

SECTION ST
STEERING SYSTEM

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PRECAUTIONS

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PRECAUTION

PRECAUTIONS

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

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

Precaution for Steering System

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- Before disassembly, thoroughly clean the outside of the unit.
- Disassembly should be done in a clean work area. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- For easier and proper assembly, place disassembled parts in order on a parts rack.
- Use nylon 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

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PREPARATION

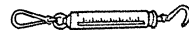
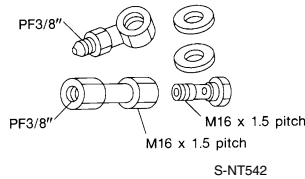
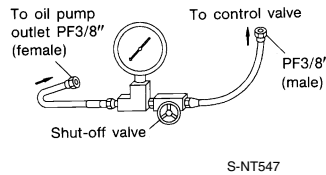
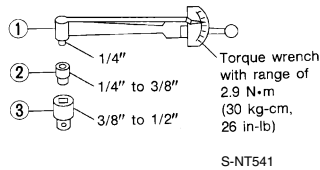
PREPARATION

Special Service Tool

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The actual shape of the tools may differ from those illustrated here.

| Tool number (TechMate No.) Tool name | Description |
|--|--|
| ST3127S000 (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 and steering column |
| KV48103500 (J-26357) Pressure gauge | Measuring oil pump relief pressure |
| KV48102500 (J-33914) Pressure gauge adapter | Measuring oil pump relief pressure |
| — (J-44372) Spring gauge | Measuring steering wheel turning force, rack sliding force and ball joint swinging force |



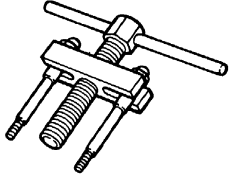


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PREPARATION

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Commercial Service Tool

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| Tool name | Description |
|--|--|
| Steering wheel puller  ZZA0819D | Removing steering wheel |
| Power tool  PIIB1407E | Loosening nuts, screws and bolts |
| Pitman arm puller  ALGIA0091ZZ | Removing pitman arm from steering gear |

POWER STEERING FLUID

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PERIODIC MAINTENANCE

POWER STEERING FLUID

Checking Fluid Level

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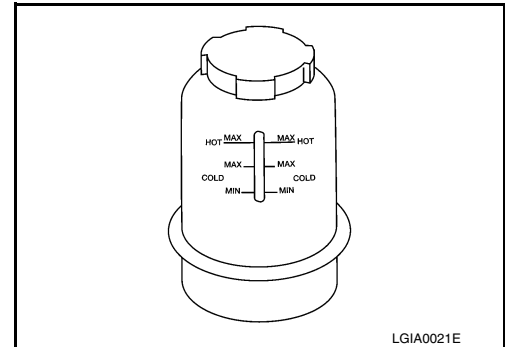
Check fluid level, referring to the scale on reservoir tank.

Use HOT range for power steering fluid temperatures of 50° – 80°C (122° – 176°F).

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

CAUTION:

- Do not overfill.
- Do not reuse any used power steering fluid.
- Recommended power steering fluid is Genuine NISSAN PSF or equivalent. Refer to [MA-15, "FOR USA AND CANADA : Fluids and Lubricants"](#) (United States and Canada) or [MA-17, "FOR MEXICO : Fluids and Lubricants"](#) (Mexico).



Checking Fluid Leakage

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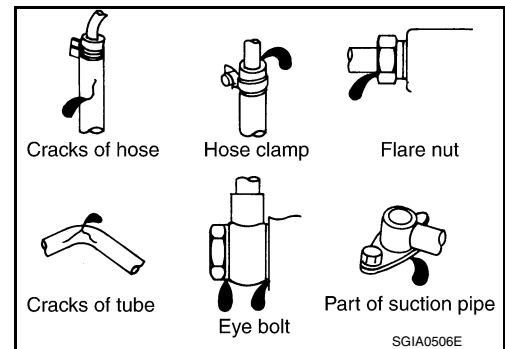
Check the hydraulic piping lines for improper attachment and for leaks, cracks, damage, loose connections, chafing or deterioration.

1. Run engine until power steering fluid temperature reaches 50° – 80°C (122° – 176°F) in reservoir tank. Keep engine speed at idle.
2. Turn steering wheel right-to-left several times.
3. Hold steering wheel at each "lock" position for five seconds to check fluid leakage.

CAUTION:

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

4. If power steering fluid leakage at connections is noticed, then loosen flare nut and then retighten. Do not over tighten connector as this can damage O-ring, washer and connector.
5. If power steering fluid leakage from oil pump is noticed, check power steering oil pump. Refer to [ST-9, "On-Vehicle Inspection and Service"](#).
6. Check steering gear boots for accumulation of power steering fluid indicating a leak from the power steering gear.



Air Bleeding Hydraulic System

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Incomplete air bleeding causes the following. When this happens, bleed air again.

- Air bubbles in reservoir tank.
- Clicking noise in power steering oil pump.
- Excessive buzzing in power steering oil pump.

NOTE:

When vehicle is stationary or while steering wheel is being turned slowly, some noise may be heard from power steering oil pump or the power steering gear. This noise is normal and does not affect any system.

1. Stop engine and turn steering wheel fully to right and left several times. When fluid is lowered, refill reservoir. Repeat process until fluid level is stabilized.

CAUTION:

Do not allow steering fluid reservoir tank to go below the MIN level line. Check tank frequently and add power steering fluid as needed.

2. Run engine at idle speed. Turn steering wheel fully right and then fully left, hold for about three seconds. Then check for power steering fluid leakage.
3. Repeat step 2 several times at about three second intervals.

CAUTION:

POWER STEERING FLUID

< PERIODIC MAINTENANCE >

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

4. Check for air bubbles or cloudy fluid.
5. If air bubbles or cloudiness still exists, stop engine, perform steps 2 and 3 again until air bubbles or cloudiness does not exist.
6. Stop engine, check power steering fluid level.

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STEERING WHEEL

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STEERING WHEEL

On-Vehicle Inspection and Service

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CHECKING CONDITION OF INSTALLATION

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

End play of the axial direction for steering wheel : Refer to [ST-38, "Steering Wheel"](#).

- Check if the nuts for power steering gear assembly are loose. Refer to [ST-16, "Exploded View - Steering Gear"](#).

CHECKING STEERING WHEEL PLAY

1. Turn tires straight ahead, start engine, then turn steering wheel to the left and right lightly. Measure steering wheel movement on the outer circumference of the steering wheel when it is turned to the point where tires start moving.

Steering wheel play on the outer circumference : Refer to [ST-38, "Steering Wheel"](#).

CHECKING NEUTRAL POSITION ON STEERING WHEEL

- Check neutral position on steering wheel after confirming that front wheel alignment is correct. Refer to [FSU-8, "Front Wheel Alignment"](#).

1. Turn tires straight ahead, check if steering wheel is in the neutral position.
2. If it is not in the neutral position, remove steering wheel and reinstall it correctly.
3. If the neutral position cannot be attained by repositioning the steering wheel two teeth or less on steering stem, loosen tie-rod lock nuts of steering outer sockets, then adjust tie-rods by the same amount in the opposite direction.

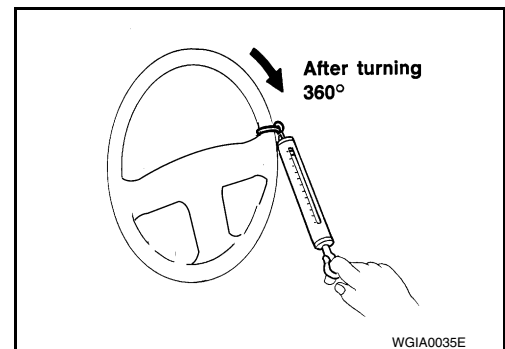
CHECKING STEERING WHEEL TURNING FORCE

1. Park vehicle on a level, dry surface and set parking brake.
2. Start engine.
3. Bring power steering fluid up to operating temperature of 60° – 80°C (140° – 176°F).
4. Tires need to be inflated to specified pressure. Refer to [WT-69, "Tire"](#).
5. 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-38, "Steering Wheel"](#).

6. If steering wheel turning force is out of specification, inspect steering column. Refer to [ST-12, "Removal and Installation"](#).
7. If steering column meets specification, repair steering gear. Refer to [ST-33, "Disassembly and Assembly"](#).



CHECKING FRONT WHEEL TURNING ANGLE

When checking front wheel turning angle, refer to [FSU-8, "Front Wheel Alignment"](#).

POWER STEERING OIL PUMP

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POWER STEERING OIL PUMP

On-Vehicle Inspection and Service

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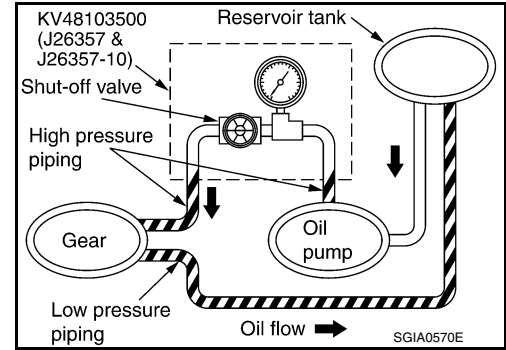
CHECKING RELIEF OIL PRESSURE

CAUTION:

Before starting work, confirm belt tension is proper.

1. Connect Tool between power steering oil pump discharge connector and high pressure hose. Bleed air from the hydraulic circuit with the shut-off valve in the fully open position.

| | | |
|-----------------------------------|------------------------|--|
| Tool number: | | |
| Pressure gauge and shut-off valve | | KV48103500 (J-26357 and J-26357-10) |
| Power steering oil pump side | Connector A and O-ring | KV48105300-4 and 5295262U10 (—) |
| | Eye-bolt and O-ring | KV48105300-3 and 5295262U00 (—) |
| High pressure piping side | Connector B and O-ring | KV48105300-1 and 5295262U00 (—) |
| | Nut | KV48105300-2 (—) |



2. Start engine. Allow engine to run until tank temperature reaches 50° – 80°C (122° – 176°F).

CAUTION:

- Warm up engine with shut-off valve fully opened. If engine is started with shut-off valve closed, fluid pressure in power steering oil pump increases to maximum. This will raise power steering fluid temperature excessively.
- Be careful not to contact hose with belt when engine is started.

3. With engine at idle, close shut-off valve and read the relief oil pressure.

Relief oil pressure : Refer to [ST-40, "Power Steering Oil Pump"](#).

CAUTION:

Do not close shut-off valve of pressure gauge for more than 10 seconds.

4. After measurement, open shut-off valve slowly.
 - If relief oil pressure is outside the specification, replace the power steering oil pump. Refer to [ST-25, "Removal and Installation - VQ40DE"](#), [ST-27, "Removal and Installation - VK56DE"](#).
5. After inspection, disconnect oil pressure gauge and oil pressure gauge adapter from hydraulic circuit, connect power steering oil pump discharge connector and high pressure hose. Add power steering fluid and bleed air from hydraulic circuit thoroughly. Refer to [ST-6, "Air Bleeding Hydraulic System"](#).

STEERING WHEEL

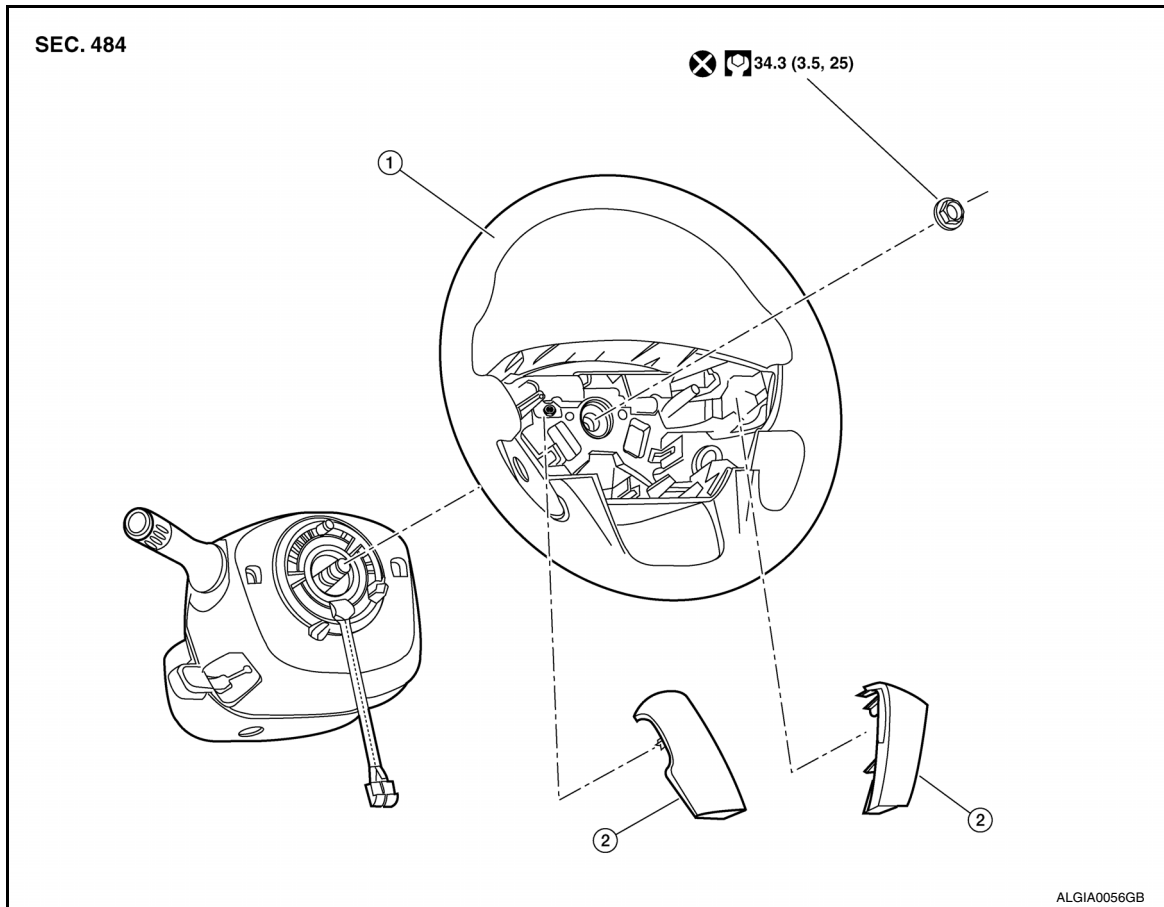
< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

STEERING WHEEL

Exploded View

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1. Steering wheel

2. Finisher panel (if equipped)

Removal and Installation

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REMOVAL

1. Set the front wheels in the straight-ahead position.
2. Remove the driver air bag module. Refer to [SR-11. "Removal and Installation"](#).
3. Disconnect steering wheel switches (if equipped).
4. Remove the steering wheel center nut.
5. Remove the steering wheel using suitable tools.

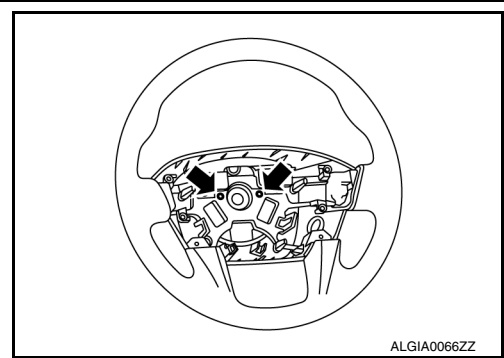
CAUTION:

Place a piece of tape across the spiral cable so it will not be rotated out of position.

STEERING WHEEL

< REMOVAL AND INSTALLATION >

6. Inspect the steering wheel near the puller holes for damage. If damaged, replace the steering wheel.
7. Remove steering wheel rear cover and steering wheel switches, if required. Refer to [AV-82. "Removal and Installation"](#) (MID AUDIO), [AV-150. "Removal and Installation"](#) (PREMIUM AUDIO).



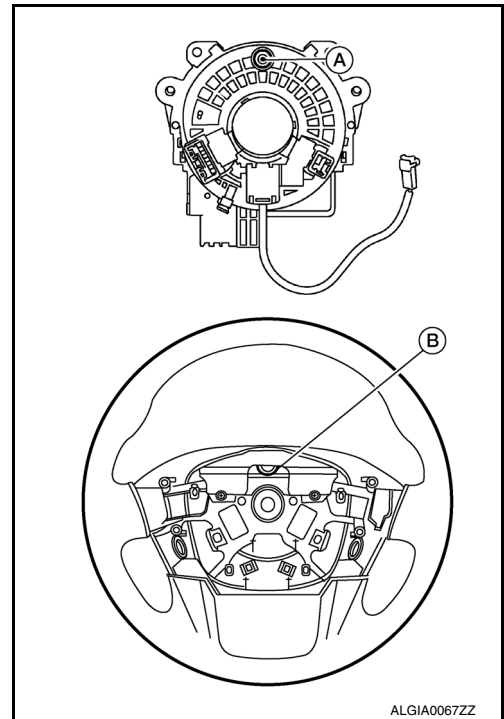
INSTALLATION

Installation is in the reverse order of removal.

- Align spiral cable correctly before installing steering wheel. Make sure that the spiral cable is in the neutral position, ending up with the knob (A) at the top. Refer to [SR-14. "Removal and Installation"](#).
- During steering wheel installation, make sure the locating pin hole (B) is aligned with the locating pin of the spiral cable (A).
- Refer to [BRC-56. "Work Procedure"](#) for steering angle sensor adjustment.
- Tighten steering wheel center nut to specification. Refer to [ST-10. "Exploded View"](#).

CAUTION:

- The spiral cable may snap due to steering operation if the cable is not installed in the correct position.
- With the steering linkage disconnected, the cable may snap by turning the steering wheel beyond the limited number of turns.



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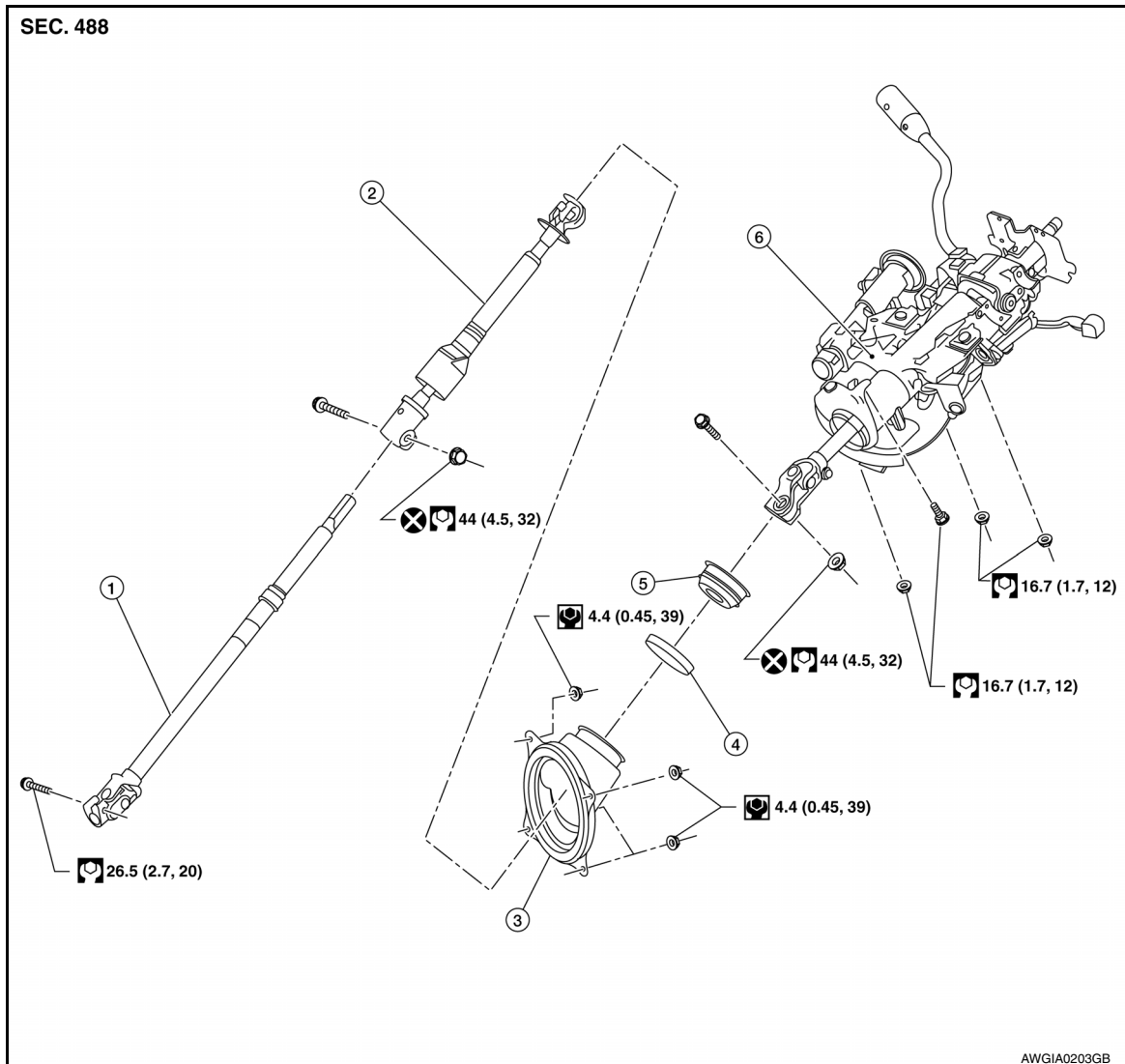
STEERING COLUMN

< REMOVAL AND INSTALLATION >

STEERING COLUMN

Exploded View

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- | | | |
|-------------------------|--------------------------------|-----------------------------|
| 1. Steering lower joint | 2. Steering intermediate shaft | 3. Hole cover |
| 4. Herbie clip | 5. Hole cover seal | 6. Steering column assembly |

Removal and Installation

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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 manual.
- Care must be taken not to give axial impact to steering column assembly during removal and installation.
- Care must be taken not to move steering gear during removal of steering column assembly.

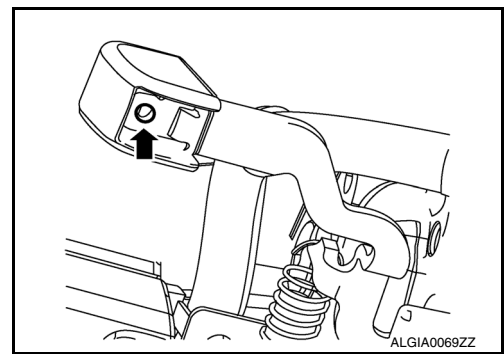
REMOVAL

1. Remove spiral cable from steering column assembly. Refer to [SR-14, "Removal and Installation"](#).
2. Remove the steering angle sensor. Refer to [BRC-145, "Removal and Installation"](#).
3. Remove the combination switch. Refer to [EXL-127, "Removal and Installation"](#).

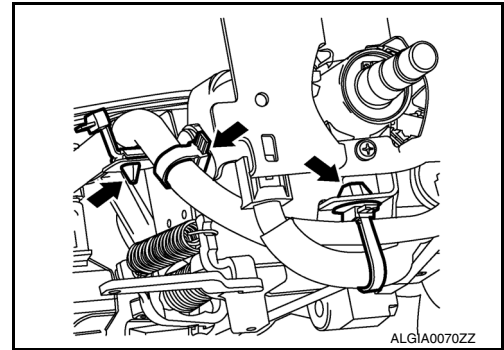
STEERING COLUMN

< REMOVAL AND INSTALLATION >

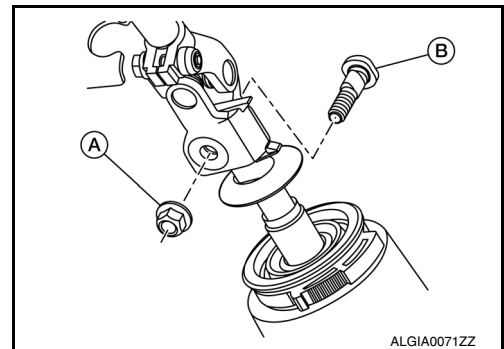
4. Remove tilt lever knob from tilt lever by inserting a suitable tool into slot of tilt lever knob, then depress tab and withdraw tilt lever knob.



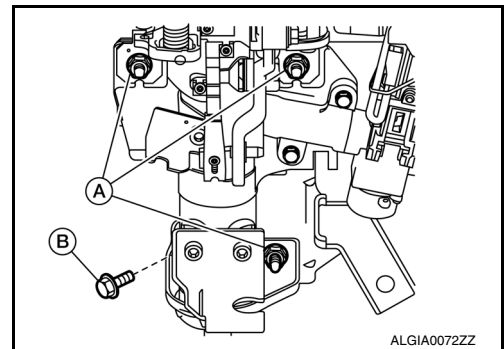
5. Remove the instrument lower panel LH. Refer to [IP-18. "Removal and Installation"](#).
6. Disconnect the three clips from the column and position the wiring harness aside.



7. Disconnect the following harness connectors:
• Immobilizer
• Ignition switch
• Key set module
8. Disconnect the A/T shift selector control cable from steering column. Refer to [TM-163. "Removal and Installation"](#).
9. Remove lock nut (A) and bolt (B), then separate steering column assembly joint from intermediate shaft.



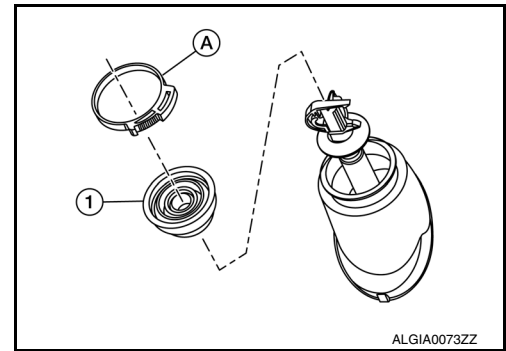
10. Remove steering column assembly nuts (A) and bolt (B), then remove steering column assembly from steering member.



STEERING COLUMN

< REMOVAL AND INSTALLATION >

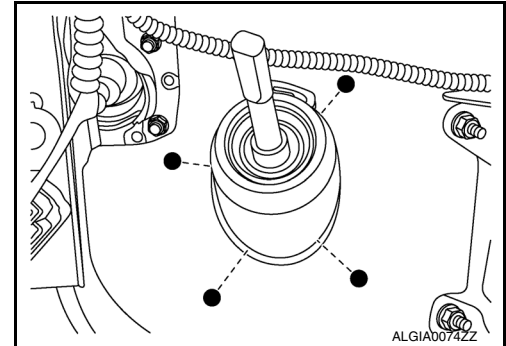
11. Remove the herbie clip (A) and hole cover seal (1) from the vehicle.



12. To access the hole cover fasteners, carefully remove the carpet directly over the fasteners.

NOTE:

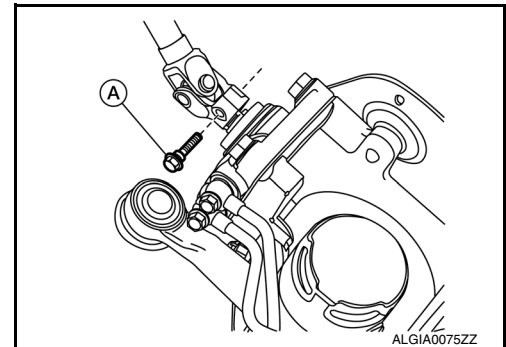
Be sure to place the carpet back to the original position after hole cover installation.



13. Remove nuts, then remove hole cover from the lower dash.

14. Remove the bolt and nut from (lower side) of steering intermediate shaft joint and remove steering intermediate shaft from vehicle.

15. Remove the bolt (A) and steering lower shaft from vehicle.



INSPECTION AFTER REMOVAL

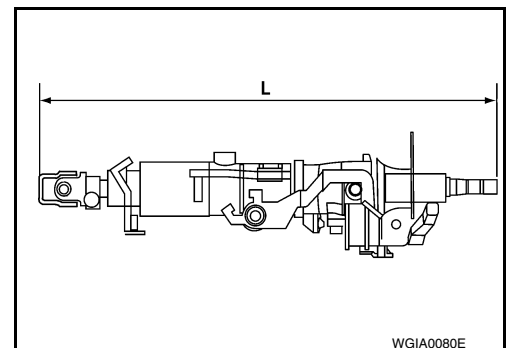
- Check for damage to steering column jacket tube. If damage is found, replace steering column with new one.
- If the vehicle has been involved in a collision, or if noise and rattles are heard during a turn, check the length (L, L¹ and L²) of the column. If out of specification, replace the steering column as an assembly.

Steering column length

L : Refer to [ST-38, "Steering Column"](#).

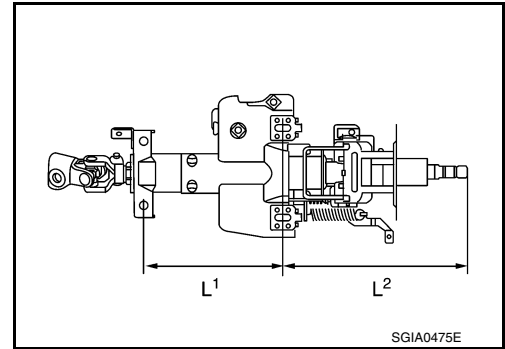
L¹ : Refer to [ST-38, "Steering Column"](#).

L² : Refer to [ST-38, "Steering Column"](#).



STEERING COLUMN

< REMOVAL AND INSTALLATION >



- Check for proper lubrication, apply grease as necessary.

INSTALLATION

Installation is in the reverse order of removal.

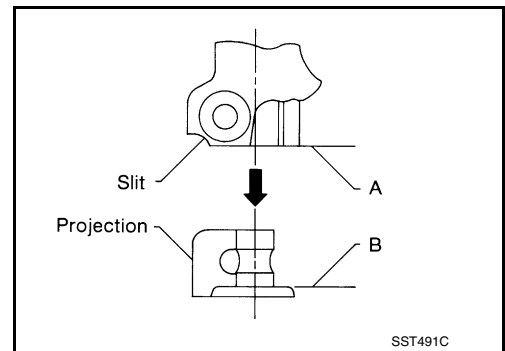
CAUTION:

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

NOTE:

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

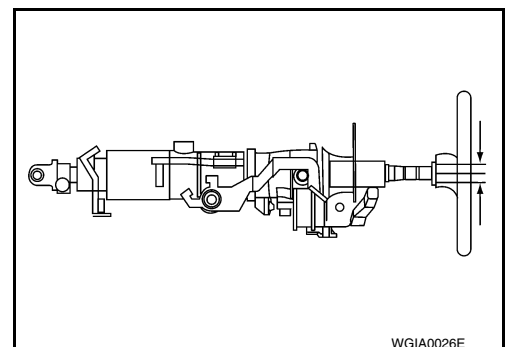
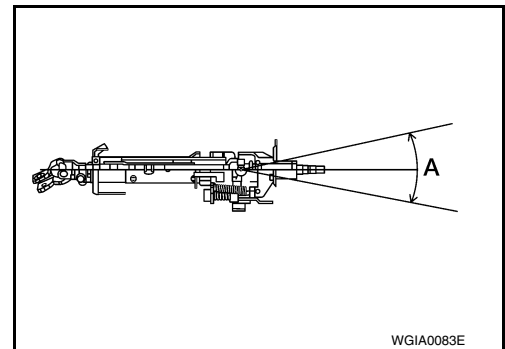
- After installation, turn steering wheel to make sure it moves smoothly. Make sure the number of turns are the same from the straight-forward position to left and right locks. Make sure that the steering wheel is in a neutral position when driving straight ahead.
- When installing steering column to steering member, install nut from front side of vehicle.



INSPECTION AFTER INSTALLATION

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

Range (A) :Refer to [ST-38, "Steering Column"](#).



- Check if steering wheel operation can turn to the end of the left and right stops smoothly.

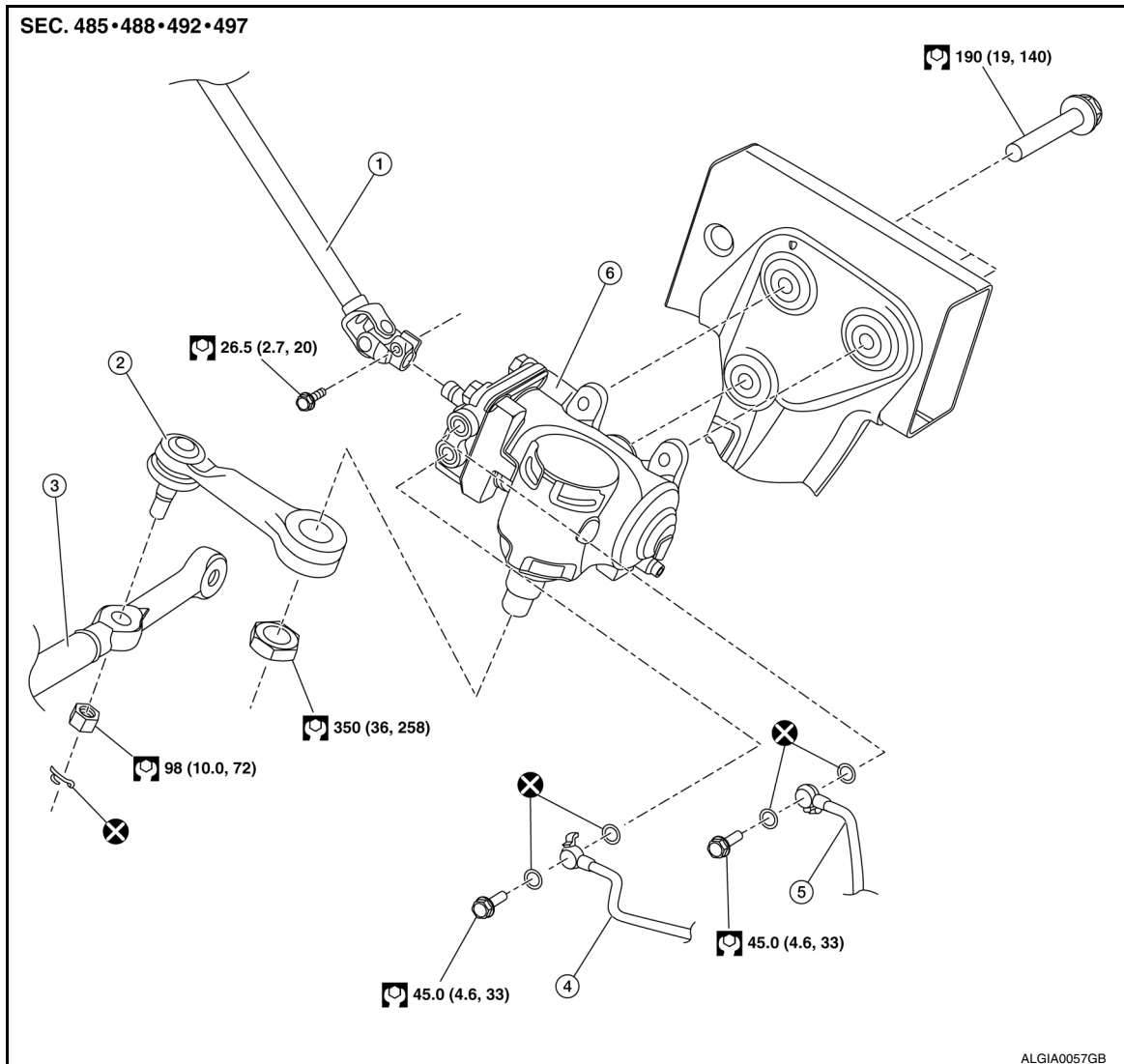
STEERING GEAR AND LINKAGE

< REMOVAL AND INSTALLATION >

STEERING GEAR AND LINKAGE

Exploded View - Steering Gear

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- | | | |
|-------------------------------|---------------------------------|------------------|
| 1. Steering lower joint | 2. Pitman arm | 3. Relay rod |
| 4. Power steering return line | 5. Power steering pressure line | 6. Steering gear |

Removal and Installation - Steering Gear

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NOTE:

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

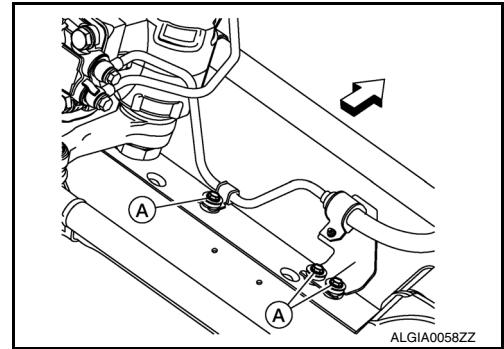
REMOVAL

1. Set the front wheels in the straight-ahead position.
2. Remove the LH front wheel and tire assembly using power tool. Refer to [WT-62. "Adjustment"](#).
3. Remove the front under cover. Refer to [EXT-38. "Removal and Installation"](#).

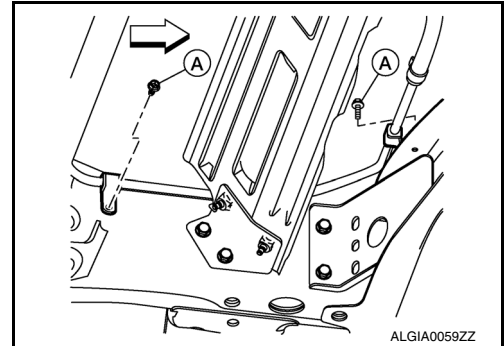
STEERING GEAR AND LINKAGE

< REMOVAL AND INSTALLATION >

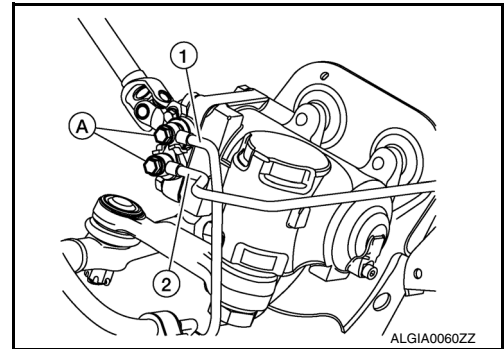
4. Remove the three bolts (A) from the power steering pressure line at the crossmember.
⇐: Front



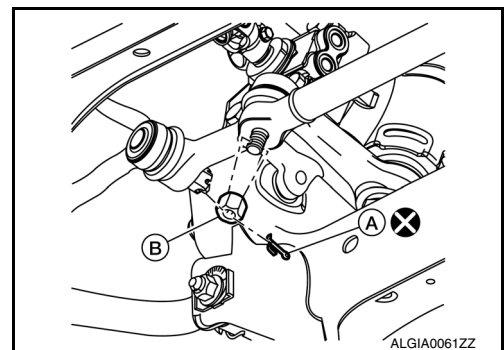
5. Remove the two bolts (A) from the power steering return line at the LH side of the frame and the radiator core support.
⇐: Front



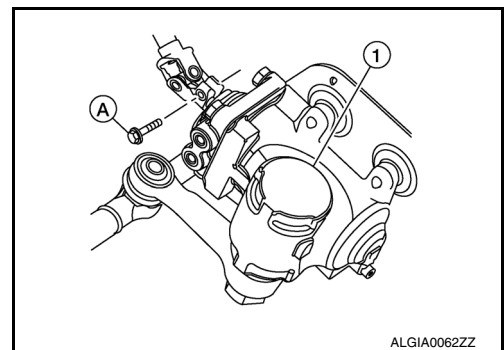
6. Remove the two banjo bolts (A) and disconnect the power steering pressure line (1) and return line (2) from the steering gear. Drain the power steering system and plug the lines. Discard the copper sealing washers.
CAUTION:
Do not reuse copper sealing washers.



7. Remove the cotter pin (A) and nut (B) from the relay rod. Separate the pitman arm from the relay rod using suitable tool. Discard the cotter pin.



8. Remove the steering lower joint pinch bolt (A) at the steering gear (1). Separate the steering lower joint shaft from the steering gear.

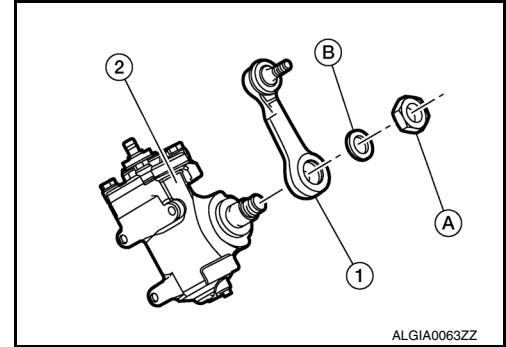


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STEERING GEAR AND LINKAGE

< REMOVAL AND INSTALLATION >

9. Remove the three bolts and the steering gear from the vehicle.
10. Remove the pitman arm nut (A) and washer (B). Remove the pitman arm (1) from the steering gear (2), using a suitable tool.



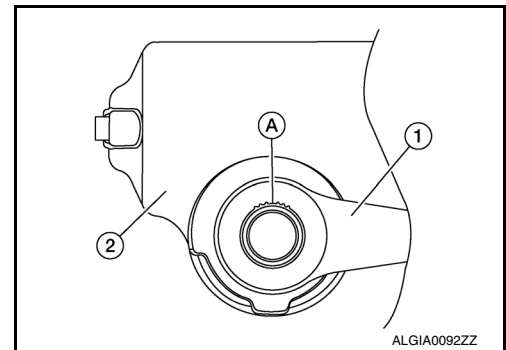
INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Do not reuse copper sealing washers.

- Align the mark (A) from the pitman arm (1) to the steering gear sector shaft (2).



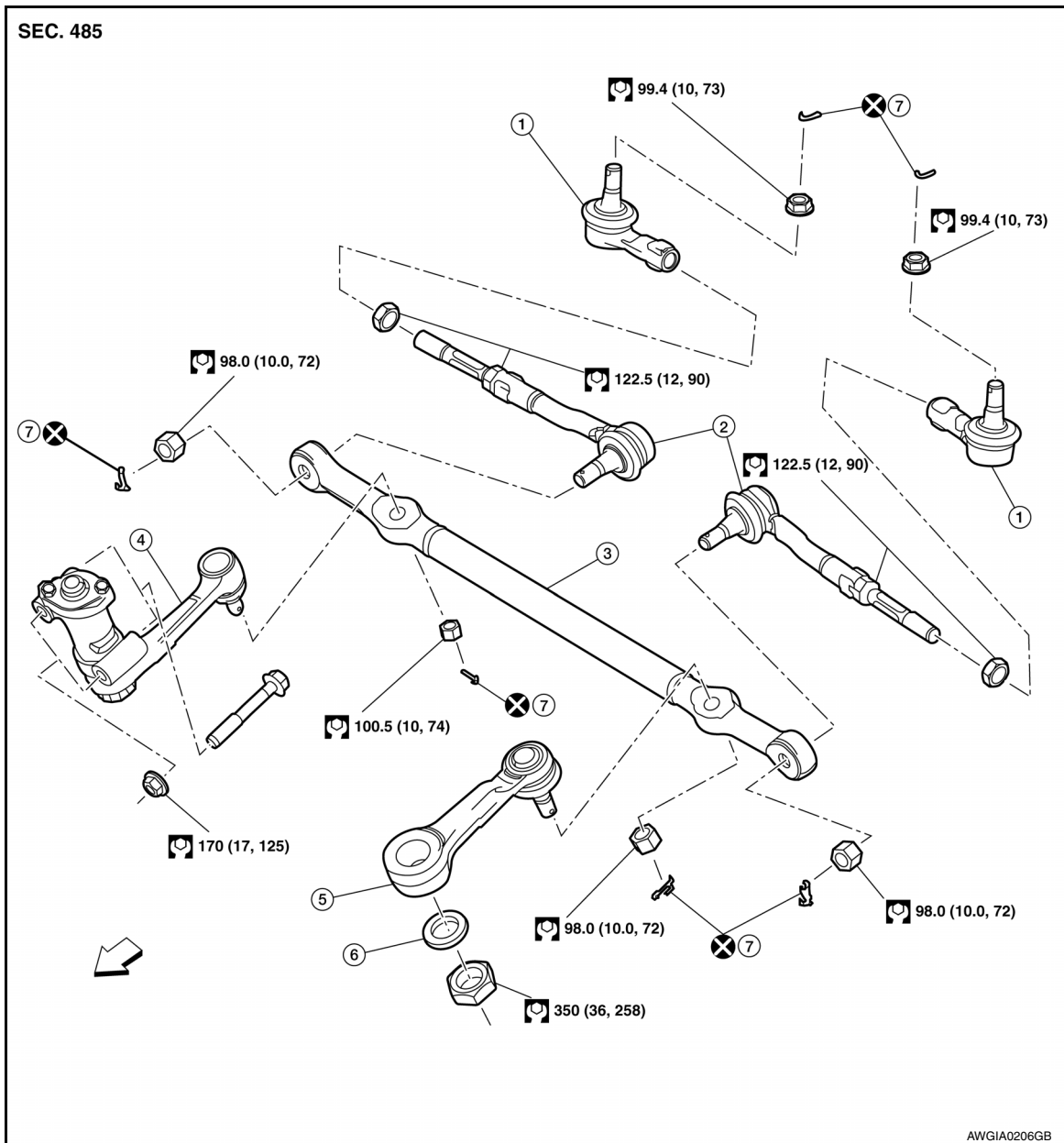
- Tighten the fasteners to specification. Refer to [ST-16. "Exploded View - Steering Gear"](#).
- Tighten the LH front wheel and tire assembly to specification. Refer to [WT-62. "Adjustment"](#).
- After installation, fill the hydraulic system with fluid and bleed air. Refer to [ST-6. "Air Bleeding Hydraulic System"](#).

STEERING GEAR AND LINKAGE

< REMOVAL AND INSTALLATION >

Exploded View - Steering Linkage

INFOID:000000012521874



- | | | |
|-----------------------|-----------------|--------------|
| 1. Outer socket | 2. Inner socket | 3. Relay rod |
| 4. Idler arm assembly | 5. Pitman arm | 6. Washer |
| 7. Cotter pin | ↔ Front | |

Removal and Installation - Steering Linkage

INFOID:000000012521875

NOTE:

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

PITMAN ARM

Removal

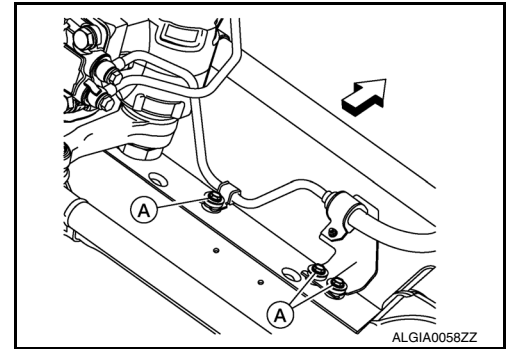
1. Set the front wheels in the straight-ahead position.
2. Remove the LH front wheel and tire assembly using power tool. Refer to [WT-62. "Adjustment"](#).
3. Remove the front under cover. Refer to [EXT-38. "Removal and Installation"](#).

STEERING GEAR AND LINKAGE

< REMOVAL AND INSTALLATION >

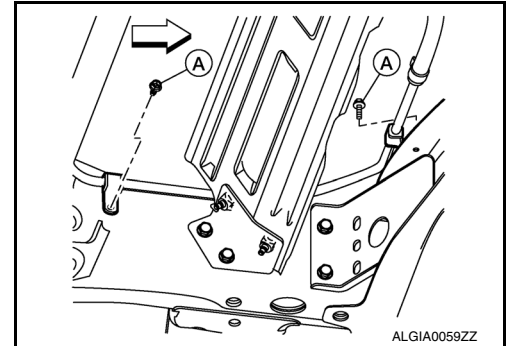
4. Remove the three bolts (A) from the power steering pressure line at the crossmember.

⇄: Front



5. Remove the two bolts (A) from the power steering return line at the LH side of the frame and the radiator core support.

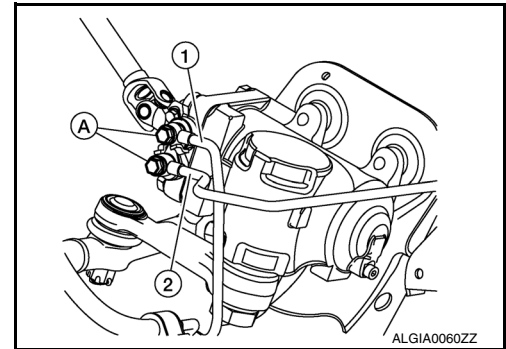
⇄: Front



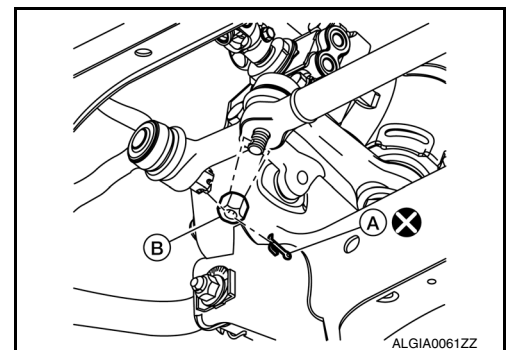
6. Remove the two banjo bolts (A) and disconnect the power steering pressure line (1) and return line (2) from the steering gear. Drain the power steering system and plug the lines. Discard the copper sealing washers.

CAUTION:

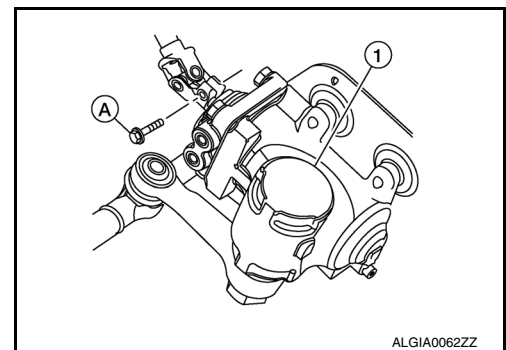
Do not reuse copper sealing washers.



7. Remove the cotter pin (A) and nut (B) from the relay rod. Separate the pitman arm from the relay rod using suitable tool. Discard the cotter pin.



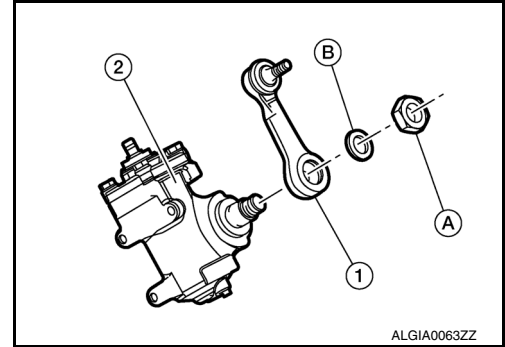
8. Remove the steering lower joint pinch bolt (A) at the steering gear (1). Separate the steering lower joint shaft from the steering gear.



STEERING GEAR AND LINKAGE

< REMOVAL AND INSTALLATION >

- Remove the three bolts and the steering gear from the vehicle.
- Remove the pitman arm nut (A) and washer (B). Remove the pitman arm (1) from the steering gear (2), using a suitable tool.

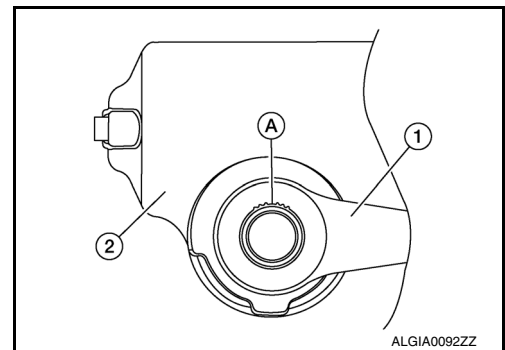


INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not reuse cotter pins.
- Do not reuse copper sealing washers.
- Align the mark (A) from the pitman arm (1) to the steering gear sector shaft (2).

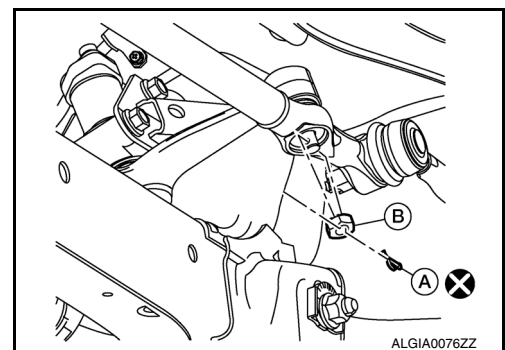


- Tighten the fasteners to specification. Refer to [ST-16, "Exploded View - Steering Gear"](#).
- Tighten the LH front wheel and tire assembly to specification. Refer to [WT-62, "Adjustment"](#).
- After installation, fill the hydraulic system with fluid and bleed air. Refer to [ST-6, "Air Bleeding Hydraulic System"](#).

IDLER ARM

Removal

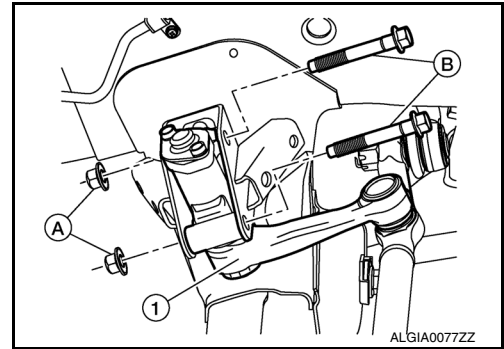
- Set the front wheels in the straight-ahead position.
- Remove the front under cover. Refer to [EXT-38, "Removal and Installation"](#).
- Remove the cotter pin (A) and nut (B) from the relay rod. Separate the idler arm from the relay rod using suitable tool. Discard the cotter pin.



STEERING GEAR AND LINKAGE

< REMOVAL AND INSTALLATION >

4. Remove the nuts (A), bolts (B) and the idler arm (1) from the vehicle.



Installation

Installation is in the reverse order of removal.

CAUTION:

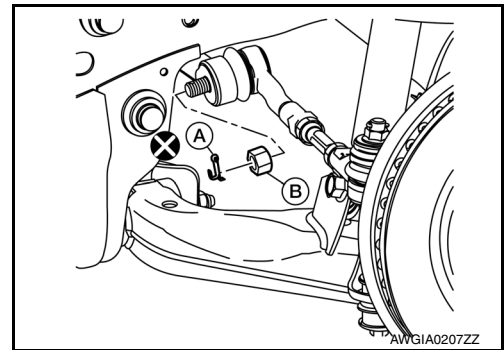
Do not reuse cotter pins.

- Tighten the fasteners to specification. Refer to [ST-19, "Exploded View - Steering Linkage"](#).

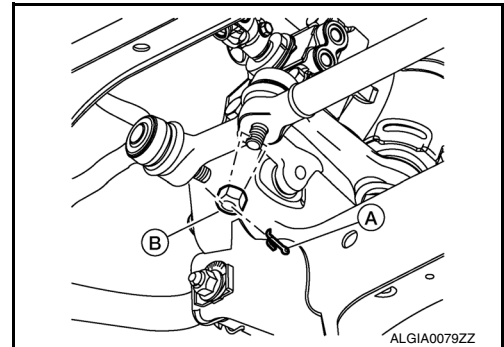
RELAY ROD

Removal

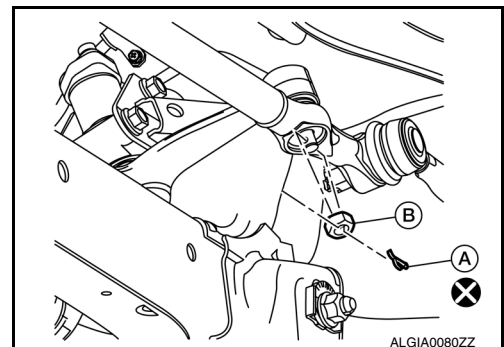
1. Set the front wheels in the straight-ahead position.
2. Remove the front under cover. Refer to [EXT-38, "Removal and Installation"](#).
3. Remove the cotter pin (A) and nut (B) from each inner tie rod. Separate the inner tie rods from the relay rod using suitable tool. Discard the cotter pins.



4. Remove the cotter pin (A) and nut (B) from the relay rod. Separate the pitman arm from the relay rod using suitable tool. Discard the cotter pin.



5. Remove the cotter pin (A) and nut (B) from the relay rod. Separate the idler arm from the relay rod using suitable tool. Discard the cotter pin.



STEERING GEAR AND LINKAGE

< REMOVAL AND INSTALLATION >

6. Remove the relay rod from the vehicle.

Installation

Installation is in the reverse order of removal.

CAUTION:

Do not reuse cotter pins.

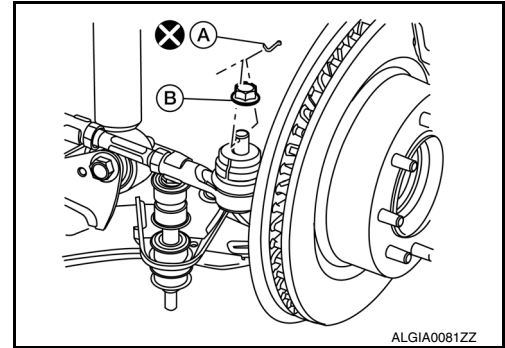
- Tighten the fasteners to specification. Refer to [ST-19, "Exploded View - Steering Linkage"](#).

TIE RODS

Outer Tie Rod

REMOVAL

1. Remove the wheel and tire assembly using power tool. Refer to [WT-62, "Adjustment"](#).
2. Loosen the outer tie rod jam nut.
3. Remove the cotter pin (A) and nut (B) from the outer tie rod. Separate the outer tie rod from the steering knuckle using suitable tool. Discard the cotter pin.



4. Remove the outer tie rod from the vehicle.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

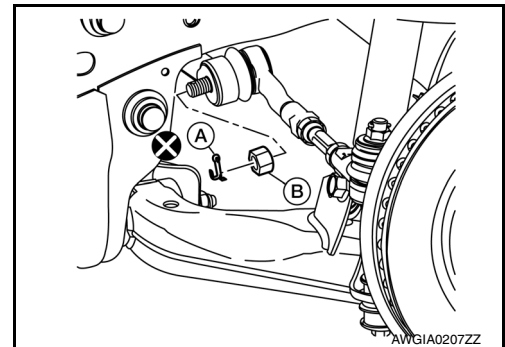
Do not reuse cotter pins.

- Tighten the fasteners to specification. Refer to [ST-19, "Exploded View - Steering Linkage"](#).
- Check wheel alignment. Refer to [FSU-8, "Front Wheel Alignment"](#).

Inner Tie Rod

REMOVAL

1. Remove the wheel and tire assembly using power tool. Refer to [WT-62, "Adjustment"](#).
2. Remove the cotter pin (A) and nut (B) from the inner tie rod. Separate the inner tie rod from the relay rod using suitable tool. Discard the cotter pin.

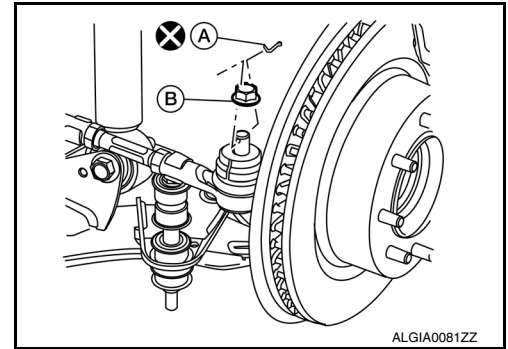


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STEERING GEAR AND LINKAGE

< REMOVAL AND INSTALLATION >

3. Remove the cotter pin (A) and nut (B) from the outer tie rod. Separate the outer tie rod from the steering knuckle using suitable tool. Discard the cotter pin.



4. Remove the inner tie rod and outer tie rod from the vehicle as an assembly. Separate the outer tie rod from the inner tie rod on a clean working surface.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Do not reuse cotter pins.

- Tighten the fasteners to specification. Refer to [ST-19, "Exploded View - Steering Linkage"](#).
- Check wheel alignment. Refer to [FSU-8, "Front Wheel Alignment"](#).

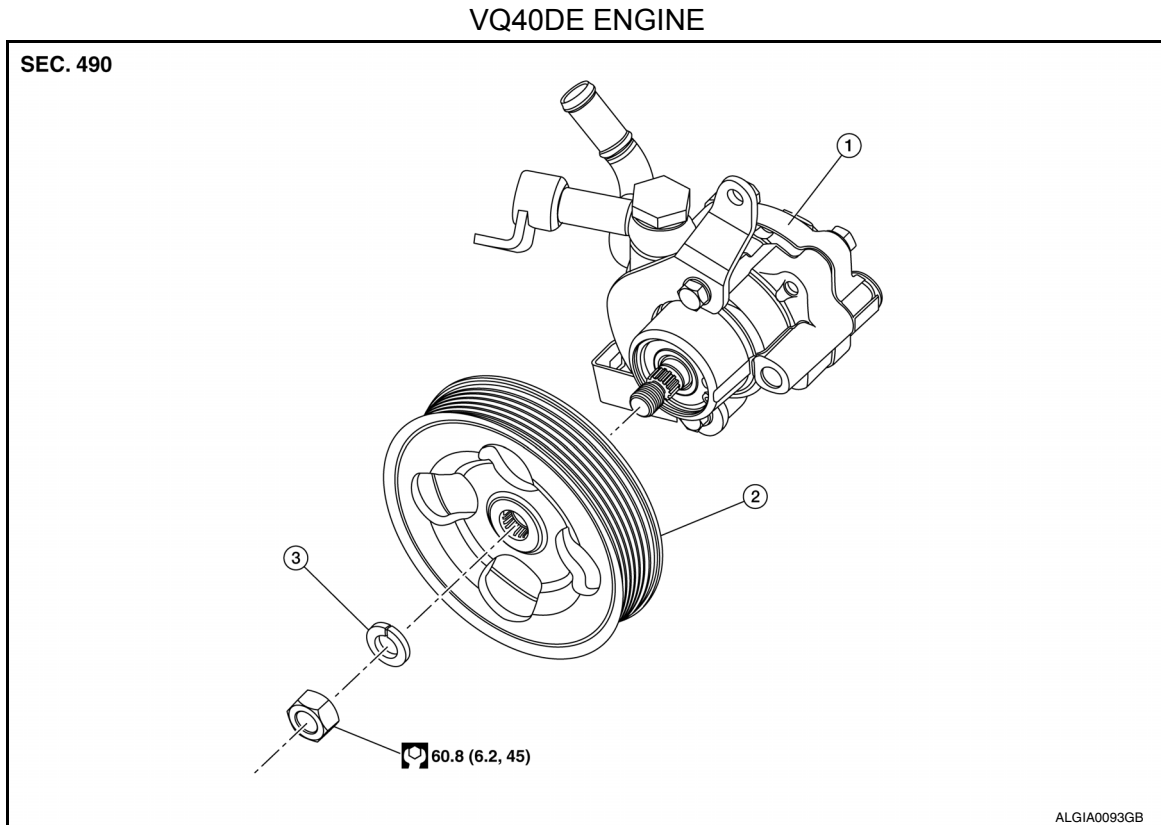
POWER STEERING OIL PUMP

< REMOVAL AND INSTALLATION >

POWER STEERING OIL PUMP

Component View - VQ40DE

INFOID:000000012521876



1. Power steering pump 2. Pulley 3. Lock washer

Removal and Installation - VQ40DE

INFOID:000000012521877

NOTE:

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

REMOVAL

1. Drain the power steering fluid from the power steering reservoir tank.
2. Remove the drive belt. Refer to [EM-13. "Removal and Installation"](#).
3. Remove the right front fender protector. Refer to [EXT-33. "Removal and Installation"](#).
4. Disconnect the power steering suction hose from the power steering pump.
5. Disconnect the power steering oil pressure sensor harness connector.
6. Remove the eye bolt and disconnect the power steering pressure line from the power steering pump. Plug the lines and discard the copper sealing washers.

CAUTION:

Do not reuse copper sealing washers.

7. Remove the bolts and the power steering pump from the vehicle.

INSTALLATION

Installation is in the reverse order of removal.

POWER STEERING OIL PUMP

< REMOVAL AND INSTALLATION >

- Install the bolts hand tight, then tighten to specification in the order shown.

Power steering pump to bracket bolt (1) : 64.7 N·m (6.6 kg–m, 48 ft–lb)

Power steering pump to block bolt (2) : 28 N·m (2.9 kg–m, 21 ft–lb)

- After installation, bleed air. Refer to [ST-6, "Air Bleeding Hydraulic System"](#).

CAUTION:

Do not reuse copper sealing washers.

NOTE:

Belt tension is automatic and requires no adjustment.

POWER STEERING OIL PUMP BRACKET (VQ40DE)

Removal

1. Remove the power steering oil pump.
2. Remove the bolts and the power steering oil pump bracket.

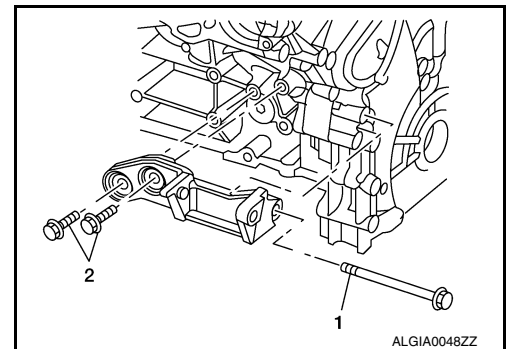
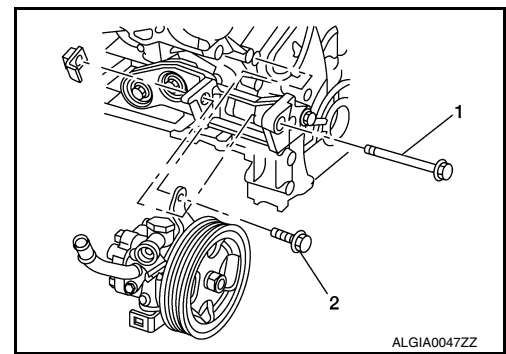
Installation

1. Position the bracket and install the bracket to block bolts finger tight.
2. Tighten the bolts to specification in order as shown.

Bracket to front of block bolt (1) : 61.3 N·m (6.3 kg–m, 45 ft–lb)

Bracket to side of block bolt (2) : 61.3 N·m (6.3 kg–m, 45 ft–lb)

3. Install the power steering oil pump.

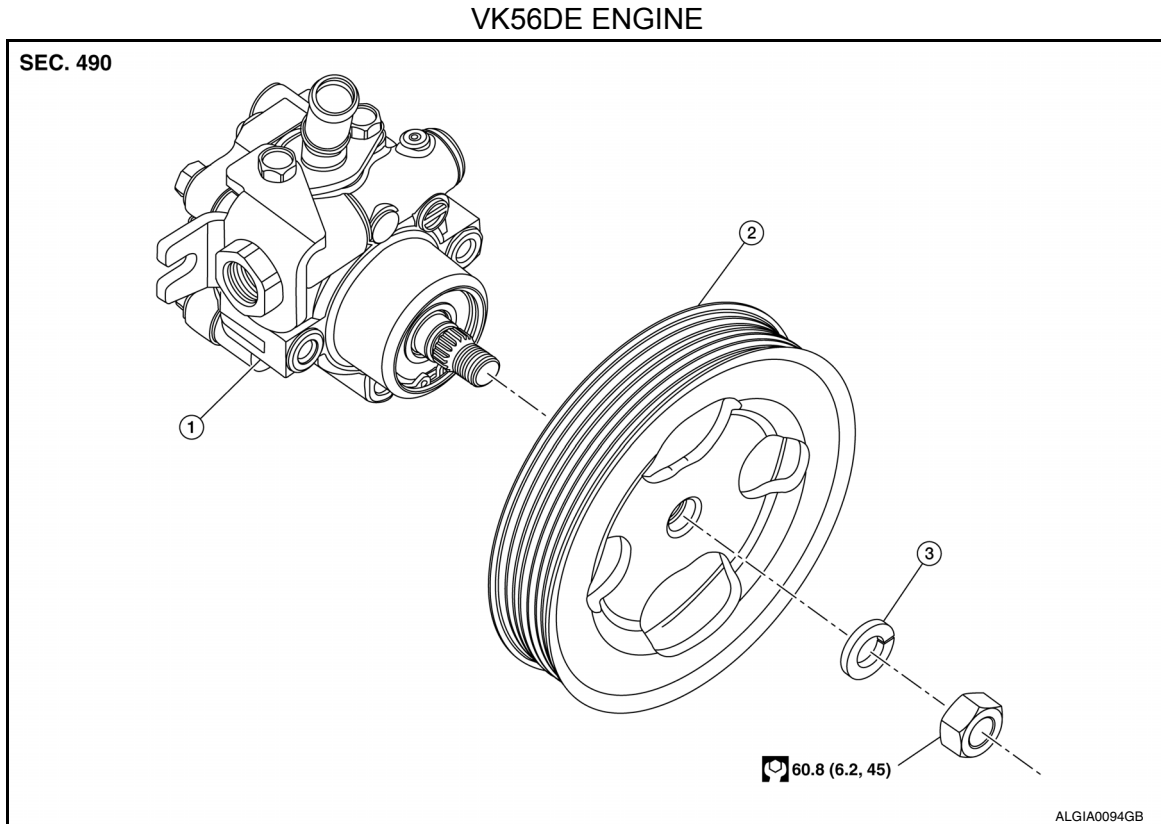


POWER STEERING OIL PUMP

< REMOVAL AND INSTALLATION >

Component View - VK56DE

INFOID:000000012521878



1. Power steering pump 2. Pulley 3. Lock washer

Removal and Installation - VK56DE

INFOID:000000012521879

NOTE:

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

REMOVAL

1. Drain the power steering fluid from the power steering reservoir tank.
2. Remove the drive belt. Refer to [EM-153. "Removal and Installation"](#).
3. Remove the RH front wheel and tire assembly using power tool. Refer to [WT-62. "Adjustment"](#).
4. Remove the RH front fender protector. Refer to [EXT-33. "Removal and Installation"](#).
5. Disconnect the power steering suction hose from the power steering pump.
6. Disconnect the harness connector from the power steering oil pressure sensor.
7. Remove the eye bolt and disconnect the power steering pressure line from the power steering pump. Plug the lines and discard the copper sealing washers.

CAUTION:

Do not reuse copper sealing washers.

8. Remove the bolts and the power steering pump from the vehicle.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Do not reuse copper sealing washers.

NOTE:

Belt tension is automatic and requires no adjustment.

POWER STEERING OIL PUMP

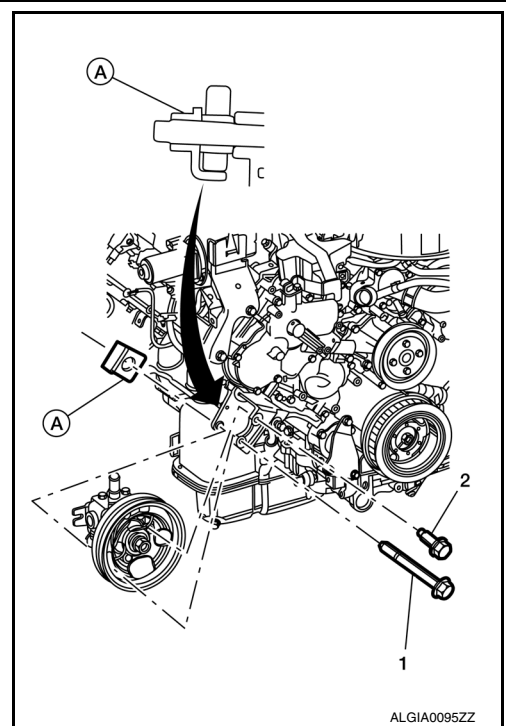
< REMOVAL AND INSTALLATION >

- Install the bolt (1) to the baffle hook (A) hand tight, then install bolt (2) hand tight. Tighten to specification in the order shown.

Power steering pump to bracket bolt (1) : 64.7 N·m (6.6 kg-m, 48 ft-lb)

Power steering pump to block bolt (2) : 31 N·m (3.2 kg-m, 23 ft-lb)

- Tighten the wheel and tire assembly to specification. Refer to [WT-62. "Adjustment"](#).
- After installation, bleed air. Refer to [ST-6. "Air Bleeding Hydraulic System"](#).



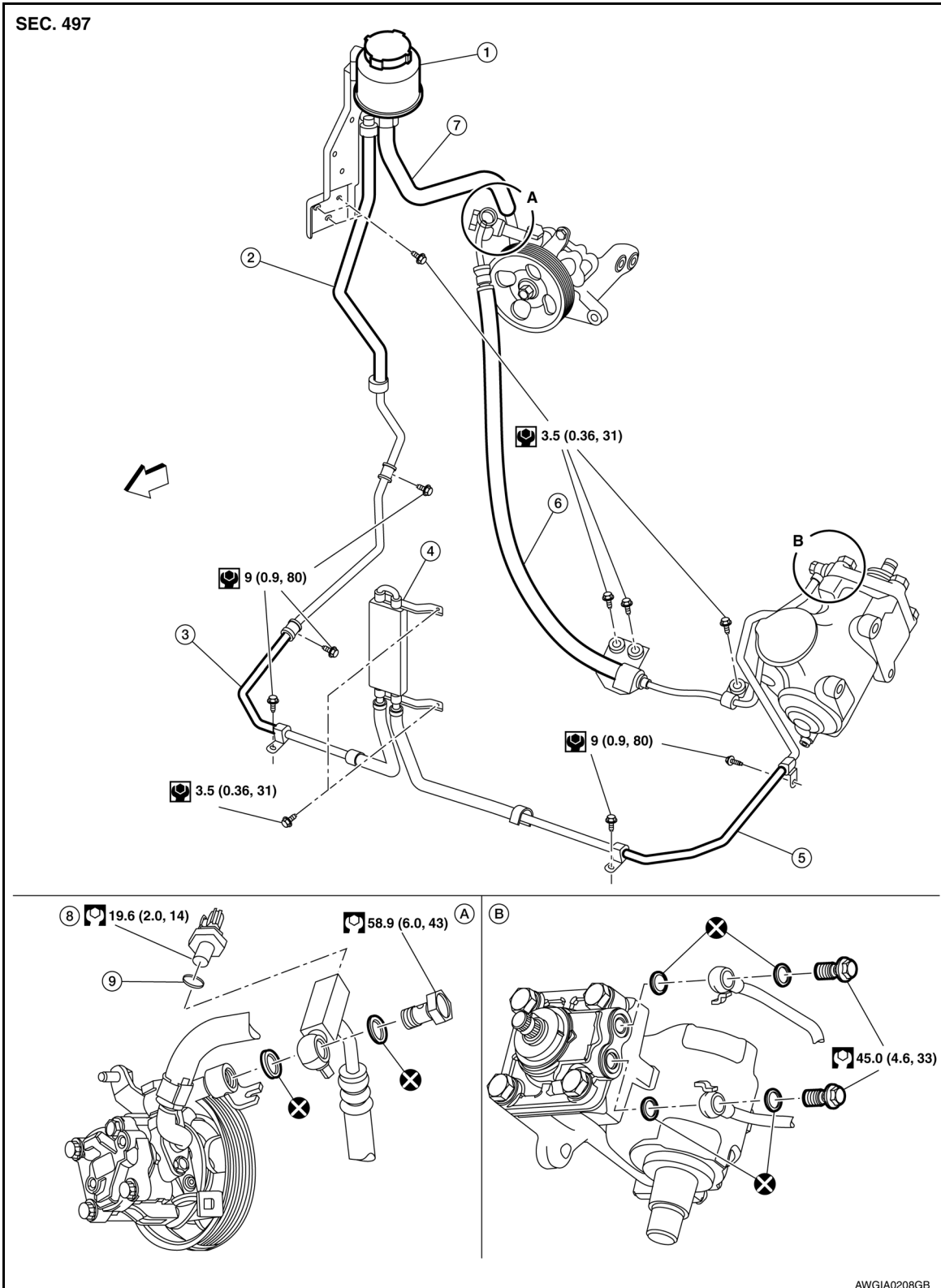
HYDRAULIC LINE

< REMOVAL AND INSTALLATION >

HYDRAULIC LINE

Component Parts Location - VQ40DE

INFOID:000000012521880



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HYDRAULIC LINE

< REMOVAL AND INSTALLATION >

7. Power steering suction hose 8. Power steering pressure sensor 9. O-ring

⇐ Front

Removal and Installation - VQ40DE

INFOID:000000012521881

NOTE:

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

REMOVAL

Refer to the component parts location illustration for hydraulic line removal. Refer to [ST-29, "Component Parts Location - VQ40DE"](#).

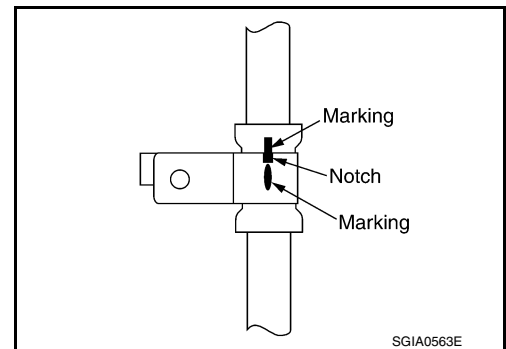
CAUTION:

Do not reuse copper sealing washers.

INSTALLATION

Installation is in the reverse order of removal.

- Confirm mating marks are aligned with hose and clamp, then correct if needed.

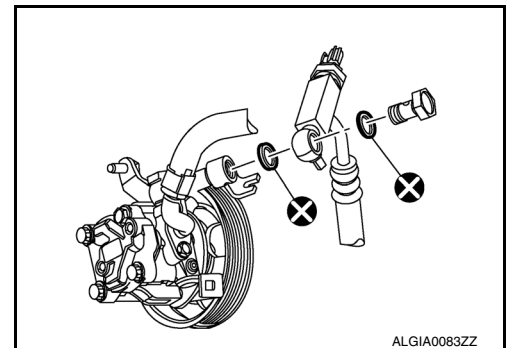


- To install eye joint, align projection of eye joint with notch of power steering pump, and attach eye joint to power steering oil pump properly. Tighten eye bolt by hand fully, then torque to specification. Refer to [ST-29, "Component Parts Location - VQ40DE"](#).

CAUTION:

Do not reuse copper sealing washers.

- After installation, bleed air. Refer to [ST-6, "Air Bleeding Hydraulic System"](#).

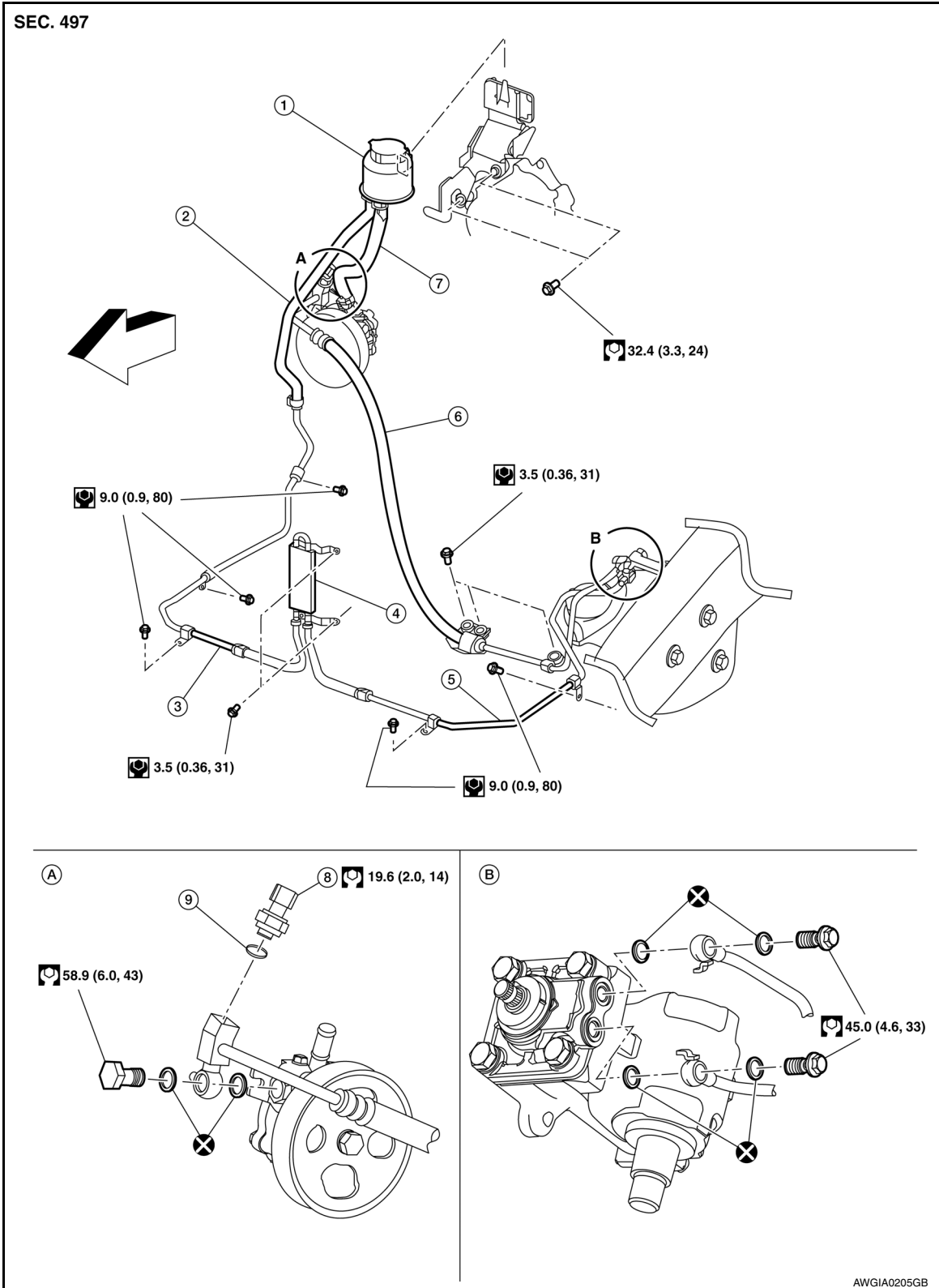


HYDRAULIC LINE

< REMOVAL AND INSTALLATION >

Component Parts Location - VK56DE

INFOID:000000012521882



- | | | |
|----------------------------------|------------------------------------|---------------------------------|
| 1. Power steering reservoir tank | 2. Power steering return hose | 3. Power steering return pipe |
| 4. Oil cooler assembly | 5. Power steering gear return pipe | 6. Power steering pressure line |
| 7. Power steering suction hose | 8. Power steering pressure sensor | 9. O-ring |

↶ Front

HYDRAULIC LINE

< REMOVAL AND INSTALLATION >

Removal and Installation - VK56DE

INFOID:000000012521883

NOTE:

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

REMOVAL

Refer to the component parts location illustration for hydraulic line removal. Refer to [ST-31, "Component Parts Location - VK56DE"](#).

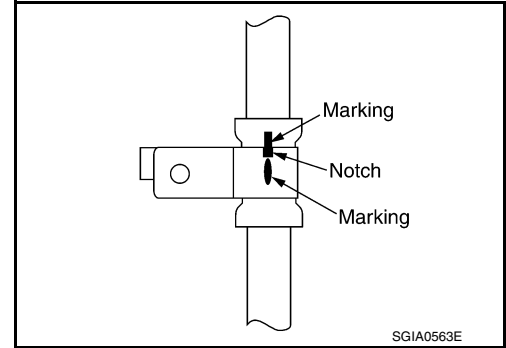
CAUTION:

Do not reuse copper sealing washers.

INSTALLATION

Installation is in the reverse order of removal.

- Confirm mating marks are aligned with hose and clamp, then correct if needed.

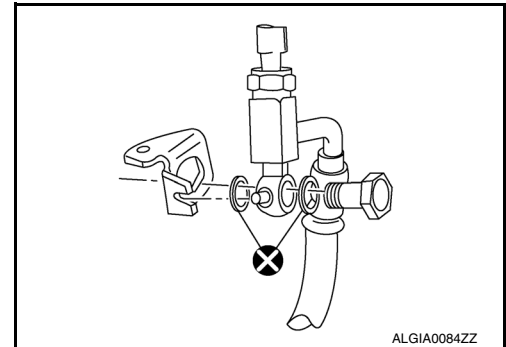


- To install eye joint, align projection of eye joint with notch of power steering pump, and attach eye joint to power steering oil pump properly. Tighten eye bolt by hand fully, then torque to specification. Refer to [ST-31, "Component Parts Location - VK56DE"](#).

CAUTION:

Do not reuse copper sealing washers.

- After installation, bleed air. refer to [ST-6, "Air Bleeding Hydraulic System"](#).



STEERING COLUMN

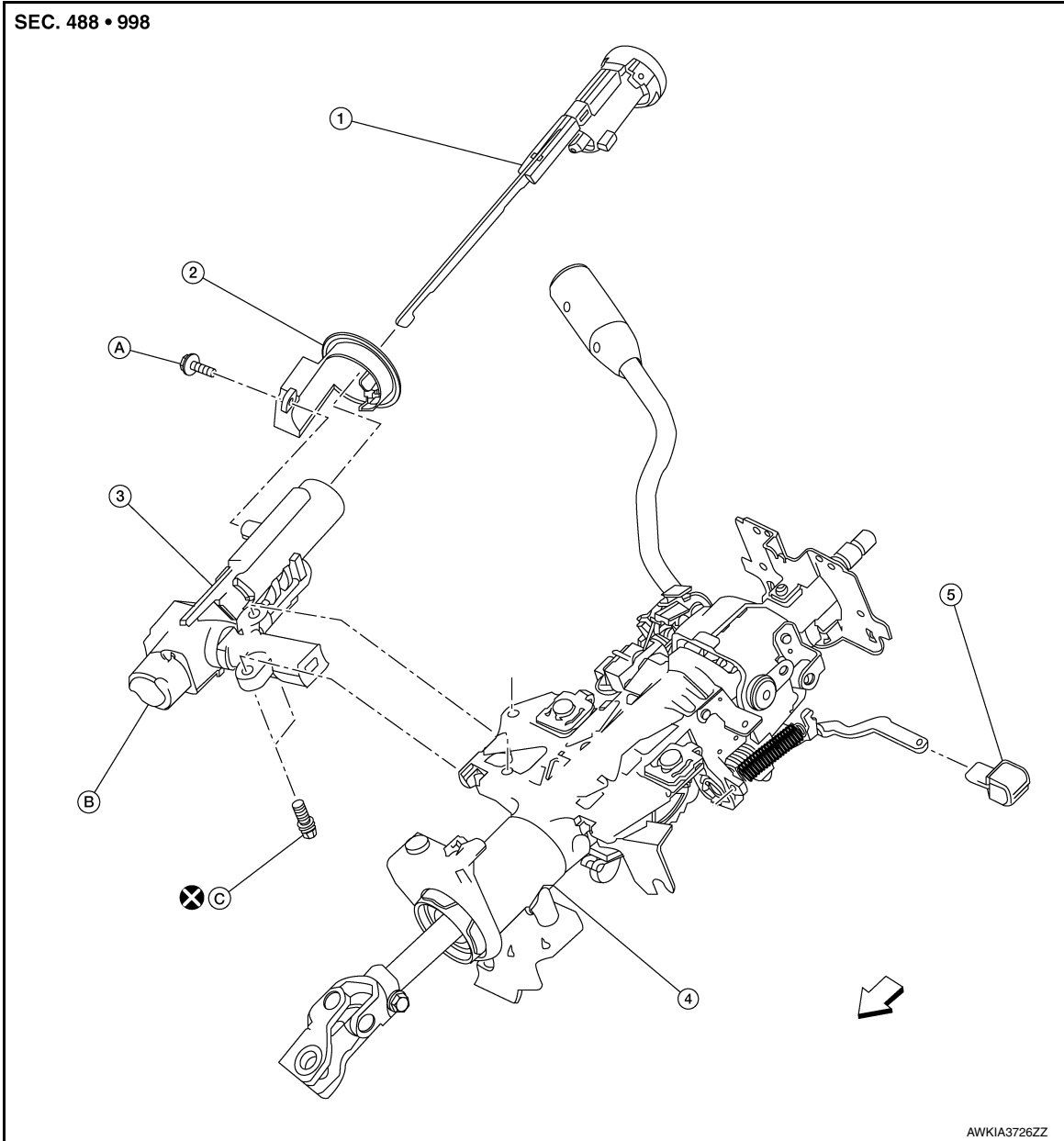
< UNIT DISASSEMBLY AND ASSEMBLY >

UNIT DISASSEMBLY AND ASSEMBLY

STEERING COLUMN

Disassembly and Assembly

INFOID:0000000012521884



- | | | |
|--------------------|--------------------------------------|--|
| 1. Key cylinder | 2. NATS antenna amp (if equipped) | 3. Steering lock unit |
| 4. Steering column | 5. Steering column tilt lever knob | A. NATS antenna amp bolt (if equipped) |
| B. Ignition switch | C. Tamper resistant self-shear screw | ⇐ Front |

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.
- Use care when handling steering column during disassembly and assembly.

DISASSEMBLY

STEERING COLUMN

< UNIT DISASSEMBLY AND ASSEMBLY >

1. Remove spring from steering column and tilt lever.
2. Remove upper joint bolt, then remove upper joint from steering column.
3. Remove steering lock unit. Refer to [DLK-125. "Removal and Installation - Steering Lock Unit"](#).

ASSEMBLY

Assembly is in the reverse order of disassembly.

For initialization and registration of mechanical keys, refer to CONSULT Immobilizer mode and follow the on-screen instructions. Refer to [BCS-47. "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT \(BCM\) : Description"](#).

INSPECTION AFTER ASSEMBLY

When the steering wheel does not turn smoothly, check the steering column as follows:

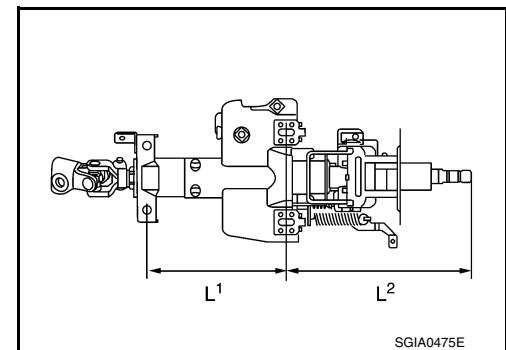
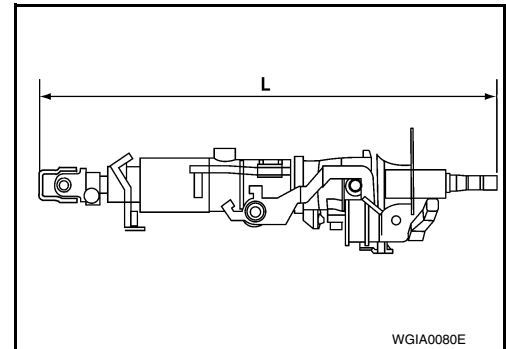
1. Check the column bearings for damage or unevenness. Lubricate with recommended multi-purpose grease. Replace the steering column as an assembly, if necessary.
2. Check the column tube for deformation or breakage. Replace the steering column as an assembly, if necessary.
3. If the vehicle has been involved in a collision, or if noise and rattles are heard during a turn, check the length (L) of the column. If out of specification, replace the steering column as an assembly.

Steering column length L

L : Refer to [ST-38. "Steering Column"](#).

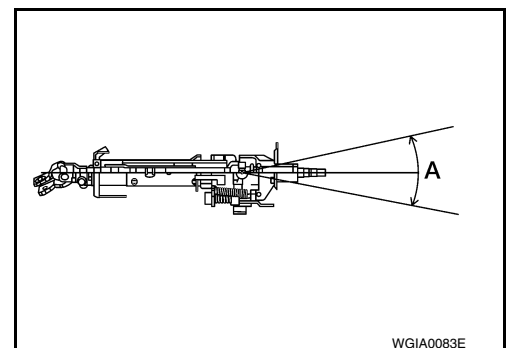
L¹ : Refer to [ST-38. "Steering Column"](#).

L² : Refer to [ST-38. "Steering Column"](#).



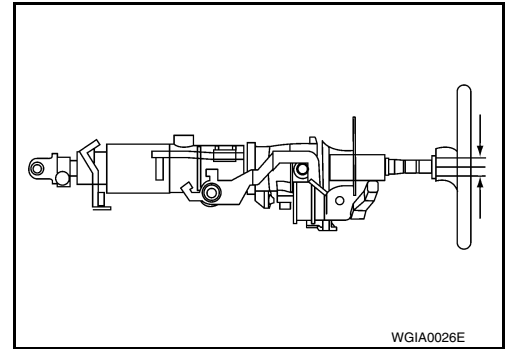
4. Check for proper lubrication, apply grease as necessary.
5. Check for wear around the seal edges, replace as necessary.
6. Check for corrosion or pitting around the seal sliding area.
7. Replace the seal and shaft in case of seal edge wear or damage.
8. After installing the steering column, check the tilt mechanism for proper operation.

Range (A) : Refer to [ST-38. "Steering Column"](#).



STEERING COLUMN

< UNIT DISASSEMBLY AND ASSEMBLY >



CAUTION:

- Do not exert any load or impact in the axial direction immediately before or after column removal.
- After installation, check for smooth steering wheel rotation, without any catches or noise.
- Replace the column if it is depleted of grease, worn, damaged, or if any scratches or coating separation is present on the shaft seal area.
- The lower nut on the upper joint may not be reused.
- During lower joint detachment, insert a tool into the yoke groove to prevent gouging damage.

A

B

C

D

E

F

ST

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POWER STEERING OIL PUMP

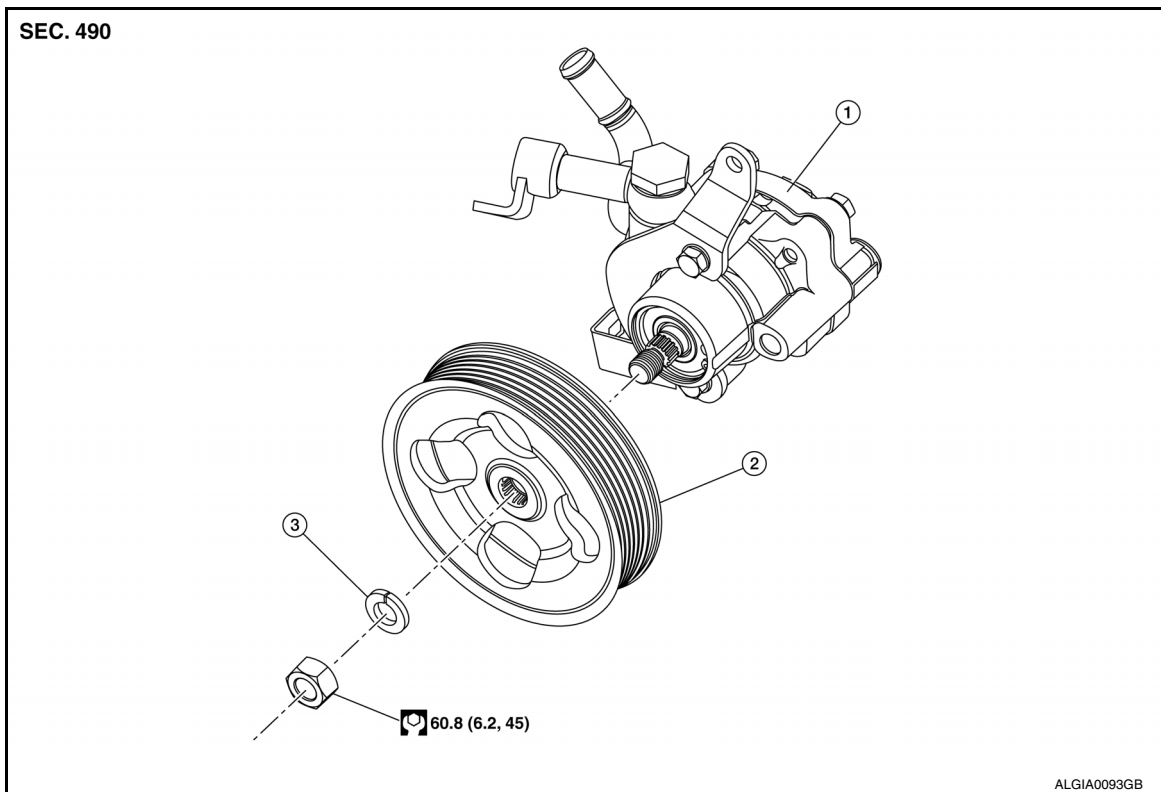
< UNIT DISASSEMBLY AND ASSEMBLY >

POWER STEERING OIL PUMP

Disassembly and Assembly

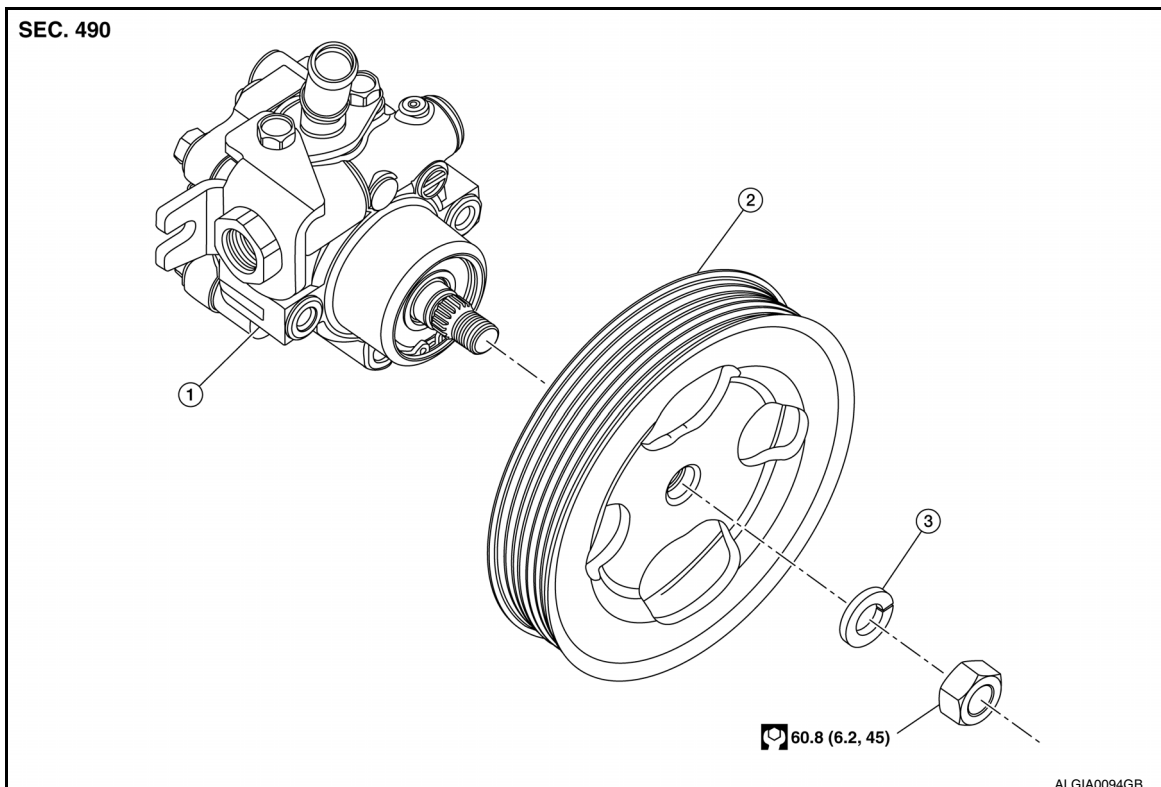
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VQ40DE ENGINE



1. Power steering pump 2. Pulley 3. Lock washer

VK56DE ENGINE



POWER STEERING OIL PUMP

< UNIT DISASSEMBLY AND ASSEMBLY >

1. Power steering pump 2. Pulley 3. Lock washer

A

INSPECTION BEFORE DISASSEMBLY

Disassemble the power steering oil pump only if the pulley is found to be deformed or damaged.

B

DISASSEMBLY

NOTE:

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

C

1. Remove the pulley nut.
2. Remove the lock washer.
3. Remove the pulley.

D

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.

E

ASSEMBLY

Assembly is in the reverse order of disassembly.

F

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SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Steering Wheel

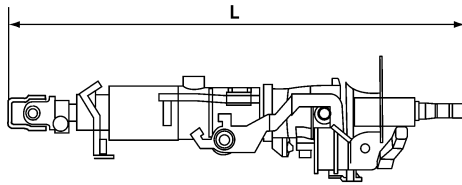
INFOID:0000000012521886

| | |
|--|-------------------------------|
| End play of the axial direction for steering wheel | 0 mm (0 in) |
| Steering wheel play on the outer circumference | 0 – 35 mm (0 – 1.38 in) |
| Steering wheel turning force | 39 N (4 kg-f, 9 lb-f) or less |

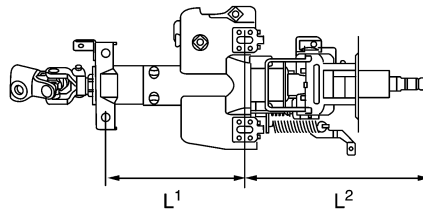
Steering Column

INFOID:0000000012521887

Unit: mm (in)



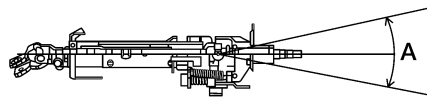
WGIA0080E



SGIA0475E

| | |
|--|---------------|
| Steering column length (L) | 612.5 (24.11) |
| Steering column length (L ¹) | 165.1 (6.50) |
| Steering column length (L ²) | 258 (10.16) |

Inspection After Installation



WGIA0083E

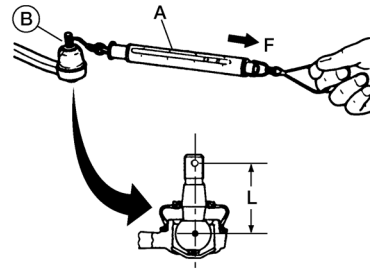
| | |
|-----------|-----|
| Range (A) | 18° |
|-----------|-----|

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

Steering Linkage

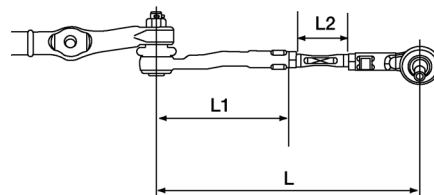
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AWGIA0164ZZ

| | | |
|----------------------|--|--|
| Tie-rod ball stud | Swinging torque (F) Measurement on spring balance (A) • Measuring point: cotter pin hole of stud (B) | 5.9 - 45.8 N (0.60 - 4.67 kg-f, 1.33 - 10.30 lb-f) |
| | Rotating torque | 0.3 - 2.9 N-m (0.03 - 0.29 kg-m, 3 - 25 in-lb) |
| | Axial end play | 0.5 mm (0.020 in) or less |
| | Ball stud length (L) | 67.7 mm (2.67 in) |
| Pitman arm ball stud | Swinging torque (F) Measurement on spring balance (A) • Measuring point: cotter pin hole of stud (B) | 5.9 - 45.8 N (0.60 - 4.67 kg-f, 1.33 - 10.30 lb-f) |
| | Ball stud length (L) | 67.7 mm (2.67 in) |
| Idler arm ball stud | Swinging torque (F) Measurement on spring balance (A) • Measuring point: cotter pin hole of stud (B) | 9.1 - 89 N (0.93 - 9.1 kg-f, 2.05 - 20.0 lb-f) |
| | Ball stud length (L) | 55 mm (2.17 in) |
| Idler arm | Swinging torque (F) Measurement on spring balance (A) • Measuring point: cotter pin hole of stud (B) | 4.7 - 29 N (0.48 - 3.0 kg-f, 1.06 - 6.5 lb-f) |

Unit: mm (in)



ALGIA0089ZZ

| | |
|---|---------------|
| Standard dimension before toe-in adjustment (L) | 388.1 (15.28) |
| Inner socket length (L ¹) | 195 (7.68) |
| Possible amount of adjustment (L ²) | ±5 (±0.2) |

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

Power Steering Gear

INFOID:0000000012521889

Unit: mm (in)

| | |
|---------------------------|-------------|
| Power steering gear model | PB64Z |
| End play at sector shaft | 0.1 (0.004) |

Power Steering Oil Pump

INFOID:0000000012521890

| | |
|---------------------|--|
| Relief oil pressure | 8.6 – 9.4 mPa (87.69 – 95.85 kg/cm ² , 1247.32 – 1363.35 psi) |
|---------------------|--|

Power Steering Fluid

INFOID:0000000012521891

| | |
|-------------------------------|--|
| Power steering fluid capacity | Approx. 1.4 ℓ (3 US pt, 2 1/2 Imp pt) |
| Power steering fluid type | Refer to MA-15. "FOR USA AND CANADA : Fluids and Lubricants" (United States and Canada) or MA-17. "FOR MEXICO : Fluids and Lubricants" (Mexico). |