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GENERAL INFORMATION

Power steering has been adopted in all models. The power steering is responsive to engine speed. The main features are as follows.
Four-spoke steering wheel has been adopted. In addition, a driver SRS airbag is provided as a standard in all vehicles.
The steering column in all vehicles has a shock absorber mechanism and a tilt steering mechanism.
A vane-type oil pump with a fluid flow control system included has been adopted.
The steering gear and linkage is an integral rack and pinion type.

Items		Specifications
Gear box	Steering gear type	Rack and pinion
Oil pump	Oil pump type	Vane type
	Displacement cm^3/rev.	9.6
	Relief set pressure MPa	8.8

SERVICE SPECIFICATIONS

Items		Standard value	Limit
Steering wheel free play mm	with engine stopped	0–10	–
	with engine running	–	30
Steering angle	Inner wheel	37°30' ± 2°	–
	Outer wheel	30°0'	–
Tie rod end ball joint starting torque Nm		0.5–2.5	–
Stationary steering effort N		27 or less	–
Fluctuation allowance N		5.9 or less	–
Oil pump pressure MPa	Oil pump relief pressure	8.8	–
	Pressure under no-load conditions	0.8–1.0	–
	Steering gear holding hydraulic pressure	8.8	–
Power steering pressure switch operating pressure MPa	ON → OFF	3.4–4.4	–
	OFF → ON	1.8–2.4	–
Total pinion preload Nm		0.8–1.6	–
Tie-rod joint swing resistance N		6–20	–
Tie-rod joint swing torque Nm		2–5	–
Oil pump pulley assembly backlash mm		–	0.1

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LUBRICANTS

Items		Specified lubricants	Quantity
Power steering gearbox	Bearing	Automatic transmission fluid DEXRON II ATF	As required
	O-ring		
	Oil seal		
	Special tool (E37M1–6)		
	Pinion and valve assembly seal ring part		
	Bellows	Silicone grease	As required
Oil pump	Power steering fluid	Automatic transmission fluid DEXRON II ATF	0.9 dm^3
	Flow control valve	Automatic transmission fluid DEXRON II ATF	As required
	Friction surface of rotor, vane, cam ring and pump cover		
	O-ring		

SEALANT

Items		Specified sealant and adhesive	Remarks
Power steering gearbox	End plug screw	Loctite 577	Semi-drying sealants
	Power steering rack support cover screw		
	Dust cover lip for tie rod end ball joint		

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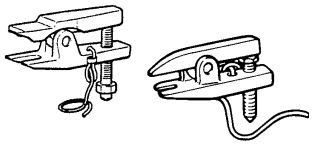
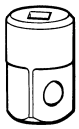
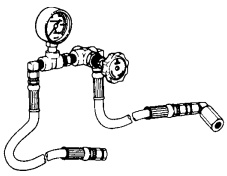
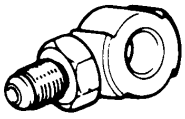
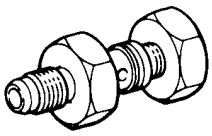
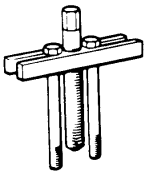
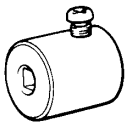
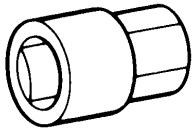
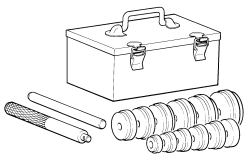
SPECIAL TOOLS

Tool	Tool number and name	Supersession	Application
	MB991113 or MB990635 Steering linkage Puller	13–006	Tie-rod end disconnection
	EMB990326 Preload socket	MB990326	Tie rod end ball joint starting torque check
	MB990662 Oil pressure gauge assembly	E9254A	Oil pump pressure test
	MB990993 or MB991217 Power steering oil pressure gauge adaptor (pump side)	–	Oil pump pressure test
	MB990994 Power steering oil pressure gauge adaptor (hose side)	–	
	MB990803 Steering wheel puller	7245	Steering wheel removal
	MB991006 Preload socket	EMB991006	Pinion shaft preload measurement
	E37M2–2 Torque wrench socket	–	Rack support adjustment Rack support cover removal
	MB990925 Bearing and oil seal installer set	27794	Bearing and oil seal installation

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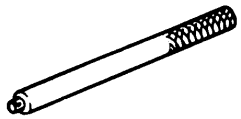
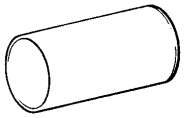
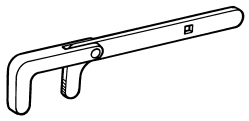
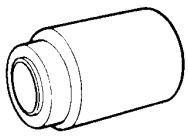
Tool	Tool number and name	Supersession	Application
	MB991197 Rack oil seal installer bar (long type)	–	Oil seal installation
	E37M1–2 Oil seal installer	–	Oil seal installation
	E37M1–6 Rack installer	–	Rack installation
	E37M2–1 Pinion gear seal compressor	–	Seal ring installation
	E37M2–3 Rack bush remover and installer	–	To remove the rack bush circlip
	E37M50–3 Oil seal & bearing installer	–	Oil seal and bearing installation
	E8802-6 Tie rod torque wrench adaptor	–	To remove and replace tie rod on rack
	MB990776 Tie rod end seal installer	E2M44	Dust cover installation
	M16X1.5 tap	–	To re-tap the rack end thread

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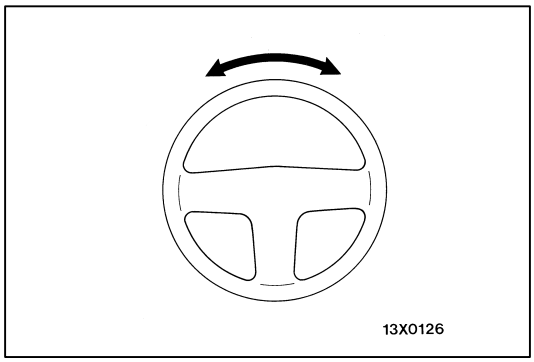


ON-VEHICLE SERVICE

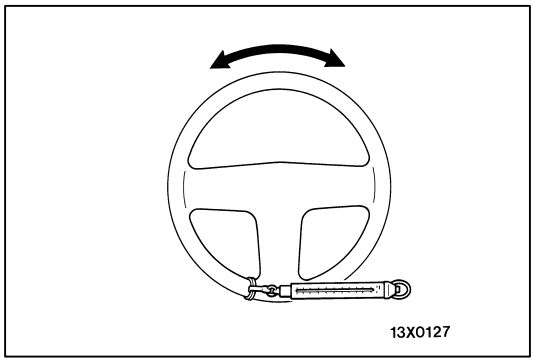
STEERING WHEEL FREE PLAY CHECK

1. With engine running (hydraulic operation), set front wheels straight ahead.
2. Measure the play on steering wheel circumference before wheels start to move when slightly moving steering wheel in both directions.

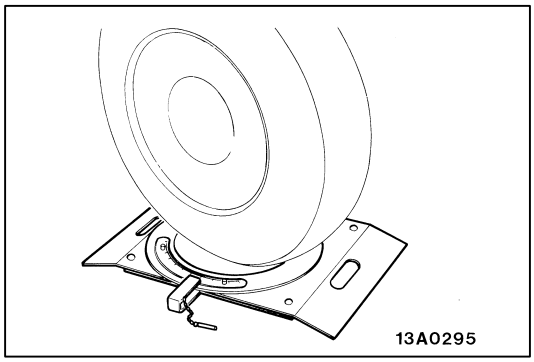
   Limit: 30 mm
3. When play exceeds the limit, check for play on steering shaft connection and steering linkage. Correct or replace.
4. If the free play still exceeds the limit value, set steering wheel straight ahead with engine stopped.
   Load 5 N towards steering wheel circumference and check play.

   Standard value (steering wheel play with engine stopped): 0–10 mm or less

   If the play exceeds the standard value, remove steering gear box and check total pinion torque.



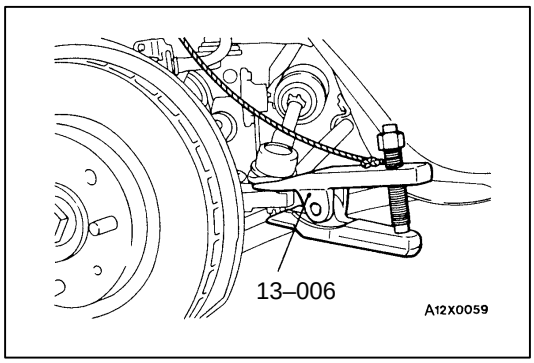
STEERING ANGLE CHECK



1. Locate front wheels on turning radius gauge and measure steering angle.

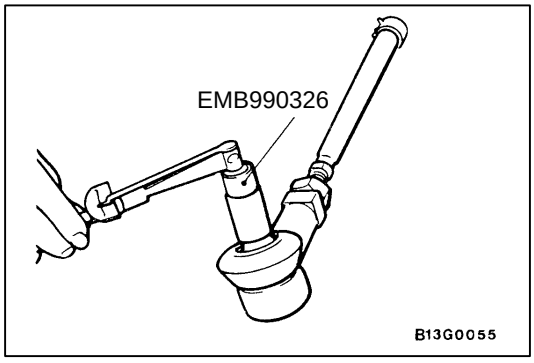
   Standard value:
   Inside wheel: 37°00' ± 2°
   Outside wheel: 30°00'
2. When the angle is not within the standard value, the toe is probably incorrect. Adjust toe (Refer Group 33A.) and recheck steering angle.

TIE ROD END BALL JOINT STARTING TORQUE CHECK



1. Disconnect tie rod and knuckle with special tool.

   Caution
   1. Be sure to tie the cord of the special tool to the nearby part.
   2. Loosen the nut but do not remove it until the tie rod end is separated from the knuckle.



2. Move ball joint stud several times and install nut on stud. Measure ball joint starting torque with special tools.

   Standard value: 0.5–2.5 Nm
3. When the starting torque exceeds the standard value, replace tie rod end.
4. When the starting torque is less than the standard value, check ball joint for excessive end play or binding. If these checks are satisfactory, the joint is still serviceable.

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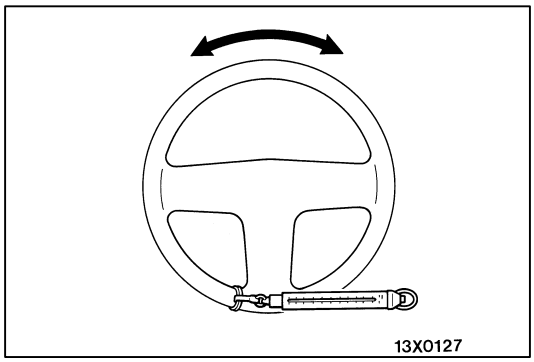


STATIONARY STEERING EFFORT CHECK

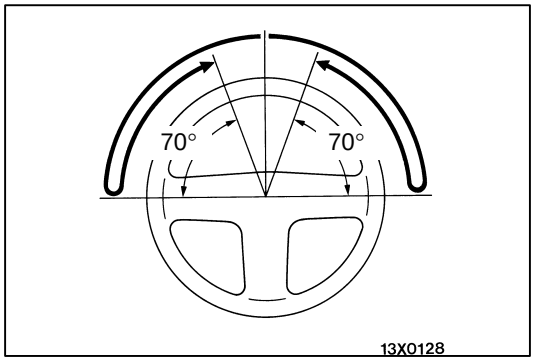
1. With the vehicle stopped on a flat, paved surface, turn the steering wheel to the straight ahead position.
2. Start the engine and set it to 1,000 ± 100 rpm.

   Caution
   After checking, reset the idle speed to the specified idling rpm.

3. Attach a spring balance to the outer circumference of the steering wheel and measure the steering force required to turn the steering wheel from the straight ahead position to the left and right (within a range of 1.5 turns). Also check to be sure that there is no significant fluctuation of the required steering force.

   Standard value:
   Steering effort: 27 N or less
   Fluctuation allowance: 5.9 N or less

4. If the measured force exceeds the standard value, refer to the troubleshooting and make the checks and adjustments described there.

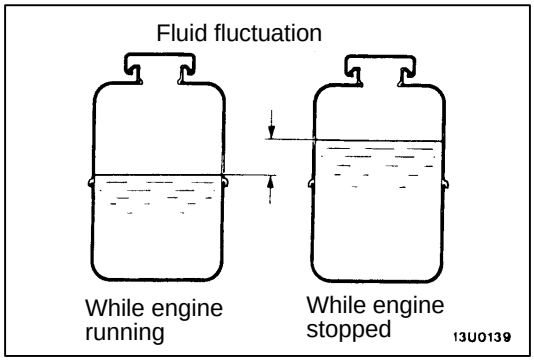


CHECKING STEERING WHEEL RETURN TO CENTRE

To perform this test, conduct a road test and check as follows.

1. Make both gradual and sudden turns and check the steering "feeling" to be sure that there is no difference in the steering force required and the wheel return between left and right turns.
2. At a speed of 20–30 km/h, turn the steering wheel 90°, and release the steering wheel after 1 or 2 seconds. If the steering wheel then returns 70° or more, the return can be judged to the satisfactory.

   NOTE
   There will be a momentary feeling or "heaviness" when the wheel is turned quickly, but this is not abnormal. (This is because the oil pump discharge amount is reduced during idling.)



FLUID LEVEL CHECK

1. Park the vehicle on a flat, level surface, start the engine, and then turn the steering wheel several times to raise the temperature of the fluid to approximately 50–60°C.
2. With the engine running, turn the wheel all the way to the left and right several times.
3. Check the fluid in the oil reservoir for foaming or milkiness.
4. Check the difference of the fluid level when the engine is stopped, and while it is running. If the fluid level changes considerably, air bleeding should be done.

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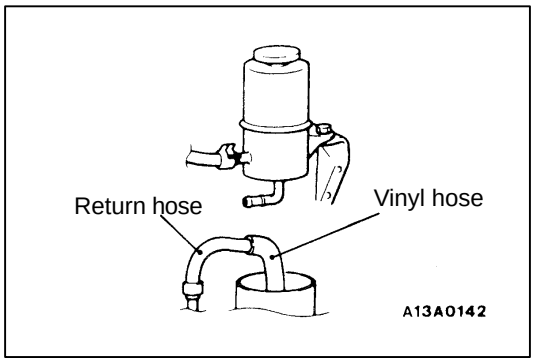

FLUID REPLACEMENT

1. Raise the front wheels on a jack, and then support them with rigid racks.
2. Disconnect the return hose connection.
3. Connect a vinyl hose to the return hose, and drain the oil into a container.
4. Disconnect the connector from the crank angle sensor and then while operating the starter motor intermittently, turn the steering wheel all the way to the left and right several times to drain all of the fluid.
5. Connect the return hoses securely, and then secure it with the clip.
6. Fill the oil reservoir with the specified fluid up to the lower position of the filter, and then bleed the air.

   Specified fluid:
   Automatic transmission fluid DEXRON II ATF

   Caution:
   Do not use ELC–SP2
7. Erase the diagnosis code (generated by step 4) from the MPI system.

BLEEDING

1. Jack up the front wheels and support them by using a rigid rack.
2. Manually turn the oil pump pulley a few times.
3. Turn the steering wheel all the way to the left and to the right five or six time.
4. Disconnect the connector from the crank angle sensor and then, while operating the starting motor intermittently, turn the steering wheel all the way to the left and right five or six times (for 15 to 20 seconds).

   Caution
   1. **During air bleeding, replenish the fluid supply so that the level never falls below the lower position of the filter.**
   2. **If air bleeding is done while engine is running, the air will be broken up and absorbed into the fluid; be sure to do the bleeding only while cranking.**
5. Connect the crank angle sensor connector and then start the engine (idling).
6. Turn the steering wheel to the left and right until there are no air bubbles in the oil reservoir.
7. Confirm that the fluid is not milky, and that the level is up to the specified position on the level gauge.
8. Confirm that there is very little change in the fluid level when the steering wheel is turned left and right.

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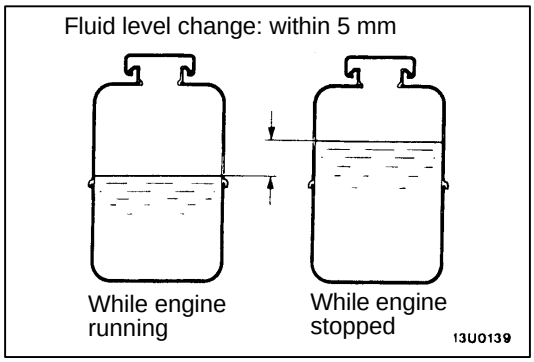
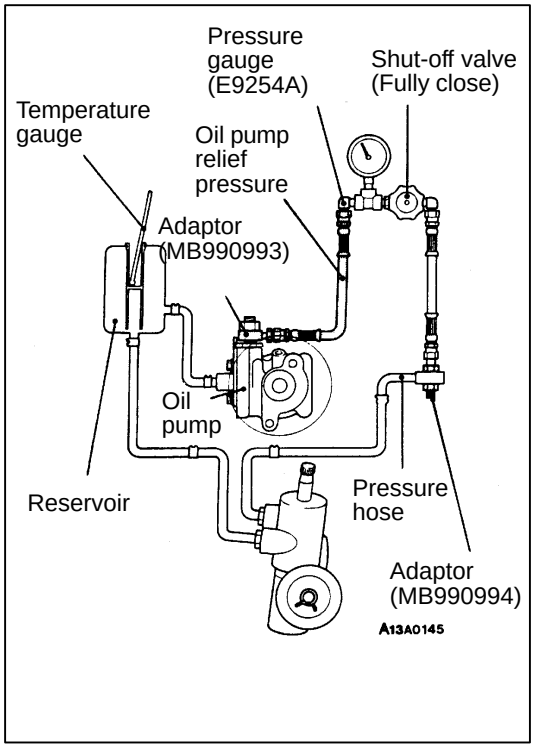


9. Check whether or not the change in the fluid level is within 5 mm when the engine is stopped and when it is running.

Caution

1. **If the change of the fluid level is 5 mm or more, the air has not been completely bled from the system, and thus must be bled completely.**
2. **If the fluid level rises suddenly after the engine is stopped, the air has not been completely bled.**
3. **If air bleeding is not complete, there will be abnormal noises from the pump and the flow-control valve, and this condition could cause a lessening of the life of the pump, etc.**



OIL PUMP PRESSURE TEST

CHECKING THE OIL PUMP RELIEF PRESSURE

1. Disconnect the pressure hose from the oil pump, and then connect the special tools.
2. Bleed the air, and then turn the steering wheel several times while the vehicle is not moving so that the temperature of the fluid rises to approximately 50–60°C.
3. Start the engine and idle it at 1,000 ± 100 rpm.
4. Fully close the shut-off valve of the pressure gauge and measure the oil pump relief pressure to confirm that it is within the standard value range.

   Standard value: 8.3–8.8 MPa

   Caution
   Pressure gauge shut off valve must not remain closed for more than 10 seconds.
5. If it is not within the standard value, overhaul the oil pump.
6. Remove the special tools and then tighten the pressure hose to the specified torque.
7. Bleed the system.

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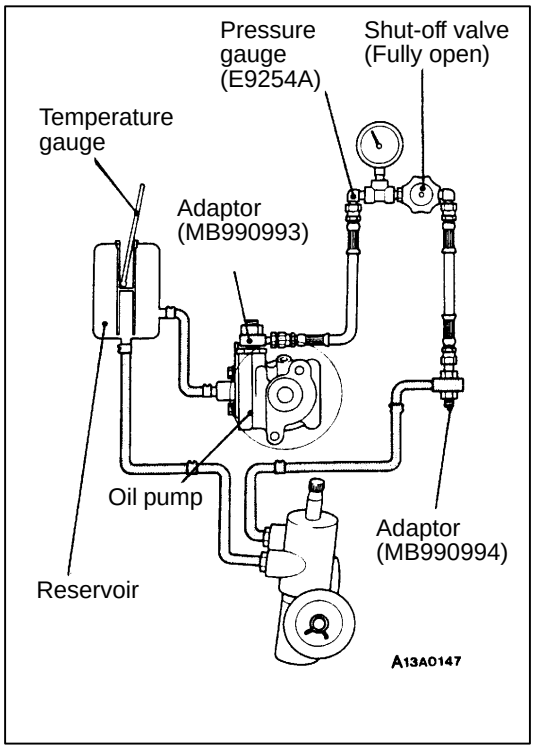
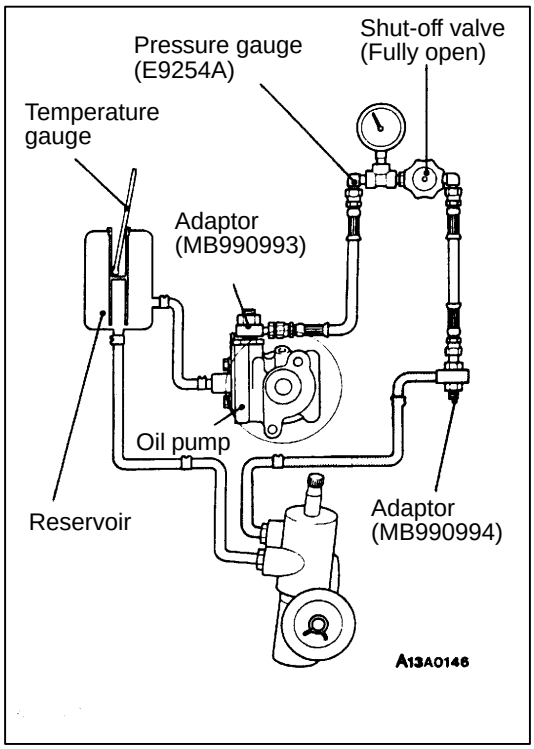


CHECKING THE PRESSURE UNDER NO-LOAD CONDITIONS

1. Disconnect the pressure hose from the oil pump, and then connect the special tools.
2. Bleed the air, and then turn the steering wheel several times while the vehicle is not moving so that the temperature of the fluid rises to approximately 50–60°C.
3. Start the engine and idle it at 1,000 ± 100 rpm.
4. Check whether or not the hydraulic pressure is the standard value when no-load conditions are created by fully opening the shut-off valve of the pressure gauge.

   Standard value: 0.8–1.0 MPa

5. If it is not within the standard value, the probable cause is a malfunction of the oil line or steering gear box, so check these parts and repair as necessary.
6. Remove the special tools, and then tighten the pressure hose to the specified torque.
7. Bleed the system.

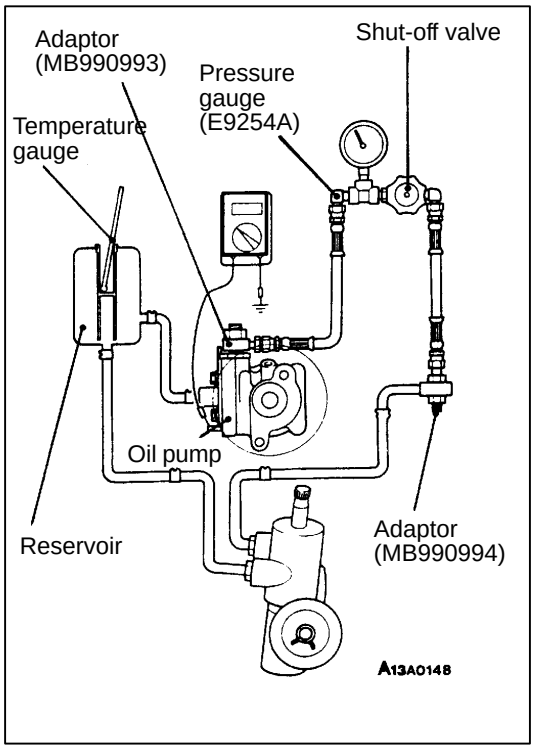


CHECKING THE STEERING GEAR HOLDING HYDRAULIC PRESSURE

1. Disconnect the pressure hose from the oil pump, and then connect the special tools.
2. Bleed the air, and then turn the steering wheel several times while the vehicle is not moving so that the temperature of the fluid rises to approximately 50–60°C.
3. Start the engine and idle it at 1,000 ± 100 rpm.
4. Fully close and fully open the shut-off valve of the pressure gauge.
5. Turn the steering wheel all the way to the left or right; then check whether or not the holding hydraulic pressure is the standard value.

   Standard value: 8.8 MPa

6. When not within the standard value, overhaul the steering gear box.
   Remeasure fluid pressure.
7. Remove the special tools, and the tighten the pressure hose to the specified torque.
8. Bleed the system.



POWER STEERING PRESSURE SWITCH CHECK

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

   Standard value: 3.4–4.4 MPa

6. Gradually open the shut-off valve and reduce the hydraulic pressure; then check whether or not the hydraulic pressure that deactivates the switch is the standard value.

   Standard value: 1.8–2.4 MPa

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

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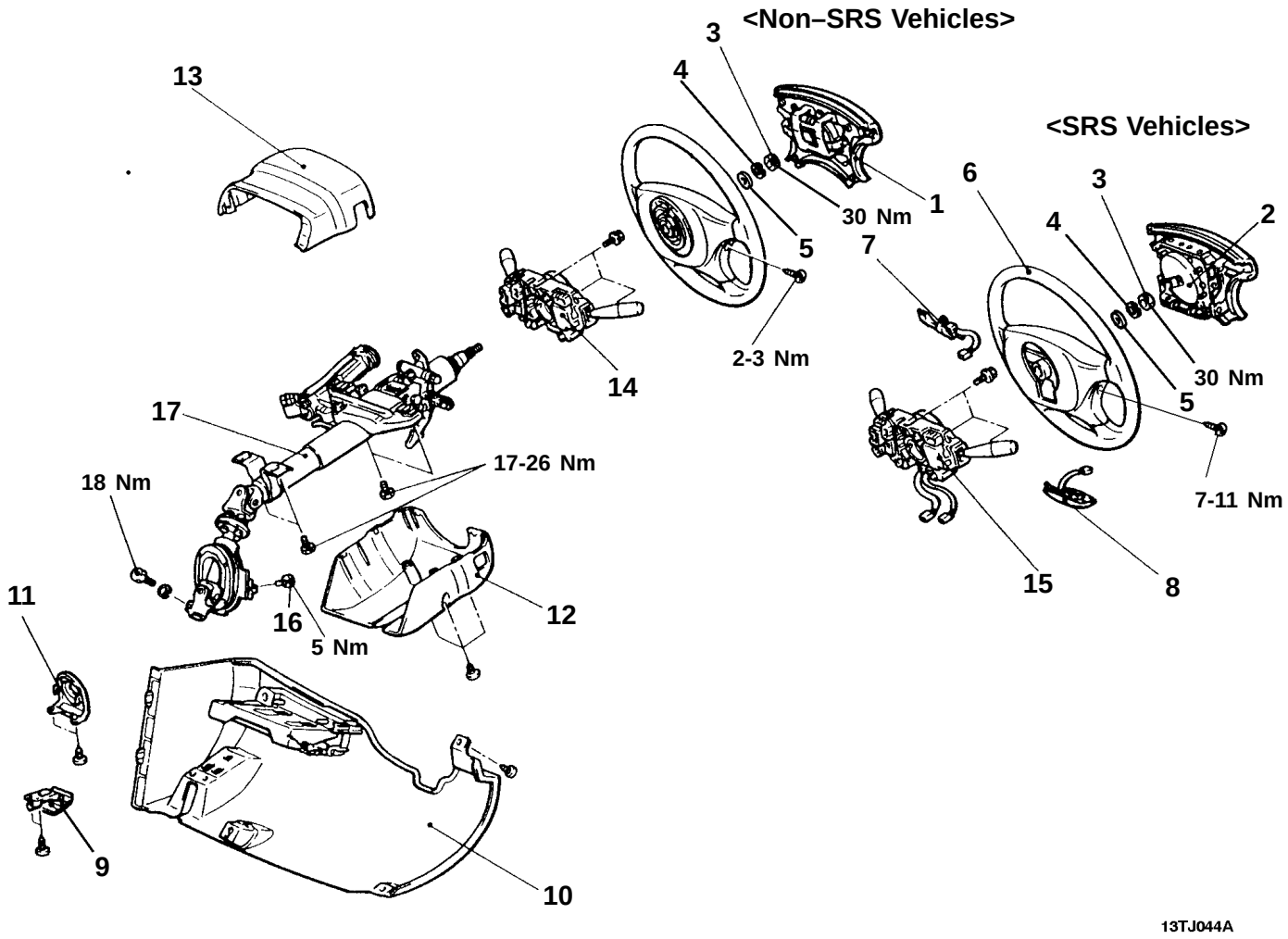
STEERING WHEEL AND SHAFT

REMOVAL AND INSTALLATION

CAUTION: SRS
Before removal of air bag module, refer to:
Group 52B - SRS Service Precautions
Group 52B - Air bag module and clock spring

Post-installation Operation
- Checking Steering Wheel Position with Wheels Straight Ahead



Removal steps

1. Horn pad assembly <Non – SRS vehicles>
2. Air bag module <SRS vehicles> (Refer Group 52B.)
3. Steering wheel retaining nut
4. Spring washer
5. Flat washer
◀A▶ 6. Steering wheel
7. Cruise control switch
8. Remote control switch
9. Hood release handle
10. Instrument panel lower cover
11. Key cylinder panel
12. Lower column cover
13. Upper column cover
14. Column switch assembly
15. Clock spring and column switch assembly (Refer Group 52B.)
16. Retainer mounting bolt
17. Steering column assembly

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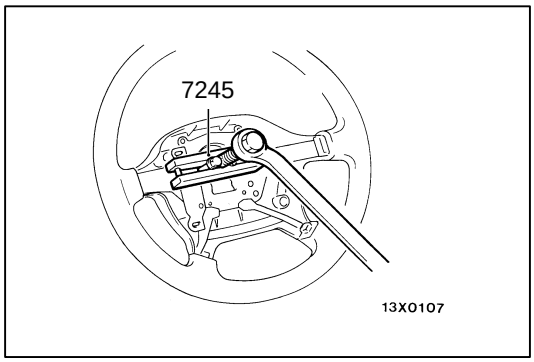
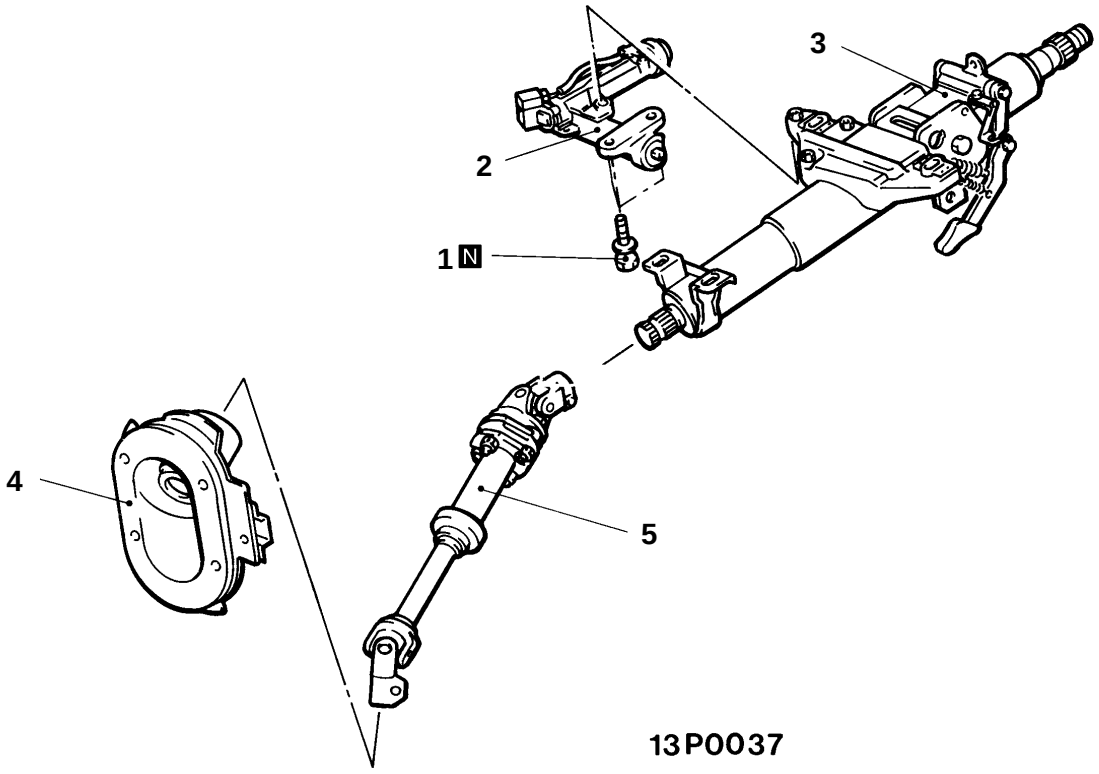


REMOVAL SERVICE POINT

◀A▶ STEERING WHEEL REMOVAL

DISASSEMBLY AND REASSEMBLY



Disassembly steps

◀A▶ ▶A◀ 1. Special bolt
▶A◀ 2. Steering handle lock
3. Steering column assembly
4. Cover assembly
5. Steering joint assembly

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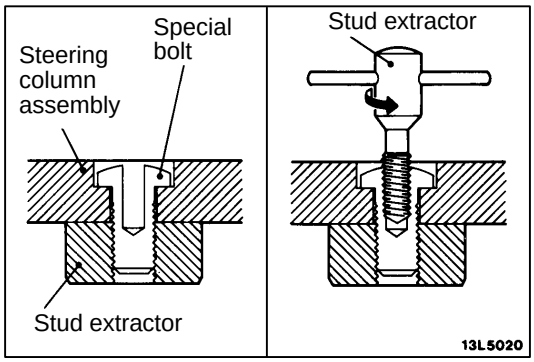
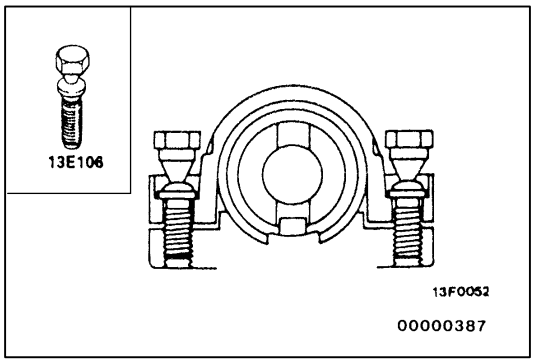


DISASSEMBLY SERVICE POINTS

◀A▶ SPECIAL BOLT

1. Drill a hole in the special bolt to a depth to enable a suitable size stud extractor to stand up.
2. Using the stud extractor, remove the special bolt.



REASSEMBLY SERVICE POINTS

▶A◀ STEERING LOCK CYLINDER/STEERING LOCK BRACKET/SPECIAL BOLT INSTALLATION

1. When installing the steering lock and steering lock bracket to the column tube, temporarily install the steering lock in alignment with the column boss.
2. After checking that the lock works properly, tighten the special bolts until the head twists off.

Caution
The steering lock bracket and bolts must be replaced with new ones when the steering lock is installed.

INSPECTION

- Check the steering shaft for play and rough movement.
- Check the joints for play, damage, or rough movement.
- Check the joint bearing for wear and damage.
- Check the dust shield for damage.

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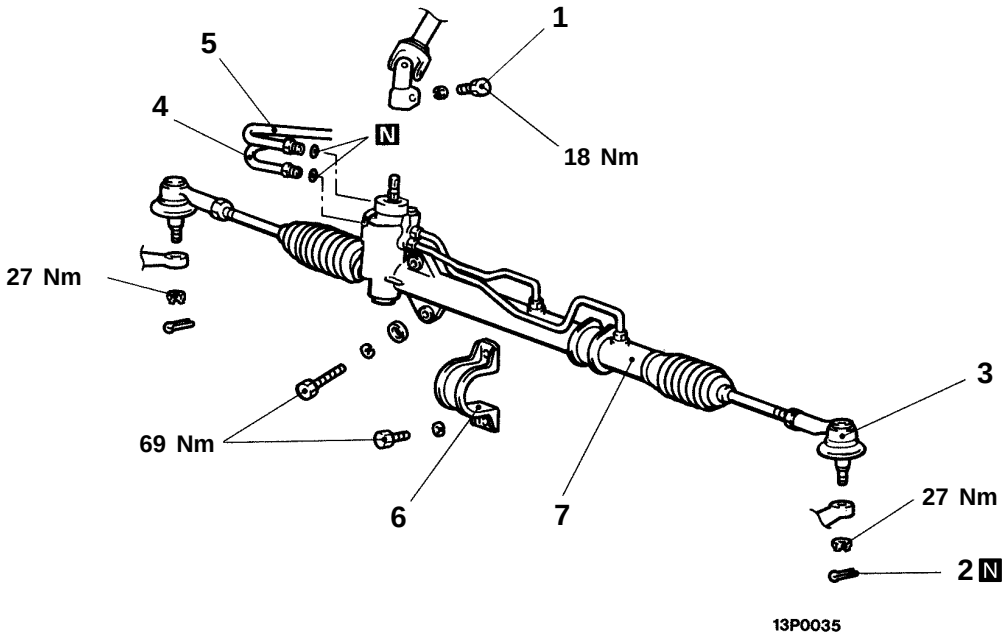
RACK AND PINION

REMOVAL AND INSTALLATION

Pre-removal Operation
- Power Steering Fluid Draining (Refer On vehicle service.)
- Disconnect the centre member (Refer Group 32.)
- Disconnect the front exhaust pipe (Refer Group 15.)

CAUTION: SRS
For vehicles with SRS, before removal of steering gear box, refer Group 52B – General Information, centre front wheels and remove ignition key. Failure to do so may damage the SRS clock spring and render the SRS system inoperative, risking serious driver injury.

Post-installation Operation
- Fit the front exhaust pipe (Refer Group 15.)
- Fit the centre member (Refer Group 32.)
- Power Steering Fluid Supplying (Refer On vehicle service.)
- Power Steering Fluid Line Bleeding (Refer On vehicle service.)
- Steering Wheel Position with Wheels Straight Ahead Checking
- Front Wheel Alignment Adjustment (Refer Group 33A.)



Removal steps

1. Joint assembly and gear box connecting bolt
2. Cotter pin
3. Connection for tie-rod end and knuckle
4. Pressure pipe
5. Return pipe
6. Clamp
7. Steering gear and linkage

◀A▶ ◀B▶

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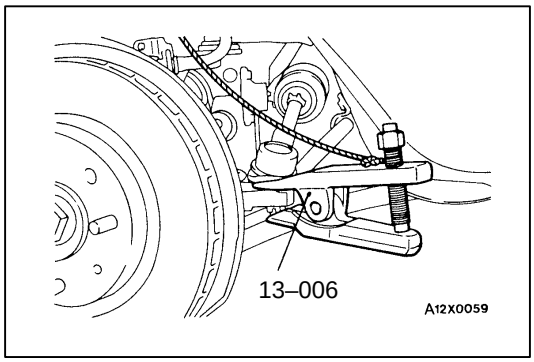


REMOVAL SERVICE POINTS

◀A▶ TIE-ROD END DISCONNECTION

Caution

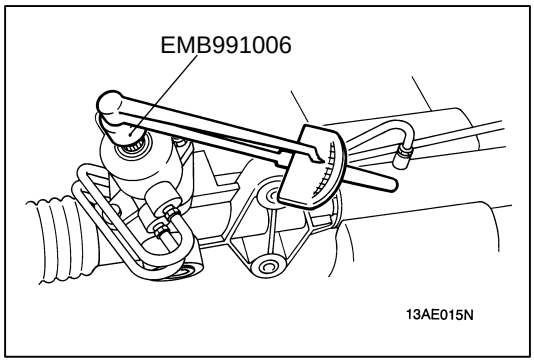
1. **Be sure to tie the cord of the special tool to the nearby part.**
2. **Loosen the nut but do not remove it until the tie rod end is separated from the knuckle.**

◀B▶ GEAR BOX ASSEMBLY REMOVAL

Caution
Be careful not to damage the bellows and the tie-rod end dust cover when removing the gear box assembly.

INSPECTION

- Check the rubber parts for cracks and breakage.



GEAR BOX TOTAL PINION TORQUE

Using the special tools, rotate the pinion gear at the rate of one rotation in approximately 4 to 6 seconds to check the total pinion torque.

Standard value: 0.8–1.6 Nm
Torque variation: 0.5 Nm

NOTE
When measuring, remove the bellows from the rack housing. Measure the pinion torque through the whole stroke of the rack.
If the measured value is not within the standard range, first adjust the rack support cover, and then check the total pinion starting torque again.
If the total pinion starting torque cannot be adjusted to within the standard range by adjusting the rack support cover, check the rack support cover, rack support spring, rack support and replace any parts necessary.

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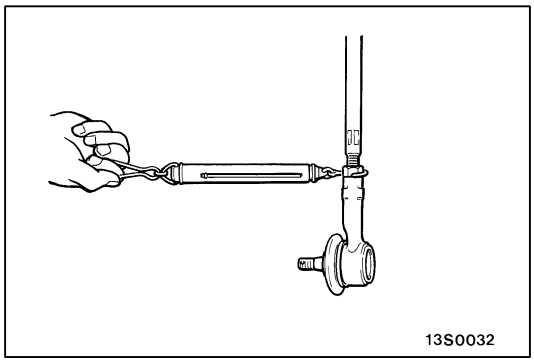

CHECK THE TIE ROD FOR SWING RESISTANCE

1. Give 10 hard swings to the tie rod.
2. Measure the tie rod swing resistance with a spring balance.

   Standard value: 6–20 N

3. If the measured value exceeds the standard value, replace tie rod assembly.
4. Even if the measured value is below the standard value, the tie rod which swings smoothly without excessive play may be used.

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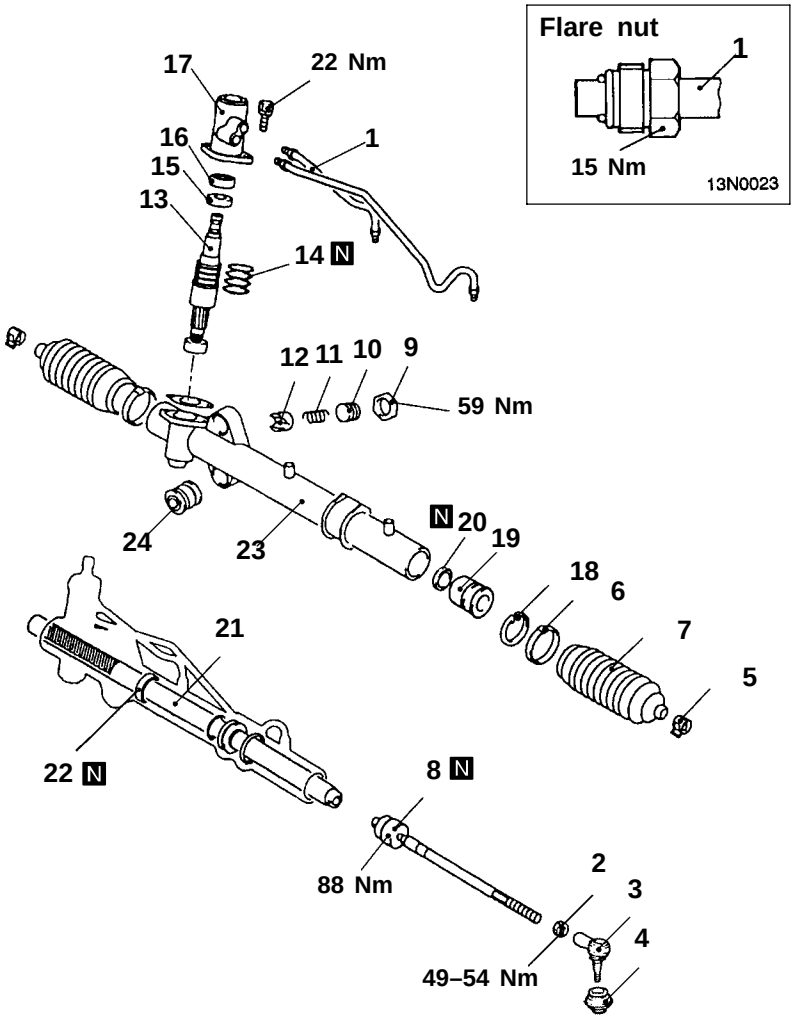
DISASSEMBLY AND REASSEMBLY



Disassembly steps

1. Feed tube
2. Lock nut
3. Tie rod end
4. Dust cover
5. Clip
6. Band
7. Bellows
- Total pinion rotation torque adjustment
8. Tie rod
9. Lock nut
10. Rack support cover
11. Spring
12. Rack support
13. Pinion and valve assembly
14. Seal ring
15. Valve housing
16. Upper oil seal
17. Upper bearing
18. Retaining wire
19. Rack bush
20. Outer oil seal
21. Rack assembly
22. Inner oil seal
23. Rack housing
24. Rack housing mount bush

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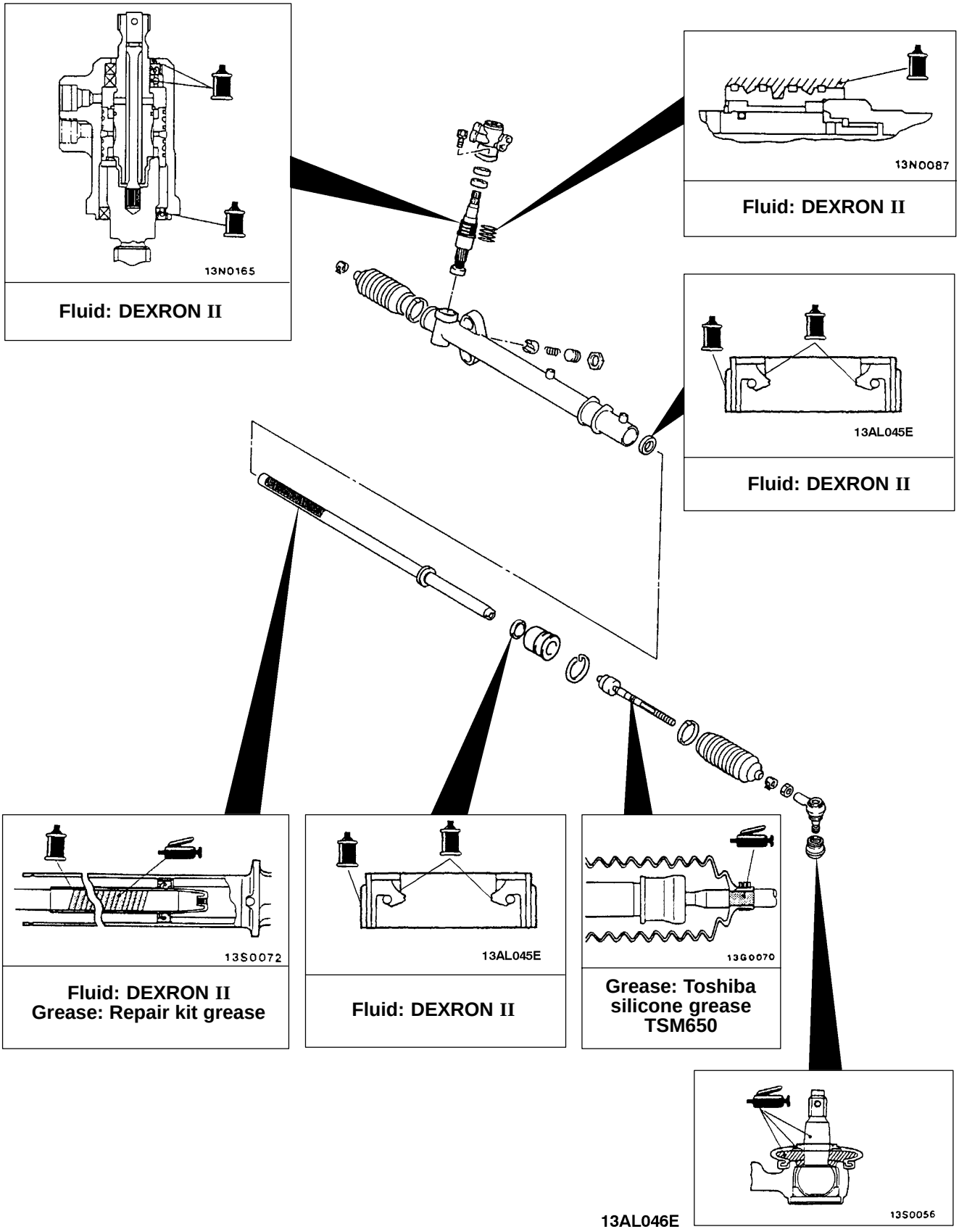
LUBRICATION AND SEALING POINTS



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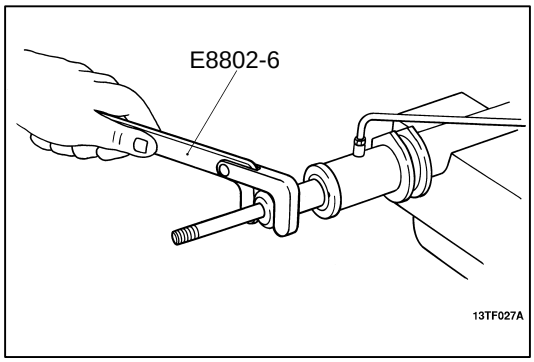
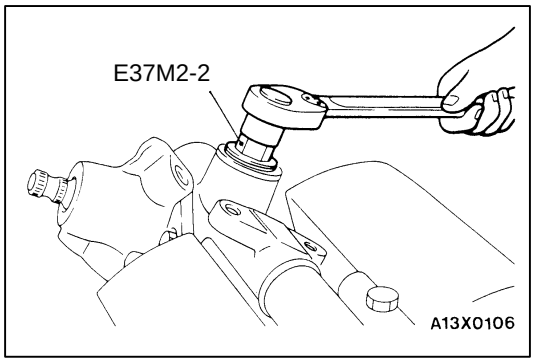


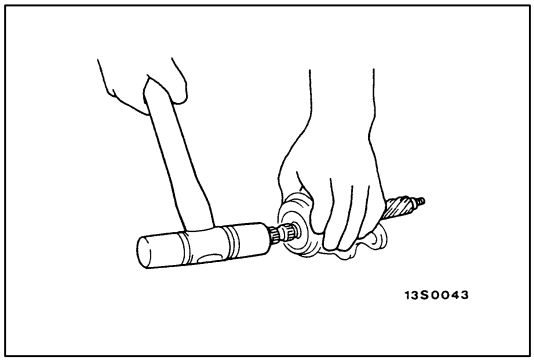
SERVICE POINTS OF DISASSEMBLY

◀A▶ TIE ROD REMOVAL



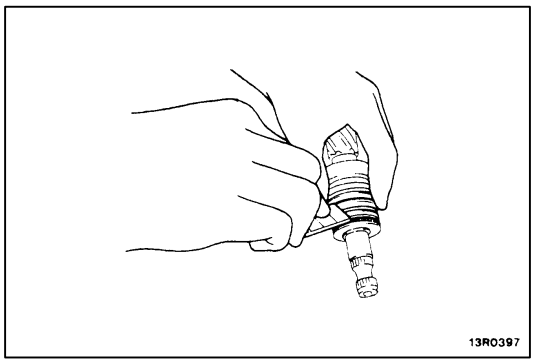
◀B▶ RACK SUPPORT COVER

1. Scribe a mark across the surface of the rack support cover and the rack housing.
2. Remove the lock nut.
3. Remove the rack support cover.



◀C▶PINION AND VALVE ASSEMBLY

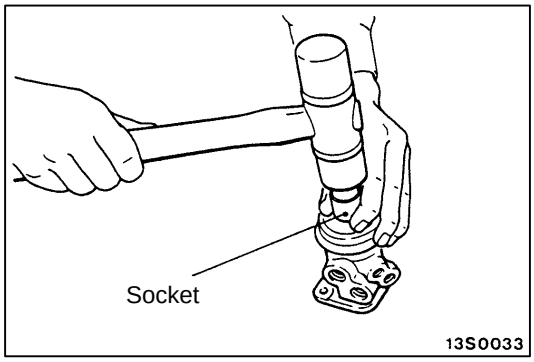
1. Using a plastic hammer, gently tap the pinion to remove it.



◀D▶ SEAL RING

1. Cut the seal ring and remove it from the pinion and valve assembly and the rack.

   NOTE
   Take care not to scratch the pinion and valve assembly, or the rack assembly when cutting the seal ring.



◀E▶ UPPER BEARING/UPPER OIL SEAL

1. Using an appropriate socket, remove the oil seal and the ball bearing from the valve housing simultaneously.

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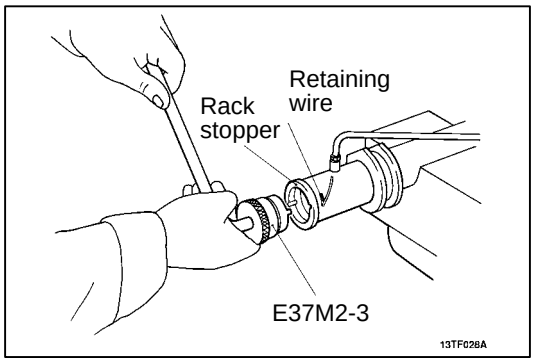
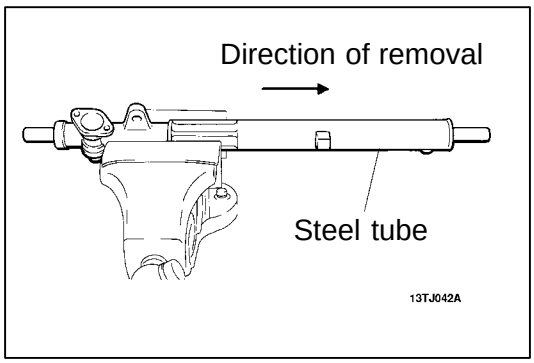


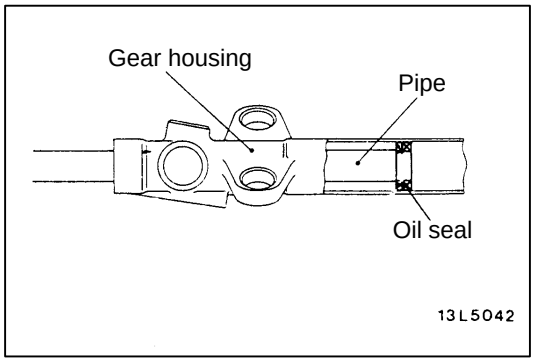
◀F▶ RETAINING WIRE

1. Turn the rack stopper in the direction of least resistance until the wire end emerges from the cylinder slot.
2. Locate the end of the wire, lift with a suitable screwdriver, turn the rack bushing to remove the wire.



◀G▶ RACK BUSH/RACK ASSEMBLY/OUTER OIL SEAL

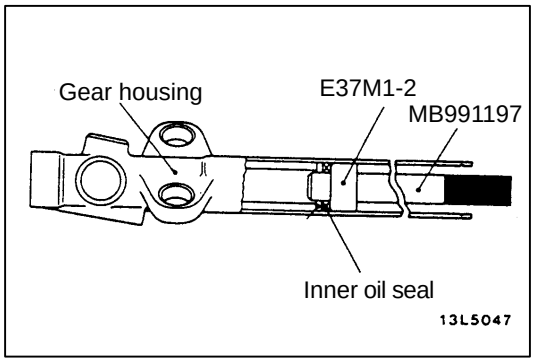
1. Pull out the rack slowly and remove the rack bush and the outer oil seal at the same time from the steel tube end.



◀H▶ OIL SEAL

1. Use a pipe, [outside diameter 30mm] or similar tool to remove the oil seal and back up washer.

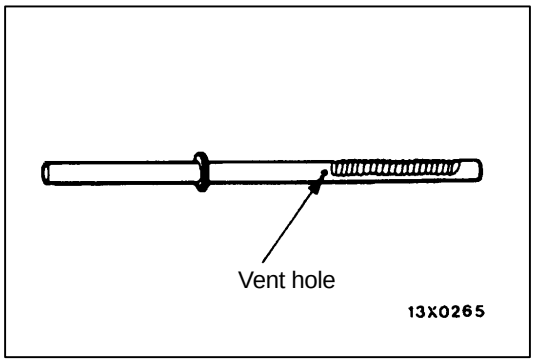
REASSEMBLY SERVICE POINTS



▶A◀ OIL SEAL

1. Apply a coating of the specified fluid to the inside and outside of the oil seal.
2. Place the inner oil seal on the seal installer.
3. Slowly insert the installer into the gear housing from the gear steel tube end.

NOTE
Ensure installer is aligned with gear steel tube during insertion to prevent damage and distortion to the seal.



▶B◀ RACK ASSEMBLY

1. Re-tap the tie rod threads using a M16x1.5 tap.
2. Apply a coating of multipurpose grease to the rack teeth face.

NOTE
Do not block the vent hole in the rack with grease.

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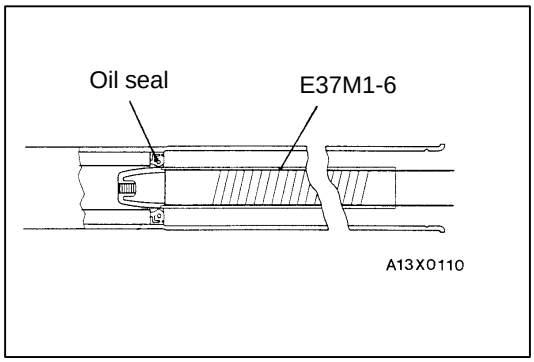
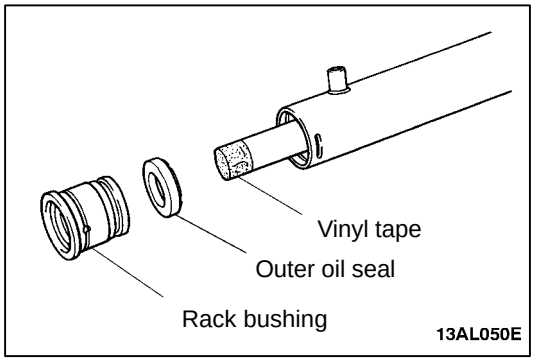


3. Cover the rack assembly teeth side using a special tool.
4. Apply specified fluid to the outside of the special tool and the piston seal ring.

   Fluid: DEXRON II

5. Slowly insert the rack covered with the special tool from the power cylinder end of the gear housing.

   NOTE
   When inserting the rack, ensure the oil seal retaining ring does not pop out by keeping the centre of the oil seal aligned with the front end of the special tool.
6. Remove the special tool.

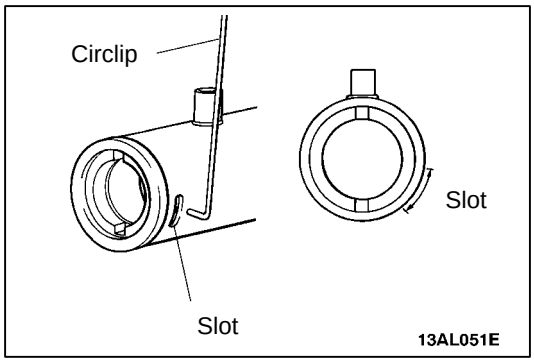


▶C◀ RACK BUSH AND OUTER OIL SEAL

1. Apply the specified fluid to both sides of the outer oil seal.

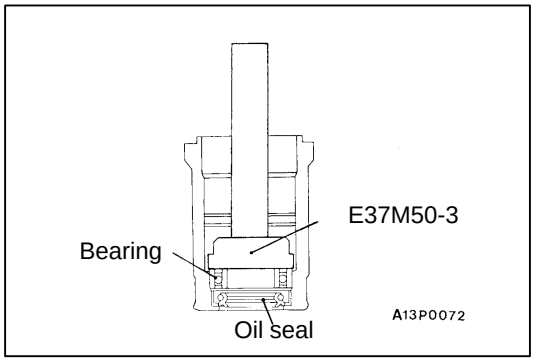
   Fluid: DEXRON II

   Caution
   Do not allow oil seal retainer spring to slip out.
2. Wrap the end of the rack in plastic tape and insert the outer oil seal and rack bush into the rack.



▶D◀ RETAINING WIRE

1. Align the rack stopper marking with the cylinder slot. Insert the circlip into the cylinder slot and then into the rack stopper hole and turn the rack stopper in a clockwise direction until the circlip is fully in place.



▶E◀ UPPER OIL SEAL/UPPER BEARING

1. Apply a thin film of the designated fluid to the inside of the seal.
2. Place the upper bearing, then the seal onto the special tool.
3. Lightly press the upper seal and upper bearing into the valve housing.

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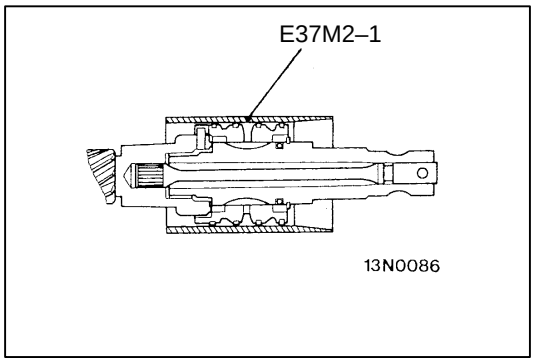
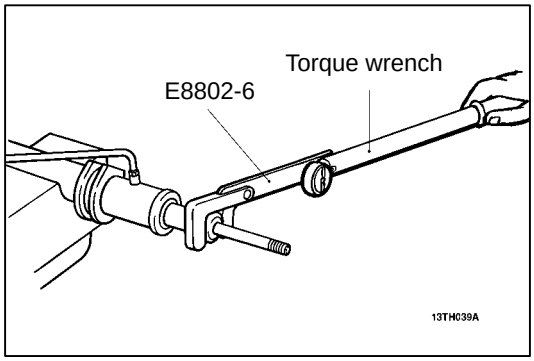


▶F◀ SEAL RING

1. As the seal rings will be stretched after assembly onto the pinion shaft use the special tool to compress the seal rings so that they will be well seated into the grooves and be able to be easily installed without causing any damage to them.

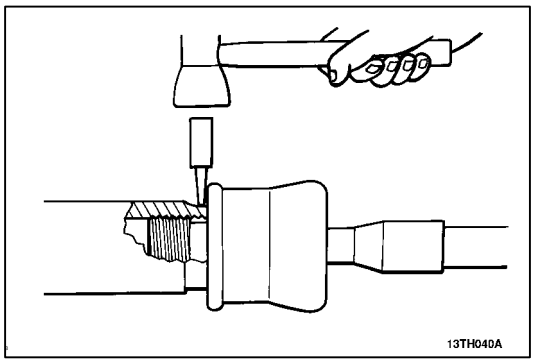


▶G◀ TIE ROD ASSEMBLY

NOTE
Tie rods must be replaced as the thread would have been damaged during removal.

1. Install the new tie rod to the rack assembly after the pinion assembly has been installed. Tighten the tie rod using special tool E8802-6 and a torque as follows:

Torque Wrench Effective Length (mm)	Torque Setting (Nm)
300	62
350	64
400	67

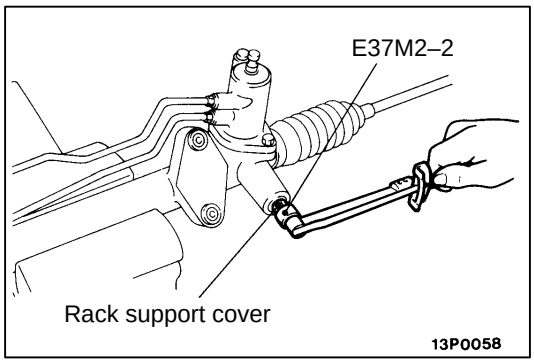


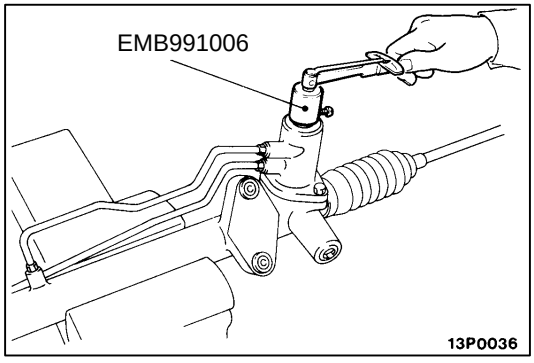
NOTE
Ensure the torque wrench is kept in the same plane as the special tool; as shown in the illustration. Any variation to this will alter the torque setting.

2. Stake the key slot section of the rack assembly end to the recessed area behind the thread of the tie rod.

▶H◀ ADJUSTING THE TOTAL PINION TORQUE

1. Use the special tool to tighten the rack support cover to 15 Nm.
2. Reverse rotate the rack support cover by about 30°.





3. Use the special tool to rotate the pinion shaft at the rate of one rotation in approximately 4 to 6 seconds and inspect if rotation torque and torque fluctuations during rotation are standard values.

Standard value: 0.8 – 1.6 Nm

Torque variation: 0.5 Nm or less

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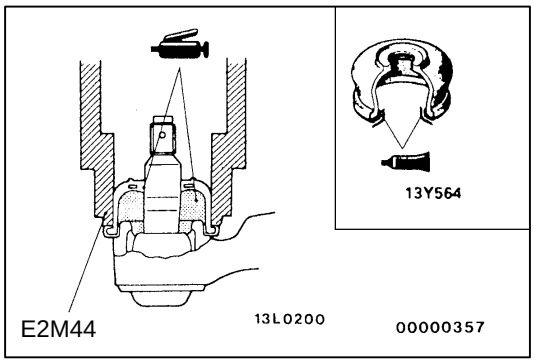
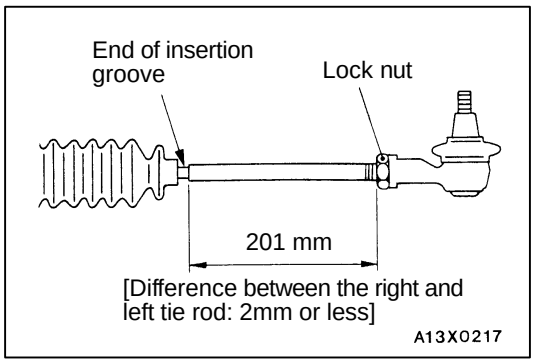
4. If the rotation torque or torque fluctuation is outside the standard value, adjust by reverse rotating the rack support cover to within a range of 0 – 30°.
5. After adjusting, lock rack support cover with lock nut.

NOTE
1. When adjusting, keep to the upper limits of the designated values.
2. When operating the rack in the axial direction,ensure there is no roughness or snagging.
3. Measure the torque at all points.
4. If it is impossible to adjust the rack support cover to the standard values while within the regulated reverse rotation angle, carry out an inspection of the rack support cover and replace if necessary.



▶I◀ DUST COVER



▶J◀ TIE ROD END INSTALLATION

1. Temporarily tighten the tie-rod to the measurements shown in the illustration using a screw lock nut.

NOTE
Final tightening of the lock nut is carried out when the steering gear and linkage are attached to the chassis (after toe-in adjustment).

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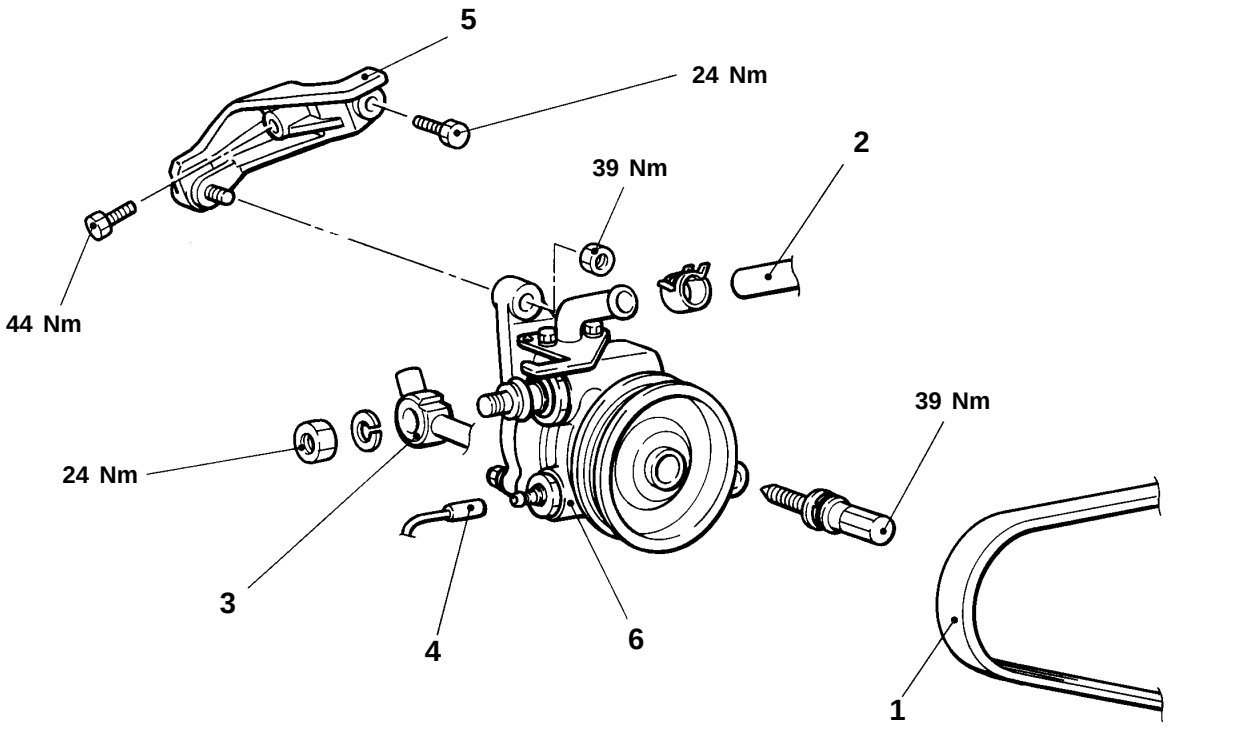
POWER STEERING OIL PUMP

REMOVAL AND INSTALLATION

Pre-removal Operation
- Power Steering Fluid Draining (Refer On vehicle service.)

Post-installation Operation
- Power Steering Fluid Supplying (Refer On vehicle service.)
- Drive-belt Tension Adjusting (Refer Group 11A.)
- Power Steering Fluid Line Bleeding (Refer On vehicle service.)
- Oil Pump Pressure Check (Refer On vehicle service.)



13P0041

Removal steps
1. Drive-belt
2. Suction hose
▶A◀ 3. Pressure hose
4. Pressure switch connector
5. Power steering pump bracket stay
6. Oil pump

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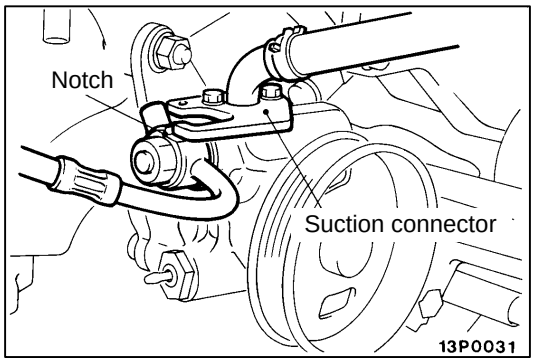

INSTALLATION SERVICE POINT

▶A◀ PRESSURE HOSE INSTALLATION

Connect the pressure hose so that its notched part contacts the suction connector.

INSPECTION

- Check the drive-belt for cracks
- Check the pulley assembly for uneven rotation.

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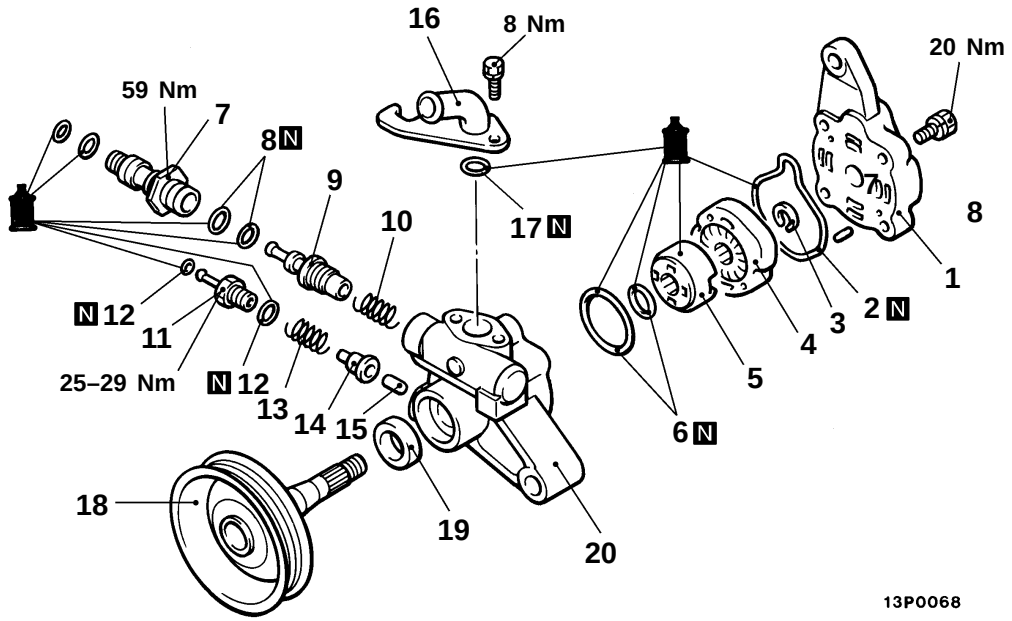
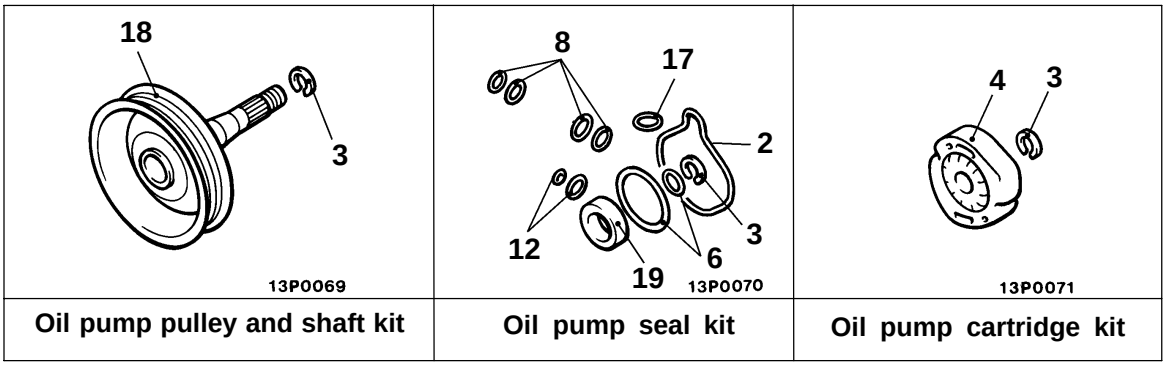
DISASSEMBLY AND REASSEMBLY





Oil pump pulley and shaft kit	Oil pump seal kit	Oil pump cartridge kit

13AE016N

Disassembly steps

1. Pump cover
2. O-ring
3. Snap ring
4. Oil pump cartridge
5. Side plate
▶A◀ 6. O-ring
7. Connector
▶A◀ 8. O-ring
9. Flow control valve
10. Flow control spring
11. Terminal assembly
▶A◀ 12. O-ring
13. Plunger spring
14. Plunger
15. Piston rod
16. Suction connector
▶A◀ 17. O-ring
18. Pulley and shaft
19. Shaft oil seal
20. Oil pump

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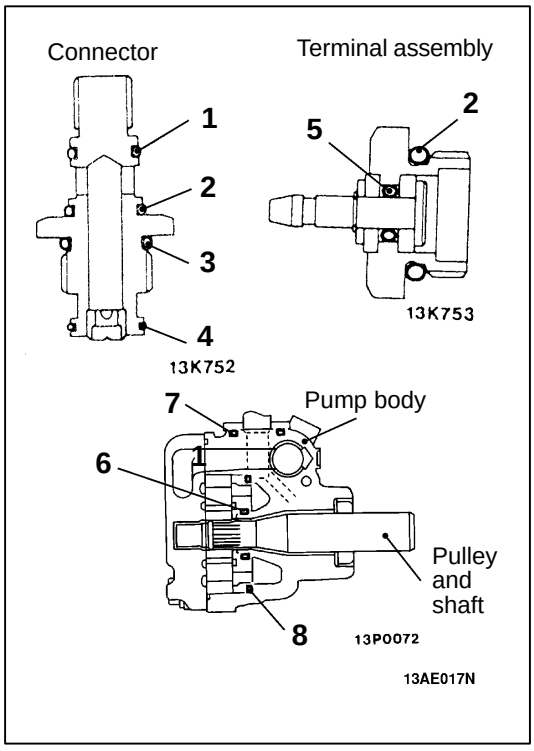

REASSEMBLY SERVICE POINTS

▶A◀ O-RINGS INSTALLATION

No.	I.D.×Width mm
1	11×1.9
2	13×1.9
3	17.8×2.4
4	13.5×1.5
5	3.8×1.9
6	16.8×2.4
7	17.8×2.4
8	47.2×2.4

INSPECTION

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

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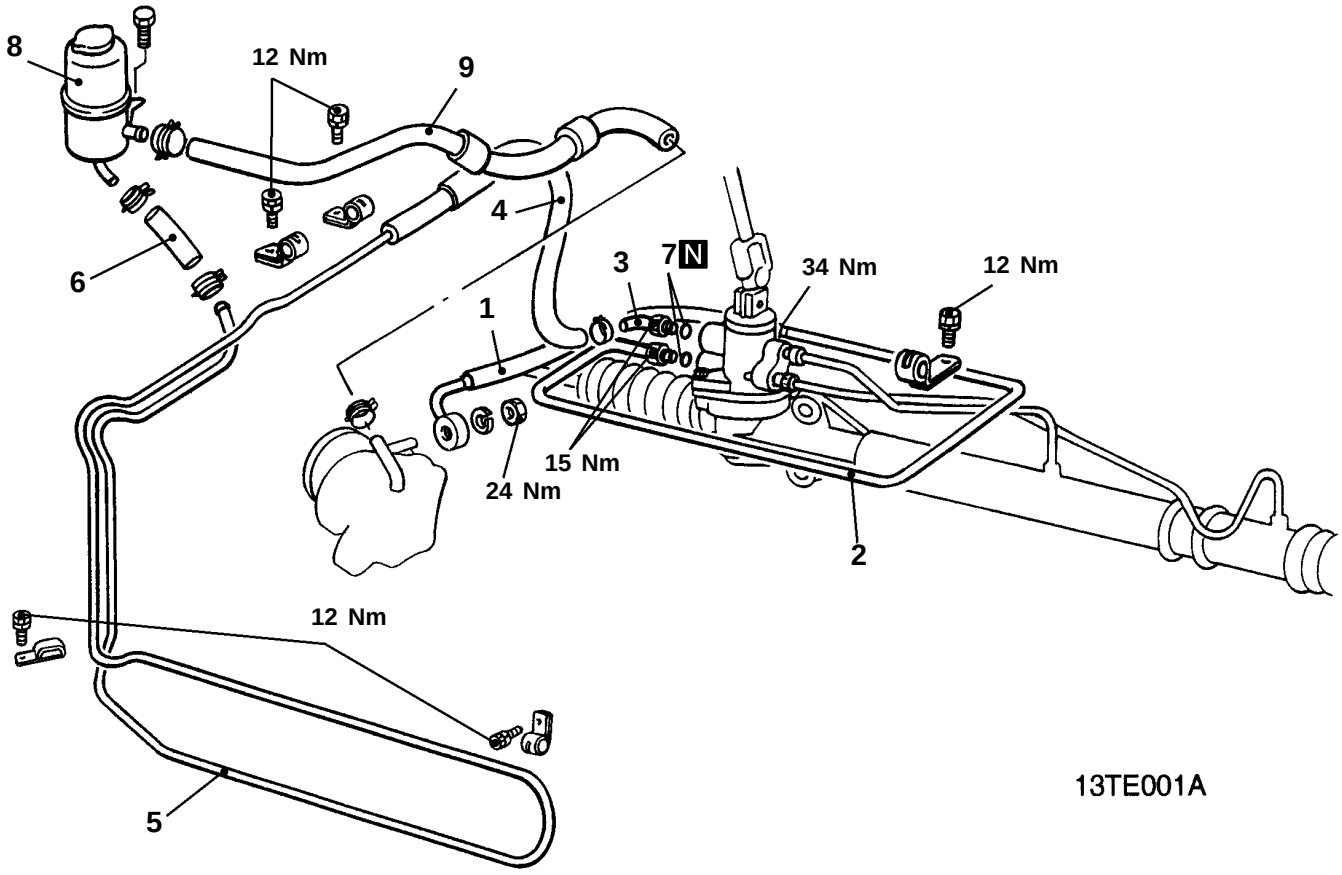
POWER STEERING HOSES

REMOVAL AND INSTALLATION

Pre-removal Operation
- Power Steering Fluid Draining (Refer On vehicle service.)
- Front Bumper Removal (Refer Group 51.)

Post-installation Operation
- Front Bumper Installation (Refer Group 51.)
- Power Steering Fluid Supplying (Refer On vehicle service.)
- Power Steering Fluid Line Bleeding (Refer On vehicle service.)



▶A◀ 1. Pressure hose
2. Pressure tube
3. Return tube
4. Return hose
5. Cooler tube
6. Hose
7. O-ring
8. Oil reservoir
9. Suction hose

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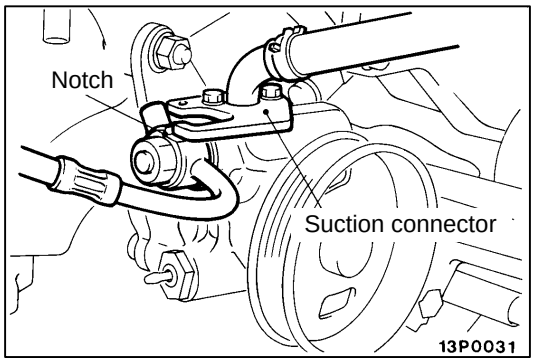
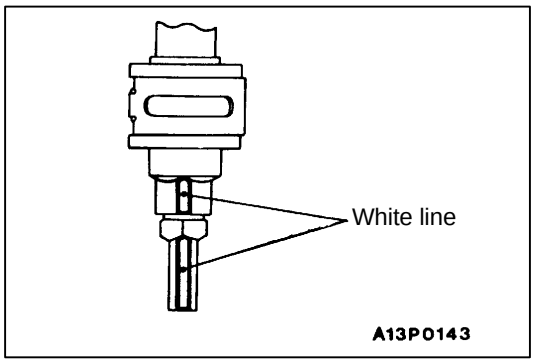


INSTALLATION SERVICE POINT

▶A◀ PRESSURE HOSE INSTALLATION

1. Connect the pressure hose so that its slot section contacts the oil pump's guide bracket.



2. When the pressure hose is installed, align the white line on the pressure hose with the white line on the pressure tube so that together they form a straight line.