SECTION ST
STEERING SYSTEM

CONTENTS

PRECAUTION

PRECAUTIONS

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

INFOID:0000000005399828

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:0000000005288074

NOTE:

- This Procedure is applied only to models with Intelligent Key system and NATS (NISSAN ANTI-THEFT SYSTEM).
- Remove and install all control units after disconnecting both battery cables with the ignition knob in the ″LOCK″ position.
- Always use CONSULT-III to perform self-diagnosis as a part of each function inspection after finishing work. If DTC is detected, perform trouble diagnosis according to self-diagnostic results.

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.
For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.
If steering wheel rotation is required when battery power is interrupted, 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. Use the Intelligent Key or mechanical key to turn the ignition switch to the ″ACC″ position. At this time, the steering lock will be released.
3. Disconnect both battery cables. The steering lock will remain released and the steering wheel can be rotated.
4. Perform the necessary repair operation.

5. When the repair work is completed, return the ignition switch to the ″LOCK″ position before connecting the battery cables. (At this time, the steering lock mechanism will engage.)
6. Perform a self-diagnosis check of all control units using CONSULT-III.

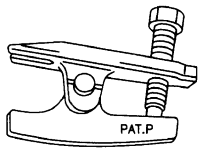
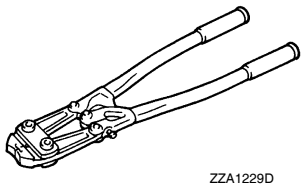
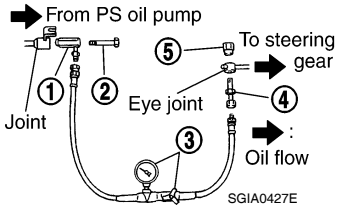
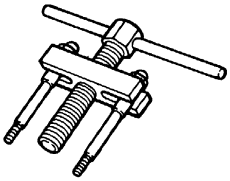
PREPARATION

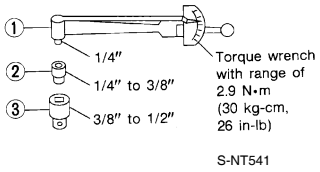
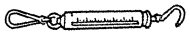
PREPARATION

Special Service Tool

INFOID:0000000005147857

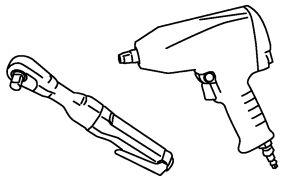
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
HT72520000 (J-25730-A) Ball joint remover  NT146	Removing ball joint
KV40107300 (—) Band clamp pliers  ZZA1229D	Crimping boot clamps
1. KV48105300-4 and 5295262U10 (— Connector A and O-ring 2. KV48105300-3 and 5295262U00 (—) Eye-bolt and O-ring 3. KV48103500 (J-26357 and J-26357-10) Pressure gauge and shut-off valve 4. KV48105300-1 and 5295262U00 (—) Connector B and O-ring 5. KV48105300-2 ——) Nut  SGIA0427E	Measuring oil pump relief pressure
ST27180001 (J-25726-A) Steering wheel puller  ZZA0819D	Removing steering wheel

Tool number (Kent-Moore 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  S-NT541	Inspecting sliding torque, steering torque and rotating torque for ball joint
(—) J-44372 Spring gauge  LST024	Measure steering wheel turning force or rack sliding force

Commercial Service Tool

INFOID:0000000005147858

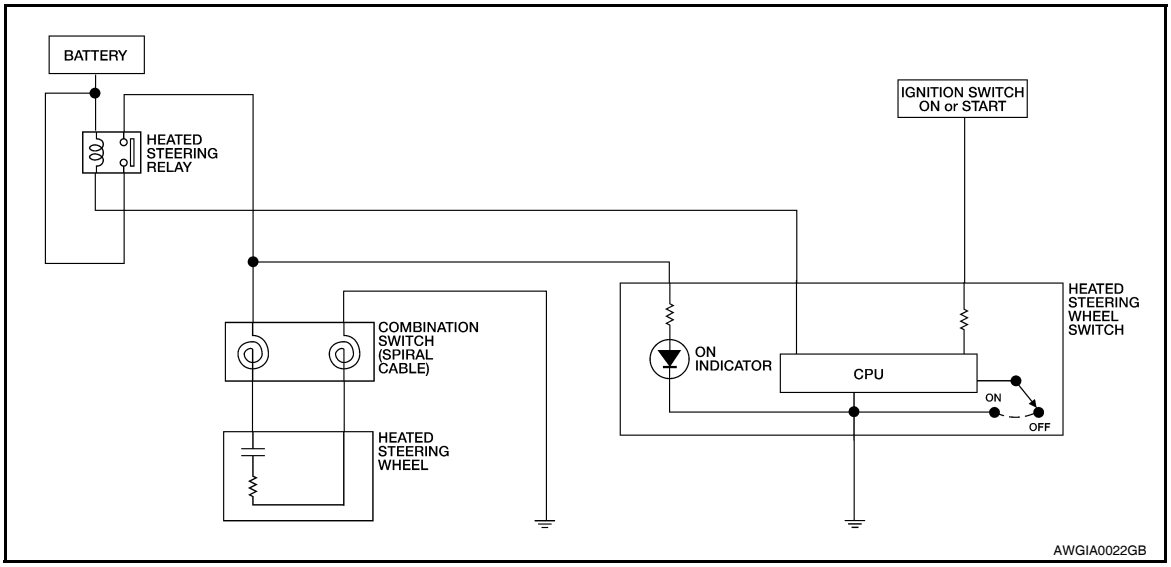
Tool name	Description
Power tool  PBIC0190E	Removing nuts and bolts

FUNCTION DIAGNOSIS

HEATED STEERING WHEEL

System Diagram

INFOID:0000000005147859



System Description

INFOID:0000000005147860

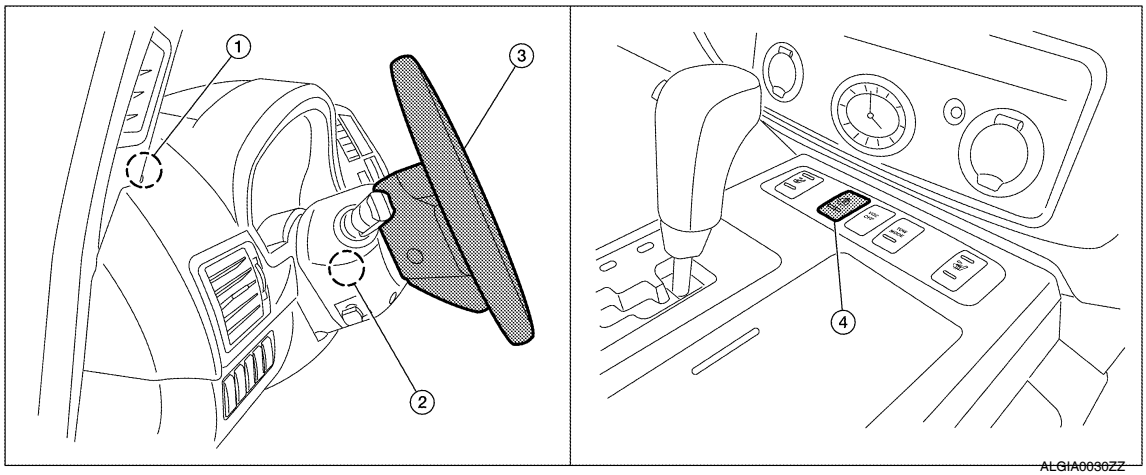
The heated steering wheel switch controls the heated steering relay. When the switch is turned on, the relay is energized and the heated steering system will operate. The heated steering system will turn off when the steering wheel temperature reaches approximately 86° F (30° C). Heated steering system operation can also be canceled by pressing the heated steering wheel switch again.

NOTE:

If the surface temperature of the steering wheel is below 68° F (20° C), the system will heat the steering wheel to approximately 86° F (30° C), and cycle off and on to maintain a temperature above 68° F (20° C). The indicator light will remain on as long as the system is on. Push the switch again to turn the heated steering wheel system off manually. The indicator light will go off.

Component Parts Location

INFOID:0000000005147861



1. Heated steering relay M71
2. Combination switch (spiral cable) M52
3. Heated steering wheel M114
4. Heated steering wheel switch M260

Component Description

INFOID:0000000005147862

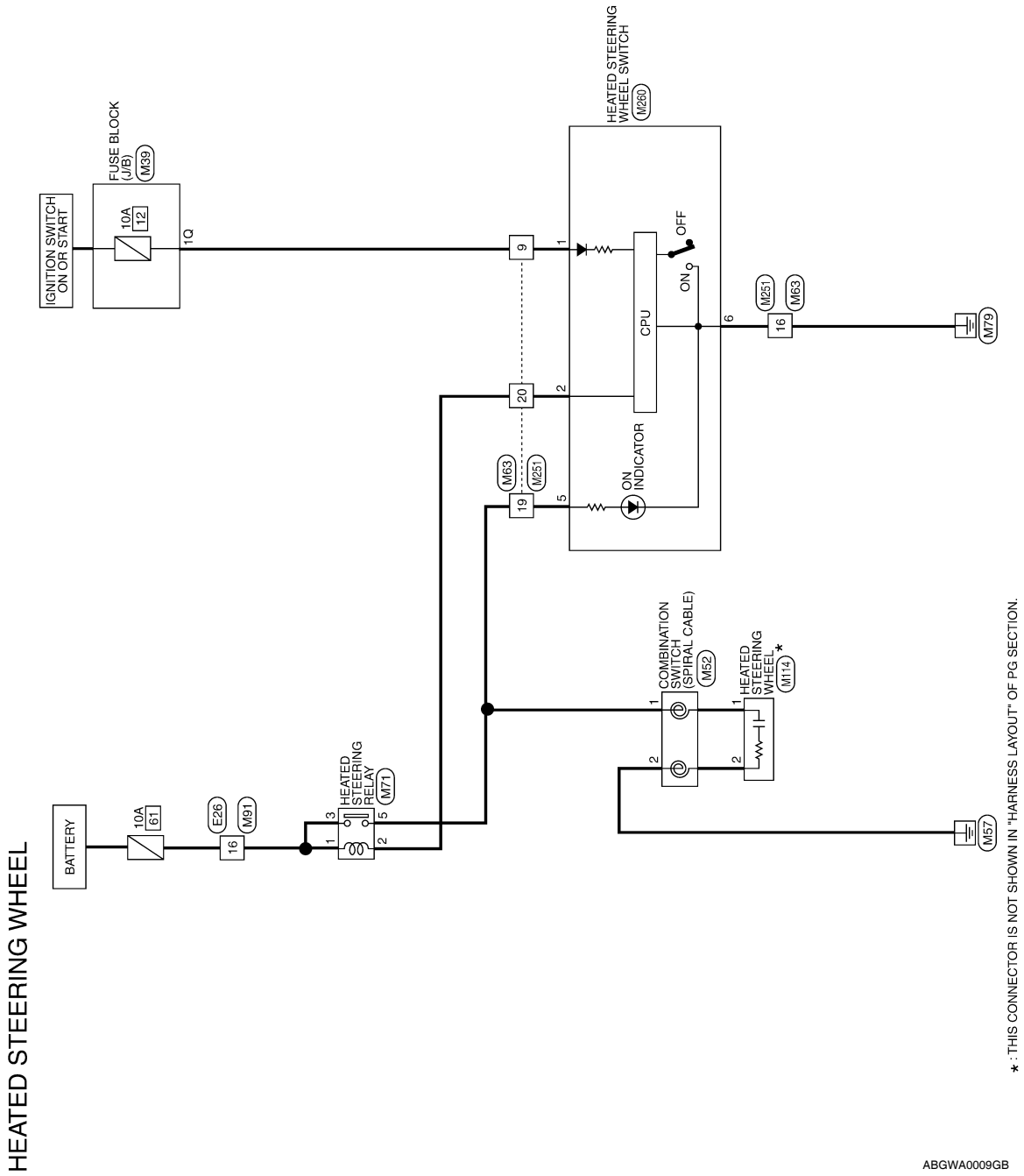
Heated steering wheel switch	• Controls the heated steering relay and operates the heated steering system. • Turns the indicator lamp ON when the system is activated.
Heated steering relay	• Operates the heated steering system with the control signal from the heated steering wheel switch.
Heated steering wheel	• Heats the heating element with the power supplied from the heated steering relay.

COMPONENT DIAGNOSIS

HEATED STEERING WHEEL

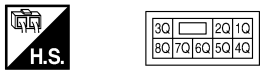
Wiring Diagram

INFOID:0000000005147863



HEATED STEERING WHEEL CONNECTORS

Connector No.	M39
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE

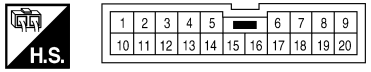


Terminal No.	Color of Wire	Signal Name
1Q	G/R	–

Connector No.	M52
Connector Name	COMBINATION SWITCH
Connector Color	WHITE

Terminal No.	Color of Wire	Signal Name
1	BR	–
2	B	–

Connector No.	M63
Connector Name	WIRE TO WIRE
Connector Color	BROWN

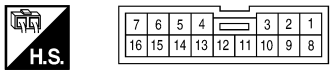


Terminal No.	Color of Wire	Signal Name
9	G/R	–
16	B	–
19	BR	–
20	B/R	–

Connector No.	M71
Connector Name	HEATED STEERING RELAY
Connector Color	BLUE

Terminal No.	Color of Wire	Signal Name
1	B/W	–
2	B/R	–
3	B/W	–
5	BR	–

Connector No.	M91
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
16	B/W	–

Connector No.	M114
Connector Name	HEATED STEERING WHEEL
Connector Color	WHITE

Terminal No.	Color of Wire	Signal Name
1	Y	–
2	L	–

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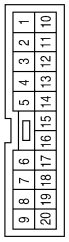
Connector No.	M251
Connector Name	WIRE TO WIRE
Connector Color	BROWN

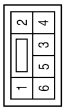
H.S.



Terminal No.	Color of Wire	Signal Name
9	G/R	–
16	B	–
19	BR	–
20	B/R	–

Connector No.	M260
Connector Name	HEATED STEERING WHEEL SWITCH
Connector Color	WHITE

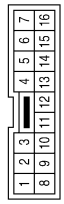
H.S.



Terminal No.	Color of Wire	Signal Name
1	G/R	–
2	B/R	–
5	BR	–
6	B	–

Connector No.	E26
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
16	B/W	–

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SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000005147864

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page		ST-13, "Checking Fluid Level"	ST-13, "Air Bleeding Hydraulic System"	ST-36	ST-36	ST-36	ST-13	ST-35	ST-37	EM-13, "Checking Drive Belts"	ST-35	ST-35	ST-37	ST-35	ST-20	ST-37	DLN-184, "NVH Troubleshooting Chart"	DLN-208, "NVH Troubleshooting Chart"	FAX-5, "NVH Troubleshooting Chart"	FSU-5, "NVH Troubleshooting Chart"	WT-43, "NVH Troubleshooting Chart"	WT-43, "NVH Troubleshooting Chart"	FAX-5, "NVH Troubleshooting Chart"	BR-6, "NVH Troubleshooting Chart"
Possible cause and suspected parts		Fluid level	Air in hydraulic system	Outer socket ball joint swinging force	Outer socket ball joint rotating torque	Outer socket ball joint end play	Steering fluid leakage	Steering wheel play	Steering gear rack sliding force	Drive belt looseness	Improper steering wheel	Improper installation or looseness of tilt lock lever	Mounting rubber deterioration	Steering column deformation or damage	Improper installation or looseness of steering column	Steering linkage looseness	PROPELLER SHAFT	FRONT FINAL DRIVE	WHEEL HUB	SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES
Symptom	Noise	×	×	×	×	×	×	×	×	×							×	×	×	×	×	×	×	×
	Shake										×	×	×				×		×	×	×	×	×	×
	Vibration										×	×	×	×	×		×		×	×	×		×	
	Shimmy										×	×	×			×			×	×	×	×		×
	Shudder												×			×			×	×	×	×		×

×: Applicable

ON-VEHICLE MAINTENANCE

POWER STEERING FLUID

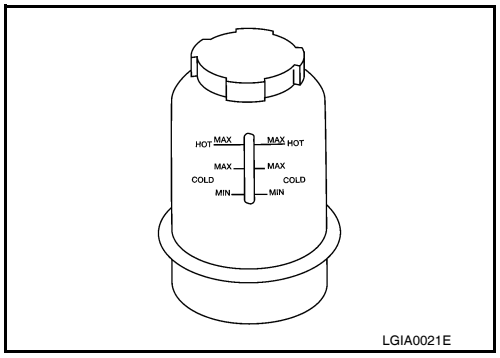
Checking Fluid Level

INFOID:0000000005147865

Check power steering fluid level with engine off, referring to the scale on reservoir tank.
Use HOT range for fluid temperatures of 50° – 80°C (122° – 176°F).
Use COLD range for fluid temperatures of 0° – 30°C (32° – 86°F).

CAUTION:

- **Do not overfill.**
- **Do not reuse any used power steering fluid.**
- **Recommended fluid is Genuine NISSAN PSF or equivalent. Refer to MA-13, "Fluids and Lubricants".**

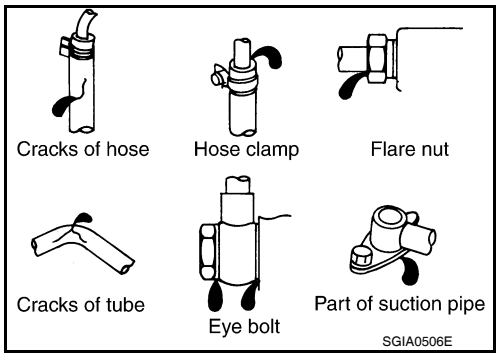


Checking Fluid Leakage

INFOID:0000000005147866

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

1. Run engine until fluid temperature reaches 50° – 80°C (122° – 176°F) in reservoir tank. Keep engine speed 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 oil pump may be damaged.)



4. If 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 fluid leakage from oil pump is noticed, check oil pump. Refer to ST-17.
6. Check steering gear boots for accumulation of fluid indicating a leak from the steering gear.

Air Bleeding Hydraulic System

INFOID:0000000005147867

NOTE:

- When vehicle is stationary or while steering wheel is being turned slowly, some noise may be heard from oil pump or gear. This noise is normal and does not affect any system.
- Incomplete air bleeding causes the following. When this happens, bleed air again.
  - Air bubbles in reservoir tank.
  - Clicking noise in oil pump.
  - Excessive buzzing in oil pump.

1. Stop engine, and then turn steering wheel fully to right and left several times.
   CAUTION:
   Do not allow steering fluid reservoir tank to go below the MIN level line. Check tank frequently and add 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 fluid leakage.
3. Repeat step 2 several times at about three second intervals.
   CAUTION:
   Do not hold steering wheel in the locked position for more than 10 seconds. (There is the possibility that 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 fluid level.

ON-VEHICLE REPAIR

STEERING WHEEL

On-Vehicle Inspection and Service

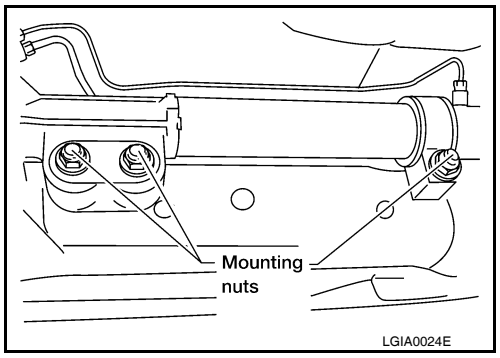
INFOID:0000000005147868

CHECKING CONDITION OF INSTALLATION

- Check installation condition of 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-35, "Steering Wheel".

- Check if the nuts for steering gear assembly are loose. Refer to ST-23, "Removal and Installation".



CHECKING STEERING WHEEL PLAY

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

Steering wheel play on the outer circumference : Refer to ST-35, "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-6, "Front Wheel Alignment".

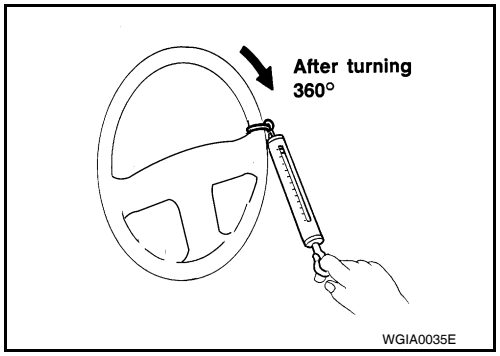
1. Turn tires straight ahead, check if steering wheel is in the neutral position.
2. If it is not in the neutral position, remove steering wheel and reinstall it correctly.
3. If the neutral position cannot be attained by repositioning the steering wheel two teeth or less on steering stem, loosen tie-rod 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-52, "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-35, "Steering Wheel".



6. If steering wheel turning force is out of specification, inspect steering column. Refer to ST-29, "Disassembly and Assembly" .
7. If steering column meets specification, repair steering gear. Refer to ST-31, "Disassembly and Assembly".

CHECKING FRONT WHEEL TURNING ANGLE

When checking front wheel turning angle, refer to FSU-23, "Wheel Alignment (Unladen*1)".

POWER STEERING OIL PUMP

On-Vehicle Inspection and Service

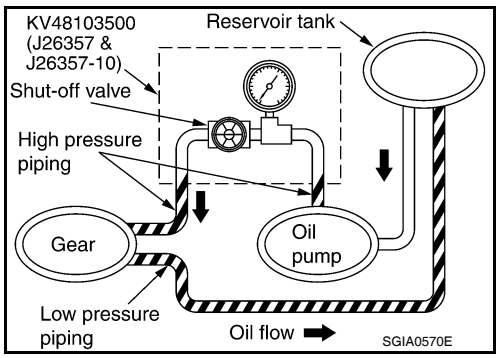
INFOID:0000000005147869

CHECKING RELIEF OIL PRESSURE

CAUTION:

Before starting work, confirm belt tension is proper.

1. Connect Tool between oil pump discharge connector and high pressure hose and then bleed air from the hydraulic circuit.



Tool number:		
Pressure gauge and shut-off valve		KV48103500 (J26357 and J26357-10)
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 pump increases to maximum. This will raise 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-37, "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, repair or replace oil pump. Refer to ST-34, "Disassembly and Assembly" .
5. After inspection, disconnect oil pressure gauge and oil pressure gauge adapter from hydraulic circuit, connect oil pump discharge connector and high pressure hose. Add fluid and bleed air from hydraulic circuit thoroughly. Refer to ST-13, "Air Bleeding Hydraulic System" .

REMOVAL AND INSTALLATION

STEERING WHEEL

Removal and Installation

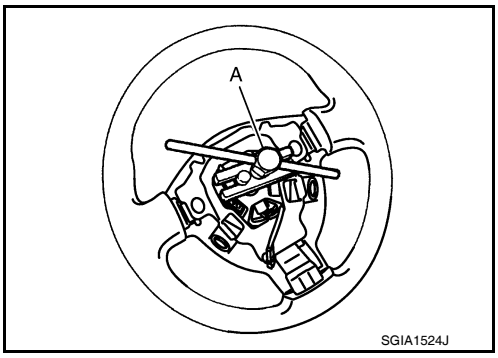
INFOID:0000000005147870

REMOVAL

1. Set the front wheels in the straight-ahead position.
2. Remove the driver air bag module. Refer to SR-5, "Removal and Installation".
3. Disconnect steering wheel switches.
4. Remove the steering wheel center nut.
5. Remove the steering wheel using Tool.

Tool number : ST27180001 (J-25726-A)

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

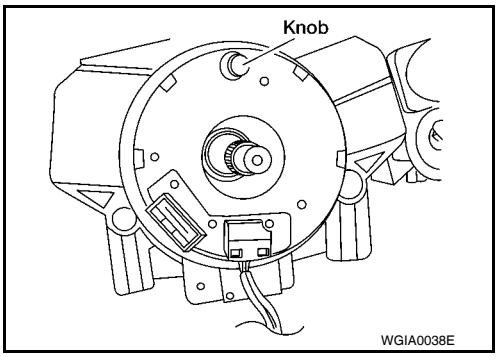


6. Disconnect heated steering wheel connector.
7. Inspect the steering wheel near the puller holes for damage. If damaged, replace the steering wheel.
   - Remove steering wheel rear cover and steering wheel switches, if required.

INSTALLATION

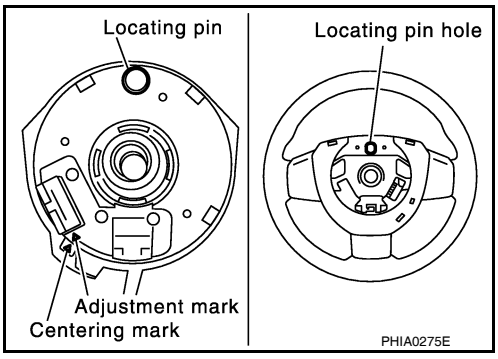
Installation is in the reverse order of removal.

- Align spiral cable correctly when installing steering wheel. Make sure that the spiral cable is in the neutral position. The neutral position is detected by turning left 2.5 revolutions from the right end position and ending with the knob at the top.
- Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement" for steering angle sensor adjustment.
- After the work is completed, perform self-diagnosis to make sure no malfunction is detected. Refer to SRC-13, "SRS Operation Check".
- Tighten steering wheel center nut to specification. SR-7, "Removal and Installation".



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. The spiral cable can be turned counterclockwise about 2.5 turns from the neutral position.**



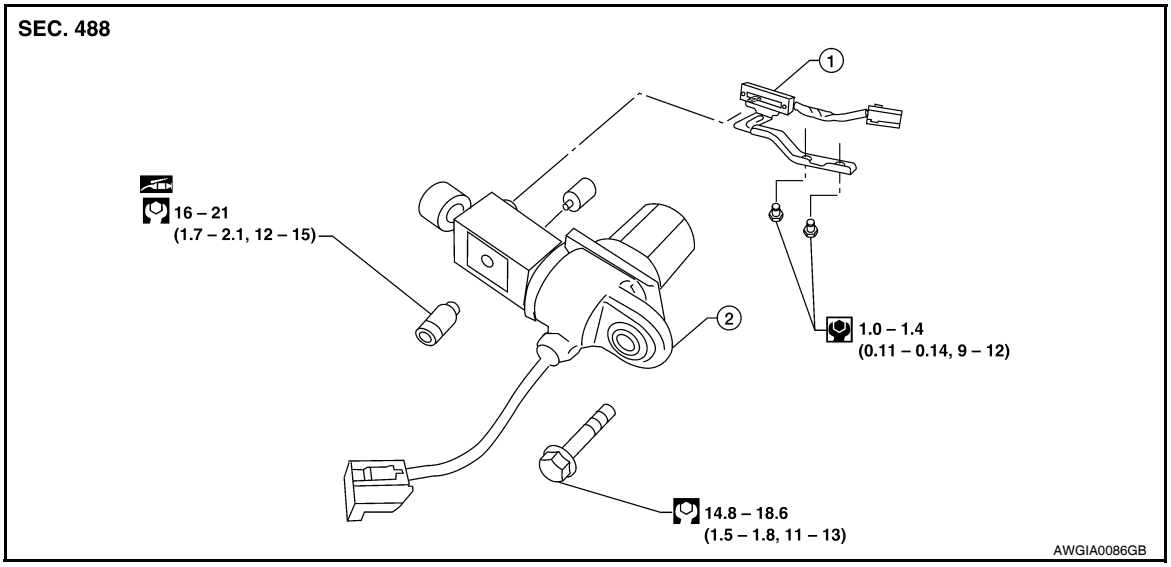
TILT SYSTEM

Removal and Installation

INFOID:0000000005147871

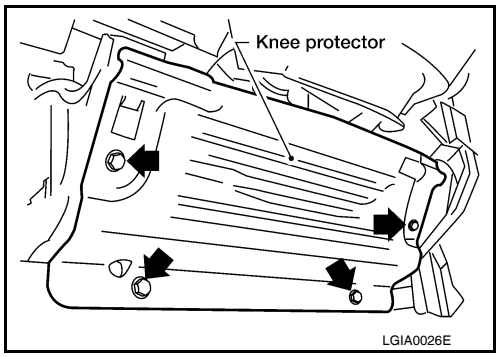
TILT MOTOR AND TILT SENSOR

Removal



1. Tilt sensor
2. Tilt motor

1. Remove the lower driver instrument panel. Refer to IP-11, "Exploded View".
2. Disconnect the sonar switch.
3. Disconnect adjustable pedal switch.
4. Remove steering column cover
5. Disconnect the tilt sensor electrical connector.
6. Remove knee protector.



7. Remove the two tilt sensor screws and the tilt sensor.
8. Disconnect the tilt motor electrical connector.
9. Remove the tilt motor bolt and the tilt motor.

Installation

Installation is in reverse order of removal.

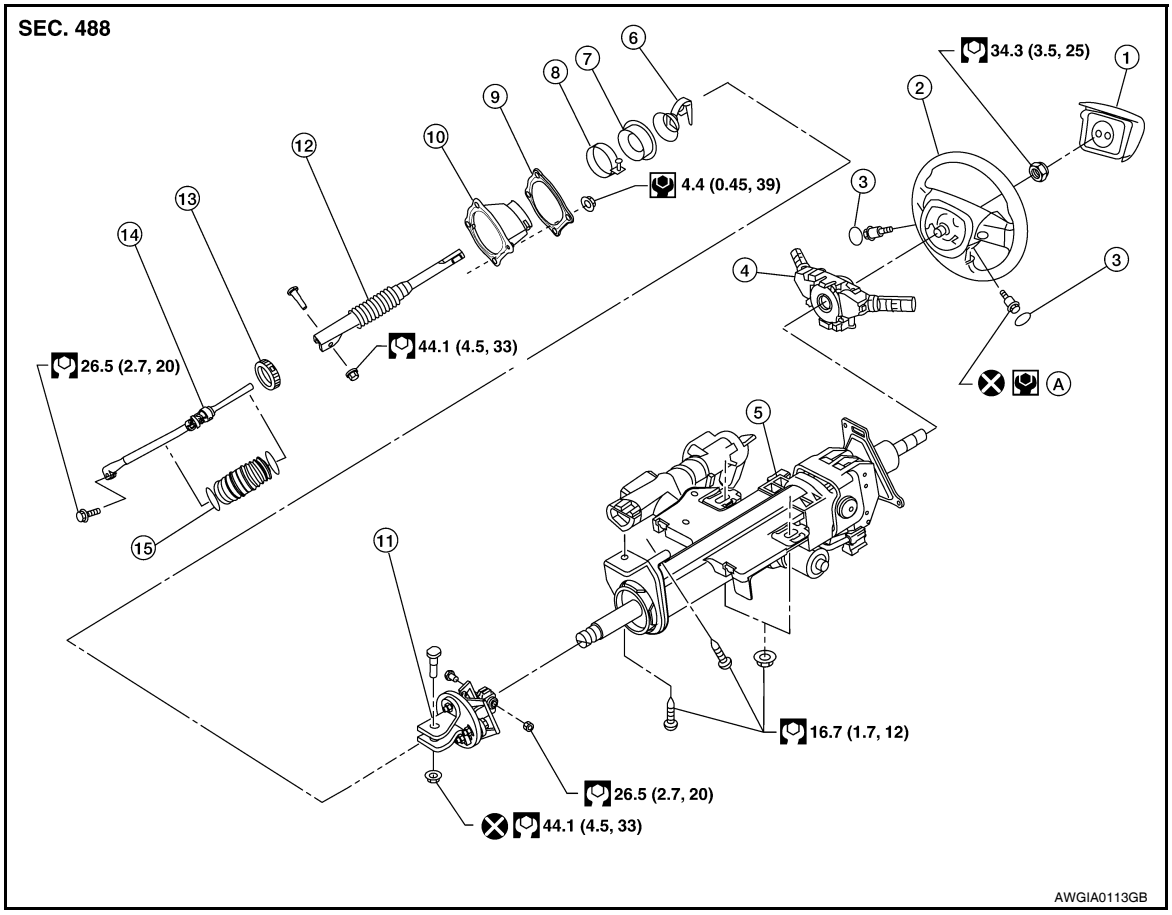
NOTE:

Make sure the tab in the tilt sensor is engaged in the bracket on the tilt motor.

STEERING COLUMN

Removal and Installation

INFOID:0000000005147872



1. Driver air bag module	2. Steering wheel	3. Steering wheel side cover
4. Combination switch and spiral cable	5. Steering column assembly	6. Collar
7. Hole cover seal	8. Clamp	9. Hole cover plate
10. Hole cover	11. Upper joint	12. Upper shaft
13. Boot clamp	14. Lower joint shaft	15. Boot and clips (plastic)
A. Refer to SR-5, "Removal and Installation"		

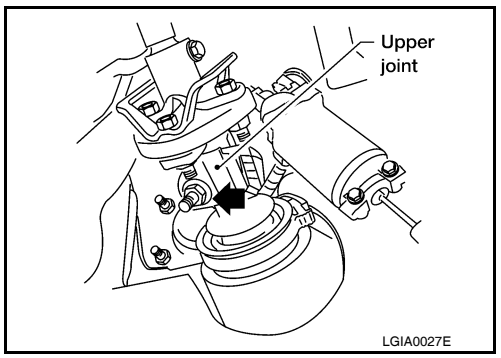
CAUTION:

- **Any time the ignition switch has been disconnecter, removed or installed, the keys must be re-rege-stered in the BCM. Refer toConsult-III operations IVIS/NVIS.**
- **Do not exert any load or impact in the axial direction immediately before or after column removal.**
- **Do not to move steering gear during removal of steering column assembly.**

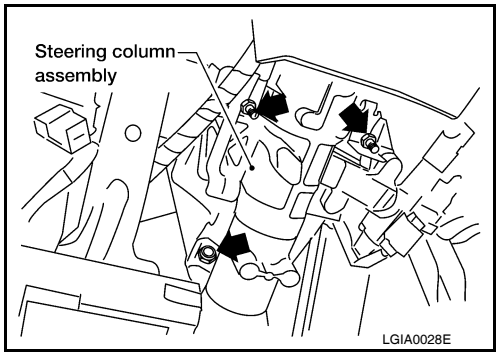
REMOVAL

1. Remove combination switch and spiral cable from steering column assembly. Refer to SR-7, "Removal and Installation".
2. Remove the tilt motor and tilt sensor. Refer to ST-19, "Removal and Installation".
3. Remove steering column cover. Refer to ST-20, "Removal and Installation".

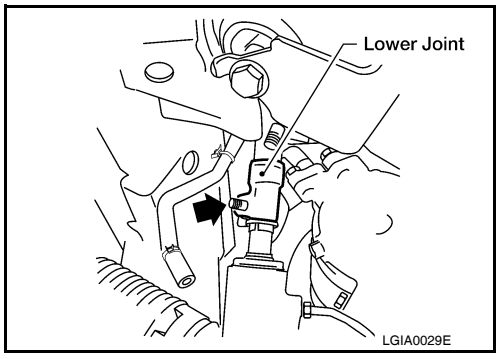
4. Remove lock nut and bolt, then separate upper shaft from upper joint.



5. Remove two nuts and two bolts, then remove steering column assembly from steering member.



6. Remove hole cover seal and clamp.
7. Remove nuts, then remove hole cover from dash panel.
8. Raise vehicle, then remove bolt (lower side) of lower joint shaft and remove lower joint shaft and upper shaft as an assembly.



INSPECTION AFTER REMOVAL

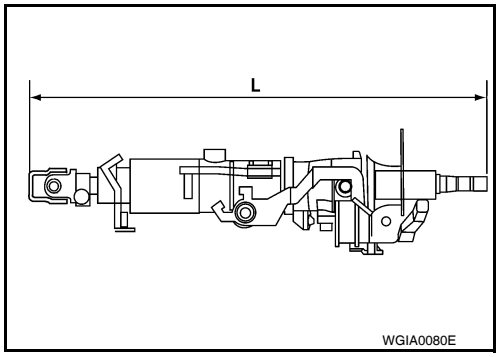
- Check for damage to steering column jacket tube. If damage is found, replace steering column with new one.
- If vehicle has been in a collision, check column length (L), (L^1) and (L^2) as shown. If out of specification, replace steering column with new one.

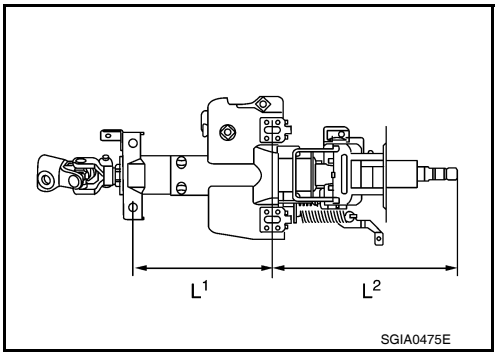
Steering column length

(L) : Refer to ST-35, "Steering Column"

(L^1) : Refer to ST-35, "Steering Column"

(L^2) : Refer to ST-35, "Steering Column"





- 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.**
- **The lower nut on the upper joint may not be reused.**

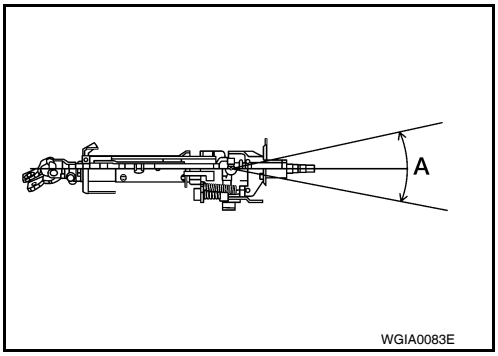
NOTE:

- 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 steering column to vehicle, check tilt device operation range is within specification.

Range "A" : Refer to ST-35, "Steering Column"

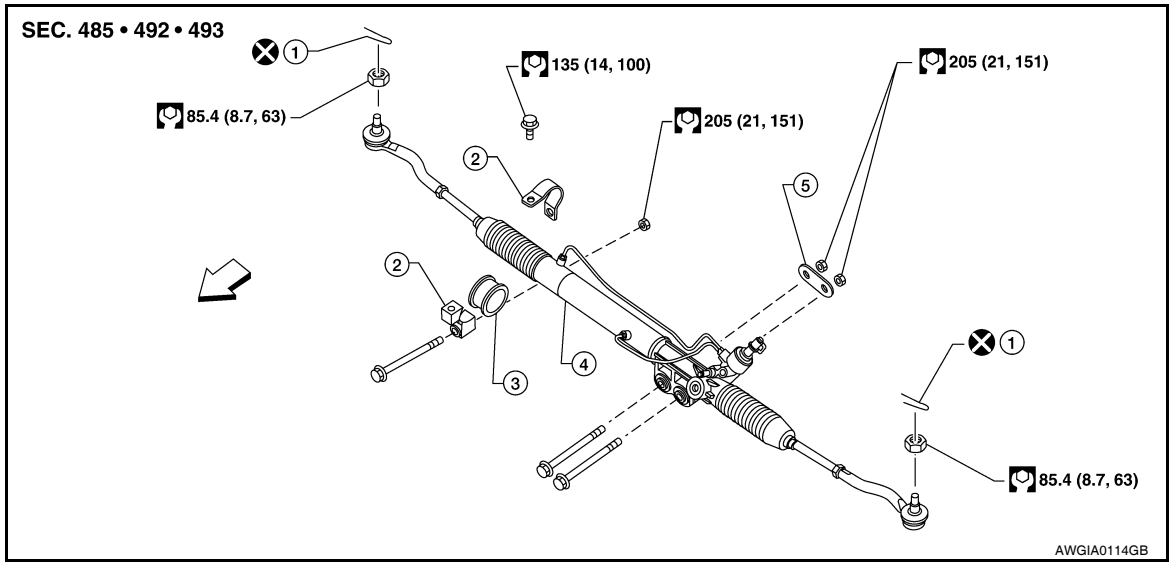


- Check if steering wheel operation can turn to the end of the left and right stops smoothly.

POWER STEERING GEAR AND LINKAGE

Removal and Installation

INFOID:0000000005147873

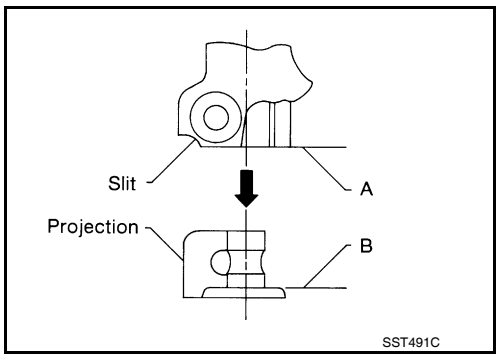


1. Cotter pin
2. Steering gear bracket
3. Steering gear insulator
4. Steering gear assembly
5. Washer

CAUTION:
Spiral cable may snap due to steering operation if steering column is separated from steering gear assembly. Therefore secure steering wheel to avoid turning.

REMOVAL

1. Turn wheels to the straight-ahead position.
2. Remove tires from vehicle using power tool.
3. Remove undercovers using power tool if equipped.
4. Remove front final drive, then support drive shafts with wire if equipped. Refer to DLN-215, "Removal and Installation".
5. Make sure slit of lower joint fits with the projection on rear cover cap, while checking that mark on steering gear assembly aligns with mark on rear cover cap.

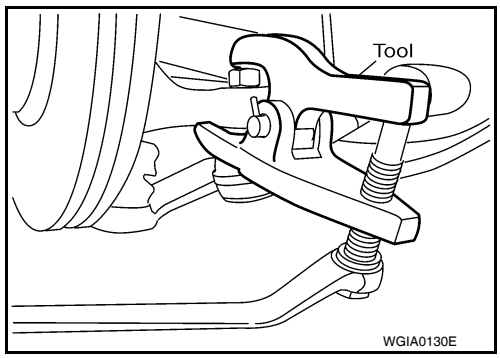


6. Remove cotter pin at steering outer socket and discard, then loosen nut.

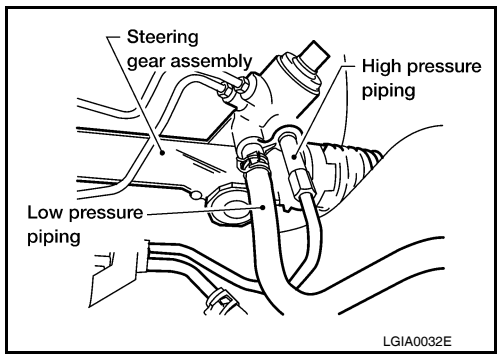
7. Remove steering outer socket from steering knuckle using Tool. Be careful not to damage ball joint boot.

Tool number : HT72520000 (J-25730-A)

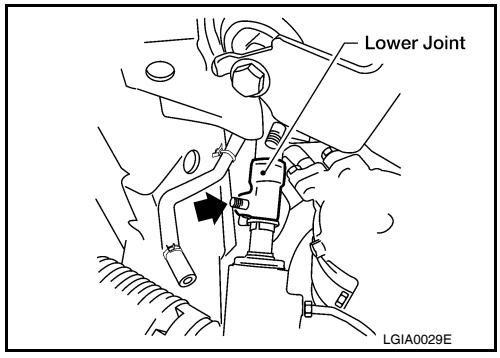
CAUTION:
Temporarily tighten nut to prevent damage to threads and to prevent Tool from coming off.



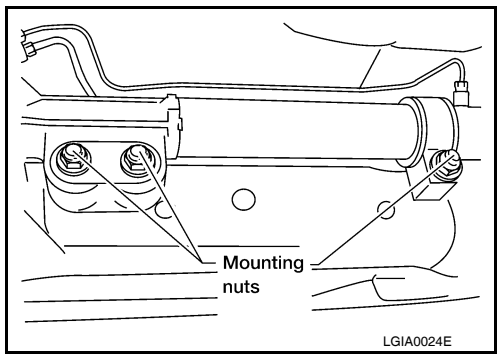
8. Remove oil piping (high pressure side and low pressure side) from steering gear assembly, then drain fluid from piping.



9. Remove lower joint bolt of lower joint shaft.



10. Remove nuts of steering gear assembly using power tool, then remove bolts and steering gear assembly.

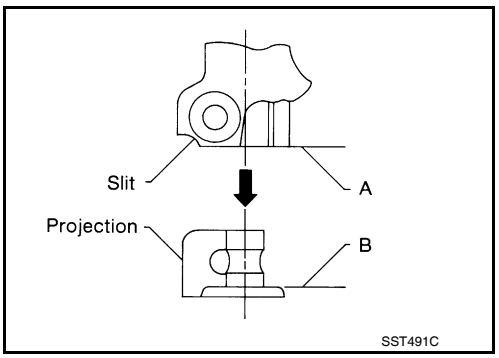


INSTALLATION

Installation is in the reverse order of removal.

- After removing/installing or replacing steering components, check wheel alignment. Refer to FSU-6, "Front Wheel Alignment".
- After adjusting wheel alignment, adjust neutral position of steering angle sensor. Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

- With steering wheel in straight ahead position, make sure slit of lower joint (A) fits with the projection on rear cover cap (B), while checking that mark on steering gear assembly aligns with mark on rear cover cap



- After installation, bleed the air from the steering hydraulic system. Refer to ST-13, "Air Bleeding Hydraulic System".

INSPECTION AFTER INSTALLATION

Check if steering wheel turns smoothly when it is turned several times fully to the left and right lock positions.

POWER STEERING OIL PUMP

Removal and Installation

INFOID:0000000005147874

REMOVAL

1. Drain power steering fluid from reservoir tank.
2. Remove engine room cover. Refer to EM-24, "Removal and Installation".
3. Remove air duct assembly. Refer to EM-25, "Removal and Installation".
4. Remove power steering reservoir tank.
5. Remove serpentine drive belt belt from auto tensioner and power steering pump. Refer to EM-13, "Removal and Installation".
6. Disconnect pressure sensor electrical connector.
7. Remove high pressure and low pressure piping from power steering oil pump. Refer to ST-27.
8. Remove bolts, then remove power steering pump.

INSTALLATION

Installation is in the reverse order of removal. Refer to ST-27 for tightening torque.

- After installation, bleed air. Refer to ST-13, "Air Bleeding Hydraulic System".

NOTE:

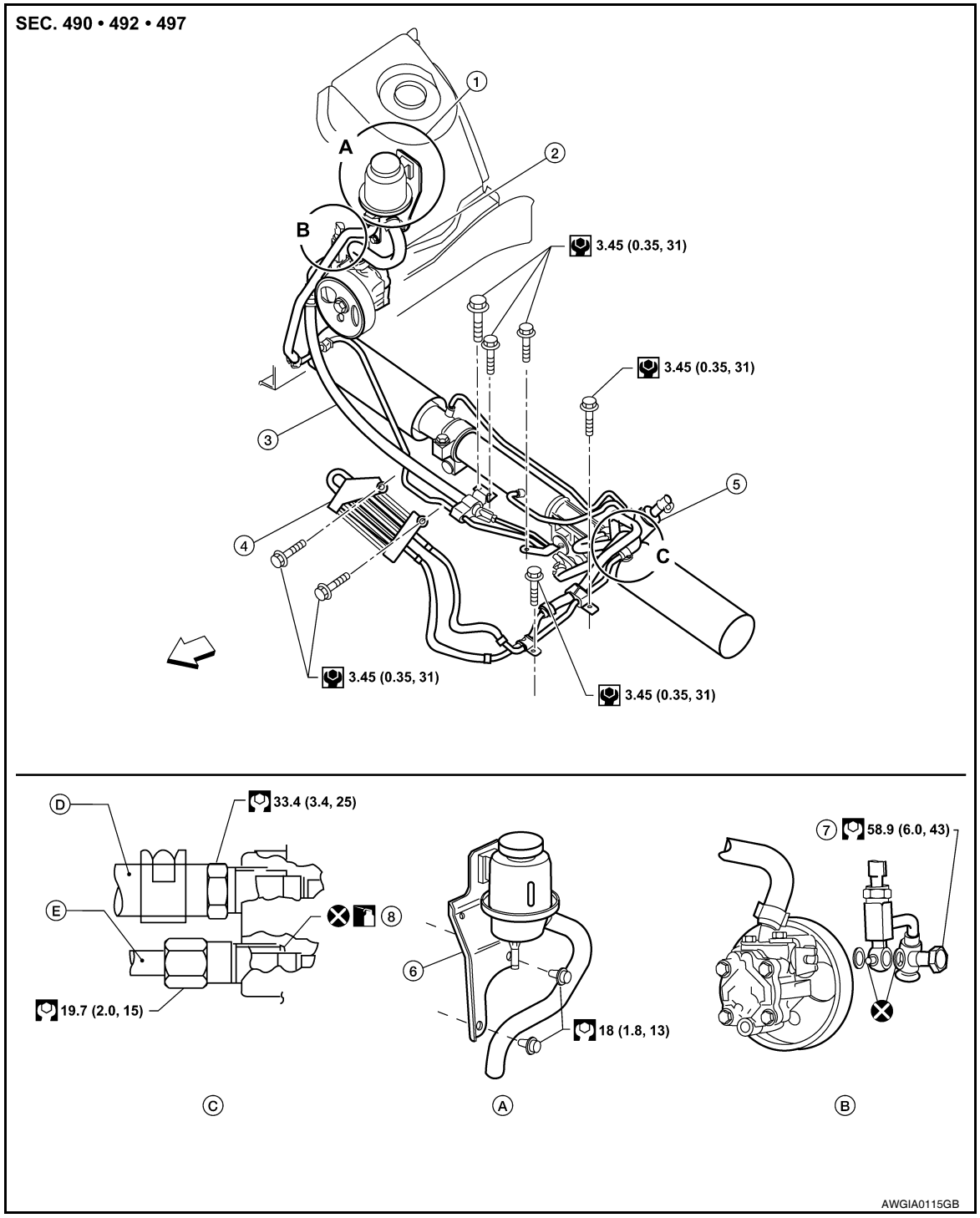
Belt tension is automatic and requires no adjustment.

HYDRAULIC LINE

Removal and Installation

INFOID:0000000005147875

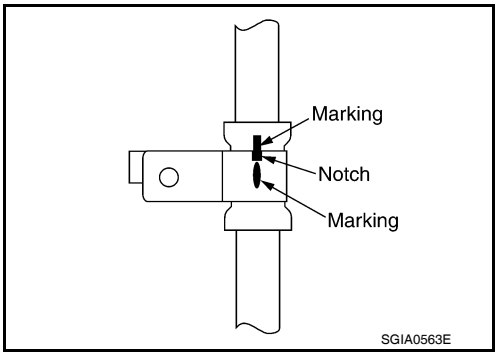
Refer to the following illustration for hydralic line removal.



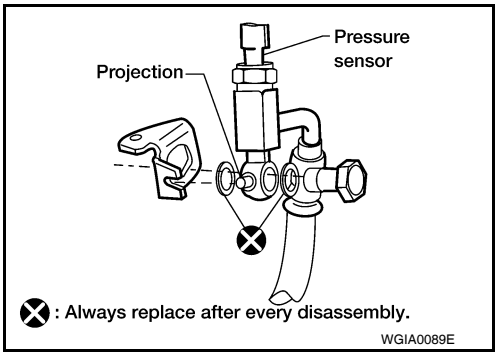
1. Reservoir tank
2. Suction hose
3. High pressure hose
4. Oil cooler
5. Steering gear assembly
6. Reservoir tank bracket
7. Eye bolt
8. O-rings

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 pump properly. Tighten eye bolt by hand fully, then torque to specification.

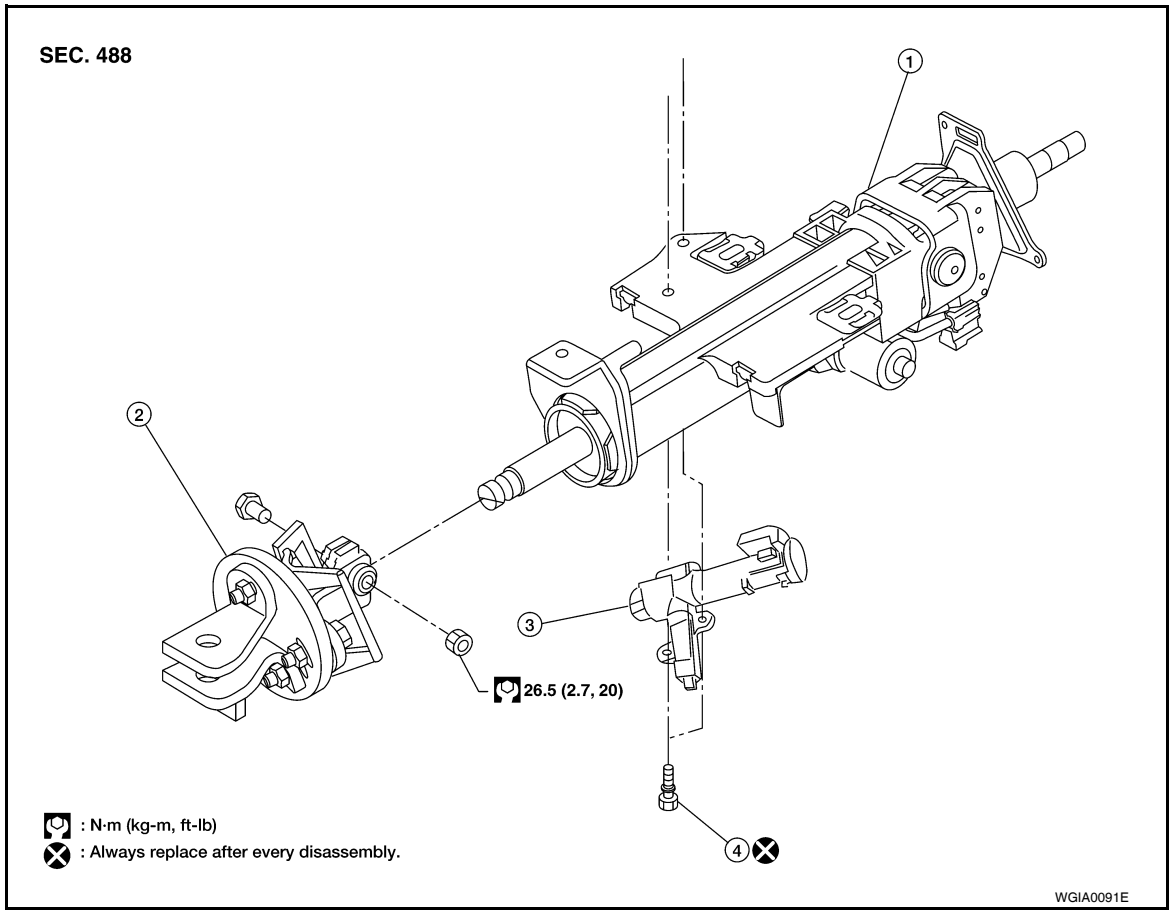


DISASSEMBLY AND ASSEMBLY

STEERING COLUMN

Disassembly and Assembly

INFOID:0000000005147876



1. Steering column assembly
2. Upper joint
3. Ignition switch
4. Tamper resistant self-shear screw

DISASSEMBLY

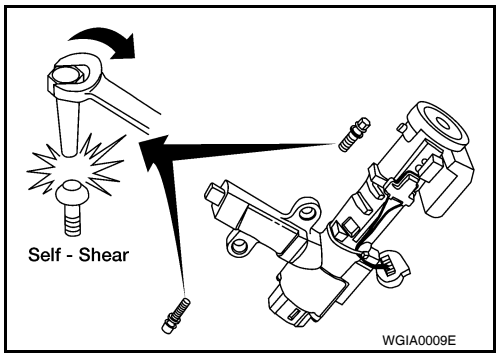
1. Remove bolt from upper joint, then remove upper joint from steering column assembly.
2. Remove ignition switch tamper resistant self-shear screws with a drill or other suitable tool.

ASSEMBLY

- Assembly is in the reverse order of disassembly.
- Install new tamper resistant self-shear screws.

CAUTION:

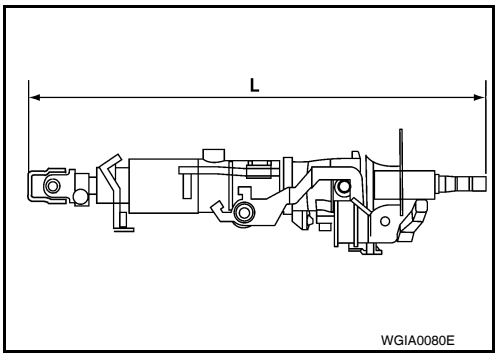
Any time the ignition switch has been disconnected, removed or installed, the keys must be re-registered in the BCM. Refer to CONSULT-III operation manual IVIS/NVIS.



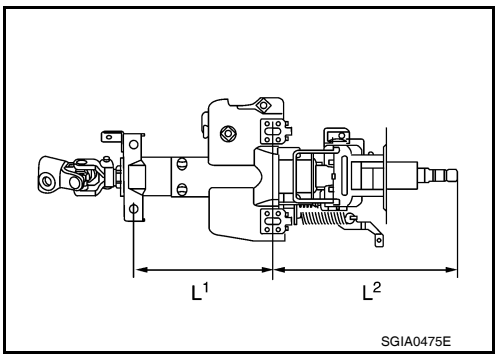
INSPECTION AFTER ASSEMBLY

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)

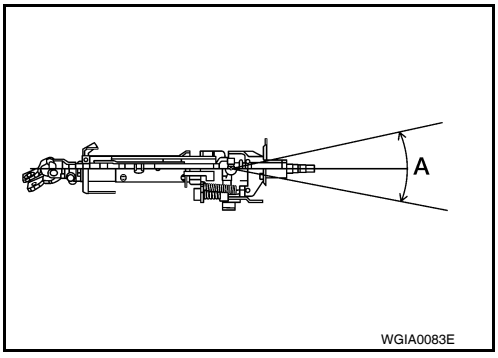
L : Refer to ST-35, "Steering Column"

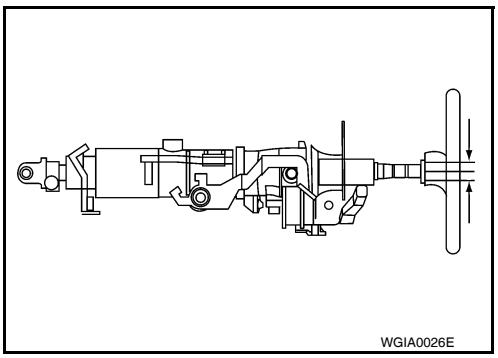
L^1 : Refer to ST-35, "Steering Column"

L^2 : Refer to ST-35, "Steering Column"

4. Check for proper lubrication, apply grease as necessary.
5. Check for wear around the seal edges, replace the steering column as an assembly 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-35, "Steering Column"





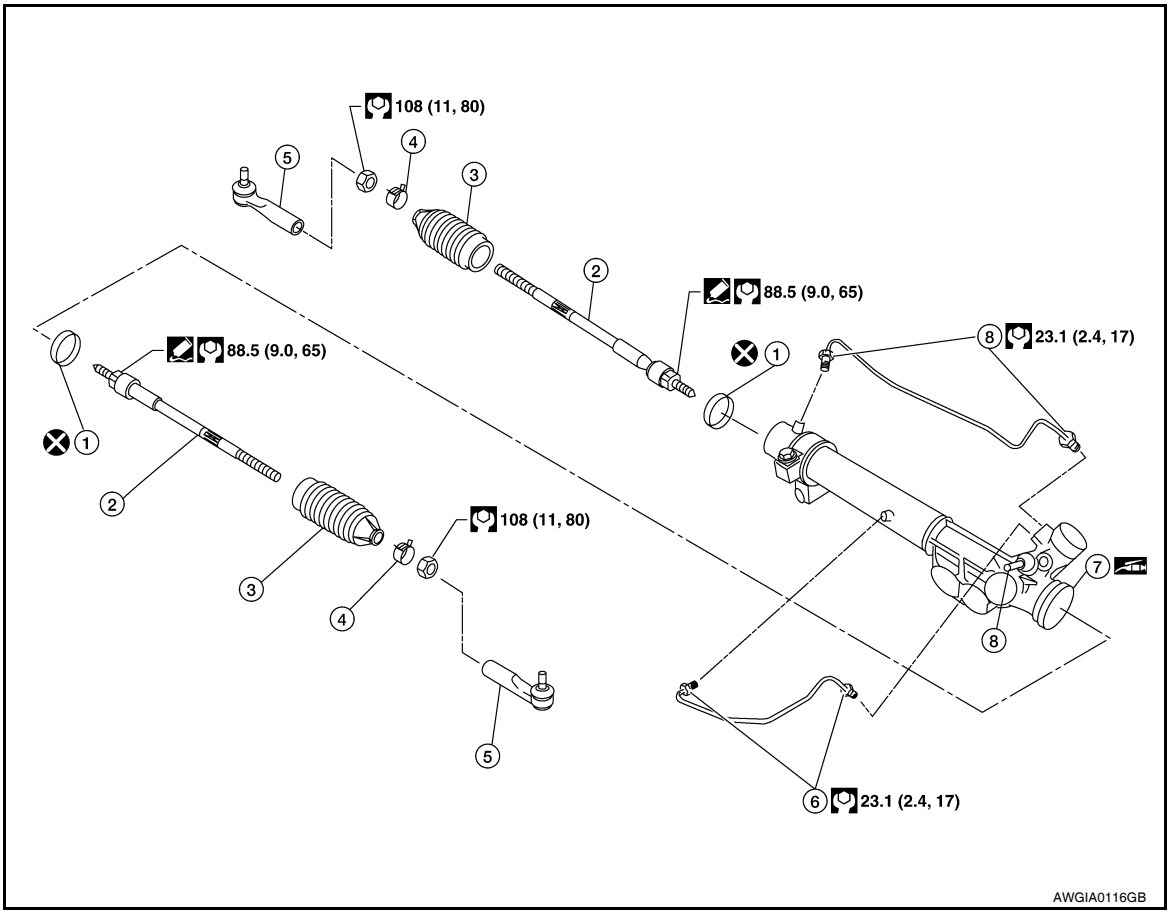
CAUTION:

- **Do not exert any load in the axial direction immediately before or after column removal.**
- **After installation, check smooth steering wheel rotation, without any catches or noise.**

POWER STEERING GEAR AND LINKAGE

Disassembly and Assembly

INFOID:0000000005147877



1. Boot clamp
2. Inner socket
3. Boot
4. Boot clamp
5. Outer socket
6. Cylinder tubes
7. Gear housing assembly
8. Connector

CAUTION:

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

DISASSEMBLY

1. Remove cylinder tubes from gear housing assembly.
2. Loosen lock nuts of outer sockets, and remove outer sockets.
3. Remove boot clamps of the small diameter side and the large diameter side, then remove boot.
   CAUTION:
   When removing boots, be careful not to damage inner socket and gear housing assembly. If they are damaged, change them to avoid oil leaks.
4. Remove inner sockets.

INSPECTION AFTER DISASSEMBLY

Boot

Check boot for tears, cracks and deformation. Replace if necessary.

Gear Housing Assembly

Check gear housing assembly for dents, cracks or damage. Replace as an assembly if necessary.

Outer Socket and Inner Socket

SWING TORQUE

- Measure the swing torque, using suitable tool. When ball stud and inner socket start moving the measured value must be within the specification. If the reading is outside the specification, replace the socket. Refer to ST-36, "Steering Outer Socket and Inner Socket".

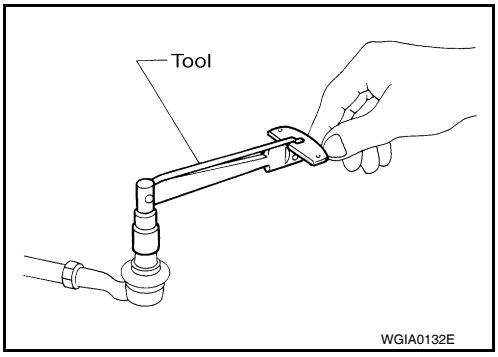
Item	Outer socket	Inner socket
Measuring point	Cotter pin hole of stud	Shown as L: 83.2 mm (3.276 in)
Swing torque	0.3 – 2.9 N·m (0.03 – 0.29 kg-m, 3 – 25 in-lb)	1.0 – 7.8 N·m (0.11 – 0.79 kg-m, 9 – 69 in-lb)
Measuring value (F)	4.84 – 46.7 N (0.50 – 4.7 kg-f, 4 - 34 lb-f)	12.1 – 93.7 N (1.3 – 9.5 kg-f, 9 – 69 lb-f)

ROTATING TORQUE

- Measure the rotating torque, using Tool. If the value is outside the specification, replace the outer sockets.

Tool number : ST3127S000 (J-25765-A)

Rotating torque : 0.3 – 2.9 N·m (0.03 – 0.29 kg-m, 3 – 25 in-lb)

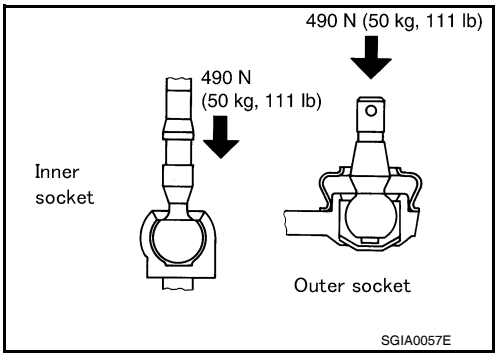


AXIAL END PLAY

- Apply a load of 490 N (50 kg-f, 110 lb-f) to the ball stud axially. Use a dial gauge to measure the amount of the movement that the stud makes. If the value is outside the specification, replace the sockets.

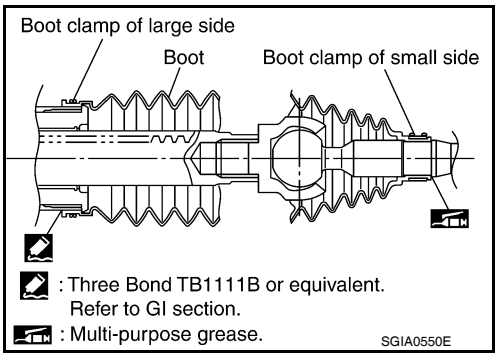
Outer socket : 0.5 mm (0.020 in) or less

Inner socket : 0.2 mm (0.008 in) or less

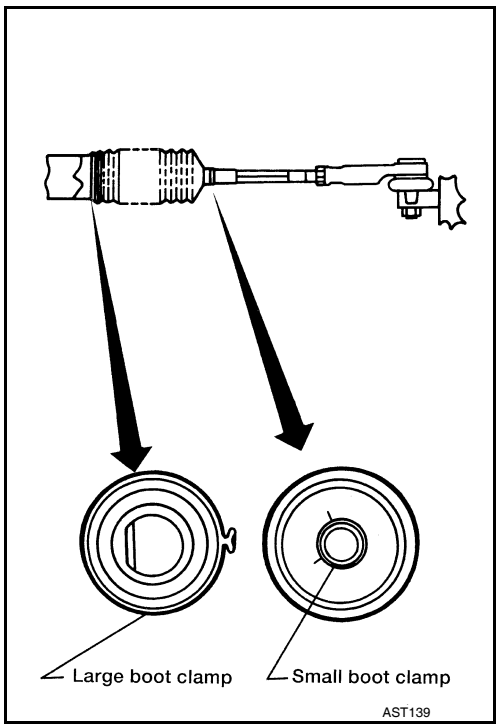


ASSEMBLY

1. Install the inner sockets.
2. Install the large-diameter side of the boots to the gear housing assembly.
3. Install the small-diameter side of the boots to the groove of the inner sockets.

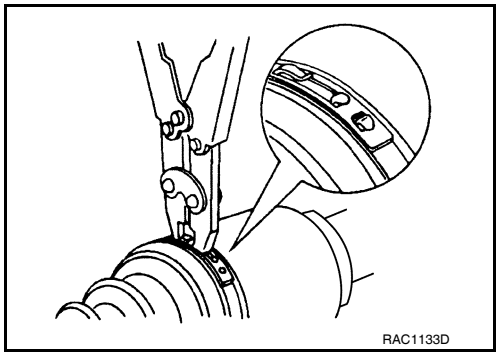


4. Install the boot clamps to the boots, as shown.
CAUTION:
Do not reuse the large-diameter boot clamps.



5. Crimp the large-diameter boot clamps, using Tool.

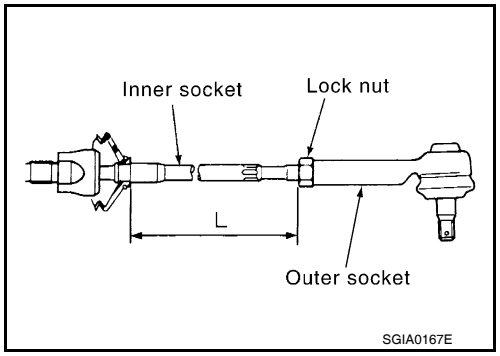
Tool number : KV40107300 (—)



6. Install the cylinder tubes to the gear housing assembly.
7. Install the lock nuts and outer sockets to the inner sockets.

8. Thread the outer sockets onto the inner sockets to the specified length (L), then tighten the lock nuts to the specification. Refer to ST-23, "Removal and Installation". Reconfirm that the tie-rod length (L) is within specification.

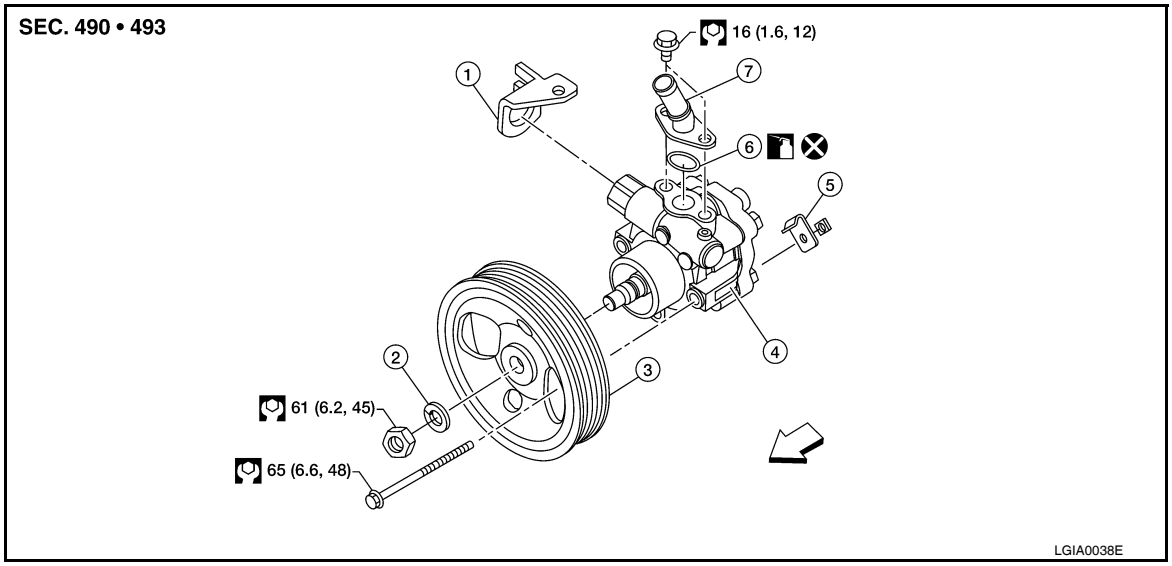
Maximum inner socket length (L) : 102.2 mm (4.02 in)



POWER STEERING OIL PUMP

Disassembly and Assembly

INFOID:0000000005147878



1.	Bracket	2.	Spring washer	3.	Pulley
4.	Power steering pump	5.	High pressure hose bracket	6.	O-ring
7.	Suction pipe	⇦	Front		

INSPECTION BEFORE DISASSEMBLY

Disassemble the power steering oil pump only if the following items are found.
- Deformed or damaged pulley, bracket, connector or suction pipe.
- Oil leakage from the suction pipe or connector.

DISASSEMBLY

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

1. Remove the connector bolt, connector and copper washers.
   CAUTION:
   Do not reuse the copper washers.
2. Remove the suction pipe and O-ring.
   CAUTION:
   Do not reuse the O-ring.
3. Remove the pulley nut and pulley.
4. Remove the bracket bolts and bracket.

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 the copper gaskets**
- **Do not reuse the O-ring. Apply a coat of Genuine Nissan PSF or equivalent to the O-ring.**

SERVICE DATA AND SPECIFICATIONS (SDS)

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Steering Wheel

INFOID:0000000005147879

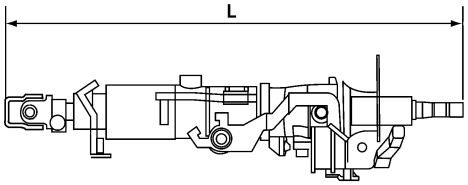
End play of the axial direction for steering wheel	0 mm (0 in)
Steering wheel play on the outer circumference	0 – 35 mm (0 – 1.38 in)
Steering wheel turning force	39 N (4 kg-f, 9 lb-f) or less

Steering Column

INFOID:0000000005147880

Inspection After Assembly

Unit: mm (in)

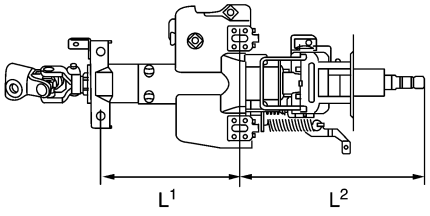


WGIA0080E

Steering column length “L”	567 (22.32)

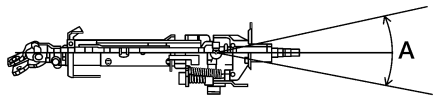
Inspection After Removal

Unit: mm (in)



SGIA0475E

Steering column length “L^1”	165.1 (6.50)
Steering column length “L^2”	258 (10.16)

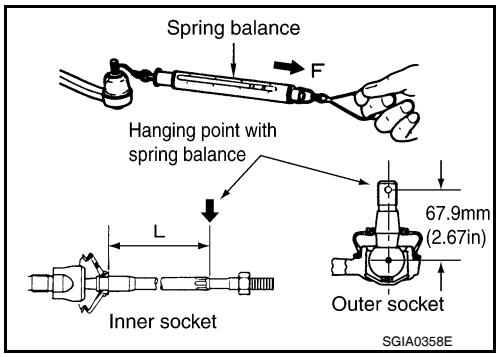


WGIA0083E

Range “A”		18°
Tilt mechanism range (Manual tilt)		3° per notch at 5 steps

Steering Outer Socket and Inner Socket

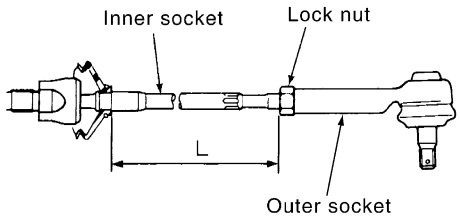
INFOID:0000000005147881



SGIA0358E

Tie-rod ball joint outer socket	Swinging torque (F)	0.3 – 2.9 N·m (0.03 – 0.29 kg-m, 3 – 25 in-lb)
	Measurement on spring balance • Measuring point: cotter pin hole of stud	4.84 – 46.7 N (0.50 – 4.7 kg-f, 4 – 34 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
Tie-rod ball joint inner socket	Swinging torque	1.0 – 7.8 N·m (0.11 – 0.79 kg-m, 9 – 69 in-lb)
	Measurement on spring balance • Measuring point: L mark see above, L=83.2 mm (3.276 in).	12.1 – 93.7 N (1.3 – 9.5 kg-f, 9 – 69 lb-f)
	Axial end play	0.2 mm (0.08 in) or less

Unit: mm (in)



SGIA0167E

Inner socket length “L”	102.2 (4.02)

Steering Gear

INFOID:0000000005147882

Steering gear model			PR26AM
Rack sliding force	At the neutral point: Range within ± 11.5 mm (±0.453 in) from the neutral position (in power ON)	Area average value	147 – 211 N (14.99 – 21.52 kg-f, 33.1 – 47.52 lb-f)
		Allowable variation	98 N (10 kg-f, 22 lb-f) or less
	Whole area (in power OFF)	Peak value	294 N (30.0 kg-f, 66 lb-f) or less
		Allowable variation	147 N (16 kg-f, 35 lb-f) or less

Oil Pump

INFOID:0000000005147883

Relief oil pressure	9.0 – 9.8 mPa (91.77 – 99.93 kg/cm^2 , 1305.34 – 1421.37 psi)

Steering Fluid

INFOID:0000000005147884

Fluid capacity	Approx. 1.0 ℓ (1-1/8 US qt, 7/8 Imp qt)