STEERING

POWER

CONTENTS

GENERAL SPECIFICATIONS

Steering wheel diameter mm (in.)	403 (15.9)
Steering shaft type	Collapsible type
Gear box	
Steering gear type	Ball and nut, torsion bar type
Steering gear ratio	16.4
Oil pump	
Oil pump type	Vane type
Displacement	10.5 cc/rev. (0.64 $in.^3$/rev.)

SERVICE SPECIFICATIONS

Standard values	
Steering angle	
Inner wheel	$33°00'^{0}_{-3°}$
Outer wheel	29°00'
Steering wheel free play mm (in.)	25 (1.0) or less
Stationary steering effort N (lbs.)	37 (8.2) or less
V belt deflection mm (in.)	9-12 (.35-.47)
Mainshaft starting torque Ncm (in.lbs.)	25-65 (2-6)
Distance between top of balls and rack piston surface mm (in.)	13 (.5)
Cross-shaft end play mm (in.)	0-0.05 (0-.002)
Mainshaft total starting torque Ncm (in.lbs.)	50-90 (4-8)
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
Tie rod ends ball joint center distance mm (in.)	297.5 (11.7)
Idler arm turning torque Ncm (in.lbs.)	300-900 (26-78)
Spring scale reading N (lbs.)	25-75 (5.5-16.5)
Repair limits	
Steering wheel free play mm (in.)	50 (2.0)
Steering gear backlash mm (in.)	0.5 (.02)
Service limits	
Steering shaft runout mm (in.)	0.5 (.02)
Steering shaft length mm (in.)	750 ± 5 (29.5 ± .2)
Backlash between rack piston ball groove and balls mm (in.)	0.2 (.008)
Free length of flow control spring mm (in.)	36.5 (1.44)
Clearance between oil pump drive shaft and bushing mm (in.)	0.09 (.004)
Ball joint end play mm (in.)	1.5 (.06)
Joint assembly end play mm (in.)	0.2 (.008)

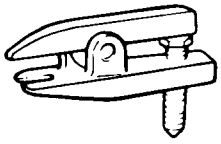
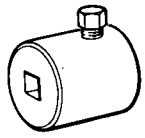
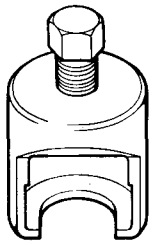
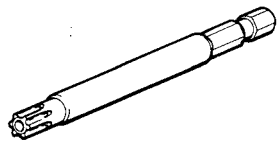
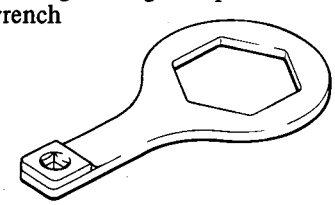
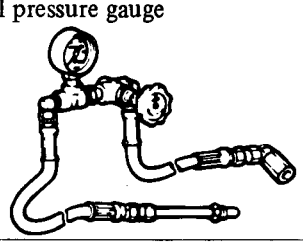
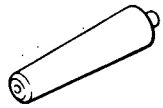
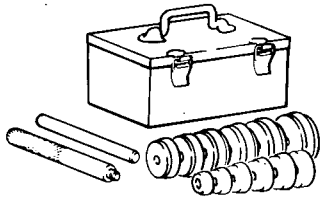
TORQUE SPECIFICATIONS

	Nm (ft.lbs.)
Steering column and shaft	
Steering wheel lock nut	35-45 (26-33)
Column tube calmp	8-11 (6-8)
Dash panel cover	3-5 (2-4)
Joint assembly	30-35 (22-26)
Column bracket	8-12 (6-9)
Special bolt for column bracket	8-11 (6-8)
Power steering gear box	
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)
Gear box installation	55-65 (40-47)
Ball guides installation	3.5-4.5 (2.5-3.3)
Valve housing	45-55 (33-40)
Lock nut*	180-230 (130-166)*
Oil pump	
Suction plate	6-10 (4-7)
Connector	50-70 (36-51)
Reservoir to reservoir bracket	6-10 (4-7)
Reservoir bracket to oil pump body	18-22 (13-16)
Oil pump bracket to oil pump body	
Front	25-33 (18-24)
Rear	14-21 (10-15)
Oil pump bracket to engine	
Left	27-41 (20-30)
Right	14-21 (10-15)
Oil pump brace bolt	25-33 (18-24)
Pump bracket stay	14-21 (10-15)
Oil pump cover	18-22 (13-16)
Steering hoses	
Pressure hose	30-40 (22-29)
Return hose	40-50 (29-36)
Clamp bolts	8-12 (6-9)
Breather stays	8-12 (6-9)
Steering linkage	
Tie rod ends	45 (33)
Tie rod sockets and relay rod	45 (33)
Relay rod to pitman arm	45 (33)
Relay rod to idler arm	45 (33)
Idler arm and bracket	40-60 (29-43)
Tie rod end studs	65-80 (47-58)
Idler arm bracket and frame	55-65 (40-47)

NOTE
*If the special tool is used to measure the torque, the measurement should be 135-175 Nm (98-127 ft.lbs.).

LUBRICANTS

	Specified lubricants	Quantity
Power steering fluid	Automatic transmission fluid ATF DEXRON or DEXRON II type	900 cc (54.9 $in.^3$)
Dash panel cover grommet	Multipurpose grease SAE J310a, NLGI grade #2	As required
Cross-shaft oil seal lip	Multipurpose grease SAE J310a, NLGI grade #2EP	As required
Side cover needle bearing	Multipurpose grease SAE J310a, NLGI grade #2EP	As required
U-packing of side cover	Multipurpose grease SAE J310a, NLGI grade #2EP	As required
Ball joint dust covers	Multipurpose grease SAE J310a, NLGI grade #2EP	As required
Idler arm support and bushings	Multipurpose grease SAE J310a, NLGI grade #2EP	As required

Tool (Number and name)	Use	Tool (Number and name)	Use
MB990635 "*" Steering linkage puller 	Disconnection of the relay rod	MB990228 Preload socket 	Measurement of mainshaft starting torque
MB990809 "*" Pitman arm puller 	Removal of the pitman arm	MB990826 "D" Torx wrench 	Removal and installation of the tilt bracket
MB990852 Housing locking nut special wrench 	Removal and installation of the housing lock nut	MB990662 Oil pressure gauge 	Measurement of oil pump pressure
MB990853 "*" Top cover remover 	Removal and installation of the top cover	MB990854 Snap ring installer 	Installation of the snap ring
MB990925 Bearing and oil seal installer set 	Installation of the oil seal and the ball bearing (Refer to GROUP 3.)		

"*", "D" see page 2 for instructions.

Symptom	Probable cause	Remedy
Steering wheel return malfunction	Steering components damaged Incorrect tire pressure Steering components binding	Replace Adjust the tire pressure Repair or replace
Steering operation is "heavy"	Incorrect tire pressure	Adjust the tire pressure
	Loose belt	Adjust the belt tension
	Damaged belt	Replace the belt
	Low fluid level	Replenish fluid
	Air in fluid line	Bleed the system
	Restricted hose(s)	Correct the hose routing or replace the hose(s)
	Fluid leakage	Locate and correct
	Incorrect wheel alignment (especially caster)	Adjust the wheel alignment
	Binding linkage ball joint	Check the ball joint turning torque, and replace the ball joint if necessary
	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(Refer to p. 19-12.)
Steering wheel pulls to one side	Excessive steering wheel play	Adjust the steering wheel play
	Insufficient tire inflation pressure	Adjust the tire pressure (Refer to GROUP 22)
	Unevenly worn or deformed tire(s)	Rotate the wheels or replace the tire(s) (Refer to GROUP 22)
	Dragging brakes	Adjust (Refer to GROUP 5)
	Deteriorated or broken front spring Distorted knuckle arm	Replace
	Incorrect wheel alignment	Adjust the wheel alignment (Refer to GROUP 2)
	Damaged wheel bearing	Replace
	Distorted or loose lower arm	Retighten or replace (Refer to GROUP 2)
	Loose linkage joints	Retighten
	Worn or damaged ball joints Deteriorated or broken lower arm bushing	Replace
	Incorrect installation or internal damage of gear box	Correct or replace

Symptom	Probable cause	Remedy
Steering wheel pulls to one side (continued)	Malfunction of shock absorber	Replace
	Uneven wheel base (between right side and left side)	Adjust the body alignment (Refer to GROUP 13)
Steering wheel vibrates	Insufficient tire inflation pressure	Adjust the tire pressure (Refer to GROUP 22)
	Unevenly worn or deformed tire(s)	Rotate the wheels or replace the tire(s) (Refer to GROUP 22)
	Loose hub nut	Retighten (Refer to GROUP 2)
	Excessive runout, or unbalance of tire and wheel	Adjust the wheel balance, or replace wheel(s) and/or tire(s) (Refer to GROUP 22)
	Poor wheel alignment	Adjust the wheel alignment (Refer to GROUP 2)
	Damaged wheel bearing	Replace
	Distorted or loose lower arm	Retighten or replace (Refer to GROUP 2)
	Bent or damaged linkage	Repair or replace
	Loose linkage joints	Retighten
	Worn or damaged ball joints	Replace
	Malfunction of front suspension	Check and adjust; replace the parts if necessary (Refer to GROUP 2)
	Incorrect installation or internal damage of gear box	Correct or replace
	Malfunction of shock absorber	Replace
	Loose joint assembly	Retighten
Road shock is felt in steering wheel	Insufficient steering wheel play	Adjust the steering wheel play
	Insufficient tire inflation pressure	Adjust the tire pressure (Refer to GROUP 22)
	Unevenly worn or deformed tire(s)	Rotate the wheels or replace the tire(s)
	Malfunction of shock absorber	Replace
Poor recovery of steering wheel to straight ahead position	Insufficient tire inflation pressure	Adjust the tire pressure (Refer to GROUP 22)
	Excessive mainshaft preload	Adjust the preload
	Stuck or damaged ball joint	Replace
	Improper wheel alignment angles	Adjust the wheel alignment (Refer to GROUP 2)

Symptom	Probable cause	Remedy
Poor recovery of steering wheel to straight ahead position (continued)	Seizure of steering shaft bearing Seizure of steering column bearing	Lubricate or replace
Rattling noise	Loose installation of oil pump or gear box	Retighten the oil pump or gear box
	Steering linkage looseness or play	Retighten or replace the steering linkage
	Loose oil pump pulley nut	Retighten the oil pump pulley nut
	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 gear box or 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
Hissing noise	Air sucked into oil pump	Check the oil level and hose clips; bleed the system
	Damage to 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
	Interference of steering shaft and joint assembly with other parts	Reposition the interfering parts
	Malfunction of gear box	Replace the gear box
Vibration**	Air suction	Bleed the system
	Malfunction of gear box	Replace the gear box

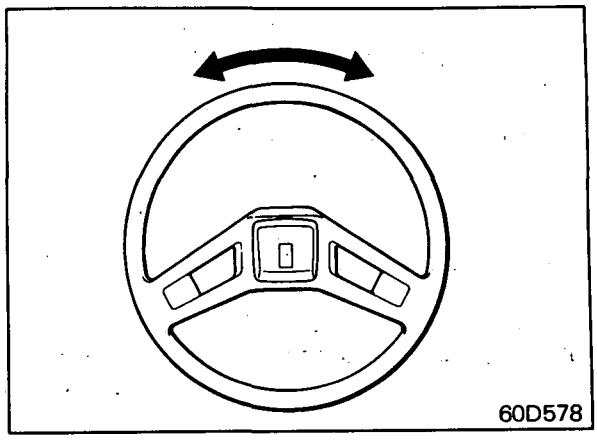
NOTE
* A slight beating noise is produced by the oil pump; this is not a malfunction. (This noise occurs particularly during stationary steering effort.)
** A slight vibration may be felt during stationary steering effort due to the condition of the road surface. To check whether the vibration is a problem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

Symptom	Probable cause	Remedy
Oil leakage from hose connections	Improperly tightened flare nut Incorrectly inserted hose Improperly clamped hose	Check, and repair or replace
Oil leakage from hose assembly	Damaged or clogged hose Hose connector malfunction	Replace
Oil leakage from oil reservoir	Leaking reservoir Improperly welded pipe	Replace
	Overflow	Bleed the system or adjust the oil level
Oil leakage from oil pump	Malfunction of 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

CHECKING STEERING WHEEL FREE PLAY

1. With the engine turned off and the steering wheel in the straight-ahead position, apply a force of 5 N (1.1 lbs.) to the steering wheel in the peripheral direction.
2. Measure the play at the circumference of the steering wheel. (60D578)

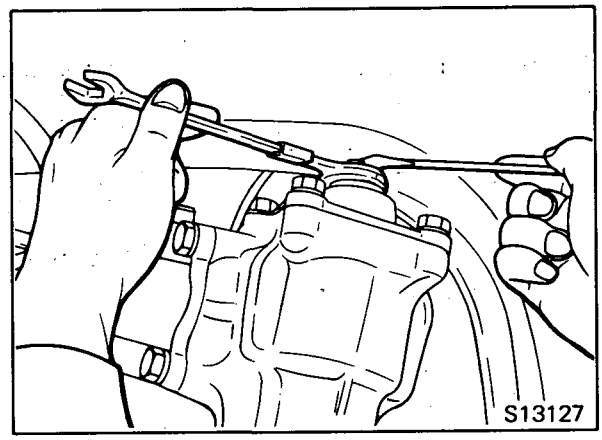
Steering wheel free play [Repair limit]	50 mm (2.0 in.)



3. If the measured value exceeds the repair limit, screw in the cross-shaft adjusting bolt until the steering wheel free play meets specifications. (S13127)

Caution
If the adjusting bolt is overtightened, more steering effort will be required and return of the wheel will be adversely affected.

Mainshaft starting torque	25-65 Ncm (2-6 in. lbs.)

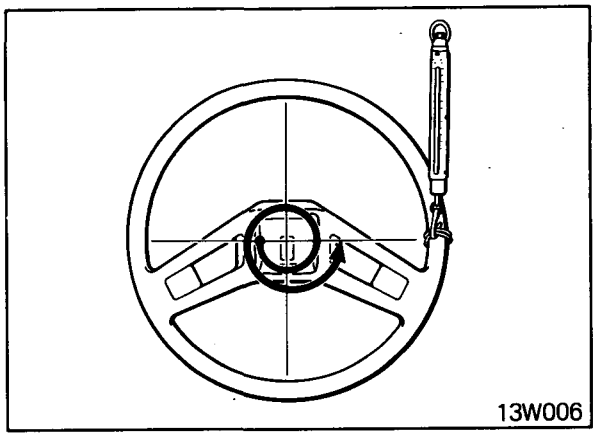


4. If steering wheel free play cannot be adjusted to meet specifications, check the mainshaft or steering linkage ball joint for wear.

CHECKING STATIONARY STEERING EFFORT

1. Position the vehicle on a level surface with the steering wheel in the straight-ahead position.
2. Run the engine at 1,000 rpm.
3. Measure the turning force with a spring scale by turning the steering wheel clockwise and counterclockwise one and a half turns. (13W006)

Stationary steering effort	37 N (8.2 lbs.)



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

CHECKING STEERING WHEEL RETURN TO CENTER

1. To check for the return of steering wheel to center, during a test drive, check the following points.
2. Make both gentle and sharp turns and check to get a feel that there is no appreciable difference either in steering effort or return to center between right and left turns.

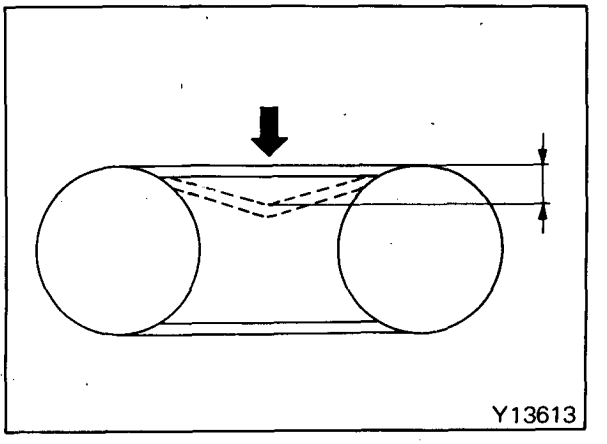
NOTE
When the steering wheel is turned abruptly, momentary hard steering might result, but this does not indicate a problem, since it is caused by low oil pump delivery during idling.

CHECKING POWER STEERING BELT TENSION

1. Check the belt for looseness by applying pressure of 100 N (22 lbs.) to the center of the belt. (Y13613)

V belt deflection	9-12 mm (.35-.47 in.)

2. If the measured value exceeds the standard value, adjust the belt tension.



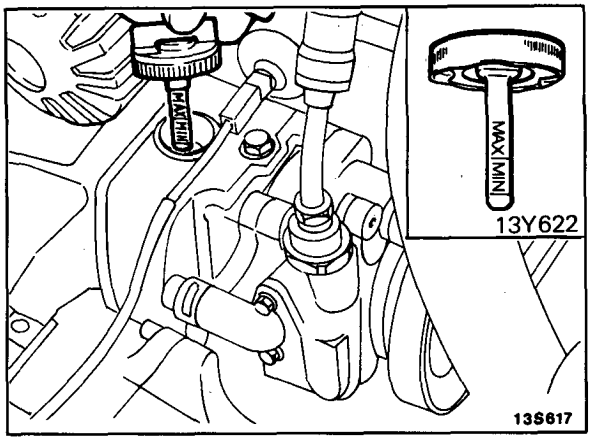
CHECKING FLUID LEVEL

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, and then check the fluid for contamination.

NOTE
Replace the fluid if it has bubbles or is somewhat white in color.

2. Fill the reservoir to the MAX level with the specified automatic transmission fluid. (13Y622, 13S617)

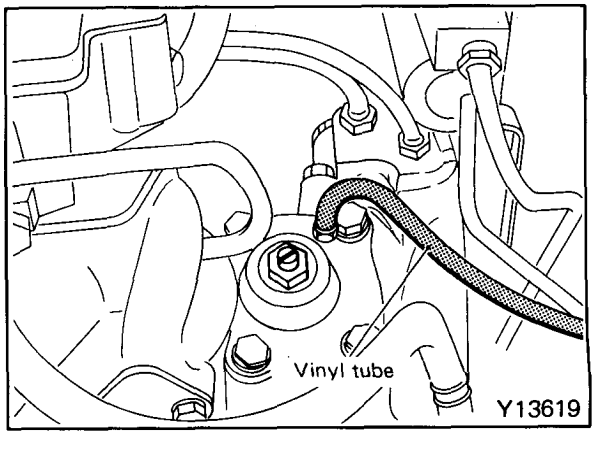
Specified fluid	Automatic transmission fluid ATF DEXRON or DEXRON II type



BLEEDING

Check the stationary steering effort. If it is not within the range of the standard value, it is possible that there is air in the system. Bleed the system.

1. Make certain the reservoir is full.
2. Jack up the front wheels.
3. Disconnect and ground the coil high tension cable.
4. Crank the engine with the starter motor while turning the steering wheel completely to the right and left.
   Repeat several times.
5. Lower the front wheels.
6. Connect one end of a clear vinyl hose to the breather plug on the gear box, and place the other end in a container. Start the engine and run at idle speed.

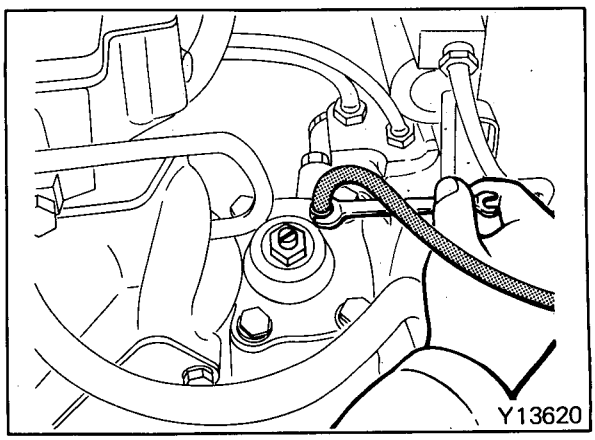


7. Loosen the breather plug and then turn the steering wheel completely to the right and left continuously until air bubbles no longer appear in the fluid coming out of the tube. (Y13620)

NOTE
Do not allow the power steering reservoir to run dry.

8. After bleeding, tighten the breather plug and remove the tube.
9. Check the fluid level, and refill if necessary.

NOTE
When turning the steering wheel completely to the right and left, check that the fluid level fluctuation is less than 4 mm (.16 in.) at a constant temperature.

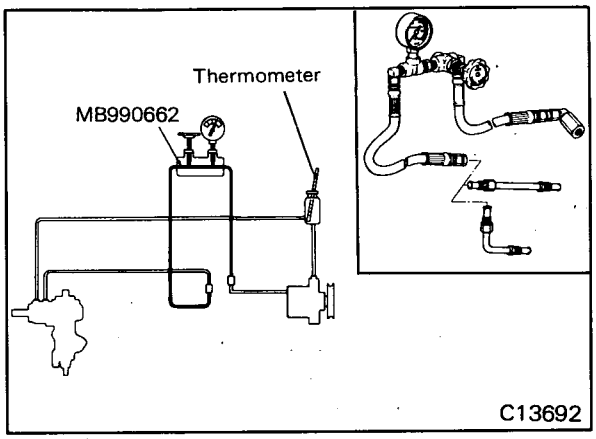


OIL PUMP PRESSURE TEST

1. Disconnect the pressure hose from the oil pump and connect the special tool as illustrated. (C13692)

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 rpm.
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.

If the hydraulic pressure is not within the range of the standard value, replace the oil pump.

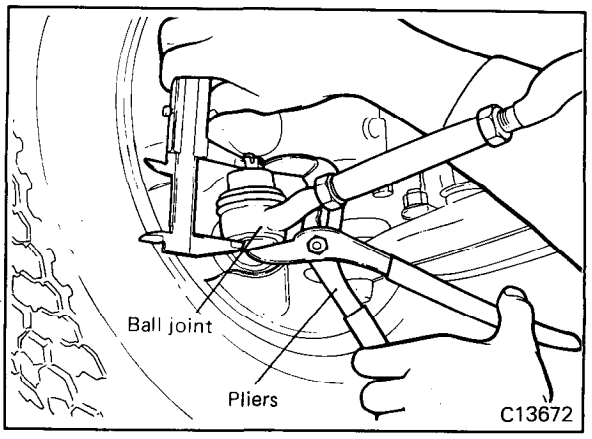
Oil pump pressure	
Valve closed	7,500-8,200 kPa (1,067-1,166 psi)
Valve opened	980 kPa (142 psi) or less

6. 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.
7. 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.

CHECKING BALL JOINT END PLAY

Grip the ball joint with pliers and, compressing the stud fully, measure the deflection.

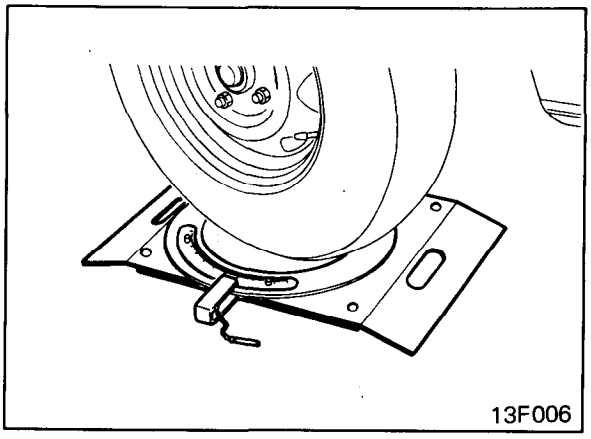
Ball joint end play [Service limit]	1.5 mm (.06 in.)



CHECKING STEERING ANGLE

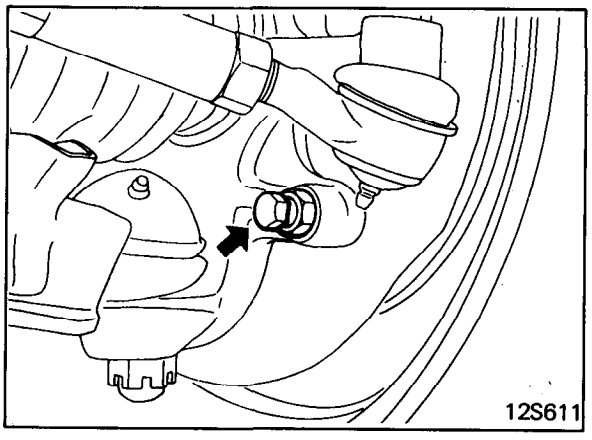
1. Place the front wheel on a turning radius gauge and measure the steering angle.

Steering angle	
Inner wheel	$33°00'^{\ 0}_{-3°}$
Outer wheel	29°00'



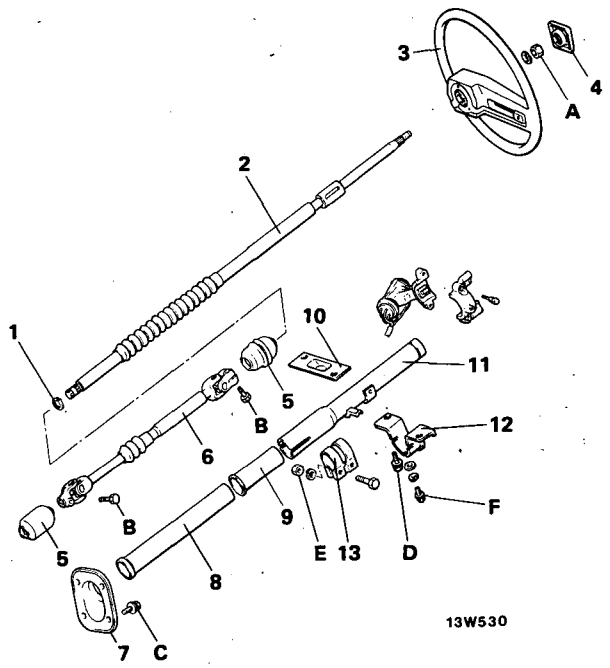
2. Adjust the steering angle of each wheel by turning the stop bolt of the knuckle arm.

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



COMPONENTS

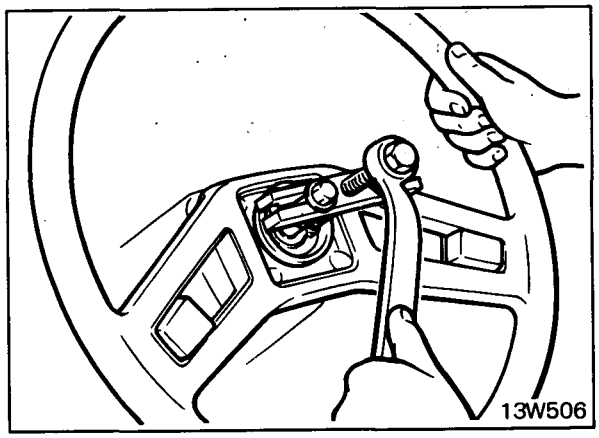
1. Snap ring
2. Steering shaft
3. Steering wheel
4. Center pad
5. Boot
6. Joint assembly
7. Dash panel cover
8. Column tube, lower
9. Column bushing
10. Column support
11. Column tube, upper
12. Column bracket
13. Column tube clamp



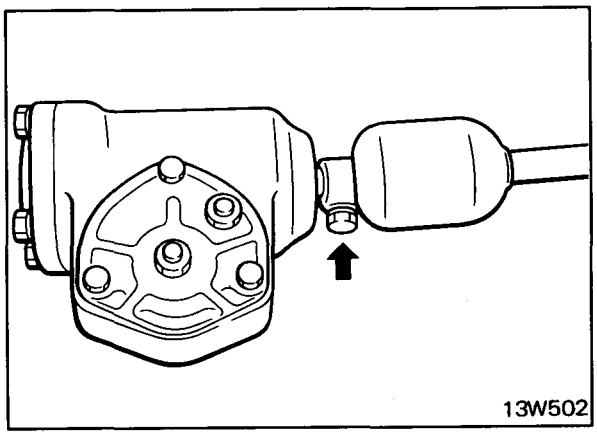
	Nm	ft.lbs.
A	35-45	26-33
B	30-35	22-26
C	3-5	2-4
D	8-12	6-9
E	8-11	6-8
F	8-11	6-8

REMOVAL

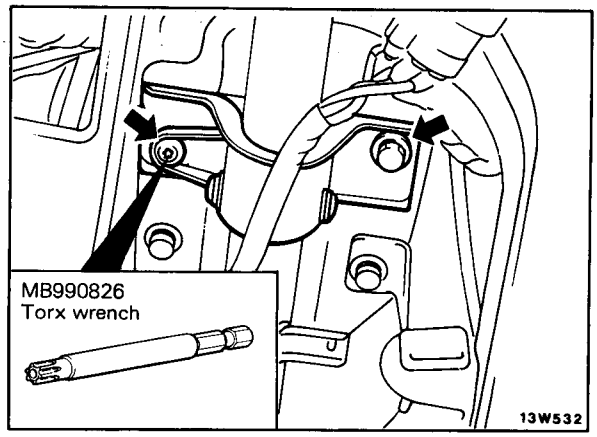
1. Remove the center pad.
2. Remove the steering wheel. (13W506)
3. Remove the instrument cluster.
4. Remove the column cover and then remove the column switch assembly.
5. Remove the heater duct. (Refer to GROUP 24.)
6. Loosen the dash panel cover.



7. Disconnect the joint assembly from the steering gear box.

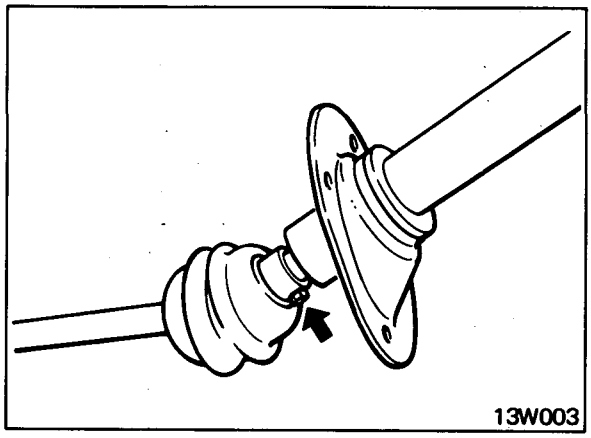


8. Remove the Torx bolt and the clamping bolts of the column support, and remove the steering column assembly.

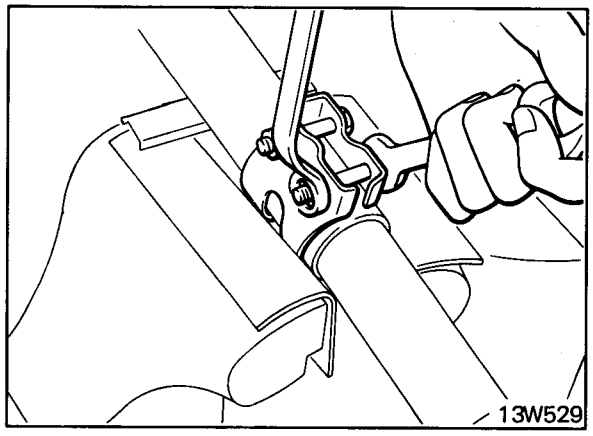


DISASSEMBLY

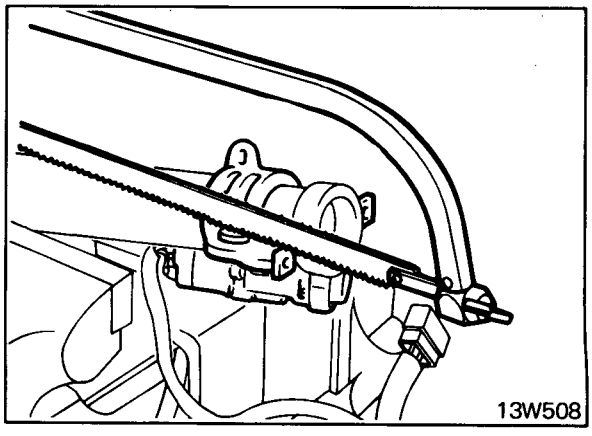
1. Disconnect the joint assembly from the steering shaft.



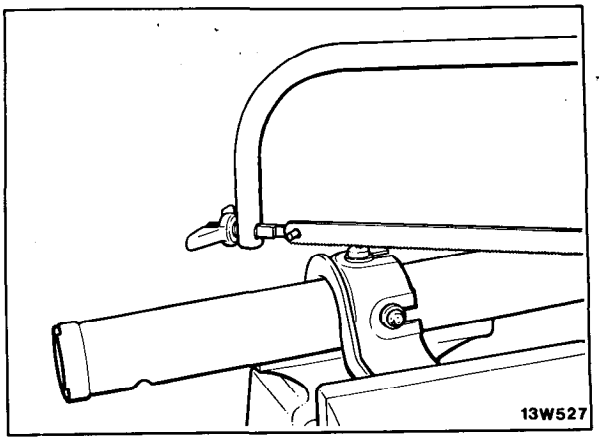
2. Undo the column tube clamp, and then separate the upper column tube from the lower column tube. (13W529)
3. Unlock the steering lock and remove the steering shaft from the lower column tube.
4. Remove the dash panel cover from the lower column tube.



5. 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.



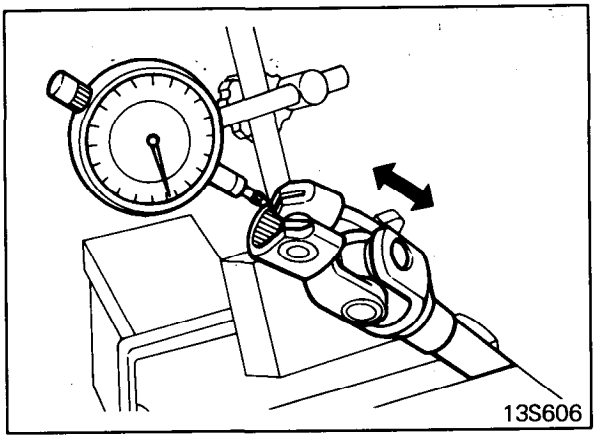
6. If it is necessary to remove the column bracket of the upper tube, cut a groove on the head of each special bolt with a metal saw, and remove the column bracket with a screwdriver.



INSPECTION

1. Check tilt bracket for cracks or damage.
2. Check column bushing for damage.
3. Check dash panel cover for damage.
4. Check steering shaft bearing for wear.
5. Check steering shaft for length, damage and deformation.

Steering shaft runout [Service limit]	0.5 mm (.02 in.)
Steering shaft length [Service limit]	745 (29.33 in.)

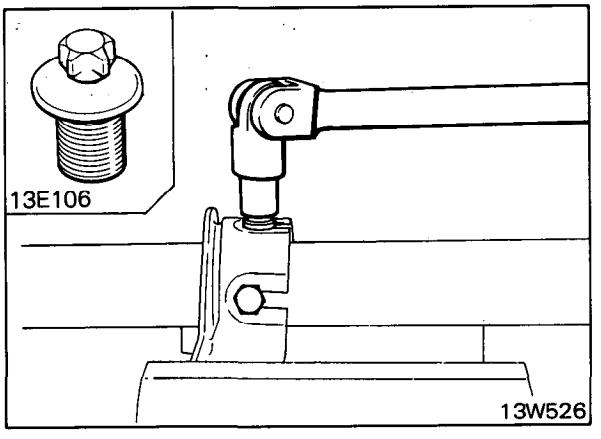


6. Check joint assembly for end play. (13S606)

Joint assembly end play [Service limit]	0.2 mm (.008 in.)

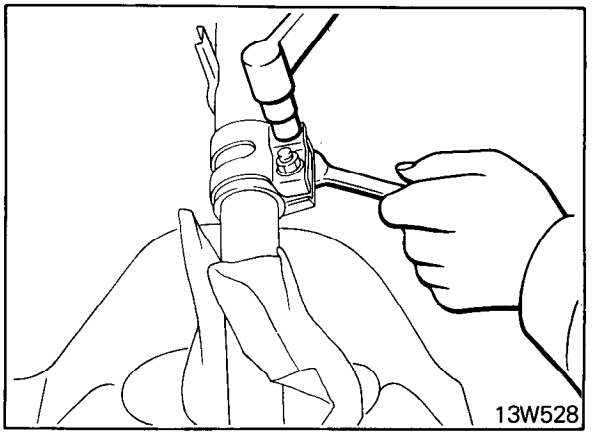
REASSEMBLY

1. When mounting the column bracket onto the column, tighten the special bolts until the heads twist off.

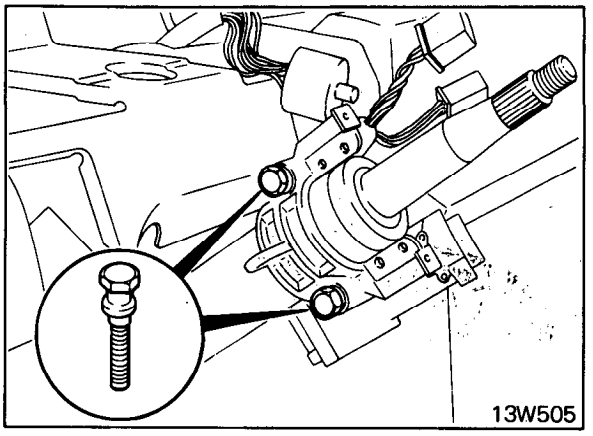


2. Attach the column bushing to the upper and lower column tubes, and then tighten the column tube clamp bolts to the specified torque. (13W528)

Column tube clamp bolts tightening torque .....
8-11 Nm (6-8 ft.lbs.)


13W528

3. When installing the steering lock onto the column, install it loosely in alignment with the column boss and check that it works properly, and then tighten the special bolts until the heads twist off. (13W505)


13W505

4. Apply the specified multipurpose grease to the dash panel cover grommet. (13S620)

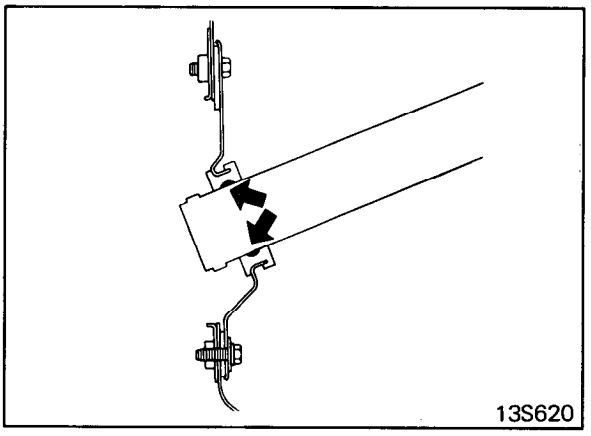
Recommended multipurpose grease .....
SAE J310a, NLGI grade #2

INSTALLATION

1. Loosely connect the joint assembly to the steering shaft and to the steering gear box.

Caution
Install the boot with the bellows toward the steering column. Also, be sure that the boots are not damaged by the bolts when the joint assembly is installed.

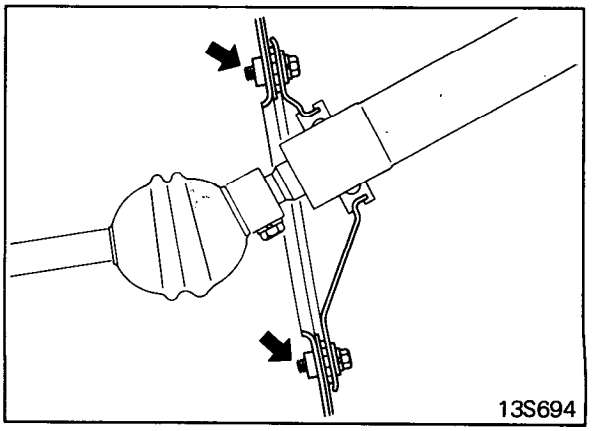
2. Install the column assembly to pedal support.
3. Tighten the joint assembly bolt.
4. Attach the dash panel cover and apply sealant around the bolt holes. (13S694)


13S620

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.

5. Position the front wheels in the straight-ahead position and install the steering wheel.
6. Tighten the steering wheel lock nut to the specified torque.

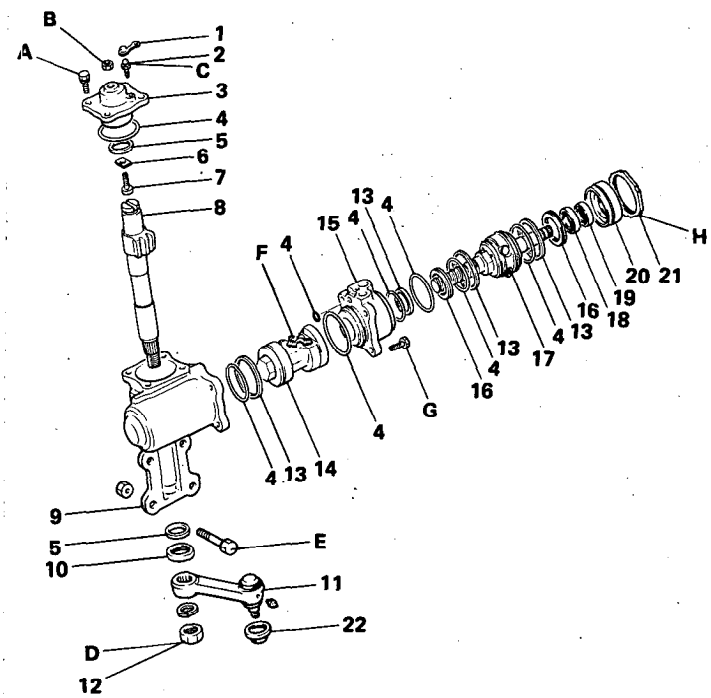
Steering wheel lock nut tightening torque .....
35-45 Nm (26-33 ft.lbs.)


13S694

NOTE
Check to be sure that when the steering wheel is turned clockwise or counterclockwise and returned, the turn signal is automatically released.

COMPONENTS

1. Breather plug cap
2. Breather plug
3. Side cover
4. O-ring
5. U-packing
6. Adjusting plate
7. Adjusting bolt
8. Cross-shaft
9. Gear box housing
10. Oil seal
11. Pitman arm
12. Nut
13. Seal ring
14. Rack piston
15. Valve housing
16. Needle thrust bearing
17. Mainshaft
18. Ball bearing
19. Oil seal
20. Top cover
21. Valve housing lock nut
22. Dust cover

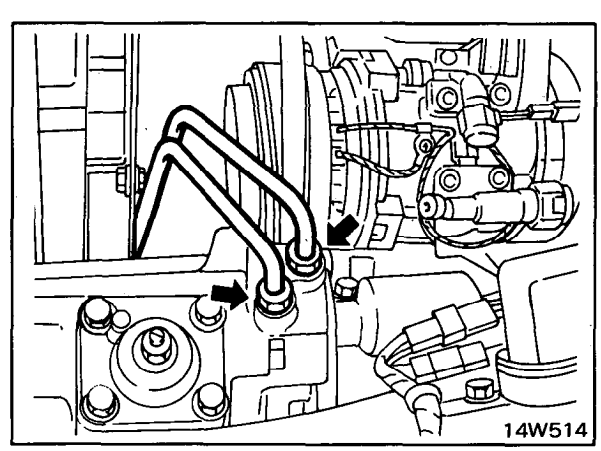


	Nm	ft.lbs.
A	45-55	33-40
B	30-45	22-33
C	3.0-4.0	2-3
D	130-150	94-108
E	55-65	40-47
F	3.5-4.5	2.5-3.3
G	45-55	33-40
H	180-230	130-166

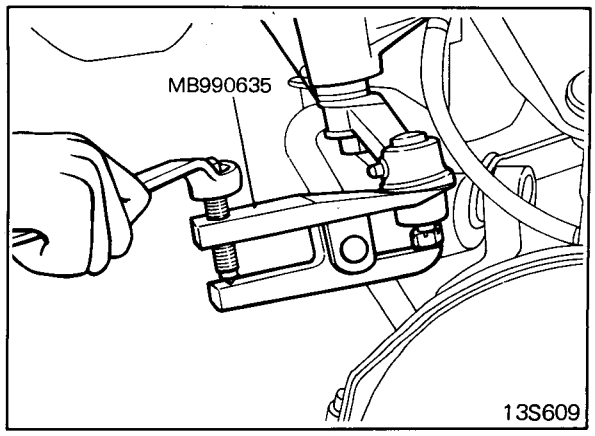
13W521

REMOVAL

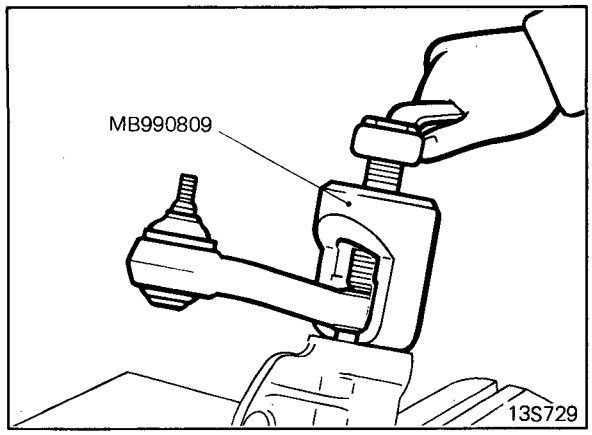
1. Remove the clamp bolt which connects the joint assembly to the gear box mainshaft.
2. Disconnect the pressure hose and return hose from the gear box. (14W514)



3. Disconnect the pitman arm from the relay rod with the special tool shown in the illustration.



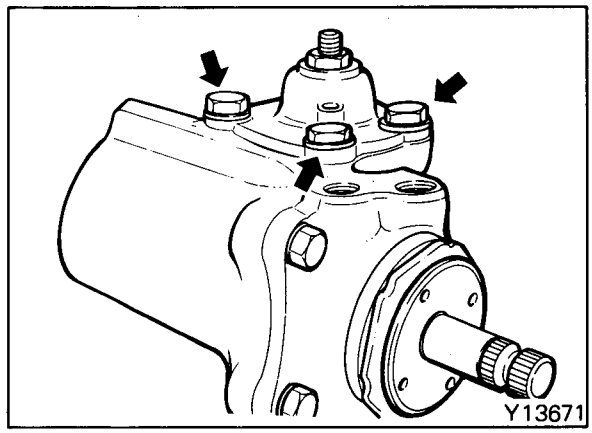
4. Remove the gear box assembly.
5. Remove the pitman arm from the gear box assembly with the special tool shown in the illustration. (13S729)



SEALS REPLACEMENT

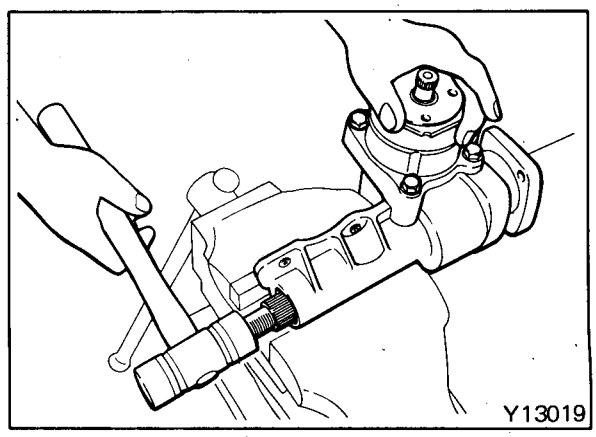
Side Cover and Gear Box Housing

1. Place the mainshaft and cross-shaft in the straight-ahead position.
2. Remove the breather plug, and drain off the steering gear oil.
3. Remove the side cover attaching bolts. (Y13671)
4. Remove the lock nut of the adjusting bolt, and screw in the adjusting bolt so that the side cover rises slightly.

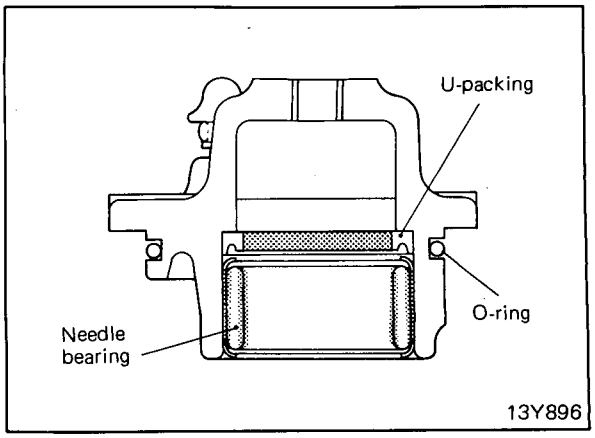


5. Tap the bottom of the cross-shaft with a plastic hammer to remove the cross-shaft and the side cover. (Y13019)
6. Remove the side cover from the cross-shaft by turning the adjusting bolt.

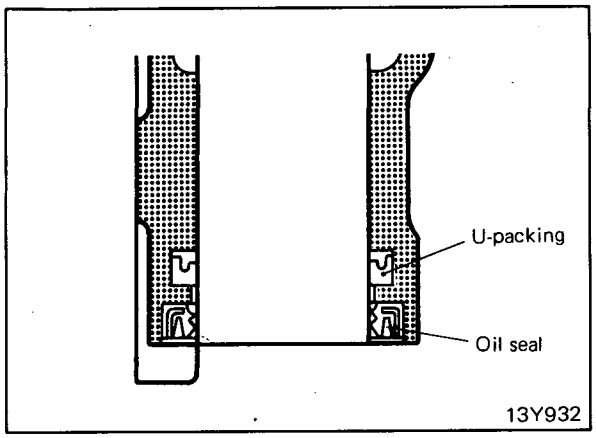
Caution
Do not lose the needle bearing rollers.



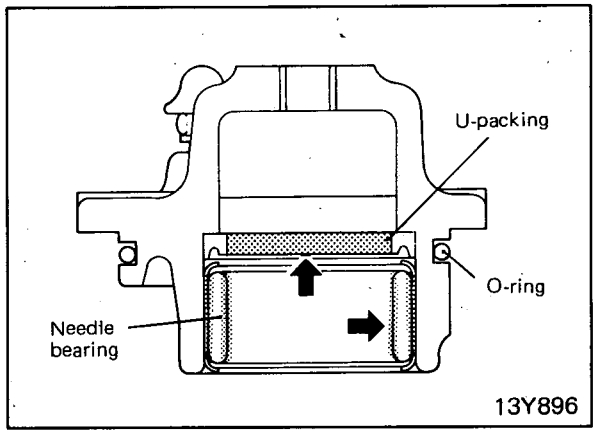
7. Remove the needle rollers from the side cover. (13Y896)
8. Remove the O-ring and U-packing from the side cover.



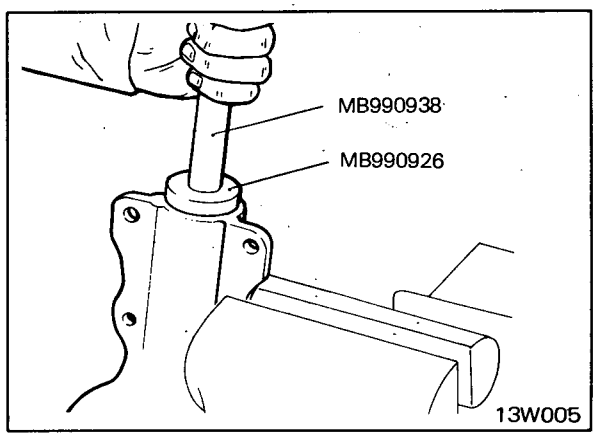
9. Remove the oil seal and U-packing from the gear box housing.



10. Apply specified multipurpose grease to the seal surface of the U-packing and fit it into the side cover. (13Y896)
11. Apply specified automatic transmission fluid to the O-ring, and attach it to the side cover.
12. Install the needle rollers into the side cover.
13. Apply specified multipurpose grease to the needle rollers.

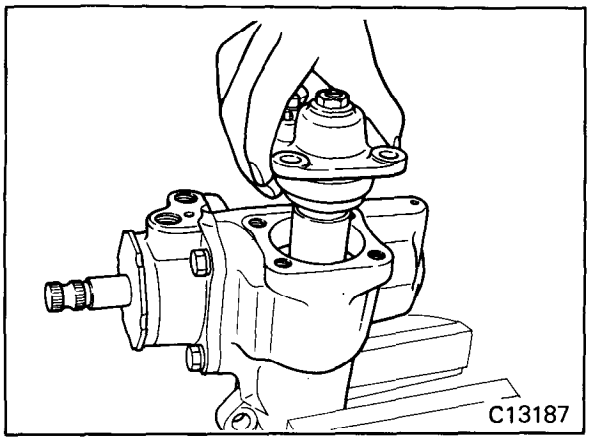


14. Apply specified multipurpose grease to the seal surface of the U-packing, and fit it into the gear box housing.
15. Apply specified automatic transmission fluid to the oil seal lip, and press it into the gear box housing with the special tools. (13W005)



16. Attach the side cover to the cross-shaft and temporarily tighten the adjusting bolt lock nut.
17. Install the cross-shaft assembly (with the side cover) to the gear box. (C13187)

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



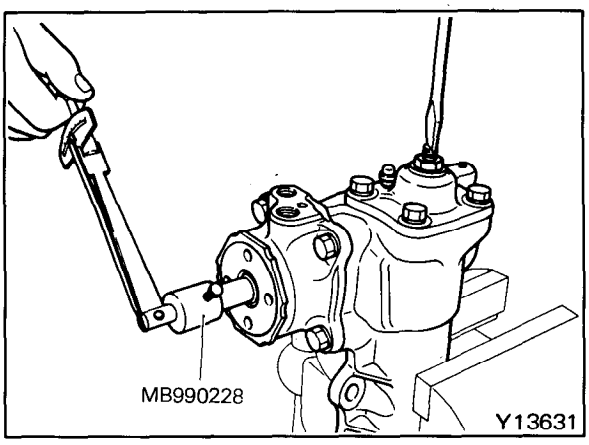
18. While turning the adjusting bolt, measure the mainshaft total starting torque by using the special tool. (Y13631)

Mainshaft total starting torque	50-90 Ncm (4-8 in.lbs.)

NOTE
Position the mainshaft in the center position during measurement.

19. Tighten the adjusting bolt lock nut to the specified torque.

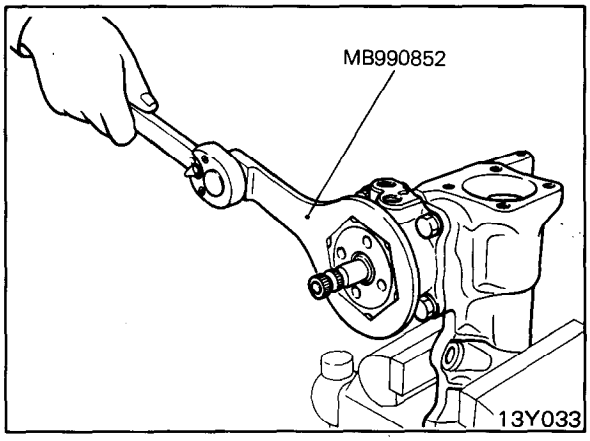
Lock nut tightening torque	30-45 Nm (22-33 ft.lbs.)



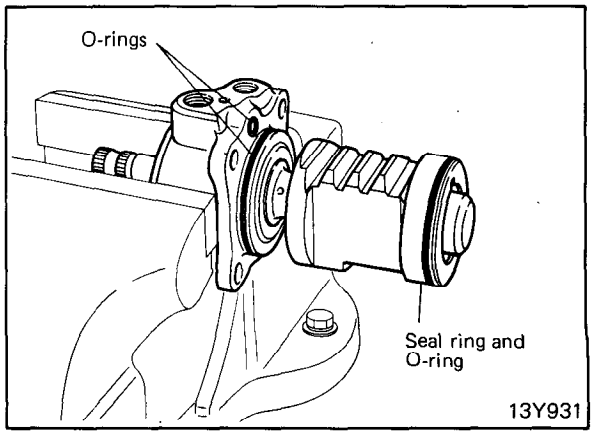
Valve Housing and Top Cover

1. Remove the cross-shaft assembly. (Refer to p. 19-19.)
2. Remove the valve housing lock nut with the special tool as illustrated. (13Y033)
3. Remove the valve housing bolts and remove the valve housing and rack piston while holding the rack piston by hand to avoid rotation.

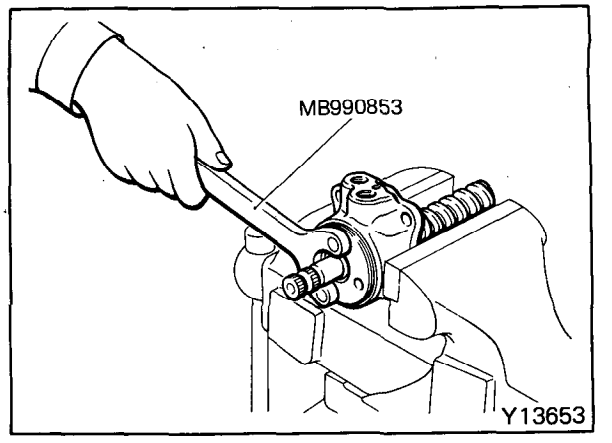
Caution
Do not hold housing with rack piston facing downward, otherwise the rack piston will fall off, scattering the steel balls.



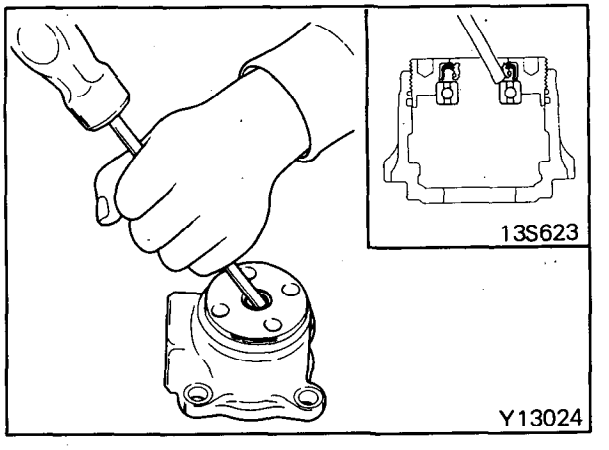
4. Remove the O-ring and seal ring from the rack piston and remove O-rings from the valve housing.



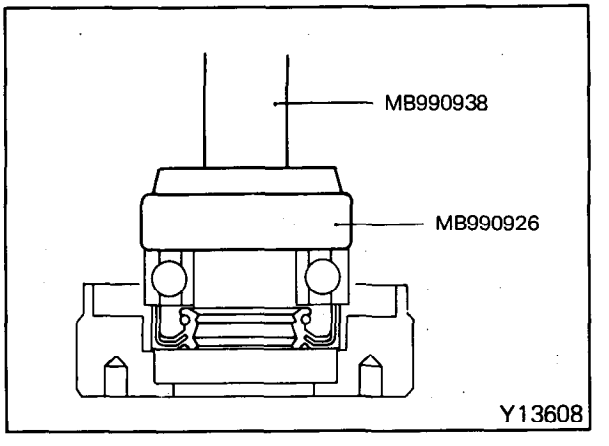
5. Remove the top cover from the valve housing with the special tool.



6. Remove the ball bearing and the oil seal with a punch.

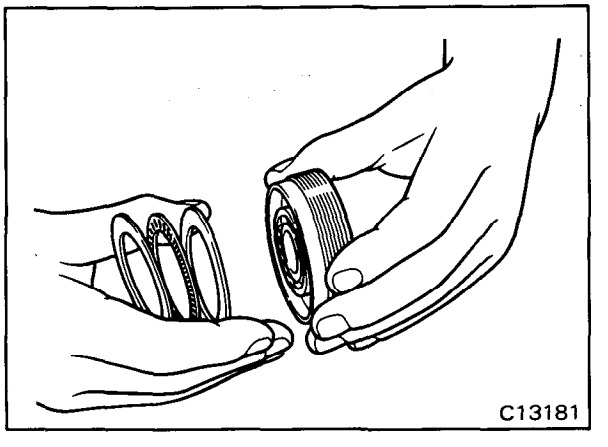


7. Apply specified multipurpose grease to the new oil seal, then press the oil seal and ball bearing into the top cover with special tools.

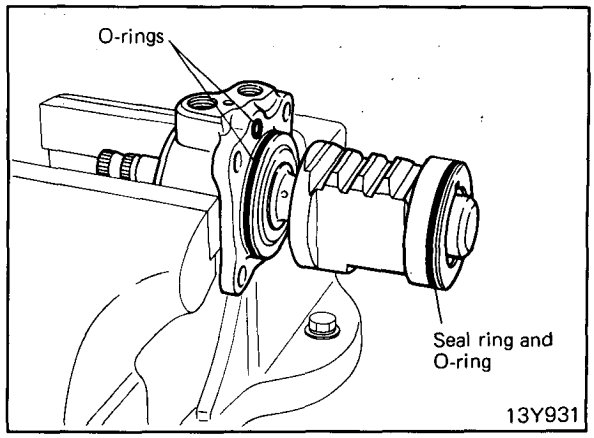


8. Install the thinner thrust plate, needle thrust bearing and thicker thrust plate into the top cover in the order shown in the illustration. (C13181)
9. Attach the top cover to the valve housing.

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

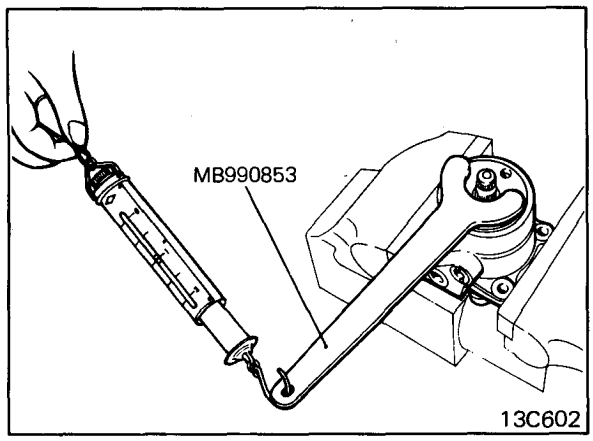


10. Apply specified automatic transmission fluid to the new O-rings and new seal ring, then install them onto the rack piston and valve housing.



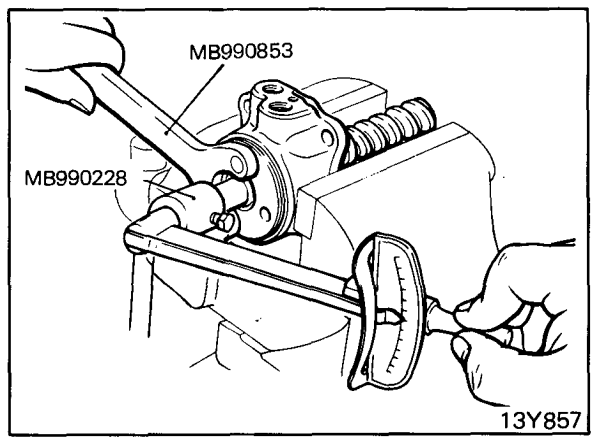
11. In order to fit in the assembly parts, use the special tool and a spring scale, and tighten the top cover until the force becomes 62-83 N (14-19 lbs.). Then turn the top cover lock nut until the force becomes 0 N (0 lbs.).

Caution
After tightening the top cover lock nut, rotate the mainshaft to confirm that there is no binding or abnormal noise.



12. Measure the mainshaft starting torque with the special tools as illustrated. (13Y857)
13. Tighten the top cover until the mainshaft starting torque is 20-30 Ncm (1.8-2.7 in.lbs.) greater than the measured value.

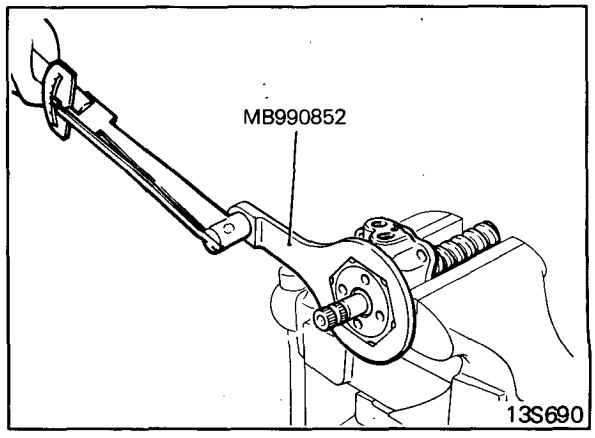
NOTE
Tighten the top cover gradually while measuring the starting torque.



14. Tighten the valve housing lock nut to the specified torque with the special tool as illustrated.

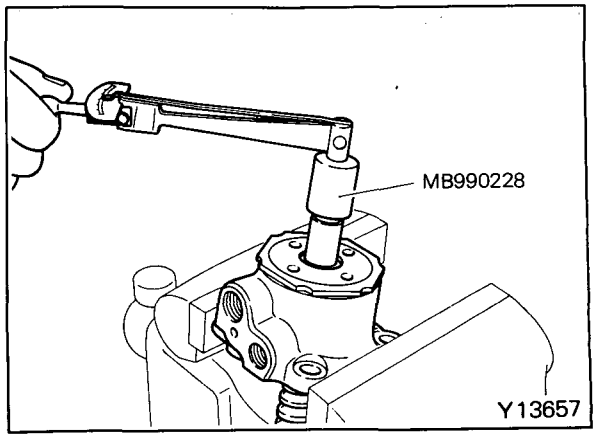
Lock nut tightening torque .....
180-230 Nm (130-66 ft.lbs.)
With special tool attached
135-175 Nm (98-127 ft.lbs.)

Caution
Be sure that the top cover does not turn with the lock nut.



15. Measure the mainshaft starting torque by using the special tools as illustrated. 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.

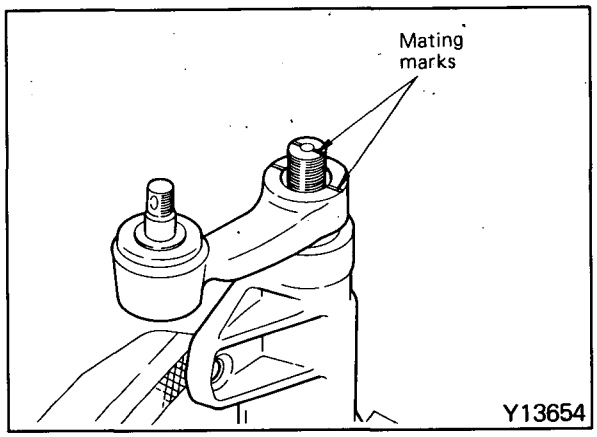
Mainshaft starting torque .....
25-65 Ncm (2-6 in.lbs.)



16. Install valve housing assembly and cross-shaft assembly to the gear box housing.
17. Adjust the mainshaft total starting torque and tighten the adjusting bolt lock nut. (Refer to p. 19-21.)

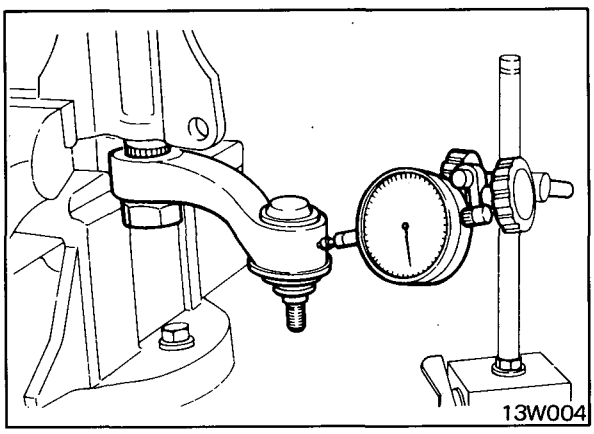
INSPECTION

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



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

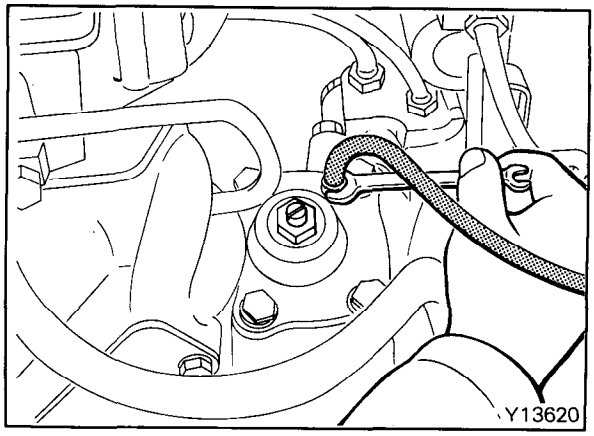
Steering gear backlash [Repair limit] .....
0.5 mm (.02 in.)



INSTALLATION

1. Connect the pressure hose and the return hose to the gear box. (Y13620)
2. Pour specified automatic transmission fluid into the reservoir, and then bleed the system. (Refer to p. 19-11, 12.)
3. Start the engine, run it for approximately five minutes at 2,000 rpm, and then check each seal for oil leakage.

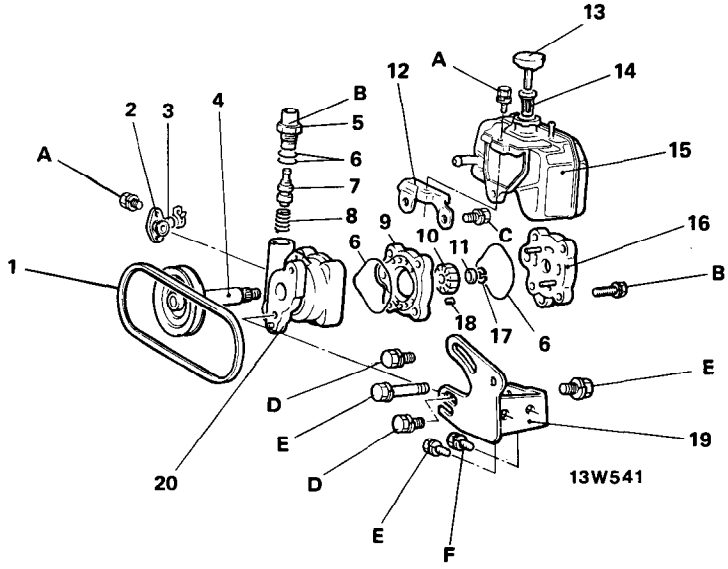
Caution
If the gear box has been disassembled, be sure to check the oil pressure. (Refer to p. 19-12.)



POWER STEERING OIL PUMP

COMPONENTS

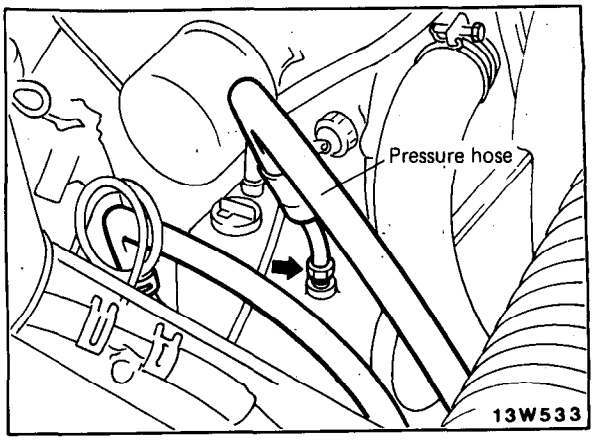
1. Drive belt
2. Suction plate
3. Suction tube
4. Pulley assembly
5. Connector
6. O-ring
7. Flow control valve
8. Flow control spring
9. Cam ring
10. Rotor
11. Collar
12. Reservoir bracket
13. Reservoir cap
14. Oil filter
15. Reservoir
16. Pump cover
17. Snap ring
18. Vanes
19. Oil pump bracket
20. Oil pump body



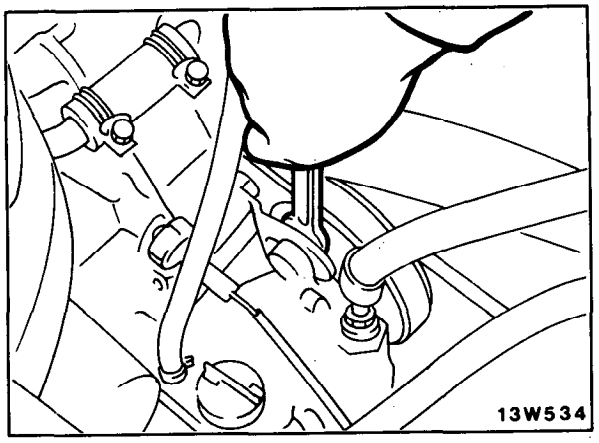
	Nm	ft.lbs.
A	6-10	4-7
B	50-70	36-51
C	18-22	13-16
D	25-33	18-24
E	14-21	10-15
F	27-41	20-30

REMOVAL

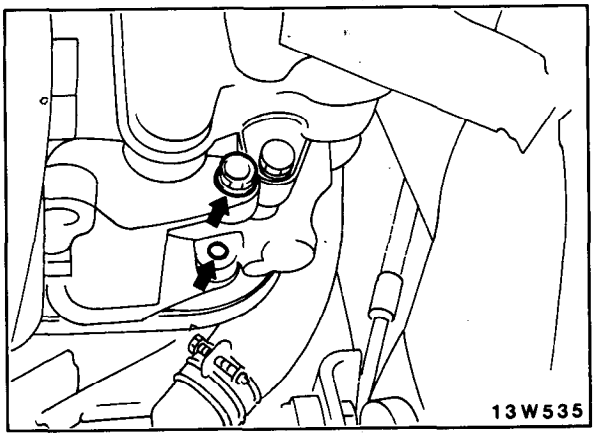
1. Remove the reservoir cap and disconnect the return hose from the reservoir to drain the fluid. (13W533)
2. Jack up the front of the vehicle and support it with floor stands.
3. Disconnect the coil high tension cable and crank the engine over serveral times to drain the fluid from the power steering system.



4. Loosen the brace bolts and lock bolt, and then remove the drive belt. (13W534)
5. Disconnect the pressure hose form the oil pump.

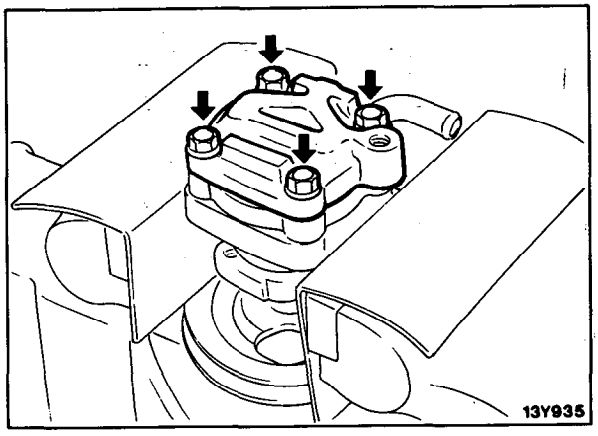


6. Remove the oil pump and reservoir from the bracket. (13W535)

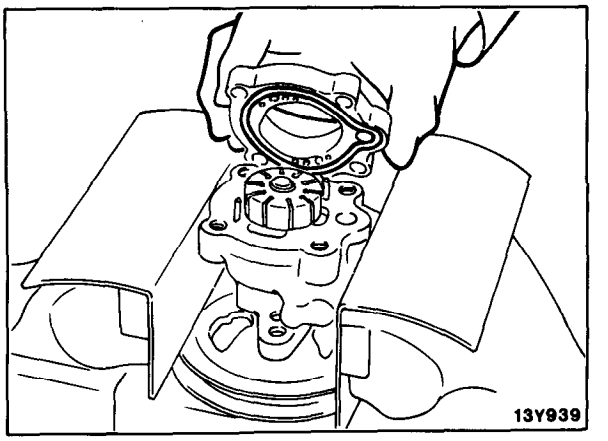


DISASSEMBLY

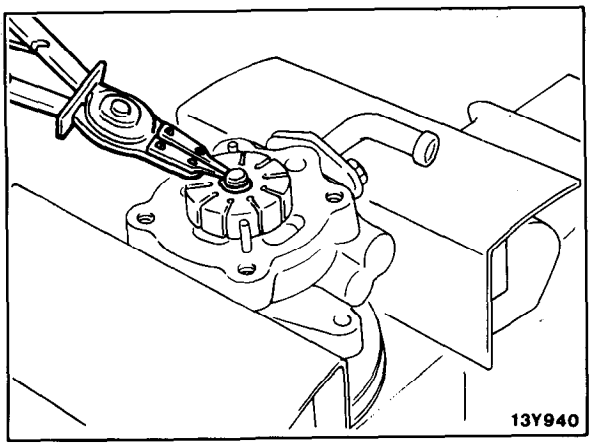
1. Remove the oil pump cover.



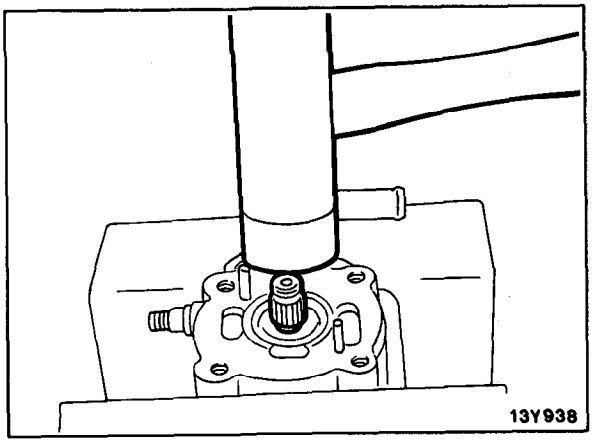
2. Remove the cam ring.
3. Remove the O-rings from the cam ring.
4. Remove the vanes from the rotor.



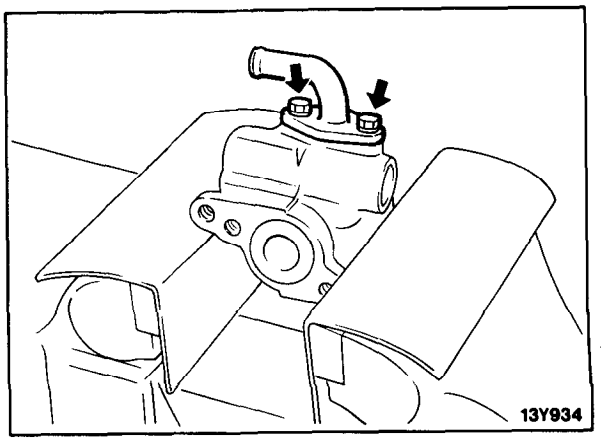
5. Remove the snap ring of the shaft with snap ring pliers and separate the rotor from the shaft.



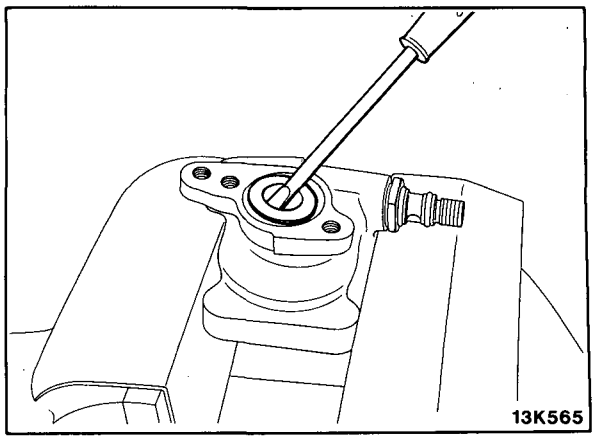
6. Tap the rotor side of the shaft lightly with a plastic hammer, and take out the pulley assembly.



7. Remove the suction connector from the oil pump body.
8. Remove the O-ring from suction connector.

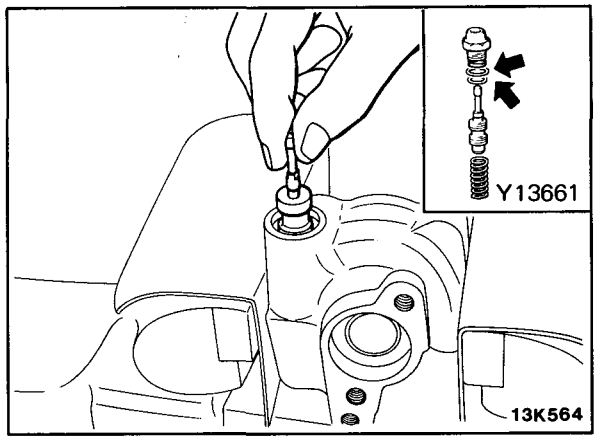


9. Remove the oil seal from the oil pump body.



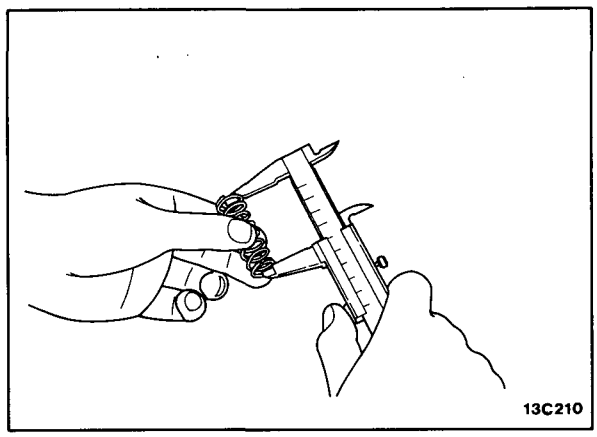
10. Remove the connector from the oil pump body, and take out the flow control valve and flow control spring. (13K564)
11. Remove the O-ring from the connector. (Y13661)

Caution
Do not disassemble the flow contol valve.



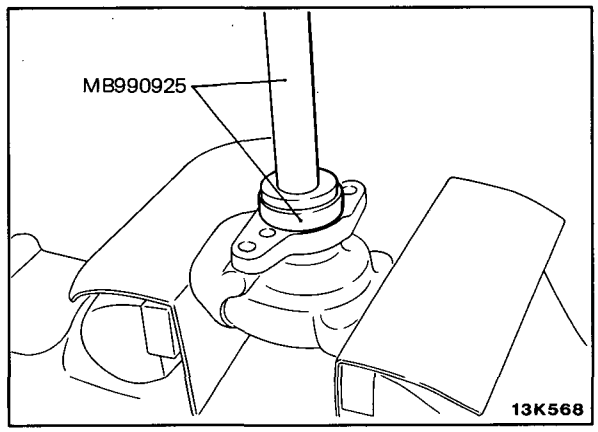
INSPECTION

1. Check flow control spring for spring free length. (13C210)
2. Check flor control valve for clogging.
3. Check pulley assembly for wear or damage.
4. Check V-belt for cracks and deterioration.
5. Check groove of rotor and vane for "stepped" wear.
6. Check contact surface of cam ring and vanes for "stepped" wear.
7. Check vanes for damage.
8. Check contact surface of pump body, and pump cover with rotor for streak-like abrasion.

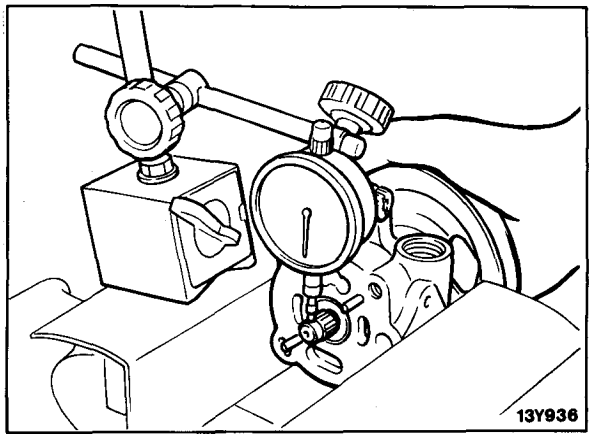


REASSEMBLY

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



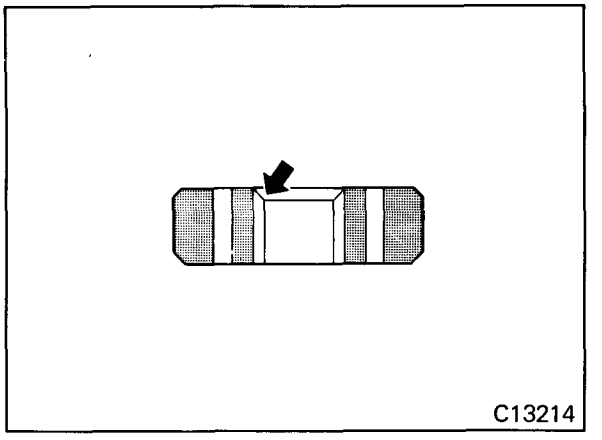
2. Gently move the pulley assembly up and down, and measure the clearance between it and the bushing as illustrated.



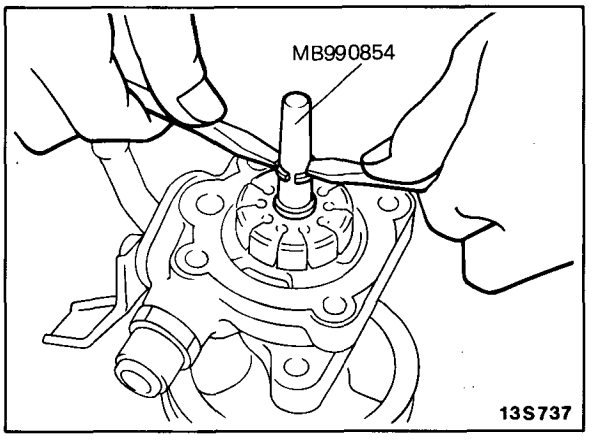
3. Install the rotor to the pulley assembly. When the rotor is to be installed, face the countersunk portion to the pump cover side. (C13214)
4. Apply automatic transmission fluid to the O-rings.

Recommended fluid	Automatic transmission fluid ATF DEXRON or DEXRON II type

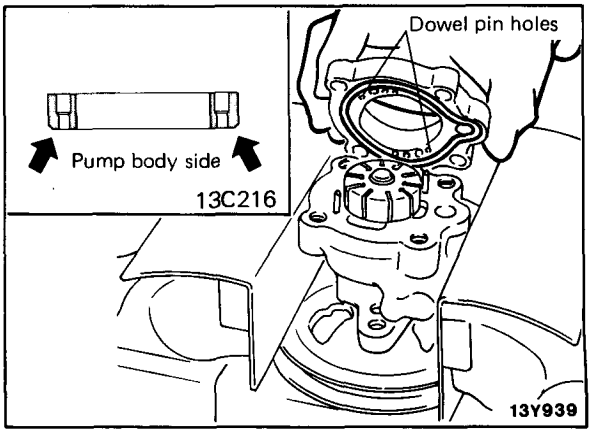
5. Install the O-rings to the cam ring.



6. Install the snap ring with the special tool as illustrated.

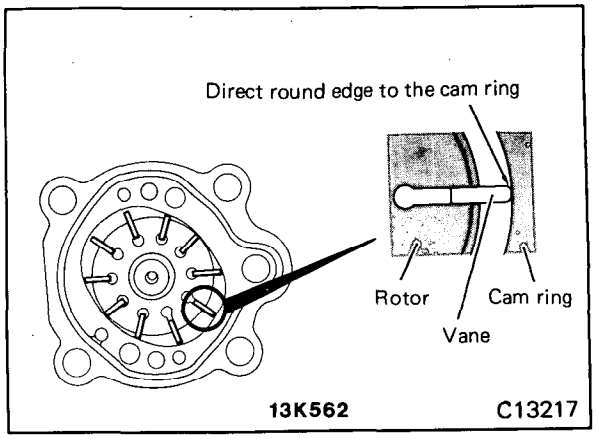


7. Install the cam ring to the pump body. (13C216)
8. Install the cam ring hole shown in the illustration so that it aligns with the dowel protruding from the oil pump body. (13Y939)

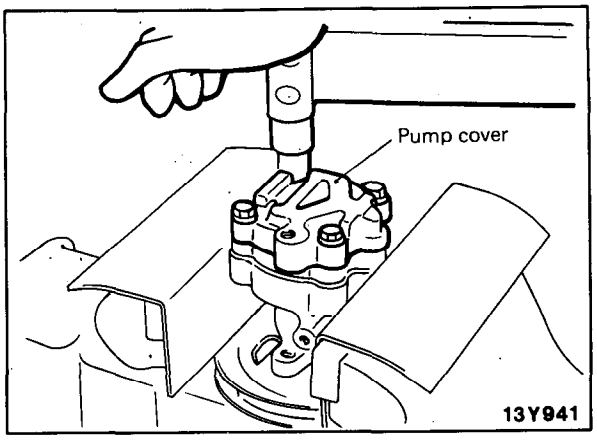


9. Apply automatic transmission fluid to the vanes and install the vanes on the rotor, paying close attention to the installation direction. (C13217)

Recommended fluid	Automatic transmission fluid ATF DEXRON or DEXRON II type



10. Install the pump cover. (13Y941)
11. Apply automatic transmission fluid to the O-ring and install O-ring to the suction connector.
12. Install the suction connector.



INSTALLATION

1. Mount the oil pump onto the oil pump bracket.
2. Install the drive belt, and adjust the deflection. (Refer to p. 19-11.)
3. Connect the pressure hose and return hose to the oil pump.

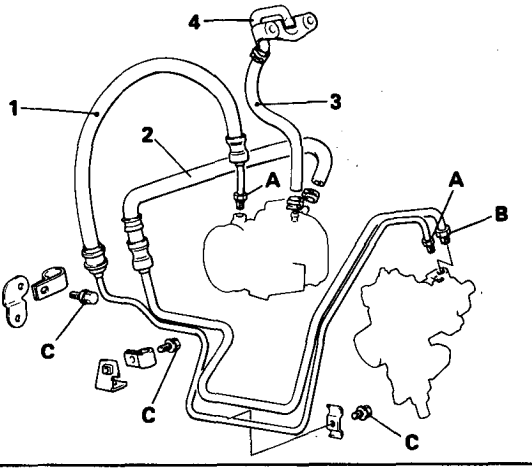
NOTE
Install the hoses so that they are not twisted and so that they do not come in contact with any other parts.

4. Fill with automatic transmission fluid. (Refer to p. 19-11.)
5. Bleed the system. (Refer to p. 19-11.)
6. Check the oil pump pressure. (Refer to p. 19-12.)
7. Torque all parts to specifications during assembly.

COMPONENTS

1. Pressure hose
2. Return hose
3. Breather hose
4. Breather pipe

	Nm	ft.lbs.
A	30-40	22-29
B	40-50	29-36
C	8-12	6-9

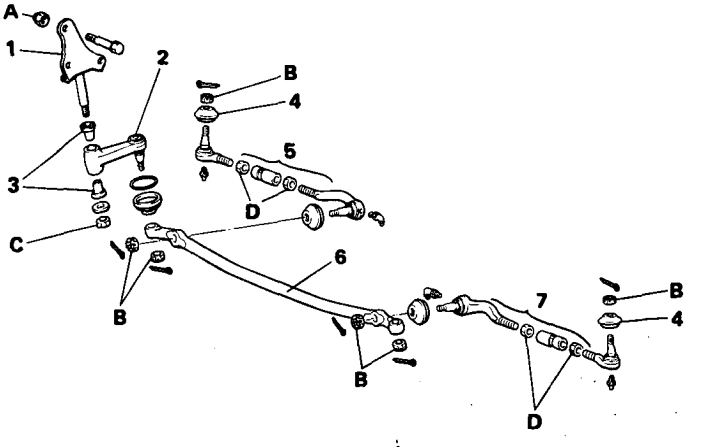


13W524

STEERING LINKAGE

COMPONENTS

1. Idler arm support
2. Idler arm assembly
3. Idler arm bushing
4. Tie rod end dust cover
5. Tie rod assembly, right
6. Relay rod
7. Tie rod assembly, left



	Nm	ft.lbs.
A	55-65	40-47
B	45	33
C	40-60	29-43
D	65-80	47-58

13W518

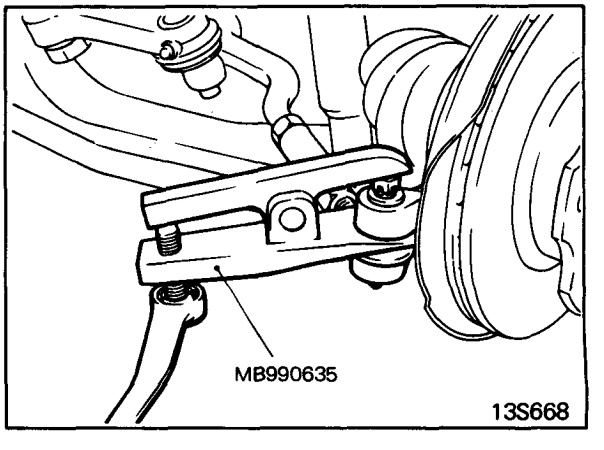
REMOVAL

Tie Rods and Relay Rod

1. Loosen the nut on the ball joint and remove the linkage by using the special tool as illustrated. (13S668)
2. Disassemble the tie rod.

NOTE

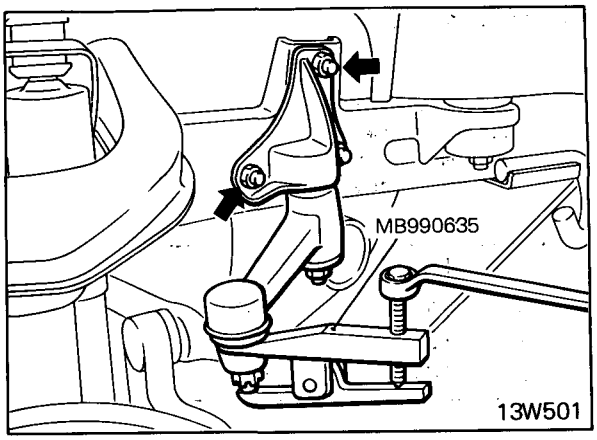
The outer tie rod end is left threaded and the inner tie rod end is right threaded.



13S668

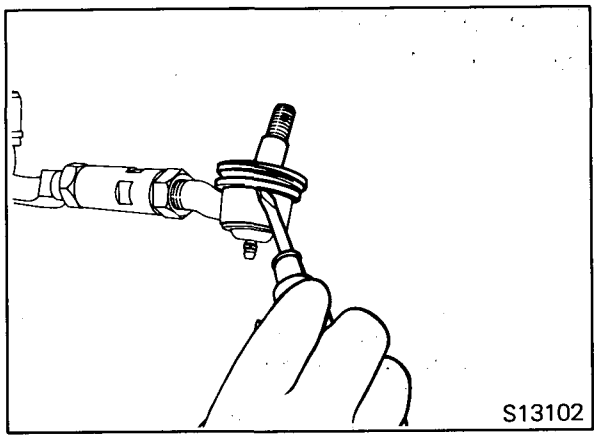
Idler Arm Assembly

1. Detach the relay rod from the idler arm by using the special tool. (13W501)
2. Remove the idler arm assembly. (13W501)
3. Disassemble the idler arm assembly.



Ball Joint Dust Cover

Remove the dust cover and O-ring from the ball joint.



INSPECTION

1. Check idler arm support for damage or deformation.
2. Check idler arm for damage or deformation.
3. Check idler arm bushings for wear or deterioration.
4. Check dust covers and O-rings for damage or deterioration.
5. Check tie rods for damage or deformation.
6. Check relay rod for bends or damage.

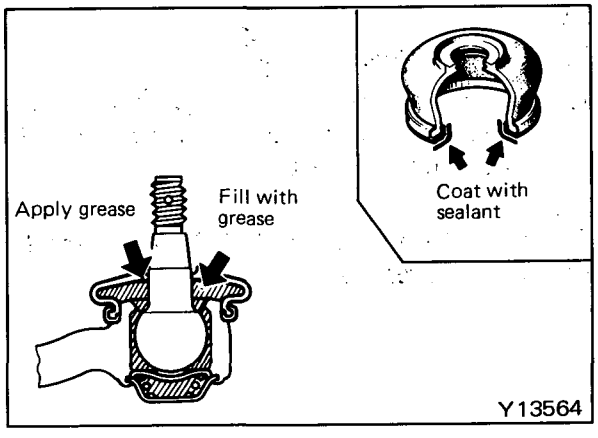
INSTALLATION

Ball Joint Dust Cover

1. Before installing the dust cover, apply the specified multipurpose grease to the cover lip and the interior.

Recommeded multipurpose grease	SAE J310a, NLGI grade #2EP

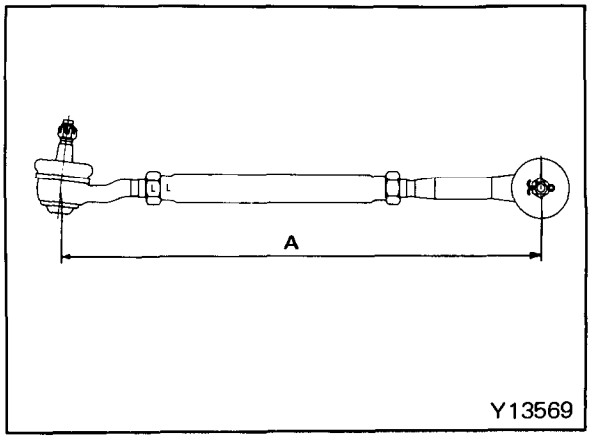
2. Apply packing sealant to the tie rod mounting surface.



Tie Rod

1. Apply the specified multipurpose grease to the threaded portion of the tie rods, and then adjust the tie rod so that the distance between the stud bolts of the tie rod agrees with the standard value. (Y13569)

Tie rod ends ball joint center distance A .....
326.5 mm (12.85 in.)



Caution
Tie rod end tightness, left to right, should be uniform.

2. Connect the tie rod to the steering arm and to the relay rod. Torque to specification and insert cotter pins.
3. Adjust toe-in. (Refer to GROUP 2.)

Idler Arm Assembly

1. Apply a thin coat of the specified multipurpose grease to the arm support and bushings. (13W001)

Recommended multipurpose grease .....
SAE J310a, NLGI grade #2EP

2. Insert the bushings into the idler arm.
3. Insert the support into the idler arm.

NOTE
The washer should be installed with the knurled surface facing the bushing.

4. Measure the turning torque of the idler arm with a spring scale. (S13115)

Idler arm turning torque .....
300-900 Ncm (26-78 in.lbs.)
Turning force (when measured with a spring scale)
25-75 N (5.5-16.5 lbs.)