

SECTION **ST**
STEERING SYSTEM

A
 B
 C
 D
 E
 F
ST
 H
 I
 J
 K
 L
 M
 N
 O
 P

CONTENTS

PRECAUTION	3	STEERING GEAR AND LINKAGE	17
PRECAUTIONS	3	Exploded View	17
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"	3	Removal and Installation	17
Precaution Necessary for Steering Wheel Rotation after Battery Disconnect	3	POWER STEERING OIL PUMP	19
Precaution for Steering System	4	QR25DE	19
SYMPTOM DIAGNOSIS	5	QR25DE : Exploded View	19
NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING	5	QR25DE : Removal and Installation	19
NVH Troubleshooting Chart	5	VQ35DE	19
PREPARATION	6	VQ35DE : Exploded View	20
PREPARATION	6	VQ35DE : Removal and Installation	20
Special Service Tool	6	HYDRAULIC LINE	21
Commercial Service Tool	7	QR25DE	21
PERIODIC MAINTENANCE	8	QR25DE : Component Parts Location	21
POWER STEERING FLUID	8	QR25DE : Removal and Installation	22
Inspection	8	VQ35DE	22
Draining	8	VQ35DE : VQ35DE: Component Parts Location - 17 Inch Tire	22
Refilling	8	VQ35DE : VQ35DE: Component Parts Location - 18 Inch Tire	24
STEERING WHEEL	10	UNIT DISASSEMBLY AND ASSEMBLY ...	27
Inspection	10	STEERING COLUMN	27
POWER STEERING OIL PUMP	12	Disassembly and Assembly	27
Inspection	12	STEERING GEAR AND LINKAGE	28
REMOVAL AND INSTALLATION	13	Exploded View	28
STEERING WHEEL	13	Disassembly	28
Removal and Installation	13	Inspection	28
STEERING COLUMN	14	Assembly	29
Exploded View	14	POWER STEERING OIL PUMP	31
Removal and Installation	14	QR25DE	31
		QR25DE : Disassembly and Assembly	31
		VQ35DE	32
		VQ35DE : Disassembly and Assembly	32

SERVICE DATA AND SPECIFICATIONS	
(SDS)	34
SERVICE DATA AND SPECIFICATIONS	
(SDS)	34
Steering Wheel	34

Steering Angle	34
Steering Column	34
Steering Gear	35
Oil Pump	36
Steering Fluid	36

PRECAUTIONS

< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:000000007423307

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SR 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 SR 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 WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Precaution Necessary for Steering Wheel Rotation after Battery Disconnect

INFOID:000000007423308

NOTE:

- Before removing and installing any control units, first turn the push-button ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

This vehicle is equipped with a push-button ignition switch and a steering lock unit.

If the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.

NOTE:

Supply power using jumper cables if battery is discharged.

2. Carry the Intelligent Key or insert it to the key slot and turn the push-button ignition switch to ACC position. (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.

PRECAUTIONS

< PRECAUTION >

5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT.

Precaution for Steering System

INFOID:000000007423309

- 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 cloth or paper towels to clean the parts; common shop rags can leave lint that might interfere with their operation.
- Before inspection or reassembly, carefully clean all parts with a general purpose, non-flammable solvent.
- Before assembly, apply a coat of recommended Genuine NISSAN PSF or equivalent to hydraulic parts. Petroleum jelly may be applied to O-rings and seals. Do not use any grease.
- Replace all gaskets, seals and O-rings. Avoid damaging O-rings, seals and gaskets during installation. Perform functional tests whenever designated.

PREPARATION

< PREPARATION >

PREPARATION

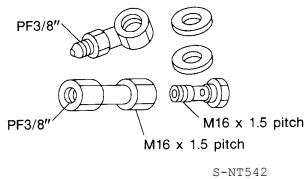
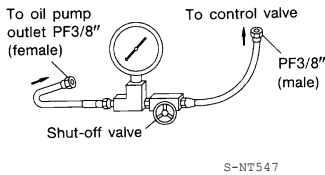
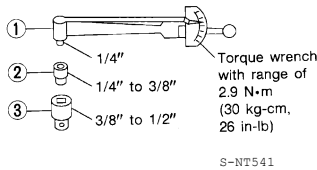
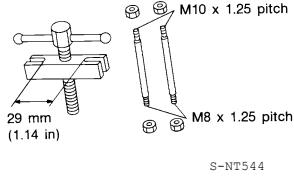
PREPARATION

Special Service Tool

INFOID:000000007423311

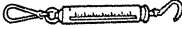
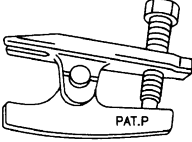
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
ST27180001 (J-25726-A) Steering wheel puller	Removing steering wheel
ST3127S000 (See J-25765-A) Preload gauge 1. GG9103000 (J-25765-A) Torque wrench 2. HT62940000 (-) Socket adapter 3. HT62900000 (-) Socket adapter	Inspecting of rotating torque for ball joint
KV48103500 (J-26357) Pressure gauge	Measuring oil pump relief pressure
KV48102500 (J-33914) Pressure gauge adapter	Measuring oil pump relief pressure



PREPARATION

< PREPARATION >


Tool number (Kent-Moore No.) Tool name	Description
— (J-44372) Pull gauge  LST024	Measuring steering wheel turning force and ball joint swinging force
HT72520000 (J-25730-A) Ball joint remover  NT146	Removing ball joint

A
B
C
D
E
F

Commercial Service Tool

INFOID:000000007423312

ST

Tool number Tool name	Description
Power tool  PIIB1407E	Loosening nuts, screws and bolts

H
I
J
K
L
M
N
O
P

POWER STEERING FLUID

< PERIODIC MAINTENANCE >

PERIODIC MAINTENANCE

POWER STEERING FLUID

Inspection

INFOID:000000007423313

FLUID LEVEL

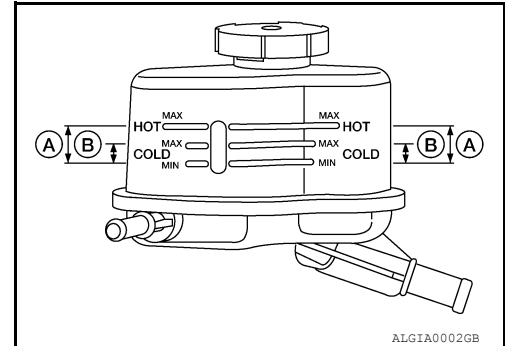
- Check fluid level with engine stopped.
- Make sure that fluid level is between MIN and MAX.
- Fluid levels at HOT (A) and COLD (B) are different. Do not confuse them.

HOT (A) : Fluid temperature 50°- 80°C (122°- 176°F)

COLD (B) : Fluid temperature 0°- 30°C (32°- 86°F)

CAUTION:

- The fluid level should not exceed the MAX line. Excessive fluid will cause fluid leakage from the cap.
- Do not reuse drained power steering fluid.
- Recommended fluid is Genuine Nissan PSF or equivalent.



FLUID LEAKAGE

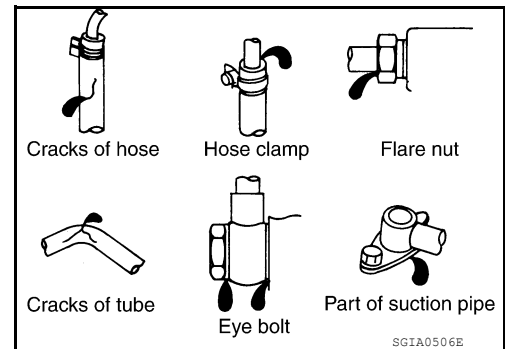
Check hydraulic connections for fluid leakage, cracks, damage, looseness, or wear.

1. Run engine until the fluid temperature reaches 50° to 80° C (122° to 176°F) in reservoir tank, and keep engine speed idle.
2. Turn steering wheel several times from full left stop to full right stop.
3. Hold steering wheel at each lock position for five seconds and carefully, check for fluid leakage.

CAUTION:

Do not hold the steering wheel in a locked position for more than 10 seconds. (There is the possibility that oil pump may be damaged.)

4. If fluid leakage at connections 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 oil pump is noticed, check oil pump. Refer to [ST-19. "QR25DE : Removal and Installation"](#) (QR25DE), [ST-20. "VQ35DE : Removal and Installation"](#) (VQ35DE).
6. Check steering gear boots for accumulation of fluid indicating leak from steering gear.



Draining

INFOID:000000007423314

1. Disconnect both high and low pressure lines from power steering gear.
2. Drain into a suitable container.

Refilling

INFOID:000000007423315

FILLING HYDRAULIC SYSTEM

1. Fill power steering reservoir while checking fluid level.
2. Bleed air from hydraulic system.
3. Check for fluid leaks.

AIR BLEEDING HYDRAULIC SYSTEM

CAUTION:

If air bleeding is not complete, the following symptoms can be observed.

- Bubbles are created in reservoir tank.
- Clicking noise can be heard from oil pump.
- Excessive buzzing in the oil pump.

NOTE:

POWER STEERING FLUID

< PERIODIC MAINTENANCE >

Fluid noise may occur in the steering gear or oil pump. This does not affect performance or durability of the system.

1. Turn steering wheel several times from full left stop to full right stop with engine off.

CAUTION:

Turn steering wheel while filling reservoir tank with fluid so as not to lower fluid level below the MIN line.

2. Start engine and hold steering wheel at each lock position for 3 seconds at idle to check for fluid leakage.
3. Repeat step 2 above several times at approximately 3 second intervals.

CAUTION:

Do not hold the steering wheel in a locked position for more than 10 seconds. (There is the possibility that oil pump may be damaged.)

4. Check fluid for bubbles and white contamination.
5. Stop engine if bubbles and white contamination do not drain out. Perform step 2 and 3 above after waiting until bubbles and white contamination drain out.
6. Stop the engine, and then check fluid level.

A

B

C

D

E

F

ST

H

I

J

K

L

M

N

O

P

STEERING WHEEL

< PERIODIC MAINTENANCE >

STEERING WHEEL

Inspection

INFOID:000000007423316

INSTALLATION CONDITION

- Check installation conditions of steering gear assembly, front suspension assembly, axle and steering column assembly.
- Check if movement exists when steering wheel is moved up and down, to the left and right and to the axial direction.

Steering wheel axial end play : Refer to [ST-34, "Steering Wheel"](#).

- Check steering gear assembly bolts and nut for looseness. Refer to [ST-17, "Exploded View"](#).

STEERING WHEEL PLAY

- Turn steering wheel so that front wheels come to the straight-ahead position. Start engine and lightly turn steering wheel to the left and right until front wheels start to move. Measure steering wheel movement on the outer circumference.

Steering wheel play : Refer to [ST-34, "Steering Wheel"](#).

- When the measurement value is outside the standard value, check backlash for each joint of steering column assembly and installation condition of steering gear assembly.

NEUTRAL POSITION OF STEERING WHEEL

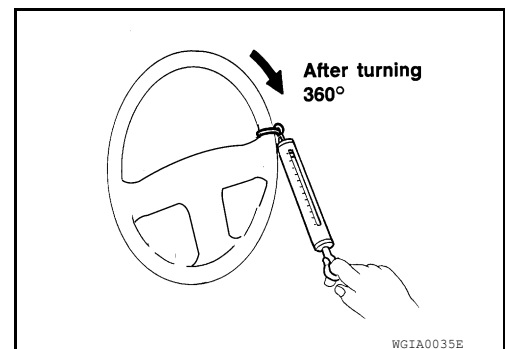
- Make sure that steering gear assembly, steering column assembly and steering wheel are installed in the correct position.
- Perform neutral position inspection after wheel alignment. Refer to [FSU-7, "Inspection and Adjustment"](#).
- Set vehicle to the straight-ahead position and confirm steering wheel is in the neutral position.
- Loosen outer socket lock nut and turn inner socket to left and right equally to make fine adjustments if steering wheel is not in the neutral position.

STEERING WHEEL TURNING FORCE

1. Park vehicle on a level, dry surface and set parking brake.
2. Start engine.
3. Bring power steering fluid up to adequate operating temperature. Make sure the fluid temperature is approximately 50° to 80°C (122° to 176°F).
Tires need to be inflated to normal pressure.
4. Check steering wheel turning force using tool when steering wheel has been turned 360° from the neutral position.

Tool number : — (J-44372)
Steering wheel turning force : Refer to [ST-34, "Steering Wheel"](#).

5. If steering wheel turning force is out of specification, check rack sliding force. Refer to [ST-28, "Inspection"](#).
6. If rack sliding force is not within specifications, adjust rack sliding force. Refer to [ST-28, "Inspection"](#).
7. If rack sliding force is OK, inspect steering column. Refer to [ST-14, "Removal and Installation"](#).

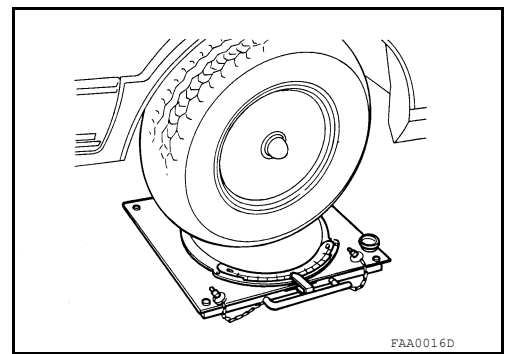


FRONT WHEEL TURNING ANGLE

STEERING WHEEL

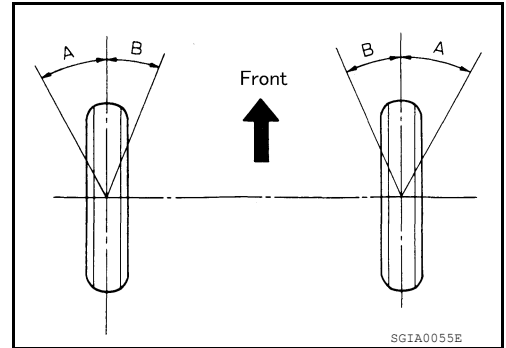
< PERIODIC MAINTENANCE >

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



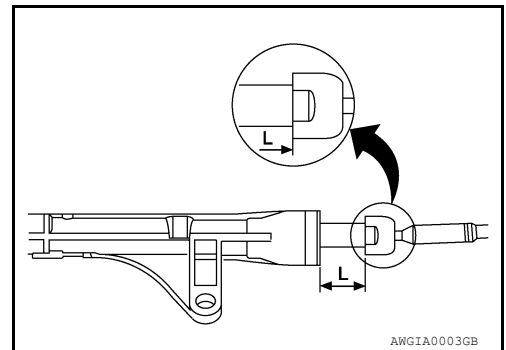
- With the engine at idle, turn steering wheel from full left stop to full right stop and measure the steering angles.

Inner wheel (Angle: A) : Refer to [ST-34, "Steering Angle"](#).
Outer wheel (Angle: B) : Refer to [ST-34, "Steering Angle"](#).



- Measure rack stroke if angles are outside the specified value.

Rack stroke (L) : Refer to [ST-35, "Steering Gear"](#).



POWER STEERING OIL PUMP

< PERIODIC MAINTENANCE >

POWER STEERING OIL PUMP

Inspection

INFOID:000000007423317

RELIEF OIL PRESSURE

CAUTION:

Make sure that belt tension is normal before starting the following procedure.

1. Connect the Tool between oil pump discharge connector and high-pressure hose. Bleed air from the hydraulic circuit while opening valve fully. Refer to [ST-8, "Inspection"](#).

Tool numbers : KV48103500 (J-26357),
KV48102500 (J-33914)

2. Start engine. Run engine until oil temperature reaches 50° to 80°C (122° to 176°F).

CAUTION:

- Leave the valve of the hydraulic pressure gauge [SST] fully open while starting and running engine. If engine is started with the valve closed, the hydraulic pressure in oil pump goes up to the relief pressure along with unusual increase of oil temperature.
- Be sure to keep hose clear of belts and other parts when engine is started.

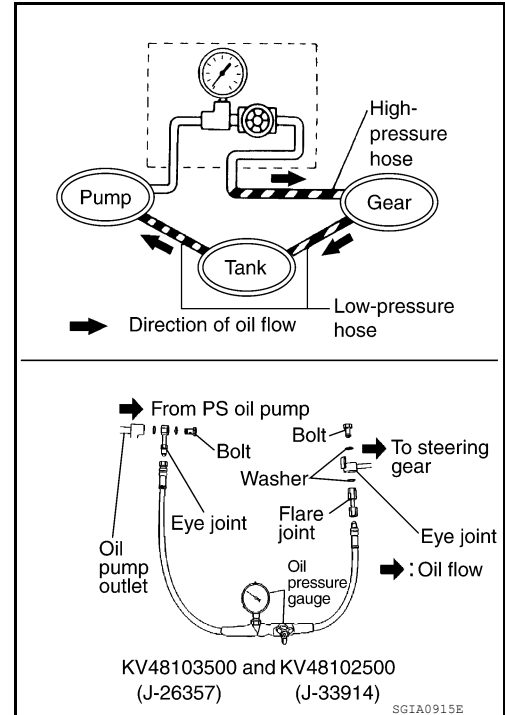
3. Fully close the Tool valve with engine at idle and measure the relief oil pressure.

Relief oil pressure : Refer to [ST-36, "Oil Pump"](#).

CAUTION:

Never keep valve closed for 10 seconds or longer.

4. Open the valve slowly after measuring. Replace oil pump if the relief oil pressure is outside the standard.
5. After inspection, disconnect the Tool from hydraulic circuit, then add fluid and bleed air. Refer to [ST-8, "Inspection"](#).



STEERING WHEEL

< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

STEERING WHEEL

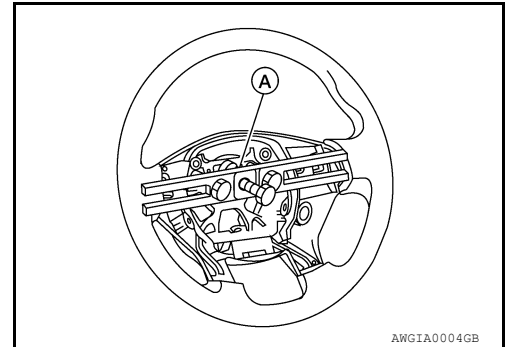
Removal and Installation

INFOID:000000007423318

REMOVAL

1. Set vehicle to the straight-ahead position.
2. Remove driver air bag module. Refer to [SR-5, "Removal and Installation"](#).
3. Remove steering wheel lock nut after steering is locked.
4. Remove steering wheel using Tool (A).

Tool number (A) : ST27180001 (J-25726-A)



INSTALLATION

Installation is in the reverse order of removal.

- Align the spiral cable. Refer to [SR-8, "Removal and Installation"](#).
- Tighten steering wheel nut to specification. Refer to [ST-14, "Exploded View"](#).

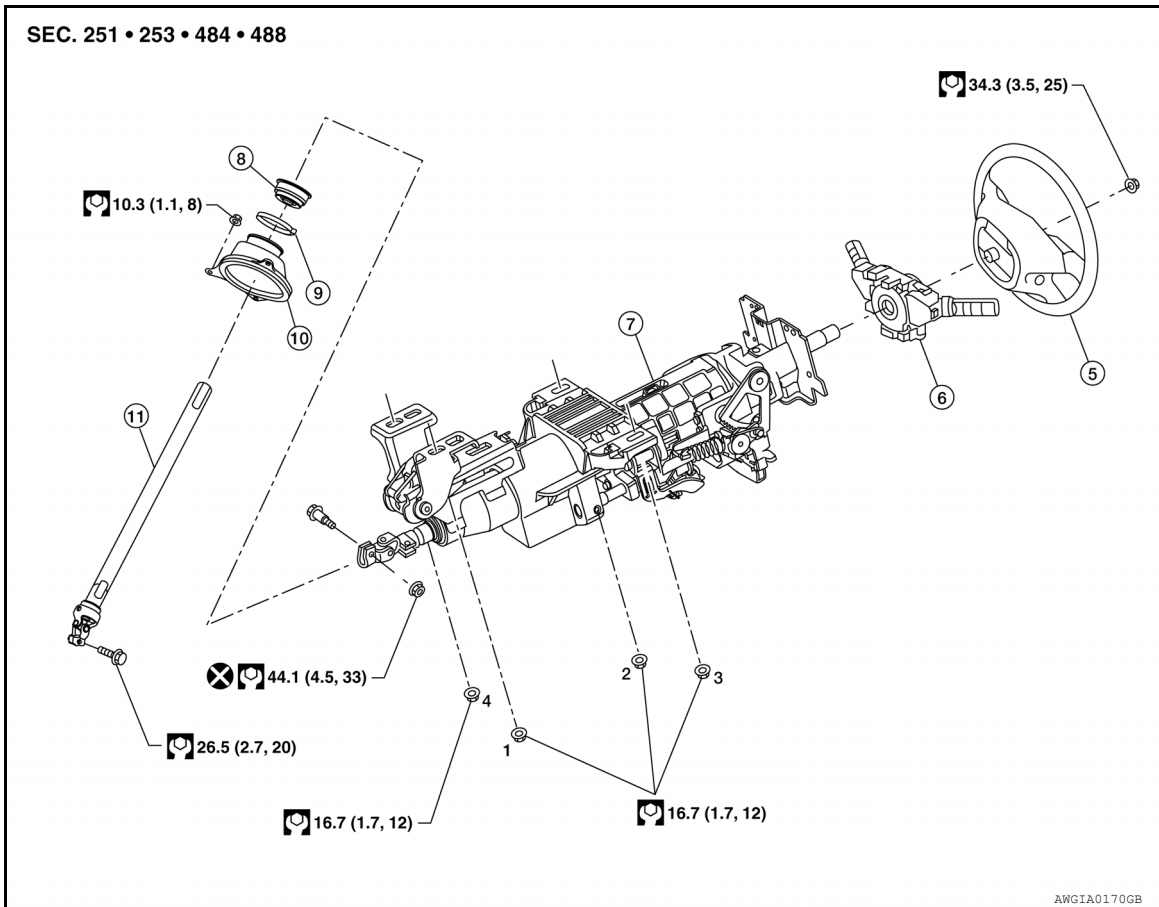
STEERING COLUMN

< REMOVAL AND INSTALLATION >

STEERING COLUMN

Exploded View

INFOID:000000007423319



- | | | |
|--|--------------------------|--|
| 1-4. Steering column assembly nut tightening order | 5. Steering wheel | 6. Combination switch and spiral cable |
| 7. Steering column assembly | 8. Hole cover seal | 9. Herbie clip |
| 10. Hole cover | 11. Lower shaft assembly | |

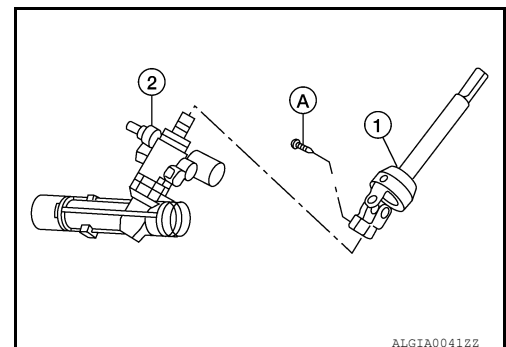
Removal and Installation

INFOID:000000007423320

REMOVAL

Hole Cover Seal, Hole Cover and Lower Shaft Assembly

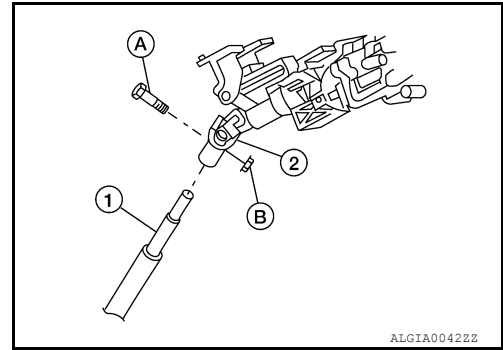
1. Set wheels to the straight-ahead position.
2. Remove the instrument lower panel LH. Refer to [IP-18. "Removal and Installation"](#).
3. Remove lower side bolt (A) of lower shaft assembly (1).
 - Steering gear (2)



STEERING COLUMN

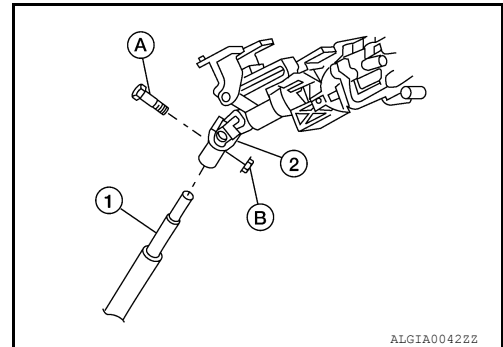
< REMOVAL AND INSTALLATION >

4. Remove bolt (A) and nut (B) of column upper joint (2), then remove lower shaft assembly (1).
5. Loosen herbie clip, then remove hole cover seal from hole cover.
6. Remove nuts of hole cover, and then remove clamp and hole cover from dash panel.



Steering Column Assembly

1. Set wheels to the straight-ahead position.
2. Disconnect the battery negative and positive terminals, then wait at least 3 minutes.
CAUTION:
Always work from the side of the airbag module. Do not work from the front of it.
3. Remove instrument lower cover (LH). Refer to [IP-11, "Exploded View"](#).
4. Remove steering column cover (upper and lower). Refer to [IP-11, "Exploded View"](#).
5. Disconnect each switch connector installed to steering column assembly, and then disconnect harness from steering column assembly.
6. Remove bolt (A) and nut (B) of column upper joint (2).
 - Lower shaft assembly (1)



7. Remove steering column assembly and nuts, then remove steering column assembly.
8. If replacing steering column, remove the following:
 - Remove driver air bag module. Refer to [SR-5, "Removal and Installation"](#).
 - Remove steering wheel. Refer to [ST-13, "Removal and Installation"](#).
 - Remove combination switch and spiral cable. Refer to [SR-8, "Removal and Installation"](#).

INSPECTION AFTER REMOVAL

Hole Cover Seal, Hole Cover and Lower Shaft Assembly

Check each part of hole cover seal, hole cover and steering column and lower shaft assembly for damage or other malfunctions. Replace if necessary.

Steering Column Assembly

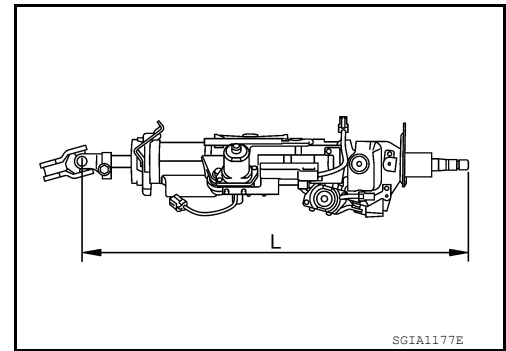
- Check each part of steering column assembly for damage or other malfunctions. Replace entire steering column assembly if any parts are damaged.

STEERING COLUMN

< REMOVAL AND INSTALLATION >

- Measure the length (L) as shown if vehicle has been involved in a minor collision. Replace steering column assembly if outside the specifications.

Steering column length (L) : Refer to [ST-34, "Steering Column"](#)



- Measure steering column rotating torque using Tool. Replace steering column assembly if outside the standard.

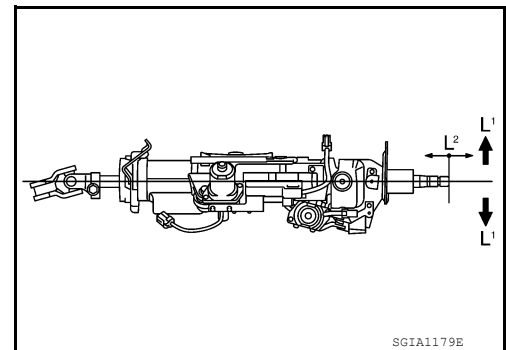
Tool number : ST3127S000 (J-25765-A)

Rotating torque : Refer to [ST-34, "Steering Column"](#)

- Check tilt and telescopic mechanism operating range (L^1), (L^2) as shown.

Tilt operating range (L^1) : Refer to [ST-34, "Steering Column"](#)

Telescopic operating range (L^2) : Refer to [ST-34, "Steering Column"](#)



INSTALLATION

Steering Column Assembly

Installation is in the reverse order of removal.

CAUTION:

- **Any time the ignition switch has been disconnected, removed or installed, the keys must be re-registered in the BCM. Refer to CONSULT operations IVIS/NVIS.**

Hole Cover Seal, Hole Cover and Lower Shaft Assembly

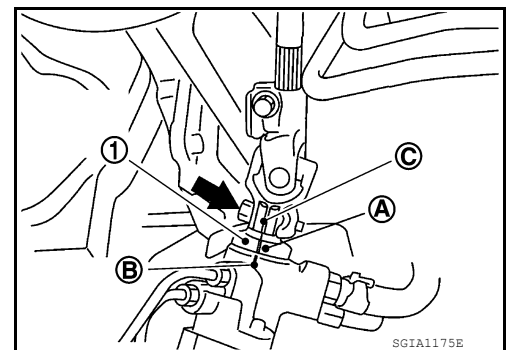
Installation is in the reverse order of removal.

- When installing lower shaft assembly to steering gear assembly, follow the procedure listed below.
 - Set rack of steering gear in the neutral position.

NOTE:

To get the neutral position of rack, turn gear sub-assembly and measure the distance of inner socket, and then measure the intermediate position of the distance.

- Align rear cover cap projection (A) with the marking position (B) of gear housing assembly.
- Install slit part of lower shaft assembly (C) aligning with the projection (A) of rear cover cap (1). Make sure that the slit part of lower shaft assembly (C) is aligned with both the projection (A) of rear cover cap (1) and the marking position (B) of gear housing assembly.
- Perform final tightening of nuts and bolts on each part under unladen conditions with tires on level ground when removing steering gear assembly. Check wheel alignment. Refer to [FSU-7, "Inspection and Adjustment"](#).



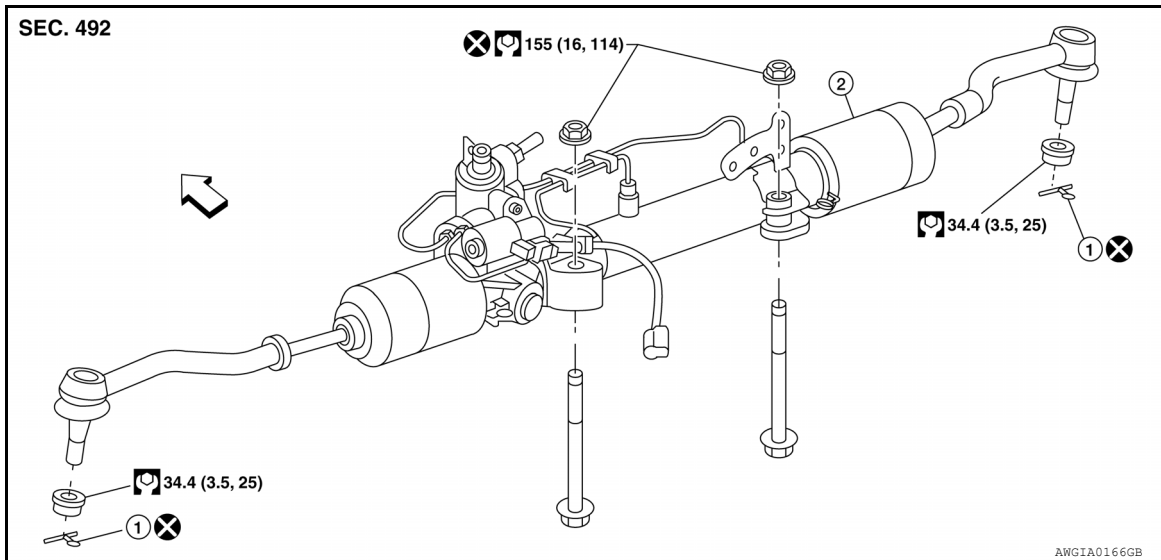
STEERING GEAR AND LINKAGE

< REMOVAL AND INSTALLATION >

STEERING GEAR AND LINKAGE

Exploded View

INFOID:000000007423321



1. Cotter pin

2. Steering gear assembly

← Front

Removal and Installation

INFOID:000000007423322

CAUTION:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

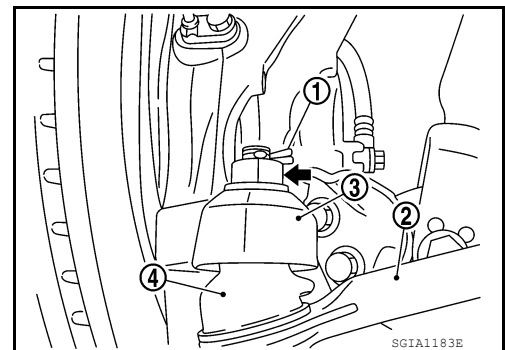
REMOVAL

1. Remove the front wheels and tires using power tools. Refer to [WT-68, "Adjustment"](#).
2. Disconnect stabilizer connecting rods at steering knuckles and reposition. Refer to [FSU-14, "Exploded View"](#).
3. Remove cotter pin (1), and then loosen the nut.
4. Remove steering outer socket (2) from steering knuckle (3) so as not to damage ball joint boot (4) using the Tool.

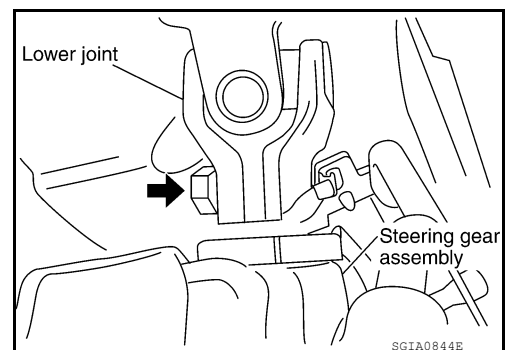
CAUTION:

Temporarily tighten the nut to prevent damage to threads and to prevent the Tool from suddenly coming off.

Tool number : HT72520000 (J-25730-A)



5. Remove lower side bolt of lower joint.



STEERING GEAR AND LINKAGE

< REMOVAL AND INSTALLATION >

6. Remove front exhaust tube. Refer to [EX-6, "Exploded View"](#) (QR25DE), [EX-13, "Exploded View"](#) (VQ35DE).
7. Remove high and low pressure piping of hydraulic piping, and then drain power steering fluid. Refer to [ST-8, "Draining"](#).
8. Remove steering hydraulic piping bracket from front suspension member.
9. Disconnect the SSPS valve harness connector. Refer to [ST-17, "Exploded View"](#).
10. Remove bolts and nuts of steering gear assembly, and then remove steering gear assembly from vehicle.

INSPECTION AFTER REMOVAL

Check for fluid leaks or damage to steering gear assembly. Replace steering gear assembly and linkage as necessary. Refer to [ST-28, "Disassembly"](#)

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

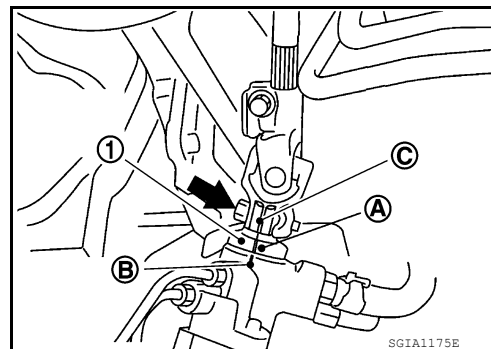
Do not reuse O-rings or copper sealing washers.

- When installing lower joint to steering gear assembly, follow the procedure listed below.
- Set rack of steering gear in the neutral position.

NOTE:

To get the neutral position of rack, turn gear-sub assembly and measure the distance of inner socket, and then measure the intermediate position of the distance.

- Align rear cover cap projection (A) with the marking position (B) of gear housing assembly.
- Install slit part of lower joint (C) aligning with the projection (A) of rear cover cap (1). Make sure that the slit part of lower joint (C) is aligned with both the projection (A) of rear cover cap (1) and the marking position (B) of gear housing assembly.
- After installation, bleed air from the steering hydraulic system. Refer to [ST-8, "Inspection"](#).
- Perform final tightening of nuts and bolts on each part under unladen conditions with tires on level ground when removing steering gear assembly.
- Check wheel alignment. Refer to [FSU-7, "Inspection and Adjustment"](#).
- Perform neutral position steering angle adjustment, if equipped with VDC. Refer to [BRC-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#).



INSPECTION AFTER INSTALLATION

Make sure that steering wheel operates smoothly by turning several times from full left stop to full right stop.

POWER STEERING OIL PUMP

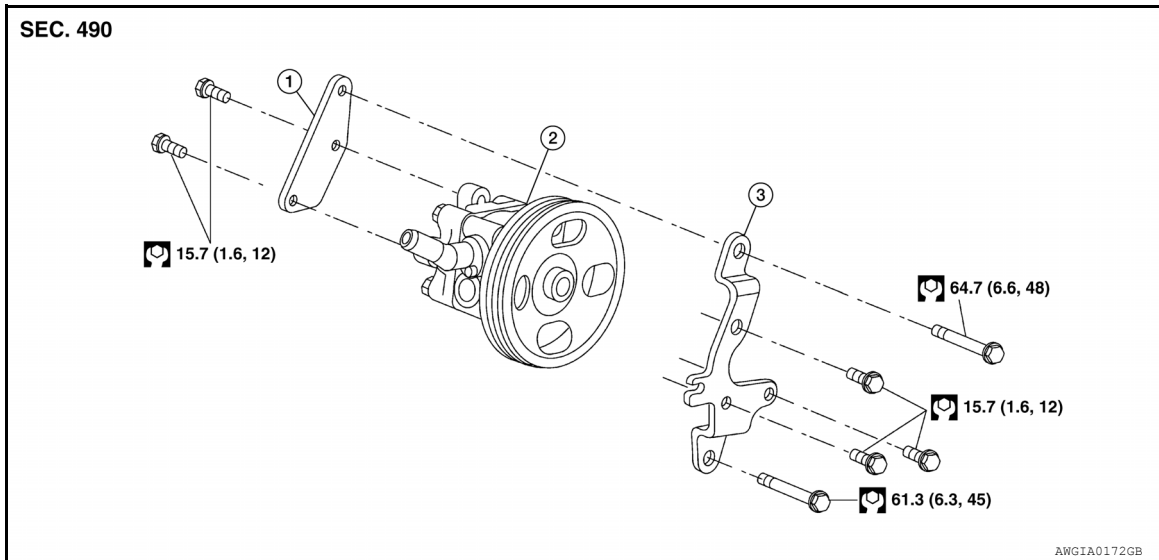
< REMOVAL AND INSTALLATION >

POWER STEERING OIL PUMP

QR25DE

QR25DE : Exploded View

INFOID:000000007423323



1. Rear bracket
2. Power steering oil pump assembly
3. Front bracket

QR25DE : Removal and Installation

INFOID:000000007423324

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

REMOVAL

1. Drain power steering fluid. Refer to [ST-8, "Draining"](#).
2. Remove the front wheel and tire (RH) using power tool. Refer to [WT-68, "Adjustment"](#).
3. Remove the fender protector side cover (RH). Refer to [EXT-22, "Removal and Installation"](#) (Coupe models), [EXT-46, "Removal and Installation"](#) (Sedan models).
4. Loosen drive belt. Refer to [EM-16, "Removal and Installation"](#).
5. Remove drive belt from oil pump pulley.
6. Disconnect the power steering pressure sensor connector.
7. Disconnect the high pressure hose and suction hose from the power steering oil pump assembly. Refer to [ST-22, "QR25DE : Removal and Installation"](#).
8. Remove oil pump bolts, and then remove power steering oil pump. Refer to [ST-19, "QR25DE : Exploded View"](#).

INSTALLATION

- Installation is in the reverse order of removal.
- After installation, bleed air from the hydraulic system.

CAUTION:

Do not reuse O-rings or copper sealing washers

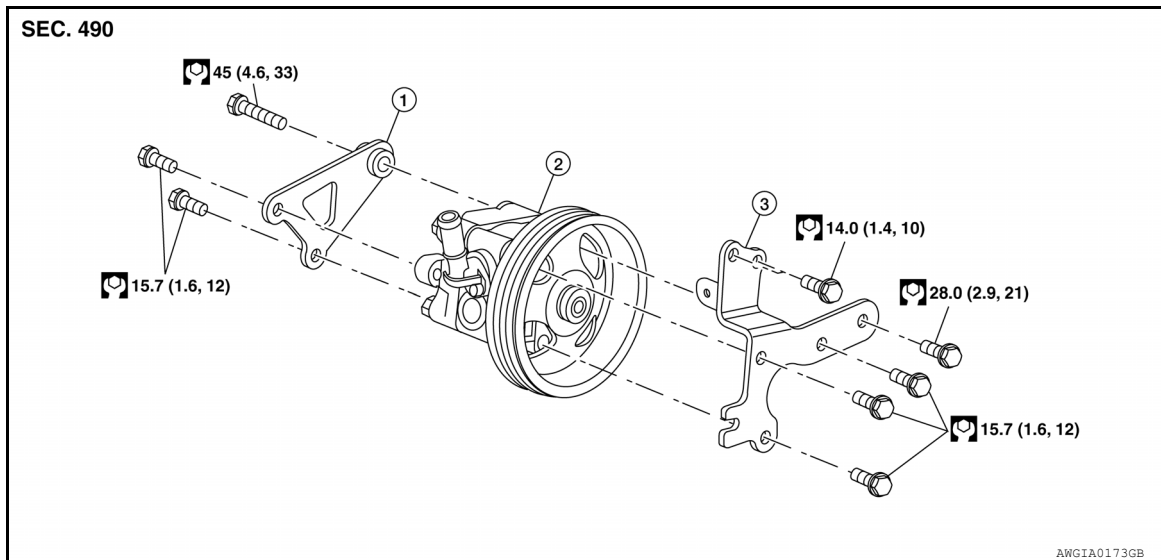
VQ35DE

POWER STEERING OIL PUMP

< REMOVAL AND INSTALLATION >

VQ35DE : Exploded View

INFOID:000000007423325



1. Rear bracket 2. Power steering oil pump assembly 3. Front bracket

VQ35DE : Removal and Installation

INFOID:000000007423326

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

REMOVAL

1. Partially drain power steering fluid. Refer to [ST-8, "Draining"](#).
2. Remove undercover using power tool.
3. Remove the fender protector side cover (RH). Refer to [EXT-22, "Removal and Installation"](#) (Coupe models), [EXT-46, "Removal and Installation"](#) (Sedan models).
4. Loosen drive belt. Refer to [EM-123, "Removal and Installation"](#).
5. Remove drive belt from oil pump pulley.
6. Disconnect the power steering pressure sensor connector.
7. Disconnect the high pressure hose and the suction hose from the power steering oil pump assembly. Refer to [ST-22, "VQ35DE : VQ35DE: Component Parts Location - 17 Inch Tire"](#) (Sedan models), [ST-24, "VQ35DE : VQ35DE: Component Parts Location - 18 Inch Tire"](#) (Coupe models).
8. Remove oil pump bolts, and then remove power steering oil pump. Refer to [ST-20, "VQ35DE : Exploded View"](#).

INSTALLATION

Installation is in the reverse order of removal.

- After installation, bleed air from the hydraulic system.

HYDRAULIC LINE

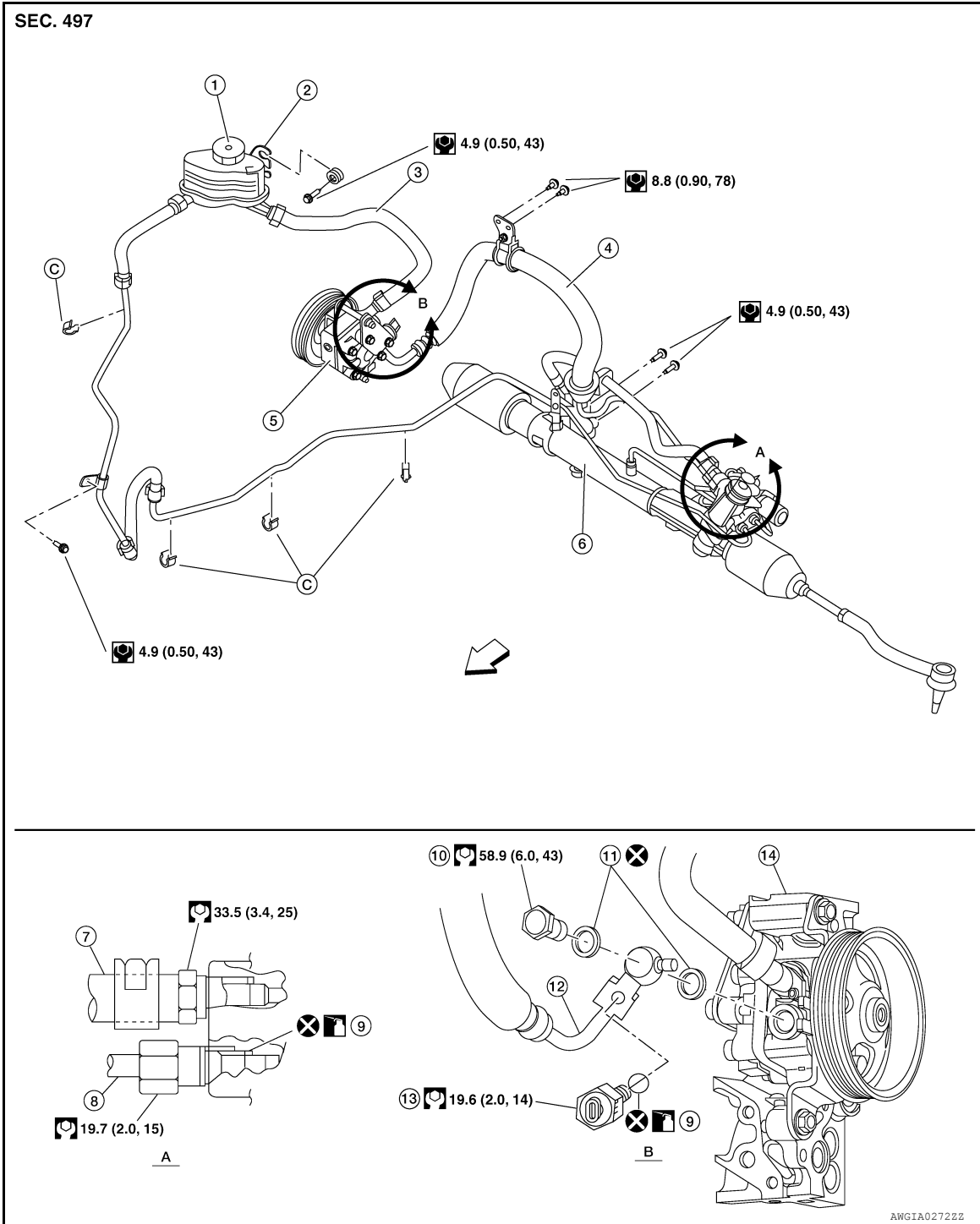
< REMOVAL AND INSTALLATION >

HYDRAULIC LINE

QR25DE

QR25DE : Component Parts Location


INFOID:000000007423327



- | | | |
|------------------------|-------------------------------------|--|
| 1. Reservoir tank | 2. Reservoir tank bracket | 3. Suction hose |
| 4. High-pressure hose | 5. Power steering oil pump assembly | 6. Steering gear assembly |
| 7. Low pressure piping | 8. High pressure piping | 9. O-ring |
| 10. Eye-bolt | 11. Copper sealing washer | 12. Eye-joint (assembled to high-pressure side hose) |

HYDRAULIC LINE

< REMOVAL AND INSTALLATION >

- | | | |
|---|---|--|
| 13. Pressure sensor | 14. Oil pump bracket to engine block mounting point | A. Steering gear assembly connections |
| B. Power steering oil pump assembly connections | C. Clip |  Apply Genuine Nissan PSF or equivalent |
- ⇐ Front

QR25DE : Removal and Installation

INFOID:000000007423328

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

REMOVAL

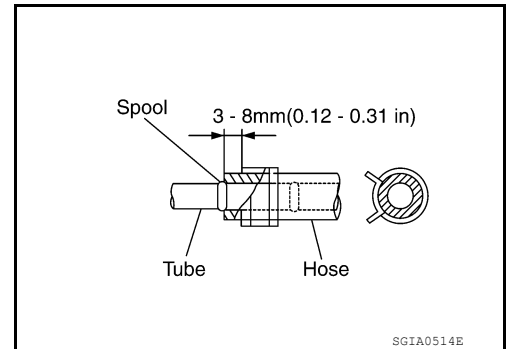
Refer to [ST-21, "QR25DE : Component Parts Location"](#) for removal procedure.

INSTALLATION

- Insert hose securely until it contacts tube spool.

CAUTION:

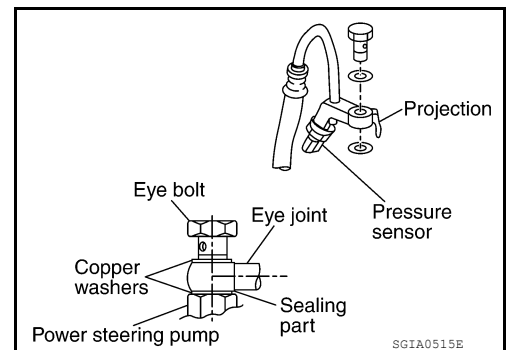
Do not apply fluid.



- Install eye-bolt with eye-joint (assembled to high-pressure hose) protrusion facing with pump side cutout, and then tighten it to the specified torque after tightening by hand.

CAUTION:

- **Do not reuse O-rings or copper sealing washers.**
- **Securely insert harness connector to pressure sensor.**



VQ35DE

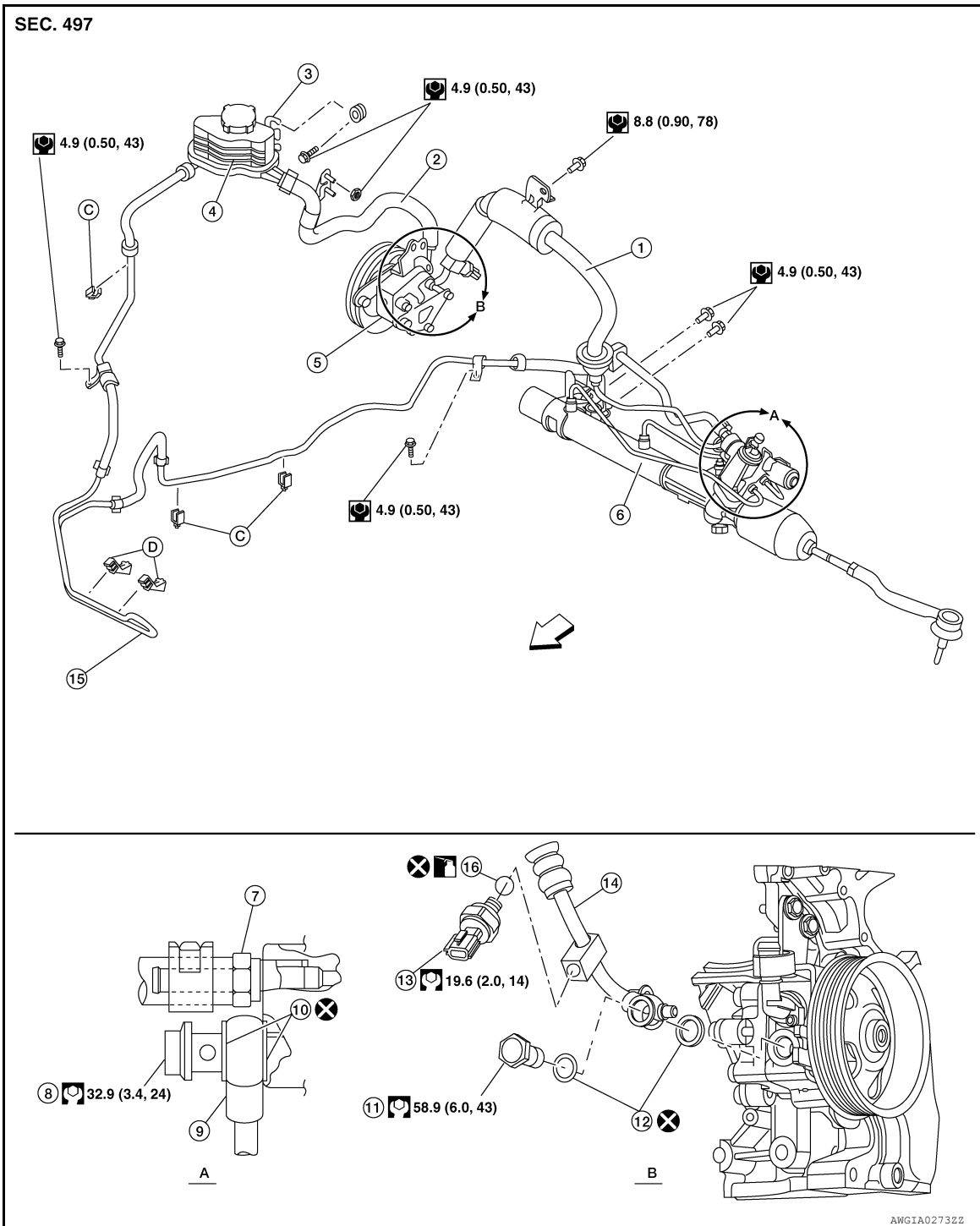
VQ35DE : VQ35DE: Component Parts Location - 17 Inch Tire

INFOID:000000007423329

EXPLODED VIEW

HYDRAULIC LINE

< REMOVAL AND INSTALLATION >



- | | | |
|---------------------------------------|---|--|
| 1. Reservoir tank | 2. Reservoir tank bracket | 3. Suction hose |
| 4. High pressure hose | 5. Power steering oil pump assembly | 6. Steering gear assembly |
| 7. Low pressure piping | 8. High pressure piping | 9. O-ring |
| 10. Eye-bolt | 11. Copper sealing washer | 12. Eye-joint (assembled to high-pressure side hose) |
| 13. Pressure sensor | 14. Oil pump bracket to engine mounting point | 15. Power steering oil cooler |
| A. Steering gear assembly connections | B. Oil pump assembly connections | C. Clip |
| D. Power steering oil cooler clip | ← Front | Genuine Nissan PSF or equivalent |

HYDRAULIC LINE

< REMOVAL AND INSTALLATION >

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

REMOVAL

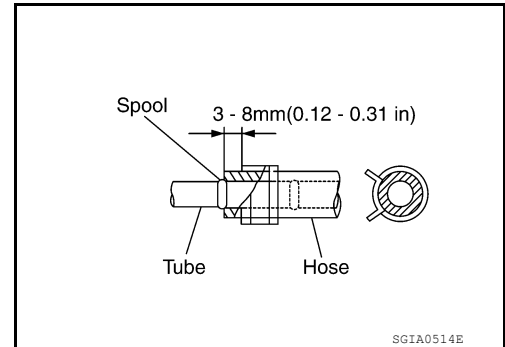
Refer to [ST-22. "VQ35DE : VQ35DE: Component Parts Location - 17 Inch Tire"](#) for removal procedure.

INSTALLATION

- Insert hose securely until it contacts tube spool.

CAUTION:

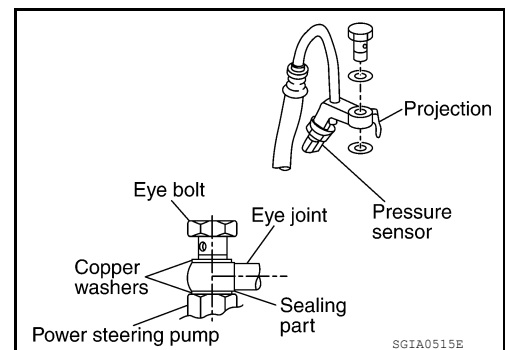
Do not apply fluid.



- Install eye-bolt with eye-joint (assembled to high-pressure hose) protrusion facing with pump side cutout, and then tighten it to the specified torque after tightening by hand.

CAUTION:

- **Do not reuse O-rings or copper sealing washers.**
- **Securely insert harness connector to pressure sensor.**



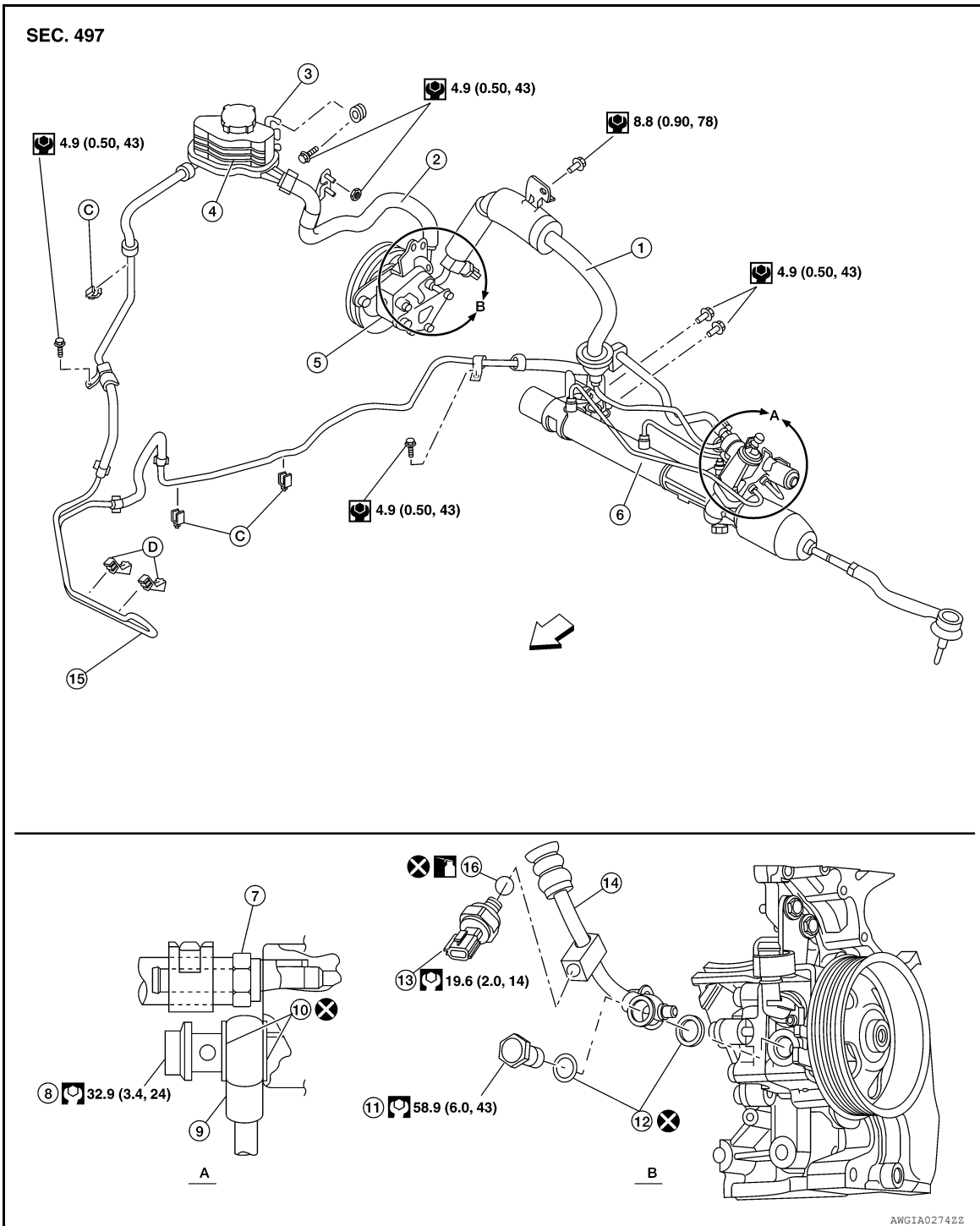
VQ35DE : VQ35DE: Component Parts Location - 18 Inch Tire

INFOID:000000007423330


Component Parts Location

HYDRAULIC LINE

< REMOVAL AND INSTALLATION >



- | | | |
|---------------------------|--|--|
| 1. High pressure hose | 2. Suction hose | 3. Reservoir tank bracket |
| 4. Reservoir tank | 5. Power steering oil pump assembly | 6. Steering gear assembly |
| 7. Low pressure piping | 8. Eye-bolt | 9. High pressure piping |
| 10. Copper sealing washer | 11. Eye-bolt | 12. Copper sealing washer |
| 13. Pressure sensor | 14. Eye-joint (assembled to high-pressure side hose) | 15. Power steering oil cooler |
| 16. O-ring | A. Steering gear assembly connections | B. Power steering oil pump connections |
| C. Clip | D. Power steering oil cooler pipe clip | ⇐ Front |

 Genuine Nissan PSF or equivalent

HYDRAULIC LINE

< REMOVAL AND INSTALLATION >

VQ35DE: Removal and Installation - 18 Inch Tire

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

REMOVAL

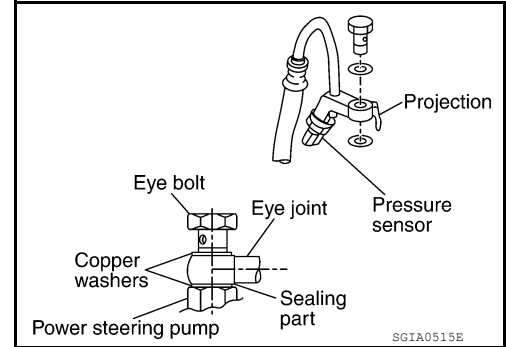
Refer to [ST-24. "VQ35DE : VQ35DE: Component Parts Location - 18 Inch Tire"](#) for removal procedure.

INSTALLATION

- Install eye-bolt with eye-joint (assembled to high-pressure hose) protrusion facing with pump side cutout, and then tighten it to the specified torque after tightening by hand.

CAUTION:

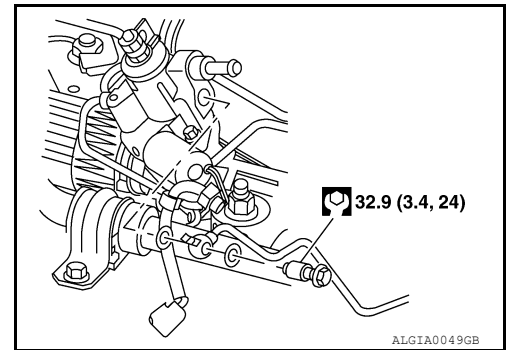
- Do not reuse O-rings or copper sealing washers.
- Securely insert harness connector to pressure sensor.



- Install eye-bolt with eye-joint (assembled to high pressure tube) protrusion facing gear side and tighten it to the specified torque after tightening by hand.

CAUTION:

- Do not reuse O-rings or copper sealing washers.



STEERING COLUMN

< UNIT DISASSEMBLY AND ASSEMBLY >

UNIT DISASSEMBLY AND ASSEMBLY

STEERING COLUMN

Disassembly and Assembly

INFOID:000000007423331

The steering column assembly is not serviceable and must be replaced as an assembly.

A

B

C

D

E

F

ST

H

I

J

K

L

M

N

O

P

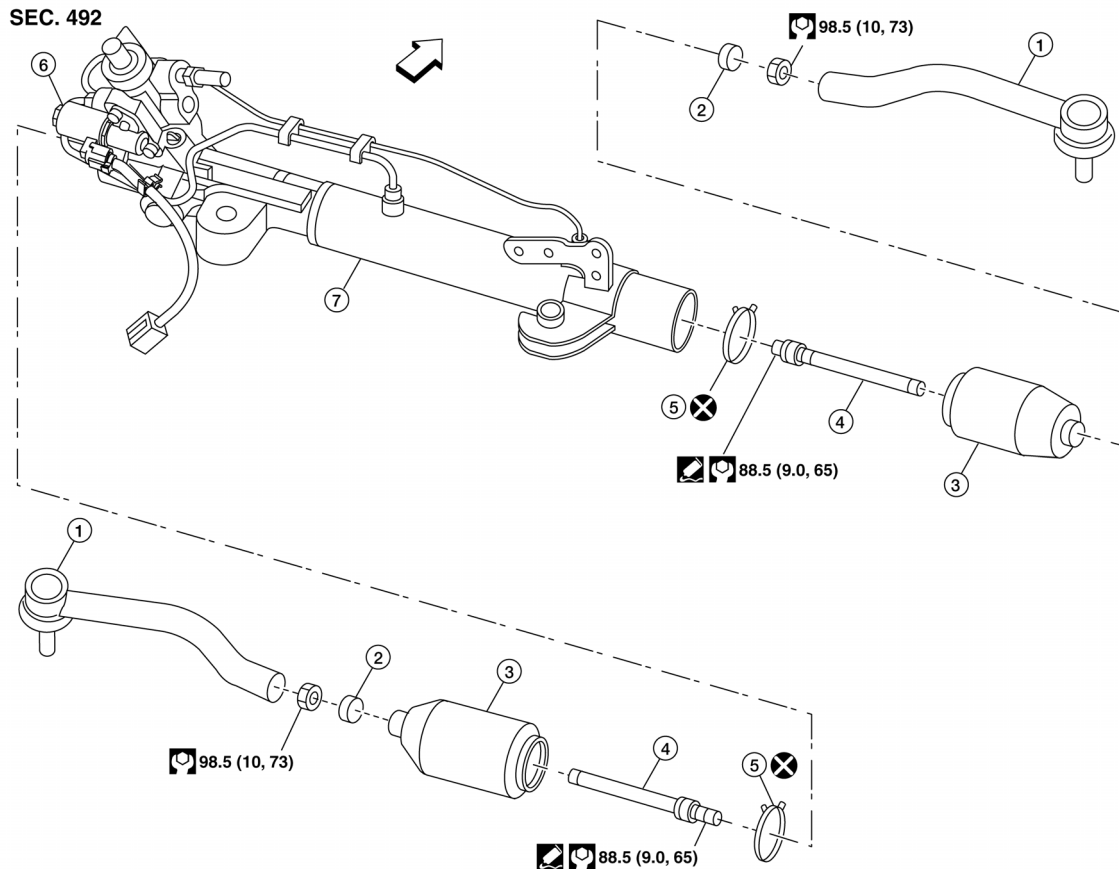
STEERING GEAR AND LINKAGE

< UNIT DISASSEMBLY AND ASSEMBLY >

STEERING GEAR AND LINKAGE

Exploded View

INFOID:000000007423332



AWGIA0158GB

- | | | |
|------------------|---------------------|---------------------------------------|
| 1. Outer socket | 2. Outer boot clamp | 3. Boot |
| 4. Inner socket | 5. Inner boot clamp | 6. SSPS valve (part of gear assembly) |
| 7. Gear assembly | ← Front | ☑ Three Bond TB1111 or equivalent |

Disassembly

INFOID:000000007423333

1. Remove outer socket locknut, outer boot clamp and outer socket.
2. Remove inner boot clamp and boot.
3. Remove inner socket.

Inspection

INFOID:000000007423334

INSPECTION AFTER DISASSEMBLY

Boot

Check boot for cracks and replace if necessary.

Outer Socket and Inner Socket

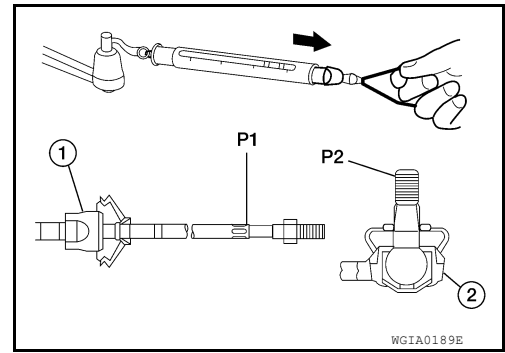
- Ball joint swinging torque

STEERING GEAR AND LINKAGE

< UNIT DISASSEMBLY AND ASSEMBLY >

- Hook Tool at the points (P1, P2) as shown. Pull the Tool making sure that the Tool reads the specified value when outer socket (2) and inner socket (1) start to move. Replace outer socket (2) or inner socket (1) if they are outside the standard.

Tool number : — (J-44372)

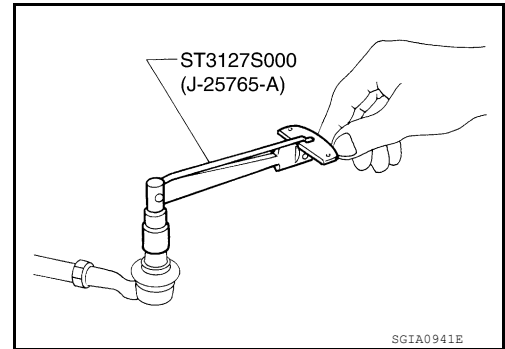


Items	Outer socket	Inner socket
Measuring point of spring balance	Stud cotter pin mounting hole (P2)	Measuring point (P1)
Swinging torque	Refer to ST-35, "Steering Gear" .	
Spring balance measurement		

- Ball joint rotating torque
- Make sure that the reading is within the following specified range using Tool. Replace outer socket if the reading is outside the specified value.

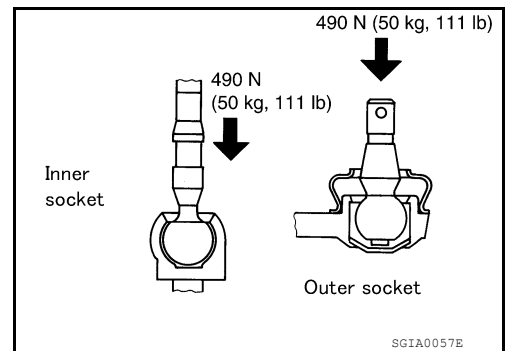
Tool number : ST31227S000 (J-25765-A)

Outer socket rotating torque : Refer to [ST-35, "Steering Gear"](#).



- Ball joint axial end play
- Apply an axial load of 490 N (50 kg-f, 111 lb-f) to ball stud. Using a dial gauge, measure amount of stud movement, and then make sure that the value is within the following specified range. Replace outer socket or inner socket if the measured value is outside the standard.

Inner socket, outer socket : Refer to [ST-35, "Steering Gear"](#).



INFOID:000000007423335

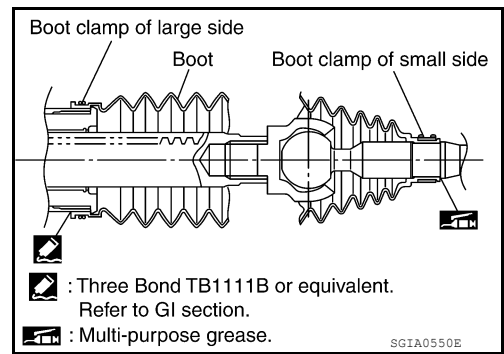
Assembly

1. Apply Three Bond TB1111 or equivalent to inner socket and install to gear housing assembly. Tighten to specification. Refer to [ST-28, "Exploded View"](#).

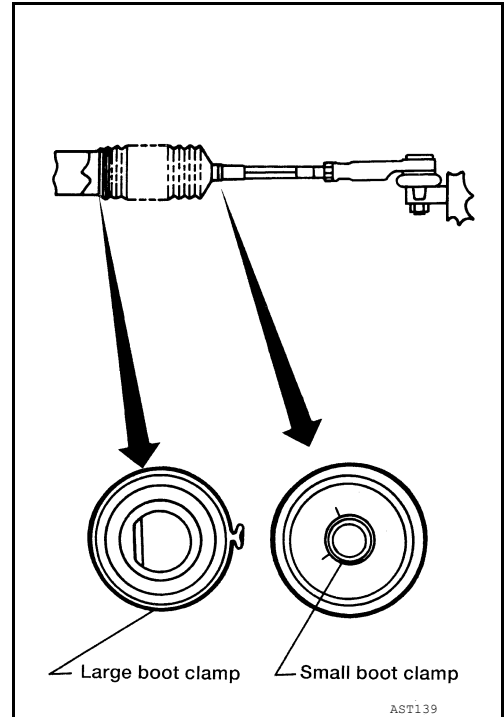
STEERING GEAR AND LINKAGE

< UNIT DISASSEMBLY AND ASSEMBLY >

2. Install large end of boot to gear housing assembly.
3. Install small end of boot to inner socket boot mounting groove.



4. Install boot clamp to boot small end.
5. Install boot clamp to boot large end.

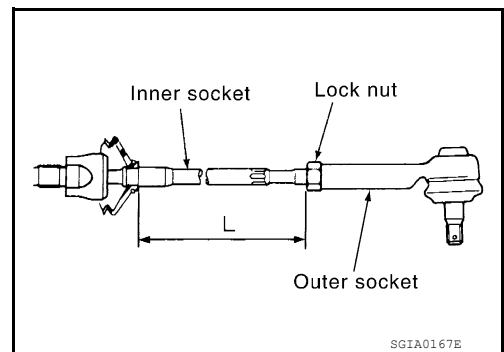


6. Adjust inner socket to standard length (L), and then tighten lock nut to the specified torque. Refer to [ST-28, "Exploded View"](#). Check length of inner socket (L) again after tightening lock nut. Make sure that the length is the standard.

Inner socket length (L) : Refer to [ST-35, "Steering Gear"](#).

CAUTION:

Adjust toe-in after this procedure. Length achieved after toe-in adjustment should not be more than 98.3 mm (3.870 in) max.



POWER STEERING OIL PUMP

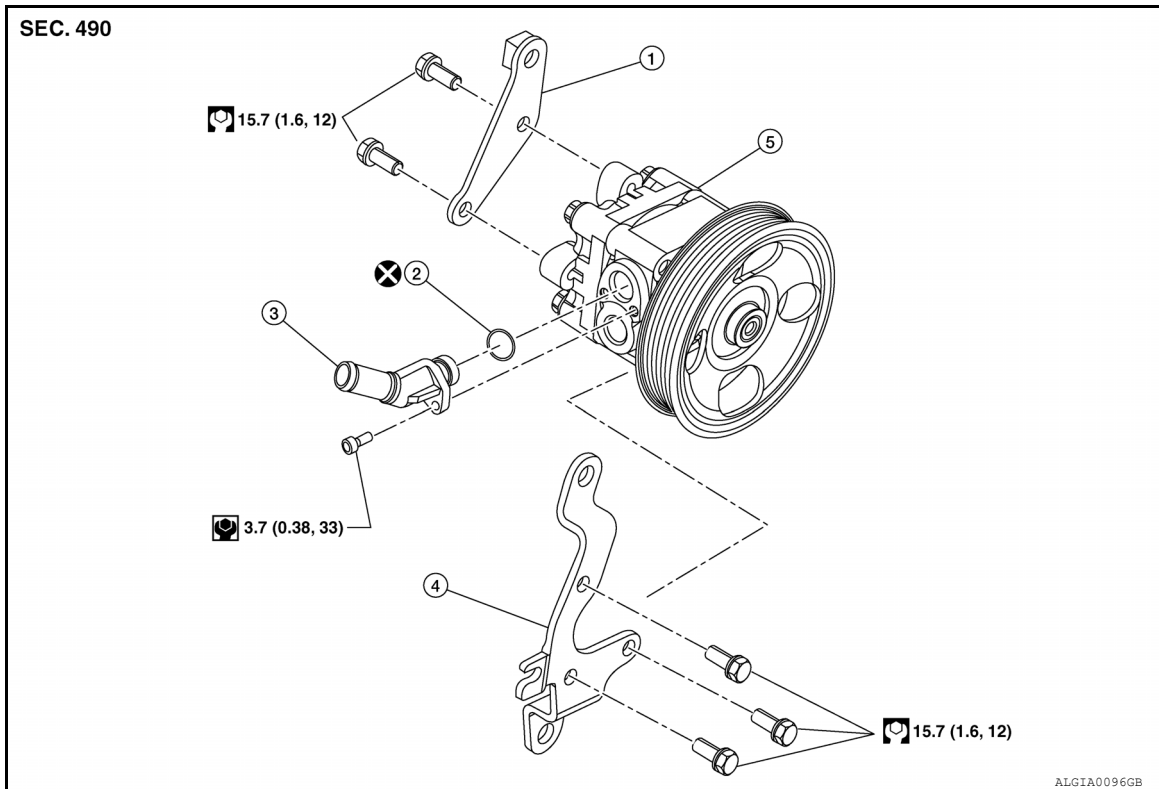
< UNIT DISASSEMBLY AND ASSEMBLY >

POWER STEERING OIL PUMP

QR25DE

QR25DE : Disassembly and Assembly

INFOID:000000007630819



- | | | |
|------------------|-------------------------------------|-----------------|
| 1. Rear bracket | 2. O-ring | 3. Suction pipe |
| 4. Front bracket | 5. Power steering oil pump assembly | |

INSPECTION BEFORE DISASSEMBLY

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

- Deformed or damaged bracket, connector or suction pipe
- Oil leakage from the suction pipe or connector.
- The power steering oil pump and pulley is not serviceable and should be replaced as an assembly.

DISASSEMBLY

NOTE:

Mount the power steering oil pump in a vise as needed.

1. Remove the bolt, the suction pipe and the O-ring.

CAUTION:

Do not reuse the O-ring.

2. Remove the bracket bolts and bracket(s).

INSPECTION AFTER DISASSEMBLY

Body Assembly Inspection

Check the power steering oil pump body assembly for damage. If any damage is found, replace with a new power steering oil pump assembly.

ASSEMBLY

Assembly is in the reverse order of disassembly.

CAUTION:

- **Do not reuse O-rings or copper sealing washers.**

POWER STEERING OIL PUMP

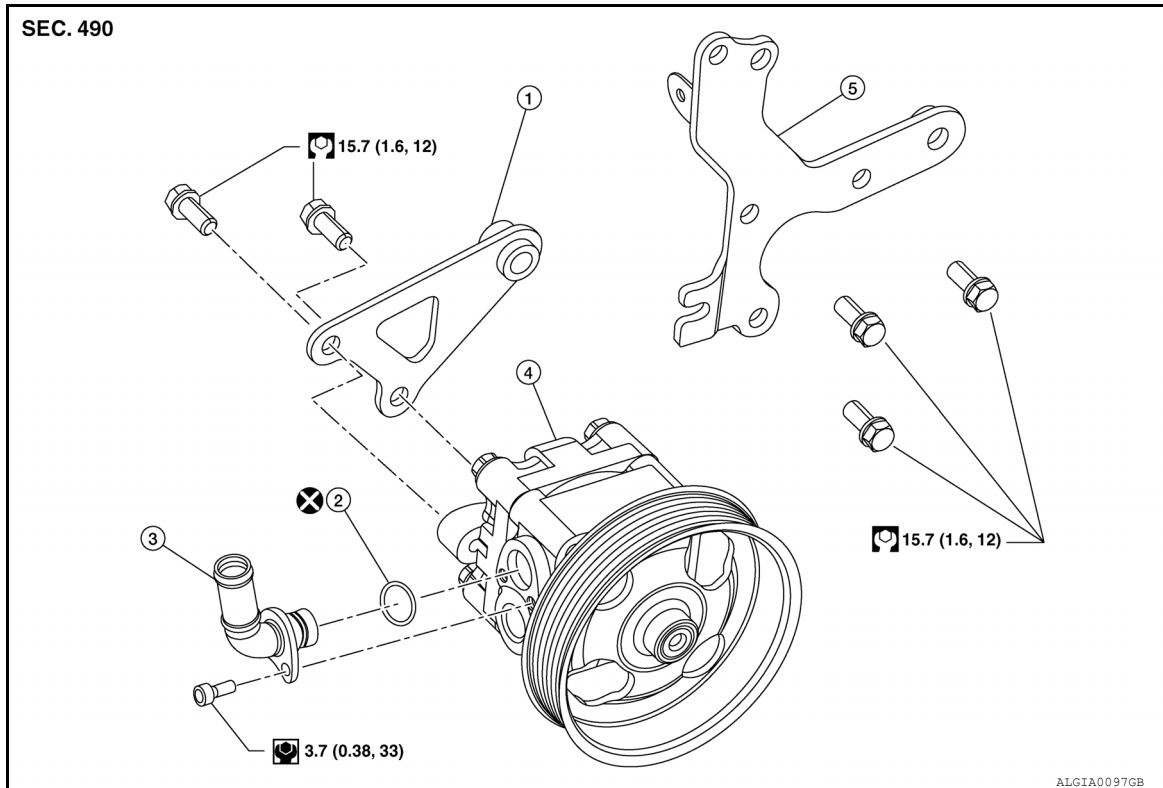
< UNIT DISASSEMBLY AND ASSEMBLY >

- Apply a coat of Genuine NISSAN PSF or equivalent to the new O-ring. Refer to [MA-12. "Fluids and Lubricants"](#).

VQ35DE

VQ35DE : Disassembly and Assembly

INFOID:000000007630820



- | | | |
|-------------------------------------|------------------|-----------------|
| 1. Rear bracket | 2. O-ring | 3. Suction pipe |
| 4. Power steering oil pump assembly | 5. Front Bracket | |

INSPECTION BEFORE DISASSEMBLY

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

- Deformed or damaged bracket, connector or suction pipe
- Oil leakage from the suction pipe or connector.
- The power steering oil pump and pulley is not serviceable and should be replaced as an assembly.

DISASSEMBLY

NOTE:

Mount the power steering oil pump in a vise as needed.

1. Remove the bolt, the suction pipe and the O-ring.

CAUTION:

Do not reuse the O-ring.

2. Remove the bracket bolts and bracket(s).

INSPECTION AFTER DISASSEMBLY

Body Assembly Inspection

Check the power steering oil pump body assembly for damage. If any damage is found, replace with a new power steering oil pump assembly.

ASSEMBLY

Assembly is in the reverse order of disassembly.

CAUTION:

- Do not reuse O-rings or copper sealing washers.

POWER STEERING OIL PUMP

< UNIT DISASSEMBLY AND ASSEMBLY >

- Apply a coat of Genuine NISSAN PSF or equivalent to the new O-ring. Refer to [MA-12, "Fluids and Lubricants"](#).

A

B

C

D

E

F

ST

H

I

J

K

L

M

N

O

P

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Steering Wheel

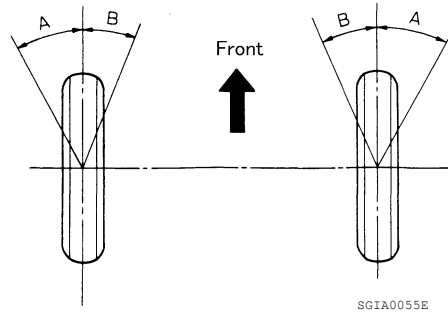
INFOID:000000007423338

Steering wheel axial end play	0 mm (0 in)
Steering wheel play	0 - 35 mm (0 - 1.38 in)
Steering wheel turning force	39 N (4 kg-f, 9 lb-f) or less

Steering Angle

INFOID:000000007423339

Unit: Degree minute (Decimal Degree)



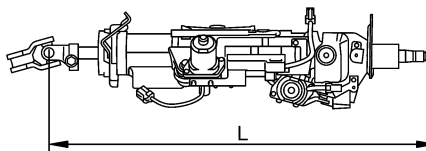
Tire size		205/65R16	215/55R17	235/45R18
Inner wheel (Angle: A)	Minimum	35° 30' (35.5°)	33° 30' (33.5°)	32° (32.0°)
	Nominal	38° 30' (38.5°)	36° 30' (36.5°)	35° (35.0°)
	Maximum	39° 30' (39.5°)	37° 30' (37.5°)	36° (36.0°)
Outer wheel (Angle: B)	Nominal	31° 30' (31.5°)	30° 30' (30.5°)	29° 30' (29.5°)

Steering Column

INFOID:000000007423340

STEERING COLUMN LENGTH

Unit: mm (in)



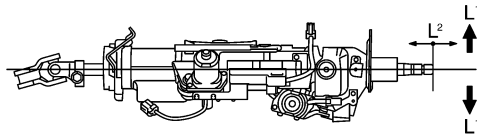
Steering column length (L)	Telescopic maximum	590 (23.23)
	Telescopic minimum	513 (20.20)

TILT MECHANISM OPERATING RANGE

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

Unit: mm (in)



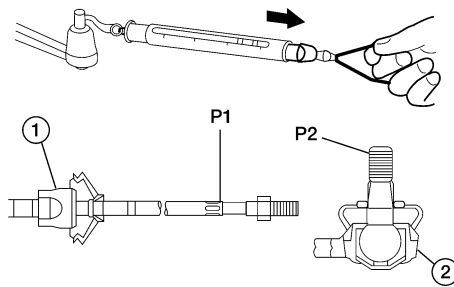
SGIA1179E

Tilt operating range (L ¹)	Tilt up	Tilt down
	9.0°	6.0°
Telescopic operating range (L ²)	77 (3.03)	

Steering Gear

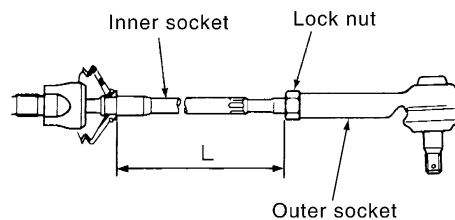
INFOID:000000007423341

STEERING OUTER SOCKET AND INNER SOCKET



WGIA0189E

Steering gear type		PR26AF
Outer socket (2)	Swinging torque	0.1 - 2.9 N·m (0.01 - 0.29 kg-m, 1.0 - 25 in-lb)
	Measurement on spring balance Measuring point: cotter pin hole of stud (P2)	1.4 - 42.7 N (0.14 - 4.4 kg, 12 - 31 lb)
	Rotating torque	0.3 - 2.9 N·m (0.03 - 0.29 kg-m, 3.0 - 25 in-lb)
	Axial end play	0.5 mm (0.020 in) or less
Inner socket (1)	Swinging torque	0.1 - 7.8 N·m (0.01 - 0.79 kg-m, 1.0 - 69 in-lb)
	• Measurement on spring balance • Measuring point (P1)	0.8 - 64 N (0.082 - 6.5 kg, 0.18 - 14.4 lb)
	Axial end play	0.2 mm (0.008 in) or less



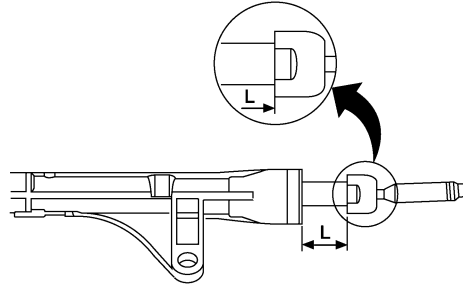
SGIA0167E

Inner socket length (L)	Minimum	81.3 mm (3.201 in)
	Maximum	98.3 mm (3.870 in)

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

RACK STROKE



AWGIA0003GB

Steering gear model	PR26AF		
Tire size	205/65R16	215/55R17	235/45R18
Rack neutral position, dimension (L) (rack stroke)	71.5 mm (2.815 in)	69.0 mm (2.717 in)	66.5 mm (2.167 in)

RACK SLIDING FORCE

Steering gear model	PR26AF		
Tire size	205/65R16	215/55R17	235/45R18
Rack sliding force	255 ± 29 N (26.0 ± 3.0 kg, 57.3 ± 6.5 lb)		

Oil Pump

INFOID:000000007423342

Oil pump relief hydraulic pressure	8,500 - 9,300 kPa (85 - 93 bar, 86.70 - 94.86 kg/cm ² , 1,232.5 - 1,348.5 psi)
------------------------------------	---

Steering Fluid

INFOID:000000007423343

Fluid capacity	1.0 ℓ (1 1/8 US qt, 7/8 Imp qt)
Fluid type	Refer to MA-12, "Fluids and Lubricants"