

POWER STEERING

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N19AA--

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GENERAL INFORMATION

N19BAB

A tilt steering system in which the steering column can be adjusted in four steps of 3° each for the most suitable driving position has been adopted.

A ball-and-nut type (variable-ratio gear) manual steering gear box has been adopted; it features excellent wear resistance and withstand resistance to impact shocks from the road surface, and assures excellent operation of the steering system.

In addition, an integral type of power steering gear box has been adopted which reduces the required steering force during full-angle turns and during low-speed driving.

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' ⁰ / ₋₃
Outer wheel	29°00'
Steering gear oil level mm (in.)	25 (.98)
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
Mainshaft starting torque Ncm (in.lbs.)	25–65 (2–6)
Cross-shaft end play mm (in.)	0.05 (.0020)
Mainshaft total starting torque Ncm (in.lbs.)	50–90 (4–8)
Backlash between ball groove of rack piston and balls mm (in.)	0.05–0.1 (.0020–.004)
Ball joint starting torque Ncm (in.lbs.)	100–300 (8.9–26)
Idler arm turning torque Ncm (in.lbs.)	300–900 (26–78)
Spring balance reading N (lbs.)	25–75 (5.5–16.5)

Items	Specifications
Limit	
Steering wheel free play mm (in.)	50 (2.0)
Steering gear backlash mm (in.)	0.5 (.02)
Ball joint end play mm (in.)	1.5 (.06)
Oil pump pressure kPa (psi)	
Gauge hose valve closed	1,500 (218)
Backlash between ball groove of rack piston and balls mm (in.)	0.2 (.008)
Clearance between oil pump drive shaft and bushing mm (in.)	0.1 (.004)

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	14–18
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	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	40–50	29–36
Gear box to return hose	30–40	22–29
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
Circulators installation	3.5–4.5	2.5–3.2
Valve housing	45–55	33–40
Lock nut*	180–230*	130–166*

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.
Oil pump		
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 assembly		
Reservoir to reservoir bracket	6-10	4-7
Reservoir to oil pump body	18-22	13-16
Oil pump body to oil pump bracket	25-33	18-24
Connector	40-60	29-43
Suction plate	6-10	4-7
Pump cover	18-22	13-16
Steering hoses		
Under skid plate		
Front	18-25	13-18
Rear	10-13	7-9
Pressure hose		
Oil pump side	16-24	12-17
Gear box side	30-40	21-29
Return tube	40-50	29-36
Clip	8-10	6-7
Pressure hose clip	8-12	6-9
Return hose clip	8-12	6-9
Tube stay	16-24	12-17
Tube clip	8-12	6-9
Breather pipe	8-12	6-9
Steering linkage		
Underskid plate		
Front	18-25	13-18
Rear	10-13	7-9
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
Between the cap and stop bolt for steering angle adjustment, and the head of the stop bolt	Multipurpose grease SAE J310, NLGI No. 2	As required
Steering shaft C and D	Multipurpose grease SAE J310, NLGI No. 2	As required
Surface of lever cam which contacts steering column B	Multipurpose grease SAE J310, NLGI No. 2	As required
Surface of plate clevis pin which contacts steering column B	Multipurpose grease SAE J310, NLGI No. 2	As required
Between plate clevis pin and return spring	Multipurpose grease SAE J310, NLGI No. 2	As required
Dash panel cover grommet	Multipurpose grease SAE J310, NLGI No. 2	As required
Installation location of steering shaft A bushing	Multipurpose grease SAE J310, NLGI No. 2	As required
Installation locations of steering column A bushings	Multipurpose grease SAE J310, NLGI No. 2	As required
Power steering fluid	Automatic transmission fluid DEXRON type	900 cc (54.9 cu.in.)
Oil seal lip of mainshaft	Multipurpose grease SAE J310, NLGI No. 2	As required
U-packing of side cover	Multipurpose grease SAE J310, NLGI No. 2	As required
Needle bearing of side cover	Multipurpose grease SAE J310, NLGI No. 2	As required
Oil seal lip of cross-shaft	Multipurpose grease SAE J310, NLGI No. 2	As required
Lip portion of dust cover	Multipurpose grease SAE J310, NLGI No. 2	As required
Inside of dust cover	Multipurpose grease SAE J310, NLGI No. 2	As required
Inside surface of idler arm bushing and shaft of idler arm support	Multipurpose grease SAE J310, NLGI No. 2	As required

SEALANTS AND ADHESIVES

N19CE--

Items	Specified sealant
Dash panel cover bolt installation hole	3M ART Part No. 8663, 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

TROUBLESHOOTING

N19EABB

Symptom	Probable cause	Remedy	Reference page
Excessive play of steering wheel	Excessive play in steering gear box	Repair	19-25, 28
	Loose steering gear mounting bolts	Retighten	19-23
	Loose or worn stud of tie rod end	Retighten or replace as necessary	19-39
Steering wheel operation is hard (insufficient power assist)	Loose belt	Adjust the belt tension	19-11
	Damaged belt	Replace the belt	–
	Low fluid level	Refill with fluid	19-11
	Air in fluid line	Bleed the system	19-12
	Twisted or damage hoses	Correct the hose routing or replace the hoses	19-38
	Fluid leakage	Check the fluid leakage	–
	Malfunction of gear box	Check and replace the gear box if necessary	19-23
	Malfunction of oil pump	Check the oil pump pressure and repair oil pump	19-13
Rattling noise	Loose installation of oil pump or gear box	Retighten the oil pump or gear box	19-23, 33
	Interference around column or between pressure hose and other parts	Correct or replace the pressure hose and the parts around the column	19-38
	Abnormal noise inside of gear box and oil pump	Replace the gear box or oil pump	19-23, 33
Shrill noise	Air sucked into oil pump	Check the oil level and hose clips, bleed the system or replace the oil pump	19-11, 38, 19-33
	Oil pump seizure	Replace the oil pump	19-33
Squealing noise	Loose belt	Adjust the belt tension	19-11
	Oil pump seizure	Replace the oil pump	19-33
Hissing noise	Air sucked into oil pump	Check the oil level and hose clips; bleed the system	19-11, 38
	Damage to the olive of the gear box port section	Replace the gear box	19-23
	Malfunction of return hose	Replace the hose	19-38
Whistling noise	Malfunction of gear box port section	Replace the gear box	19-23

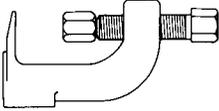
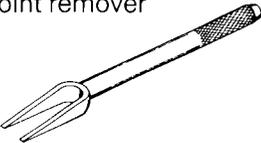
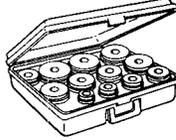
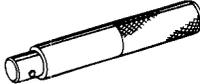
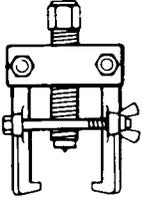
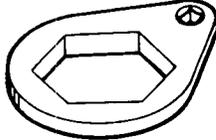
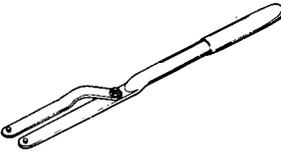
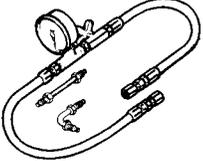
Symptom	Probable cause	Remedy	Reference page
Droning noise	Loose mounting bolt on oil pump or oil pump bracket	Retighten the pump bracket or pump mounting bolt	19-33
	Poor condition of oil pump body*	Replace the oil pump	19-33
Squeaking noise	Malfunction of steering stopper contact	Check and adjust the steering stopper	19-10
	Interference of wheel with vehicle body	Adjust the steering angle	19-10
	Malfunction of gear box	Replace the gear box	19-23
Vibration**	Air suction	Bleed the system	19-12
	Malfunction of gear box	Replace the gear box	19-23
Oil leakage from hose connection	Improperly tightened flare nut Incorrectly inserted hose Improperly clamped hose	Check, and repair or replace	19-38
Oil leakage from hose assembly	Damaged or clogged hose Hose connector malfunction	Replace	19-38
Oil leakage from oil reservoir	Improperly welded pipe	Weld the pipes or replace	19-33
	Overflow	Bleed the system or adjust the oil level	19-11, 12
Oil leakage from oil pump	Malfunction oil pump housing	Replace the oil pump	19-33
	Malfunction of O-ring and/or oil seal	Replace the O-ring and oil seal	19-34
Oil leakage from gear box	Malfunction of gear box housing (including leakage from air hole)	Replace the gear box	19-23
	Malfunction of O-ring and/or oil seal	Replace the O-ring and oil seal	19-25, 28

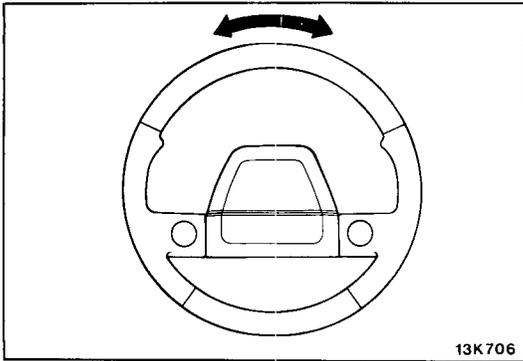
NOTE

- * 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.

SPECIAL TOOLS

N19DA--

Tool (Number and name)	Use	Tool (Number and name)	Use
<p>MB990635-01 Steering linkage puller</p>  <p>MB990778-01 Ball joint remover</p> 	<p>Disconnection of the steering linkage</p>	<p>MB990925-01 Bearing and oil seal installer set</p>  <p>MB990938-01 Handle</p> 	<p>Installation of the oil seal and the ball bearing (Refer to GROUP 3)</p>
<p>MB990809-01 Pitman arm puller</p> 	<p>Removal of the pitman arm</p>	<p>MB990852-01 Housing lock nut special spanner</p> 	<p>Removal and installation of the housing lock nut</p>
<p>MB990228-01 Preload socket</p> 	<p>Measurement of the mainshaft starting torque</p>	<p>MB990853-01 Top cover remover</p> 	<p>Removal and installation of the top cover</p>
<p>MB990662-01 Oil pressure gage</p> 	<p>Measurement of the oil pump pressure</p>	<p>MB990854-01 Snap ring installer</p> 	<p>Installation of the snap ring</p>
<p>MB990993-01 (pump side) Oil pressure gage adapter</p>  <p>MB990994-01 (hose side) Oil pressure gage adapter</p> 	<p>Connection of oil pressure gage</p>		



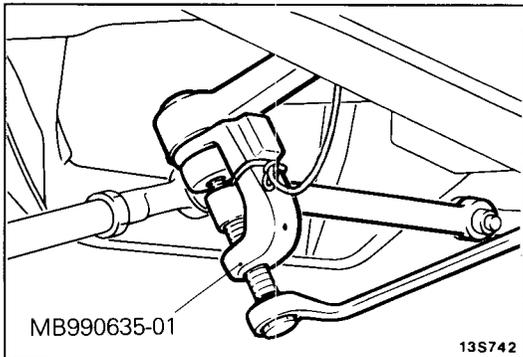
SERVICE ADJUSTMENT PROCEDURES

CHECKING STEERING WHEEL FREE PLAY N19FABD

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 (2.0 in.)

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

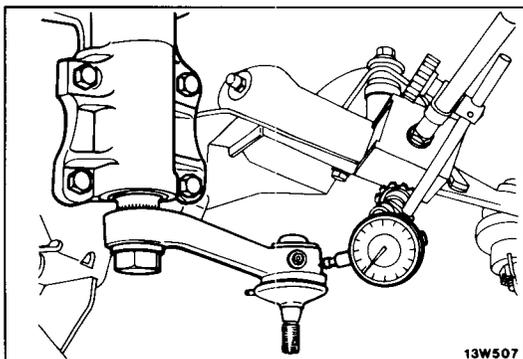


CHECKING STEERING GEAR BACKLASH N19FOAB

1. Jack up to the vehicle front and hold the steering wheel in the straight ahead position.
2. Apart the pitman arm and the relay rod.

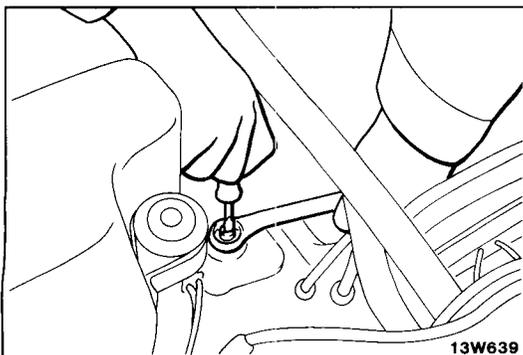
Caution

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



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

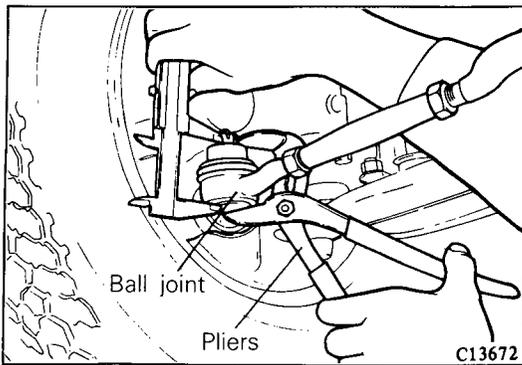
Limit : 0.5 mm (.02 in.)



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.

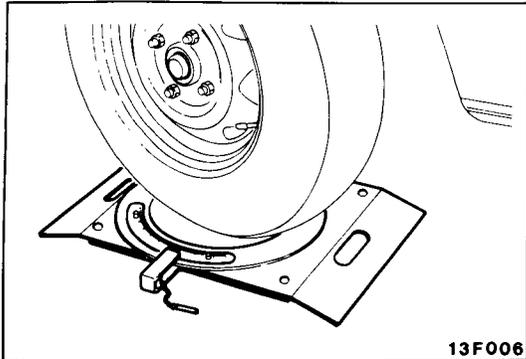
**MEASURING BALL JOINT END PLAY**

N19FPAA

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 (.06 in.)

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

**CHECKING STEERING ANGLE**

N19FDAC

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

**Standard value : Inner wheel 32°30' $_{-3}^0$
Outer wheel 29°00'**

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

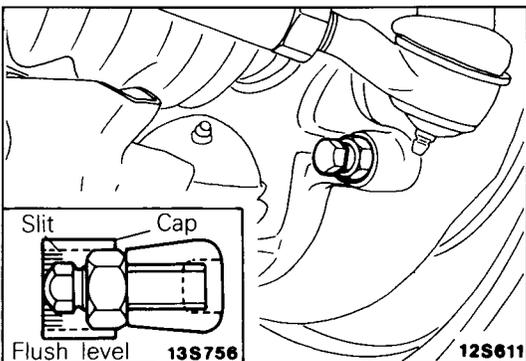
NOTE

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 specified grease.

Specified grease : Multipurpose grease SAE J310, NLGI No. 2

Caution

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

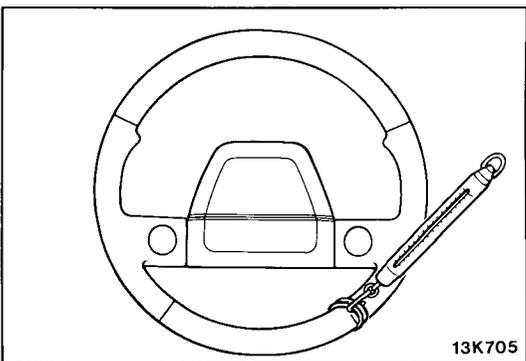
**CHECKING STATIONARY STEERING EFFORT**

N19FFAD

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 (8.21 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.



CHECKING STEERING WHEEL RETURN TO CENTER

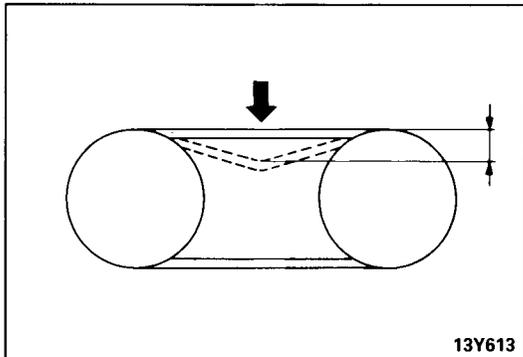
N19FGAD

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

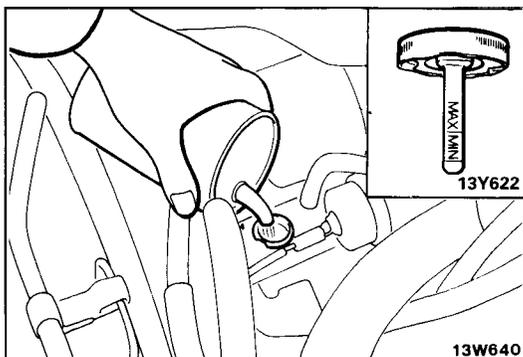
1. Make gentle and sharp turns and check to get a feel for that there is no appreciable difference in steering effort and return to center between right and left turns.
2. Drive at a speed of about 35 km/h (22 mph), turn the steering wheel 90° clockwise or counterclockwise, and release the wheel a second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

NOTE

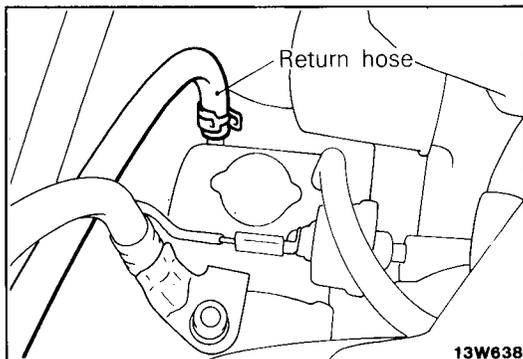
When the steering wheel is turned abruptly, momentary hard steering might result, but this does not mean any problem. It is caused by low oil pump delivery during idling.



13Y613



13Y622



13W638

CHECKING DRIVE-BELT TENSION

N19FHAD

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

Standard value : 9–12mm (.35–.47 in.)

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

CHECKING FLUID LEVEL

N19FIAF

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

REPLACEMENT OF FLUID

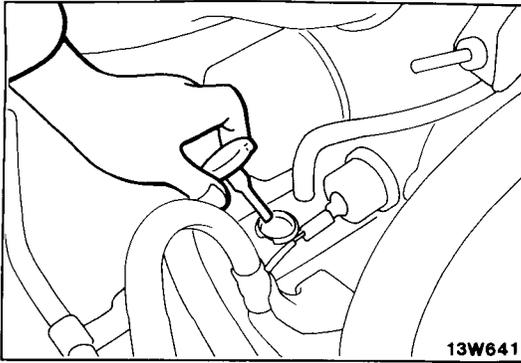
N19FJAF

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

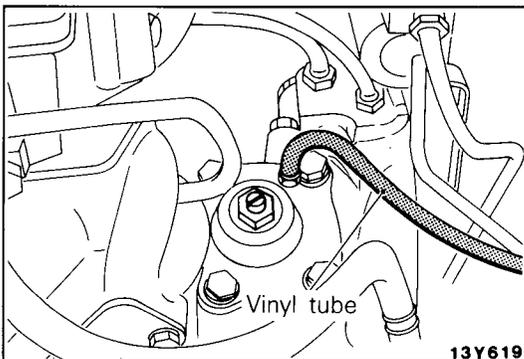
Check stationary steering effort. If it is different from the standard value, air in the system is suspected. Bleed the system.

1. Make certain the reservoir is filled up.
2. Jack up the front wheels.
3. Remove the high tension cable.

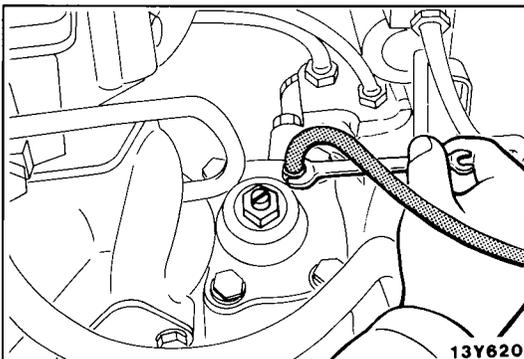
4. While turning the steering wheel completely to the right and to the left, turn the engine over by using the starting motor. Repeat this several times.

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 thoroughly 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.

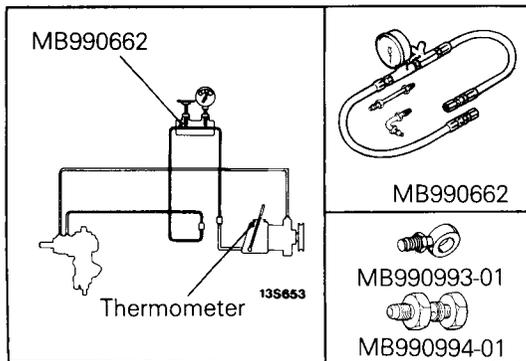


8. Loosen the breather plug, and then turn the steering wheel completely to the right and left continuously until air bubbles no longer appear in the fluid coming out of the tube.

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.)

**PRESSURE TEST OF OIL PUMP**

N19FLAD

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

NOTE

Use the adapter 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 :

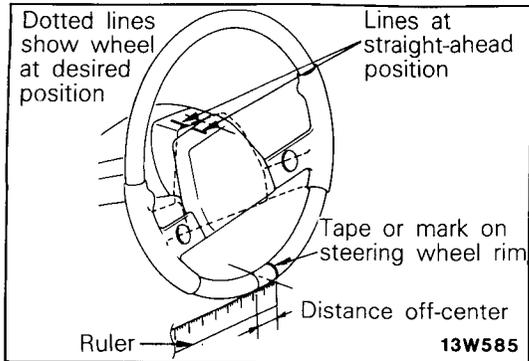
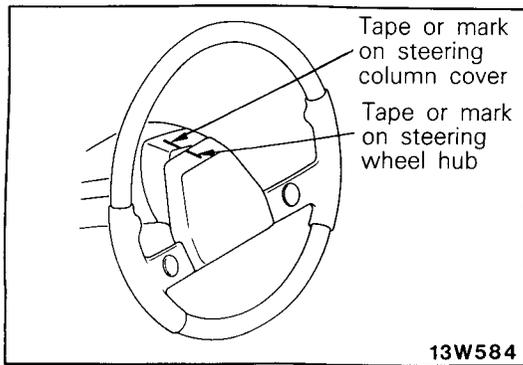
Valve closed 4,900–7,800 kPa (711–1,138 psi.)

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.



STEERING WHEEL CENTERING

N19FNAB

SIMPLIFIED STEERING WHEEL CENTERING

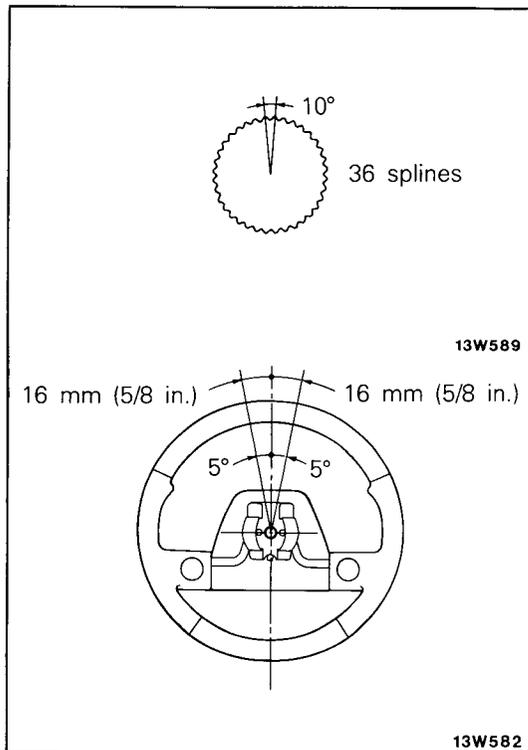
DETERMINING STEERING WHEEL'S OFF CENTER

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 then steer the steering wheel until it is in the desired 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.) off center, it can be centered by indexing it ten degrees towards the center.

INDEXING STEERING WHEEL TO CENTER IT

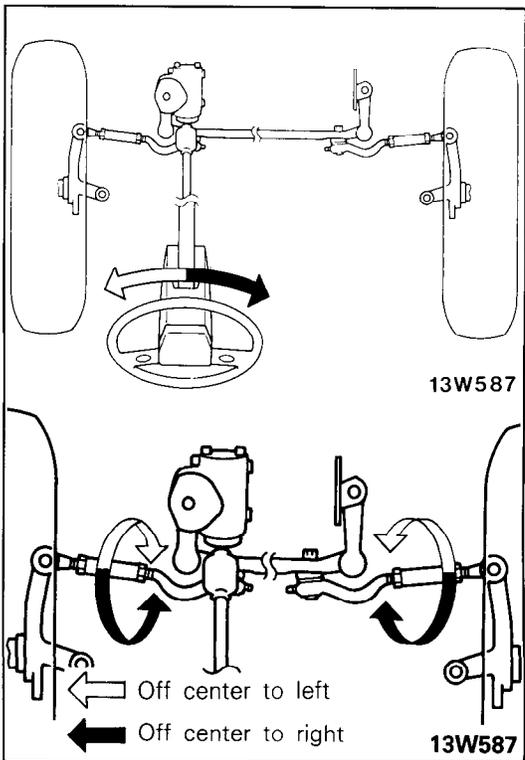
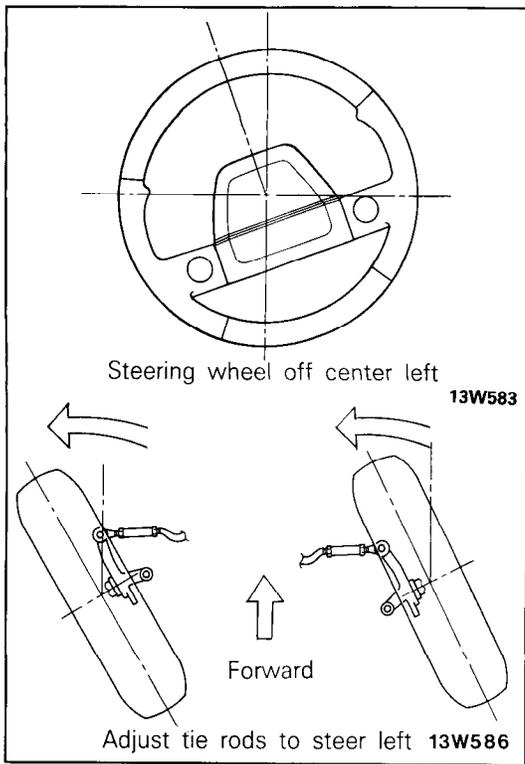
The steering wheel shaft has 36 splines, allowing the steering wheel to be indexed in ten-degree increments.

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.



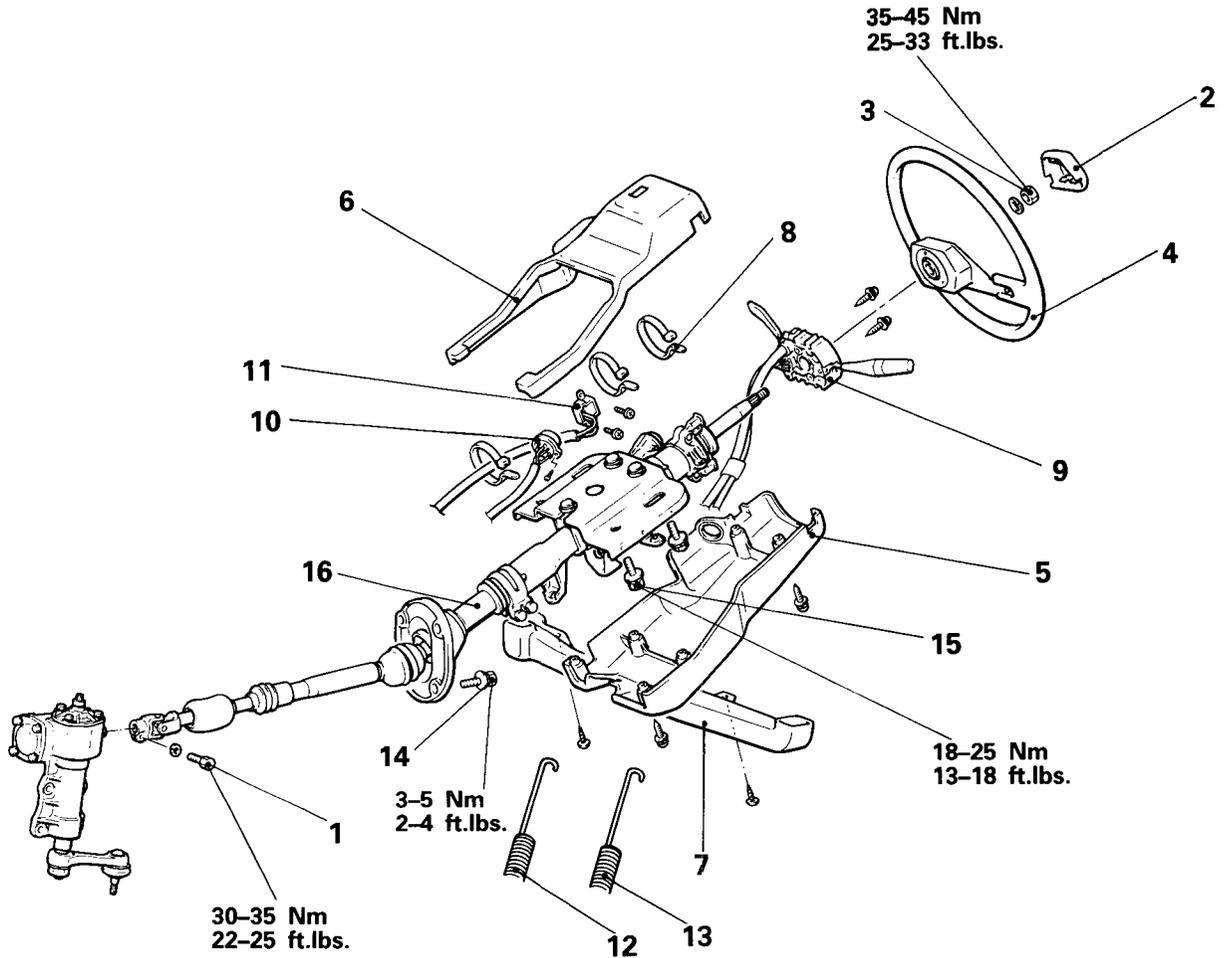
1. Hold the tie rods with a wrench while loosening the locking nuts at least 1/4 turn.
2. Hold the tie rod end with a wrench and turn the tie rod the desired number of turns. Adjust both tie rods equally in the same direction to center the steering wheel.

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--



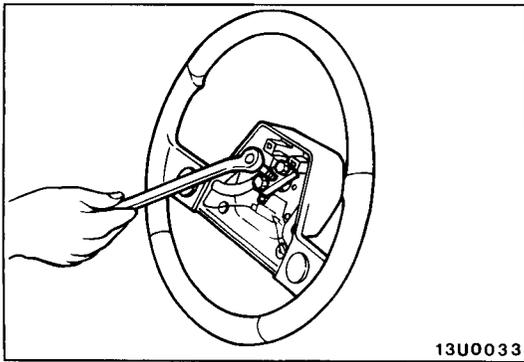
Removal steps

13W644

- | | |
|----------------------------------|--|
| 1. Bolt | 11. Key remained switch |
| 2. Horn pad | ◆◆ 12. Brake pedal return spring |
| 3. Jam nut | ◆◆ 13. Clutch pedal return spring |
| ◆◆ ◆◆ 4. Steering wheel assembly | ◆◆ 14. Washer bolts |
| 5. Lower column cover | 15. Bolts |
| 6. Upper column cover | 16. Steering column and shaft assembly |
| 7. Lap heater duct | |
| 8. Cable band | |
| 9. Column switch | |
| 10. Ignition switch | |

NOTE

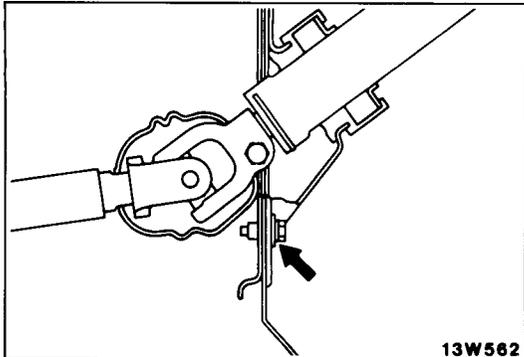
- (1) Reverse the removal procedures to reinstall.
 (2) ◆◆ : Refer to "Service Points of Removal".
 (3) ◆◆ : Refer to "Service Points of Installation".

**SERVICE POINTS OF REMOVAL**

N19GBAH

4. REMOVAL OF STEERING WHEEL ASSEMBLY

Remove the steering wheel.

**SERVICE POINTS OF INSTALLATION**

N19GDAE

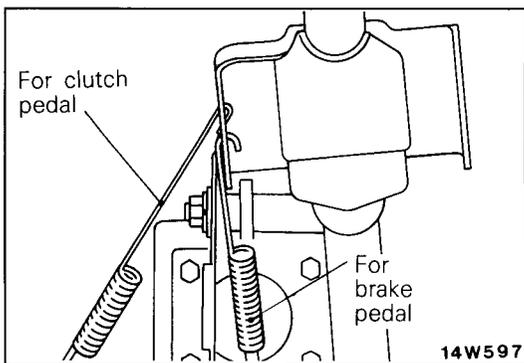
13. APPLICATION OF SEALANT TO WASHER BOLTS

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. 8663 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.

**13. INSTALLATION OF CLUTCH PEDAL RETURN SPRING /12.BRAKE PEDAL RETURN SPRING**

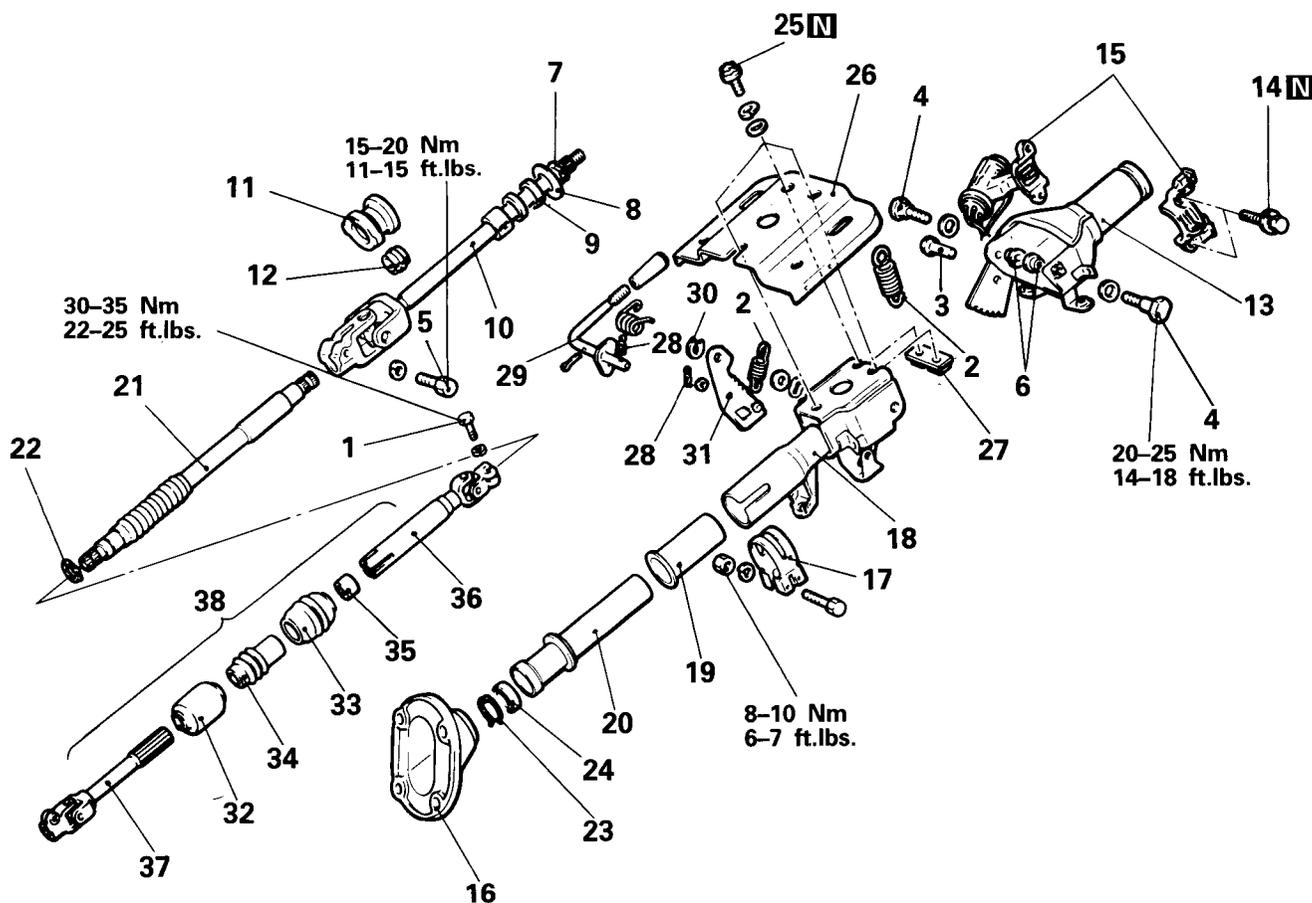
Install the return spring to the position as shown in the figure.

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 19-14.)

DISASSEMBLY AND REASSEMBLY



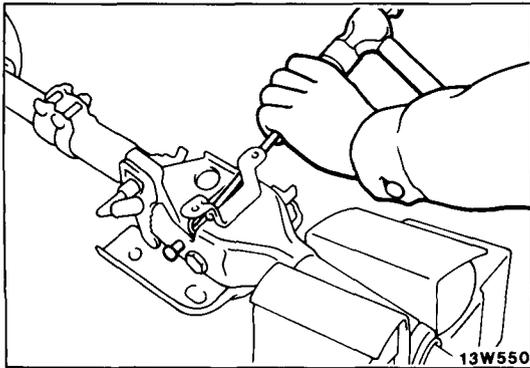
13W612

Disassembly steps

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

NOTE

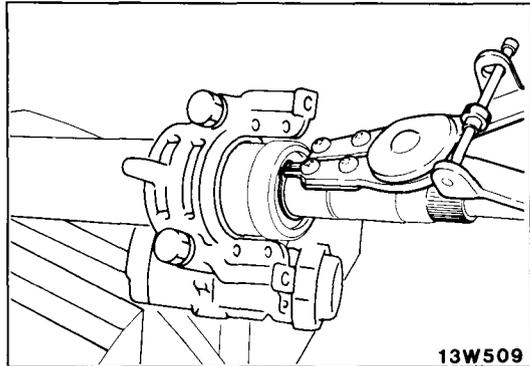
- (1) Reverse the disassembly procedures to reassemble.
- (2) ◆◆◆◆ : Refer to "Service Points of Disassembly".
- (3) ◆◆◆◆ : Refer to "Service Points of Reassembly".
- (4) N : Non-reusable parts

**SERVICE POINTS OF DISASSEMBLY**

N19GFAF

3. REMOVAL OF CLEVIS PIN

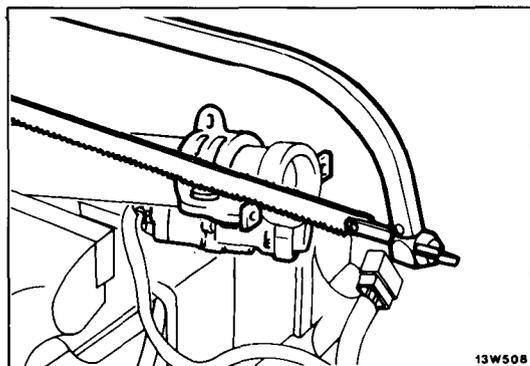
Knock the clevis pin out from the inside of the steering column.

**7. REMOVAL OF SNAP RING**

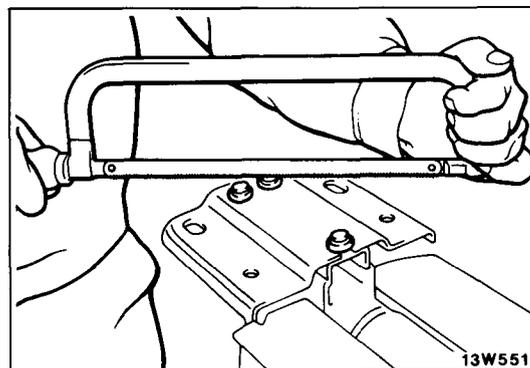
Using the snap ring pliers, remove the snap ring from steering shaft A and extract steering shaft A from the bottom of steering column A.

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.

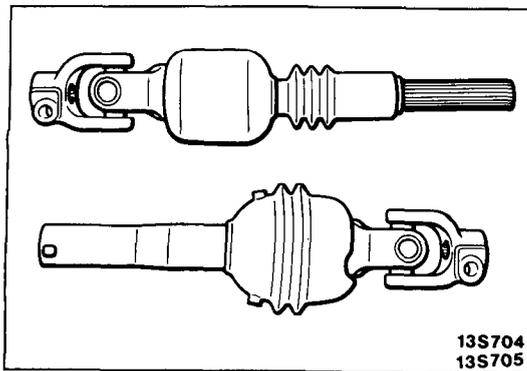
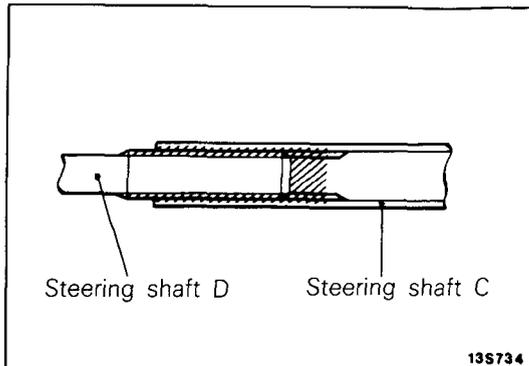
**25. REMOVAL OF SPECIAL BOLTS/26. PLATE**

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.

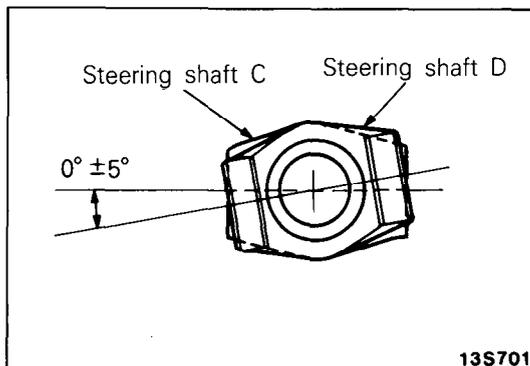
INSPECTION

N19GGAF

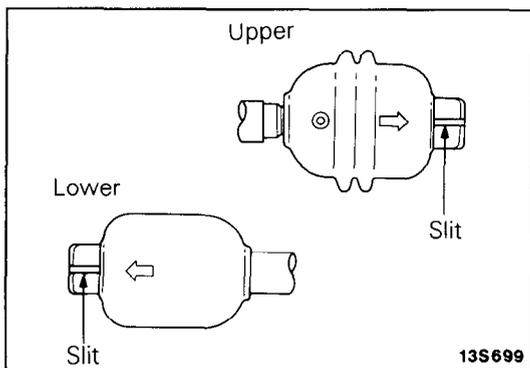
- Check the plate for cracks or damage.
- Check the column bushing for damage.
- Check the dash panel cover for damage.
- Check the steering shaft bearing for wear.
- Check the steering shaft for damage and deformation.
- Check the teeth of the plate assembly for wear.
- Check the steering shaft joint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

13S704
13S705

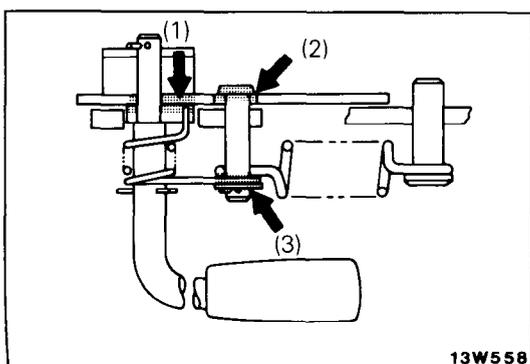
13S734



13S701



13S699



13W558

SERVICE POINTS OF REASSEMBLY

N19GHAK

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.

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

Specified grease : Multipurpose grease SAE J310, NLGI No. 2

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

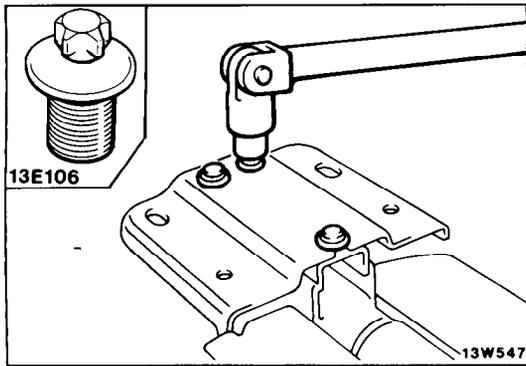
Align the arrows on the upper and lower boots to the slits on the yokes in order to assemble.

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

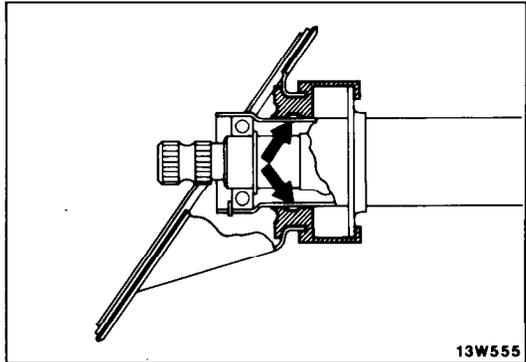
When installing the lever assembly and the plate assembly, apply the specified grease to the following locations:

Specified grease : Multipurpose grease SAE J310, NLGI No. 2

- (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.

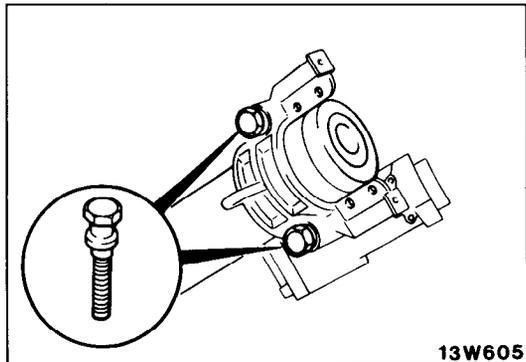
**26. INSTALLATION OF PLATE/25.SPECIAL BOLTS**

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

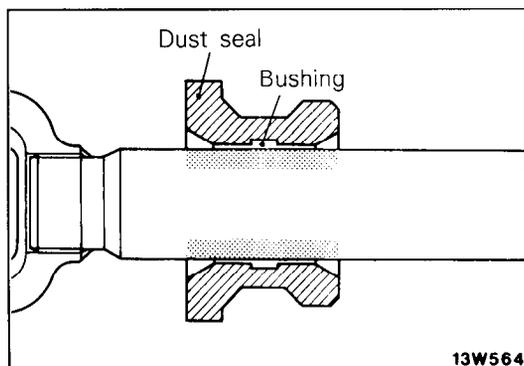
**16. APPLICATION OF GREASE TO DASH PANEL COVER**

Apply the specified grease to the dash panel cover grommet.

Specified grease : Multipurpose grease SAE J310, NLGI No. 2

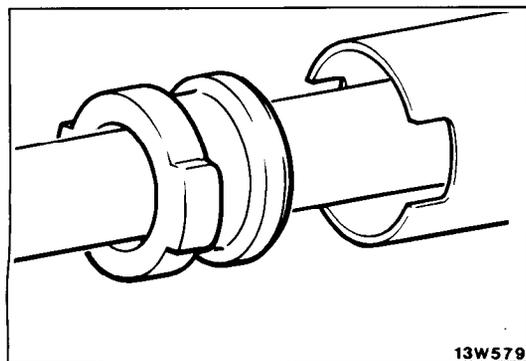
**15. INSTALLATION OF STEERING LOCK ASSEMBLY/14. SPECIAL BOLTS**

- (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.

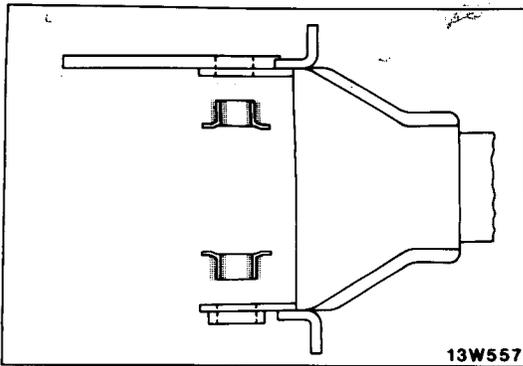
**12. APPLICATION OF GREASE TO BUSHING/11.DUST SEAL**

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

Specified grease : Multipurpose grease SAE J310, NLGI No. 2

**10. INSTALLATION STEERING SHAFT A**

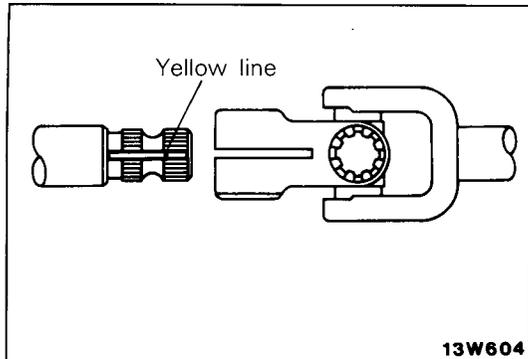
Align the projection of the dust seal and the notch of steering column A, and then install steering shaft A to steering column A.



6. APPLICATION OF GREASE TO BUSHINGS

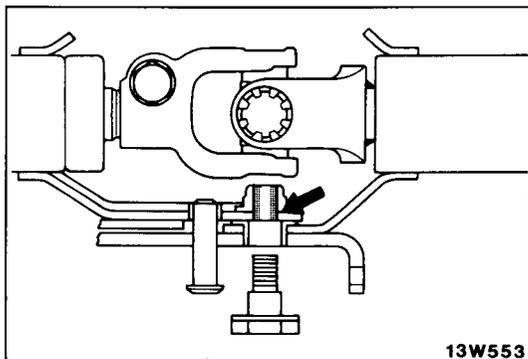
Apply the specified grease to the bushings and install steering column A.

Specified grease : Multipurpose grease SAE J310, NLGI No. 2



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.



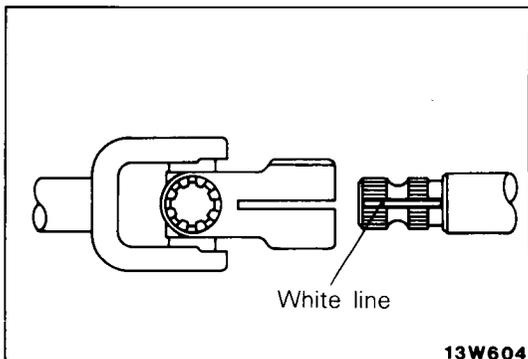
4. APPLICATION OF ADHESIVE TO BOLTS

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**

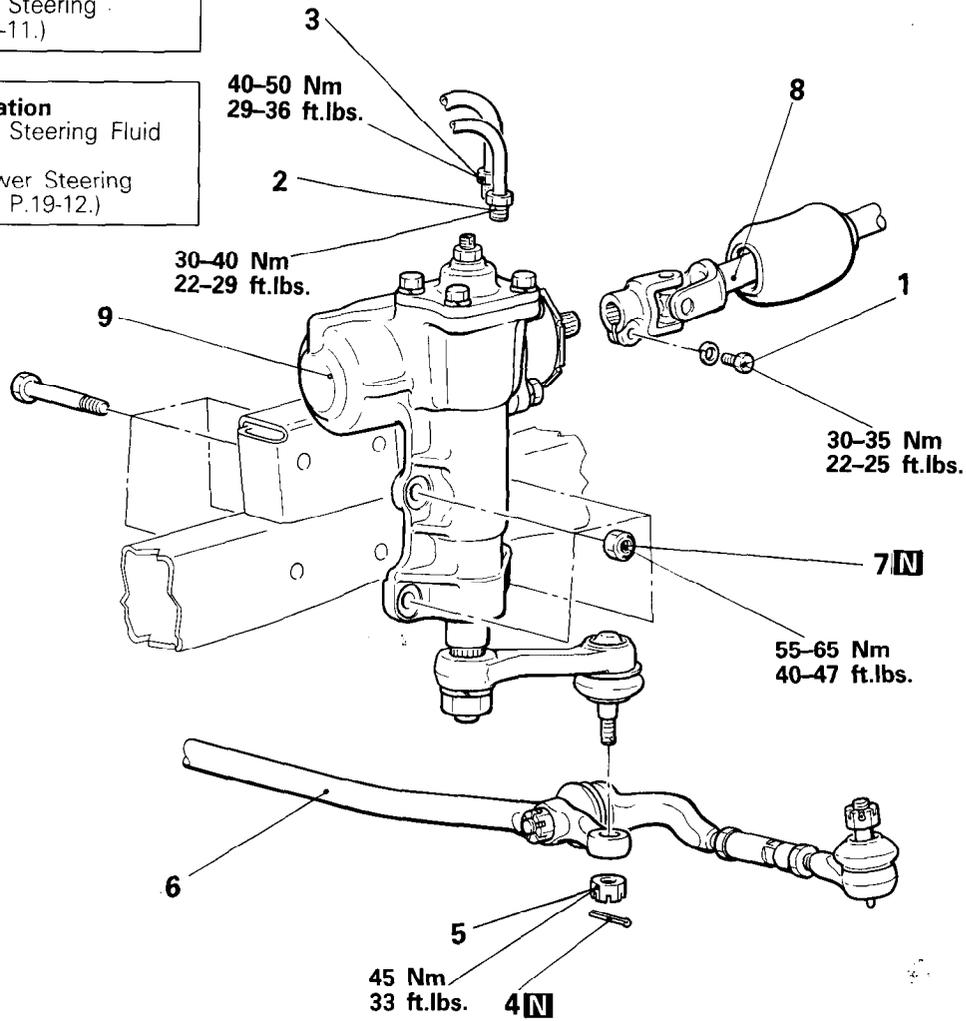
N19NA--

Pre-removal Operation

- Drain of the Power Steering Fluid (Refer to P.19-11.)

Post-installation Operation

- Supplying of Power Steering Fluid (Refer to P.19-11.)
- Bleeding of the Power Steering Fluid Line (Refer to P.19-12.)



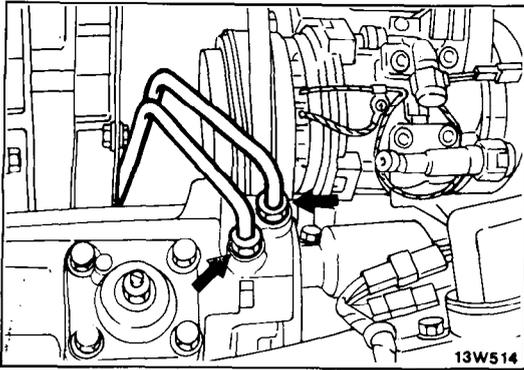
13W642

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**

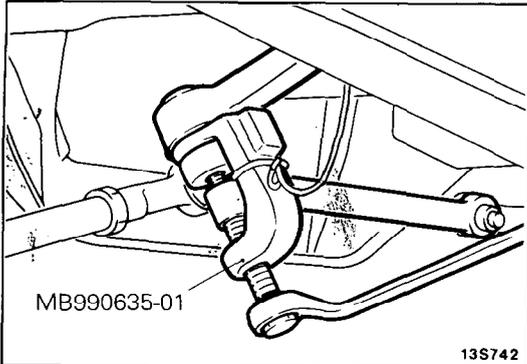
N19NBAC

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.

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.

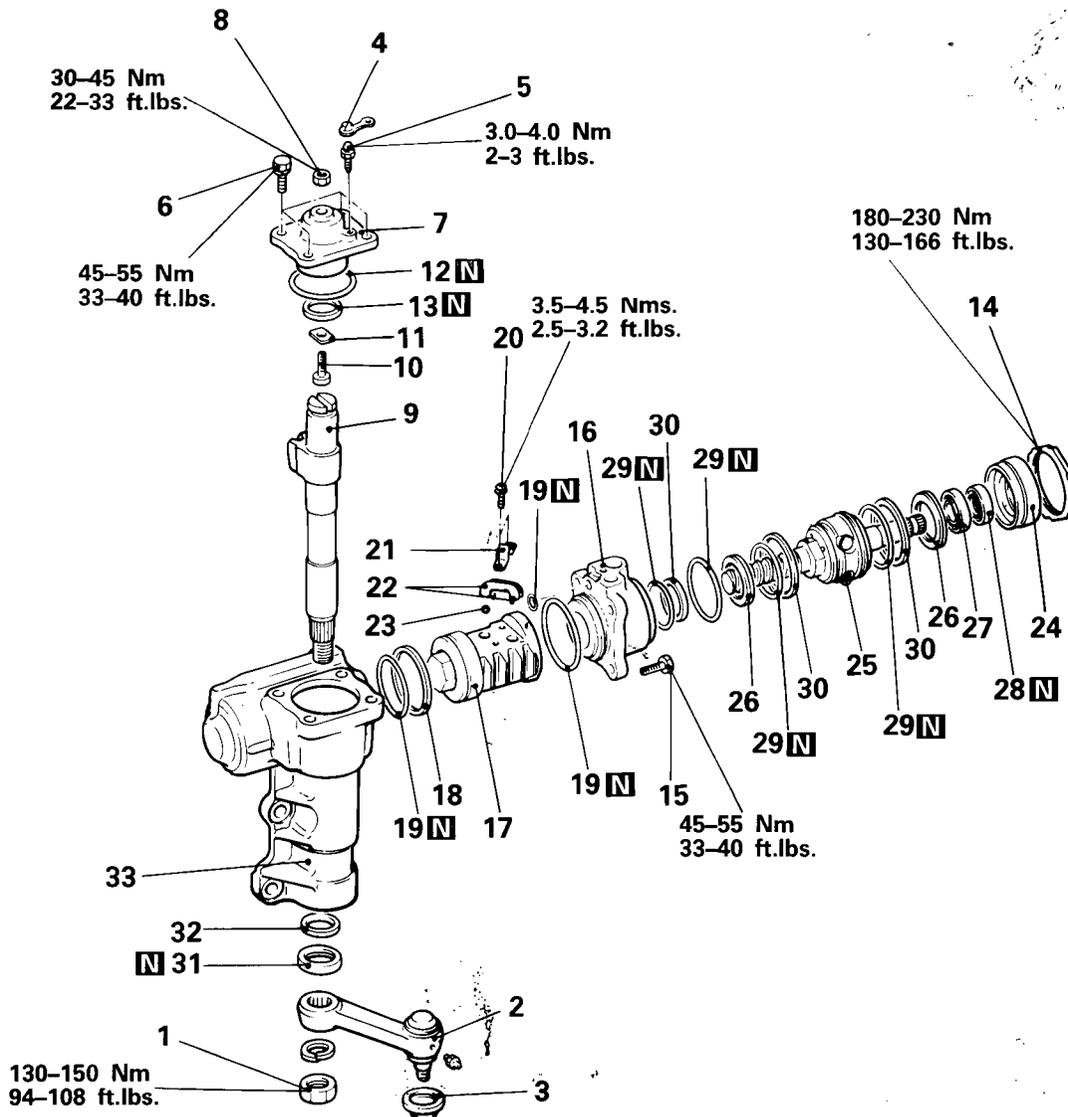
SERVICE POINTS OF INSTALLATION

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.

DISASSEMBLY



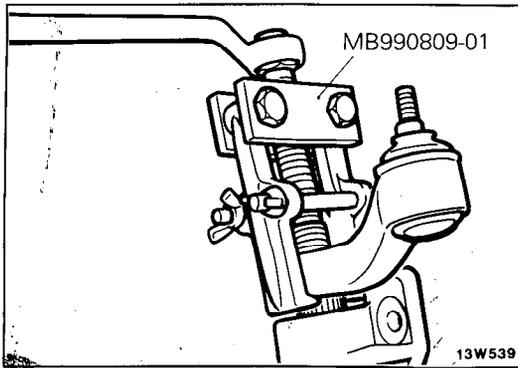
13W609

Disassembly steps

- | | |
|------------------------------|----------------------------|
| 1. Jam nut | 19. O-rings |
| ↔ 2. Pitman arm | 20. Screws |
| 3. Dust cover | 21. Circulator holder |
| ↔ 4. Breather plug cap | 22. Circulators |
| ↔ 5. Breather plug | 23. Balls |
| 6. Washer bolts | ↔ 24. Top cover |
| 7. Side cover | 25. Main shaft |
| ↔ 8. Adjusting bolt lock nut | 26. Thrust needle bearings |
| ↔ 9. Cross-shaft | ↔ 27. Ball bearing |
| ↔ 10. Adjusting bolt | ↔ 28. Oil seal |
| 11. Adjusting plate | ↔ 29. O-rings |
| 12. O-ring | 30. Seal rings |
| ↔ 13. U-packing | 31. Oil seal |
| ↔ 14. Valve housing lock nut | 32. U-packing |
| 15. Bolts | 33. Gear box housing |
| ↔ 16. Valve housing | |
| ↔ 17. Rack piston | |
| ↔ 18. Seal ring | |

NOTE

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

**SERVICE POINTS OF DISASSEMBLY**

N19NFAC

2. REMOVAL OF PITMAN ARM

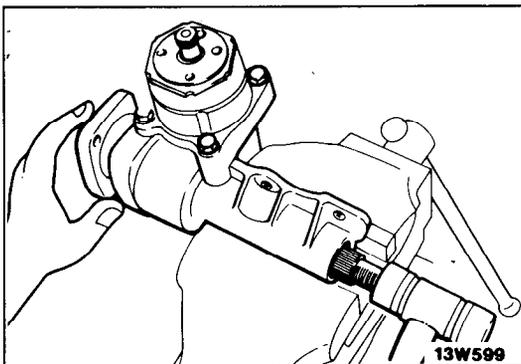
Remove the pitman arm from the gear box assembly by using the special tool.

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**

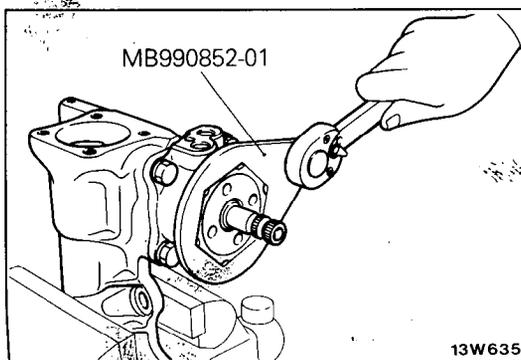
With the mainshaft and cross-shaft placed in the straight ahead position, tap the bottom of the cross-shaft with a plastic hammer to take out the cross-shaft together with the side cover.

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**

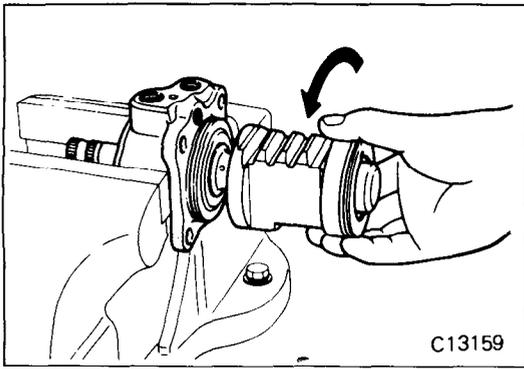
Remove the valve housing lock nut by using the special tool.

16. REMOVAL OF VALVE HOUSING

Remove the valve housing together with the rack piston.

Caution

Use care not to drop the rack piston.

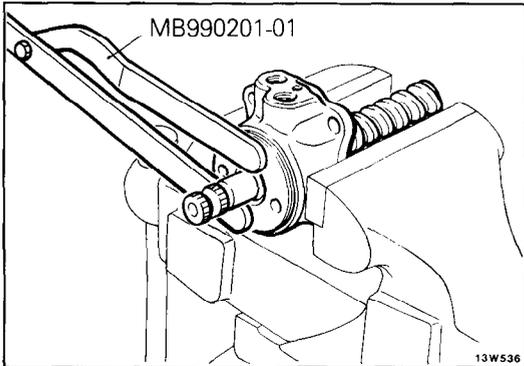


17. REMOVAL OF RACK PISTON

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

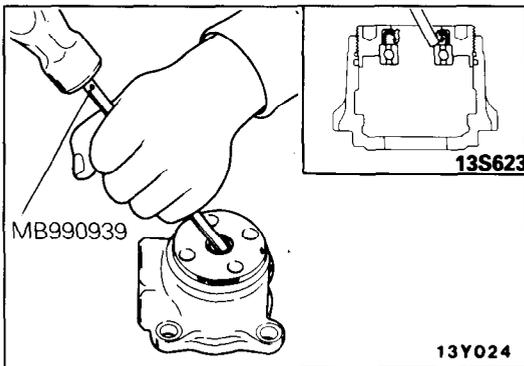
Caution

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



24. 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.



27. REMOVAL OF BALL BEARING/28.OIL SEAL

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

INSPECTION

N19NGAA

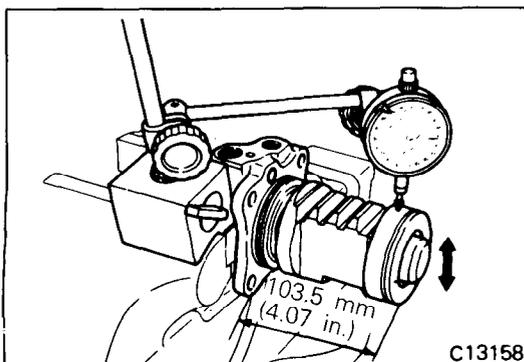
- Check the mainshaft for wear and damage.
- Check the tooth surface of cross shaft and the rack piston for wear and damage.
- Check the contact part of adjusting bolt for uneven wear.
- Check the dust seal and the oil seal for wear and damage.
- Check the O-rings for damage.

CHECKING BACKLASH BETWEEN BALL GROOVE OF RACK PISTON AND BALLS

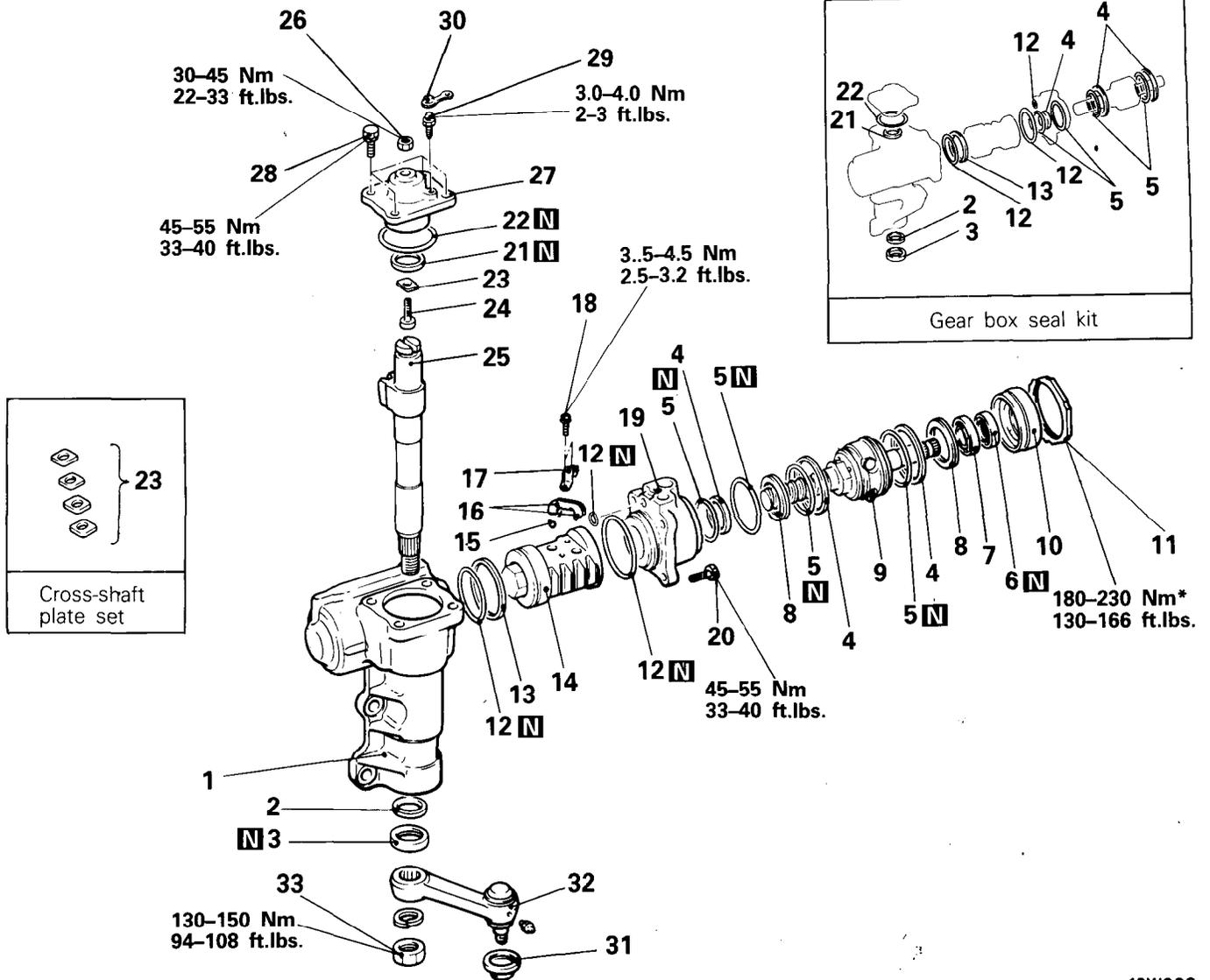
Set the rack piston to the position shown in the figure, and then measure the backlash by using a dial gauge.

Standard value : 0.05–0.1 mm (.0020–.004 in.)

Limit : 0.2 mm (.008 in.)



REASSEMBLY

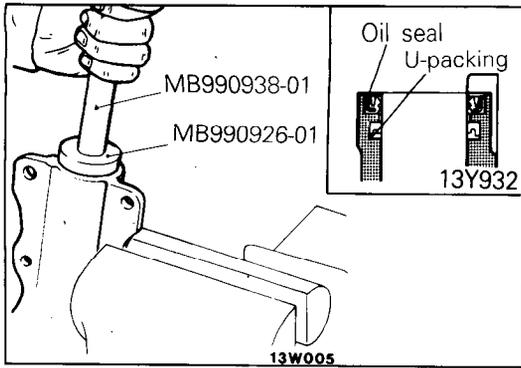


Reassembly steps

- | | | | |
|----|--|----|--|
| ◆◆ | 1. Gear box housing | ◆◆ | 21. U-packing |
| ◆◆ | 2. U-packing | ◆◆ | 22. O-ring |
| ◆◆ | 3. Oil seal | ◆◆ | Adjustment of cross-shaft end play |
| | 4. Seal rings | | 23. Adjusting plate |
| | 5. O-rings | | 24. Adjusting bolt |
| ◆◆ | 6. Oil seal | ◆◆ | 25. Cross-shaft |
| ◆◆ | 7. Ball bearing | ◆◆ | 26. Adjusting bolt lock nut |
| ◆◆ | 8. Thrust needle bearings | ◆◆ | 27. Side cover |
| | 9. Main shaft | ◆◆ | Adjustment of main shaft total starting torque |
| ◆◆ | Adjustment of main shaft starting torque | | 28. Washer bolts |
| | 10. Top cover | | 29. Breather plug |
| | 11. Valve housing lock nut | | 30. Breather plug cap |
| | 12. O-rings | | 31. Dust cover |
| | 13. Seal ring | | 32. Pitman arm |
| ◆◆ | 14. Rack piston | ◆◆ | 33. Jam nut |
| ◆◆ | 15. Balls | | |
| ◆◆ | 16. Circulators | | |
| | 17. Circulator holder | | |
| | 18. Screws | | |
| ◆◆ | 19. Valve housing | | |
| | 20. Bolt | | |

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.)

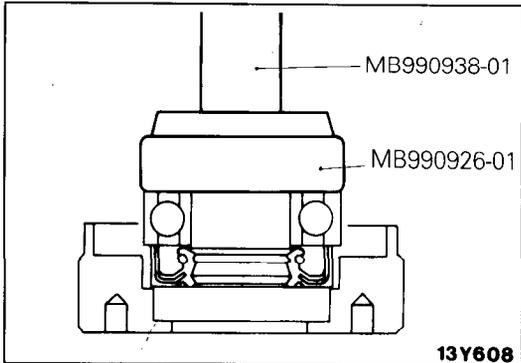


SERVICE POINTS OF REASSEMBLY

N19NHAB

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

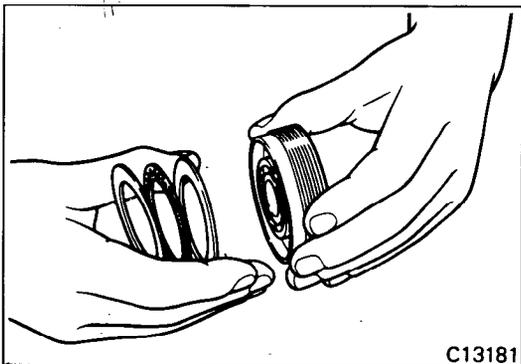
Install the U-packing on the gear box, and press-fit the oil seal.



6. INSTALLATION OF OIL SEAL/7. BALL BEARING

- (1) Press-fit the ball bearing and oil seal into the top cover.
- (2) Apply specified grease to the oil seal of the top cover.

Specified grease : Multipurpose grease SAE J310, NLGI No. 2

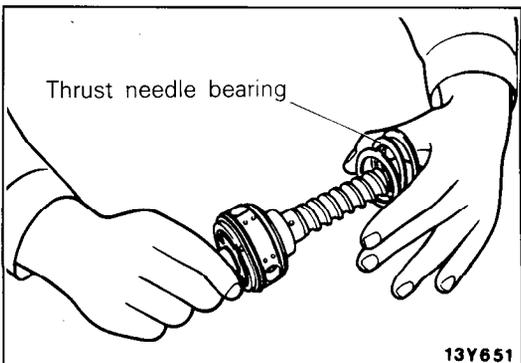


8. INSTALLATION OF THRUST NEEDLE BEARING

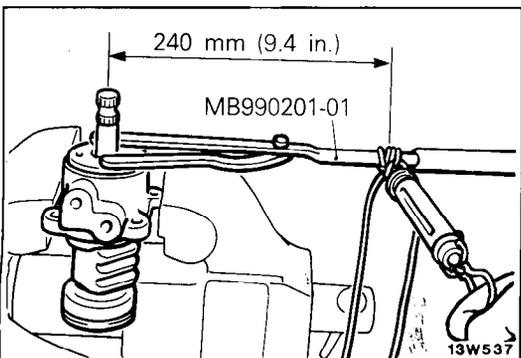
- (1) Install the thinner thrust plate, thrust needle bearing and thicker thrust plate to the top cover in that order as shown in the illustration.
- (2) Attach the top cover to the valve housing.

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.

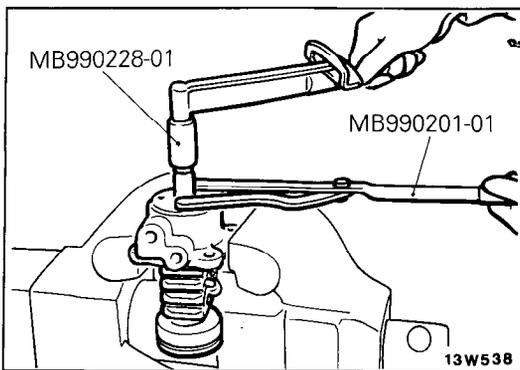


• ADJUSTMENT OF MAINSHAFT STARTING TORQUE

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

Caution

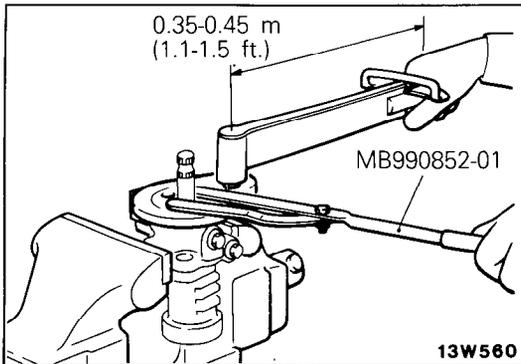
After tightening the top cover, rotate the mainshaft to confirm that there is no torque fluctuation or abnormal noise.



- (2) Measure the mainshaft starting torque by using the special tools.
- (3) Tighten the top cover until the mainshaft starting torque is 20-30 Ncm (1.8-2.7 in.lbs.) greater than the previously mentioned measurement value.

NOTE

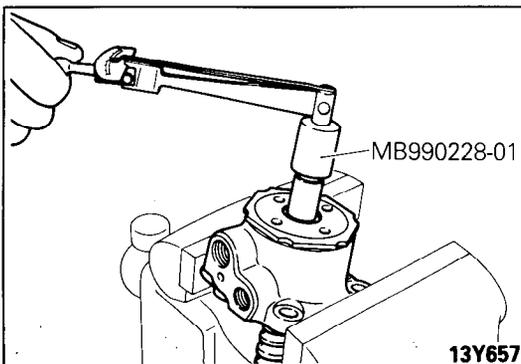
Tighten the top cover gradually while measuring the starting torque.



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

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 tools.

Standard value : 25-65 Ncm (2-6 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.

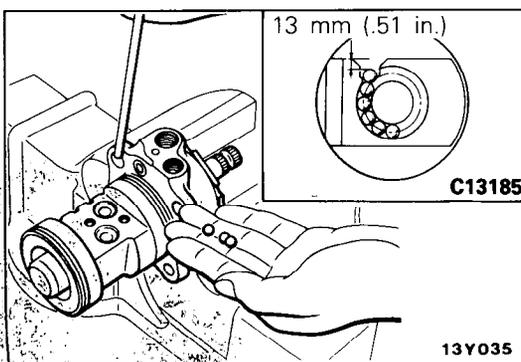
15. INSTALLATION OF BALLS

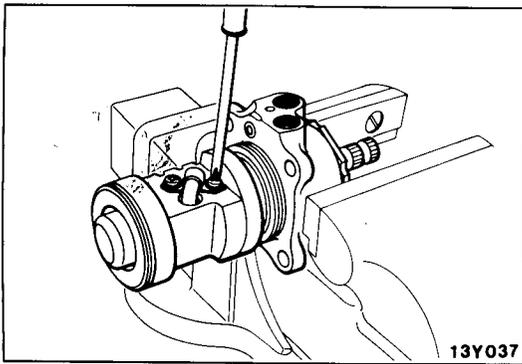
- (1) Insert 19 balls into the ball-insertion hole, pushing them gently with a brass bar.

Caution

Do not rotate the rack piston while inserting the balls.

- (2) Measure, by using calipers, the distance from the surface of the rack piston to the ball top point at both holes.
- (3) If the distance differs from the value shown in the figure, remove the rack piston and reinsert the 19 balls.
- (4) Insert 7 balls into the circulators.



**16. INSTALLATION OF CIRCULATORS**

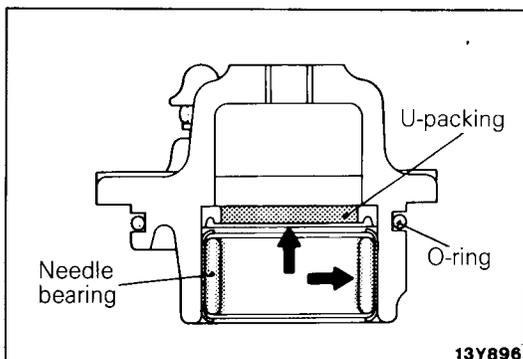
Install the circulators of the rack piston.

19. 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).

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

Apply specified grease to the seal surface of U-packing and the needle bearing.

**Specified grease : Multipurpose grease SAE J310, NLGI
No. 2**

22. 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**

- **ADJUSTMENT OF CROSS SHAFT END PLAY**

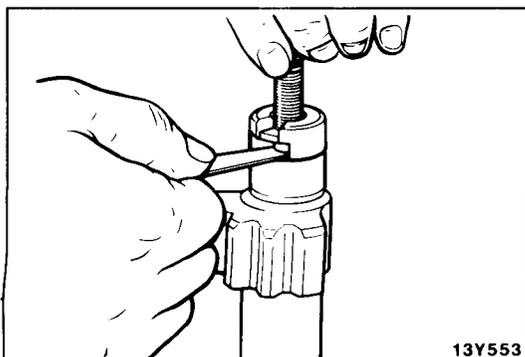
- (1) Insert the adjusting bolt and the adjusting plate into the T-groove in the top of the cross shaft.

NOTE

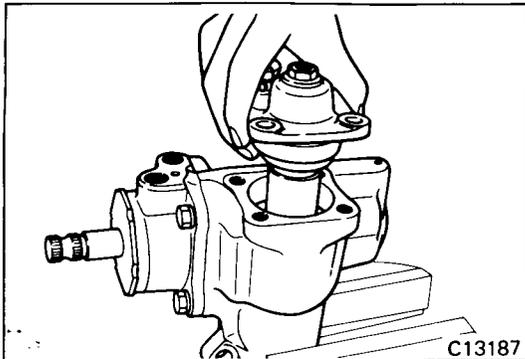
Install the adjusting plate so that the bevelled side faces the contact surface of the cross-shaft.

- (2) Measure the end play of the adjusting bolt with a feeler gauge.

Standard value : 0.05 mm (.0020 in.) or less



- (3) If the end play exceeds the standard value, select a suitable adjusting plate from the table, install it, and then measure the end play once again.



25. INSTALLATION OF CROSS SHAFT/26. ADJUSTING BOLT LOCK NUT

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

27. INSTALLATION OF SIDE COVER

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

NOTE

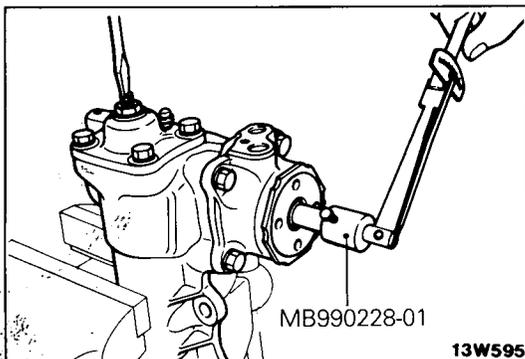
Apply specified automatic transmission fluid to the teeth and shaft areas of the rack piston, and apply specified grease to the oil seal lip.

Specified fluid : Automatic transmission fluid DEXRON Type

Specified grease : Multipurpose grease SAE J310, NLGI No. 2

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

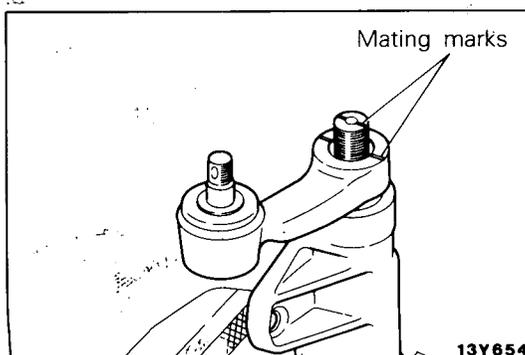
- (1) While turning the adjusting bolt, measure the mainshaft total starting torque by using the special tools.

Standard value : 50–90 Ncm (4–8 in.lbs.)

NOTE

Position the mainshaft in the center position during measurement.

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



32. INSTALLATION OF PITMAN ARM

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

OIL PUMP

REMOVAL AND INSTALLATION

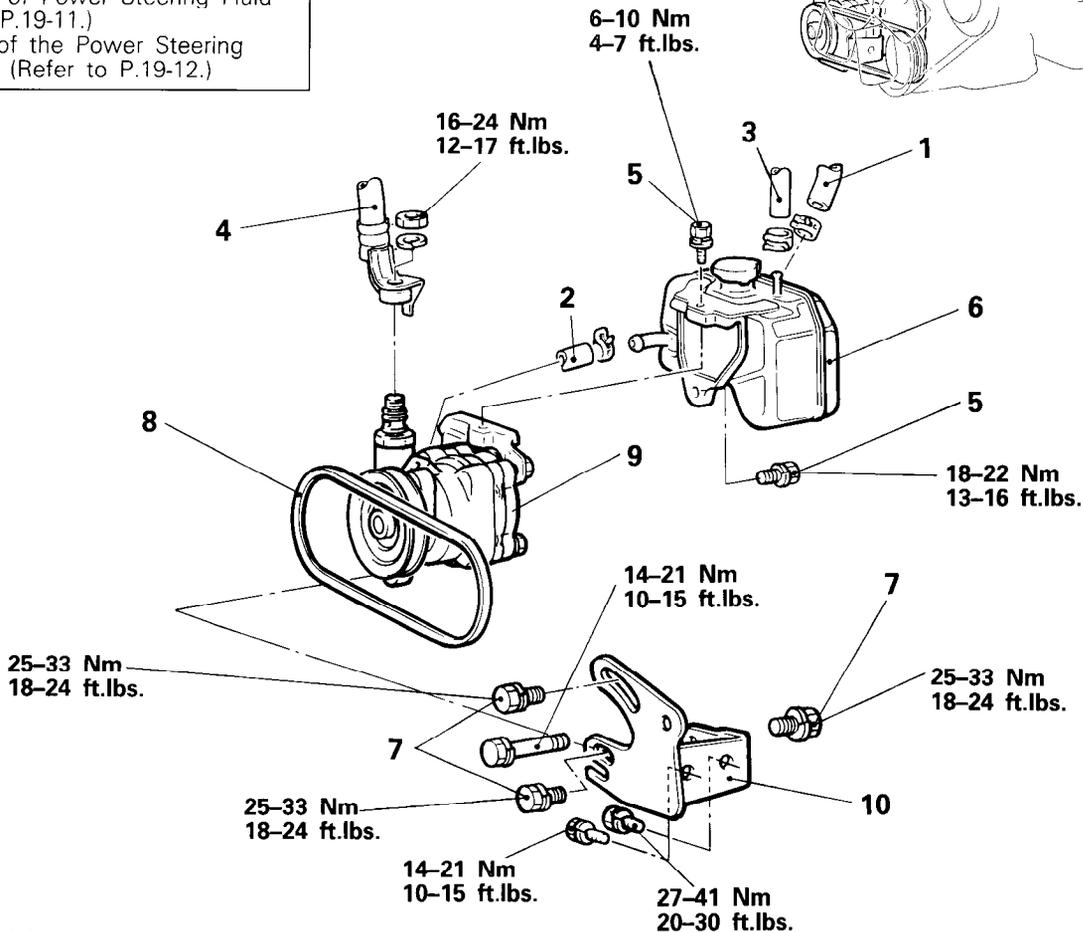
N19RA--

Pre-removal Operation

- Drain of the Power Steering Fluid (Refer to P.19-11.)

Post-installation Operation

- Supplying of Power Steering Fluid (Refer to P.19-11.)
- Bleeding of the Power Steering Fluid Line (Refer to P.19-12.)



13W634

13W648

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".

SERVICEPOINTS OF REMOVAL

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.

SERVICEPOINTS OF INSTALLATION

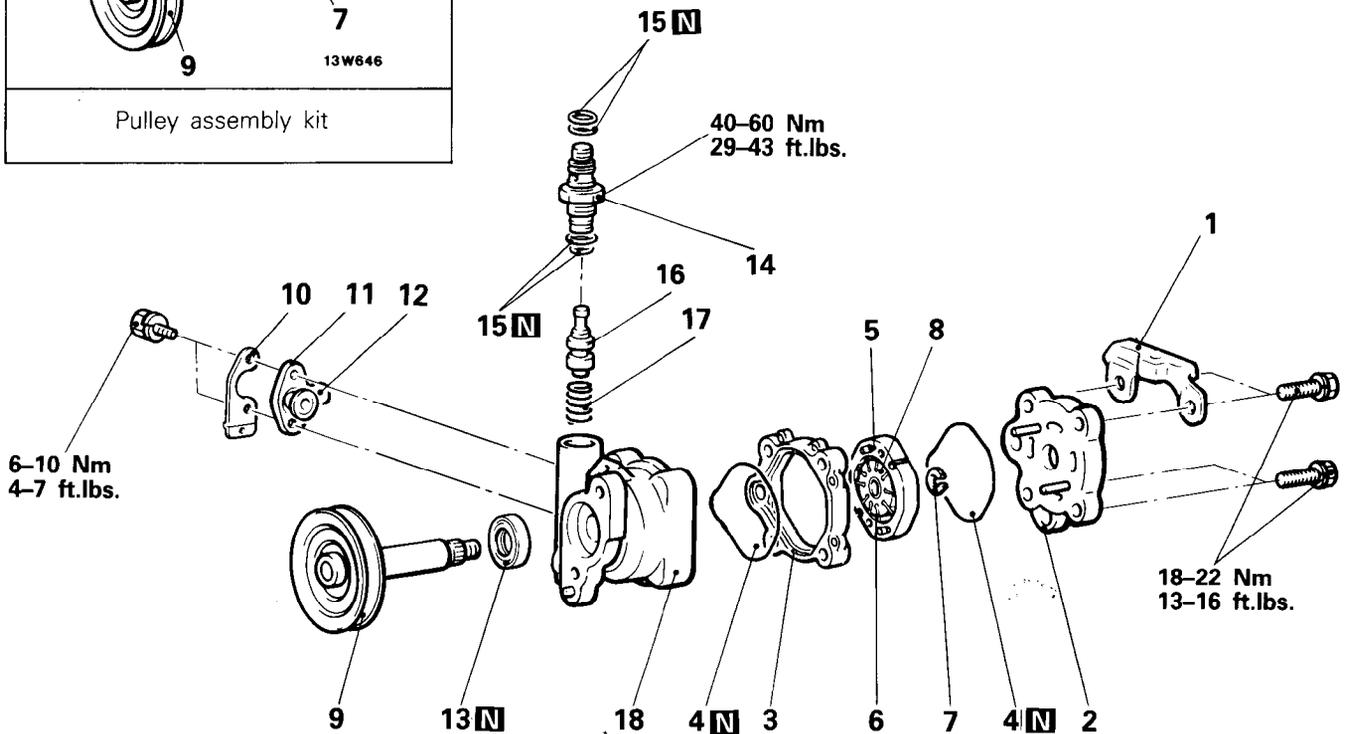
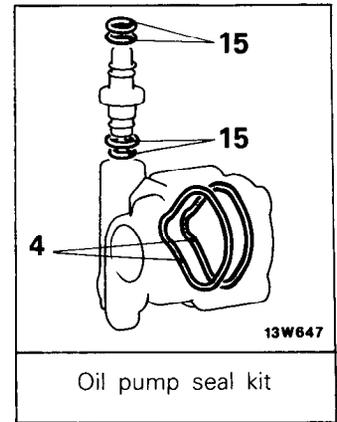
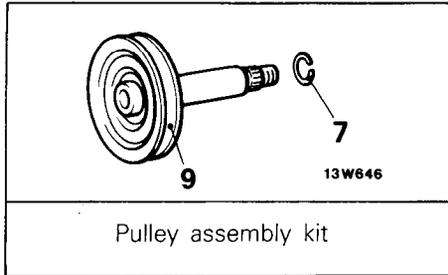
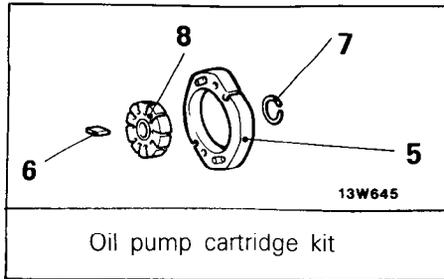
8. ADJUSTMENT OF DRIVE BELT TENSION

Refer to P.19-11.

N19RBAD

N19RDAD

DISASSEMBLY AND REASSEMBLY



13W636

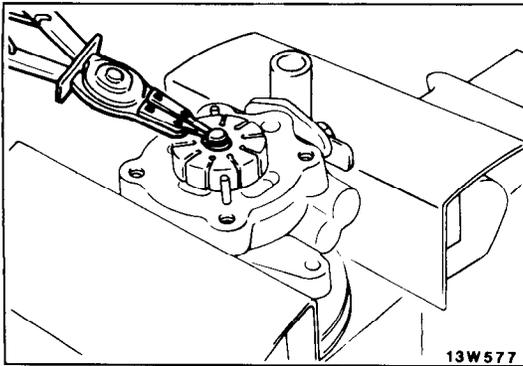
Disassembly steps

- 1. Reservoir bracket
- 2. Pump cover
- 3. Cam case
- 4. O-ring
- 5. Cam ring
- 6. Vanes
- 7. Snap ring
- 8. Rotor
- 9. Pulley assembly
- 10. Plate
- 11. Suction plate
- 12. Suction tube

- 13. Oil seal
- 14. Connector
- 15. O-ring
- 16. Flow control valve
- 17. Flow control spring
- 18. Oil pump body

NOTE

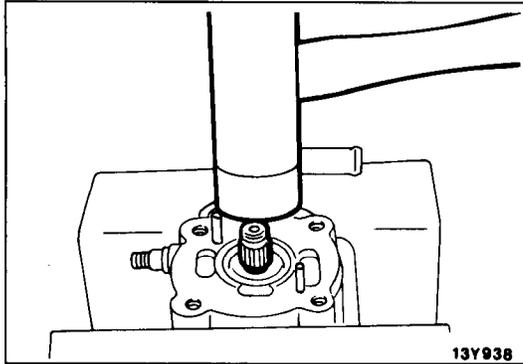
- (1) Reverse the disassembly procedures to reassemble.
- (2) ◀▶ : Refer to "Service Points of Disassembly".
- (3) ▶▶ : Refer to "Service Points of Reassembly".
- (4) [N] : Non-reusable parts.

**SERVICE POINTS OF DISASSEMBLY**

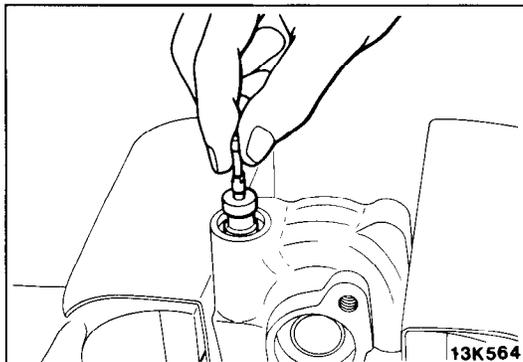
N19RFAE

7. REMOVAL OF SNAP RING

Remove the snap ring from the shaft (pulley assembly) with snap ring pliers and separate the rotor from the shaft.

**9. REMOVAL OF PULLEY ASSEMBLY**

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

**16. REMOVAL OF FLOW CONTROL VALVE/17.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

N19RGAD

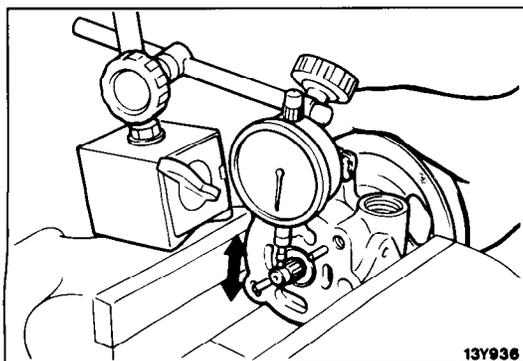
- Check the flow control valve for clogging.
- Check the pulley assembly for wear or damage.
- Check the drive belt for cracks and deterioration.
- Check the groove of rotor and vane for "Stepped" wear.
- Check the contact surface of cam ring and vanes for "stepped" wear.
- Check the vanes for damage.
- Check the contact surface of pump body, and pump cover with rotor for streak-like abrasion.

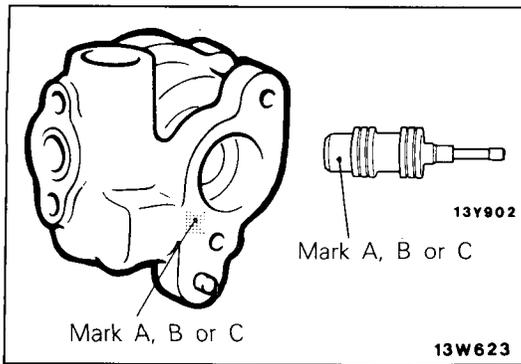
CHECKING CLEARANCE BETWEEN SHAFT AND PUMP BODY

Check the clearance between pulley assembly's shaft and the pump body.

- (1) Place the dial gauge against the end of the pulley assembly's shaft.
- (2) Move the pulley assembly up and down and measure the play.

Limit : 0.1 mm (.004 in.)



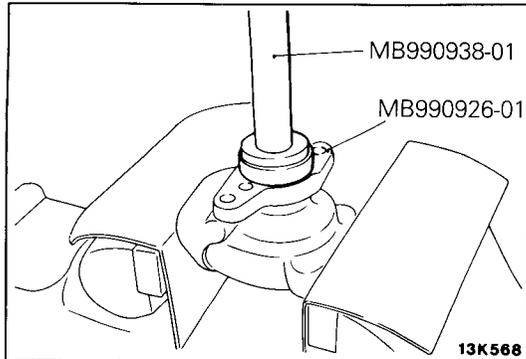
**SERVICE POINTS OF REASSEMBLY**

N19RHAH

18. INSTALLATION OF OIL PUMP BODY/16.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 specified automatic transmission fluid to the outside of the flow control valve.

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



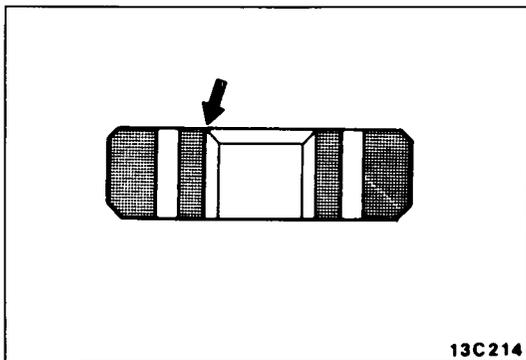
- (3) Install the flow control spring, flow control valve and connector into the pump body.

13. INSTALLATION OF OIL SEAL

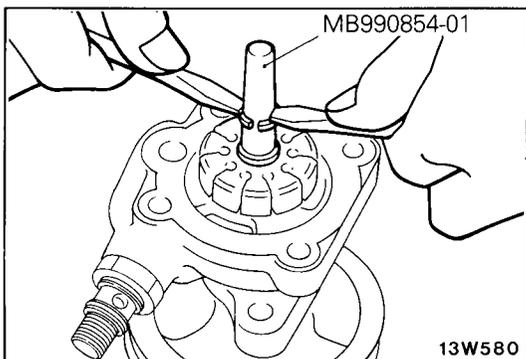
Drive the oil seal into the pump body with the special tools.

Caution

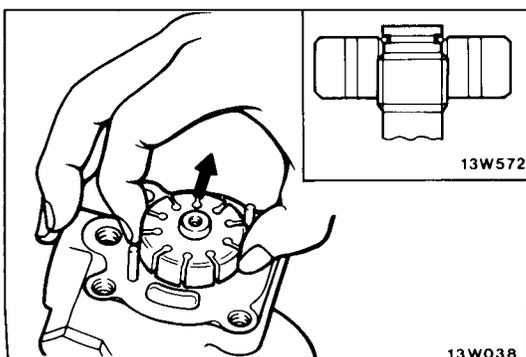
Do not disassemble the flow control valve.

**8. INSTALLATION OF ROTOR**

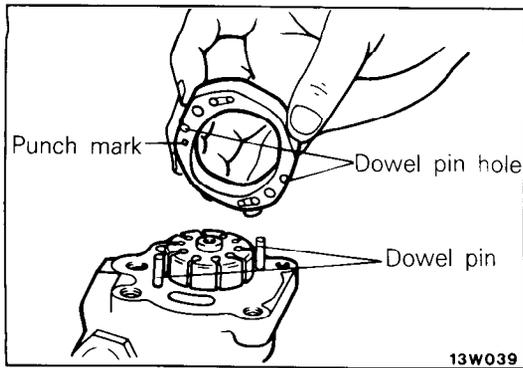
Install the rotor to the pulley assembly. When the rotor is to be installed, face the countersunk portion to the pump cover side.

**7. INSTALLATION OF SNAP RING**

- (1) Install the snap ring with the special tool.



- (2) Lift the rotor and check to be sure that the snap ring has entered the countersunk part.



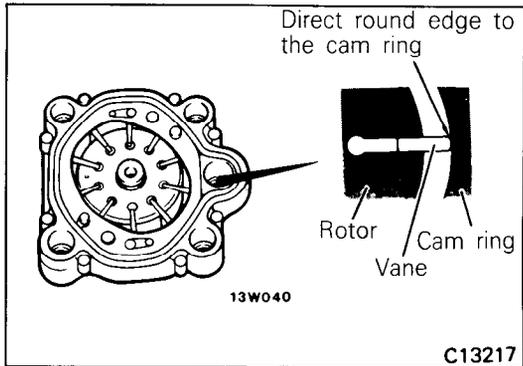
5. INSTALLATION OF CAM RING

When installing the cam ring, 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.

4. APPLICATION OF FLUID TO O-RING

Apply the specified automatic transmission fluid to the O-ring, and then install it to the cam case.

Specified fluid : Automatic transmission fluid DEXRON Type



3. INSTALLATION OF CAM CASE

- (1) Mount the cam case onto the pump body.
- (2) Apply specified automatic transmission 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

STEERING HOSES

REMOVAL AND INSTALLATION

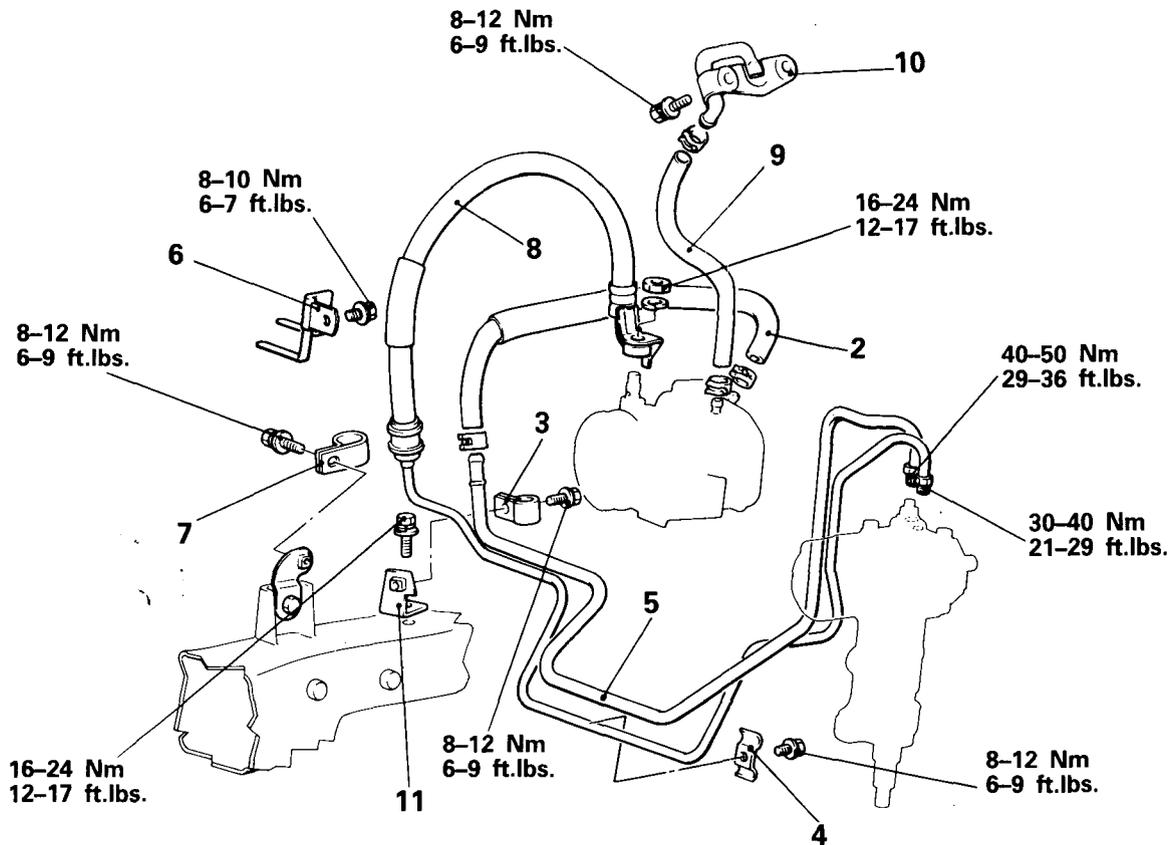
N19TA--

Pre-removal Operation

- Drain of the Power Steering Fluid (Refer to P.19-11.)

Post-installation Operation

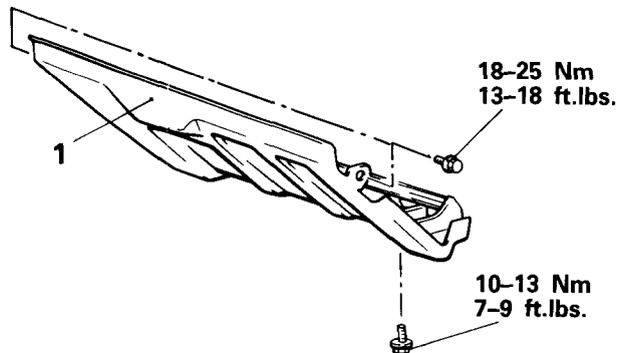
- Supplying of Power Steering Fluid (Refer to P.19-11.)
- Bleeding of the Power Steering Fluid Line (Refer to P.19-12.)



13W617

Removal steps

1. Under skid plate
2. Return hose
3. Return hose clip
4. Tube clip
5. Return tube
6. Clip
7. Pressure hose clip
8. Pressure hose
9. Breather hose
10. Breather pipe
11. Tube stay



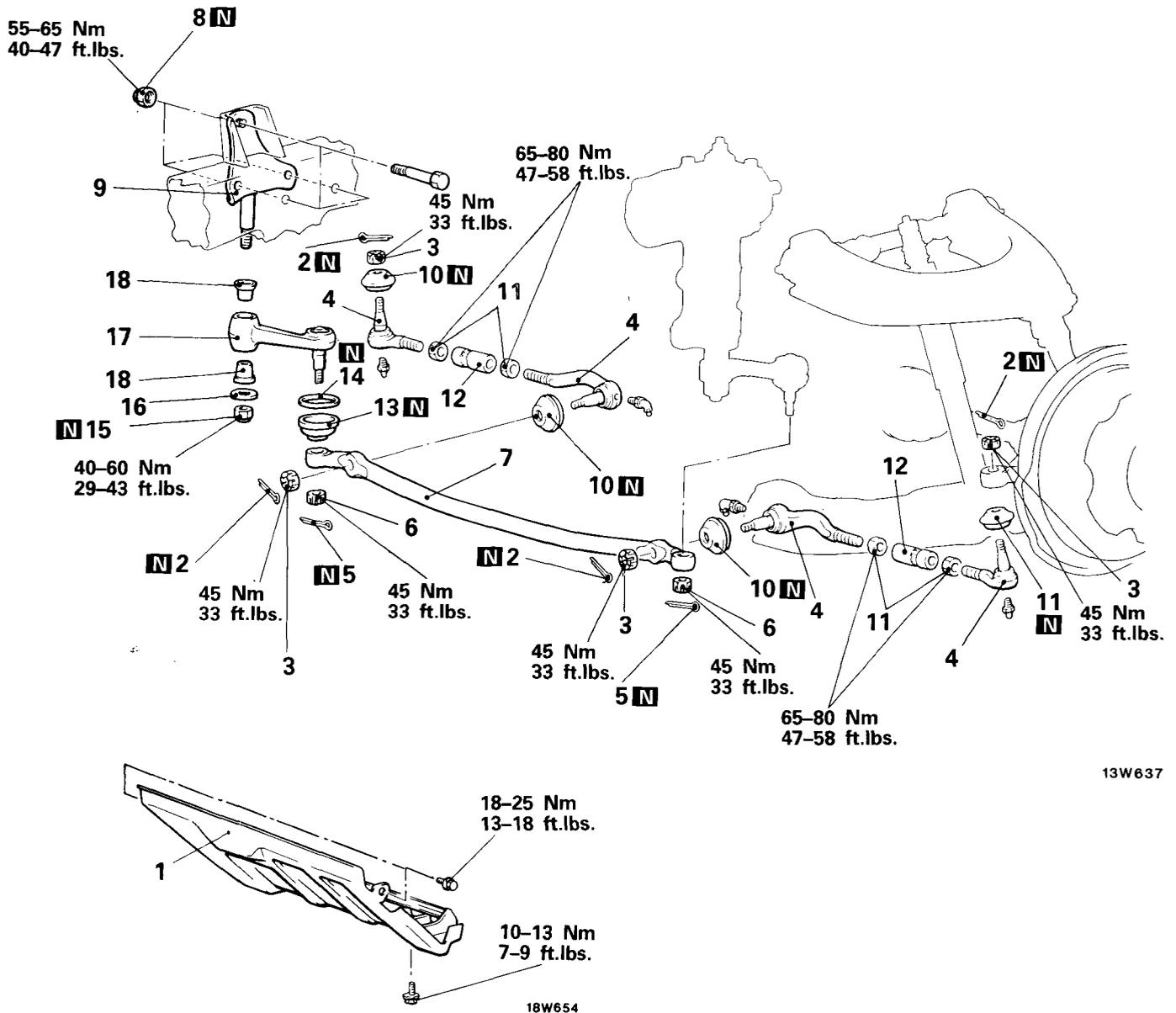
18W654

NOTE
Reverse the removal procedures to reinstall.

STEERING LINKAGE

REMOVAL AND INSTALLATION

N19VA--



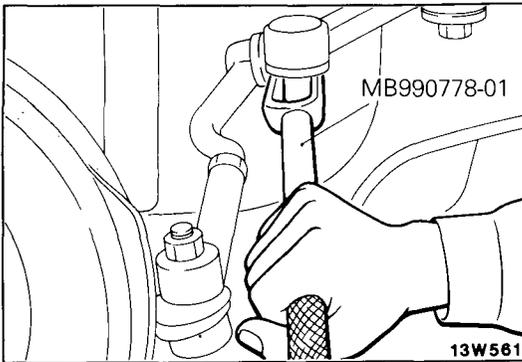
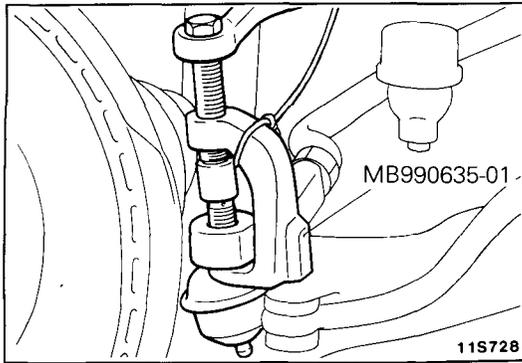
13W637

Removal steps

- | | |
|----------------------|----------------------|
| 1. Under skid plate | 13. Dust cover |
| 2. Cotter pins | 14. O-ring |
| 3. Slotted nuts | 15. Self-locking nut |
| ↔ ↔ | 16. Washer |
| 4. Tie rod ends | 17. Idler arm |
| 5. Cotter pins | 18. Bushings |
| 6. Slotted nuts | |
| ↔ | |
| 7. Relay rod | |
| 8. Self-locking nuts | |
| 9. Idler arm support | |
| 10. Dust covers | |
| 11. Nuts | |
| 12. Pipes | |

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

N19VBAC

4. DISCONNECTION OF THE ROD ENDS

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

Caution

Use cord to bind the special tool closely so it won't become separated.

The nut should be loosened only, not removed.

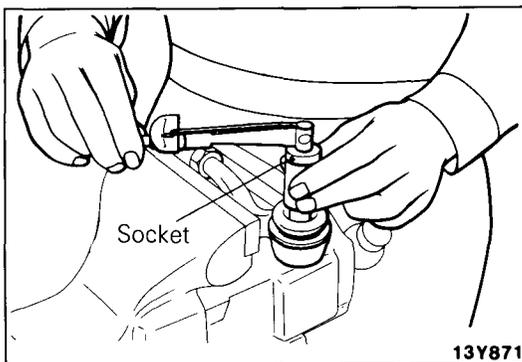
7. DISCONNECTION OF RELAY ROD

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

INSPECTION

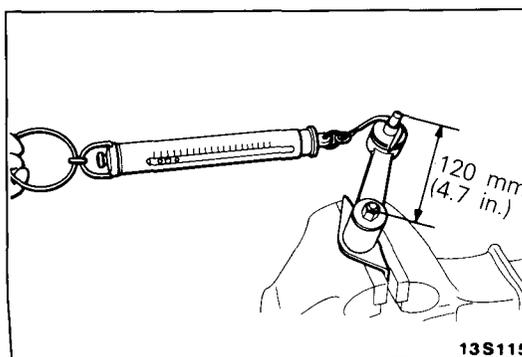
N19VCAB

- 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.



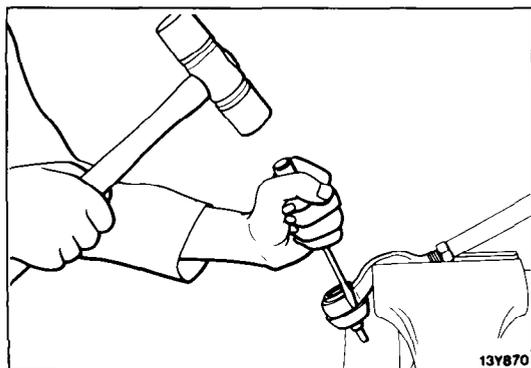
CHECKING BALL JOINT STARTING TORQUE

Standard value : 100-300 Ncm (8.9-26 in.lbs.)



CHECKING IDLER ARM STARTING TORQUE

Standard value : 300-900 Ncm (26-78 in.lbs.) [25-75 N (5.5-16.5 lbs.)]



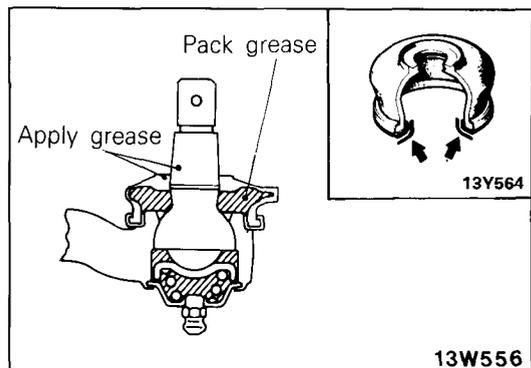
REPLACEMENT OF DUST COVER

N19VEAB

- (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 specified grease to the lip portion of the dust cover.

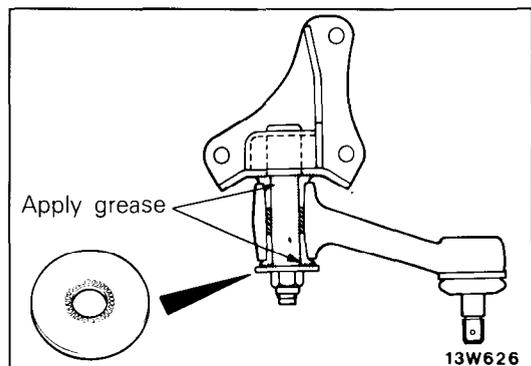
Specified grease : Multipurpose grease SEA J310, NLGI No. 2

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

Specified grease : Multipurpose grease SAE J310, NLGI No. 2

- (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

N19VFAB

- (1) Apply the specified grease to the inside surface of the bushing and the idler arm support shaft.

Specified grease : Multipurpose grease SAE J310, NLGI No. 2

- (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.

