

POWER STEERING

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N19AA--

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SPECIFICATIONS

GENERAL SPECIFICATIONS

N19CA-

Items	Specifications
Steering wheel diameter mm (in.)	380 (14.9)
Power steering gear box	
Steering gear type	Ball and nut, torsion bar type (integral type)
Steering gear ratio	16.4
Oil pump	
Oil pump type	Vane type
Displacement cc/rev. (cu.in./rev.)	9.6 (.59)

SERVICE SPECIFICATIONS

N19CB-

Items	Specifications
Standard value	
Steering wheel free play mm (in.)	25 (.98) or less
Steering angle	
Inner wheel	32°30' \pm 0°
Outer wheel	29°00'
Stationary steering effort N (lbs.)	37 (8.2)
Drive belt tension mm (in.)	9–12 (.35–.47)
Oil pump pressure kPa (psi)	
Gauge hose valve closed	7,500–8,200 (1,067–1,166)
Gauge hose valve opened	980 (142) or less
Pressure switch activation oil pressure <Vehicles with an automatic transmission>	
ON	1.5–2.0 (213–284)
OFF	0.7–1.2 (100–171)
Mainshaft starting torque Nm (in.lbs.)	0.25–0.60 (2–5)
Mainshaft total starting torque Nm (in.lbs.)	0.45–1.25 (4–11)
Ball joint starting torque Nm (in.lbs.)	1–3 (9–26)
Idler arm turning torque Nm (in.lbs.)	3–9 (26–78)
Spring balance reading N (lbs.)	25–75 (6–17)
Limit	
Steering wheel free play mm (in.)	50 (1.97)
Steering gear backlash mm (in.)	0.5 (.020)
Ball joint end play mm (in.)	1.5 (.059)
Oil pump pressure kPa (psi)	
Gauge hose valve closed	1,500 (218)
Space between vane and rotor mm(in.)	0.06 (.0024)

TORQUE SPECIFICATIONS

N19CC-

Items	Nm	ft.lbs.
Steering column and shaft		
Steering wheel lock nut	35–45	25–33
Steering column A to steering column B	20–25	14–28
Column tube clamp	8–10	6–7
Dash panel cover	3–5	2–4
Steering shaft A to steering shaft B	15–20	11–15
Steering shaft B to joint assembly	30–35	22–25
Joint assembly to steering gear box	30–35	22–25
Plate to instrument panel reinforcement	18–25	13–18
Power steering gear box		
Gear box installation	55–65	40–47
Gear box to joint assembly	30–35	22–25
Pitman arm to relay rod	45	33
Gear box to pressure hose	30–40	22–29
Gear box to return hose	40–50	29–36
Side cover	45–55	33–40
Adjusting bolt lock nut	30–45	22–33
Breather plug	3–4	2–3
Pitman arm installation	130–150	94–108
Valve housing	45–55	33–40
Valve housing lock nut*	180–230*	130–166*
Oil pump		
<2.6L Engine>		
Oil pump bracket to engine		
Front	14–21	10–15
Right side		
Front	14–21	10–15
Rear	27–41	20–30
Oil pump to pressure hose	16–24	12–17
Oil reservoir to reservoir bracket	6–10	4–7
Oil reservoir to oil pump body	18–22	13–16
Oil pump body to oil pump bracket	25–33	18–24
<3.0L Engine>		
Oil pump bracket to engine	35–45	25–33
Oil pump to oil pump bracket	35–45	25–33
Oil pump to pressure hose	16–24	12–17
Oil pump to pressure switch	25–30	18–22
Connector to oil pump body	40–60	29–43
Suction plate to oil pump body	6–10	4–7
Pump cover to oil pump body	18–22	13–16

NOTE

* If the special tool is used to measure the tightening torque, the measurement is 135–175 Nm (98–127 ft.lbs.).

Items	Nm	ft.lbs.
Steering hoses		
<2.6L Engine>		
Pressure hose assembly to oil pump	16-24	12-17
Pressure hose assembly to gear box	30-40	22-29
Breather pipe to engine	8-12	6-9
<3.0L Engine>		
Pressure hose to oil pump	16-24	12-17
Pressure hose to pressure tube assembly	30-40	22-29
Pressure tube assembly to gear box	30-40	22-29
Return tube assembly to gear box	40-50	29-36
Clip to radiator	8-10	6-7
Pressure hose clip to tube stay	8-12	6-9
Return hose clip to tube stay	8-12	6-9
Tube stay to frame	16-24	12-17
Tube clip to crossmember	8-12	6-9
Steering linkage		
Tie rod end to knuckle	45	33
Tie rod end to relay rod	45	33
Tie rod end to pipe	65-80	47-58
Relay rod to pitman arm	45	33
Relay rod to idler arm	45	33
Idler arm to idler arm support	40-60	29-43
Idler arm support to frame	55-65	40-47

LUBRICANTS

N19CD-

Items	Specified lubricant	Quantity
Power steering fluid	Automatic transmission fluid DEXRON type	1.06 lit (2.2 pints)
Needle bearing of side cover	Automatic transmission fluid DEXRON type	As required

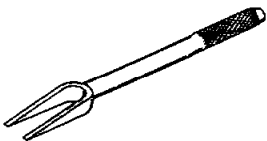
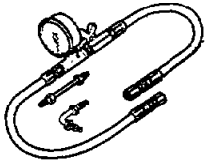

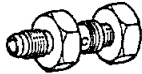
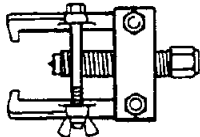
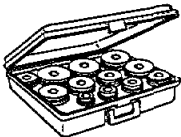
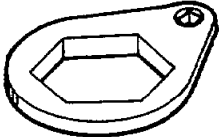
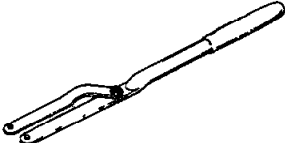

SEALANTS AND ADHESIVES

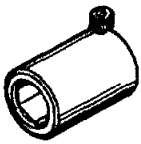
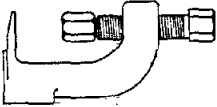
N19CE-

Items	Specified sealant
Dash panel cover bolt installation hole	3M ART Part No. 8513, or equivalent
Inside steering column B nut	3M Stud locking 4170, or equivalent
Installation surface of dust cover	3M ART Part No. 8663, or equivalent

SPECIAL TOOLS

N19DA--

Tool	Number	Name	Use
	MB990778-01	Ball joint remover	Disconnection of the pitman arm and relay rod Disconnection of the idler arm and relay rod
	MB990662-01	Oil pressure gauge	Measurement of the oil pump pressure
	MB990993-01	Oil pressure gauge adapter (pump side)	Measurement of the oil pump pressure
	MB990994-01	Oil pressure gauge adapter (hose side)	Measurement of the oil pump pressure
	MB990809-01	Pitman arm puller	Removal of the pitman arm
	MB990925-01	Bearing and oil seal installer set	Installation of the steering gear box oil seal and the ball bearing MB990926-01 Installation of the oil pump oil seal MB990926-01 (Refer to GROUP 2)
	MB990852-01	Housing nut special spanner	Removal and installation of the housing lock nut
	MB990201-01	Top cover remover	Removal and installation of the top cover
	MB990938-01	Handle	Installation of the steering gear box oil seal and the ball bearing Installation of the oil pump oil seal

Tool	Number	Name	Use
	MB990228-01	Preload socket	Measurement of the mainshaft starting torque
	MB990635-01	Steering linkage puller	Disconnection of the tie rod and knuckle

TROUBLESHOOTING

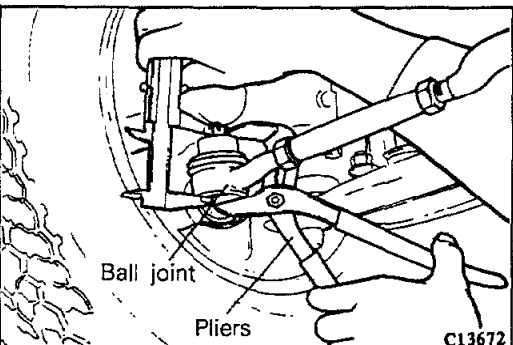
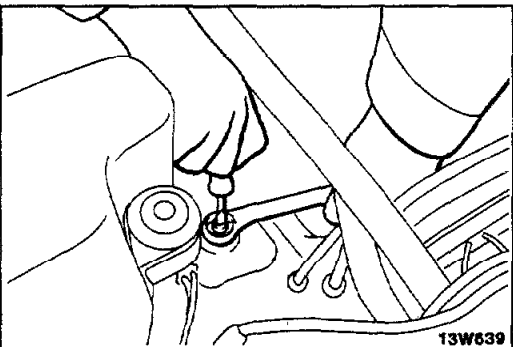
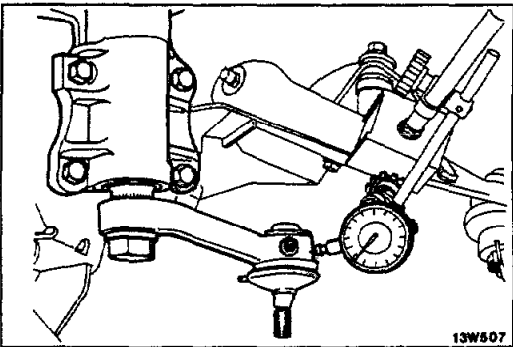
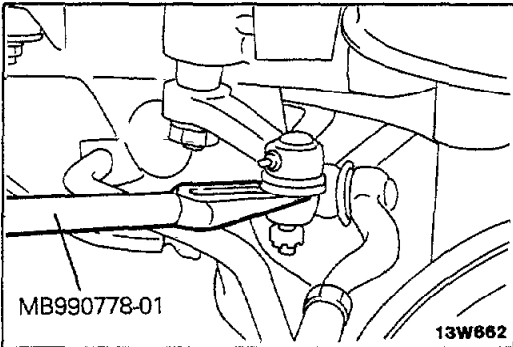
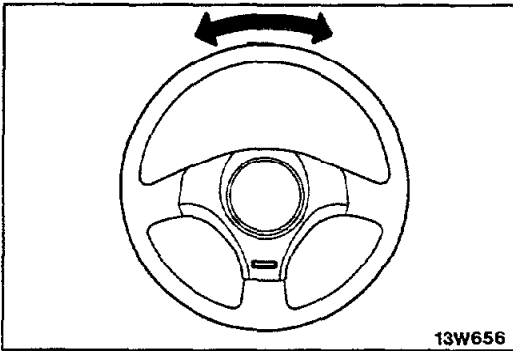
N19EABbb

Symptom	Probable cause	Remedy
Excessive play of steering wheel	Excessive play in steering gear box	Repair
	Loose steering gear mounting bolts	Retighten
	Loose or worn stud of tie rod end	Retighten or replace as necessary
Steering wheel operation is hard (insufficient power assist)	Loose belt	Adjust the belt tension
	Damaged belt	Replace the belt
	Low fluid level	Refill with fluid
	Air in fluid line	Bleed the system
	Twisted or damage hoses	Correct the hose routing or replace the hoses
	Fluid leakage	Check the fluid leakage
	Malfunction of gear box	Check and replace the gear box if necessary
Malfunction of oil pump	Check the oil pump pressure and repair oil pump	
Rattling noise	Loose installation of oil pump or gear box	Retighten the oil pump or gear box
	Interference around column or between pressure hose and other parts	Correct or replace the pressure hose and the parts around the column
	Abnormal noise inside of gear box and oil pump	Replace the gear box or oil pump
Shrill noise	Air sucked into oil pump	Check the oil level and hose clips, bleed the system or replace the oil pump
	Oil pump seizure	Replace the oil pump
Squealing noise	Loose belt	Adjust the belt tension
	Oil pump seizure	Replace the oil pump

Symptom	Probable cause	Remedy
Hissing noise	Air sucked into oil pump	Check the oil level and hose clips; bleed the system
	Damage to the olive of the gear box port section	Replace the gear box
	Malfunction of return hose	Replace the hose
Whistling noise	Malfunction of gear box port section	Replace the gear box
Droning noise	Loose mounting bolt on oil pump or oil pump bracket	Retighten the pump bracket or pump mounting bolt
	Poor condition of oil pump body*	Replace the oil pump
Squeaking noise	Malfunction of steering stopper contact	Check and adjust the steering stopper
	Interference of wheel with vehicle body	Adjust the steering angle
	Malfunction of gear box	Replace the gear box
Vibration**	Air suction	Bleed the system
	Malfunction of gear box	Replace the gear box
Oil leakage from hose connection	Improperly tightened flare nut Incorrectly inserted hose Improperly clamped hose	Repair or replace
Oil leakage from hose assembly	Damaged or clogged hose Hose connector malfunction	Replace
Oil leakage from oil reservoir	Improperly welded pipe	Weld the pipes or replace
	Overflow	Bleed the system or adjust the oil level
Oil leakage from oil pump	Malfunction oil pump housing	Replace the oil pump
	Malfunction of O-ring and/or oil seal	Replace the O-ring and oil seal
Oil leakage from gear box	Malfunction of gear box housing (including leakage from air hole)	Replace the gear box
	Malfunction of O-ring and/or oil seal	Replace the O-ring and oil seal

NOTE

- * A slight "beat noise" is produced by the oil pump; this is not a malfunction. (This noise occurs particularly when a stationary steering effort is made.)
- ** A slight vibration may be felt when the stationary steering effort is made due to the condition of the road surface. To check whether the vibration actually exists or not, test-drive the vehicle on a dry concrete or asphalt surface. Moreover, a very slight amount of vibration is not a malfunction.



SERVICE ADJUSTMENT PROCEDURES

STEERING WHEEL FREE PLAY CHECK

N19FABDa

1. With the engine stationary and the steering wheel in the straight-ahead position, apply a force of 5N (1.1 lbs.) to the steering wheel in the peripheral direction. Measure the play on the circumference of the steering wheel.

Standard value : 25 mm (.98 in.) or less

Limit : 50 mm (1.97 in.)

2. If the measured value exceeds the repair limit, check the steering gear backlash and linkage ball joint end play.

STEERING GEAR BACKLASH CHECK

N19FOAE

1. Jack up the vehicle front and hold the steering wheel in the straight ahead position.
2. Disconnect the pitman arm and the relay rod by using special tool.

3. Measure the steering gear backlash at the pitman arm top end with a dial indicator.

Limit : 0.5 mm (.020 in.)

4. If the measured value exceeds the limit, screw in the steering gear box adjusting bolt until steering wheel free play is within the range of standard value.

Caution

1. Be sure to make the adjustment with the steering wheel in the straight-ahead position.
2. If the adjusting bolt is overtightened, more steering effort will be required, and return of the wheel will be adversely affected.

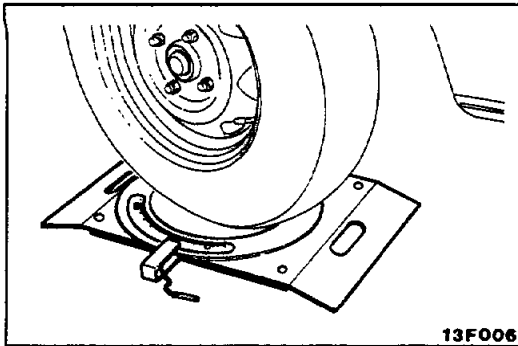
BALL JOINT END PLAY CHECK

N19FPAAa

1. Hold the ball joint with pliers.
2. Set a caliper gauge as shown in left figure and measure the displacement with the ball stud compressed.

Limit : 1.5 mm (.059 in.)

3. If the measured displacement is over the limit, replace the ball joint.



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STEERING ANGLE CHECK

N19FDACa

1. Place the front wheel on a turning radius gauge and measure the steering angle.

**Standard value : Inner wheel $32^{\circ}30'_{-3}$
Outer wheel $29^{\circ}00'$**

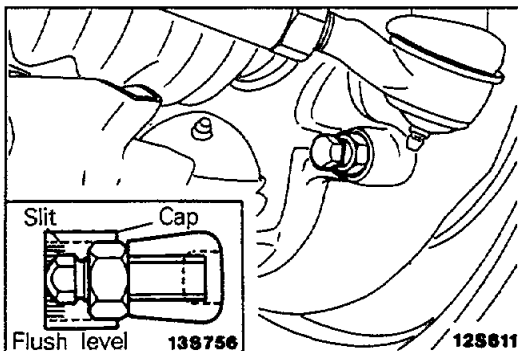
2. Adjust the steering angle of each wheel by turning the stop bolt of the knuckle arm.

NOTE

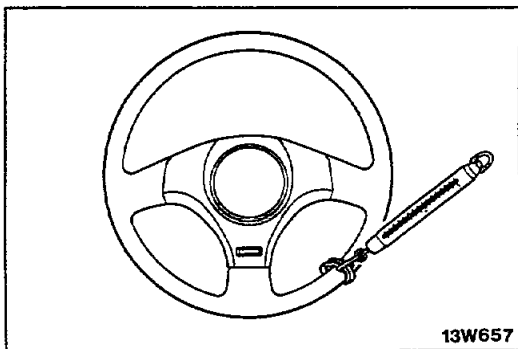
After adjusting the steering angle, mount the cap onto the jam bolt so that the edge of the slit side of the cap and the head of the stop bolt are flush and face in the same direction, and then pack the head of the stop bolt with the multipurpose grease.

Caution

Be sure that the toe-in is properly adjusted before adjusting the steering angle.



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STATIONARY STEERING EFFORT CHECK

N19FFADa

1. Place the vehicle on a level surface and place the steering wheel in the straight-ahead position.
2. Set the engine speed to 1,000 r/min.
3. Measure the tangential force with a spring balance by turning the steering wheel clockwise and counterclockwise one and a half turns.

Standard value : 37 N (8.2 lbs.) or less

4. If the stationary steering effort exceeds the standard value, check for belt slackness, damage, insufficient oil, air mixed into oil, collapsed or twisted hoses, etc., and repair if found.

STEERING WHEEL RETURN (TO CENTER) CHECK

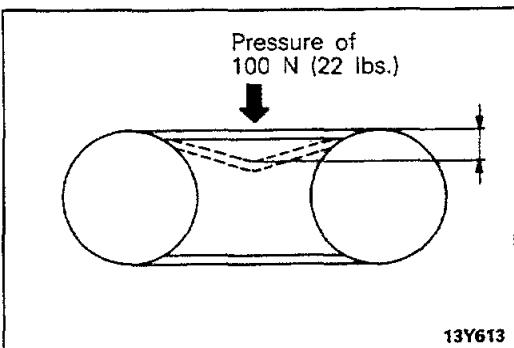
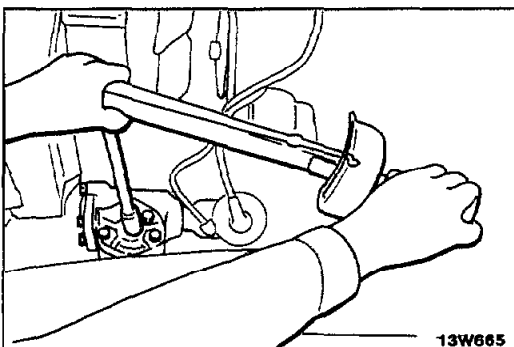
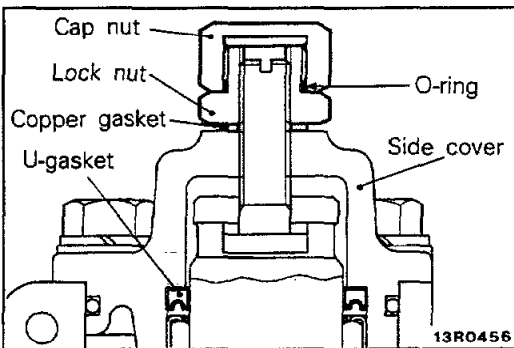
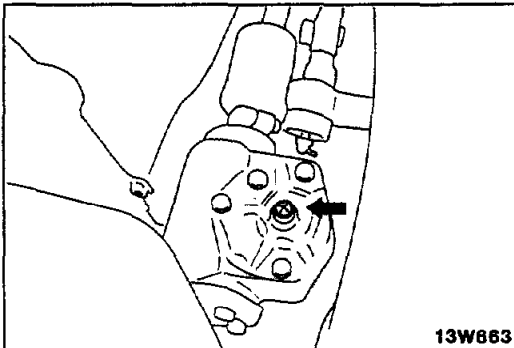
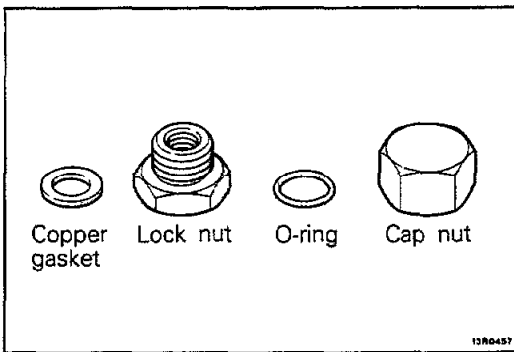
N19FGADa

To check for the return of steering wheel to center, carry out drive test and check the following points.

1. Make gentle and sharp turns and check to get a feel for that there is no appreciable difference in steering effort and return to center between right and left turns.
2. Drive at a speed of about 35 km/h (22 mph), turn the steering wheel 90° clockwise or counterclockwise, and release the wheel a second or two later. If the wheel returns more than 70°, the return may be considered good.

NOTE

When the steering wheel is turned abruptly, momentary hard steering might result, but this does not mean any problem. It is caused by low oil pump delivery during idling.



POWER STEERING GEAR BOX OIL LEAKAGE CHECK

N19FSABa

If there is oil leakage at the gear box side cover adjustment bolt (malfunction of the cross shaft U-gasket), repair as described below rather than by using the repair kit.

1. Remove the adjustment bolt's lock nut.

Caution

Because the meshing of the main shaft and the cross shaft will change if the adjustment bolt is turned, a screwdriver should be used to prevent it from turning when removing the nut.

2. Clean away all mud, paint remnants, etc. from the upper surface of the side cover.
3. Apply a coating of automatic transmission fluid to the repair kit's O-ring, and then fit into the lock nut.

Specified fluid : Automatic transmission fluid DEXRON type

4. Fit the copper gasket, and then tighten the lock nut at the specified torque to lock the adjustment bolt.

Specified torque : 30–45 Nm (22–33 ft.lbs.)

Caution

If the adjustment bolt is turned, the gear's backlash must be adjusted.

5. Tighten the cap nut at the specified torque.

Specified torque : 15–22 Nm (11–16 ft.lbs.)

6. Supply automatic transmission fluid and bleed out the air; then check to be sure that there is no oil leakage at the lock nut.

Specified fluid : Automatic transmission fluid DEXRON type

7. Apply black paint to prevent corrosion of the cap nut and the lock nut.

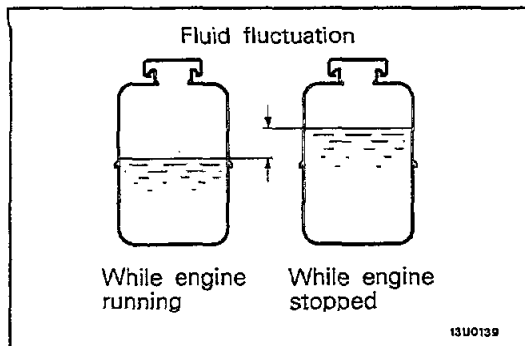
DRIVE-BELT TENSION CHECK

N19FHADa

1. Check the belt for slackness by applying pressure of 100N (22 lbs.) to the center of the belt.

Standard value : 9–12 mm (.35–.47 in.)

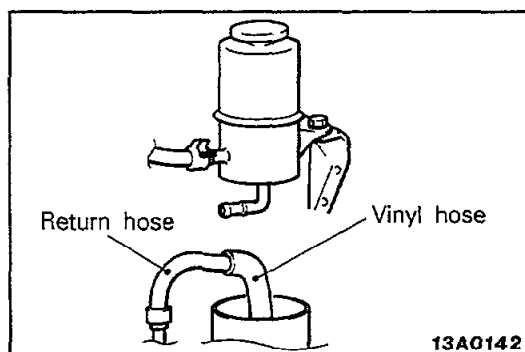
2. If the measured tension is different from the standard value, adjust the drive belt tension.

**FLUID LEVEL CHECK**

N19FJAFa

1. Start the engine on a level surface, and turn the steering wheel several times fully to the right and left while the engine is idling.
2. Replace the fluid if it has bubbles or has become white.
3. Fill the reservoir with specified automatic transmission fluid to the MAX level.

Specified fluid : Automatic transmission fluid DEXRON type

**FLUID REPLACEMENT**

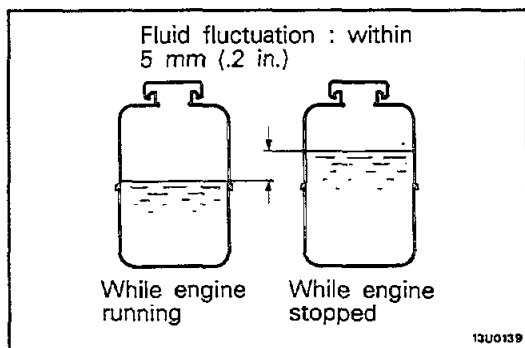
N19FJAFb

Check for contamination in the fluid reservoir. Foamy or cloudy fluid should be replaced.

1. Remove the reservoir cap.
2. Disconnect the return hose from the reservoir tank and remove the fluid.
3. Disconnect the high tension cable.
4. Run the engine intermittently several times with the starting motor, and remove the fluid from the gear box.
5. Attach the return hose and supply the specified fluid.

Specified fluid : Automatic transmission fluid DEXRON type

6. Bleed the system and check the fluid pressure.

**AIR BLEEDING**

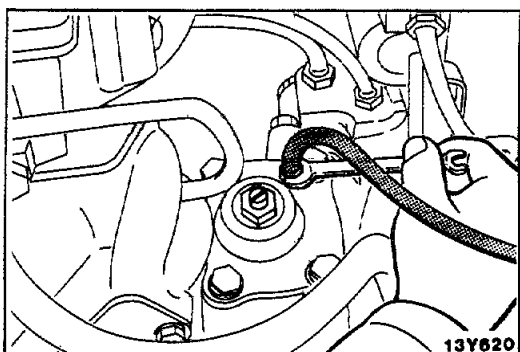
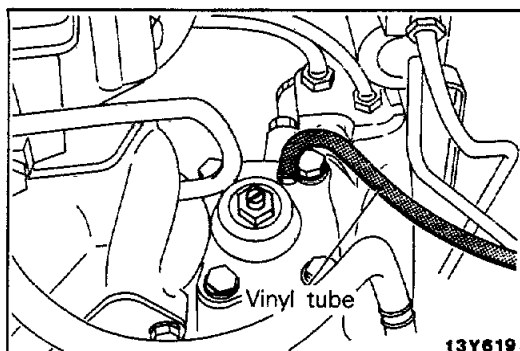
N19FKAD

Check stationary steering effort. If it is different from the standard value, air in the system is suspected. Bleed the system.

1. Make certain the reservoir is filled up.
2. Jack up the front wheels.
3. Remove the high tension cable.
4. While turning the steering wheel completely to the right and to the left, turn the engine over by using the starting motor. Repeat this several times.

Caution

Do not carry out bleeding with the engine running, high speed rotation of the oil pump mixes the power steering fluid with air, making it impossible to throughly bleed the system.



5. Lower the front wheels.
6. Connect one end of a vinyl tube of suitable length to the breather plug of the gear box, and place its other end in a container.
7. Start the engine and idle it.
8. Loosen the breather plug, and then turn the steering wheel completely to the right and left continuously until air bubbles no longer appear in the fluid coming out of the tube.

Caution

Do not hold the steering completely to the left or right for 10 seconds or more.

9. After completion of the bleeding, tighten the breather plug. Check the fluid level, and refill if necessary.
10. When turning the steering wheel right and left fully, check that the fluid level variation is less than 4 mm (.16 in.)

OIL PUMP PRESSURE TEST

N19FLADa

1. Disconnect the pressure hose from the oil pump and connect the special tool as illustrated.

NOTE

Use the adaptor to connect the special tool to the pump.

2. Bleed the power steering system.
3. Start the engine and operate it until the fluid temperature reaches about 55°C (131°F).
4. Run the engine at 1,000 r/min.
5. Completely close the shut-off valve of the special tool and read the gauge pressure.

Caution

Do not close the shut-off valve of the special tool for more than 3 seconds.

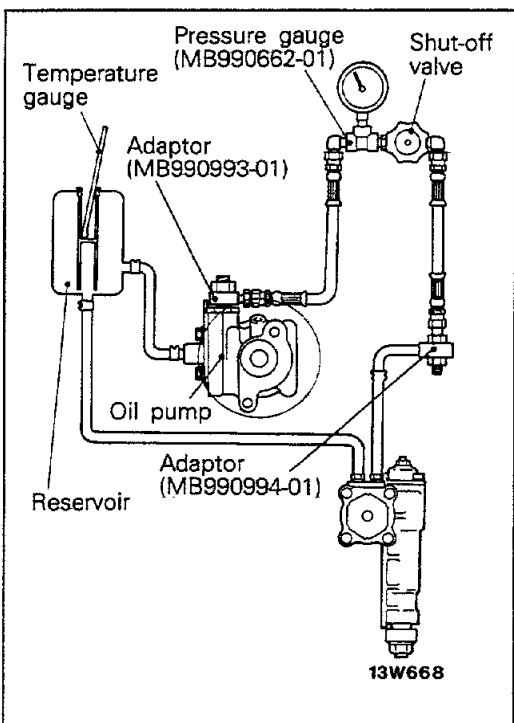
Standard value :

Valve closed 7,500–8,200 kPa (1,067–1,166 psi.)

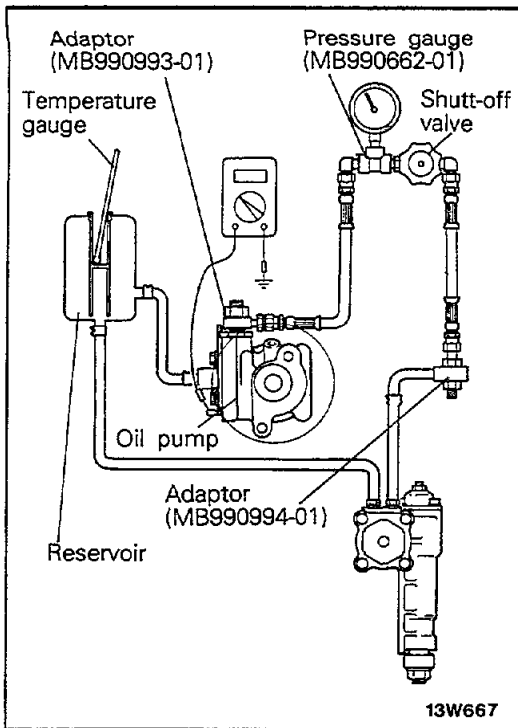
Valve opened 980 kPa (142 psi)

Limit :

Valve opened 1,500 kPa (218 psi)



6. If the hydraulic pressure is not within the range of the standard value, replace the oil pump.
7. Completely open the shut-off valve of the special tool and read the gauge pressure. If the hydraulic pressure is not within the range of the standard value, check for a clogged or collapsed oil line, or for a clogged oil passage inside the gear box.
8. With the shut-off valve of the special tool completely open, and turn the steering wheel completely to the right or left, then measure the maximum oil pressure in this condition. If the maximum oil pressure is not within the range of the standard value, (valve closed) the valve of the gear box is faulty, and the gear box must be replaced.



OIL PRESSURE SWITCH CHECK <Vehicles with an automatic transmission>

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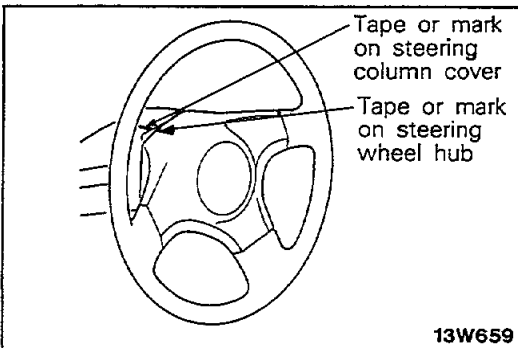
1. Disconnect the pressure hose from the oil pump, and then connect the special tools.
2. Bleed the air, and then turn the steering wheel several times while the vehicle is not moving so that the temperature of the fluid rises to approximately 50–60°C(122–140°F).
3. The engine should be idling.
4. Disconnect the connector for the oil pressure switch, and place an ohmmeter in position.
5. Gradually close the shut-off valve of the pressure gauge and increase the hydraulic pressure then check whether the hydraulic pressure that activates the switch is the standard value.

Standard value: 1.5–2.0 MPa (213–284 lbs.)

6. Gradually open the shut-off valve and reduce the hydraulic pressure; then check whether the hydraulic pressure that deactivates the switch is the standard value.

Standard value: 0.7–1.2 MPa (100–171 lbs.)

7. Remove the special tools, and then tighten the pressure hose to the specified torque.
8. Bleed the system.



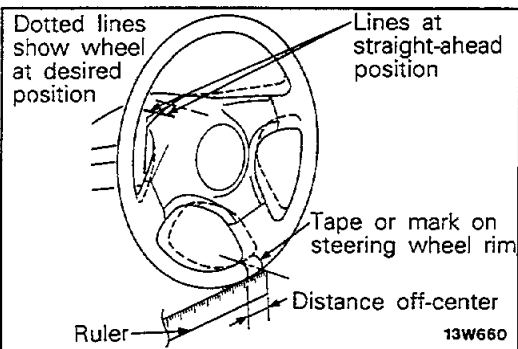
STEERING WHEEL CENTERING

N19FNAB

SIMPLIFIED STEERING WHEEL CENTERING

DETERMINING STEERING WHEEL'S OFF CENTER

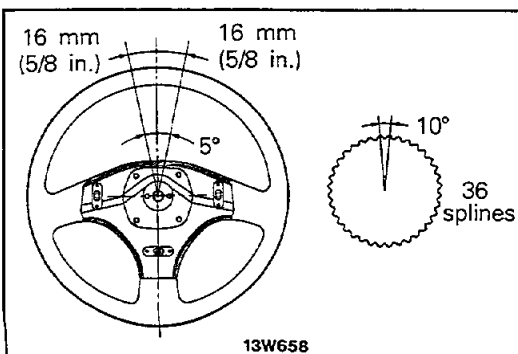
1. For the road test, take along chalk or tape and a ruler.
2. Drive straight ahead on an uncambered level surface.
3. When the vehicle's wheels are pointing straight ahead, mark the steering wheel hub and column cover with a chalk or tape line.
4. Stop the vehicle and line up the marks on the hub and column cover.
5. Place a tape strip or mark on the steering wheel rim.
6. Hold a ruler next to the rim as shown in the illustration, and centered position.
7. Record the distance the strip or mark on the rim has moved. This is how far the steering wheel is off center. If it is more than 16 mm (5/8 in.) of center, it can be centered by indexing it ten degrees towards the center.

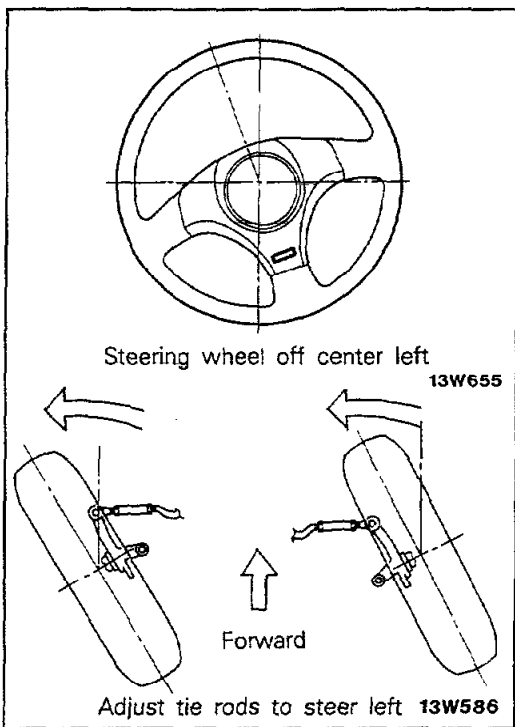


INDEXING STEERING WHEEL TO CENTER IT

The steering wheel shaft has 36 splines, allowing the steering wheel to be indexed in ten-degree increments.

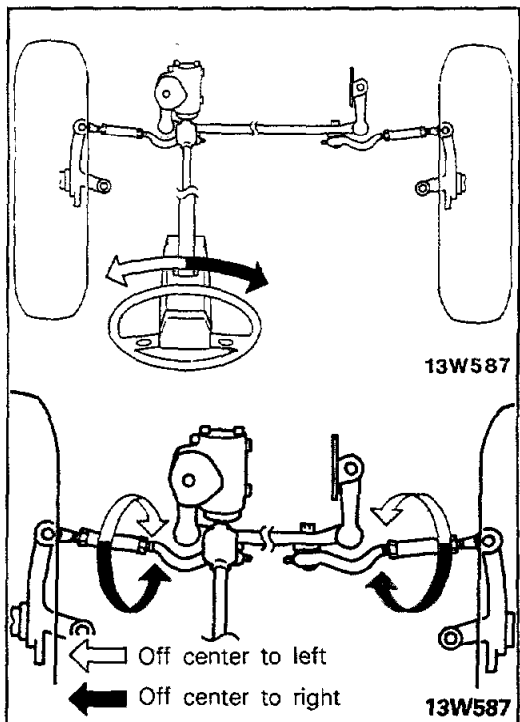
1. Remove the steering wheel.
2. Without disturbing the position of the steering wheel shaft, re-install the wheel as near on-center as possible.





PRECISION STEERING WHEEL CENTERING

In general, the tie rods are adjusted to steer the front wheels in the same direction that the steering wheel is off center. If the steering wheel is off center to the left, center it by adjusting the tie rods to make the front wheels steer toward the left, and vice versa.



1. Hold the tie rods with a wrench while loosening the locking nuts at least 1/4 turn.
2. Hold the tie rod end with a wrench and turn the tie rod the desired number of turns. Adjust both tie rods equally in the same direction to center the steering wheel.

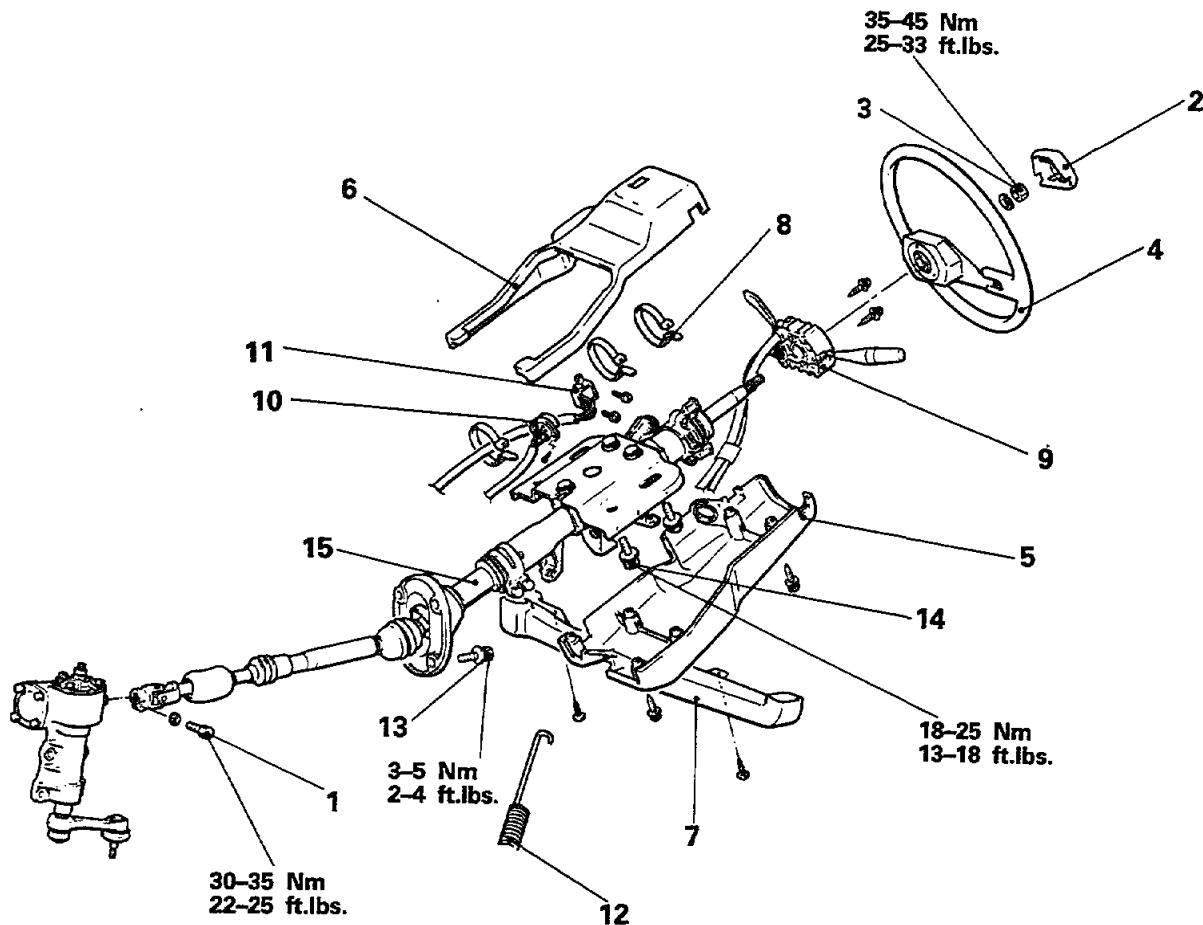
NOTE

By turning the tie rods 1/6 of a turn, an adjustment of 2° (at the steering wheel center) or 6 mm (.25 in.) (at the steering wheel rim) can be made.

STEERING COLUMN AND SHAFT

REMOVAL AND INSTALLATION

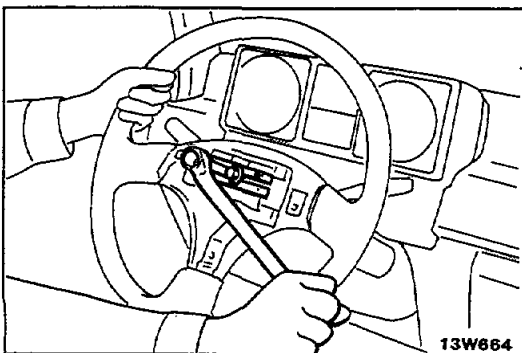
N19GA--



Removal steps

- 1. Bolt
- 2. Horn pad
- 3. Jam nut
- ◄◄ 4. Steering wheel assembly
- 5. Lower column cover
- 6. Upper column cover
- 7. Lap heater duct
- 8. Cable band
- 9. Column switch
- 10. Ignition switch
- 11. Key remained switch
- 12. Brake pedal return spring
- ◄◄ 13. Washer bolts
- 14. Bolts
- 15. Steering column and shaft assembly

NOTE
 (1) Reverse the removal procedures to reinstall.
 (2) ◄◄ : Refer to "Service Points of Removal".
 (3) ◄◄ : Refer to "Service Points of Installation".



13W664

SERVICE POINTS OF REMOVAL

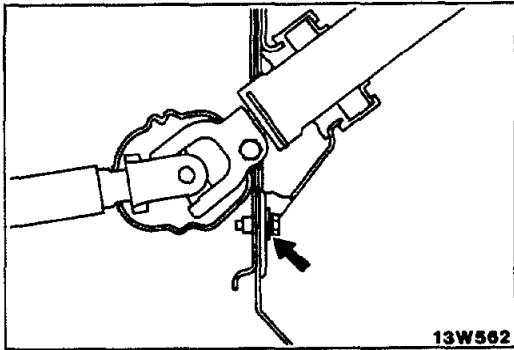
N19GBAN

4. REMOVAL OF STEERING WHEEL ASSEMBLY

Remove the steering wheel.

NOTE

In the event that the only steering wheel is to be removed, make the mating marks on both steering shaft and steering wheel.

**SERVICE POINTS OF INSTALLATION**

N19GDAM

13. APPLICATION OF SEALANT TO WASHER BOLTS

Attach the dash panel cover and apply a coating of the specified sealant in the bolt installation hole from inside the vehicle.

**Specified sealant : 3M ART Part No. 8513
or equivalent**

Caution

Do not loosen the column tube clamp bolts. If the clamp bolts should be loosened, retighten them securely while pulling the steering shaft out fully toward the interior side.

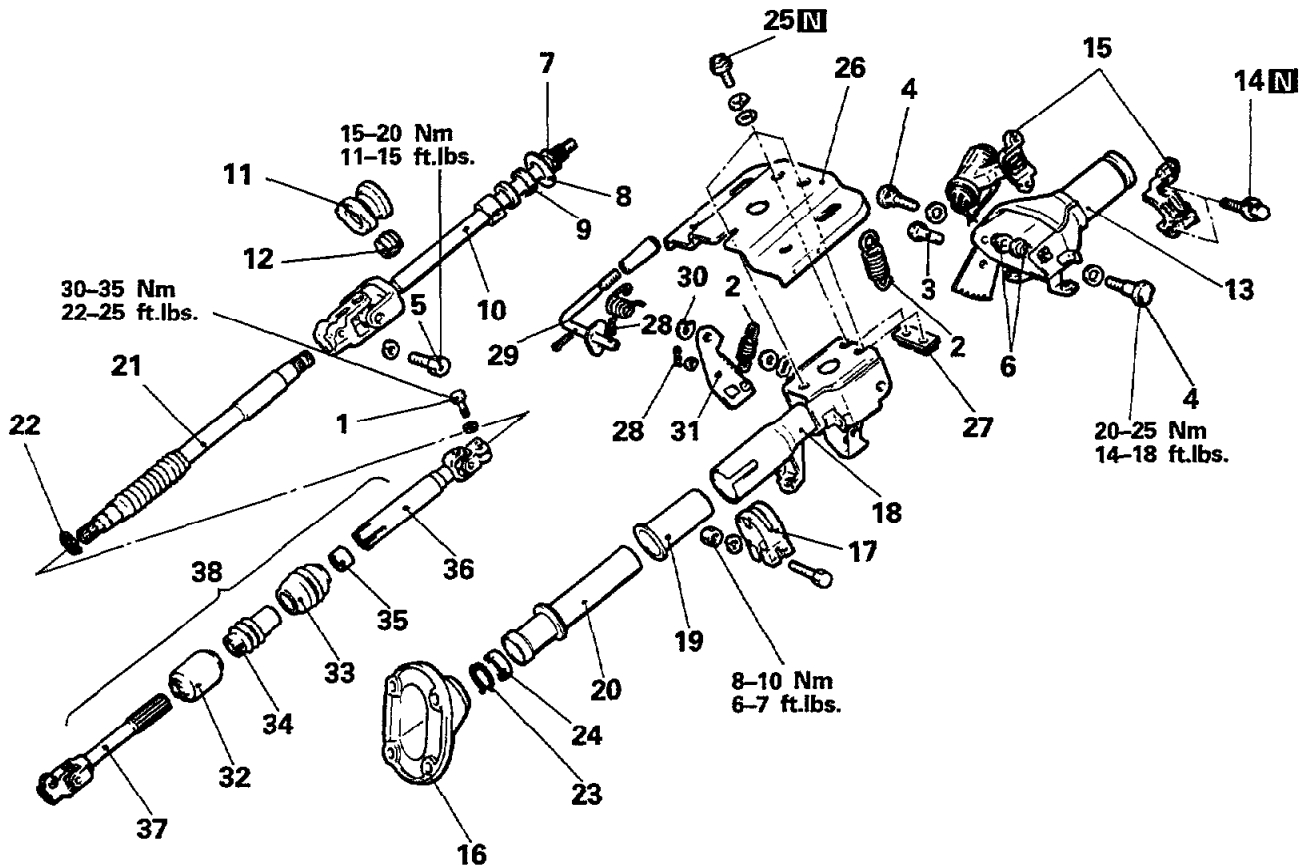
4. INSTALLATION OF STEERING WHEEL ASSEMBLY

Position the front wheels in the straight-ahead position and install the steering wheel.

If the center of the steering wheel is not in alignment, make the steering wheel centering adjustment. (Refer to 19-13.)

DISASSEMBLY AND REASSEMBLY

N19GE-



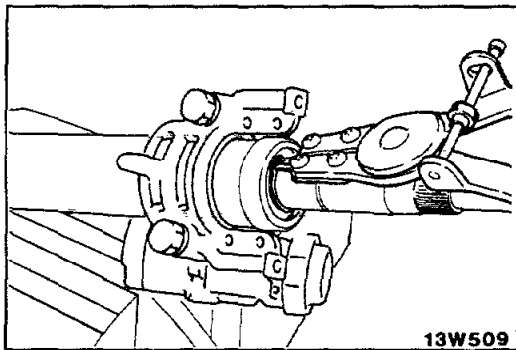
13W612

Disassembly steps

- ◆◆ 1. Bolt
- ◆◆ 2. Return springs
- ◆◆ 3. Clevis pin
- ◆◆ 4. Bolts
- ◆◆ 5. Bolt
- ◆◆ 6. Bushings
- ↔ 7. Snap ring
- ◆◆ 8. Stopper
- ◆◆ 9. Spacer
- ◆◆ 10. Steering shaft A
- ◆◆ 11. Dust seal
- ◆◆ 12. Bushing
- ◆◆ 13. Steering column A
- ↔◆◆ 14. Special bolts
- ↔◆◆ 15. Steering lock assembly
- ◆◆ 16. Dash panel cover
- ◆◆ 17. Column tube clamp
- ◆◆ 18. Steering column B
- ◆◆ 19. Column bushing
- ◆◆ 20. Column tube
- ◆◆ 21. Steering shaft B
- ◆◆ 22. Snap ring
- ◆◆ 23. Clip
- ◆◆ 24. Bearing
- ↔◆◆◆ 25. Special bolts
- ↔◆◆◆ 26. Plate
- ◆◆◆ 27. Nut plate
- ◆◆◆ 28. Snap pin
- ◆◆◆ 29. Lever assembly
- ◆◆◆ 30. Snap ring
- ◆◆◆ 31. Plate assembly
- ◆◆◆ 32. Lower boot
- ◆◆◆ 33. Upper boot
- ◆◆◆ 34. Dust cover
- ◆◆◆ 35. Spring
- ◆◆◆ 36. Steering shaft C
- ◆◆◆ 37. Steering shaft D
- ◆◆◆ 38. Joint assembly

NOTE

- (1) Reverse the disassembly procedures to reassemble.
- (2) ↔◆◆ : Refer to "Service Points of Disassembly".
- (3) ◆◆◆ : Refer to "Service Points of Reassembly".
- (4) ◆ : Non-reusable parts



13W509

SERVICE POINTS OF DISASSEMBLY

N19GFAN

7. REMOVAL OF SNAP RING

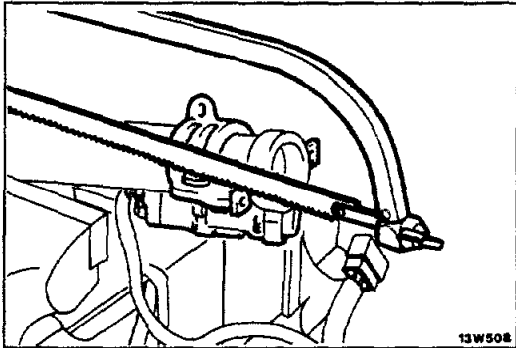
Using the snap ring pliers, remove the snap ring from steering shaft A and extract steering shaft A from the bottom of steering column A.

NOTE

Release the steering lock to extract steering shaft A.

14. REMOVAL OF SPECIAL BOLTS/15. STEERING LOCK ASSEMBLY

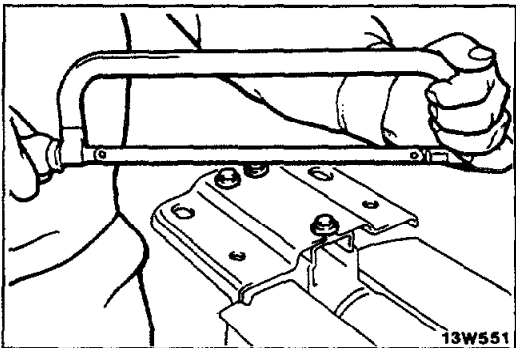
If it is necessary to remove the steering lock, cut a groove on the head of each special bolt with a metal saw, and remove the steering lock with a screwdriver.



13W508

25. REMOVAL OF SPECIAL BOLTS/26. PLATE

If it is necessary to remove the plate of steering column B, cut a groove on the head of each special bolt with a metal saw, and remove the plate with a screwdriver.



13W551

INSPECTION

N19GGA

- Check the plate for cracks or damage.
- Check the column bushing for damage.
- Check the dash panel cover for damage.
- Check the steering shaft bearing for wear.
- Check the steering shaft for damage and deformation.
- Check the teeth of the plate assembly for wear.
- Check the steering shaft joint for play or faulty operation.
- Check the dust seal and bushing for damage or unusual wear.

SERVICE POINTS OF REASSEMBLY

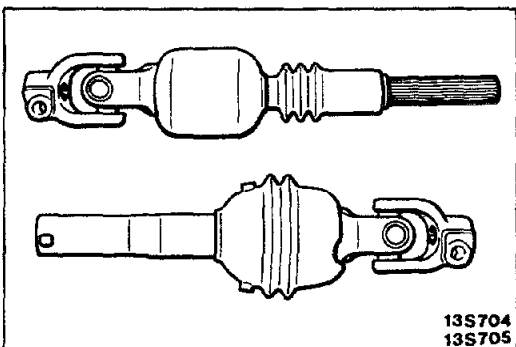
N19GHA

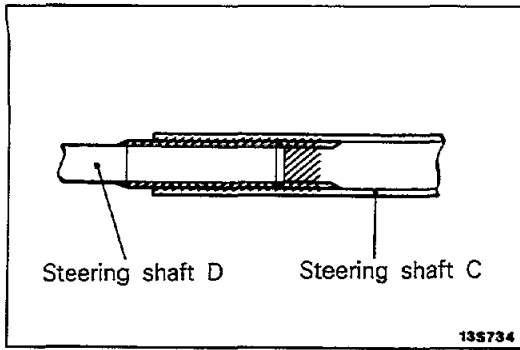
38. INSTALLATION OF JOINT ASSEMBLY

- (1) Plate the upper boot over steering shaft C assembly and the lower boot and dust cover over steering shaft D.

NOTE

Leave the upper and lower boots on the shafts without assembling them to the universal joint.

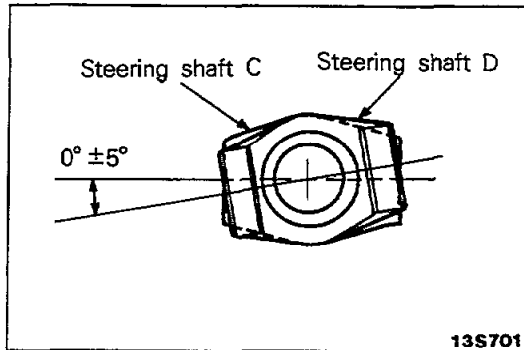
13S704
13S705



- (2) Apply the multipurpose grease to the steering shaft C and D.

Caution

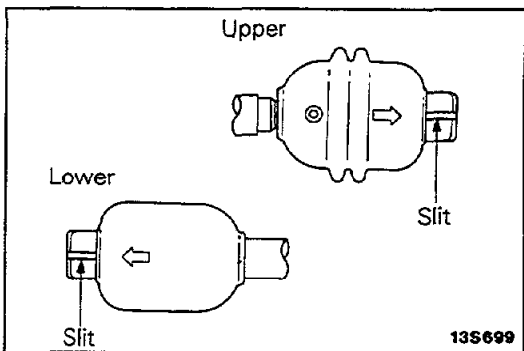
After inserting steering shaft D make sure that the tilt of the yoke of steering shaft D in relation to the yoke of steering shaft C is within the angle measurement shown in the illustration.



- (3) Assemble the upper and lower boots and the dust cover.

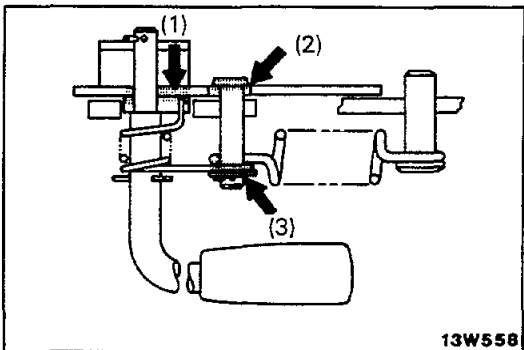
NOTE

Align the arrows on the upper and lower boots to the slits on the yokes in order to assemble.



31. APPLICATION OF GREASE TO PLATE ASSEMBLY/29. LEVER ASSEMBLY

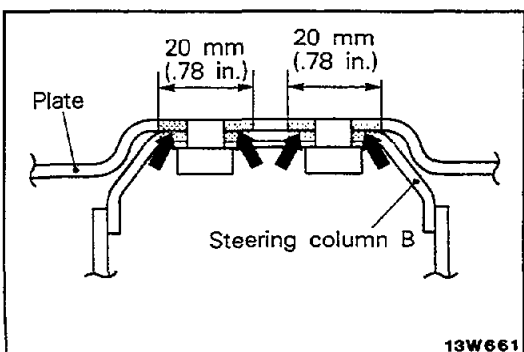
When installing the lever assembly and the plate assembly, apply the multipurpose grease to the following locations:

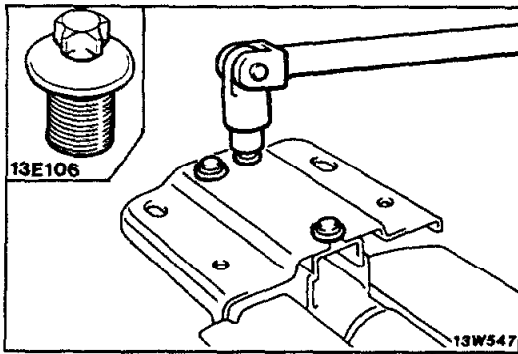


- (1) The surface of the cam part of the lever which contact steering column B.
- (2) The surface of the plate's clevis pin which contact steering column B.
- (3) The space between the plate's clevis pin and return spring.

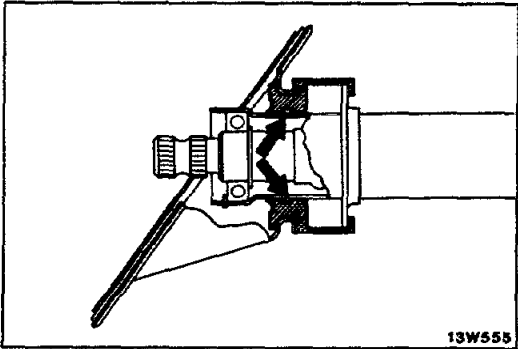
26. INSTALLATION OF PLATE/25. SPECIAL BOLTS

- (1) Apply a coating of the multipurpose grease to the periphery of the bolt hole at the steering column B and plate alignment surface.



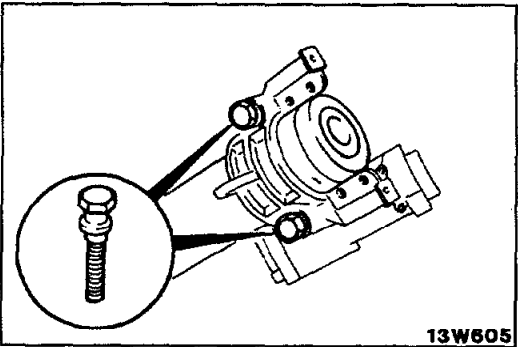


- (2) When mounting the plate onto the steering column B, tighten the special bolts until the heads twist off.



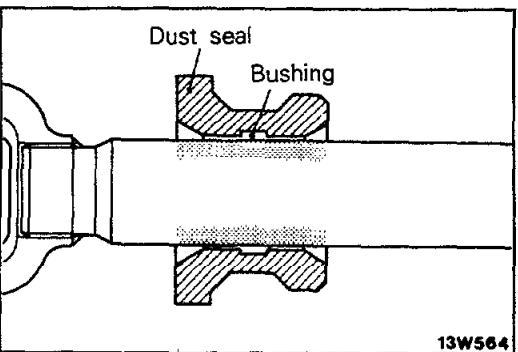
16. APPLICATION OF GREASE TO DASH PANEL COVER

Apply the multipurpose grease to the dash panel cover grommet.



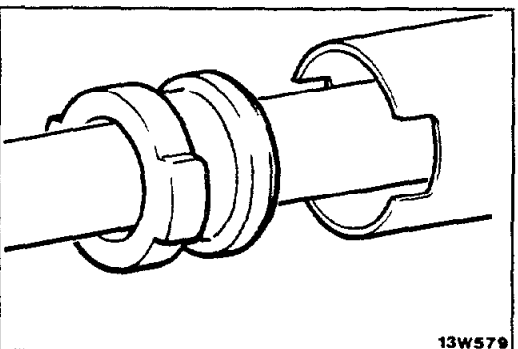
15. INSTALLATION OF STEERING LOCK ASSEMBLY/14. SPECIAL BOLTS

- (1) When installing the steering lock onto steering column A, install it loosely in alignment with the column boss and check that it works properly.
 (2) Then tighten the special bolts until the heads twist off.



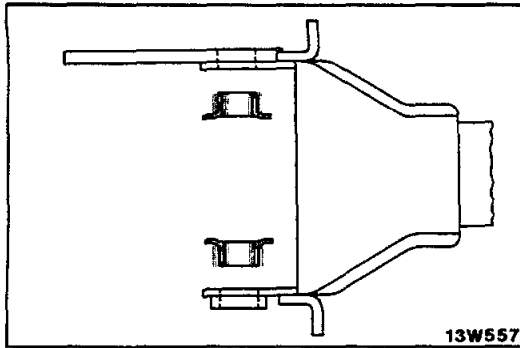
12. APPLICATION OF GREASE TO BUSHING/11. DUST SEAL

Apply a coating of multipurpose grease to the bushing of the dust seal and steering shaft A contact surfaces.



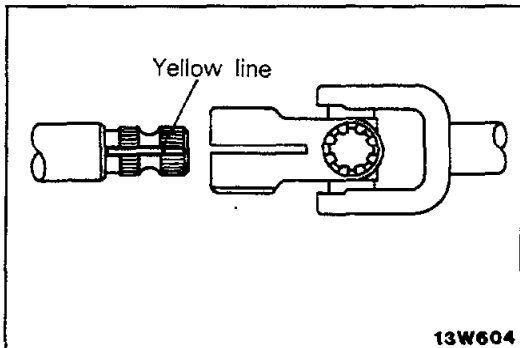
10. INSTALLATION STEERING SHAFT A

Align the projection of the dust seal and the notch of steering column A, and then install steering shaft A to steering column A.



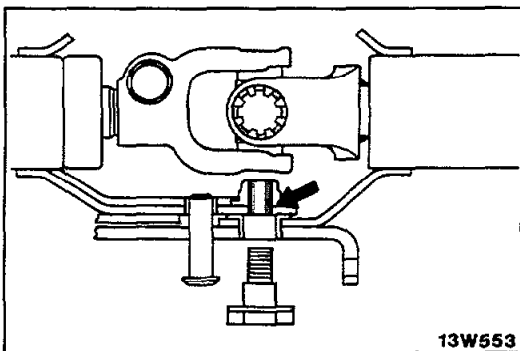
6. APPLICATION OF GREASE TO BUSHINGS

Apply the multipurpose grease to the bushings and install steering column A.



5. INSTALLATION OF BOLT

Assemble steering column A and steering column B by aligning the yellow line on the serrated part of steering shaft B with the yoke groove in steering shaft A.



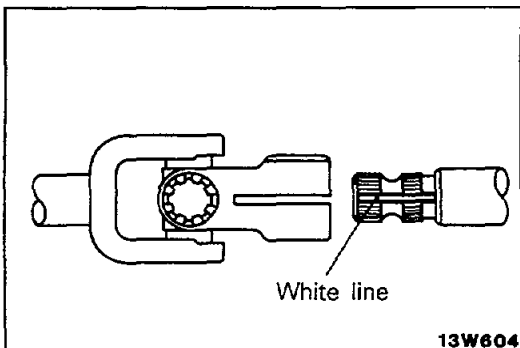
4. APPLICATION OF ADHESIVE TO BOLTS

Apply specified adhesive to the nut of steering column B and tighten the bolt.

Specified adhesive : 3M Adhesive stud locking 4170 or equivalent

Caution

If there is any adhesive hardened inside the nut, use a tap to remove it before applying the adhesive.



3. INSTALLATION OF CLEVIS PIN

Insert a new clevis pin until the tip of the pin is flush with steering column B.

1. INSTALLATION OF BOLT

Align the white line on steering shaft B and the yoke groove in steering shaft C, and then tighten at the specified torque.

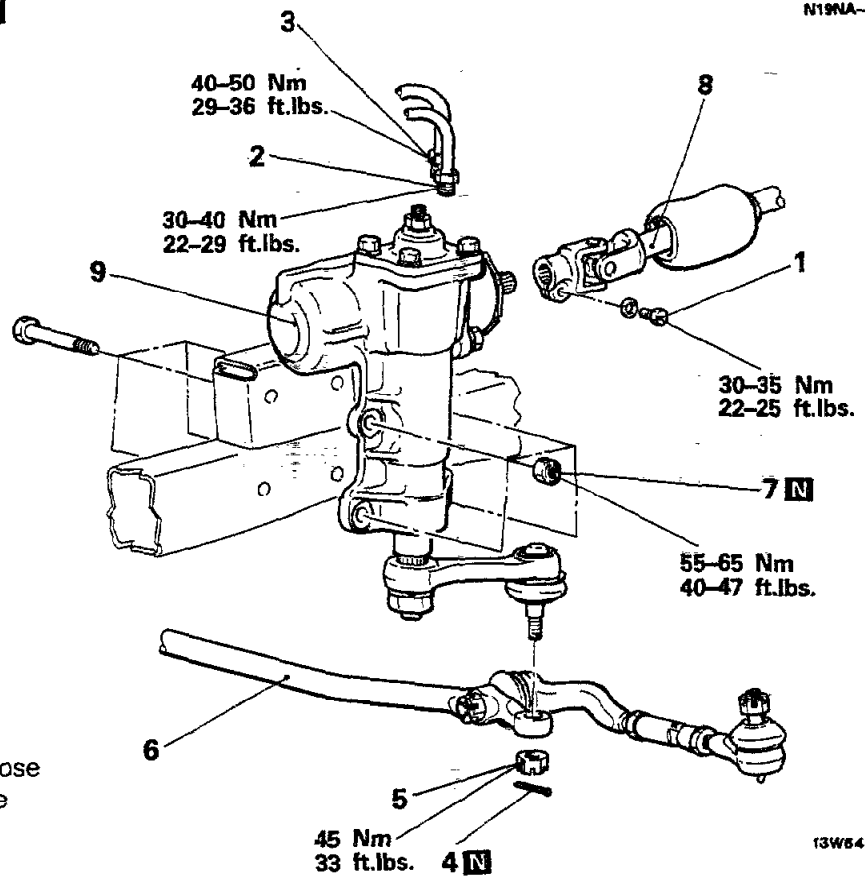
**POWER STEERING GEAR BOX
REMOVAL AND INSTALLATION**

Pre-removal Operation

- Removal of the Power Steering Fluid (Refer to P.19-12.)

Post-installation Operation

- Supplying of Power Steering Fluid (Refer to P.19-12.)
- Bleeding of the Power Steering Fluid Line (Refer to P.19-12.)

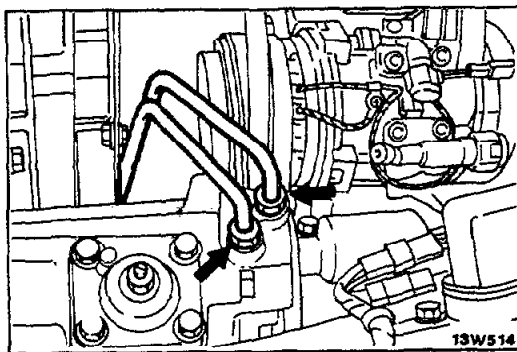


Removal steps

1. Bolt
- ↔ 2. Connection of pressure hose
- ↔ 3. Connection of return hose
4. Cotter pin
5. Slotted nut
- ↔ 6. Connection of relay rod
7. Self-locking nuts
8. Connection of joint assembly
- ↔ 9. Power steering gear box

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ↔ : Refer to "Service Points of Removal".
- (3) ↔ : Refer to "Service Points of Installation".
- (4) N : Non-reusable parts



SERVICE POINTS OF REMOVAL

N19NBAF

2. DISCONNECTION OF PRESSURE HOSE/3. RETURN HOSE

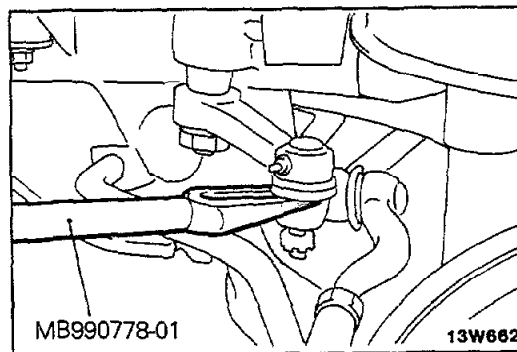
Disconnect the pressure hose and return hose from the gear box.

Caution

Use waste cloth to close the end of each hose in order to prevent escape of fluid and entrance of dirt and other foreign material.

6. DISCONNECTION OF RELAY ROD

Disconnect the pitman arm from the relay rod by using the special tool.



SERVICE POINTS OF INSTALLATION

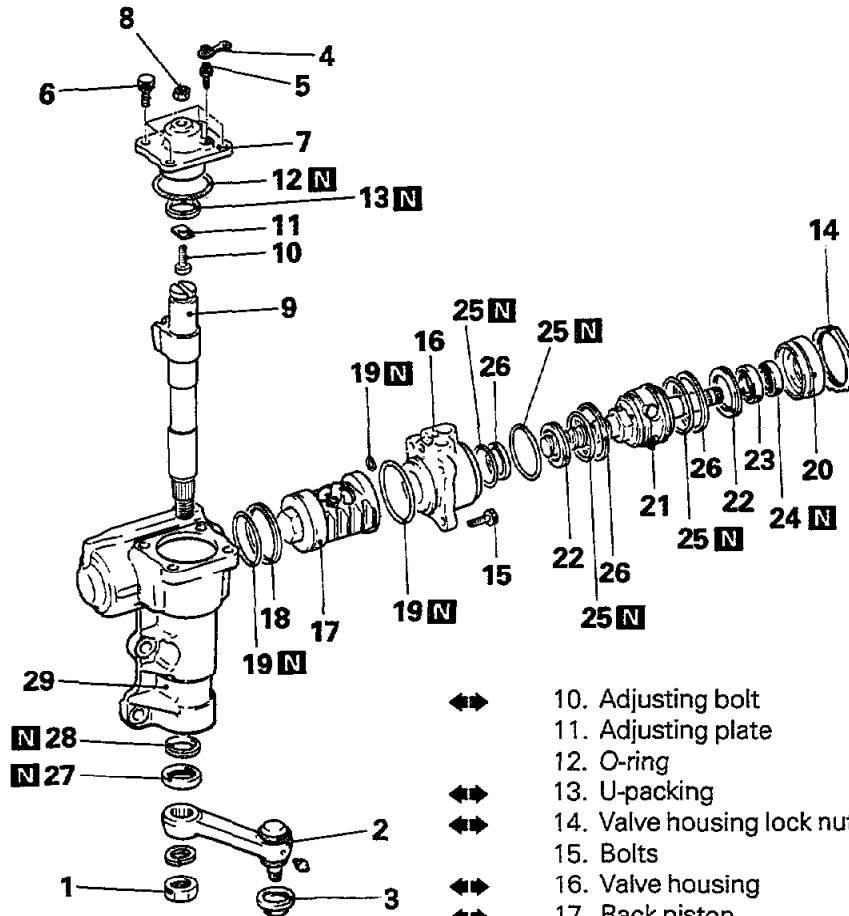
N19NDAB

9. INSTALLATION OF POWER STEERING GEAR BOX

Install the power steering gear box to the frame after inserting the power steering gear box mainshaft into the joint assembly.

N19NE-A

DISASSEMBLY



13W652

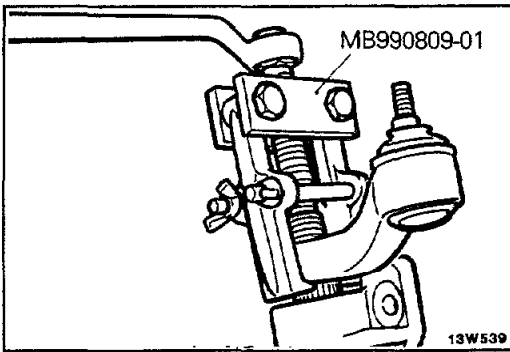
Disassembly steps

- 1. Jam nut
- ↔ 2. Pitman arm
- 3. Dust cover
- 4. Breather plug cap
- ↔ 5. Breather plug
- ↔ 6. Washer bolts
- 7. Side cover
- ↔ 8. Adjusting bolt lock nut
- ↔ 9. Cross-shaft

- ↔ 10. Adjusting bolt
- 11. Adjusting plate
- ↔ 12. O-ring
- ↔ 13. U-packing
- ↔ 14. Valve housing lock nut
- 15. Bolts
- ↔ 16. Valve housing
- ↔ 17. Rack piston
- 18. Seal ring
- 19. O-rings
- ↔ 20. Top cover
- ↔ 21. Main shaft
- ↔ 22. Thrust needle bearings
- ↔ 23. Ball bearing
- ↔ 24. Oil seal
- ↔ 25. O-rings
- ↔ 26. Seal rings
- ↔ 27. Oil seal
- ↔ 28. U-packing
- ↔ 29. Gear box housing

NOTE

- (1) ↔ : Refer to "Service Points of Disassembly".
- (2) N : Non-reusable parts

**SERVICE POINTS OF DISASSEMBLY**

N19NFAC

2. REMOVAL OF PITMAN ARM

Remove the pitman arm from the gear box assembly by using the special tool.

5. REMOVAL OF BREATHER PLUG

Remove the breather plug, and drain the steering gear oil.

8. REMOVAL OF ADJUSTING BOLT LOCK NUT

Loosen the lock nut of the adjusting bolt and screw in the adjusting bolt so that the side cover raises slightly.

9. REMOVAL OF CROSS-SHAFT

With the mainshaft and cross-shaft placed in the straight ahead position, tap the bottom of the cross-shaft with a plastic hammer to take out the cross-shaft together with the side cover.

10. REMOVAL OF ADJUSTING BOLT

Remove the side cover by turning the adjusting bolt.

13. REMOVAL OF U-PACKING

Do not remove the U-packing at the rear of the needle bearing unless there is fluid leakage from the threads of the adjusting bolt. If there is leakage, replace the U-packing with a new one.

14. REMOVAL OF VALVE HOUSING LOCK NUT

Remove the valve housing lock nut by using the special tool.

16. REMOVAL OF VALVE HOUSING

Remove the valve housing together with the rack piston.

Caution

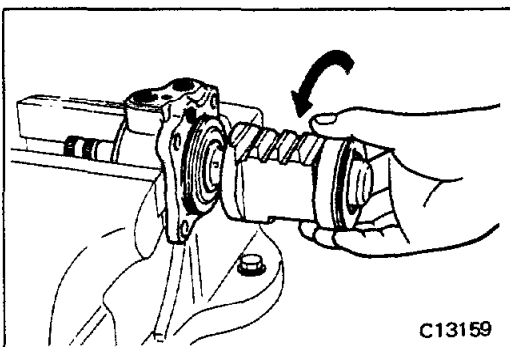
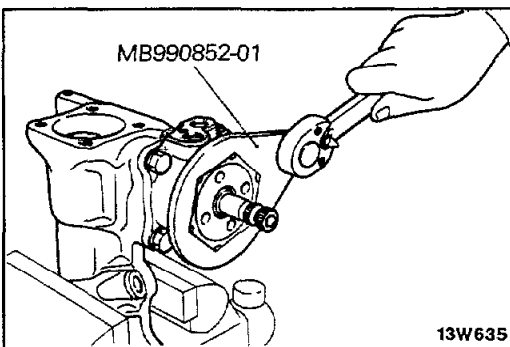
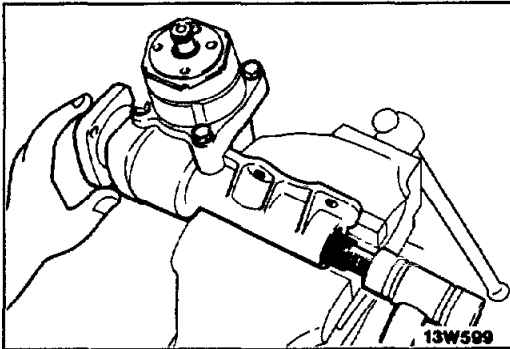
Use care not to drop the rack piston.

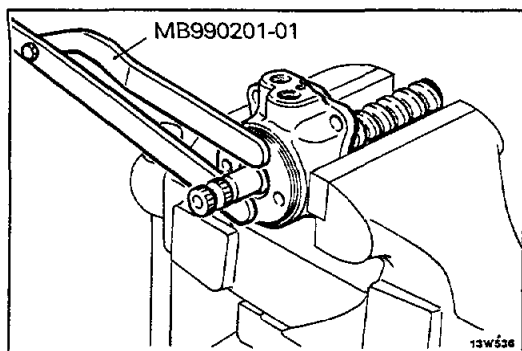
17. REMOVAL OF RACK PISTON

Remove the rack piston from the mainshaft by turning it counterclockwise.

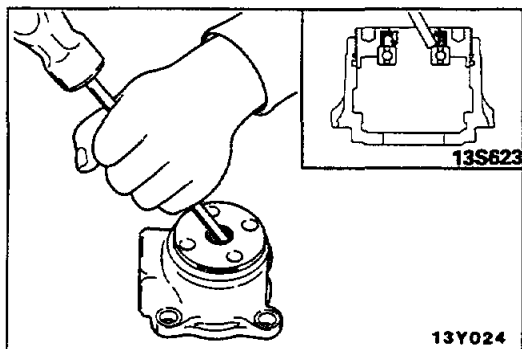
Caution

Be careful not to lose the 26 balls inside the rack piston.



**20. REMOVAL OF TOP COVER**

Remove the top cover by using the special tool, and take out the mainshaft, together with the top cover, from the valve housing.

**23. REMOVAL OF BALL BEARING/24. OIL SEAL**

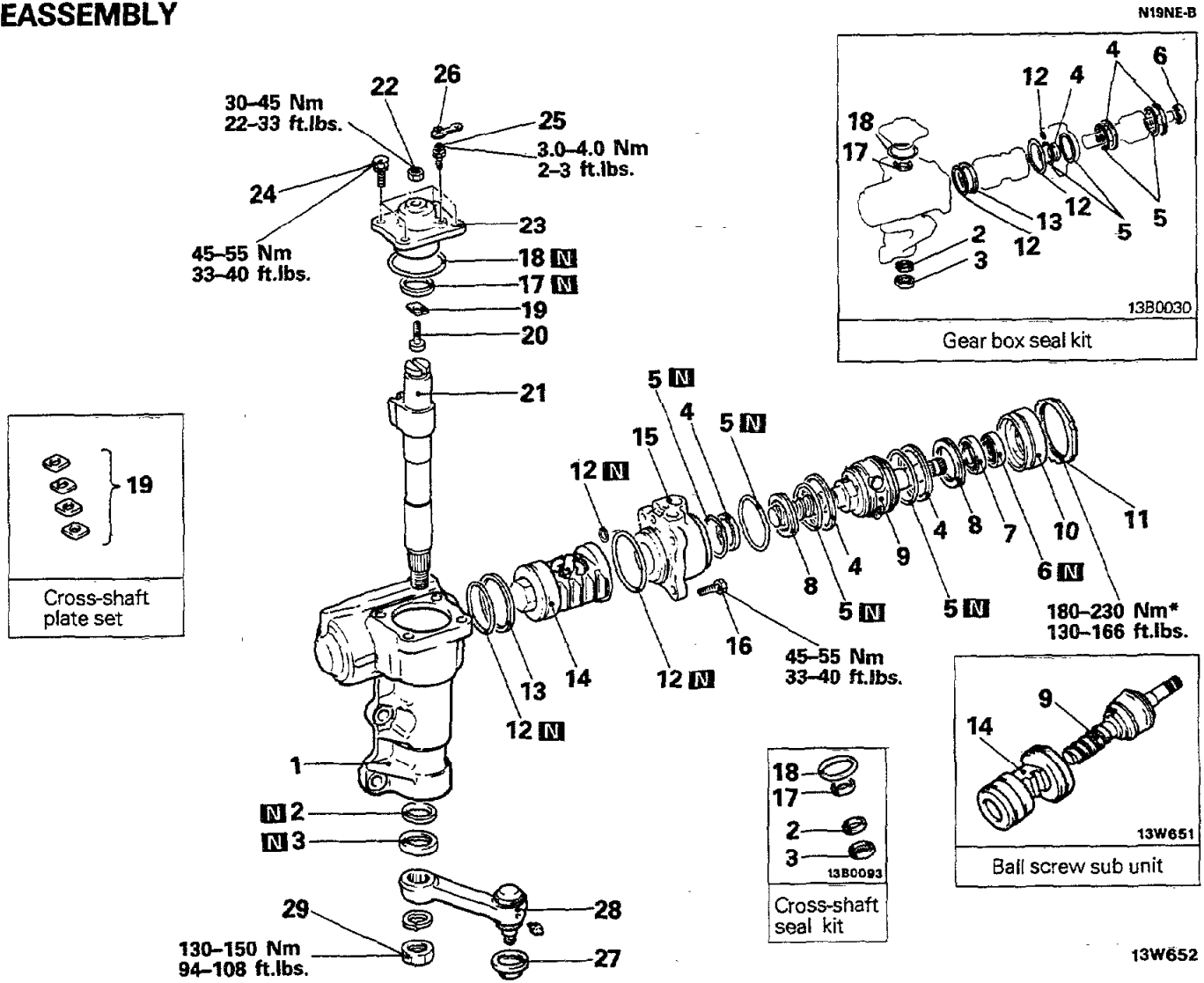
- (1) Temporarily attach the top cover to the valve housing.
- (2) Drive out the ball bearing and the oil seal.

INSPECTION

N19NGAC

- Check the mainshaft for wear and damage.
- Check the tooth surface of cross shaft and the rack piston for wear and damage.
- Check the contact part of adjusting bolt for uneven wear.
- Check the dust seal and the oil seal for wear and damage.
- Check the O-rings for damage.

REASSEMBLY



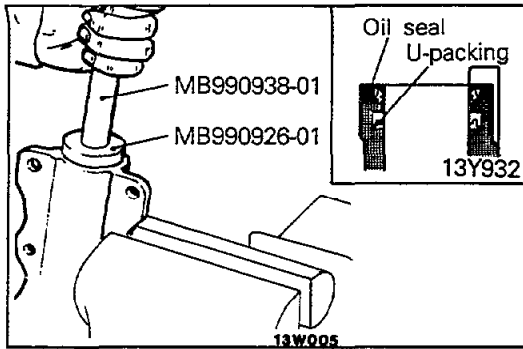
Reassembly steps

- 1. Gear box housing
- ◆◆ 2. U-packing
- ◆◆ 3. Oil seal
- 4. Seal rings
- 5. O-rings
- ◆◆ 6. Oil seal
- ◆◆ 7. Ball bearing
- ◆◆ 8. Thrust needle bearings
- 9. Main shaft
- ◆◆ Adjustment of main shaft starting torque
- 10. Top cover
- 11. Valve housing lock nut
- 12. O-rings
- 13. Seal ring
- ◆◆ 14. Rack piston
- ◆◆ 15. Valve housing
- 16. Bolt

- ◆◆ 17. U-packing
- ◆◆ 18. O-ring
- 19. Adjusting plate
- 20. Adjusting bolt
- ◆◆ 21. Cross-shaft
- ◆◆ 22. Adjusting bolt lock nut
- ◆◆ 23. Side cover
- ◆◆ Adjustment of main shaft total starting torque
- 24. Washer bolts
- 25. Breather plug
- 26. Breather plug cap
- 27. Dust cover
- ◆◆ 28. Pitman arm
- 29. Jam nut

NOTE

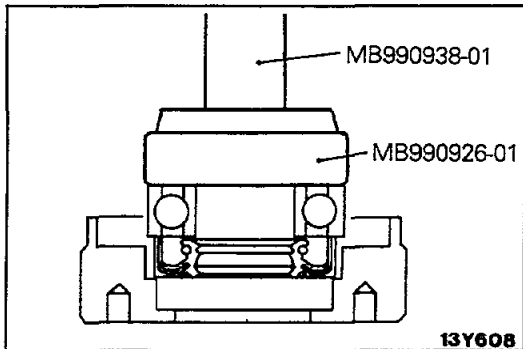
- (1) ◆◆ : Refer to "Service Points of Reassembly".
- (2) [N] : Non-reusable parts.
- (3) * : if the special tool is used to measure the tightening torque, the measurement is 135-175 Nm. (98-127 ft.lbs.)

**SERVICE POINTS OF REASSEMBLY**

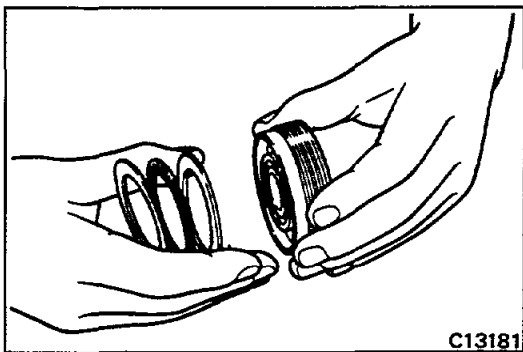
N19NHAFa

2. INSTALLATION OF U-PACKING/3. OIL SEAL

Install the U-packing on the gear box, and press-fit the oil seal by using special tools.

**6. INSTALLATION OF OIL SEAL/7. BALL BEARING**

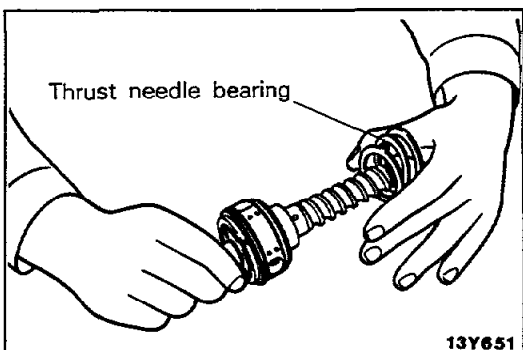
- (1) Press-fit the ball bearing and oil seal into the top cover by using special tools.
- (2) Apply multipurpose grease to the oil seal of the top cover.

**8. INSTALLATION OF THRUST NEEDLE BEARING**

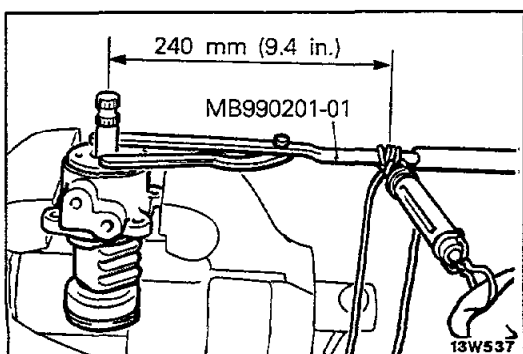
- (1) Install the thinner thrust plate, thrust needle bearing and thicker thrust plate to the top cover in that order as shown in the illustration.
- (2) Attach the top cover to the valve housing.

Caution

Be careful that the thrust plates and the thrust needle bearing do not come off the top cover.



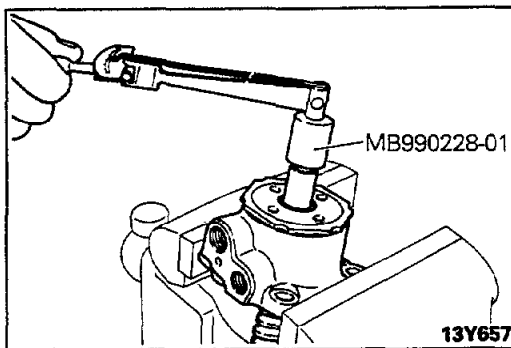
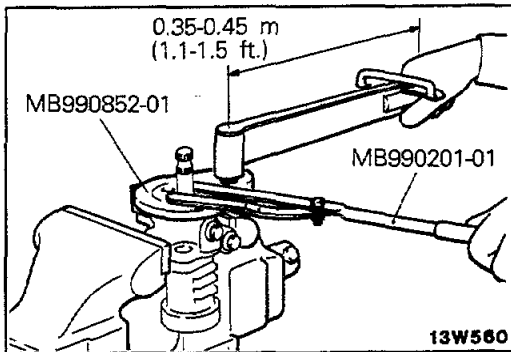
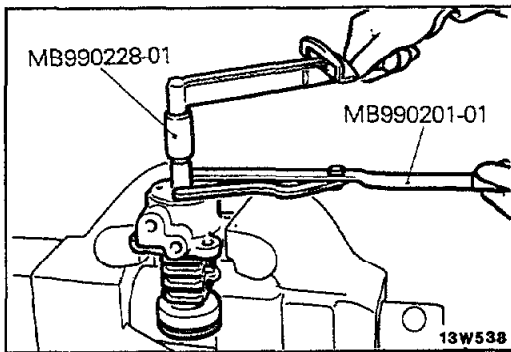
- (3) Install the thinner thrust plate, thrust needle bearing and thicker thrust plate to the mainshaft in that order as shown in the illustration.

**• ADJUSTMENT OF MAINSHAFT STARTING TORQUE**

- (1) In order to fit in the assembly parts, use the special tool and a spring balance, and tighten the top cover until the tangent force becomes 62-83 N (14-19 lbs.). Then return the top cover until the tightening torque is 0 N (0 ft.)

Caution

After tightening the top cover, rotate the mainshaft to confirm that there is no torque fluctuation or abnormal noise.



- (2) Measure the mainshaft starting torque by using the special tools.
- (3) Tighten the top cover until the mainshaft starting torque is 0.2–0.3 Nm (2–3 in.lbs.) greater than the previously mentioned measurement value.

NOTE

Tighten the top cover gradually while measuring the starting torque.

- (4) Tighten the valve housing lock nut to the specified torque by using the special tools.

Caution

Be sure that the top cover does not turn together with the lock nut at this time.

- (5) Measure the mainshaft starting torque by using the special tool.

Standard value : 0.25–0.65 Nm (2–5 in.lbs.)

- (6) If the measured mainshaft starting torque does not comply with the standard value, remove the valve housing lock nut and adjust the tightening of the top cover.

14. INSTALLATION OF RACK PISTON

Install the rack piston until it comes in contact with the edge of the mainshaft.

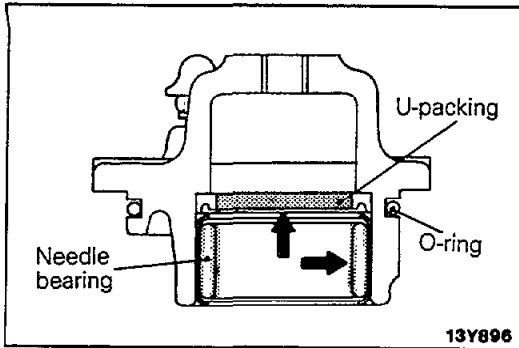
Rotate the mainshaft to align the ball raceway with the ball insertion hole.

15. INSTALLATION OF VALVE HOUSING

- (1) Apply specified automatic transmission fluid to the seal ring of the rack piston.

Specified fluid : Automatic transmission fluid DEX-RON type

- (2) Insert the valve housing.
- (3) Rotate the mainshaft until the rack piston moves to the neutral position (center).

**17. APPLICATION OF GREASE TO U-PACKING**

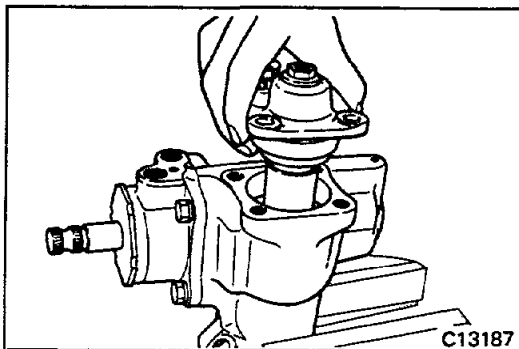
- (1) Apply multipurpose grease to the seal surface of U-packing.
- (2) Apply specified automatic transmission fluid to the needle bearing.

**Specified fluid : Automatic transmission fluid DEX-
RON type**

18. APPLICATION OF AUTOMATIC TRANSMISSION FLUID TO O-RING

Apply specified automatic transmission fluid to the O-ring, and attach it to the side cover.

**Specified fluid : Automatic transmission fluid DEXRON
type**

**21. INSTALLATION OF CROSS-SHAFT/22. ADJUSTING BOLT LOCK NUT**

Install the cross-shaft to the side cover, and then temporarily tighten the adjusting bolt lock nut.

23. INSTALLATION OF SIDE COVER

Install the side cover assembly (with the cross-shaft) to the gear box.

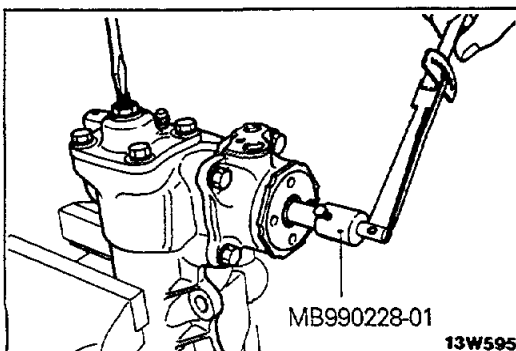
NOTE

Apply specified automatic transmission fluid to the teeth and shaft areas of the rack piston, and apply multipurpose grease to the oil seal lip.

**Specified fluid : Automatic transmission fluid DEXRON
type**

Caution

Do not rotate the side cover during installation. Take care not to damage the cross-shaft oil seal.

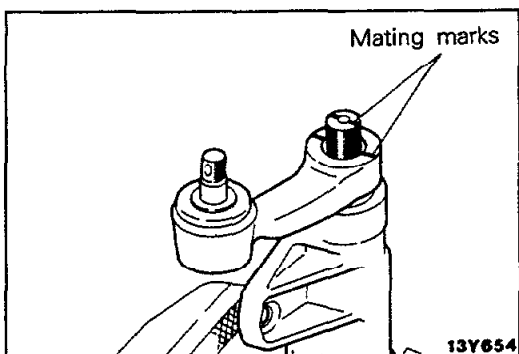
**• ADJUSTMENT OF MAINSHAFT TOTAL STARTING TORQUE**

- (1) While turning the adjusting bolt, measure the mainshaft total starting torque by using the special tool.

Standard valve : 0.45–1.25 Nm (4–11 in.lbs.)

NOTE

Position the mainshaft in the center position during measurement.



(2) Tighten the adjusting bolt lock nut to the specified torque.

28. INSTALLATION OF PITMAN ARM

Install the pitman arm to the gear box with the mating marks aligned.

OIL PUMP

REMOVAL AND INSTALLATION

N19RA-

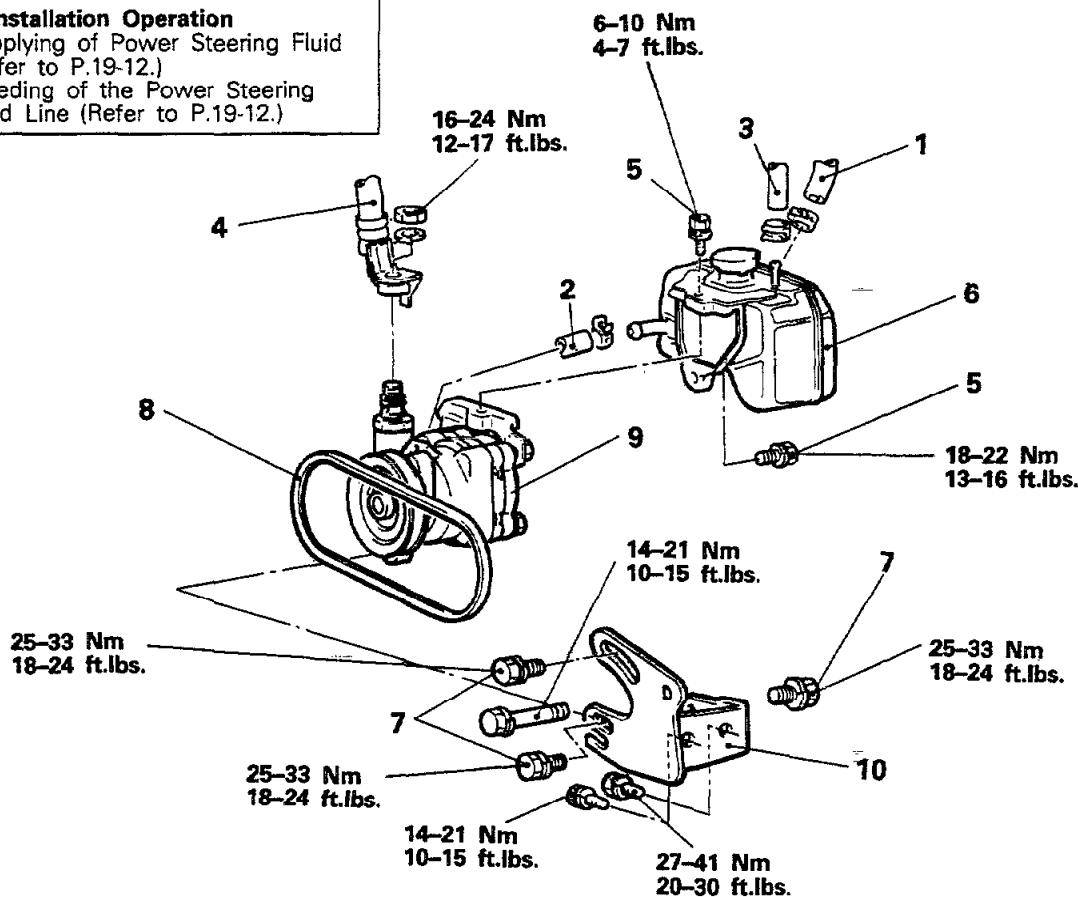
<2.6L Engine>

Pre-removal Operation

- Removal of the Power Steering Fluid (Refer to P.19-12.)

Post-installation Operation

- Supplying of Power Steering Fluid (Refer to P.19-12.)
- Bleeding of the Power Steering Fluid Line (Refer to P.19-12.)



Removal steps

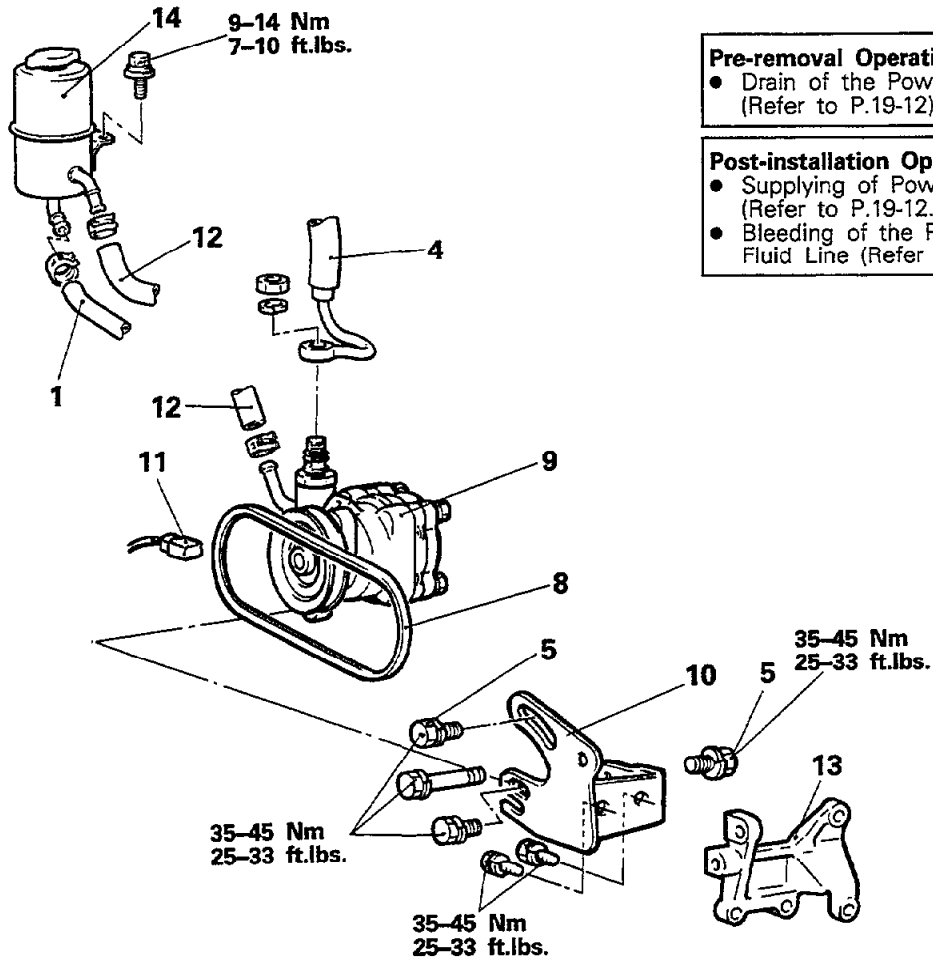
1. Connection of return hose
2. Suction tube
3. Connection of breather hose
4. Connection of pressure hose
5. Bolts
6. Oil reservoir assembly
7. Bolts

- ⇄ ⇄ ⇄ 8. Drive belt
 9. Oil pump
 10. Oil pump bracket

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ⇄ : Refer to "Service Points of Removal".
- (3) ⇄ : Refer to "Service Points of Installation".

<3.0L Engine>



- Pre-removal Operation**
- Drain of the Power Steering Fluid (Refer to P.19-12)
- Post-installation Operation**
- Supplying of Power Steering fluid (Refer to P.19-12.)
 - Bleeding of the Power Steering Fluid Line (Refer to P. 19-12)

Removal steps

11. Connection for pressure switch connector <Vehicles with an automatic transmission>
1. Connection for return hose
12. Suction hose
4. Connection for pressure hose
5. Bolts
- ◄◄ ►► 8. Drive belt
9. Oil pump
10. Oil pump bracket
13. Oil pump mounting bracket
14. Oil reservoir

13W670

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◄◄ : Refer to "Service Points of Removal".
- (3) ►► : Refer to "Service Points of Installation".

SERVICE POINTS OF REMOVAL

N19RBAK

8. REMOVAL OF DRIVE BELT

When removing the drive belts, remove the air conditioner, compressor drive belt (models equipped with air conditioner) and the alternator drive belt (2.6 Engine only).

SERVICE POINTS OF INSTALLATION

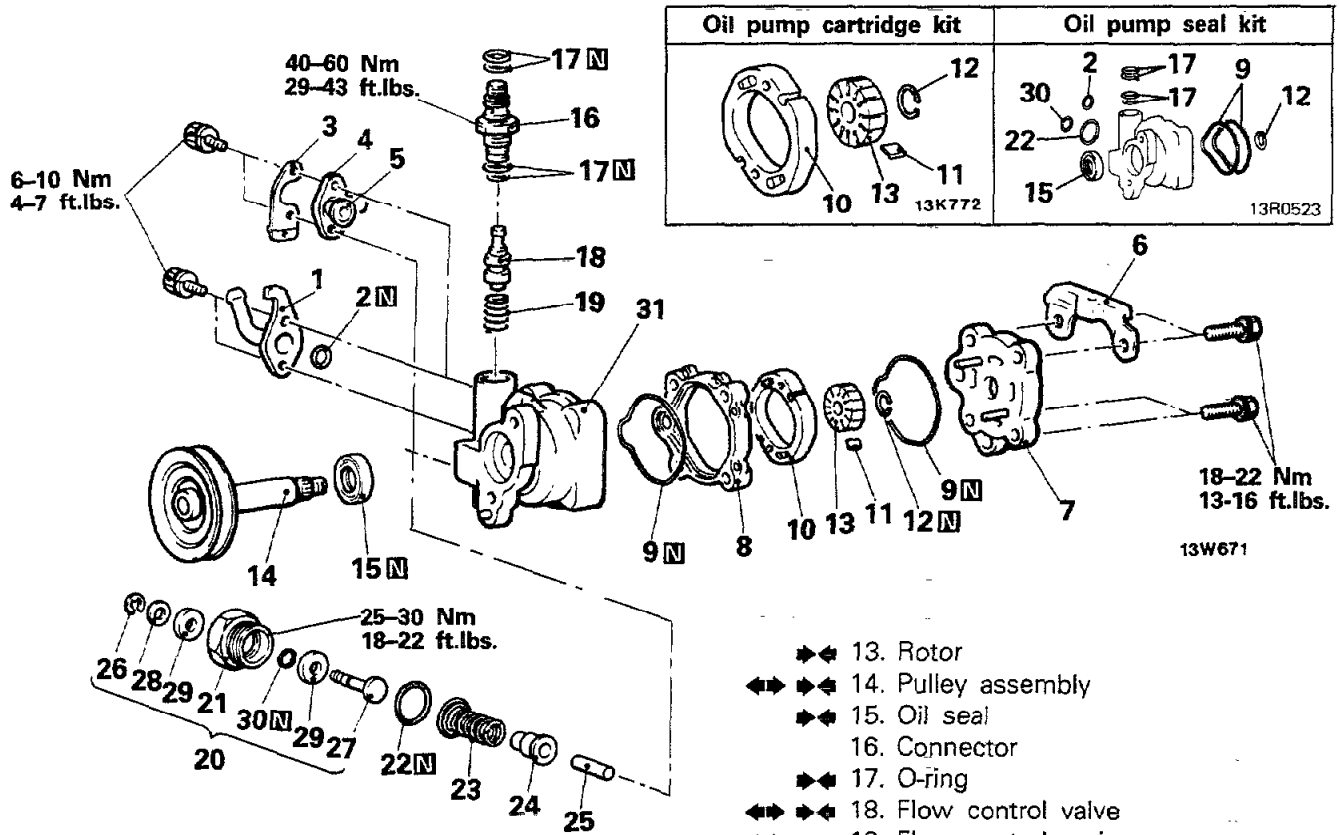
N19RDAD

8. ADJUSTMENT OF DRIVE BELT TENSION

Refer to P.19-11.

DISASSEMBLY AND REASSEMBLY

N19RE-



Oil pump cartridge kit	Oil pump seal kit
<p>10 11 12 13 13K772</p>	<p>2 9 12 15 17 22 30 13R0523</p>

Disassembly steps

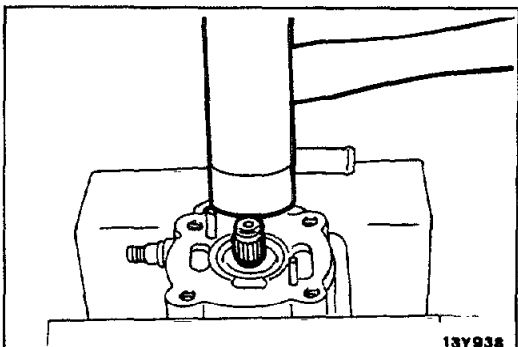
- ◆◆ 1. Suction connector
- ◆◆ 2. O-ring
- ◆◆ 3. Plate
- ◆◆ 4. Suction plate
- ◆◆ 5. Suction tube
- ◆◆ 6. Reservoir bracket
- ◆◆ 7. Pump cover
- ◆◆ 8. Cam case
- ◆◆ 9. O-ring
- ◆◆ 10. Cam ring
- ◆◆ 11. Vane
- ◆◆ 12. Snap ring

- ◆◆ 13. Rotor
- ◆◆ 14. Pulley assembly
- ◆◆ 15. Oil seal
- ◆◆ 16. Connector
- ◆◆ 17. O-ring
- ◆◆ 18. Flow control valve
- ◆◆ 19. Flow control spring
- ◆◆ 20. Terminal assembly
- ◆◆ 21. Plug
- ◆◆ 22. O-ring
- ◆◆ 23. Spring
- ◆◆ 24. Piston rod
- ◆◆ 25. Plunger
- ◆◆ 26. Snap ring
- ◆◆ 27. Terminal
- ◆◆ 28. Washer
- ◆◆ 29. Insulator
- ◆◆ 30. O-ring
- ◆◆ 31. Oil pump body

<Vehicles with an automatic transmission>

NOTE

- (1) Reverse the disassembly procedures to reassemble.
- (2) ◆◆ : Refer to "Service Points of Disassembly".
- (3) ◆◆ : Refer to "Service Points of Reassembly".
- (4) N : Non-reusable parts

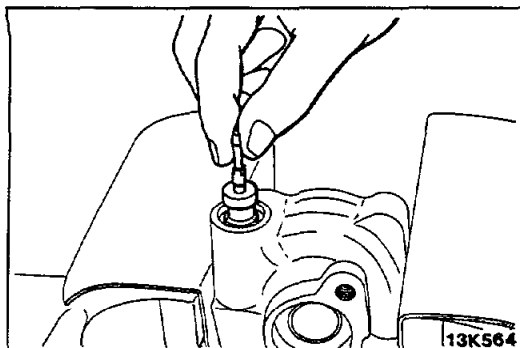


SERVICE POINTS OF DISASSEMBLY

N19RFAK

14. REMOVAL OF PULLEY ASSEMBLY

Tap the rotor side of the shaft lightly with a plastic hammer, and take out the pulley assembly.



18. REMOVAL OF FLOW CONTROL VALVE/19. FLOW CONTROL SPRING

Remove the flow-control valve and the flow-control spring from the oil pump body.

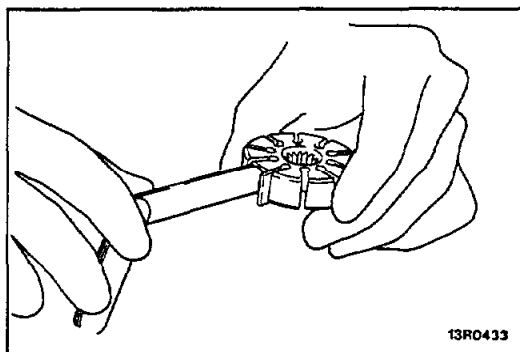
Caution

Do not disassemble the flow control valve.

INSPECTION

N19RGAL

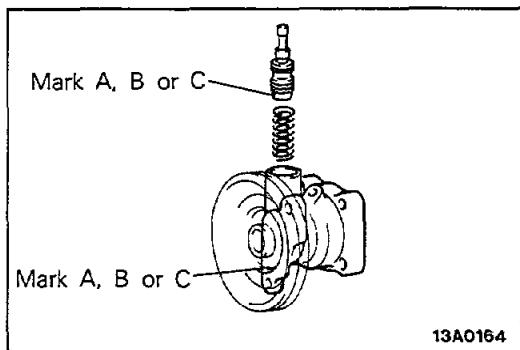
- Check the flow control valve for clogging.
- Check the pulley assembly for wear or damage.
- Check the groove of rotor and vane for "Stepped" wear.
- Check the contact surface of cam ring and vanes for "stepped" wear.
- Check the vanes for damage.



CHECK OF GAP BETWEEN VANE AND ROTOR GROOVE

Install vane to rotor groove as illustrated. Measure the gap between vane and rotor groove with feeler gage.

Limit: 0.06 mm (.0024 in.)



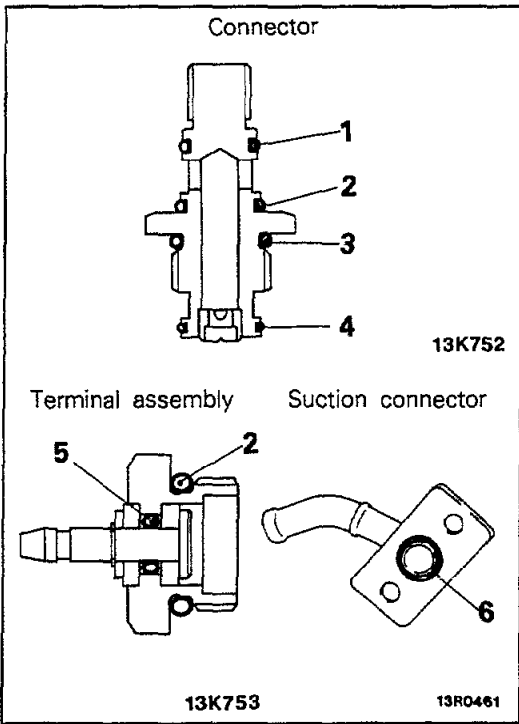
SERVICE POINTS OF REASSEMBLY

N19RHAX

18. INSTALLATION OF FLOW CONTROL VALVE

- (1) If the flow control valve is to be replaced, install the flow control valve to the oil pump body corresponding with the body identification mark (A,B,C).
- (2) Apply the specified fluid to the outside of the flow control valve.

Specified fluid: Automatic transmission fluid DEX-RON type

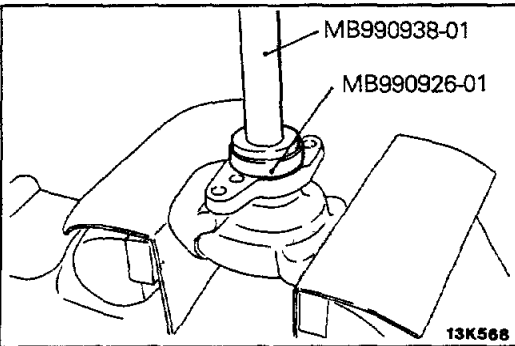


30./22./17./9./2. INSTALLATION OF O-RINGS

Apply specified fluid on O-rings to install.

Specified fluid : Automatic transmission fluid DEXRON type

No.	I.D. × Width mm (in.)	Identification colour
1	11 x 1.9 (.43 x .0748)	Yellow
2	13 x 1.9 (.51 x .0748)	Blue
3	14.8 x 2.4 (.58 x .0945)	White
4	11.5 x 1.5 (.45 x .0591)	-
5	3.8 x 1.9 (.15 x .0748)	-
6	11.8 x 2.4 (.46 x .0945)	-



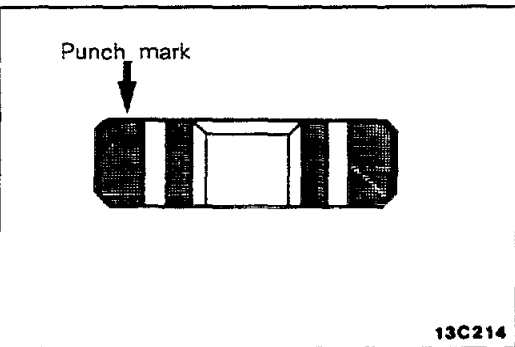
15. INSTALLATION OF OIL SEAL

Drive the oil seal into the pump body with the special tools.

14. INSTALLATION OF PULLEY ASSEMBLY

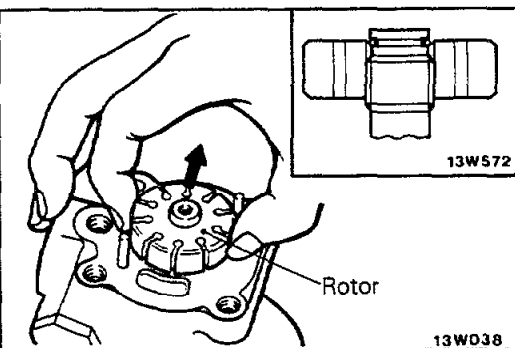
Apply specified fluid to entire shaft circumference of pulley assembly and install to pump body.

Specified fluid : Automatic transmission fluid DEXRON type



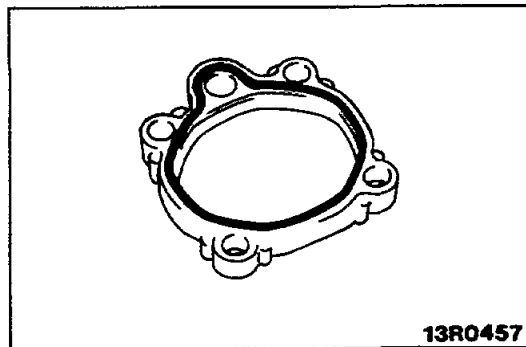
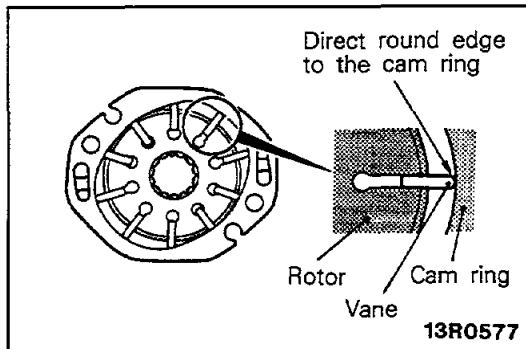
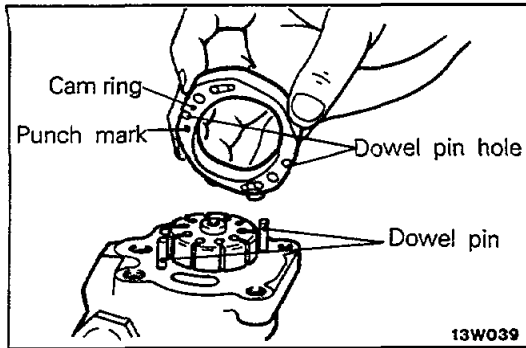
13. INSTALLATION OF ROTOR

Install the rotor to the pulley assembly so that the rotor's punch mark is at the pump cover side.



12. INSTALLATION OF SNAP RING

After installation of the snap ring, lift the rotor and check to be sure that the snap ring is in the countersunk part.



11. INSTALLATION OF VANE/10. CAM RING

- (1) Apply specified fluid to vane and cam ring friction surface.

Specified fluid: Automatic transmission fluid DEXRON type

- (2) Align the dowel pins of the pump body with the dowel holes of the cam ring, and then install so that the cam ring's punch mark is at the pump body side.
- (3) Apply specified fluid to the vanes and install the vanes on the rotor, paying close attention to the installation direction.

Specified fluid: Automatic transmission fluid DEXRON type

9. INSTALLATION OF O-RING

- Apply specified fluid to O-ring and install firmly on cam case.

Specified fluid: Automatic transmission fluid DEXRON type

7. INSTALLATION OF PUMP COVER

- Apply specified fluid to rotor friction surface of pump cover.

Specified fluid: Automatic transmission fluid DEXRON type

STEERING HOSES

REMOVAL AND INSTALLATION

N19TA-

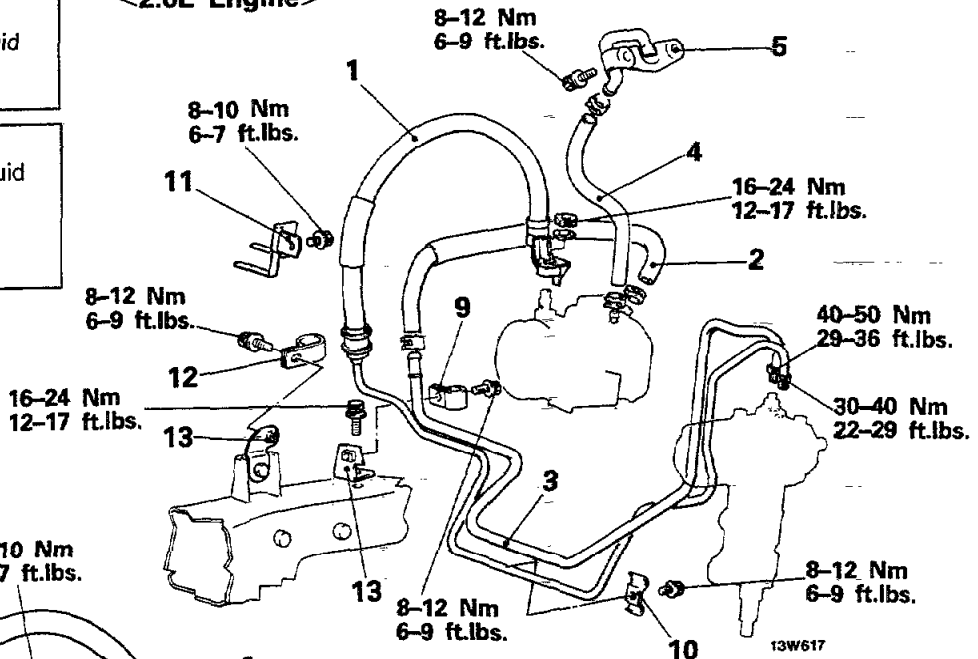
Pre-removal Operation

- Drain of the Power Steering Fluid (Refer to P. 19-12.)
- Removal of under skid plate

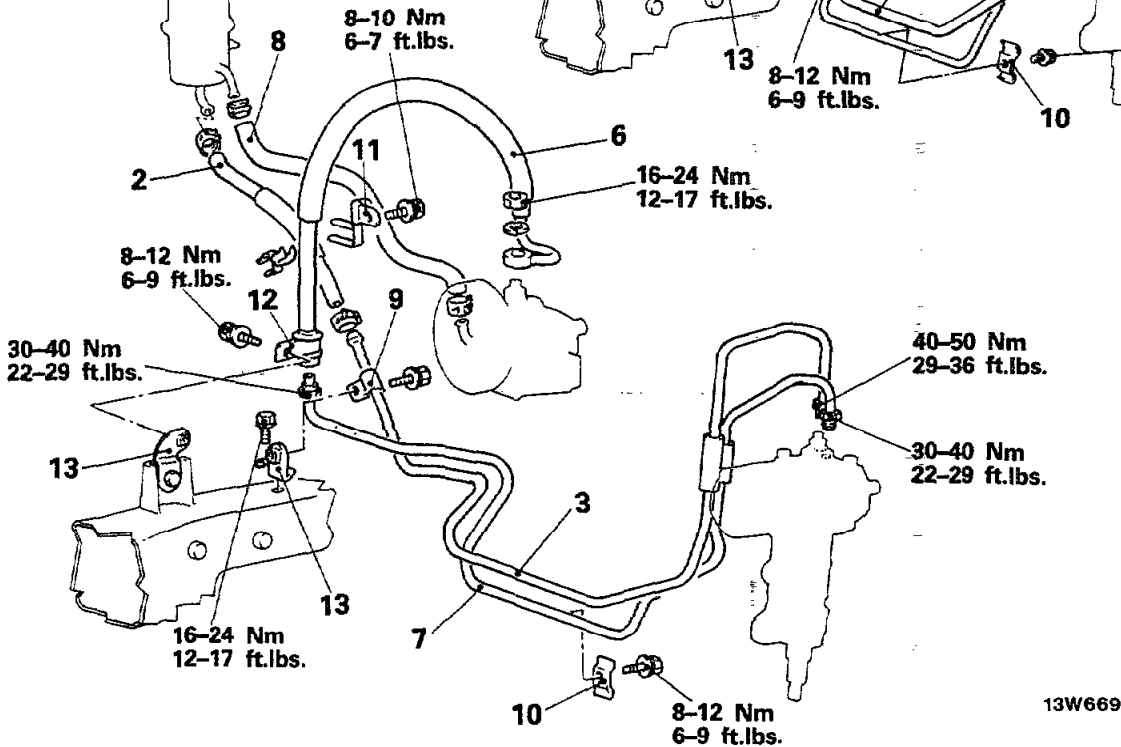
Post-installation Operation

- Supplying of Power Steering Fluid (Refer to P. 19-12.)
- Bleeding of the Power Steering Fluid Line (Refer to P. 19-12.)
- Installation of under skid plate

<2.6L Engine>



<3.0L Engine>

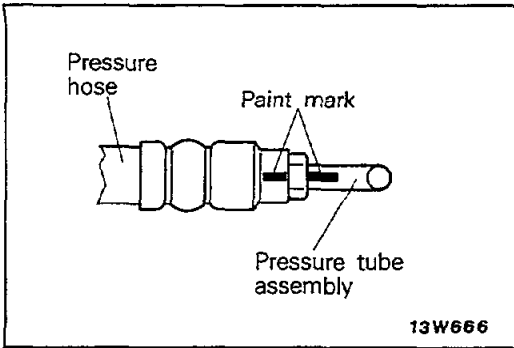


- 1. Pressure hose assembly <2.6L Engine>
- 2. Return hose
- 3. Return tube assembly
- 4. Breather hose <2.6L Engine>
- 5. Breather pipe <2.6L Engine>
- 6. Pressure hose <3.0L Engine>
- 7. Pressure tube assembly <3.0L Engine>

- 8. Suction hose <3.0L Engine>
- 9. Return hose clip
- 10. Tube clip
- 11. Clip
- 12. Pressure hose clip
- 13. Tube stay

NOTE

◆◆ : Refer to "Service Points of Installation".



SERVICE POINTS OF INSTALLATION

N19RDAJ

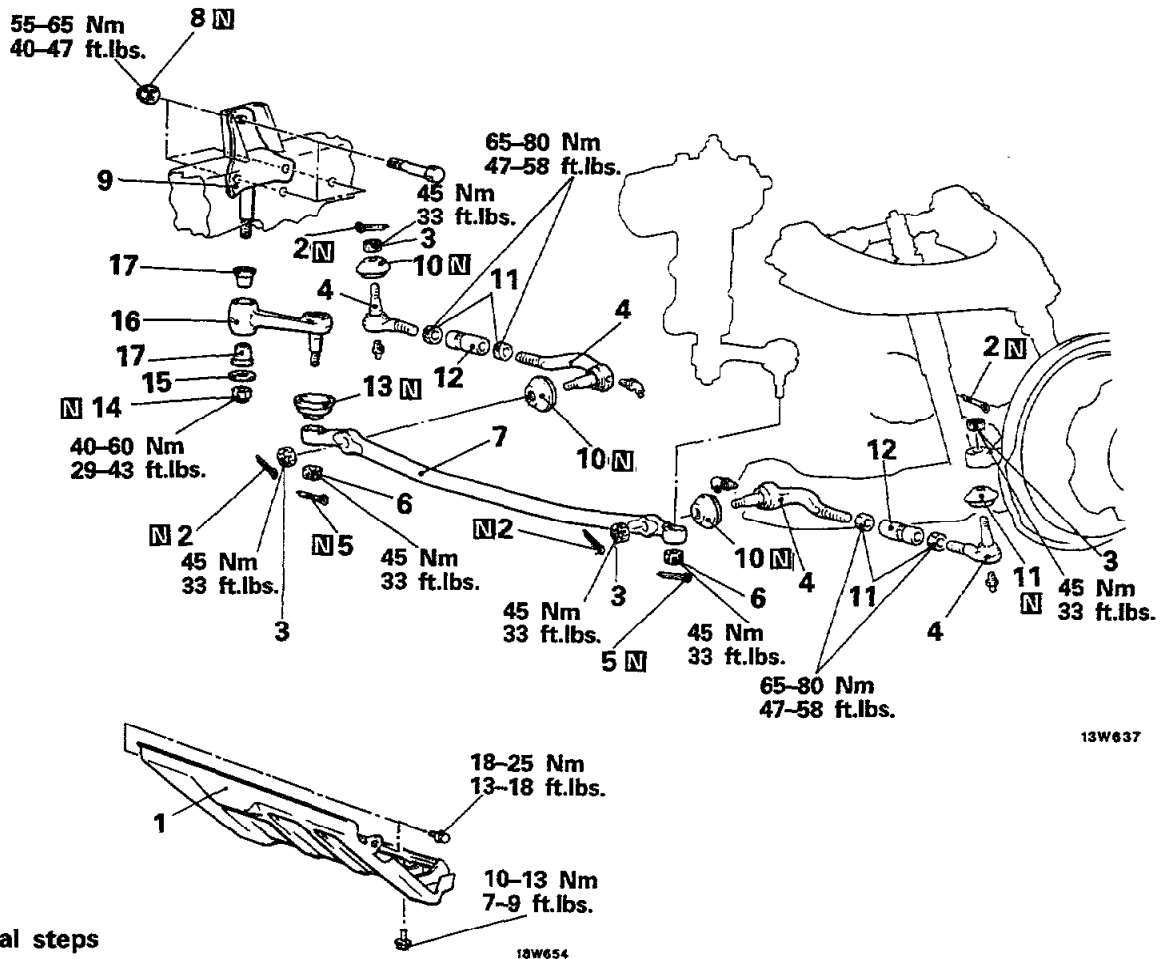
6. INSTALLATION OF PRESSURE HOSE/7. PRESSURE TUBE ASSEMBLY

Align the pressure hose and pressure tube assembly paint mark and tighten the flare nut. If there is a deviation of 2 mm (.079 in.) or more, reinstall the tube.

STEERING LINKAGE

REMOVAL AND INSTALLATION

N19VA-



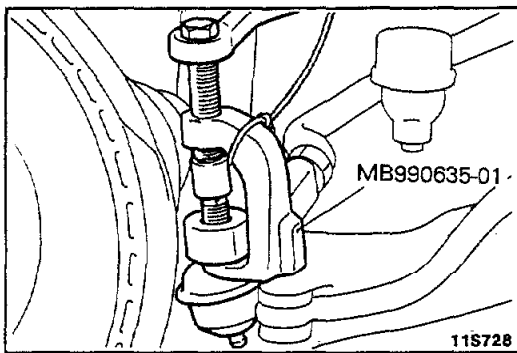
Removal steps

- 1. Under skid plate
- 2. Cotter pins
- 3. Slotted nuts
- 4. Tie rod ends
- 5. Cotter pins
- 6. Slotted nuts
- 7. Relay rod
- 8. Self-locking nuts
- 9. Idler arm support
- 10. Dust covers
- 11. Nuts
- 12. Pipes

- 13. Dust cover
- 14. O-ring
- 15. Self-locking nut
- 16. Washer
- 17. Idler arm
- 18. Bushings

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◄► : Refer to "Service Points of Removal."
- (3) ►► : Refer to "Service Points of Installation".
- (4) [N] : Non-reusable parts

**SERVICE POINTS OF REMOVAL**

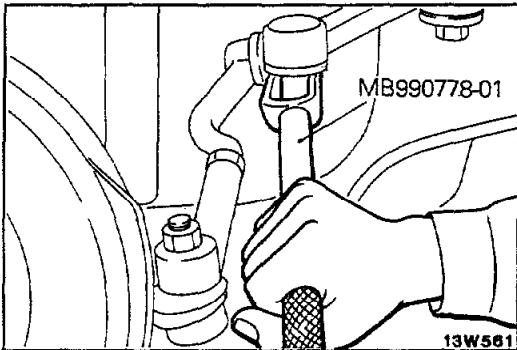
N19VBAG

4. DISCONNECTION OF TIE ROD ENDS

Using the special tool, disconnect the tie rod ends, and then remove the tie rod assembly.

Caution

1. Use cord to bind the special tool closely so it won't become separated.
2. The nut should be loosened only, not removed.

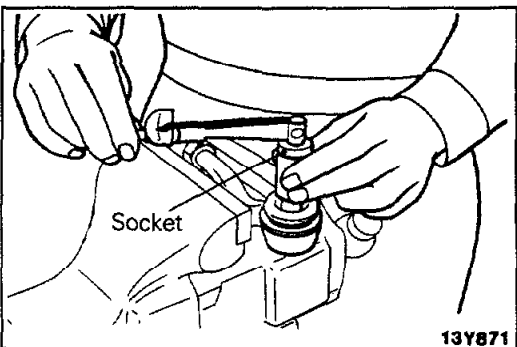
**7. DISCONNECTION OF RELAY ROD**

Using the special tool, disconnect the connecting portions of the idler arm and the steering gear box, and then remove the relay rod.

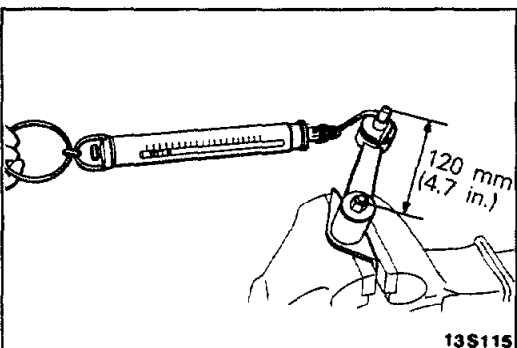
INSPECTION

N19VCABa

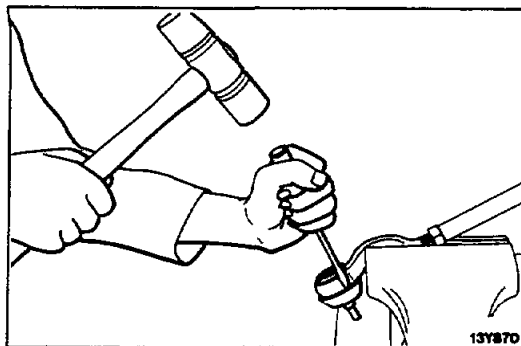
- Check the idler arm support for damage and deformation.
- Check the idler arm for damage and deformation.
- Check the dust covers for damage and cracks.
- Check the tie rods for damage and deformation.
- Check the relay rod for bends and damage.
- Check the grease nipples for clogging and looseness.

**CHECKING BALL JOINT STARTING TORQUE**

Standard value : 1–3 Nm (9–26 in.lbs.)

**CHECKING IDLER ARM STARTING TORQUE**

Standard value : 3–9 Nm (26–78 in.lbs.) [25–75 N (6–17 lbs.)]

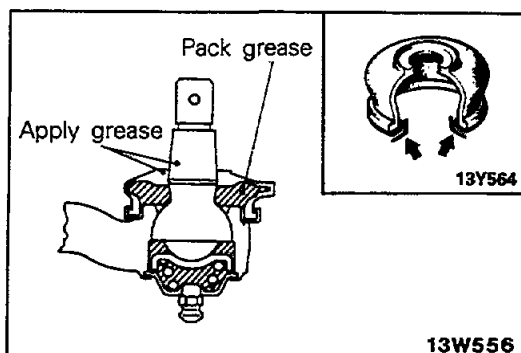
**REPLACEMENT OF DUST COVER**

N19VEABa

- (1) Remove the dust cover from the tie rod end or the idler arm.

NOTE

For the idler arm, also remove the O-ring.

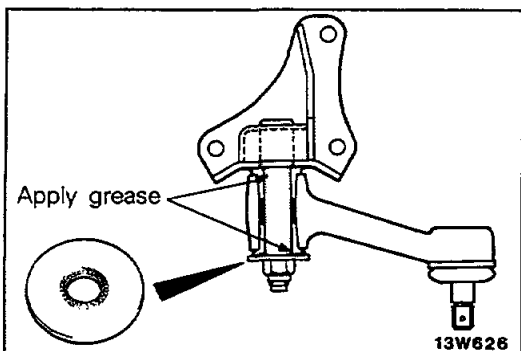


- (2) Apply the multipurpose grease to the lip portion of the dust cover.

- (3) Use the multipurpose grease inside the dust cover.

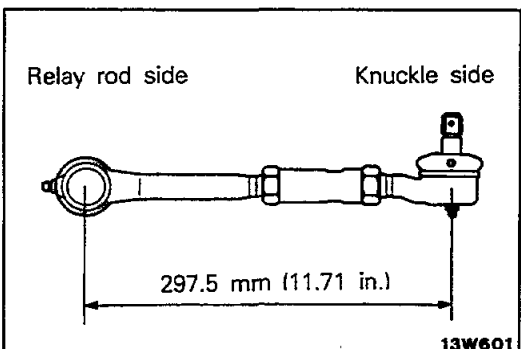
- (4) Apply the specified sealant to the dust cover installation surface, and then press in.

Specified sealant : 3M ART Part No. 8663 or equivalent

**REPLACEMENT OF IDLER ARM BUSHING**

N19VFABa

- (1) Apply the multipurpose grease to the inside surface of the bushing and the idler arm support shaft.
- (2) Insert the bushing into the idler arm.
- (3) Insert the idler arm support into the idler arm.
- (4) Install so that the knurled surface of the washer is facing the bushing side.
- (5) Tighten the self-locking nut at the specified torque.

**SERVICE POINTS OF INSTALLATION**

N19VDAA

4. INSTALLATION OF TIE ROD ENDS

- (1) Apply the specified anti-corrosion agent to the threaded portion of the tie rod end.
- (2) Temporarily tighten the tie rod so that the distance between stud bolts of the tie rod is the value shown in the figure.

Caution

Tie rod end tightness, left and right, should be uniform.

- (3) Install the tie rod assembly after first confirming which side is the relay rod side and which side is the knuckle side.

NOTE