure, slowly close shut-off valve and check pressure again.

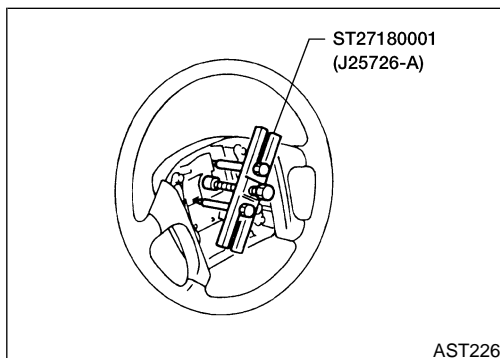
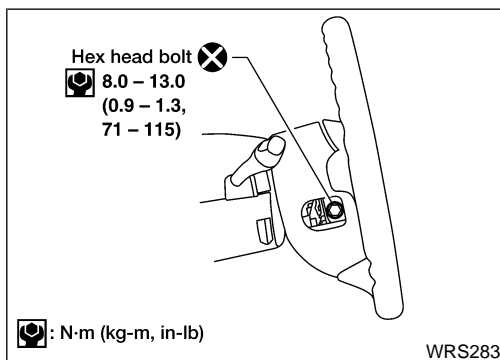
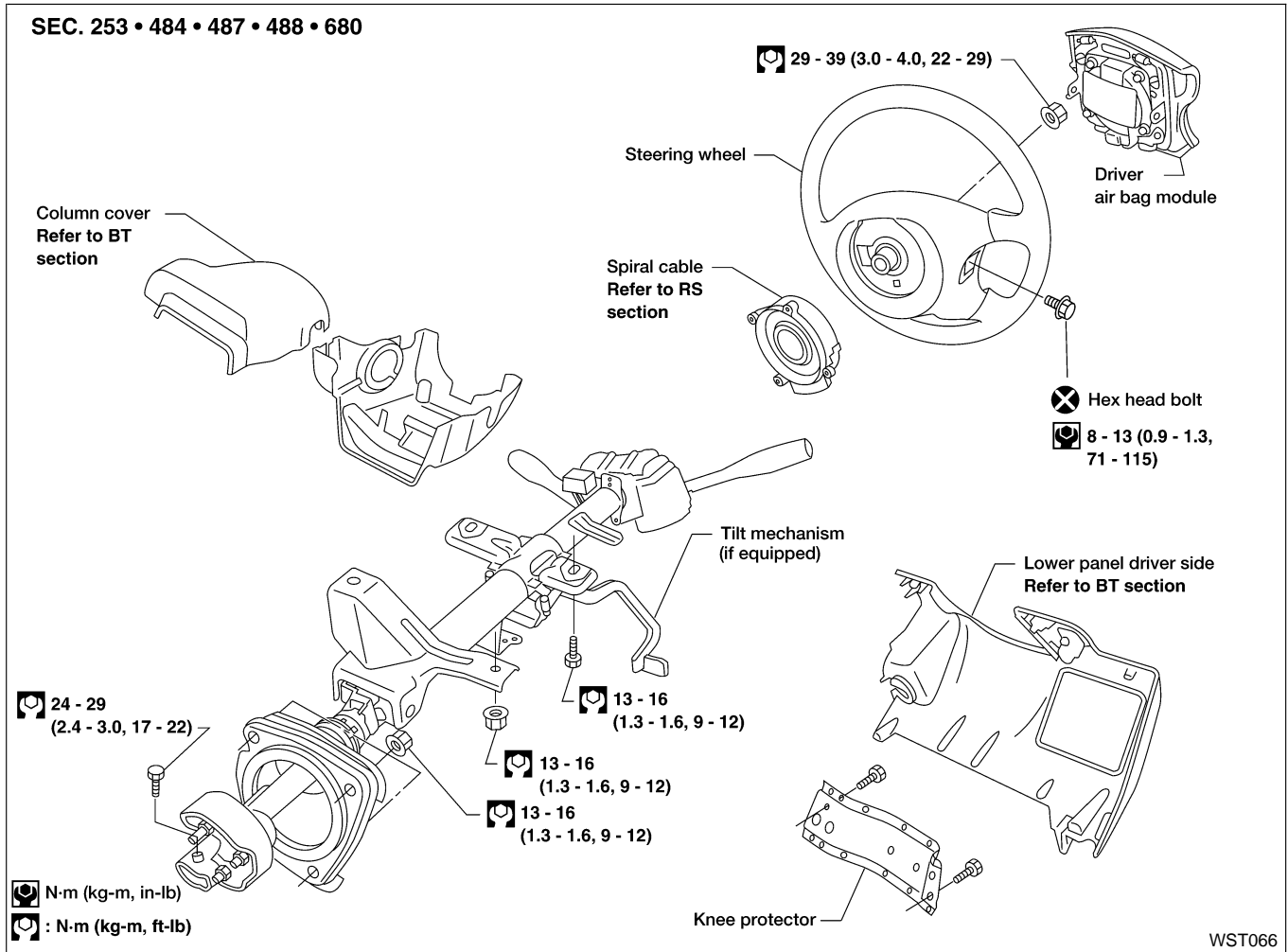
**CAUTION:**

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

- If pressure increases to maximum operating pressure, gear is damaged. Refer to “Removal and Installation”, ST-15.
- If pressure remains below maximum operating pressure, pump is damaged. Refer to “Components”, ST-18.
- 5. After checking hydraulic system, remove Tool and add fluid as necessary. Completely bleed air out of system. Refer to “Bleeding Hydraulic System”, ST-8.

## Components

NEST0015



## Removal and Installation

### STEERING WHEEL

NEST0016

NEST0016S01

1. Remove air bag module and spiral cable. Refer to **RS-19**, "Driver Air Bag Module and Spiral Cable".
2. Disconnect horn connector and remove steering wheel nut.
3. Remove steering wheel using Tool.
  - For installation, Refer to **RS-19**, "Driver Air Bag Module and Spiral Cable".

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# STEERING WHEEL AND STEERING COLUMN

Removal and Installation (Cont'd)

## STEERING COLUMN

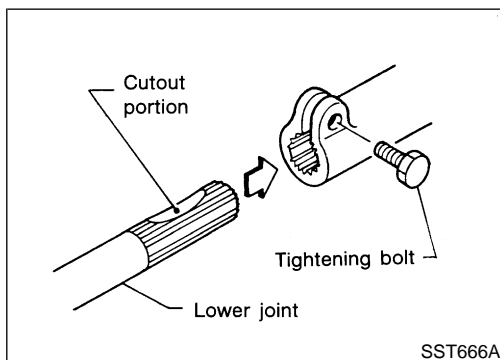
NEST0016S02

### Removal

NEST0016S0201

#### 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 “STEERING WHEEL”, ST-11.
1. Remove steering wheel, refer to “STEERING WHEEL”, ST-11.
  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

NEST0016S0202

- 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-19**, “Driver Air Bag Module and Spiral Cable”.

#### CAUTION:

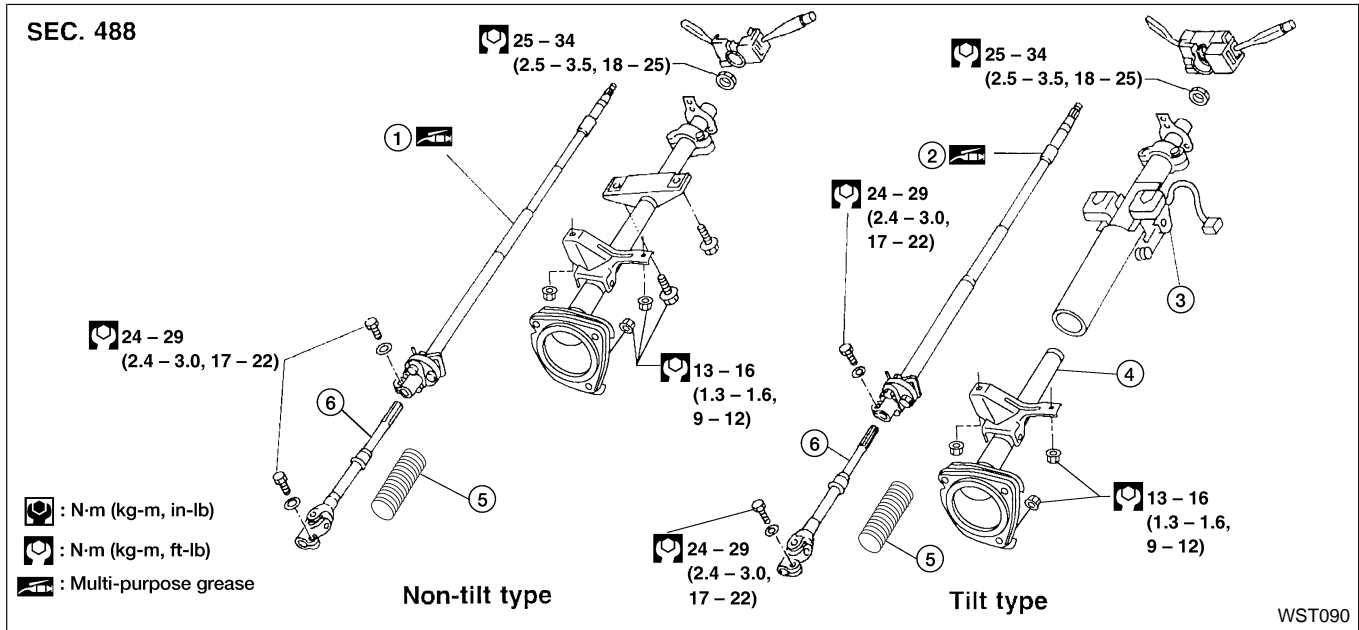
After installation, turn steering wheel to make sure it moves smoothly. Ensure the number of turns from the straight forward position to left and right locks are the same. Be sure that the steering wheel is in a neutral position when driving straight ahead.

# STEERING WHEEL AND STEERING COLUMN

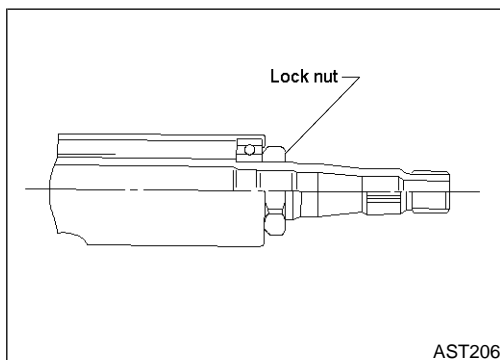
Disassembly and Assembly

## Disassembly and Assembly

NEST0017

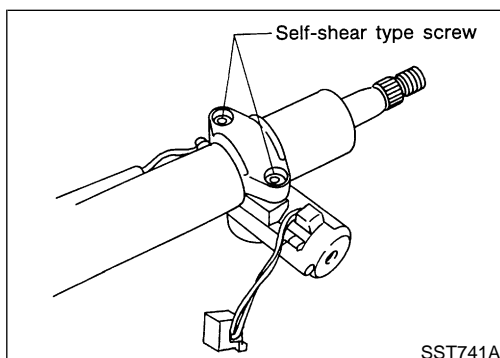


- |  |                        |                                |
|--|------------------------|--------------------------------|
| 1. Steering column shaft               | 4. Lower tube assembly | 6. Steering column lower shaft |
| 2. Steering column upper shaft         | 5. Bellows             |                                |
| 3. Tilt mechanism (Do not disassemble) |                        |                                |



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

**☑ : 25 - 34 N-m (2.5 - 3.5 kg-m, 18 - 25 ft. lb)**

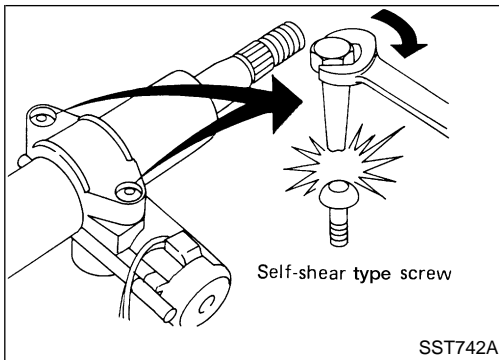


- Steering lock
  - a) Break self-shear type screws using a drill or other appropriate tool.

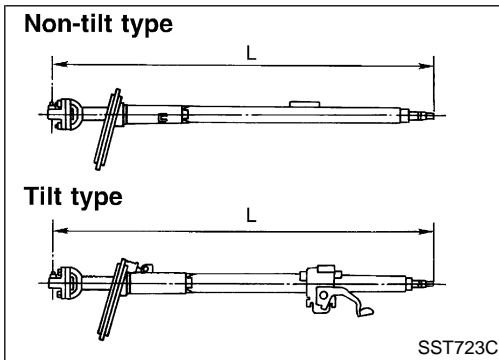
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# STEERING WHEEL AND STEERING COLUMN

Disassembly and Assembly (Cont'd)



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



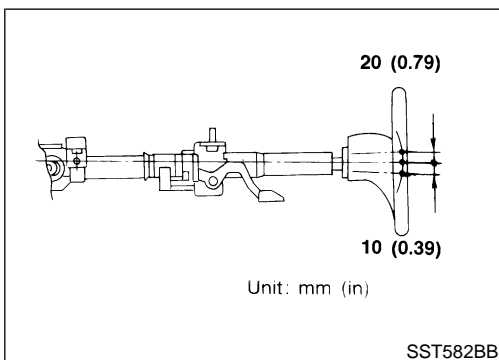
## Inspection

NEST0018

- 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 - 864.7 mm (33.980 - 34.043 in)**



## TILT MECHANISM

NEST0018S01

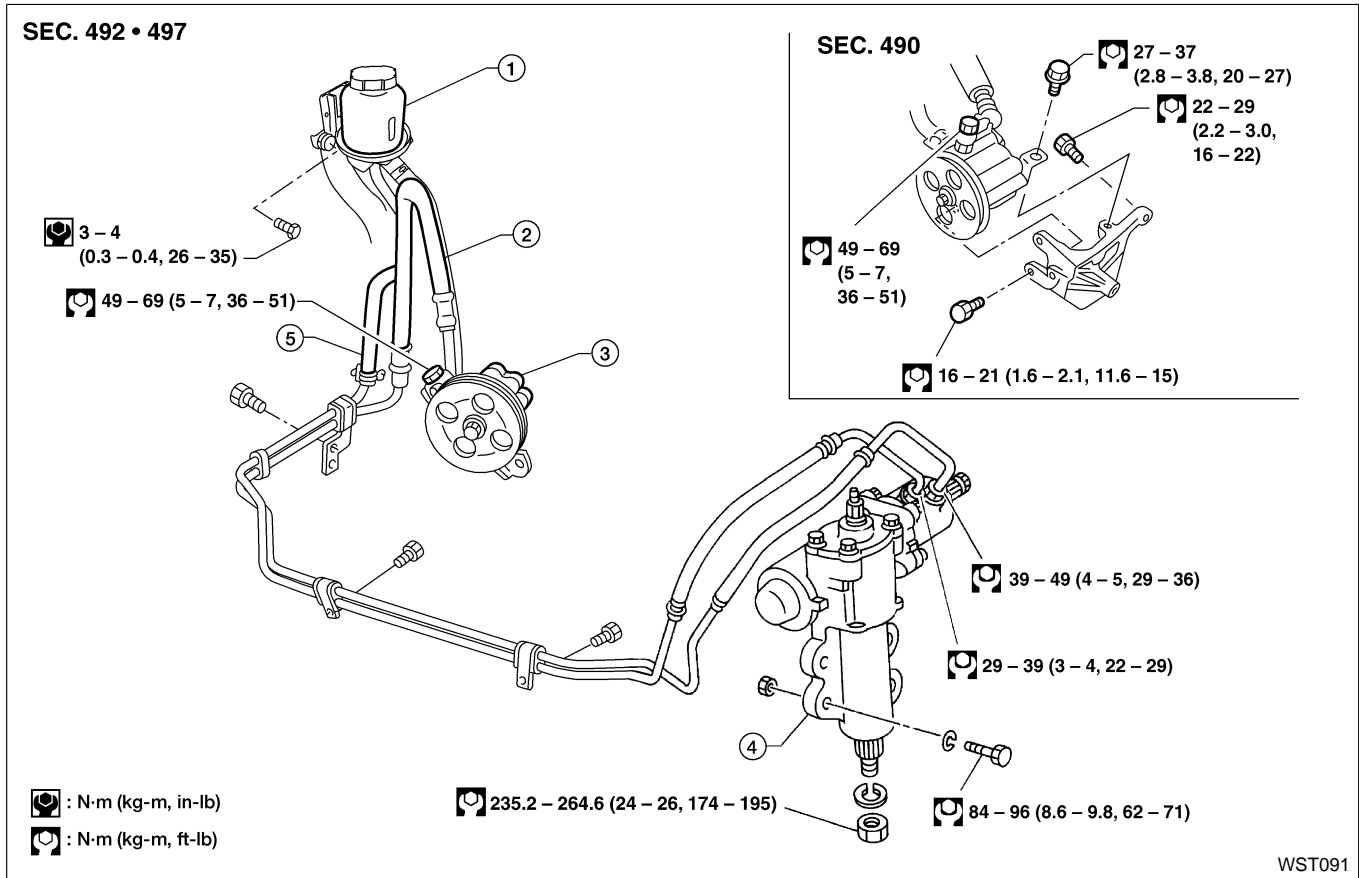
After installing steering column, check tilt mechanism operation (if equipped).

# POWER STEERING GEAR (MODEL: D600)

Description

## Description

NEST0059



- |                            |                            |                      |
|----------------------------|----------------------------|----------------------|
| 1. Power steering oil tank | 3. Power steering oil pump | 5. Low pressure hose |
| 2. High pressure hose      | 4. Steering gear           |                      |

### 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.

NEST0061


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# POWER STEERING GEAR (MODEL: D600)


Removal and Installation (Cont'd)

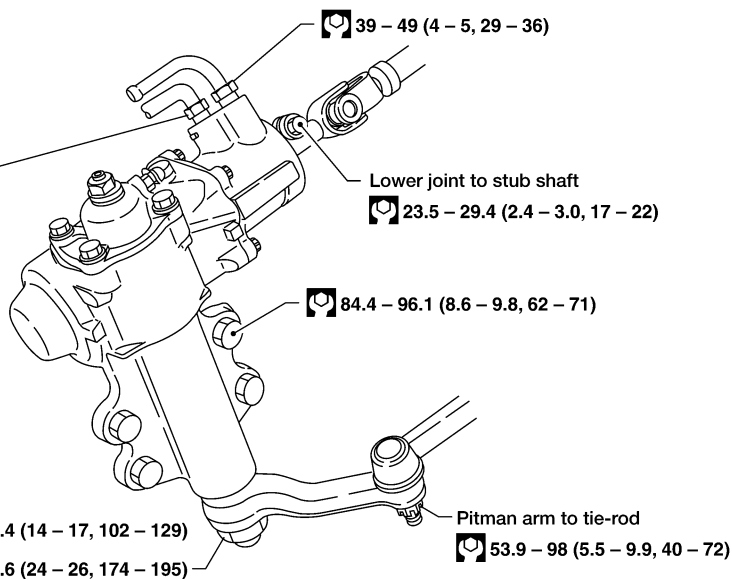
## SEC. 492

- 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.

KA24DE:  137.2 - 175.4 (14 - 17, 102 - 129)

VG33E and VG33ER:  235.2 - 264.6 (24 - 26, 174 - 195)

 : N·m (kg·m, ft·lb)



WST067

## Inspection and Adjustment

NEST0062

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

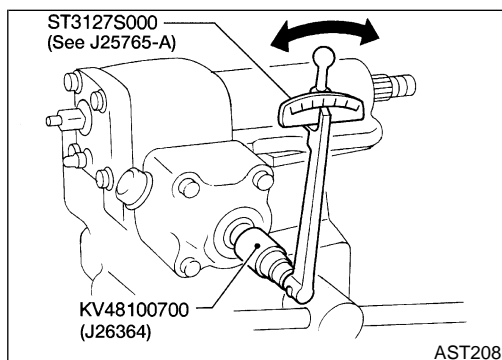
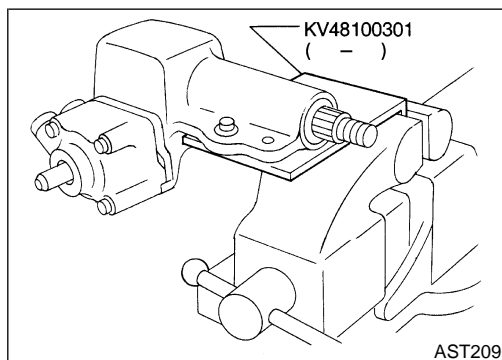
Check sealing portion.

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

## TURNING TORQUE MEASUREMENT

NEST0062S01

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.

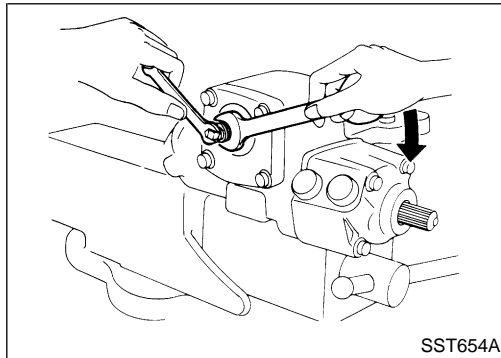
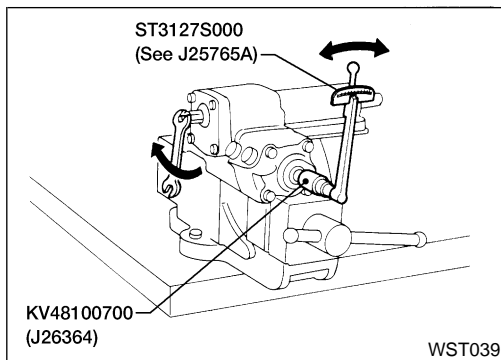
Turning torque at 360°:

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 - 0.80 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 (17.3 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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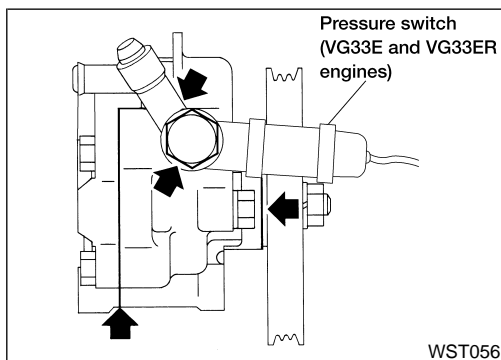
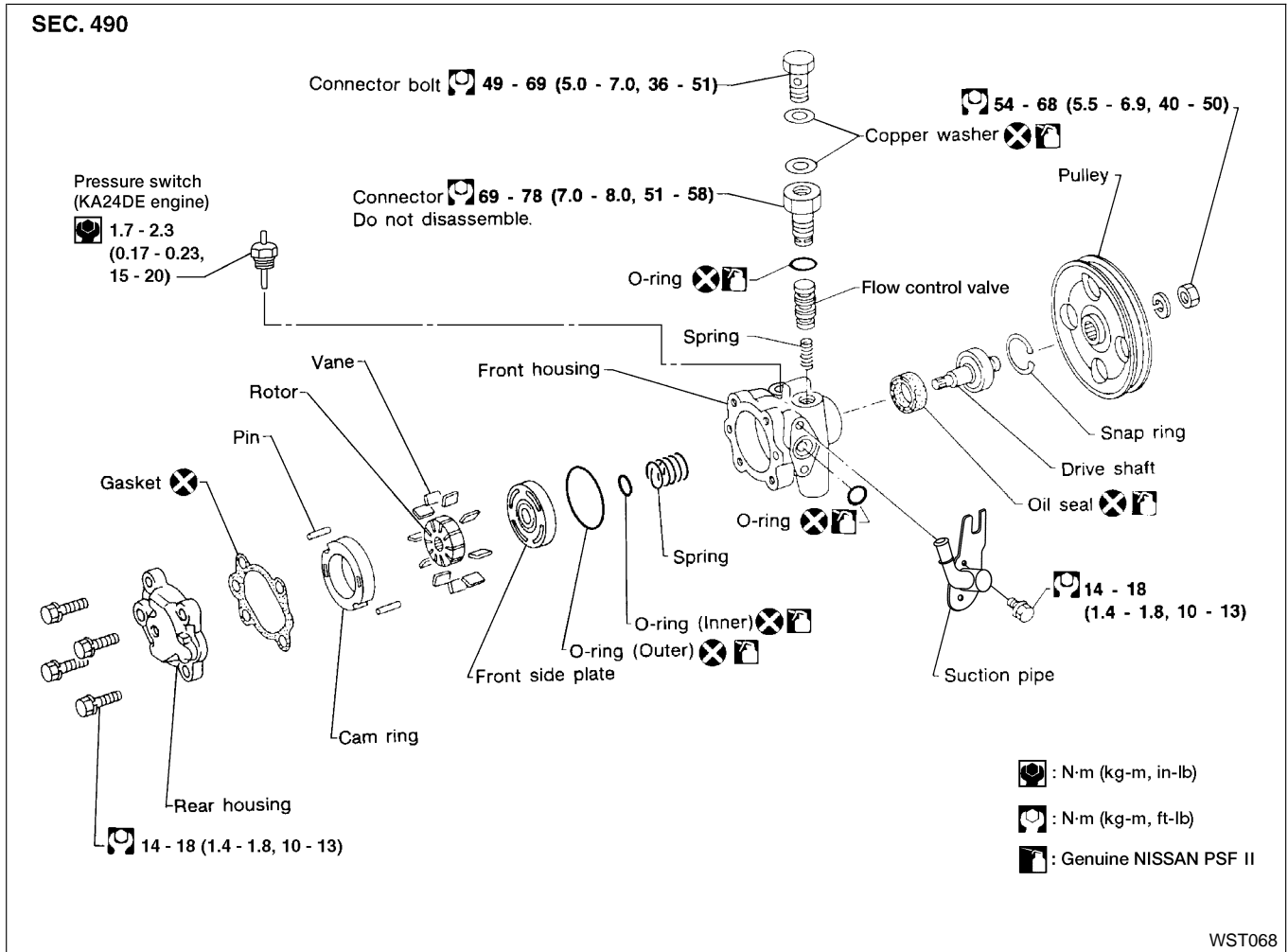
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# POWER STEERING OIL PUMP

Components

## Components

NEST0036



## Pre-disassembly Inspection

NEST0037

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

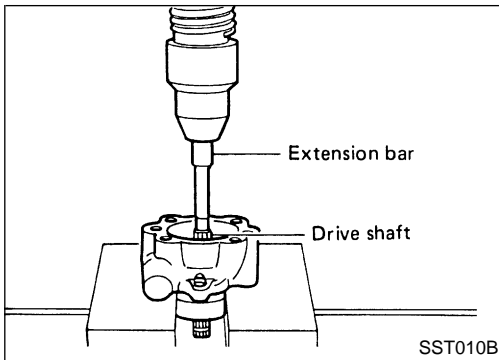
NEST0038

### CAUTION:

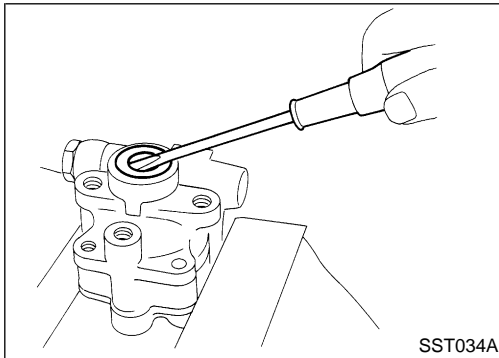
- Parts which can be disassembled are strictly limited. Never disassemble parts other than those specified.
- Disassemble in as clean a place as possible.
- Clean your hands before disassembly.
- Do not use rags; use nylon cloths or paper towels.
- When disassembling and reassembling, do not let foreign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

# POWER STEERING OIL PUMP

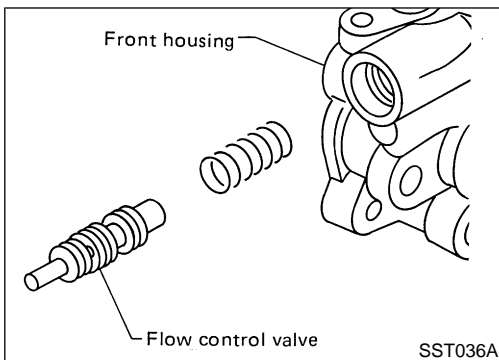
Disassembly (Cont'd)



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



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

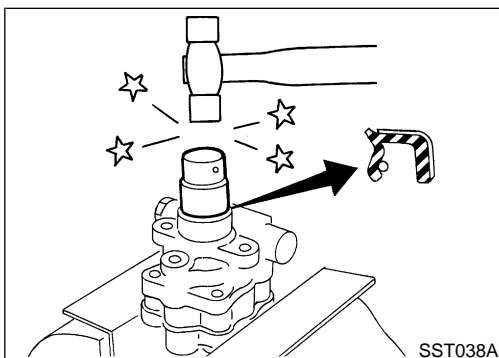


- 3) Remove connector and flow control valve with spring.
  - **Be careful not to drop flow control valve.**

## Inspection

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

NEST0039



## 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.

NEST0040

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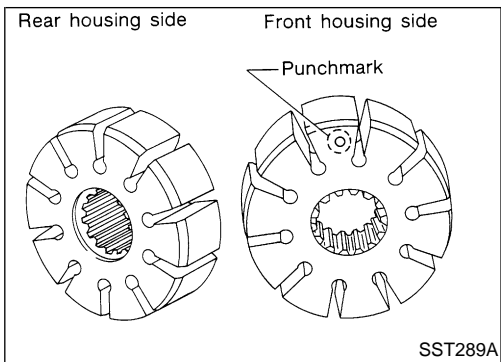
SC

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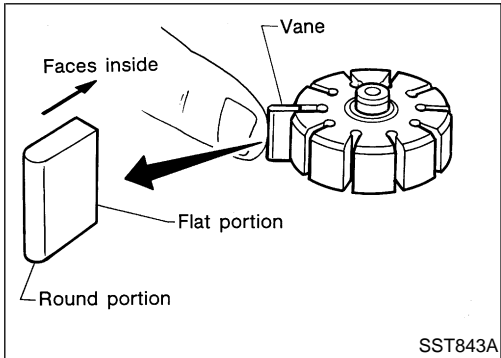
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# POWER STEERING OIL PUMP

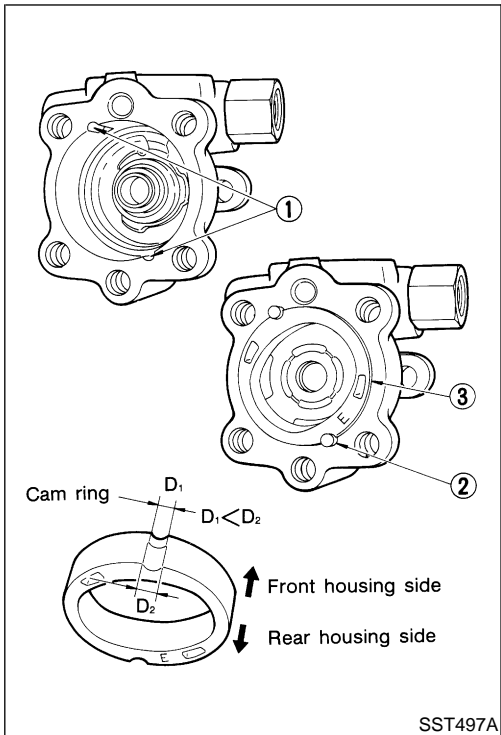
Assembly (Cont'd)



- 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.

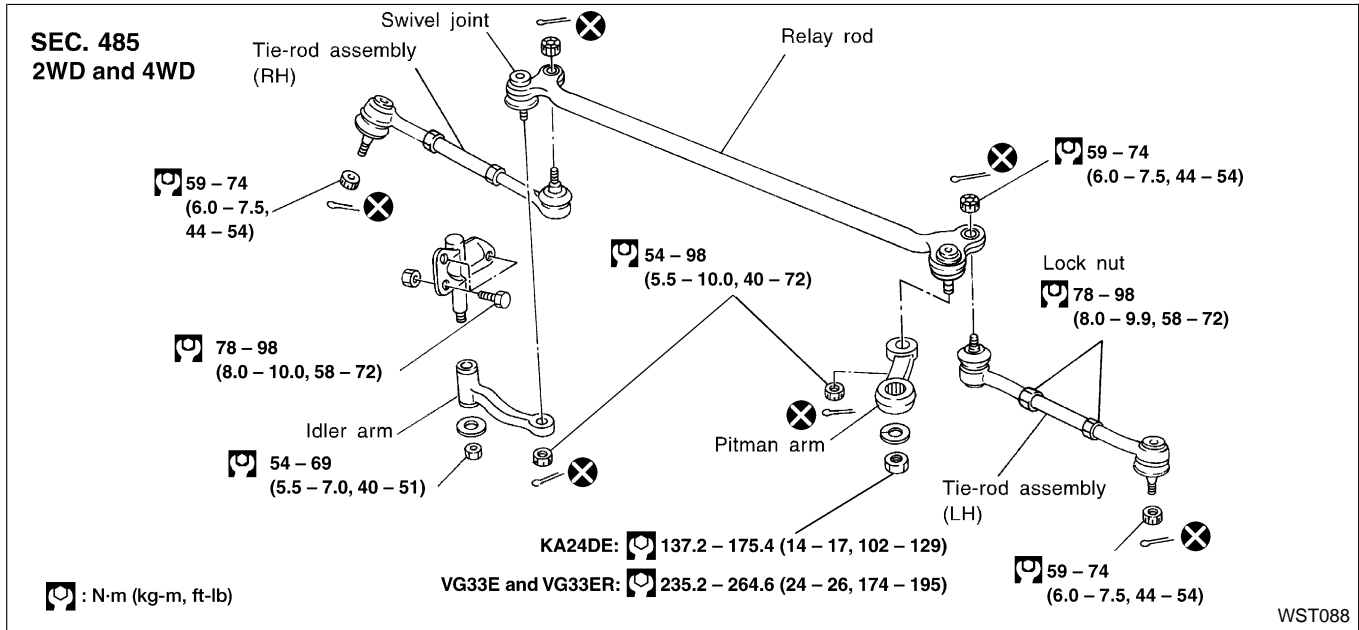
**Cam ring:**

**$D_1$  is less than  $D_2$**

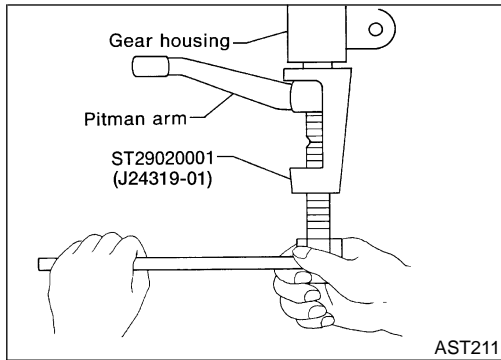
# STEERING LINKAGE

Components

NEST0041



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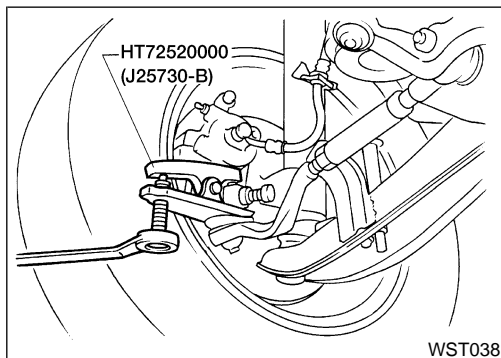


## Removal and Installation

Remove pitman arm with Tool.

NEST0042

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Remove tie-rod from knuckle arm with Tool.

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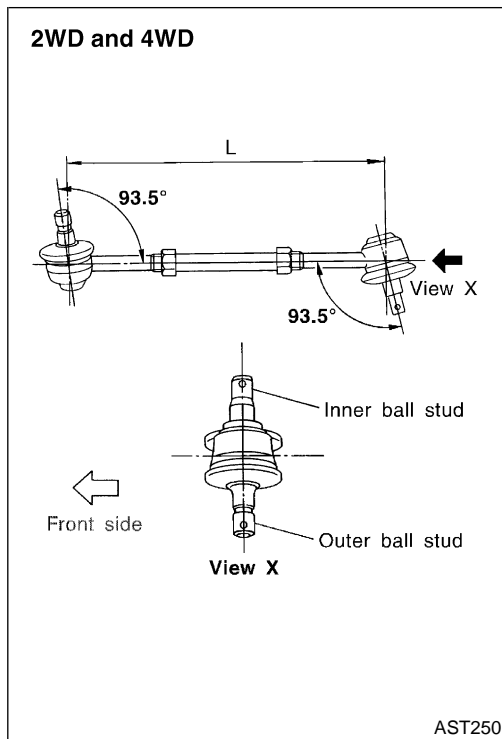
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# STEERING LINKAGE

Disassembly and Assembly



## Disassembly and Assembly

### IDLER ARM ASSEMBLY

NEST0043

NEST0043S01

- 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

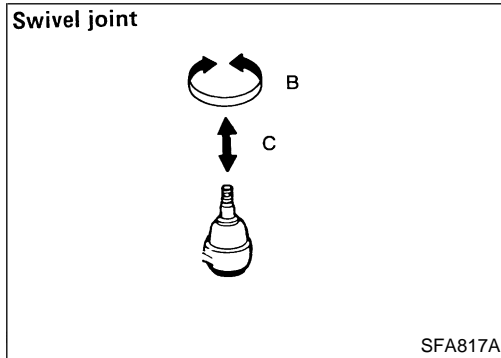
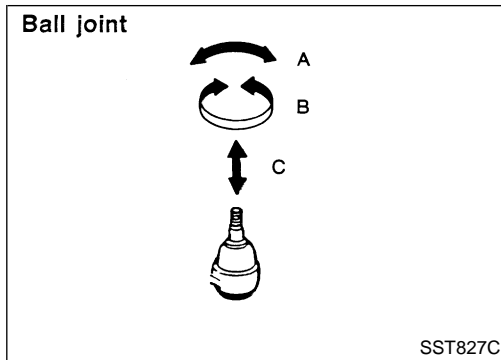
NEST0043S02

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 dimension before toe-in adjustment**  
**2WD and 4WD: 297.6 mm (11.72 in)**

### 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

=NEST0044

NEST0044S01

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

NEST0044S02

- 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

NEST0044S03

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

### FIXING LOCATION

NEST0044S04

- 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

NEST0045

Engine	KA24DE	VG33E and VG33ER
Steering column type (Collapsible)	Tilt or Non-tilt	
	2WD, 4WD	
Steering gear type	D600	
Turns of steering wheel on the vehicle (Lock-to-lock)	3.7	3.4
Steering gear ratio	18.1	17.6

### Steering Wheel

NEST0046  
Unit: mm (in)

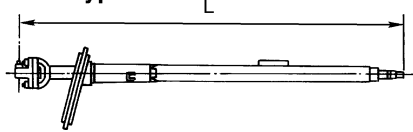
Steering wheel axial play	0 (0)
Steering wheel play	35 (1.38) or less

### Steering Column

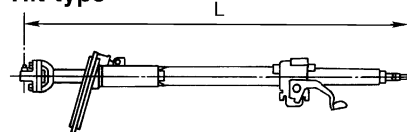
NEST0047  
Unit: mm (in)

Dimension "L"	863.1 - 864.7 (33.980 - 34.043)
---------------	---------------------------------

Non-tilt type



Tilt type



SST841C

### Power Steering Gear

#### MODEL: D600

NEST0049

NEST0049S03

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	7,551 - 8,336 kPa (77 - 85 kg/cm <sup>2</sup> , 1,095 - 1,209 psi) at idle	
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	0.20 - 0.90 N-m (2.0 - 9.2 kg-cm, 1.8 - 8.0 in-lb)
	Straight-ahead position (As compared with steering wheel turned 360°)	0.45 - 0.80 N-m (4.6 - 8.2 kg-cm, 4.0 - 7.1 in-lb) higher
	Maximum turning torque	1.7 N-m (17.3 kg-cm, 15.0 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)

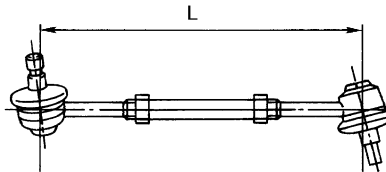
Steering Linkage

## Steering Linkage

NEST0050

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

### 2WD and 4WD



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## NOTES