

DAIHATSU
F70,F75,F77

**Service
manual**

STEERING

SR

DAIHATSU MOTOR CO., LTD.

NO.9703-FE

DAIHATSU

F70, F75, F77

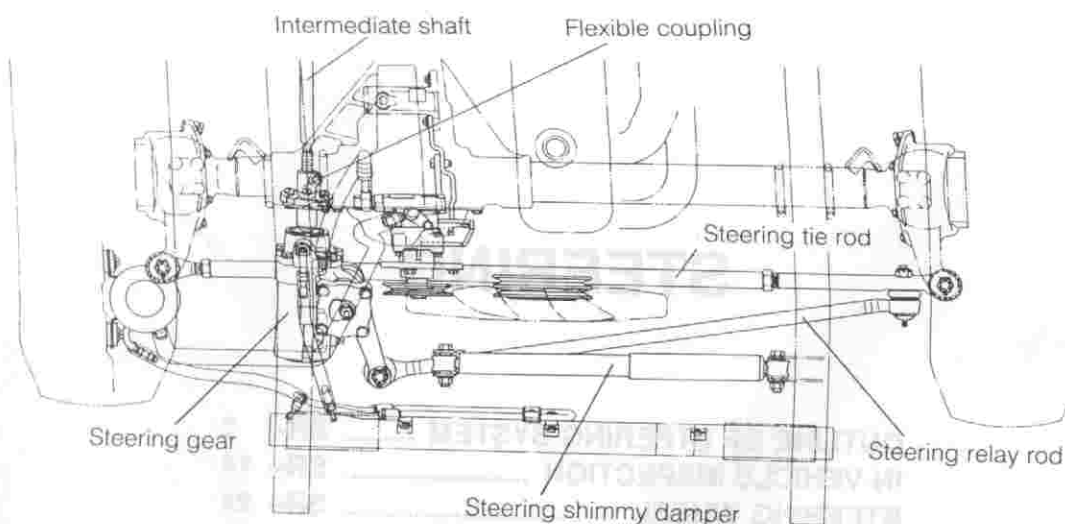
STEERING

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WRE91-SR001

OUTLINE OF STEERING SYSTEM

The steering system is composed of the steering intermediate shaft, steering flexible coupling, steering gear, relay rod, tie-rod, shimmy damper and knuckles. The steering intermediate shaft joint is installed between the intermediate shaft and the steering worm shaft. This joint enables the driver to assume an optimum driving position with the least possible fatigue. The power steering system is available as optional equipment. On the some models, the tilt steering wheel is standard equipment.



WRE91-SR002

Shimmy damper

The shimmy damper is installed between the relay rod and the frame so that the steering may stabilize during high speed operation or driving on irregular terrains.

Specifications

Damping force Rebound stroke/compression stroke [at a piston speed of 0.3 m/sec.]	(kgf)	230/230
Length	(mm)	395 - 577



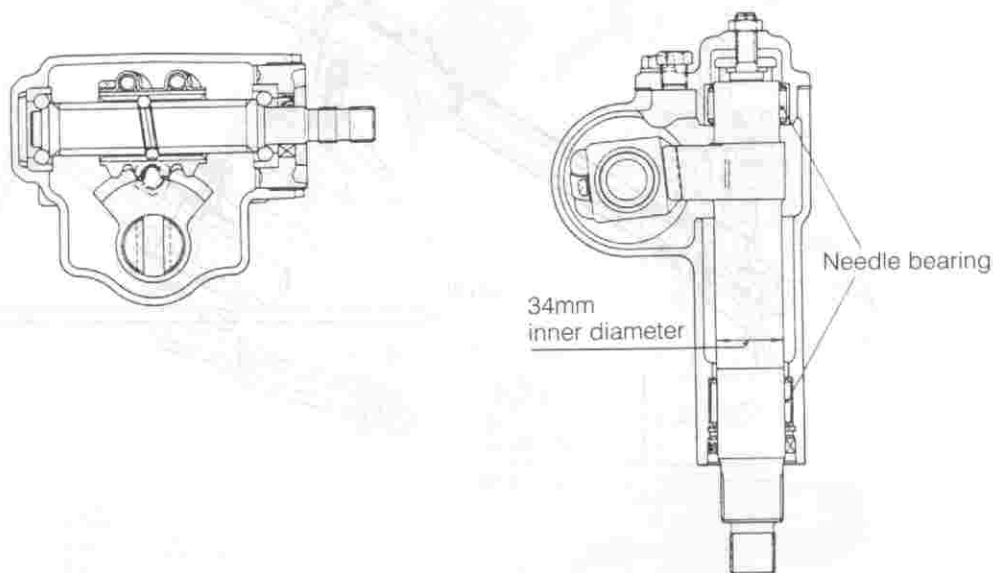
WRE91-SR003

Steering shaft

For accurate steering control, the ball bearings are installed in the steering shaft.

Steering gear box

The 34 mm dia. sector shaft employs needle bearings so that accurate steering and straight traveling characteristics may be enhanced.



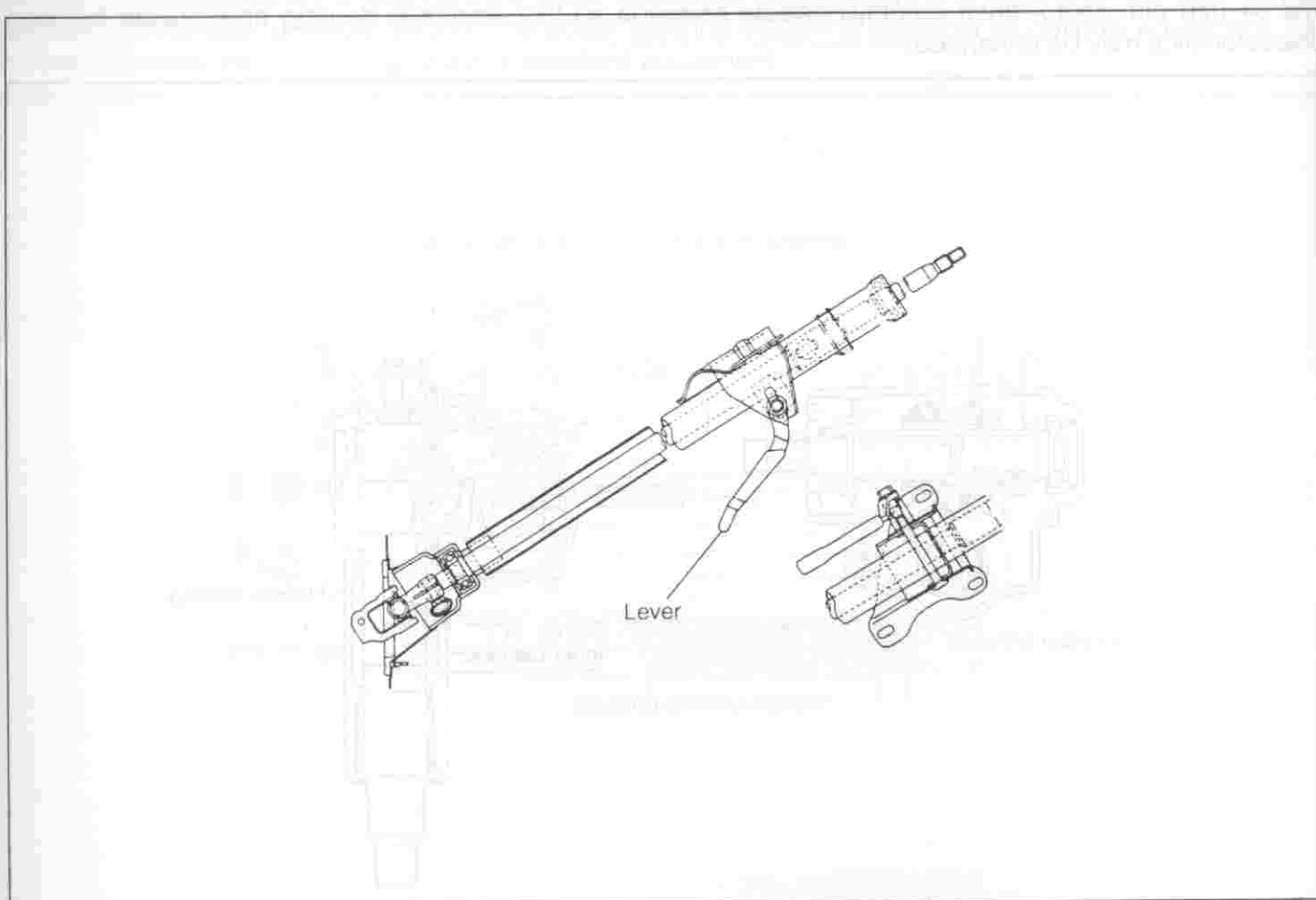
Gear ratio	24 - 28
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WRE91-SR004

STEERING

Tilt steering

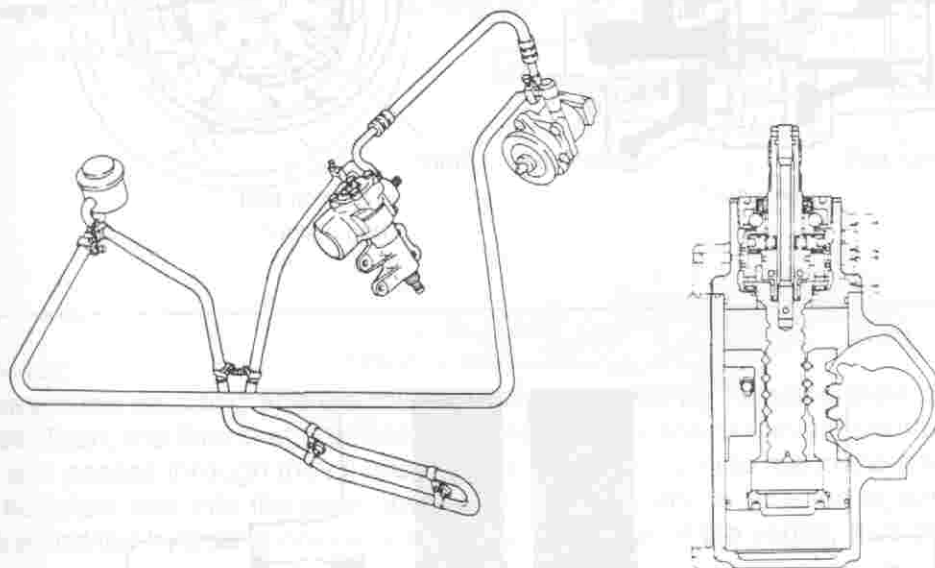
Some models employ a tilt steering wheel that tilts with the steering shaft universal joint as the fulcrum. This construction allows stepless tilting 20 mm upward and 10 mm downward from the center of the wheel. This adjustment is done by means of the lever of the upper bracket.



WRE91-SR005

Power steering

The power steering system is available as optional equipment. The power steering system consists of a vane pump which generates hydraulic pressure and an integral gear box. This integral gear box detects the force acting on the steering system, controls the hydraulic pressure, and further converts the pressure into mechanical force. Power steering fluid is used as work oil.

**Specifications**

Type	Integral type	
Gear ratio	19.79	
Power piston diameter	mm	70

Oil reservoir

The oil reservoir is located at the front right side of the engine compartment. The cap of the oil reservoir also serves as a level gauge.

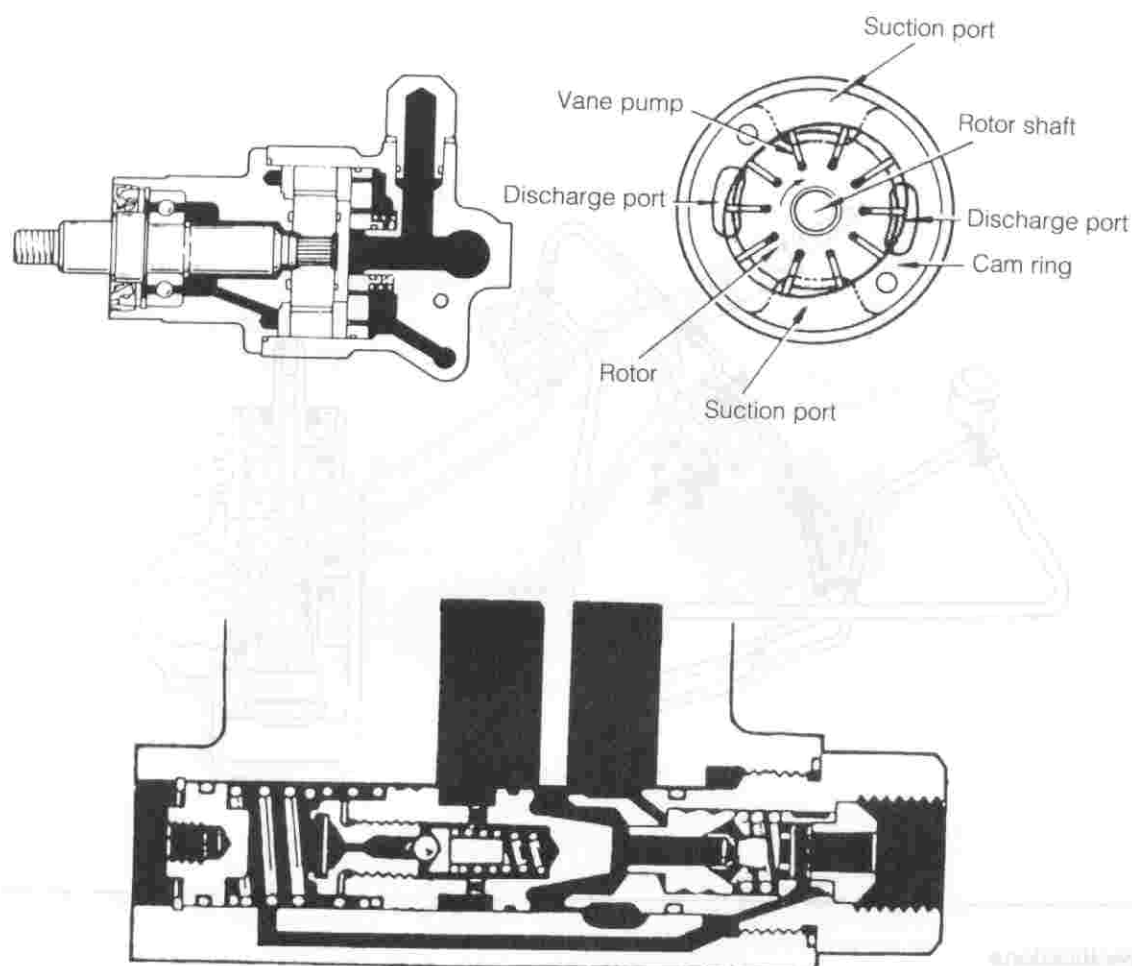
WRE91-SR006

WRE91-SR007

STEERING

Vane pump

A small size vane pump is used. At its rear side, the pump contains a flow control valve that controls the fluid flow rate depending on the pump speed.

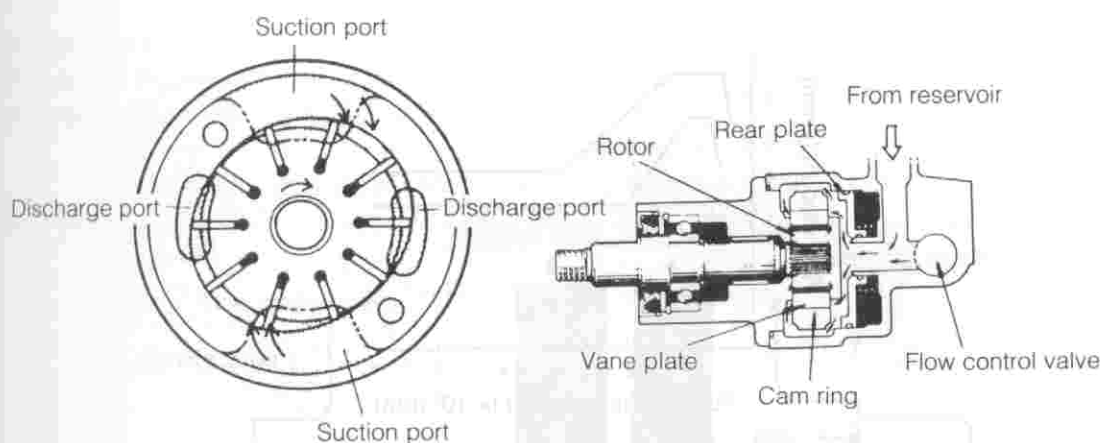


Specifications

Item	Model	F70, F75 and F77
Usable speed range	rpm	500 - 6,090
Theoretical discharge rate [at 1000 rpm]	liter/min	10.5
Relief set pressure	kg/cm ²	75 - 80
Ambient temperature	°C	-120

Suction process:

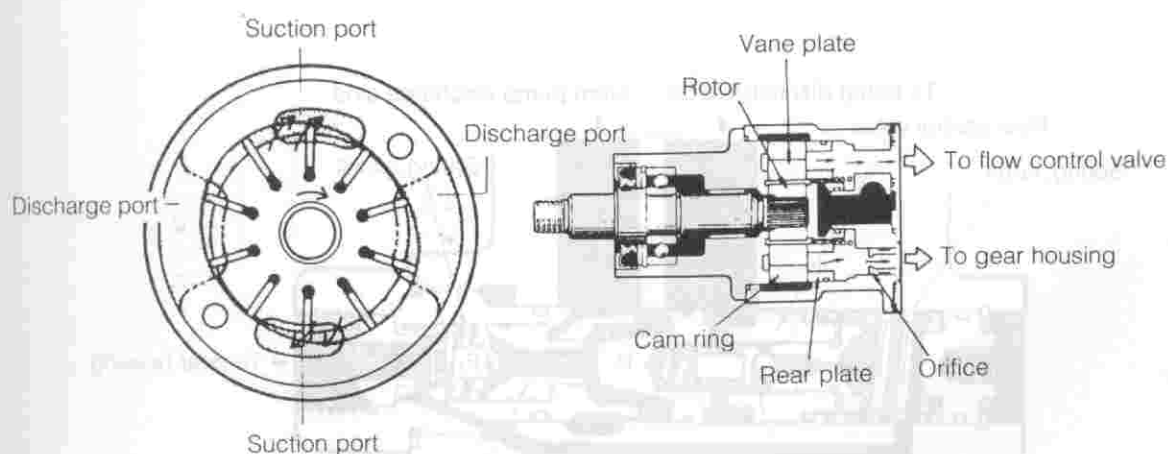
The space between the cam ring and the rotor that is partitioned by the vane plate increases in volume as the rotor rotates. As the space volume increases, the fluid is sucked into the space through the intake port in the rear plate.



WRE91-SR009

Discharge process:

The space between the cam ring and the rotor that is partitioned by the vane plate decreases in volume as the rotor rotates. Then, the fluid that has been sucked into the space leaves it out of the discharge port in the rear plate, and passes through the oil channel inside the housing to reach the flow control valve in order to control the fluid flow rate into the gear housing. The vane plate is pressed against the cam ring by the centrifugal force and the hydraulic pressure acting on the back of the vanes, thus preventing the fluid from leaking.

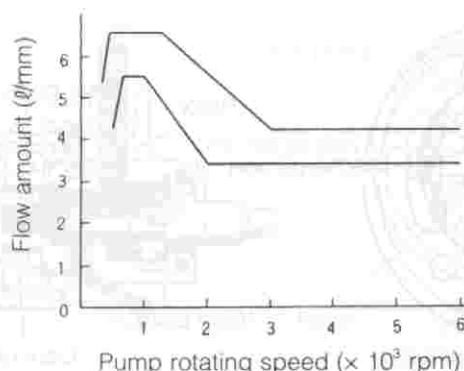


WRE91-SR010

STEERING

Flow control valve:

This rpm-responsive flow control valve controls the fluid flow rate in accordance with the engine (pump) speed. It assures light steering effort at low speeds, and necessitates a certain manual steering effort at high speeds.



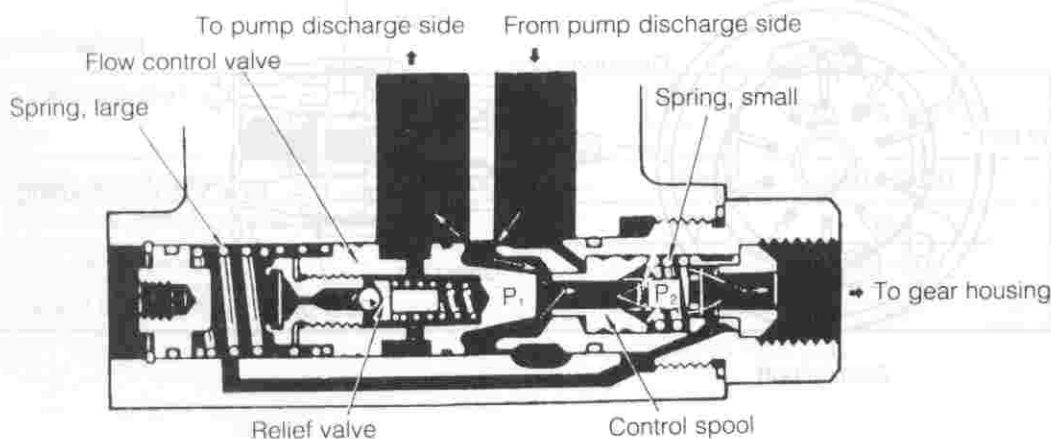
WRE91-SR011

Operation:

As the engine speed and pump discharge rate increase, a pressure difference is generated across the orifice channel, which is obtained as $P = P_1 - P_2$. This difference is attributed to the operation of the flow control valve, and it increases and decreases the oil supply to the gear housing.

With this particular pump, when the pump speed exceeds about 650 rpm, the pressure difference P overcomes the spring force, and drives the flow control valve to open the channel connecting with the pump suction port. Then, some of the fluid is returned to the suction side, so fluid quantity fed to the gear housing is controlled.

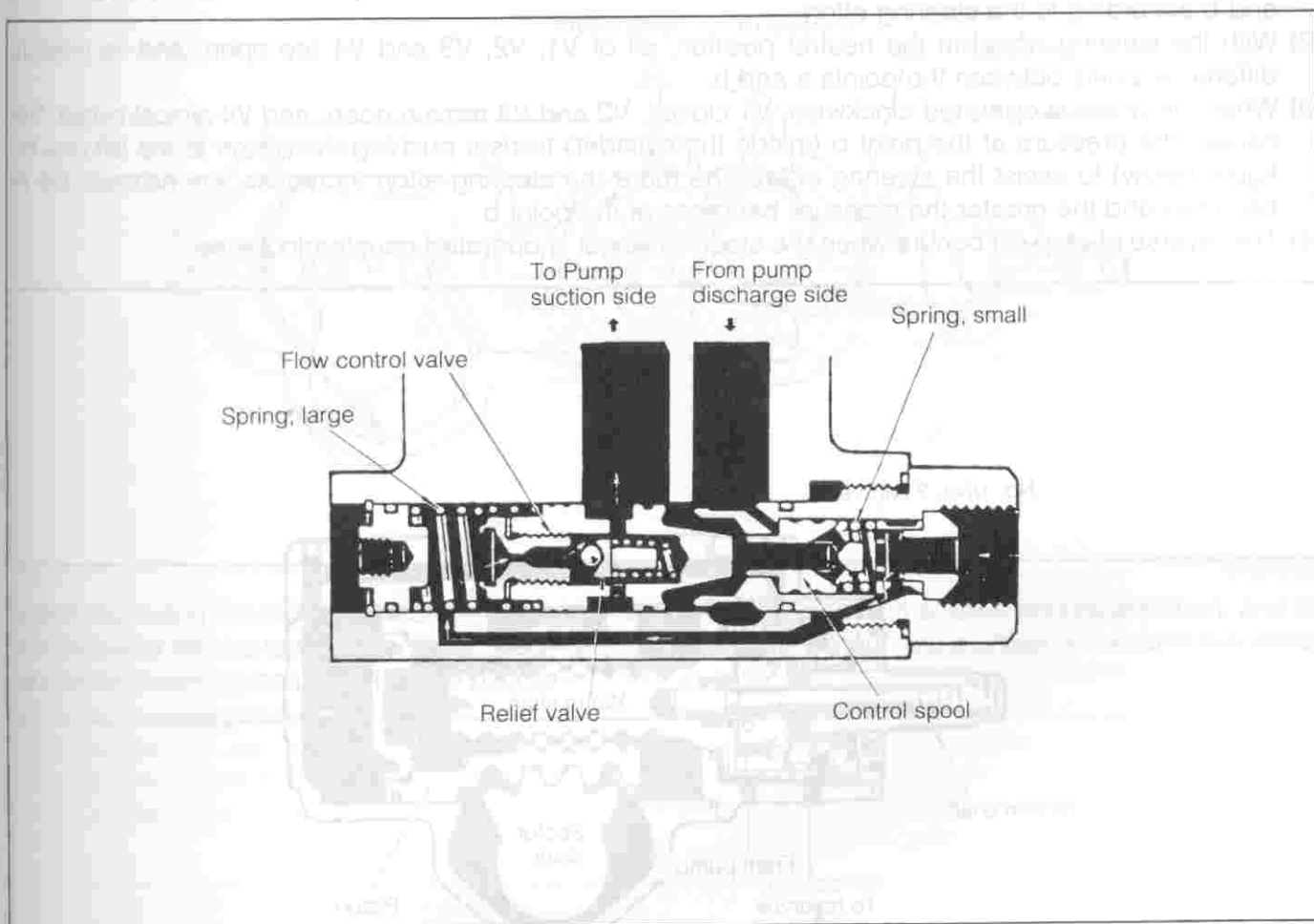
As the engine speed further increases to about 2500 rpm, the flow control spool is pressed against the edge of the orifice. As a result, excessive flow is cut off, preventing the flow rate from rising further and maintaining it at a certain level.



WRE91-SR012

Relief valve:

The relief valve is incorporated in the flow control valve. When the hydraulic pressure rises to a certain level, the relief valve opens, thus releasing only excessive pressure back to the pump suction side via the channel (see the figure) and maintaining the maximum hydraulic pressure at a level between 75 and 80 kgf/cm².

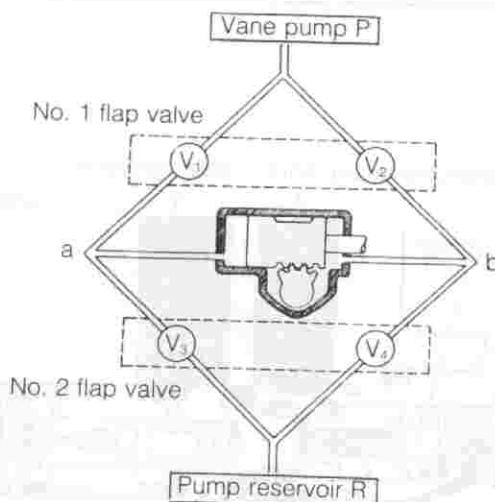
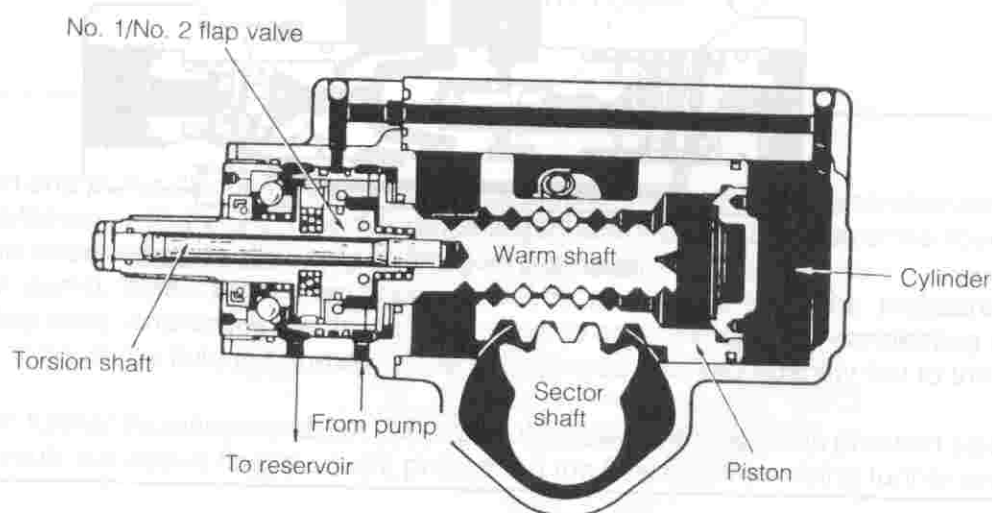


WRE91-SR013

STEERING

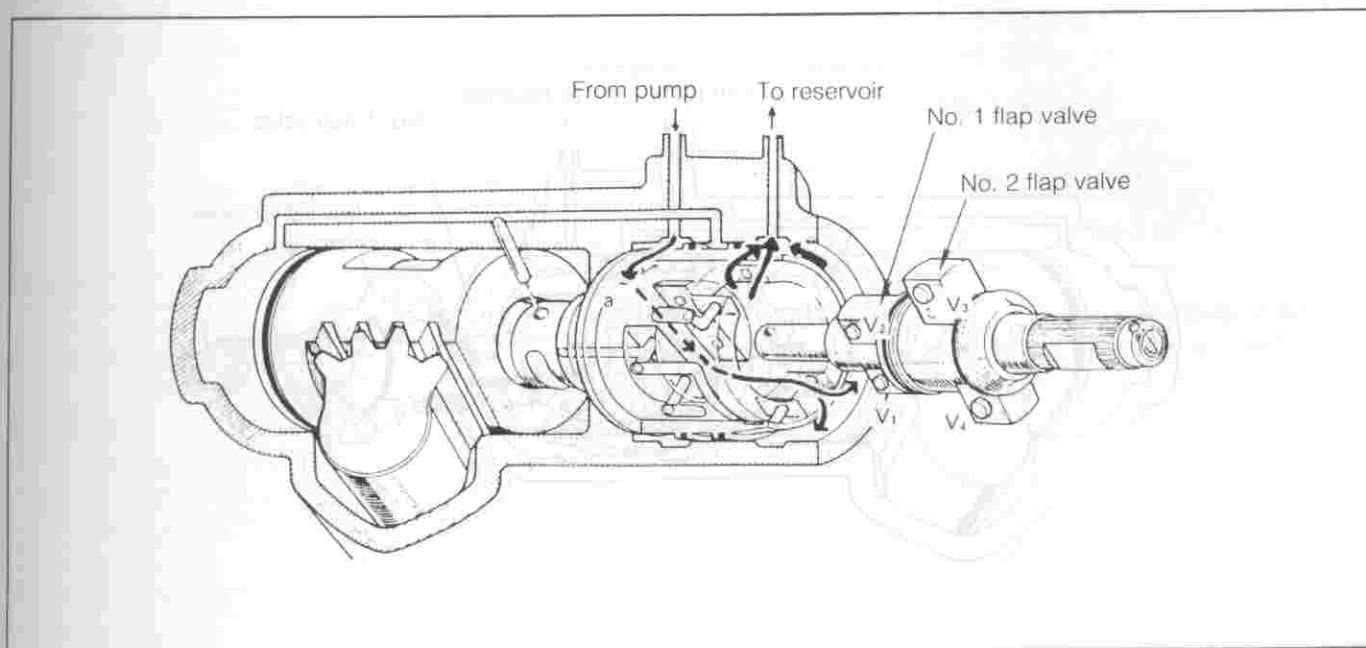
Power steering gear box

- (1) The No. 1 flap valve of V1 and V2 is directional control valve. It switches the oil passage between P a R and R b P depending on the movement of the steering wheel.
The No. 2 flap valve of V3 and V4 is a pressure control valve. It determines the pressure at the points a and b according to the steering effort.
- (2) With the steering wheel in the neutral position, all of V1, V2, V3 and V4 are open, and no pressure difference exists between the points a and b.
- (3) When the wheel is operated clockwise, V1 closes, V2 and V3 remain open, and V4 almost closes. This causes the pressure at the point b (inside the cylinder) to rise, pushing the piston to the left (see the figure below) to assist the steering effort. The more the steering effort increases, the narrower the V4 becomes and the greater the pressure becomes at the point b.
- (4) The reverse of step (3) occurs when the steering wheel is operated counterclockwise.



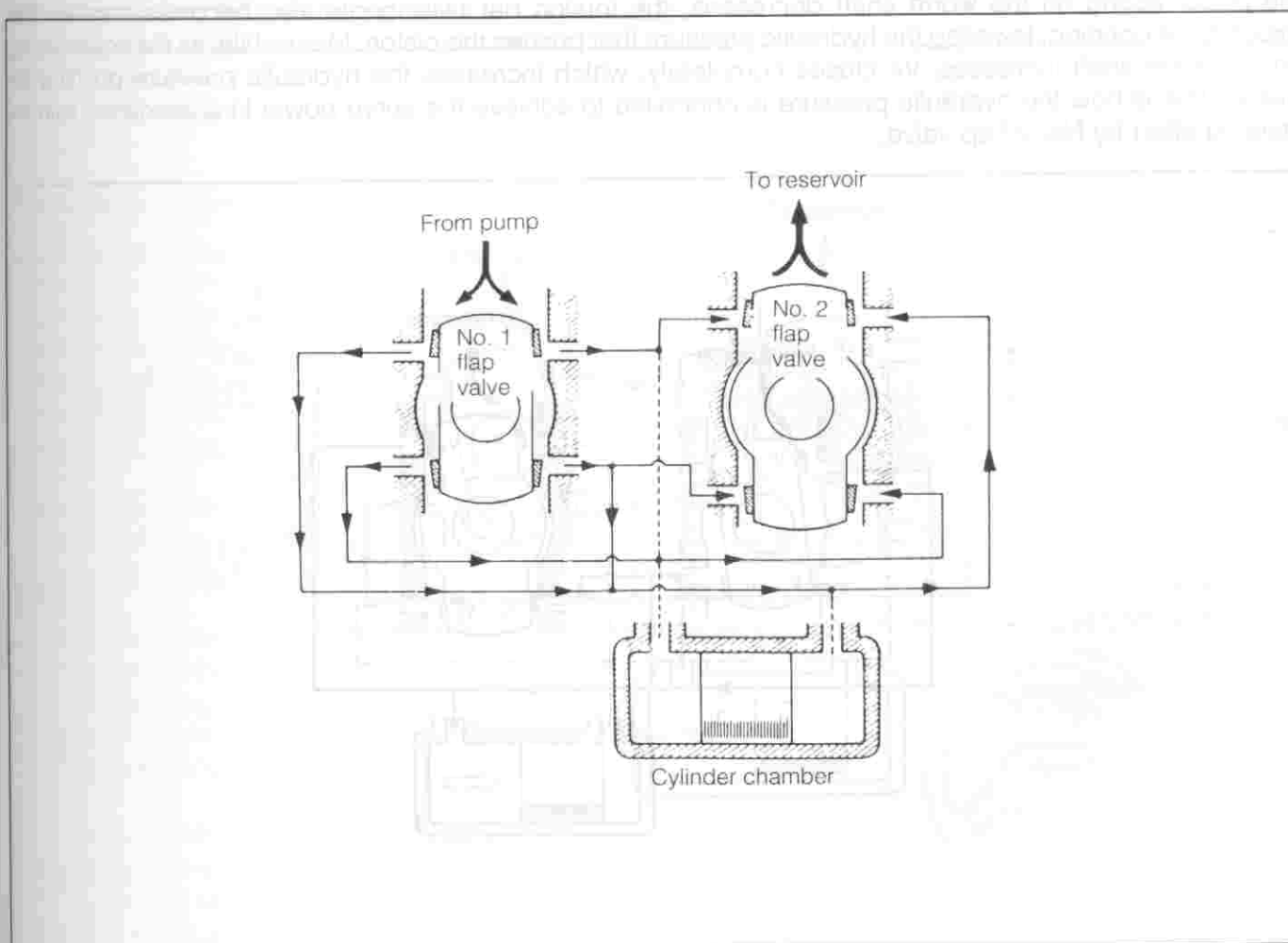
Oil passage

(1) When the steering wheel is in neutral:



WRE91-SR015

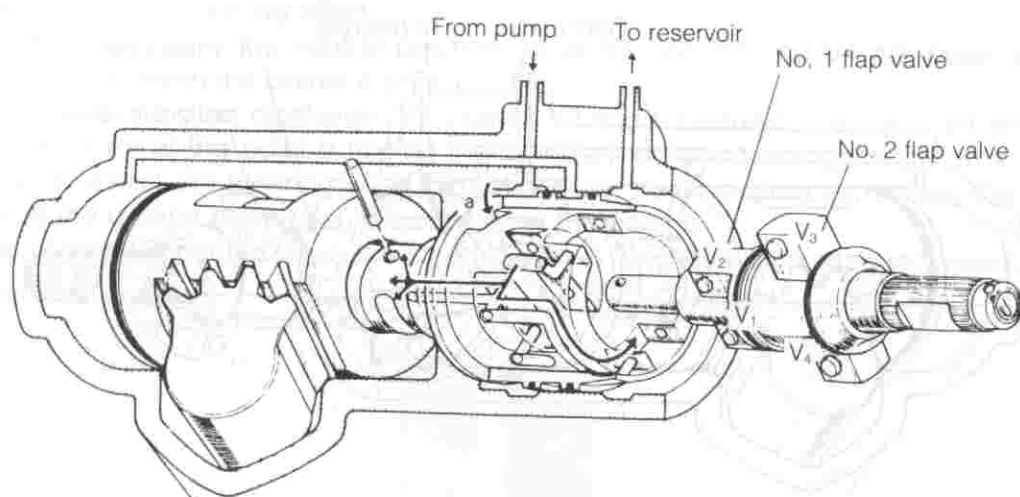
As both No. 1 and No. 2 flap valves are in neutral, all the oil channels in the valve bodies are open, and oil from the pump returns to the reservoir through them. As a result, the hydraulic pressure remains low inside the cylinder, applying no impact to the piston.



WRE91-SR016

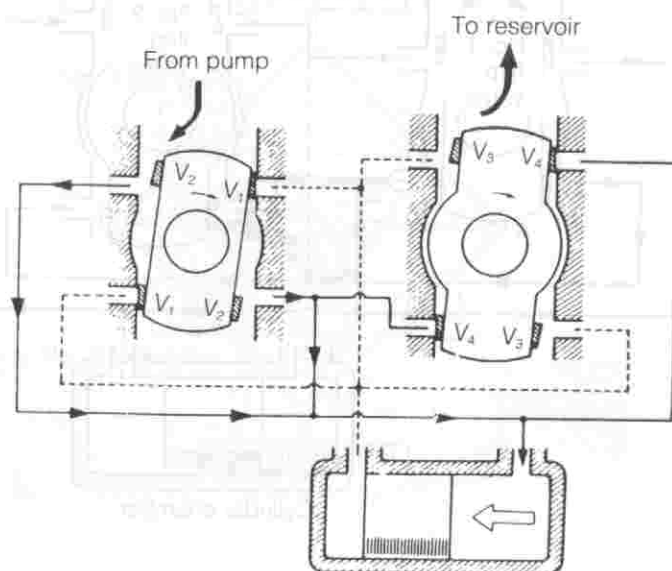
STEERING

(2) When the steering wheel is turned clockwise:



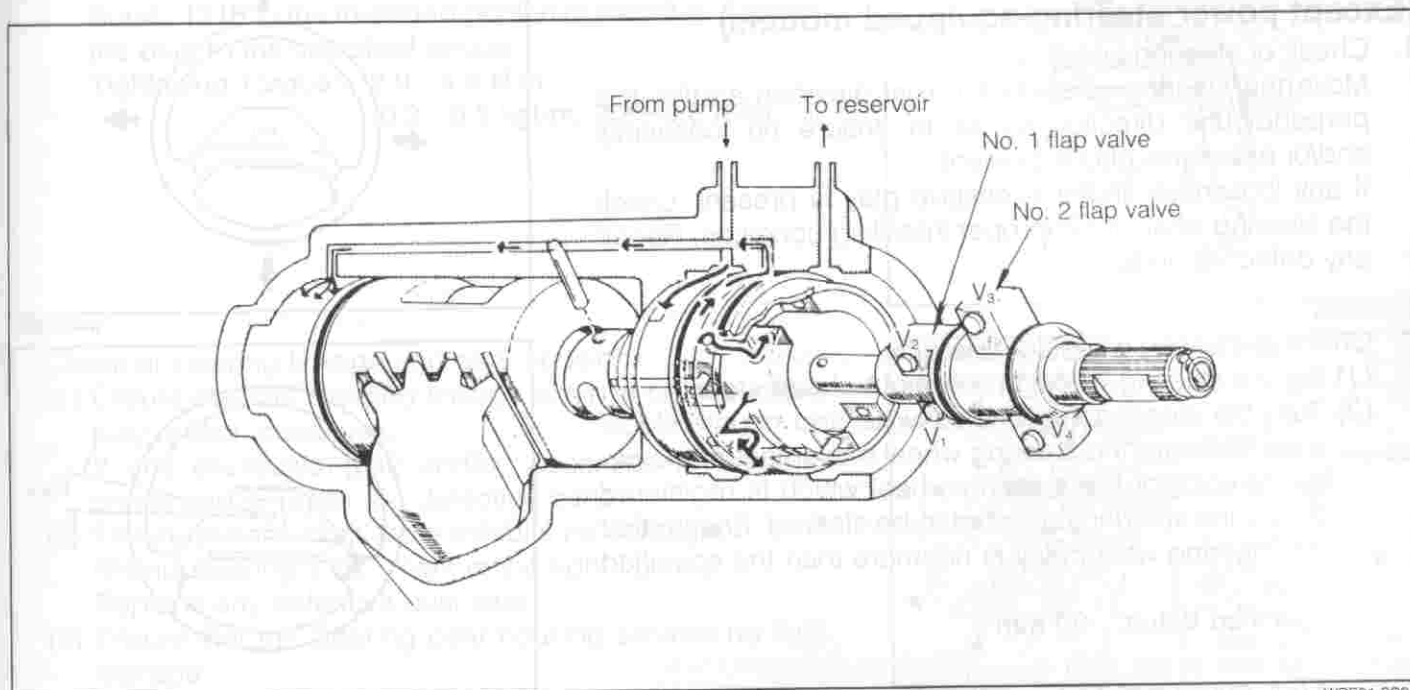
WRE91-SR017

When the steering wheel is turned clockwise, V2 of No. 1 flap valve opens, and V4 of No. 2 flap valve almost closes. Thus, the hydraulic pressure in the oil channels rises to generate oil flow as shown in the figure. As a result, the hydraulic pressure on the right side of the power piston rises to push the piston to the left. As the power acting on the worm shaft decreases, the torsion bar twist angle also becomes smaller. This expands V4 opening, lowering the hydraulic pressure that pushes the piston. Meanwhile, as the power acting on the worm shaft increases, V4 closes completely, which increases the hydraulic pressure pushing the piston. This is how the hydraulic pressure is controlled to achieve the servo power in accordance with the steering effort by No. 2 flap valve.



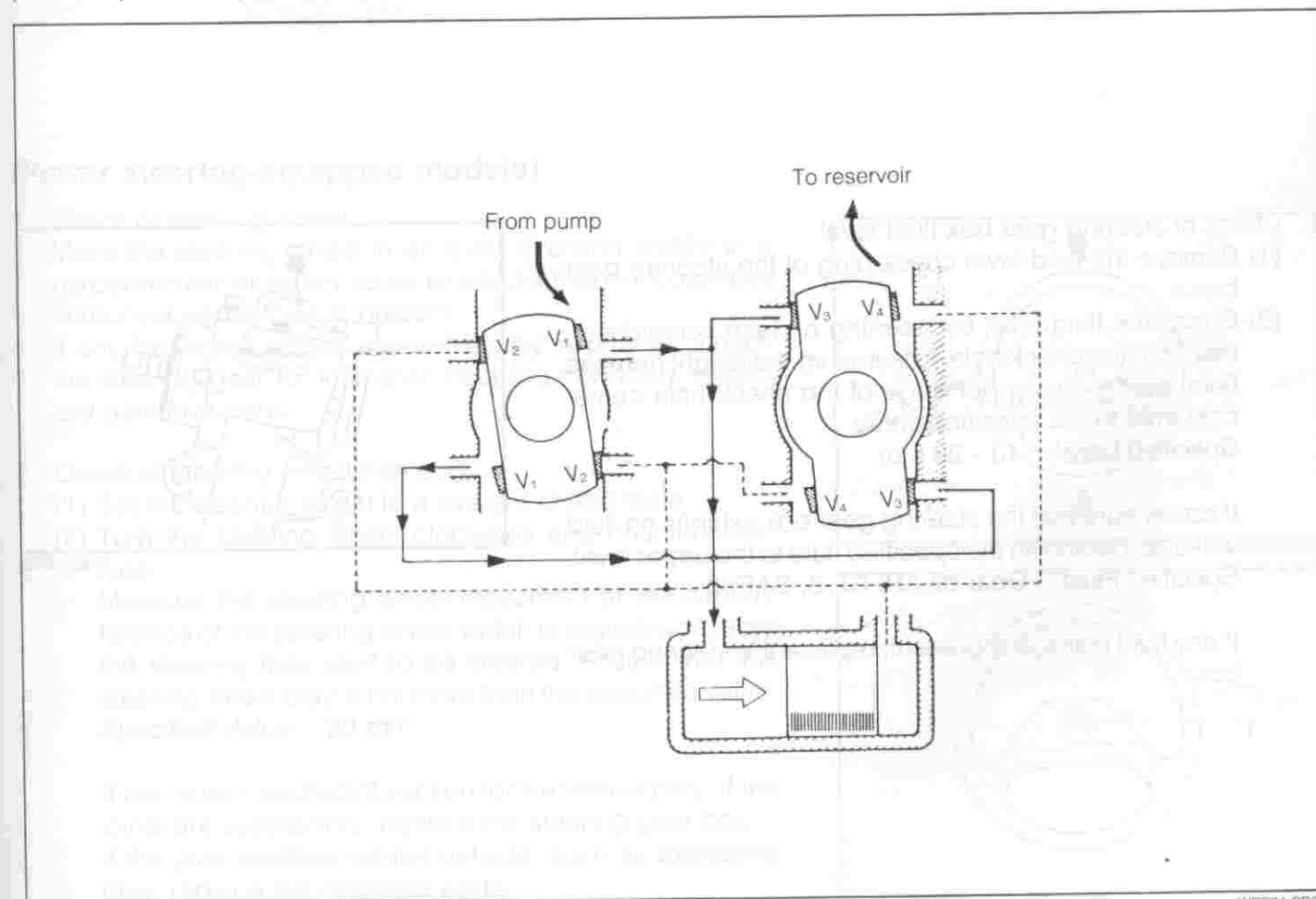
WRE91-SR018

(3) When the steering wheel is turned counterclockwise:



WRE91-SR019

When the steering wheel is turned counterclockwise, V1 of No. 1 flap valve opens and V3 of No. 2 flap valve almost closes. Thus, the oil flows along the oil groove in the outer ring, the oil channel in the valve body and housing, that of the steering gear housing, eventually entering the chamber on the left side of the power piston to push the piston to the right.



WRE91-SR020

STEERING

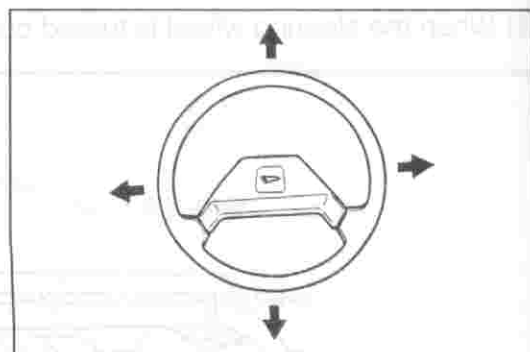
IN-VEHICLE INSPECTION

(Except power steering-equipped models)

1. Check of steering wheel

Move the steering wheel in an axial direction and/or in a perpendicular direction so as to ensure no looseness and/or excessive play is present.

If any looseness and/or excessive play is present, check the steering wheel for improper installing condition. Repair any defective parts.



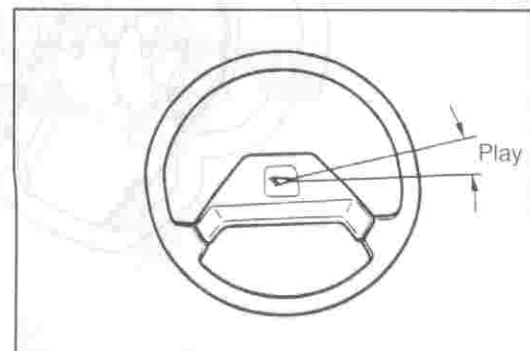
WRE91-SR021

2. Check of steering wheel for free play

(1) Set the steering wheel to a straight-ahead state.

(2) Turn the steering wheel clockwise and counterclockwise. Measure the steering wheel movement at the circumference of the steering wheel which is registered before the steering tires start to be steered. Ensure that this steering wheel play is not more than the specified value.

Specified Value: 30 mm



WRE91-SR022

If not, check each joint section for excessive play. If the joints are satisfactory, replace the steering gear box.

If the joint sections exhibit defects, such as excessive play, replace the defective parts.

3. Check of steering gear box fluid level

(1) Remove the fluid level check plug of the steering gear box.

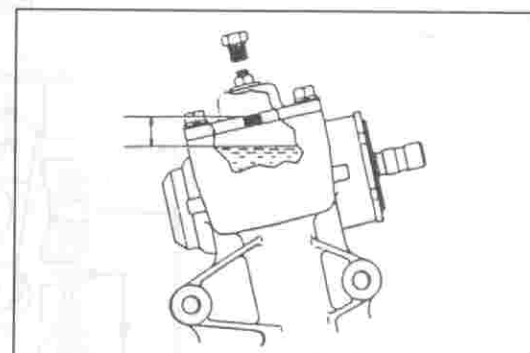
(2) Check the fluid level by inserting a clean screwdriver, etc. from the check hole. Ensure that the height from the fluid level to the upper edge of the check hole center conforms to the specified value.

Specified Level: 13 - 23 mm

If not, ensure that the steering gear box exhibits no fluid leakage. Replenish the specified fluid to the upper level.

Specified Fluid: Gear oil API GL-3, SAE90

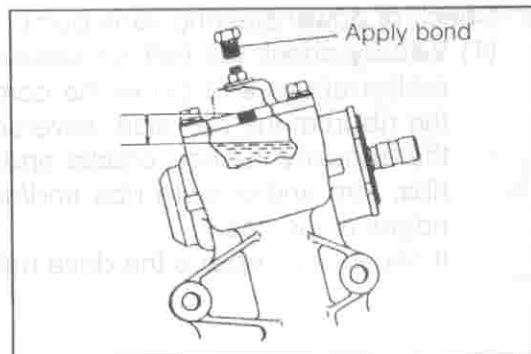
If any fluid leakage is present, replace the steering gear box.



WRE91-SR023

- (3) Clean the plug and plug hole. Furthermore, apply Three Bond[®] 1216 to the threaded portion of the plug. Tighten the plug to the specified torque.

Tightening Torque: 2.9 - 4.9 N·m
(0.3 - 0.5 kgf-m, 2.2 - 3.6 ft-lb)



WRE91-SR024

4. Check of steering linkage and gear housing

- (1) Ensure that the steering linkage exhibits no excessive play and/or looseness.

If any excessive play and/or looseness is present, check and/or repair the defective parts.

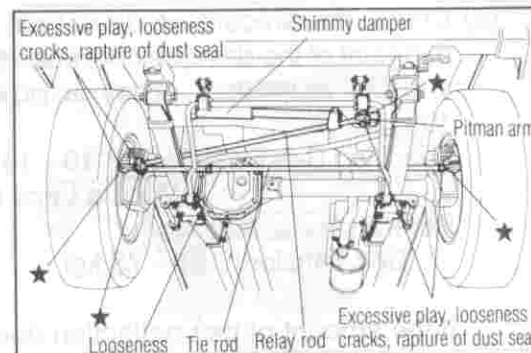
- (2) Ensure that the dust seals exhibit no damage.

(Points bearing a "★" mark in the right figure.)

Replace any defective dust seal.

- (3) Ensure that the steering gear housing exhibits no fluid leakage.

If any fluid leakage is present, replace the steering gear housing.



WRE91-SR025

(Power steering-equipped models)

1. Check of steering wheel

Move the steering wheel in an axial direction and/or in a perpendicular direction so as to ensure that no looseness and/or excessive play is present.

If any looseness and/or excessive play is present, check the steering gear for improper installing condition. Repair any defective parts.

2. Check of steering wheel free play

- (1) Set the steering wheel to a straight-ahead state.

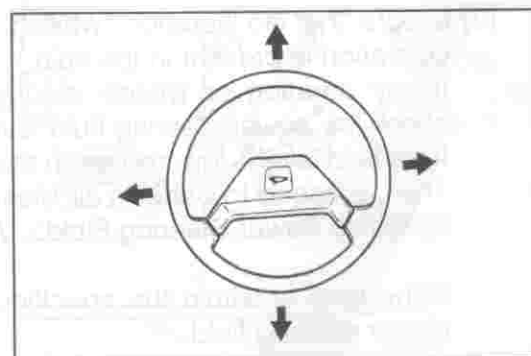
- (2) Turn the steering wheel clockwise and counterclockwise.

Measure the steering wheel movement at the circumference of the steering wheel which is registered before the steering tires start to be steered. Ensure that this steering wheel play is not more than the specified value.

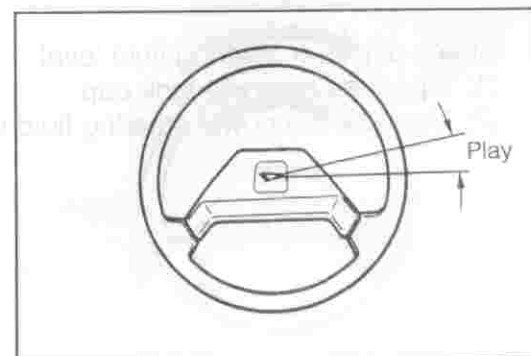
Specified Value: 30 mm

If not, check each joint section for excessive play. If the joints are satisfactory, replace the steering gear box.

If the joint sections exhibit defects, such as excessive play, replace the defective parts.



WRE91-SR026



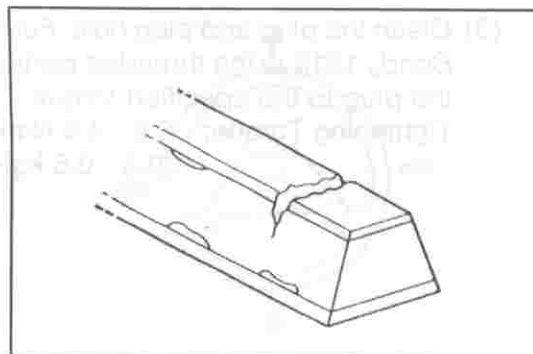
WRE91-SR027

STEERING

3. Check of power steering vane pump drive belt

- (1) Visually check the belt for separation of the adhesive rubber above and below the core, core separation of the rib from the belt side, severed core, separation of the adhesive rubber, cracks and/or separation of the ribs, torn and/or worn ribs and/or cracks in the inner ridges of the ribs.

If necessary, replace the drive belt.



WRE91-SR028

- (2) Check the amount of drive belt deflection when the midpoint of the drive belt between the vane pump pulley and the crankshaft pulley is pushed with a force of 10 kgf.

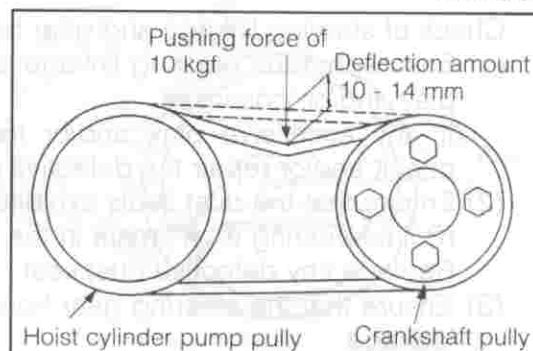
Specified Belt Deflection: 10 - 14 mm

[When a force of 10 kgf is applied.]

Reference:

Belt Tension: 50 - 75 kgf

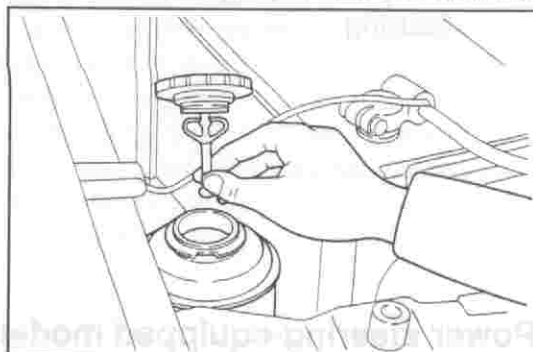
If the amount of belt deflection does not conform to the specified value, adjust the drive belt tension.



WRE91-SR029

4. Check of power steering fluid

- (1) Open the reservoir tank cap.
- (2) Ensure that the power steering fluid viscosity is not low abnormally.
If the viscosity is low abnormally, change the power steering fluid.



WRE91-SR030

- (3) Ensure that no aeration, whitish cloudy state or discoloration is present in the fluid.

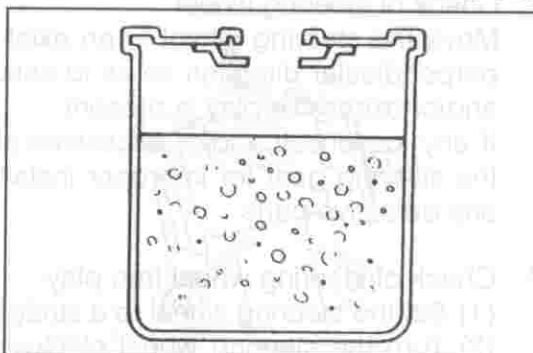
If any aeration or whitish cloudy state is observed, check the power steering fluid level.

If the fluid level is low, replenish the power steering fluid. Then, proceed to perform air bleeding.

Specified Power Steering Fluid: ATF DEXRON® II

If the level is within the specified range, change the power steering fluid.

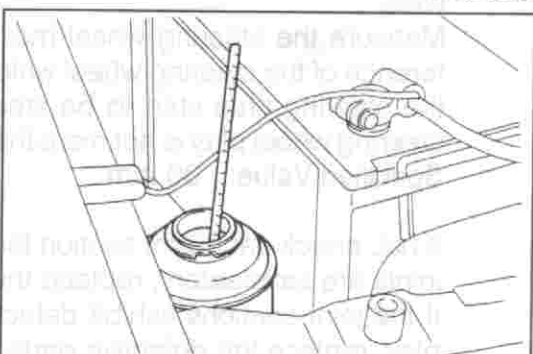
- (4) Close the reservoir tank cap.



WRE91-SR031

5. Check of power steering fluid level

- (1) Open the reservoir tank cap.
- (2) Measure the power steering fluid temperature.



WRE91-SR032

- (3) When the power steering fluid temperature is within the range of 0 to 40°C or 40 - 80°C, check to see if the fluid level is within the specified range corresponding to the measured temperature condition.

NOTE:

- The term "cold" represents a range of 0 - 40°C.
- The term "hot" represents a range of 40 - 80°C.

If the fluid level is low, replenish the specified power steering fluid up to the upper level.

Specified Power Steering Fluid: ATF DEXRON® II

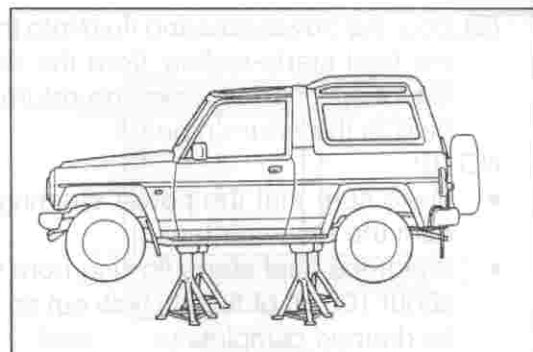
- (4) Close the reservoir tank cap.

6. Power steering fluid change procedure

CAUTION:

- Never start the engine while the power steering fluid is being drained.

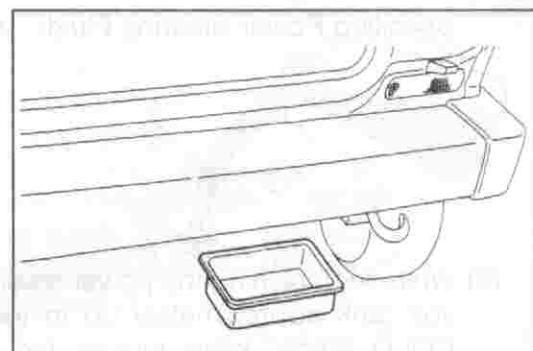
- (1) Place the vehicle on a level floor. Jack up the vehicle and support it with safety stands.
(See page GI section.)



WRE91-SR033

WRE91-SR034

- (2) Place a suitable container below the return hose connecting section.



WRE91-SR035

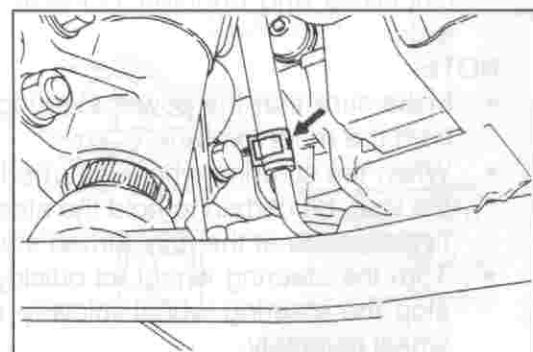
- (3) Detach the return hose clamp. Drain the fluid by disconnecting the return hose from the return pipe.

CAUTION:

- When disconnecting the return hose, special caution must be paid as to the flowing fluid.

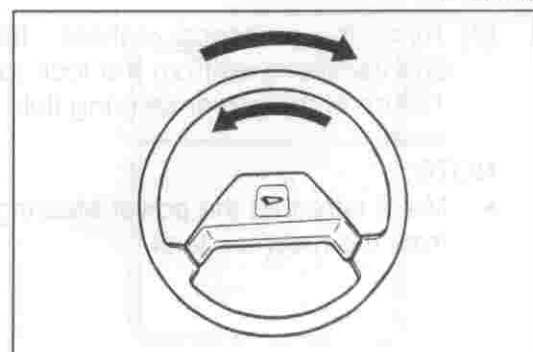
NOTE:

- Be very careful not to deform the return pipe.



WRE91-SR036

- (4) Turn the steering wheel fully clockwise or counterclockwise from the lock to the lock several times so as to drain the fluid inside the steering gear box.



WRE91-SR037

STEERING

NOTE:

- When the steering wheel is turned fully from the lock to the lock, be certain to hold the steering wheel for four to five seconds at the fully turned state.
- Make sure that the fluid no longer flows from the return hose.

- (5) Pour the power steering fluid into the reservoir tank, until the fluid starts to flow from the return pipe. When the fluid starts flowing from the return pipe, install a blank plug to the return pipe.

NOTE:

- Make sure that the power steering fluid will not run out from the reservoir tank.
- When the fluid starts flowing from the return pipe, allow about 100 cc of fluid to flow out so that the old fluid may be drained completely.

Specified Power Steering Fluid: ATF DEXRON® II

- (6) While replenishing the power steering fluid to the reservoir tank approximately up to the upper level in the COLD range, keep turning the steering wheel fully clockwise and counterclockwise from the lock to the lock.

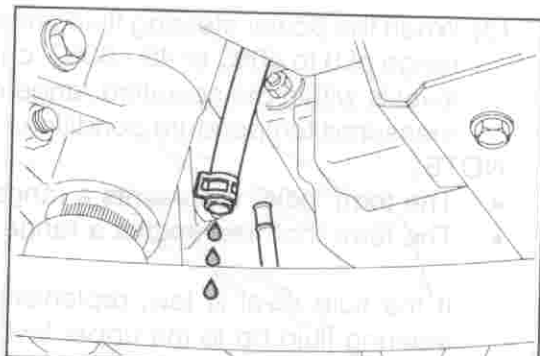
NOTE:

- Make sure that the power steering fluid will not run out from the reservoir tank.
- When the steering wheel is turned fully from the lock to the lock, be certain to hold the steering wheel for four to five seconds at the fully turned state.
- Turn the steering wheel as quickly as possible. Do not stop the steering wheel midway nor turn the steering wheel reversely.

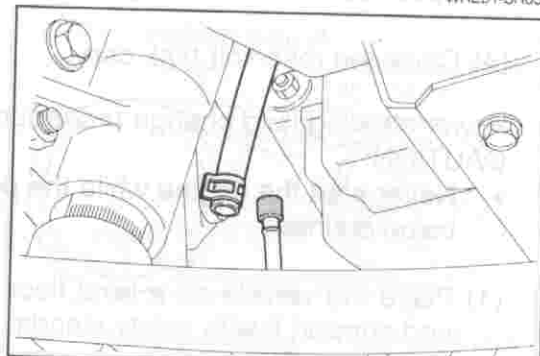
- (7) Turn the steering wheel fully clockwise and counterclockwise from the lock to the lock, until about 100 cc of the power steering fluid flows from the return hose.

NOTE:

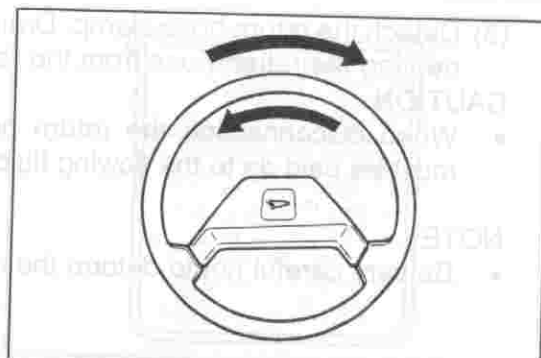
- Make sure that the power steering fluid will not run out from the reservoir tank.



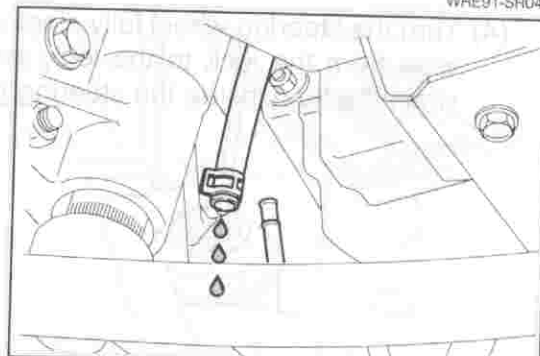
WRE91-SR038



WRE91-SR039



WRE91-SR040

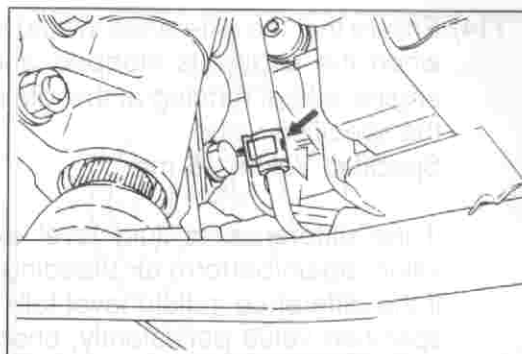


WRE91-SR041

- (8) Remove the blank plug from the return pipe. Connect the return hose to the return pipe and install the hose clamp.

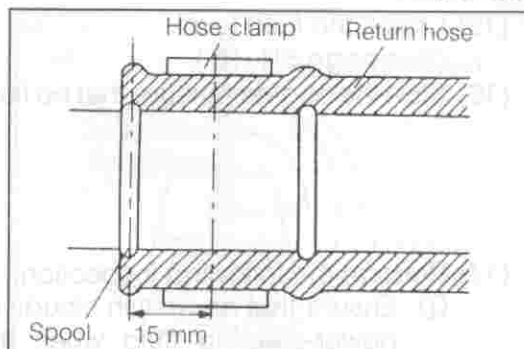
NOTE:

- Make sure that the power steering fluid will not run out from the reservoir tank.



WRE91-SR042

- Correctly clamp the return hose as shown in the right figure.
- Be sure to install the return hose so that the distance from the center of the hose clamp to the edge of the spool becomes 15 ± 2 mm.

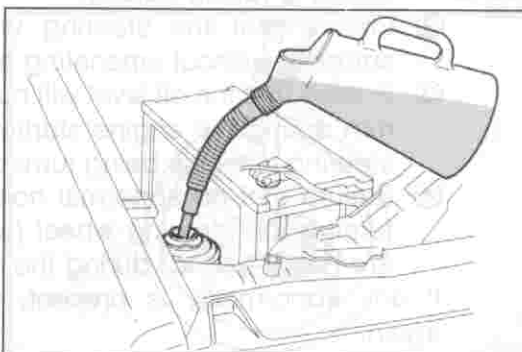


WRE91-SR043

- (9) Replenish the power steering fluid to the reservoir tank approximately up to the upper level in the COLD range.
Specified Power Steering Fluid: ATF DEXRON® II

NOTE:

- If the oil temperature is above 40°C , fill the power-steering fluid up to the upper level in the HOT level.

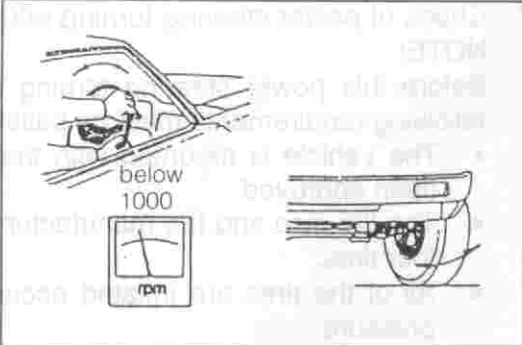


WRE91-SR044

- (10) Start the engine. Keep running the engine at the idle speed.
- (11) Turn the steering wheel fully either to the right or to the left. Hold the steering wheel for two to three seconds at the fully turned state. Then, turn the steering wheel in the opposite direction and hold it for two to three seconds.

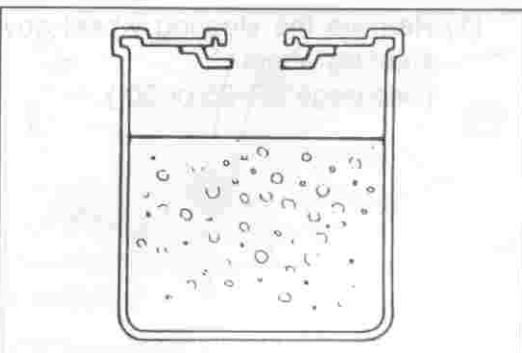
NOTE:

- Make sure that the power steering fluid will not run out from the reservoir tank.



WRE91-SR045

- (12) Repeat the operations described in the step (11) onward three or four times.
- (13) Ensure that no aeration or whitish cloudy state is present at the power steering fluid in the reservoir tank. If any aeration and/or whitish cloudy state is observed, stop the engine. Wait for about ten minutes. Again, repeat the operations described in (10) onward.



WRE91-SR046

STEERING

- (14) Ensure that the difference in fluid level between the time when the engine is stopped and the time when the engine is kept running at the idle speed will not exceed the specified value.

Specified Value: 5 mm

If the difference in fluid level exceeds the specified value, again perform air bleeding.

If the difference in fluid level fails to become within the specified value persistently, check the hydraulic pressure.

- (15) Check the fluid level.

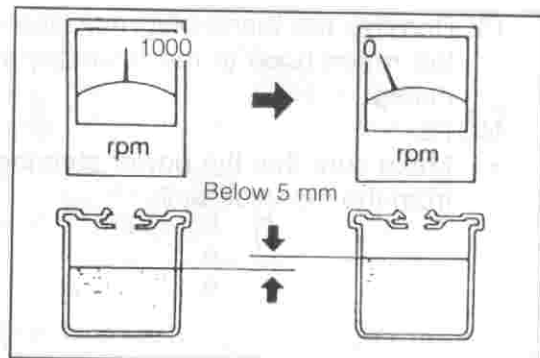
(See page SR-16.)

- (16) Start the engine. Ensure that no fluid leakage is present.

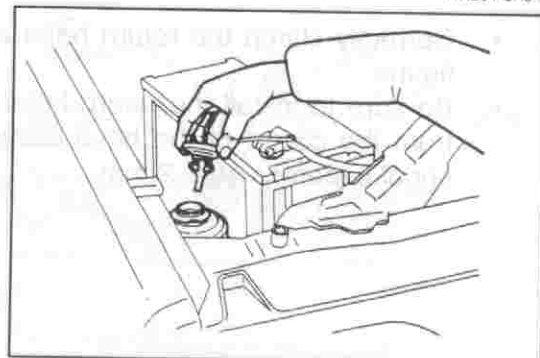
- (17) Perform the following inspection.

- ① Ensure that no whitish cloudy state is present in the power-steering fluid when the engine revolution speed is raised quickly.
- ② Ensure that the steering wheel can be turned smoothly without emanating abnormal noise.
- ③ Ensure that the oil level will not change more than 5 mm during the engine starting period or when the steering wheel is being turned.
- ④ Ensure that no abnormal noise is emanated when turning the steering wheel (when the front wheels are being turned) during the running.

If any abnormality is present, perform air bleeding again.



WRE91-SR047



WRE91-SR048

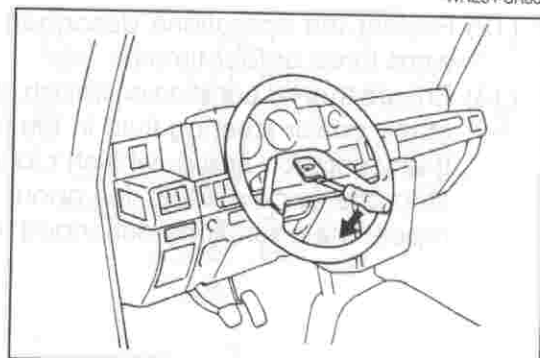
7. Check of power steering turning effort

NOTE:

Before this power steering turning effort is checked, the following requirements must be satisfied in advance.

- The vehicle is mounted with the tires whose use has been approved.
- The tire size and tire manufacturer are the same on all four tires.
- All of the tires are inflated accurately to the specified pressure.

- (1) Remove the steering wheel cover assembly from the steering wheel.
(See page SR-25 or 30.)



WRE91-SR051

- (2) Start the engine. Keep running the engine at the idle speed.
- (3) Set the steering wheel to a straight-ahead condition.
- (4) Install a torque wrench to the steering wheel attaching nut.

- (5) Measure the maximum steering torque which is registered while the steering wheel is being turned slowly one-fourth turn in the clockwise direction by means of the torque wrench. Ensure that this maximum turning effort will not exceed the specified value.

Specified Value: 7.8 N·m (80 kgf-cm, 5.8 ft-lb)

If not, perform the power steering hydraulic pressure check.

If the results of the hydraulic pressure check are satisfactory, check the following items given below:

Steering gear box preload, operating conditions of each steering linkage, steering shaft ball joints and/or operating conditions of universal joints.

- (6) Set the steering wheel to a straight-ahead condition.
- (7) Measure the maximum steering torque which is registered while the steering wheel is being turned one-fourth turn slowly in the counterclockwise direction by means of the torque wrench. Ensure that this maximum turning effort will not exceed the specified value.

Specified Value: 7.8 N·m (80 kgf-cm, 5.8 ft-lb)

If not, perform the power steering hydraulic pressure check.

If the results of the hydraulic pressure check are satisfactory, check the following items given below:

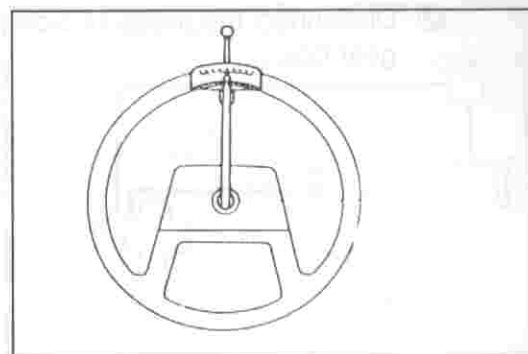
Steering gear box preload, operating conditions of each steering linkage, steering shaft ball joints and/or operating conditions of universal joints.

8. Check of power steering hydraulic pressure

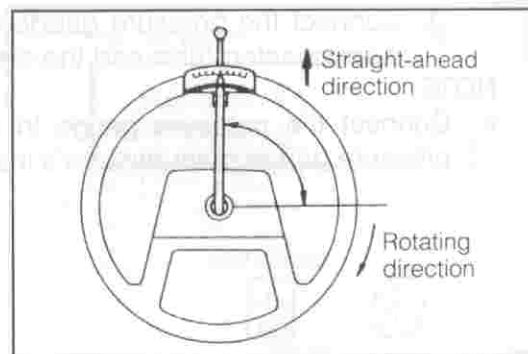
(1) Installation of pressure gauge

- ① Drain the power steering fluid.

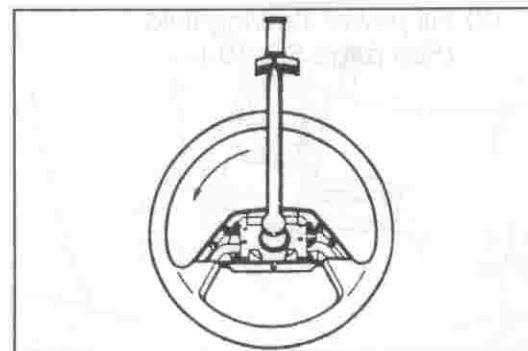
(See page SR-17, step (1) to step (4).)



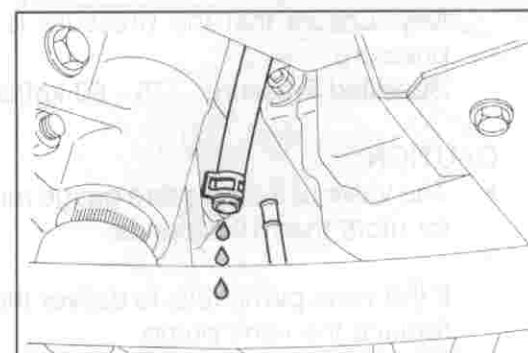
WRE91-SR052



WRE91-SR053



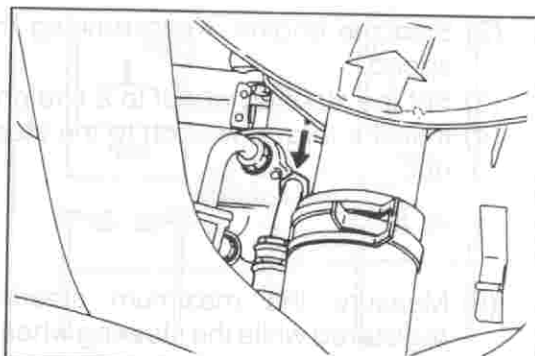
WRE91-SR054



WRE91-SR055

STEERING

- ② Disconnect the pressure side tube from the steering gear box.

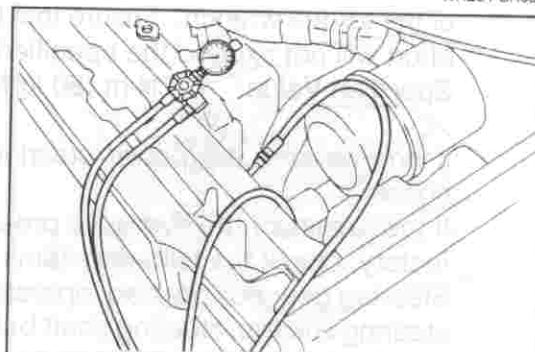


WRE91-SR056

- ③ Connect the pressure gauge midway between the disconnected tube and the steering gear box.

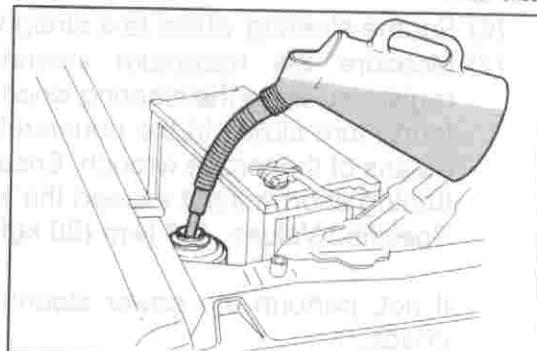
NOTE:

- Connect the pressure gauge in accordance with the pressure gauge manufacturer's instructions.



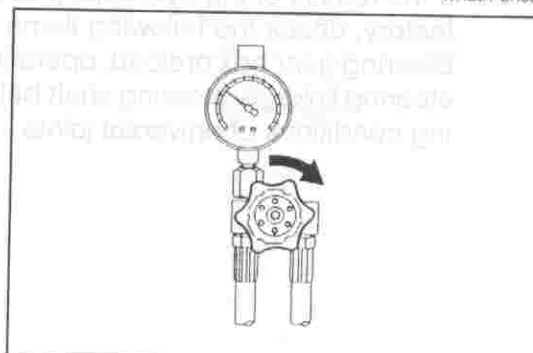
WRE91-SR057

- (2) Fill power steering fluid.
(See page SR-19.)



WRE91-SR058

- (3) Start the engine.
- (4) With the valve of the pressure gauge closed and while maintaining the line pressure at 40 to 50 kg/cm², warm up the power steering fluid, until its temperature reaches 80°C.



WRE91-SR059

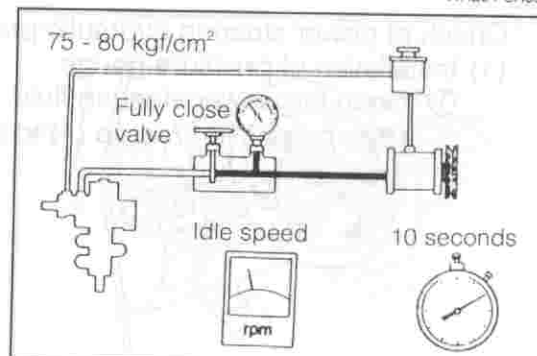
- (5) Check of vane pump hydraulic pressure
Close the valve of the pressure gauge temporarily and fully. Ensure that the pressure is within the specified pressure.

Specified Pressure: 75 - 80 kg/cm²

CAUTION:

- The valve of the pressure gauge must not be kept closed for more than 10 seconds.

If the vane pump fails to deliver the specified pressure, replace the vane pump.

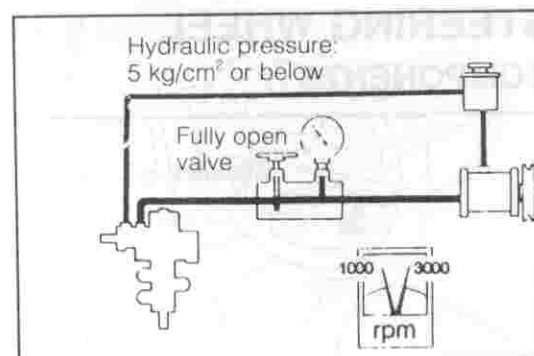


WRE91-SR060

- (6) Check of hydraulic pressure under unloaded state
- ① Open the valve of the pressure gauge fully.
 - ② Set the steering wheel to a straight-ahead condition.
 - ③ Measure the hydraulic pressure at times when the engine speed is 1000 rpm and 3000 rpm, respectively. Ensure that the difference in these pressures will not exceed the specified value.

Specified Value: 5 kg/cm²

If the difference in pressure exceeds the specified value, replace the vane pump.

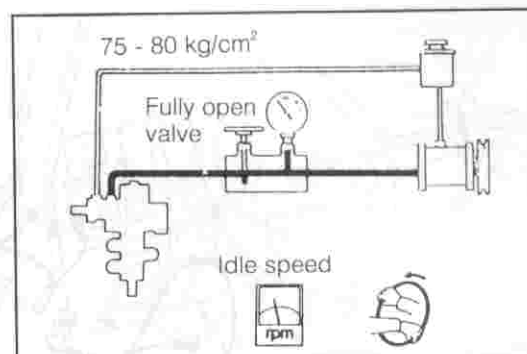


WRE91-SR061

- (7) Check of steering gear housing hydraulic pressure
- ① Open the valve of the pressure gauge fully.
 - ② Turn the steering wheel fully either clockwise or counterclockwise and hold the steering wheel at the fully turned state. Ensure that the hydraulic pressure under this state with in the specified value.

Specified Value: 75 - 80 kg/cm²

If the hydraulic pressure is below the specified value, replace the steering gear box.

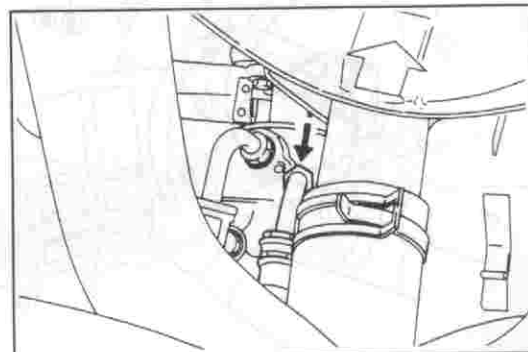


WRE91-SR062

- (8) Remove the pressure gauge.
(9) Connect the pressure side tube to the steering gear box.

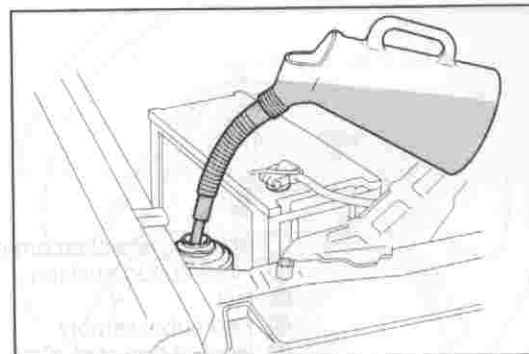
(See page SR-93.)

Tightening Torque: 39.2 - 49.0 N·m
(4.0 - 5.0 kgf-m, 28.9 - 36.2 ft-lb)



WRE91-SR063

- (10) Replenish the power steering fluid to the reservoir tank.
Perform air bleeding.
(For the air bleeding procedure, refer to page SR-19.)

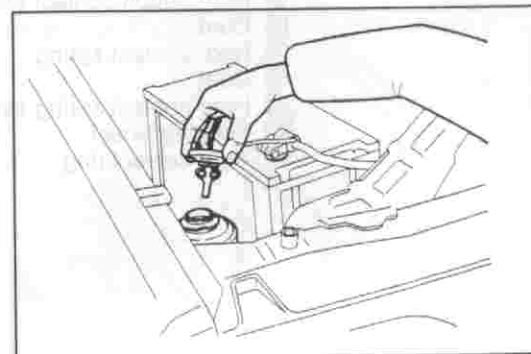


WRE91-SR064

- (11) Check the fluid level.

(See page SR-16.)

- (12) Start the engine. Ensure that no fluid leakage is present.



WRE91-SR065

STEERING

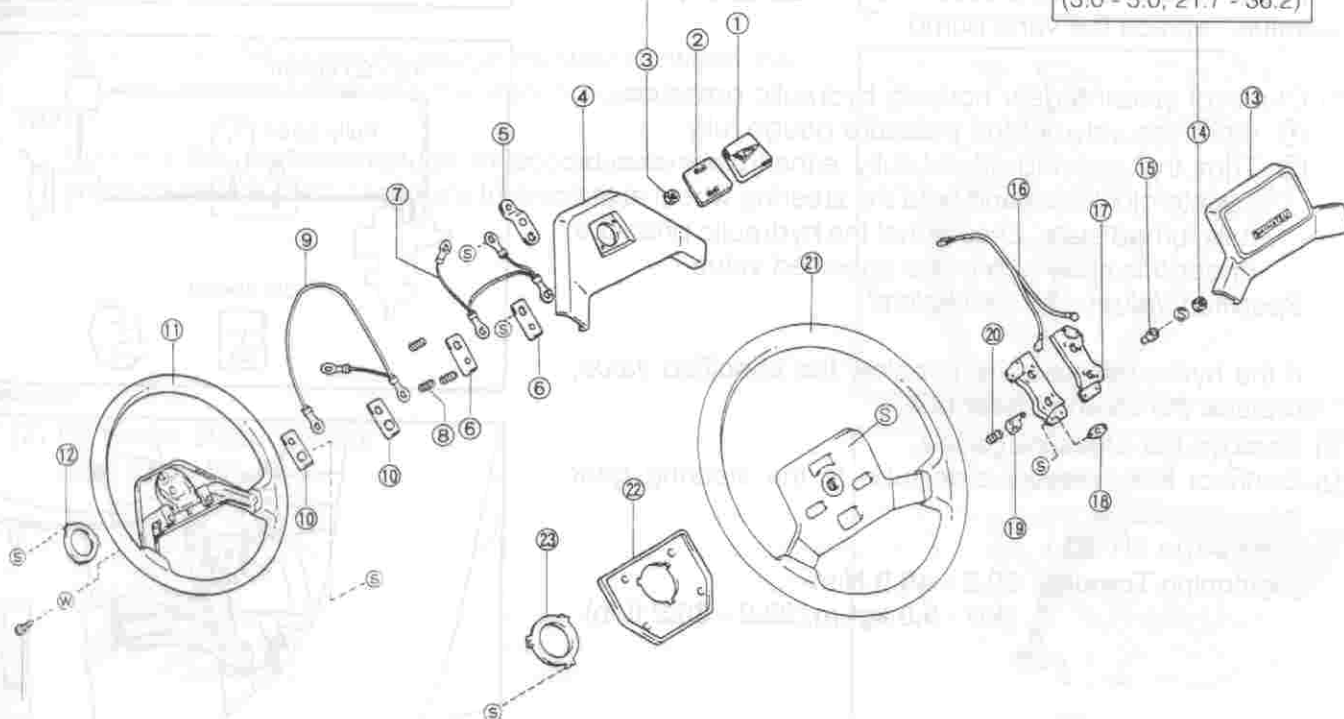
STEERING WHEEL COMPONENTS

Standard

Drethane wheel

29.4 - 49.0
(3.0 - 5.0, 21.7 - 36.2)

29.4 - 49.0
(3.0 - 5.0, 21.7 - 36.2)



 : Tightening torque
Unit : N·m (kgf·m, ft·lb)

- | | |
|---------------------------------|-----------------------------|
| ① Steering wheel ornament No.1 | ⑬ Horn button assembly |
| ② Horn button cushion | ⑭ Nut |
| ③ Nut | ⑮ Spacer |
| ④ Pad subassembly | ⑯ Cord |
| ⑤ Horn button stop plate | ⑰ Horn button stop plate |
| ⑥ Horn button contact plate | ⑱ Horn button contact seat |
| ⑦ Cord | ⑲ Horn contact plate spacer |
| ⑧ Horn contact spring | ⑳ Spring |
| ⑨ Cord | ㉑ Steering wheel |
| ⑩ Horn contact spring set plate | ㉒ Steering wheel cover |
| ⑪ Steering wheel | ㉓ Horn contact ring |
| ⑫ Horn contact ring | |

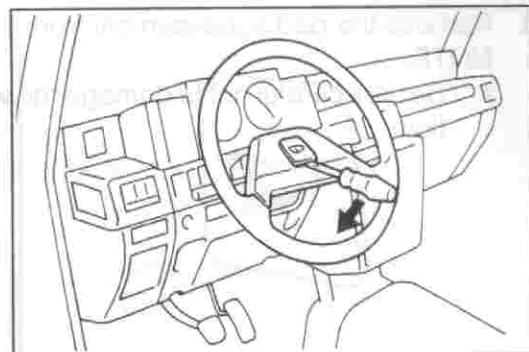
STANDARD STEERING WHEEL

REMOVAL

1. Remove the steering wheel ornament No.1 by prying it by means of a small standard screwdriver.

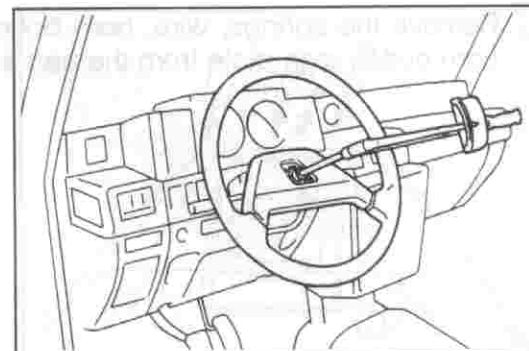
NOTE:

- Be very careful not to damage the steering wheel.



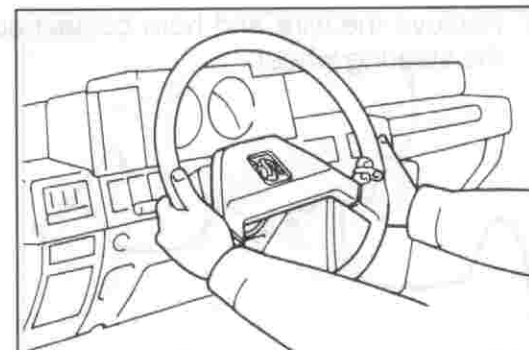
WRE91-SR067

2. Loosen the steering wheel attaching nut two or three turns.



WRE91-SR068

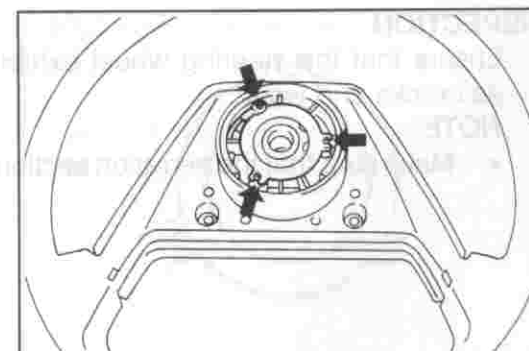
3. Disconnect the steering wheel by applying an impact to it with palm of your hand.
4. Remove the steering wheel attaching nut.
5. Remove the steering wheel.



WRE91-SR069

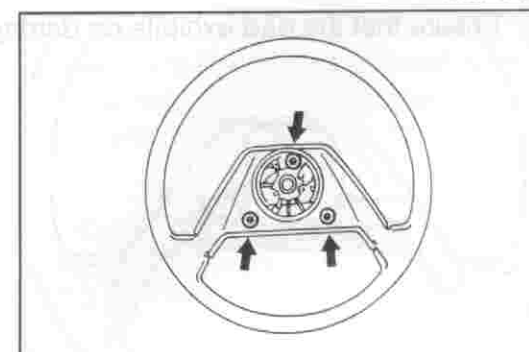
DISASSEMBLY

1. Remove the horn contact ring by removing the attaching screws.



WRE91-SR070

2. Remove the pad subassembly attaching screws.



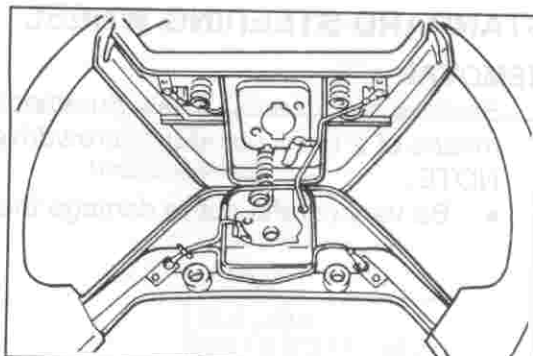
WRE91-SR071

STEERING

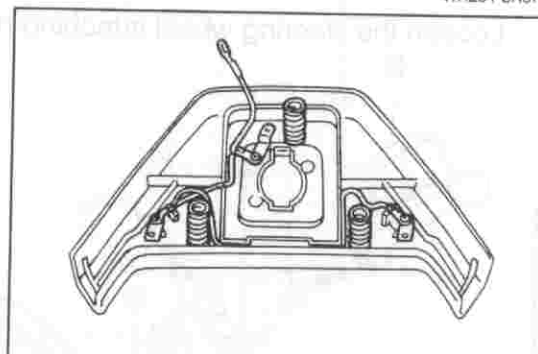
3. Remove the pad subassembly from the steering wheel.

NOTE:

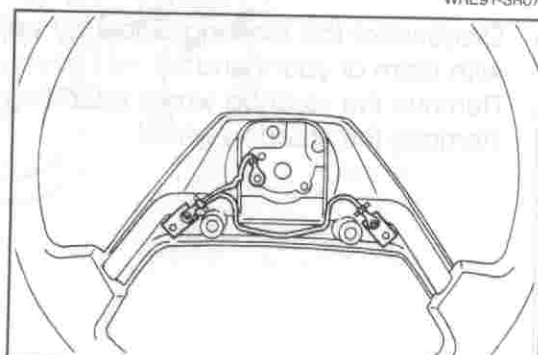
- Be very careful not to damage the wire during this operation.



4. Remove the springs, wire, horn button contact plate and horn button stop plate from the pad subassembly.



5. Remove the wire and horn contact spring set plates from the steering wheel.

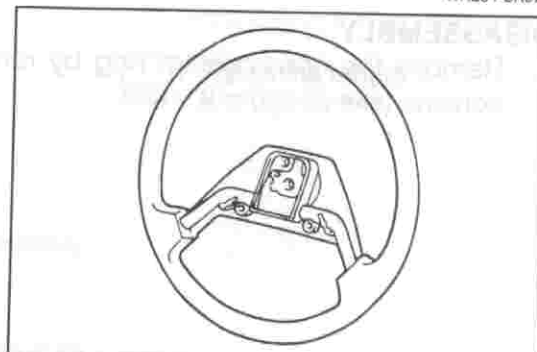


INSPECTION

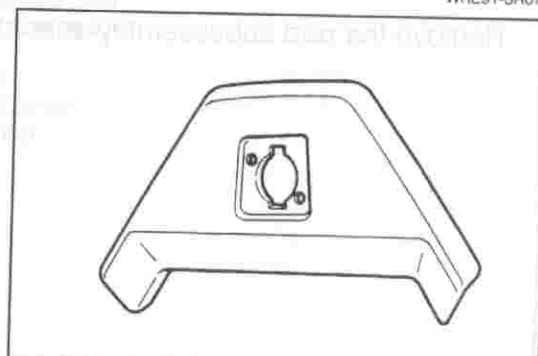
1. Ensure that the steering wheel exhibits no damage, such as cracks and wear.

NOTE:

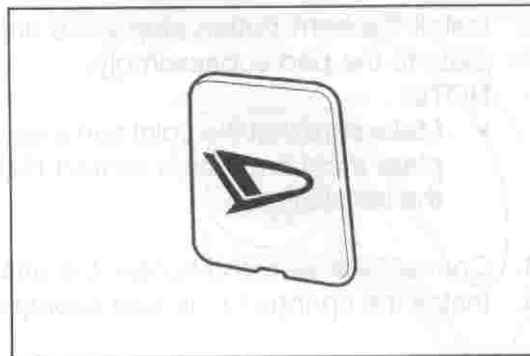
- Make sure that the serration section exhibits no damage.



2. Ensure that the pad exhibits no damage, such as cracks.

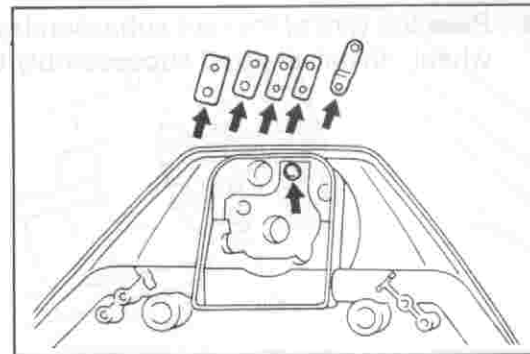


3. Ensure that the ornament exhibits no damage, such as cracks.
4. Ensure that the horn button cushion is not deteriorated.



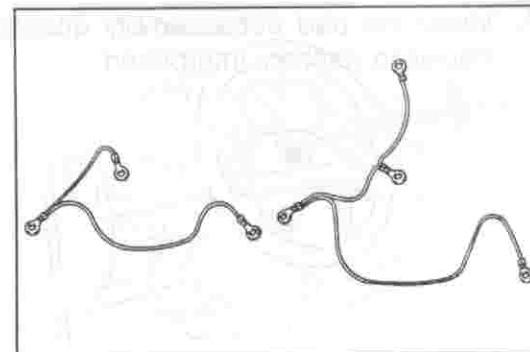
WRE91-SR077

5. Ensure that each contact point section exhibits no damage, such as electrolytic corrosion.



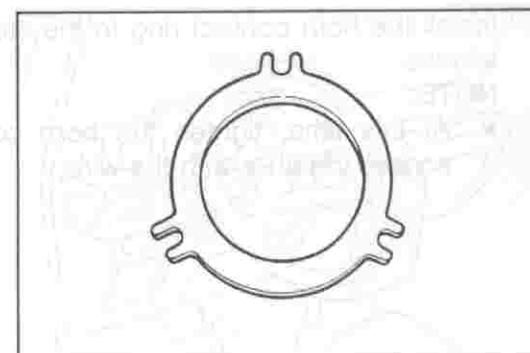
WRE91-SR078

6. Ensure that continuity exists between the terminals of each wire.



WRE91-SR079

7. Ensure that the horn contact ring exhibits no damage, such as deformation, wear and electrolytic corrosion.



WRE91-SR080

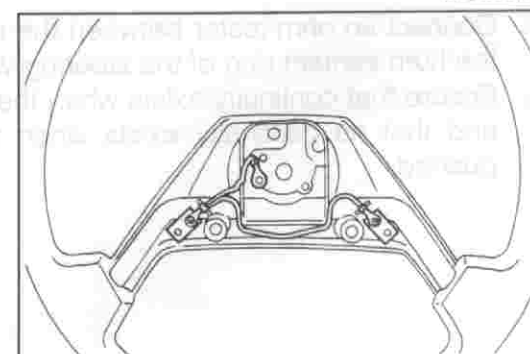
ASSEMBLY

1. Install the horn contact spring set plates to the steering wheel.

NOTE:

- Make sure that the point surface of the horn contact spring set plate faces upward during the installation.

2. Connect the wire and tighten the attaching screw.



WRE91-SR081

STEERING

3. Install the horn button stop plate and horn button contact plate to the pad subassembly.

NOTE:

- Make sure that the point surfaces of the horn button stop plate and horn button contact plate face upward during the installation.

4. Connect the wire and tighten the attaching screw.
5. Install the springs to the pad subassembly.

6. Pass the wire of the pad subassembly through the steering wheel. Install the pad subassembly to the steering wheel.

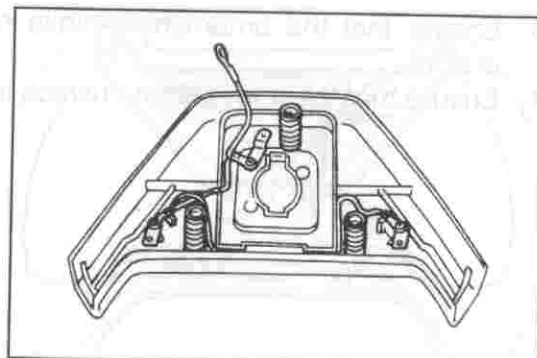
7. Install the pad subassembly attaching screws with new insulation washers interposed.

8. Install the horn contact ring to the steering wheel with the screws.

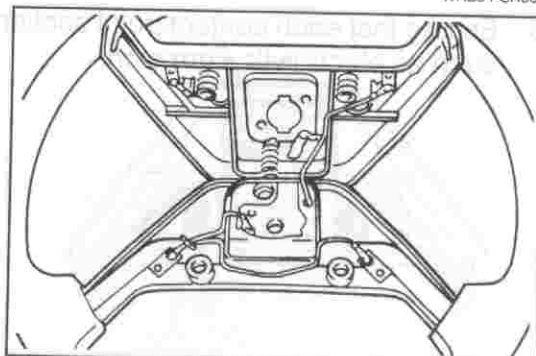
NOTE:

- At this time, tighten the horn contact ring attaching screws together with the wire.

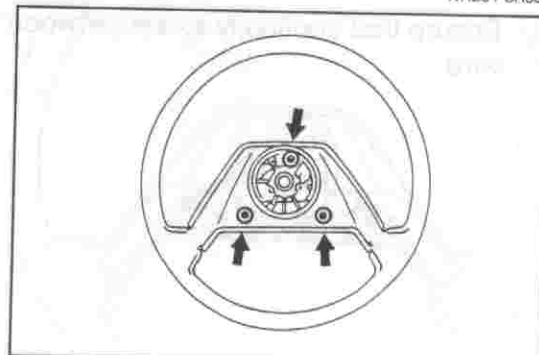
9. Connect an ohm tester between the serration section and the horn contact ring of the steering wheel.
10. Ensure that continuity exists when the horn pad is pushed and that no continuity exists when the horn pad is not pushed.



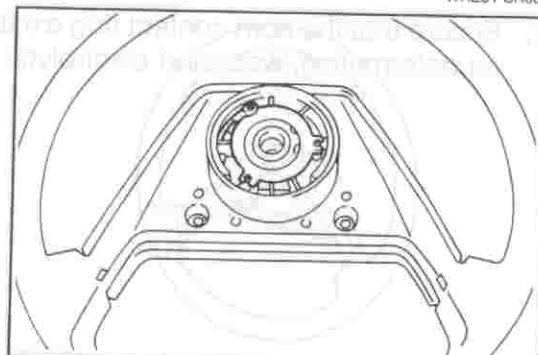
WRE91-SR082



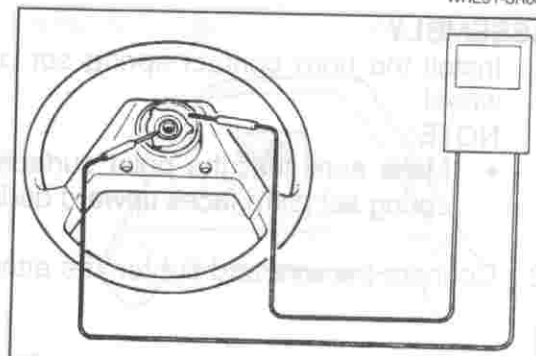
WRE91-SR083



WRE91-SR084



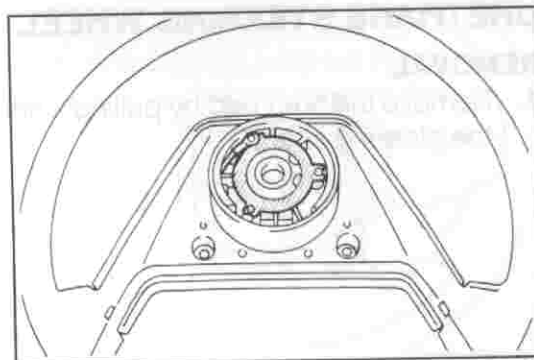
WRE91-SR085



WRE91-SR086

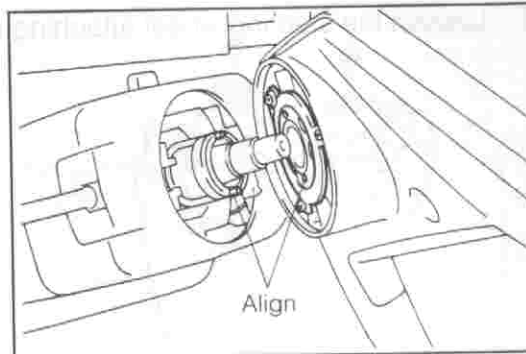
INSTALLATION

1. Apply about two grams of rubber grease to the horn contact ring.



WRE91-SR087

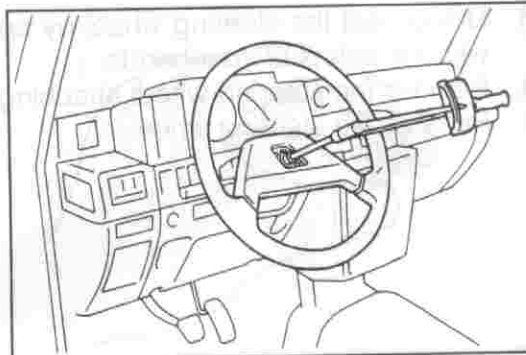
2. Align the hole of the steering wheel with the protruding section of the cancel cam. Install the steering wheel in such a way that it may be set to the straight-ahead position when the tires are in the straight-ahead position.



WRE91-SR088

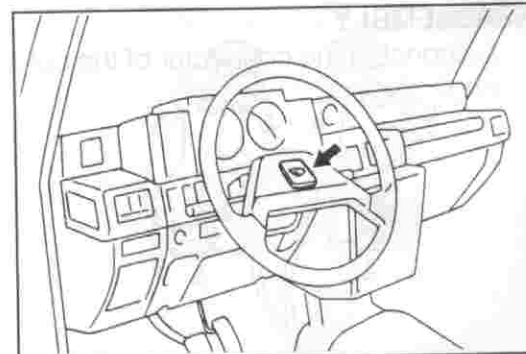
3. Install a new steering wheel attaching nut and tighten it to the specified torque.

Tightening Torque: 29.4 - 49.0 N·m
(3.0 - 5.0 kgf-m, 21.7 - 36.2 ft-lb)



WRE91-SR089

4. Fit the steering ornament No.1 to the steering wheel.



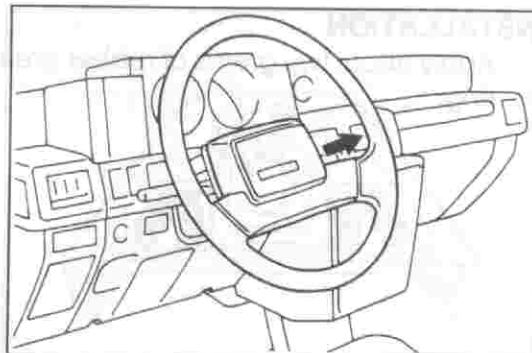
WRE91-SR090

STEERING

URETHANE STEERING WHEEL

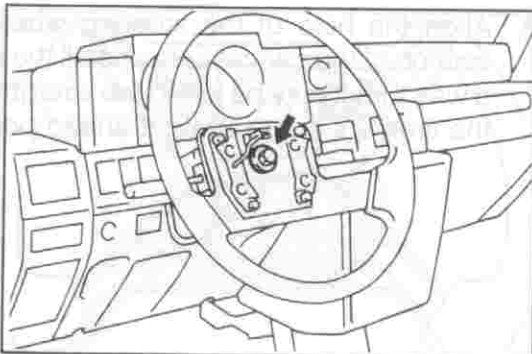
REMOVAL

1. Remove the horn pad by pulling it horizontally together with the steering shaft.



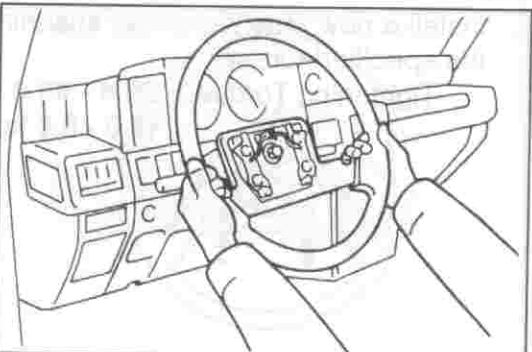
WRE91-SR091

2. Loosen the steering wheel attaching nut two or three turns.



WRE91-SR092

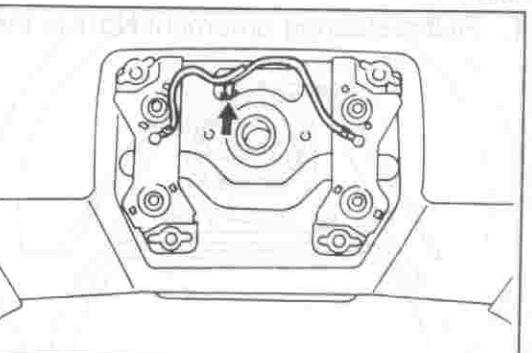
3. Disconnect the steering wheel by applying an impact to it with the palms of your hands.
4. Remove the steering wheel attaching nut.
5. Remove the steering wheel.



WRE91-SR093

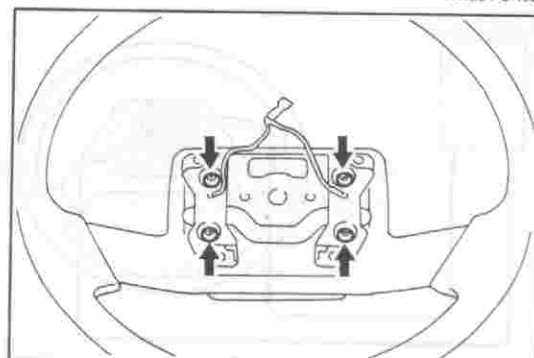
DISASSEMBLY

1. Disconnect the connector of the cord from the horn contact ring.



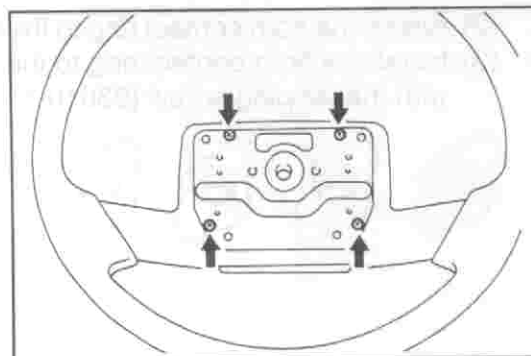
WRE91-SR094

2. Remove the horn button stop plates from the steering wheel by removing the attaching screws of the horn button stop plates together with the spacer.



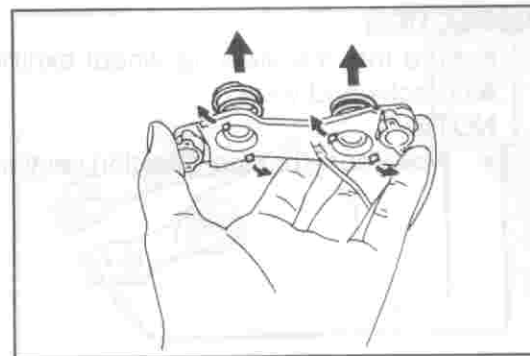
WRE91-SR095

3. Remove the steering wheel cover from the steering wheel by removing the steering wheel cover attaching screws.



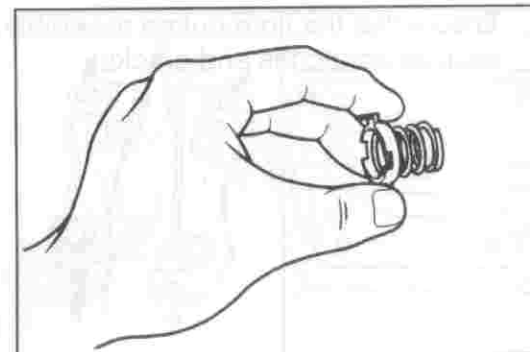
WRE91-SR096

4. Remove the horn contact plate spacers together with the spring from the horn button stop plate.



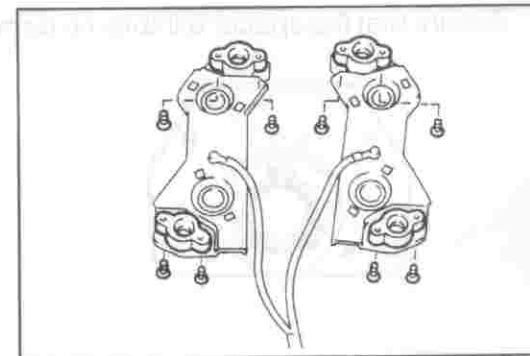
WRE91-SR097

5. Remove the spring from the horn contact plate spacer by turning the spring counterclockwise.



WRE91-SR098

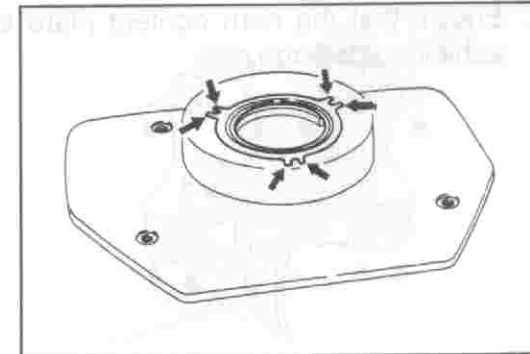
6. Remove the horn button contact seat from the horn button stop plate.



WRE91-SR099

7. Replace the horn contact ring.
(Only as required)

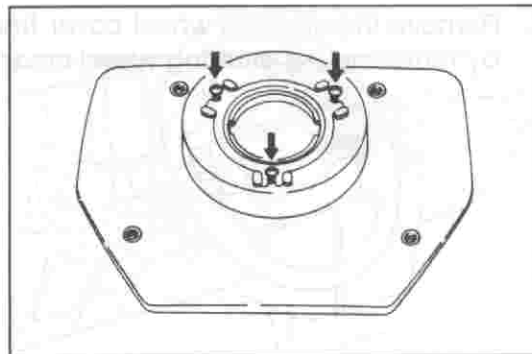
(1) Remove the horn contact ring by cutting off the horn contact ring installation staked section of the steering wheel cover by means of a cutting knife or the like.



WRE91-SR100

STEERING

- (2) Attach the horn contact ring to the steering wheel cover.
- (3) Install the horn contact ring to the steering wheel cover with the tapping screw (93610-14012-000).



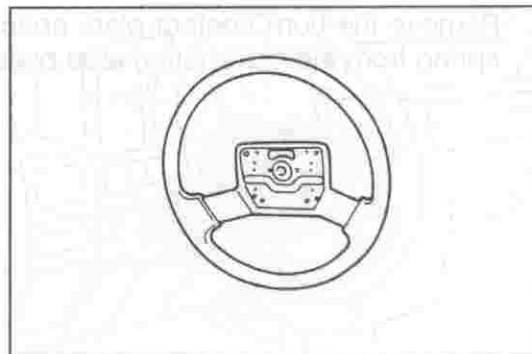
WRE91-SR101

INSPECTION

1. Ensure that the steering wheel exhibits no damage, such as cracks and wear.

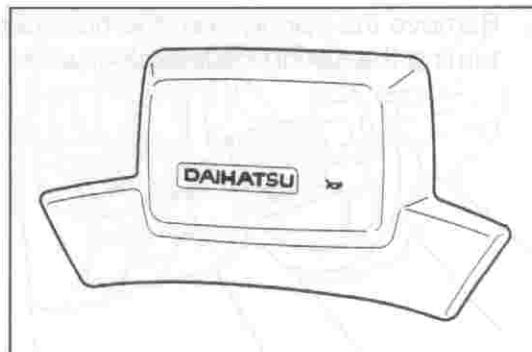
NOTE:

- Make sure that the serration section exhibits no damage.



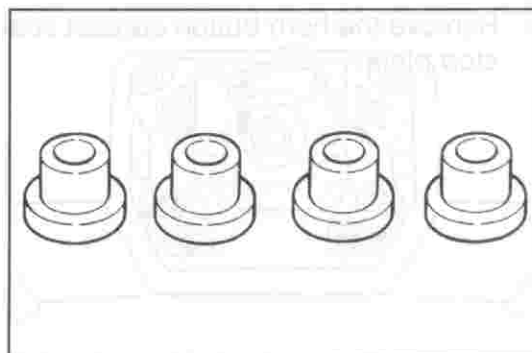
WRE91-SR102

2. Ensure that the horn button assembly exhibits no damage, such as scratches and cracks.



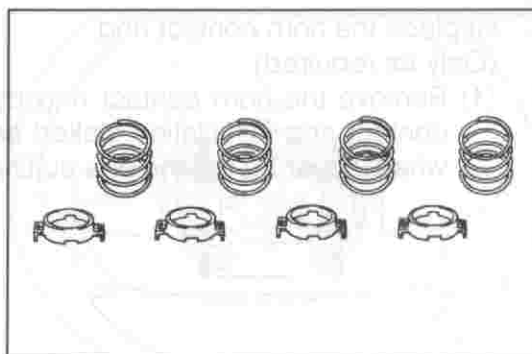
WRE91-SR103

3. Ensure that the spacer exhibits no damage, such as cracks.



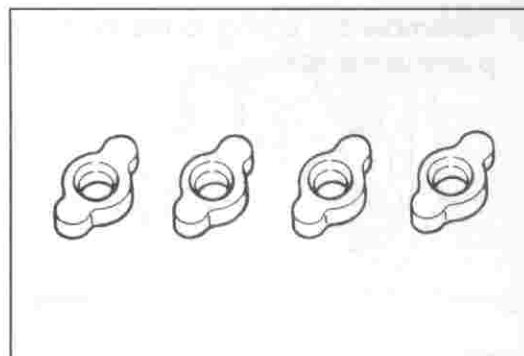
WRE91-SR104

4. Ensure that the horn contact plate spacers and springs exhibit no damage.



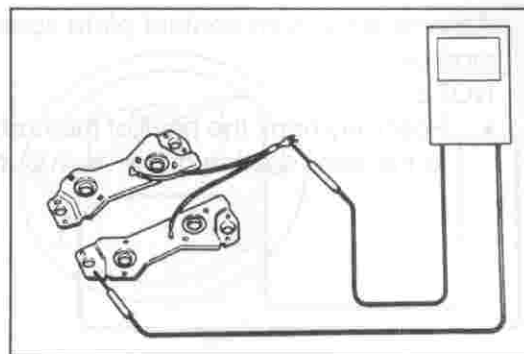
WRE91-SR105

5. Ensure that the horn button contact seat exhibits no damage, such as deformation and cracks.



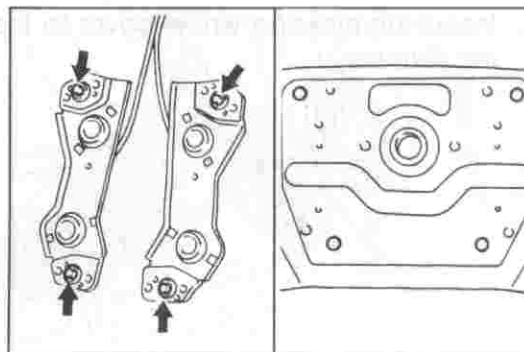
WRE91-SR106

6. Ensure that continuity exists between the cord terminal of the horn button stop plate and the horn button stop plate. If no continuity exists, replace the cord. When replacing the cord, remove the staked section by means of a drill or the like. Then, securely stake the cord to the horn contact plate with a new suitable rivet.



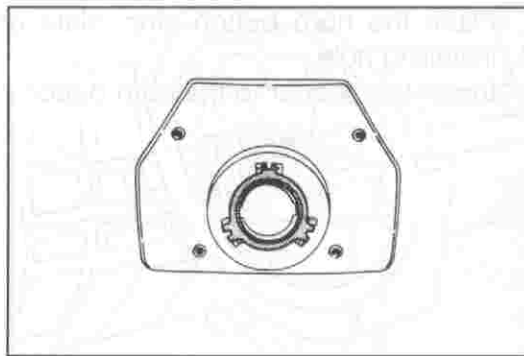
WRE91-SR107

7. Ensure that each contact point section exhibits no damage, such as electrolytic corrosion.



WRE91-SR108

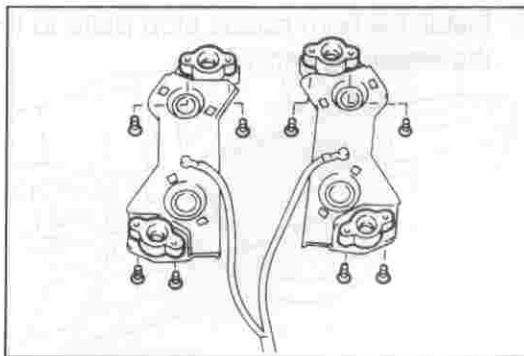
8. Ensure that the horn contact ring exhibits no damage, such as wear and electrolytic corrosion. If the horn contact ring exhibits damage, replace the horn contact ring. (See page SR-31.)



WRE91-SR109

ASSEMBLY

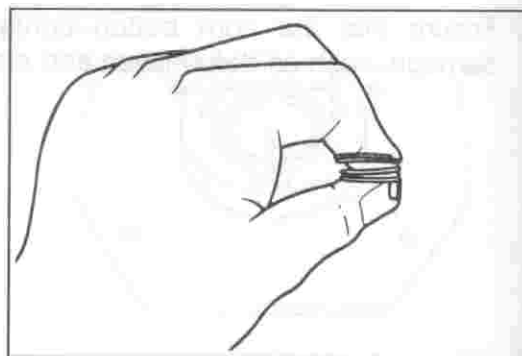
1. Install the horn button stop plates to the horn button contact seat with the screws.



WRE91-SR110

STEERING

2. Assemble the spring to the horn contact plate spacer by pushing the spring.

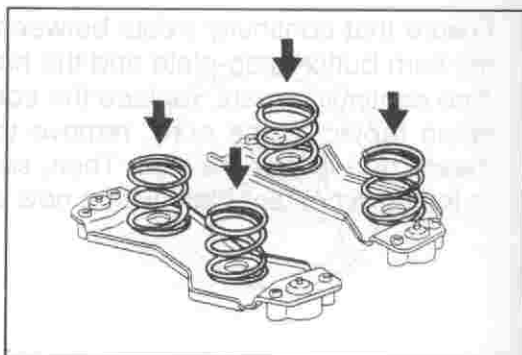


WRE91-SR111

3. Assemble the horn contact plate spacer to the horn button stop plate.

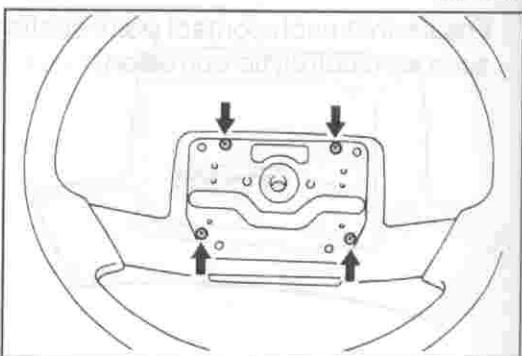
NOTE:

- Positively hook the pawl of the horn contact plate spacer to the pawl section of the horn button stop plate.



WRE91-SR112

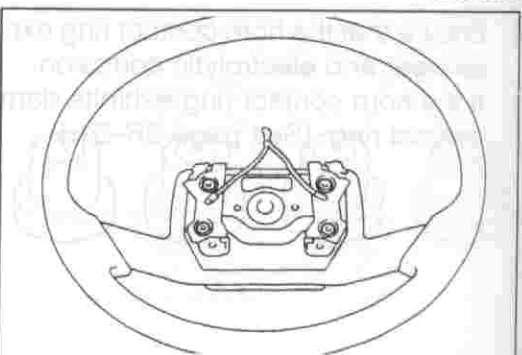
4. Install the steering wheel cover to the steering wheel with the screws.



WRE91-SR113

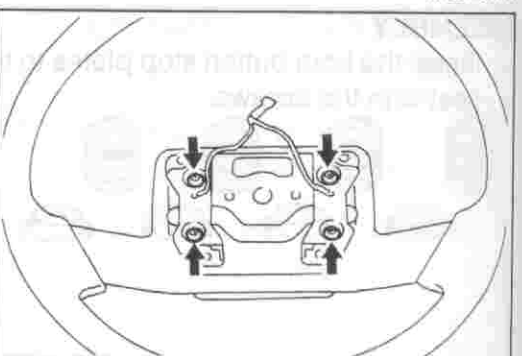
5. Place the horn button stop plate on the steering wheel installing hole.

6. Install the spacer to the horn button stop plate.



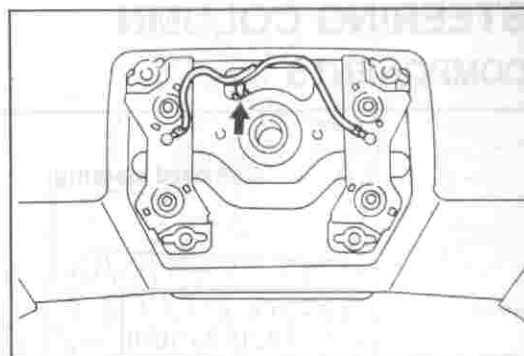
WRE91-SR114

7. Install the horn button stop plate to the steering wheel with the attaching screws.



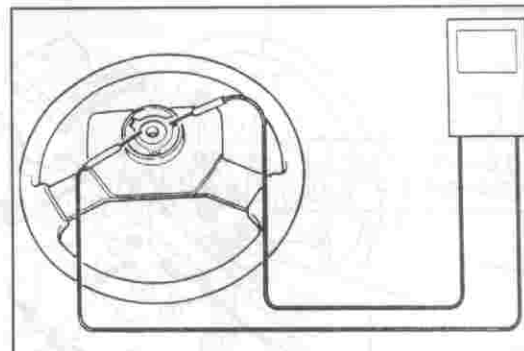
WRE91-SR115

8. Connect the connector of the cord to the horn contact ring.



WRE91-SR116

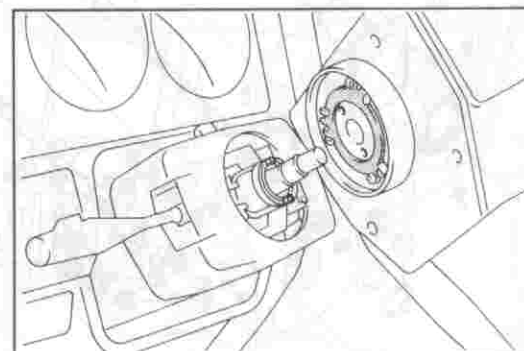
9. Connect an ohm meter between the serration section of the steering wheel and the horn contact ring. Ensure that continuity exists when the horn button stop plate is pushed and that no continuity exists when the horn button stop plate is not pushed.



WRE91-SR117

INSTALLATION

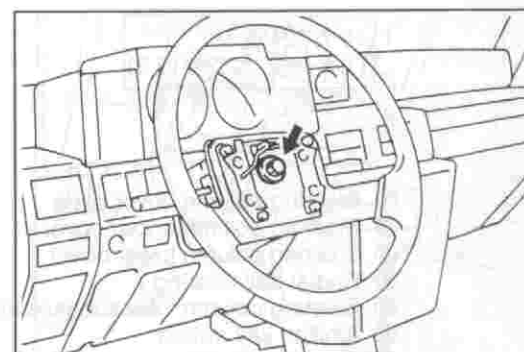
1. Apply about 2 grams of rubber grease to the horn contact ring.
2. Align the hole of the steering wheel with the protruding section of the cancel cam. Install the steering wheel in such a way that it may be set to the straight-ahead position when the tires are in the straight-ahead position.



WRE91-SR118

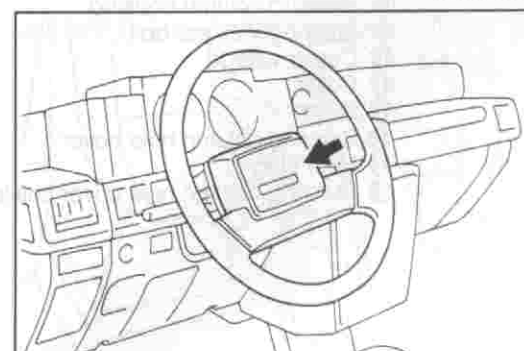
3. Install a new steering wheel attaching nut and tighten it to the specified torque.

Tightening Torque: 29.4 - 49.0 N·m
(3.0 - 5.0 kgf-m, 21.7 - 36.2 ft-lb)



WRE91-SR119

4. Install the horn button assembly while aligning it with the steering wheel attaching hole. Push the horn button assembly, until it is locked.



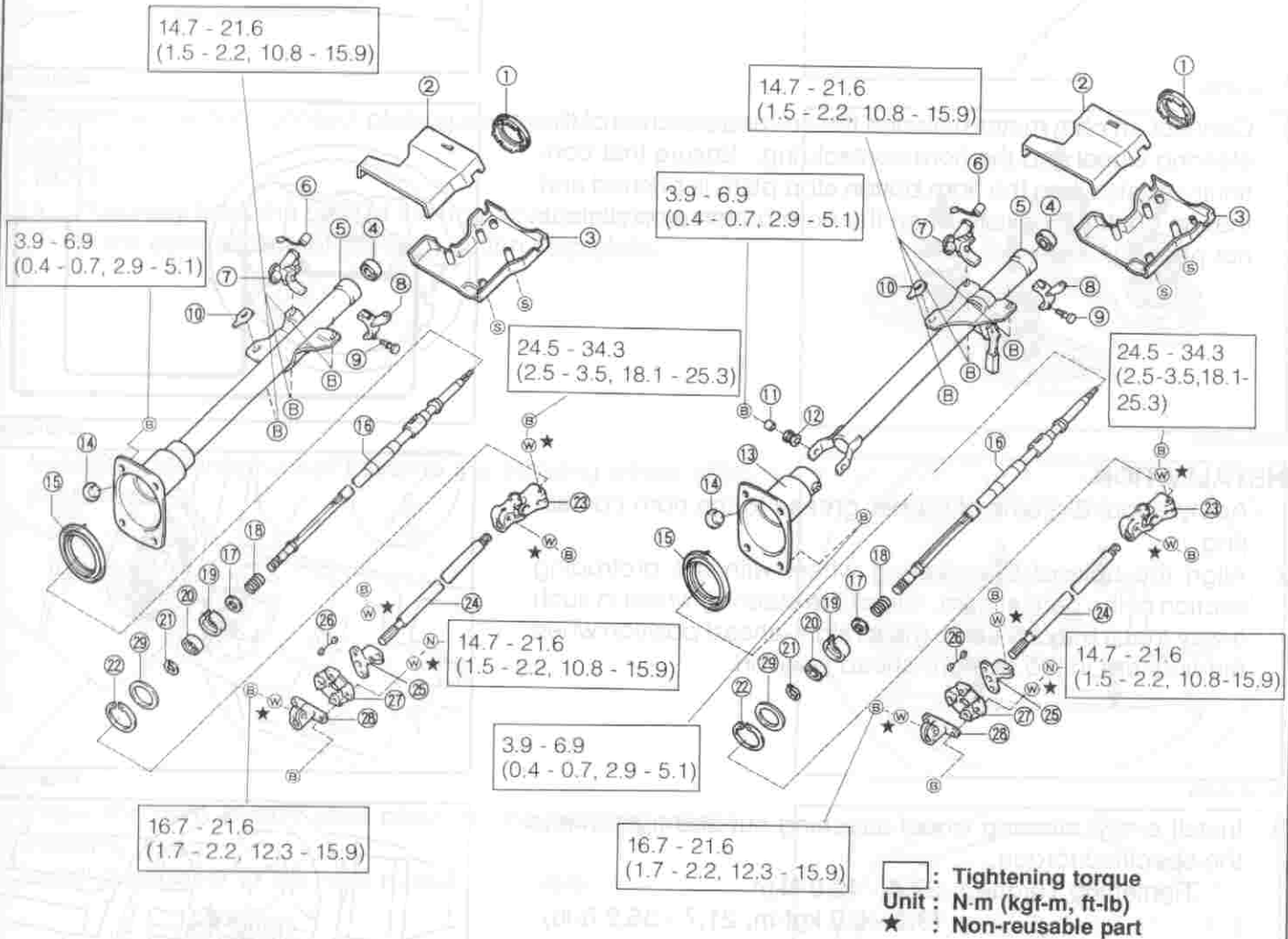
WRE91-SR120

STEERING

STEERING COLUMN COMPONENTS

Standard steering

Tilt steering

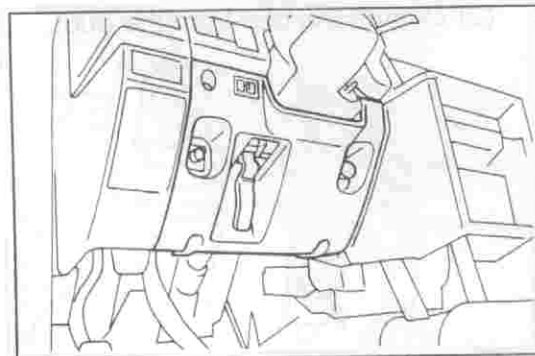


- ① Steering column cover plate
- ② Steering column upper cover
- ③ Steering column lower cover
- ④ Radial ball bearing
- ⑤ Steering column tube subassembly
- ⑥ Ignition key switch
- ⑦ Steering column upper bracket
- ⑧ Steering column housing
- ⑨ Steering lock set bolt
- ⑩ Caster wedge
- ⑪ Collar
- ⑫ Bush
- ⑬ Steering column hole cover
- ⑭ Hole plug
- ⑮ Steering column hole cover shield

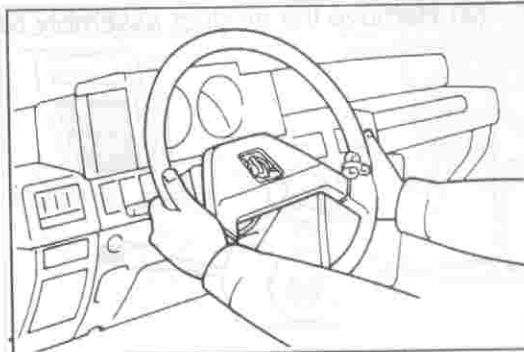
- ⑮ Steering main shaft subassembly
- ⑰ Washer
- ⑱ Compression spring
- ⑲ Steering shaft thrust stopper
- ⑳ Radial ball bearing subassembly
- ㉑ Snap ring
- ㉒ Hole snap ring
- ㉓ Steering shaft universal joint assembly
- ㉔ Steering intermediate shaft
- ㉕ Main shaft flexible coupling yoke
- ㉖ Flexible coupling earth (Bond wire)
- ㉗ Flexible coupling assembly
- ㉘ Main shaft flexible coupling yoke
- ㉙ Washer

REMOVAL

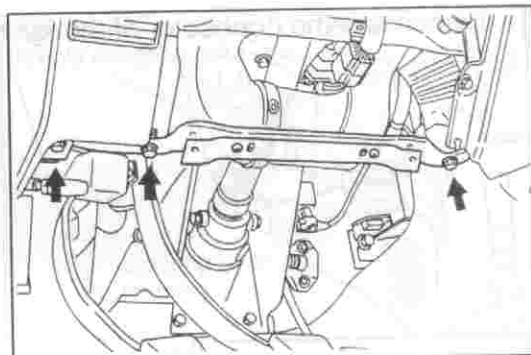
1. Remove the instrument panel finish lower panel.
(For details, refer to the Body section.)
2. Remove the steering wheel.
(See page SR-25 or SR-30.)
3. Remove the instrument panel reinforcement subassembly.
4. Remove the throttle knob from the throttle cable by removing the throttle knob attaching screw.
5. Remove the throttle cable from the instrument panel finish panel No.1.
6. Disconnect the connector from the headlamp leveling switch.
(Only vehicle so equipped)
7. Disconnect the connector of the turn signal switch.
8. Remove the connector of the turn signal switch from the instrument panel finish panel No. 1.
9. Remove the instrument panel finish panel No.1 from the instrument panel.
10. Removal of air duct assembly No. 1
(1) Push the center part of the clip, using the forward end of a Phillips screwdriver or the like.



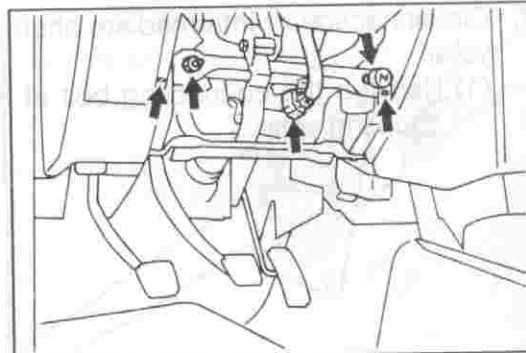
WRE91-SR122



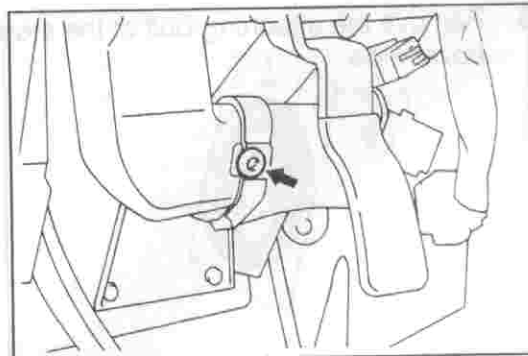
WRE91-SR123



WRE91-SR124



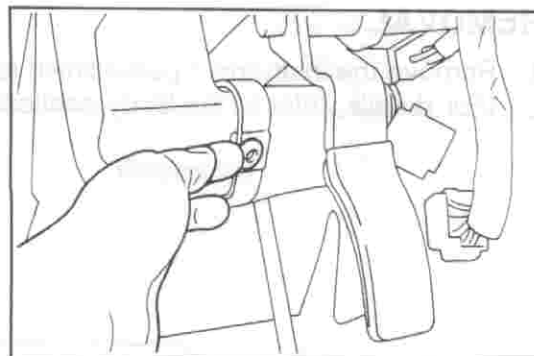
WRE91-SR125



WRE91-SR126

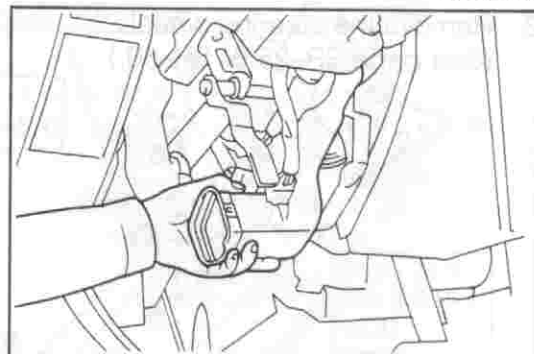
STEERING

- (2) Detach the clip from the duct.



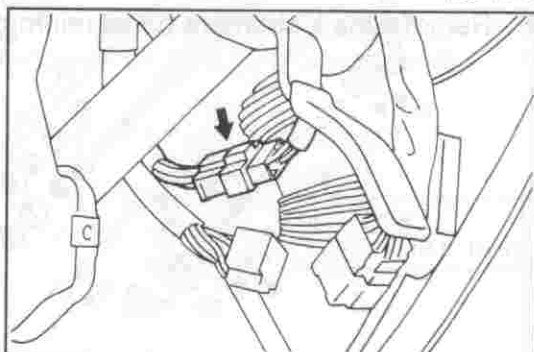
WRE91-SR127

- (3) Remove the air duct assembly No. 1.



WRE91-SR128

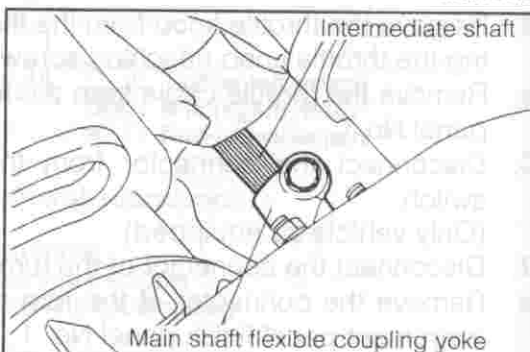
11. Disconnect the connector of the ignition switch.



WRE91-SR129

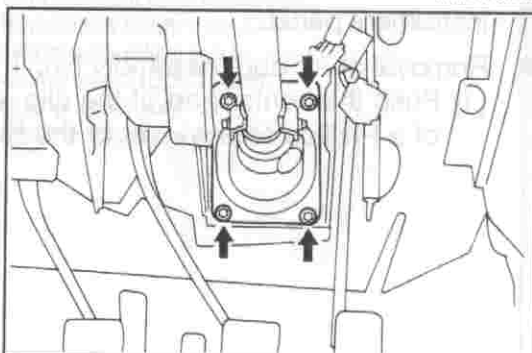
12. Disconnection of intermediate shaft from flexible coupling yoke

- (1) Remove the connecting bolt at the main shaft flexible coupling yoke.



WRE91-SR130

13. Remove the attaching bolt at the steering column tube hole cover side.

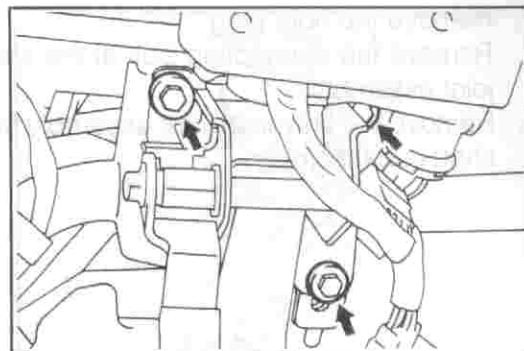


WRE91-SR131

14. Remove the steering column attaching bolts.

NOTE:

- Be very careful not to drop the steering column.
- Care must be exercised not to soil the seat.

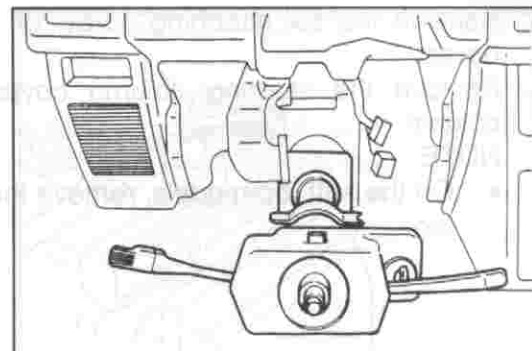


WRE91-SR132

15. Remove the steering column assembly together with the steering intermediate shaft from the vehicle.

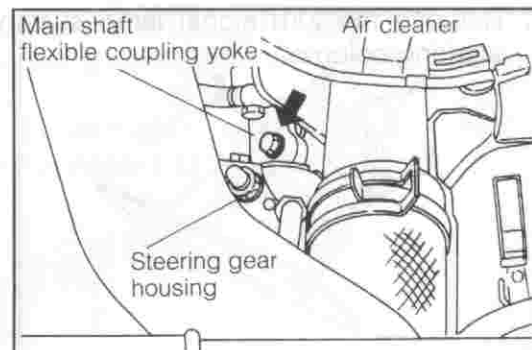
NOTE:

- Care must be exercised not to soil the seat.



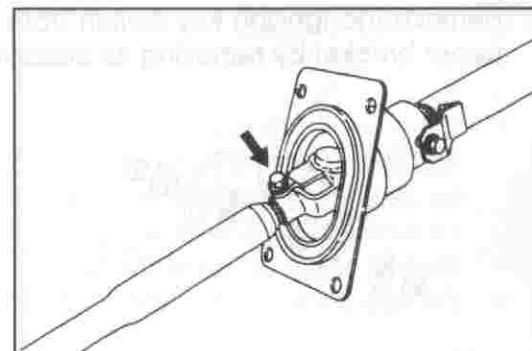
WRE91-SR133

16. Remove the connecting bolt at the main shaft flexible coupling yoke.
17. Remove the flexible coupling assembly from the steering gear housing.



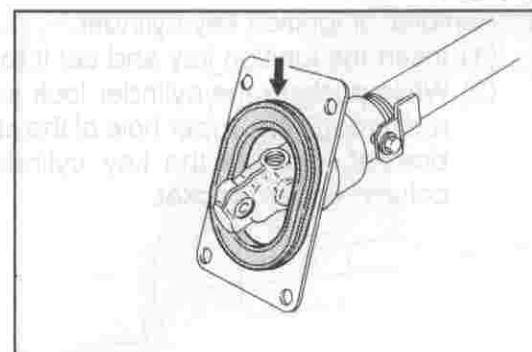
WRE91-SR134

18. Remove the connecting bolt at the steering shaft universal joint assembly.
19. Disconnect the steering intermediate shaft from the universal joint assembly.



WRE91-SR135

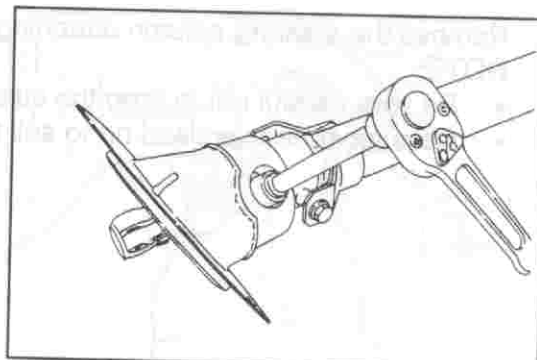
20. Remove the steering column hole cover shield.



WRE91-SR136

STEERING

21. Remove the hole plug.
22. Remove the connecting bolt at the steering shaft universal joint assembly.
23. Remove the universal joint assembly from the steering main shaft subassembly.

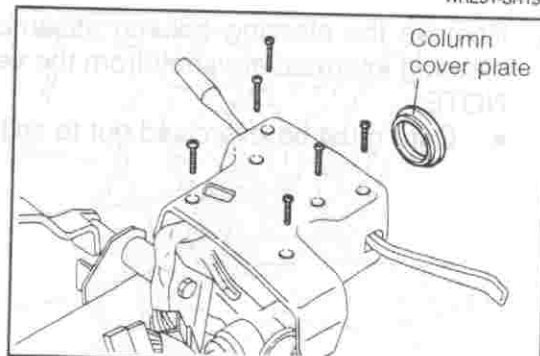


WRE91-SR137

24. Remove the six attaching screw of the steering column cover.
25. Remove the steering column cover from the steering column.

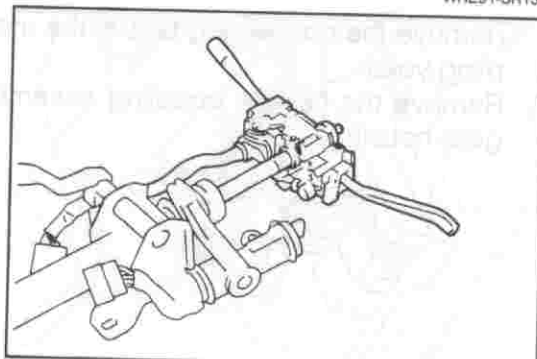
NOTE:

- On the soft top models, remove the column cover plate too.



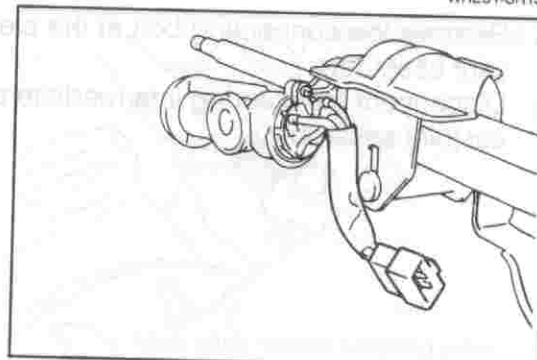
WRE91-SR138

26. Remove the turn signal lamp switch assembly from the steering column.



WRE91-SR139

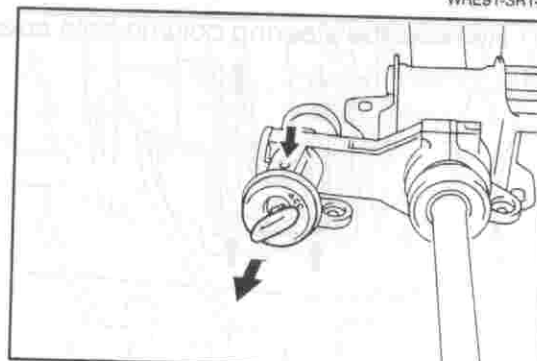
27. Remove the ignition key switch from the steering column upper bracket by removing its attaching screw.



WRE91-SR140

28. Removal of ignition key cylinder

- (1) Insert the ignition key and set it to the "ACC" position.
- (2) While pushing the cylinder lock section with a suitable rod through the upper hole of the steering column upper bracket, pull out the key cylinder from the steering column upper bracket.



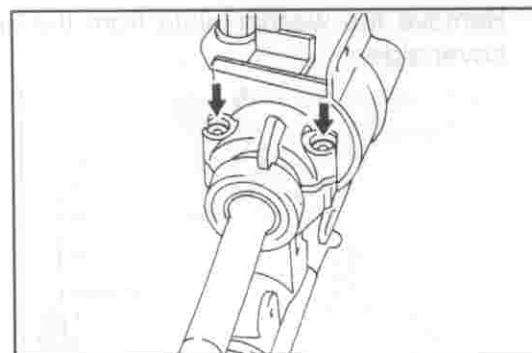
WRE91-SR141

29. Removal of steering column upper bracket

- (1) Make a recessed mark at the center of the steering lock set bolt with a center punch.
- (2) Remove the head of the set bolt by drilling the center of the set bolt with a drill having a diameter of about 8 mm.

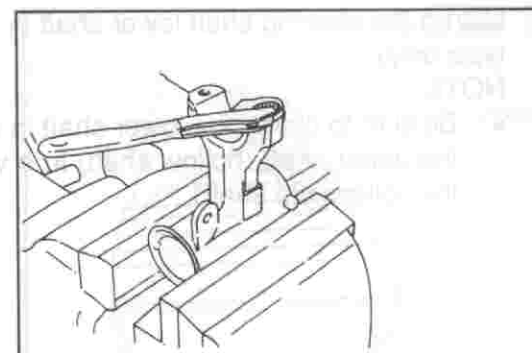
NOTE:

- Be very careful not to damage the steering column housing.
- Care must be exercised not to drop the steering column housing.



WRE91-SR142

- (3) Remove the bolt threaded portion which remains at the steering column bracket, using a pipe wrench or the like.



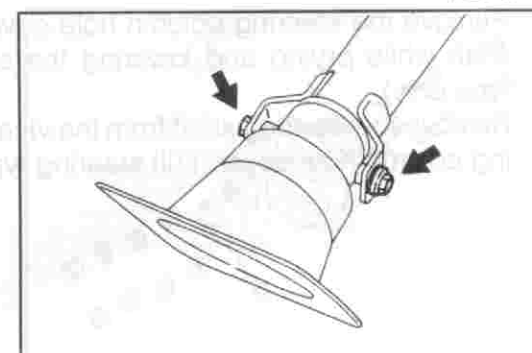
WRE91-SR143

30. Remove the attaching bolts of the steering column hole cover.

(Tilt steering type only)

31. Remove the steering column hole cover together with the steering column hole cover.

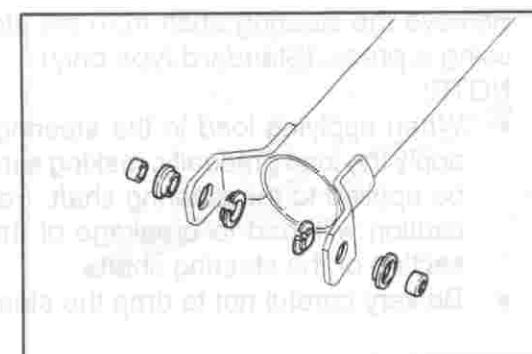
(Tilt steering type only)



WRE91-SR144

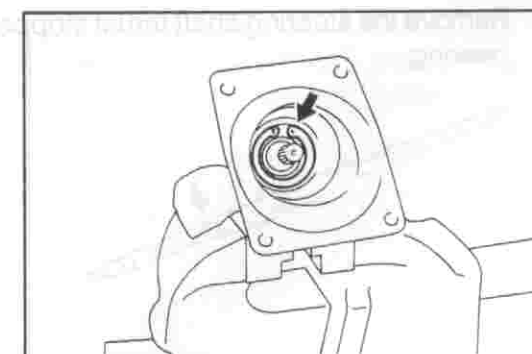
32. Remove the collars and bushes from the steering column tube subassembly.

(Tilt steering type only)



WRE91-SR145

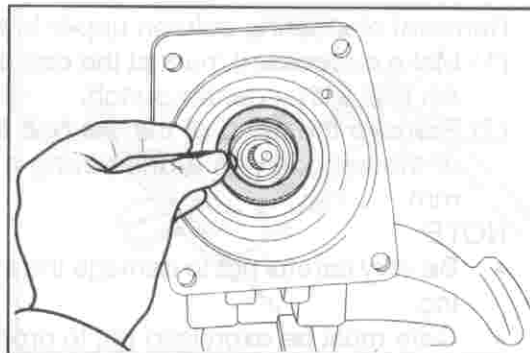
33. Detach the hole snap ring from the steering column hole cover.



WRE91-SR146

STEERING

34. Remove the washer plate from the steering column hole cover side.

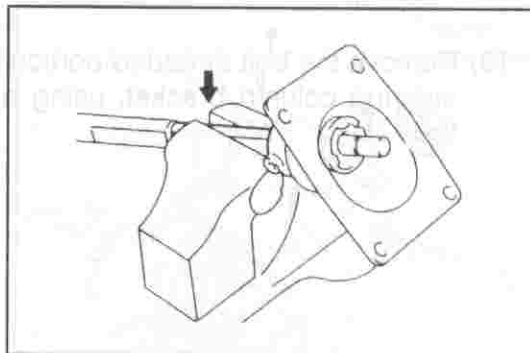


WRE91-SR147

35. Clamp the steering shaft lower shaft in a vice. (Tilt steering type only)

NOTE:

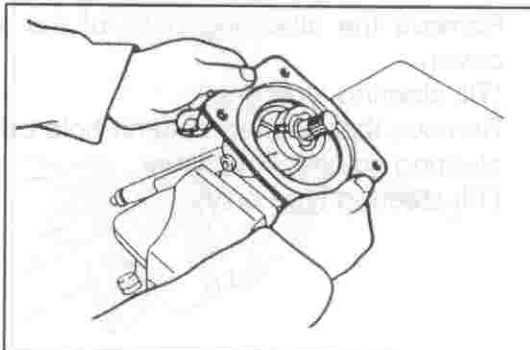
- Be sure to clamp the lower shaft in a vice. Never clamp the upper shaft (hollow shaft) in a vice. (In the case of the collapsible shaft)



WRE91-SR148

36. Remove the steering column hole cover from the steering shaft while prying and lowering the cover. (Tilt steering type only)

37. Remove the steering shaft from the vice. Remove the steering column hole cover. (Tilt steering type only)

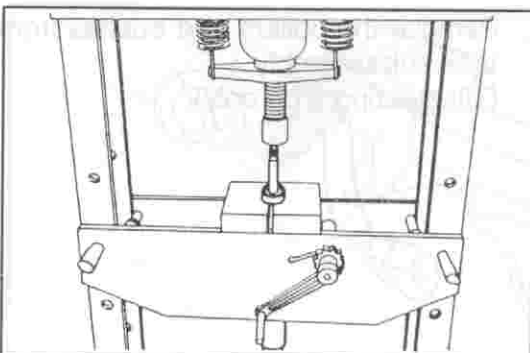


WRE91-SR149

38. Remove the steering shaft from the steering column tube, using a press. (Standard type only)

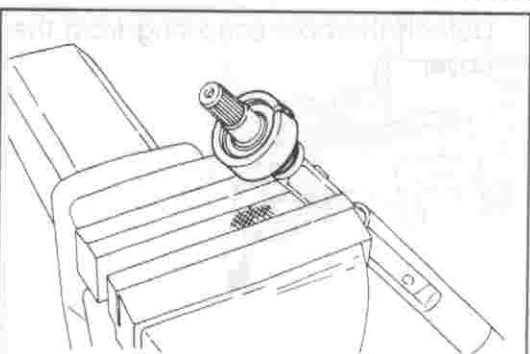
NOTE:

- When applying load to the steering shaft with a press, apply the load gradually, making sure that no impact may be applied to the steering shaft. Failure to observe this caution will lead to breakage of the center connecting section of the steering shaft.
- Be very careful not to drop the steering shaft.



WRE91-SR150

39. Remove the steering shaft thrust stopper from the radial ball bearing.



WRE91-SR151

40. Detach the snap ring from the steering main shaft subassembly.

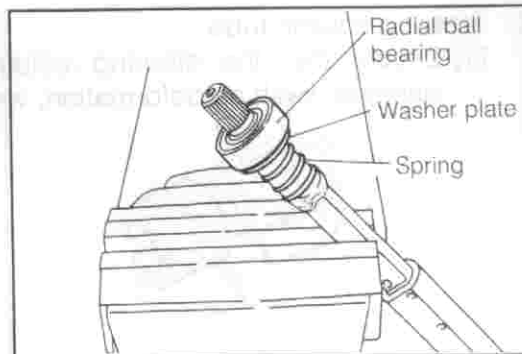
NOTE:

- Never reuse the removed snap ring.
- If any difficulty is encountered in removing the snap ring, remove the snap ring while holding the bearing.



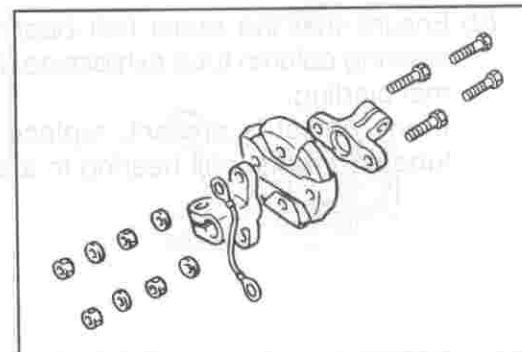
WRE91-SR152

41. Remove the radial ball bearing.
42. Remove the washer plate.
43. Remove the spring.



WRE91-SR153

44. Remove the main shaft flexible coupling yokes from the flexible coupling assembly.

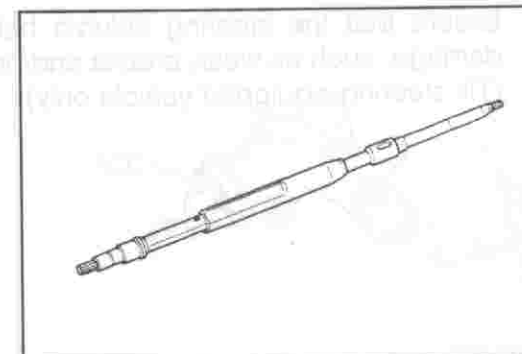


WRE91-SR154

INSPECTION

1. Inspection of steering shaft

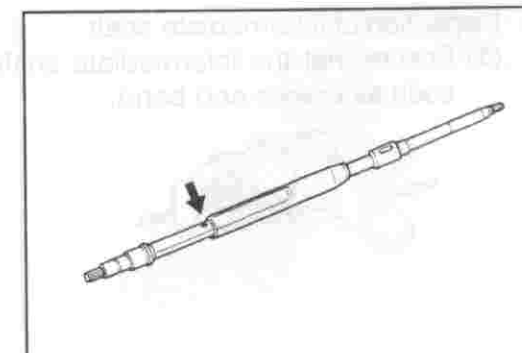
- (1) Ensure that each section of the steering shaft exhibits no damage, such as wear, cracks and deformation.



WRE91-SR155

- (2) Ensure that no play or looseness is present at the connecting section between the upper and lower sections of the steering shaft.

(Collapsible steering shaft-equipped vehicle only)



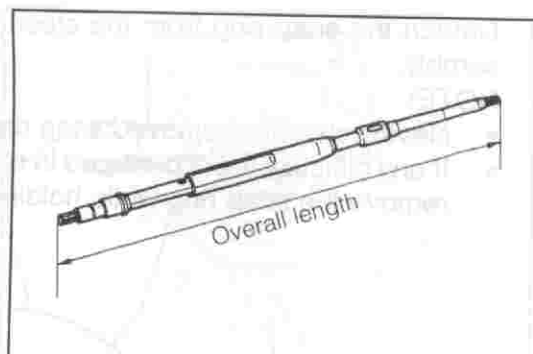
WRE91-SR156

STEERING

- (3) Ensure that the overall length of the steering shaft is within the specified value.

(Collapsible steering shaft-equipped vehicle only)

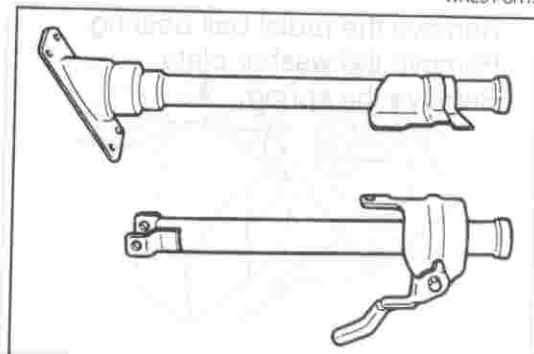
Specified Value: About 659.3 mm



WRE91-SR157

2. Steering column tube

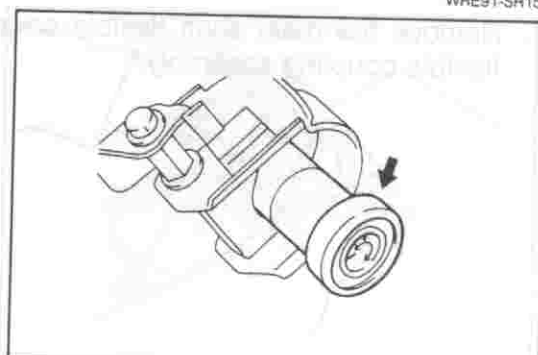
- (1) Ensure that the steering column tube exhibits no damage, such as deformation, wear and cracks.



WRE91-SR158

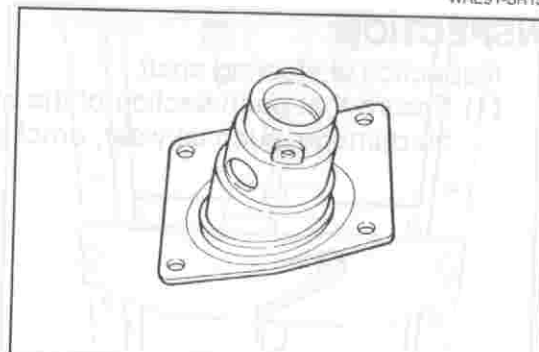
- (2) Ensure that the radial ball bearing assembled in the steering column tube exhibits no defect, such as abnormal binding.

If any defect is present, replace the steering column tube and radial ball bearing in a set.



WRE91-SR159

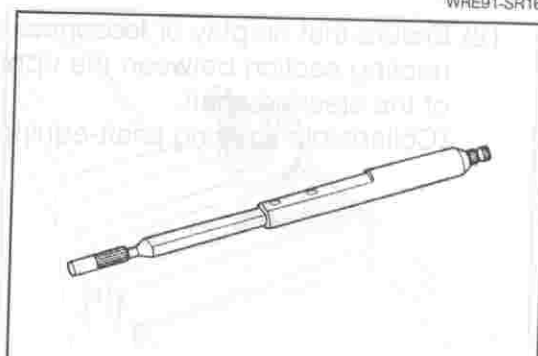
3. Ensure that the steering column hole cover exhibits no damage, such as wear, cracks and/or deformation.
(Tilt steering-equipped vehicle only)



WRE91-SR160

4. Inspection of intermediate shaft

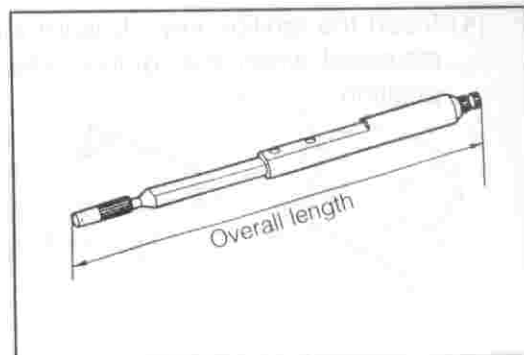
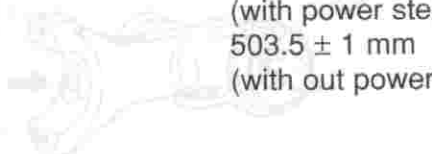
- (1) Ensure that the intermediate shaft exhibits no defect, such as cracks and bend.



WRE91-SR161

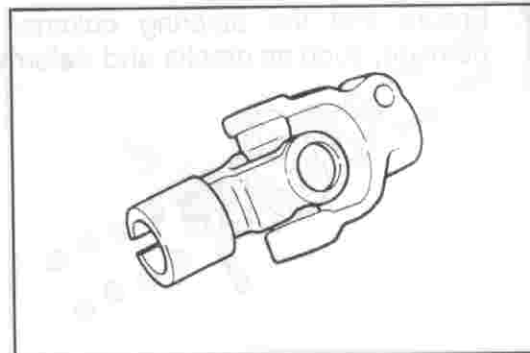
- (2) Ensure that the overall length of the intermediate shaft is within the specified value.

Overall Length: 472.5 ± 1 mm
(with power steering)
 503.5 ± 1 mm
(with out power steering)



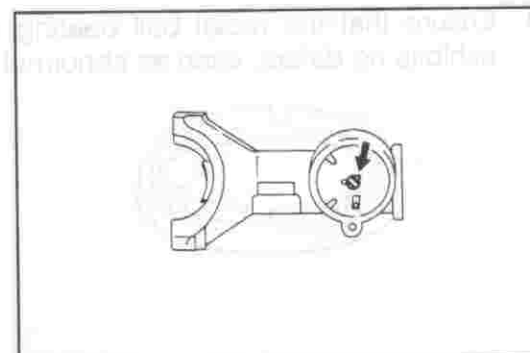
WRE91-SR162

5. Inspection of universal joint assembly
Ensure that the universal joint exhibits no defect, such as excessive play and poor sliding. Also, check the rubber boot for rupture.



WRE91-SR163

6. Inspection of steering column upper bracket
(1) Set the cam of the steering column upper bracket, as indicated in the right figure.

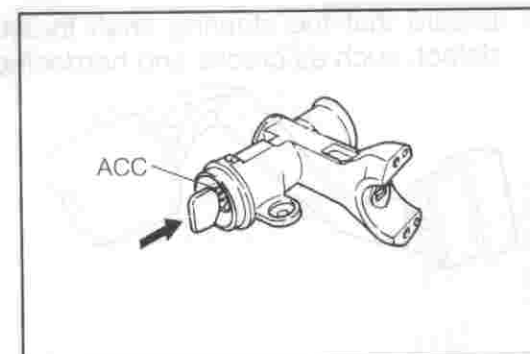


WRE91-SR164

- (2) Set the ignition key to the "ACC" position. Insert the ignition key cylinder into the steering column upper bracket.

NOTE:

- If any difficulty is encountered in inserting the ignition key cylinder, do not push it forcibly. In this case, insert the ignition key cylinder while slightly turning the cam.

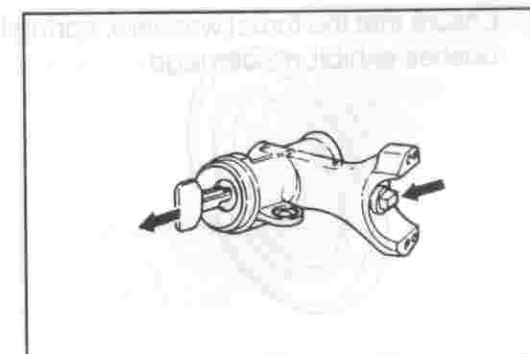


WRE91-SR165

- (3) Set the ignition key to the "Lock" position. Ensure that the locking pawl protrudes when the ignition key is pulled out.

NOTE:

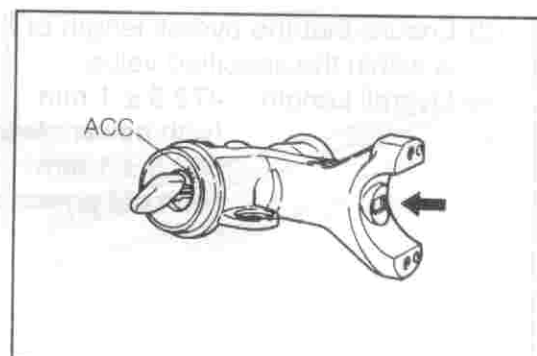
- If the cam position deviates 180 degrees, the locking pawl will not protrude.



WRE91-SR166

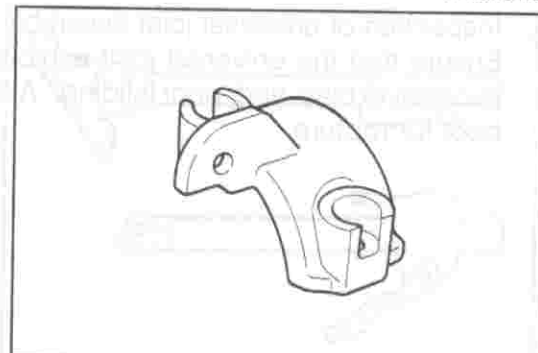
STEERING

- (4) Insert the ignition key. Ensure that the locking pawl is retracted when the ignition key is set to the "ACC" position.



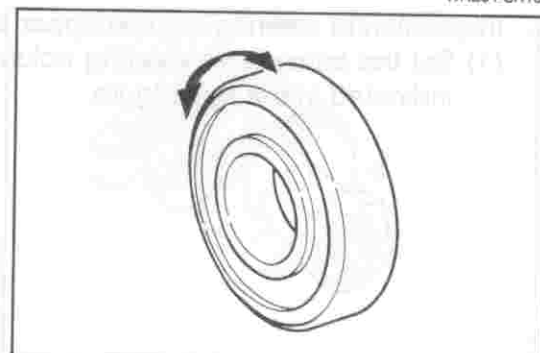
WRE91-SR167

7. Ensure that the steering column housing exhibits no damage, such as cracks and deformation.



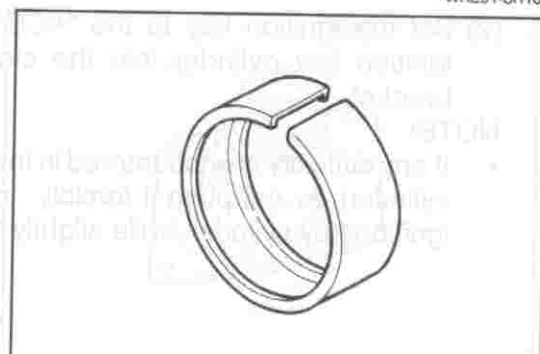
WRE91-SR168

8. Ensure that the radial ball bearing of the steering shaft exhibits no defect, such as abnormal binding.



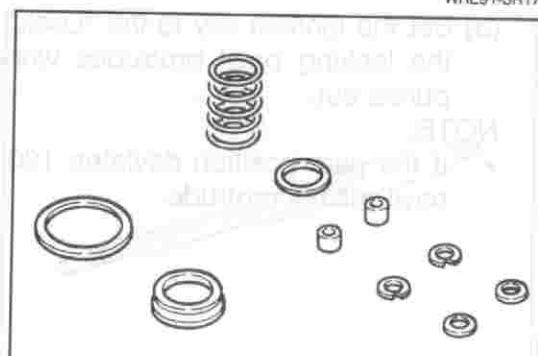
WRE91-SR169

9. Ensure that the steering shaft thrust stopper exhibits no defect, such as cracks and hardening.



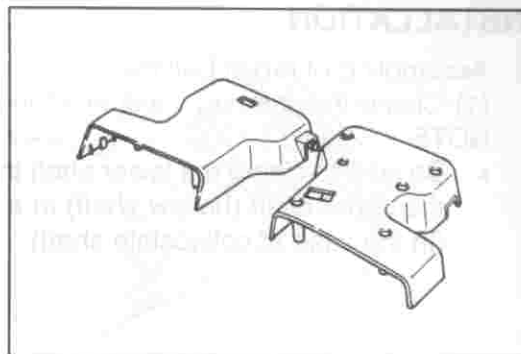
WRE91-SR170

10. Ensure that the thrust washers, spring hole plug, collars and bushes exhibit no damage.



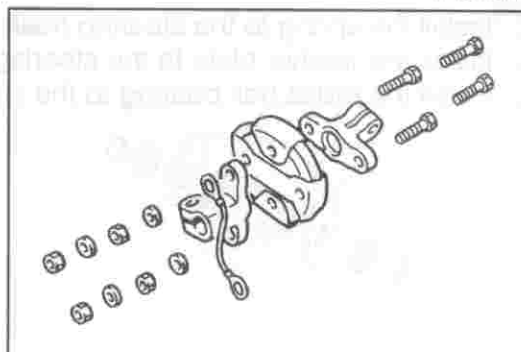
WRE91-SR171

11. Ensure that the steering column cover exhibits no damage, such as scratches, wear or deformation.



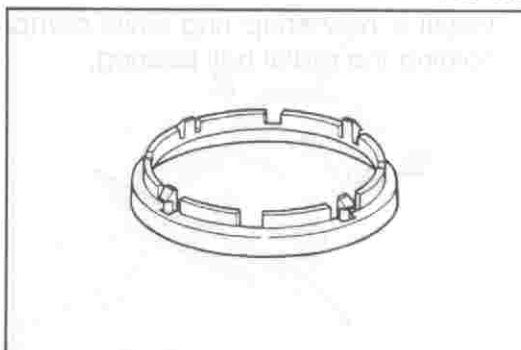
WRE91-SR172

12. Ensure that the flexible coupling and main shaft flexible coupling yoke exhibit no damage.
13. Ensure that the flexible coupling earth (bond wire) exhibits no damage, such as open wire.



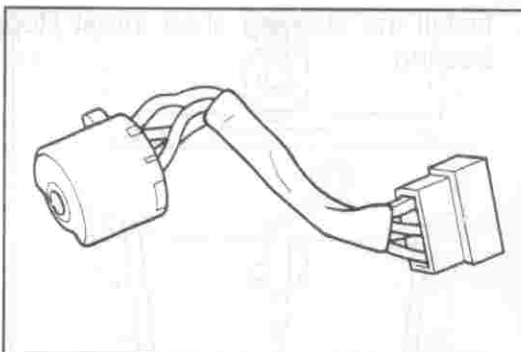
WRE91-SR173

14. Ensure that the steering column cover shield exhibits no damage, such as hardening and cracks.
(Soft top model only)



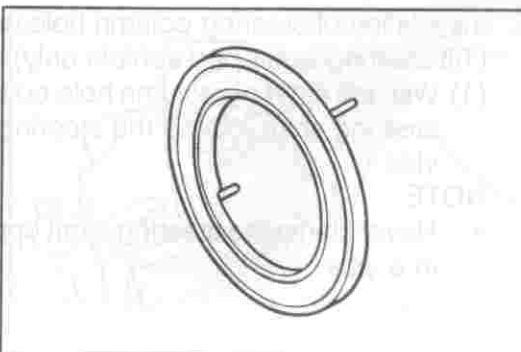
WRE91-SR174

15. Perform unit inspection for the ignition switch.
(Refer to the Body Electrical System section.)



WRE91-SR175

16. Check the steering column hole cover shield for damage, such as cracks and hardening.



WRE91-SR176

STEERING

INSTALLATION

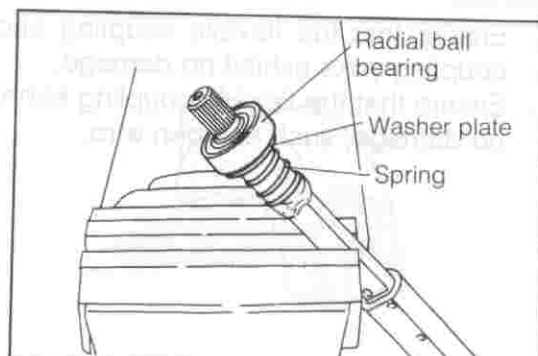
1. Assembling of radial ball bearing
(1) Clamp the steering lower shaft in a vice.

NOTE:

- Be sure to clamp the lower shaft in a vice. Never clamp the upper shaft (hollow shaft) in a vice.
(In the case of collapsible shaft)

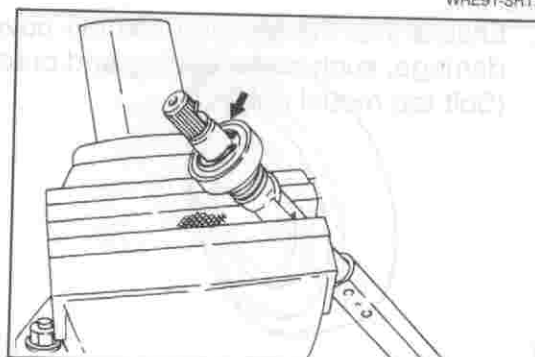
WRE91-SR177

2. Install the spring to the steering main shaft.
3. Install the washer plate to the steering main shaft.
4. Install the radial ball bearing to the steering main shaft.



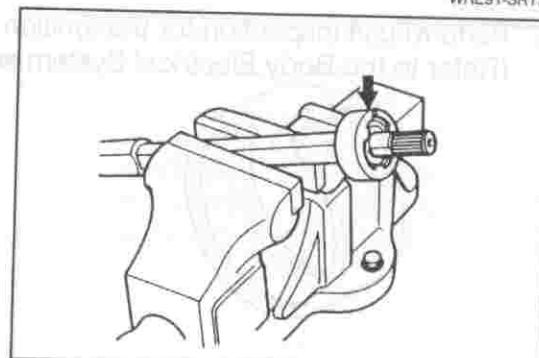
WRE91-SR178

5. Install a new snap ring while compressing the spring by holding the radial ball bearing.



WRE91-SR179

6. Install the steering shaft thrust stopper to the radial ball bearing.

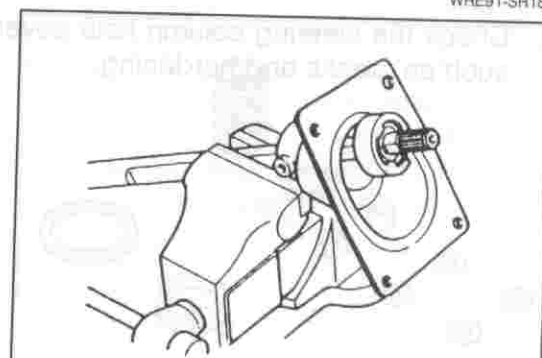


WRE91-SR180

7. Installation of steering column hole cover
(Tilt steering-equipped vehicle only)
(1) With the steering column hole cover passed through the steering shaft, clamp the steering shaft lower shaft in a vice.

NOTE:

- Never clamp the steering shaft upper shaft (hollow shaft) in a vice.

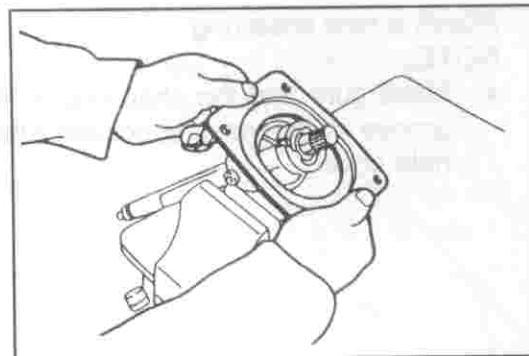


WRE91-SR181

- (2) Assemble the steering column hole cover to the steering shaft thrust stopper by pulling the cover.

NOTE:

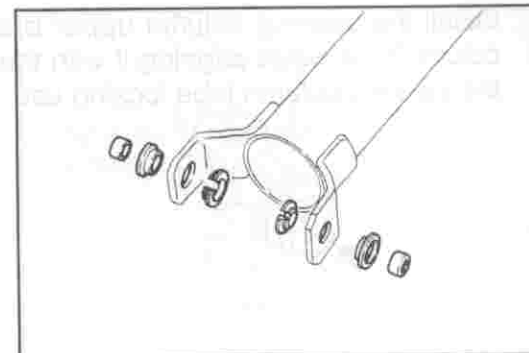
- Care must be exercised so that the steering shaft thrust stopper may not be detached.



WRE91-SR182

8. Installation of steering column tube
(Tilt steering-equipped vehicle only)

- (1) Install the bushes and collars on the steering column hole cover installation section of the steering column tube.
- (2) Insert the steering shaft into the steering column tube.



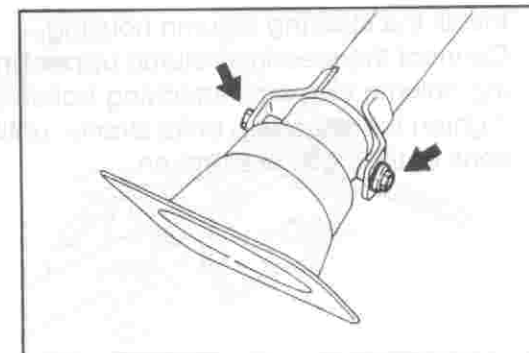
WRE91-SR183

- (3) Connect the steering column tube to the steering column hole cover with the bolts. Tighten the bolts to the specified torque.

Tightening Torque: 3.9 - 6.9 N·m
(0.4 - 0.7 kgf-m, 2.9 - 5.1 ft-lb)

NOTE:

- Be sure to install the steering hole cover in the correct direction.



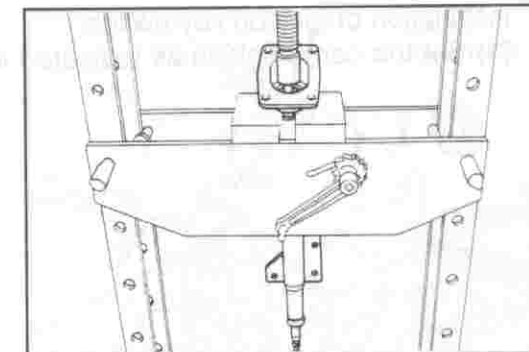
WRE91-SR184

9. Installation of steering column tube
(Standard type only)

Press the steering shaft into the steering column by means of a hydraulic press.

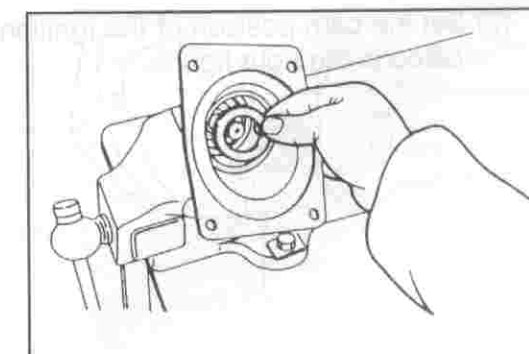
NOTE:

- Never apply excessive load to the steering shaft.
- Never hold the upper section of the steering column tube.
- The press-fitting should be performed only to such an extent that the washer and snap ring now can be installed. Do not press the steering shaft further beyond this.



WRE91-SR185

10. Insert the washer at the steering column hole side.



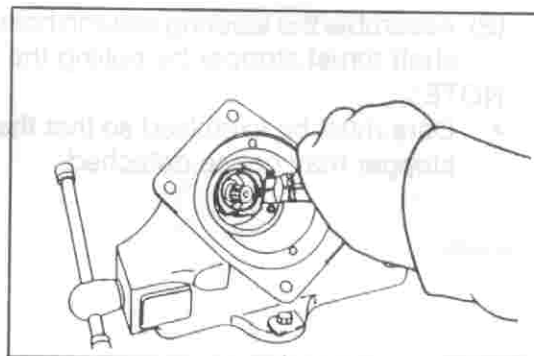
WRE91-SR186

STEERING

11. Attach a new snap ring.

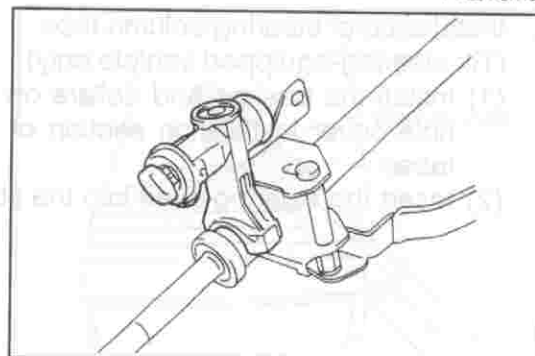
NOTE:

- Make sure that the snap ring is fitted in the snap ring groove of the steering column tube or steering column hole cover.



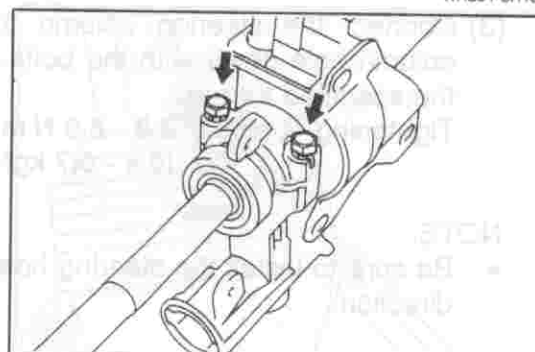
WRE91-SR187

12. Install the steering column upper bracket to the steering column tube, while aligning it with the hole of the pawl for the steering column tube locking use.



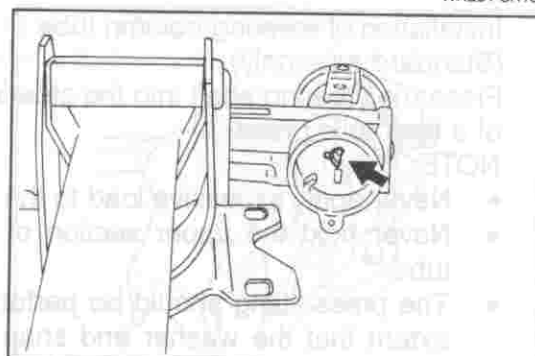
WRE91-SR188

13. Install the steering column housing.
14. Connect the steering column upper bracket with the steering column with new attaching bolts.
15. Tighten the attaching bolts evenly, until the hexagonal sections of the bolts are broken.



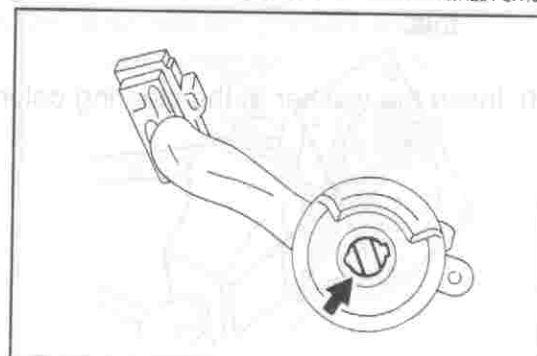
WRE91-SR189

16. Installation of ignition key switch
 - (1) Set the cam position as indicated in the right figure.



WRE91-SR190

- (2) Set the cam position of the ignition key switch as indicated in the right figure.

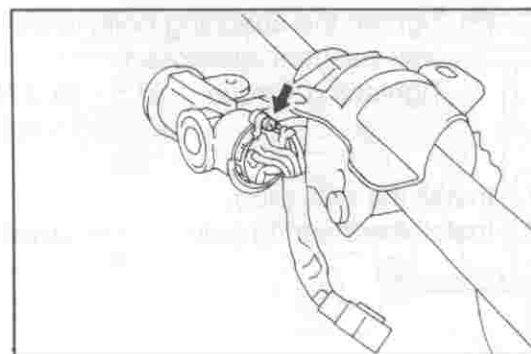


WRE91-SR191

- (3) Install the ignition key switch to the steering column housing. Tighten the attaching screw.

NOTE:

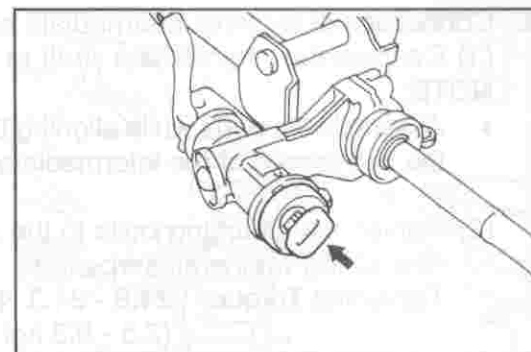
- If any difficulty is encountered in inserting the ignition key switch, align the recessed section of the ignition key switch with the cam of the steering column housing, while slightly turning the cam at the steering column side in a right-&-left direction.



WRE91-SR192

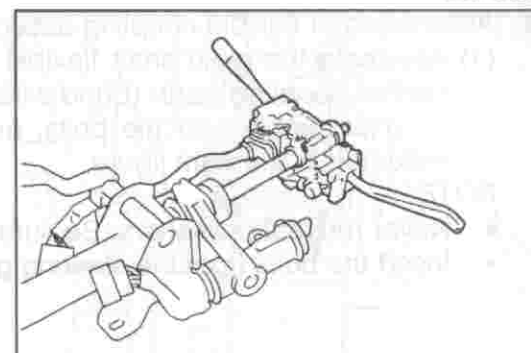
17. Installation of ignition key cylinder

Set the key of the ignition key cylinder to the ACC position. Align the recessed section of the steering column upper bracket with the protruded section of the ignition key cylinder. Under this setting, insert the ignition key cylinder into the steering upper bracket.



WRE91-SR193

18. Install the turn signal lamp switch assembly to the steering column.



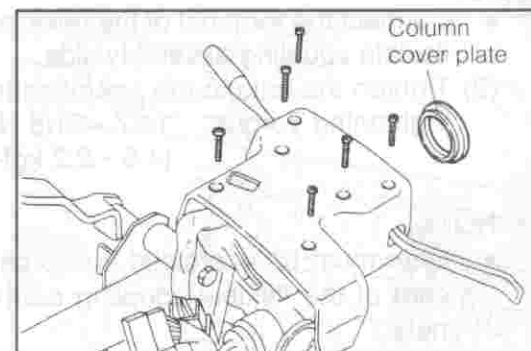
WRE91-SR194

19. Install the steering column cover to the steering column.

Tighten the attaching screws.

NOTE:

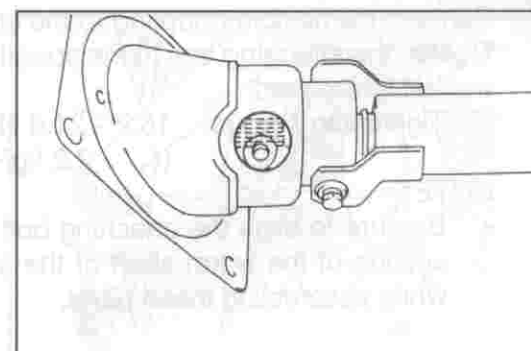
- On the soft top vehicle, fit the column cover plate after installing the steering column cover.



WRE91-SR195

20. Connection of steering shaft universal joint assembly

- (1) With the bolt hole of the universal joint aligned with the cut-out section of the steering main shaft, connect the universal joint to the steering main shaft.



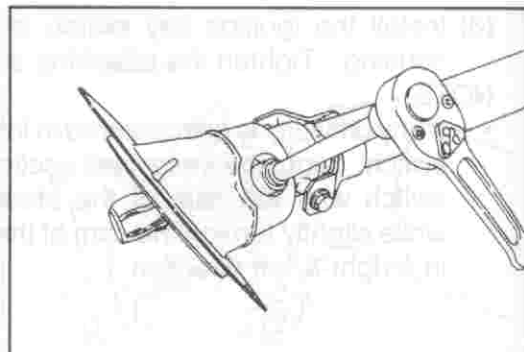
WRE91-SR196

STEERING

- (2) Tighten the attaching bolts to the specified torque with new washers interposed.

Tightening Torque: 24.5 - 34.3 N·m
(2.5 - 3.5 kgf-m, 18.1 - 25.3 ft-lb)

21. Install the hole plug.
22. Install the steering column hole cover shield.



WRE91-SR197

23. Connection of steering intermediate shaft

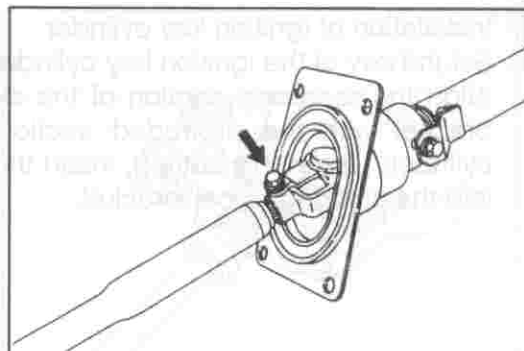
- (1) Connect the intermediate shaft to the universal joint.

NOTE:

- Assemble the parts while aligning the universal joint with the bolt groove of the intermediate shaft.

- (2) Tighten the attaching bolts to the specified torque with new spring washers interposed.

Tightening Torque: 24.5 - 34.3 N·m
(2.5 - 3.5 kgf-m, 18.1 - 25.3 ft-lb)



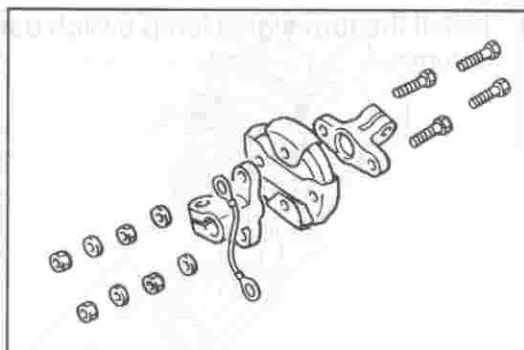
WRE91-SR198

24. Assembling of flexible coupling assembly

- (1) Assemble the main shaft flexible coupling yokes and flexible coupling earth (bond wire) to the flexible coupling assembly with the bolts, nuts and washers, as indicated in the right figure.

NOTE:

- Never reuse the washers. Be sure to use new ones.
- Insert the bolts from the steering gear housing side.



WRE91-SR199

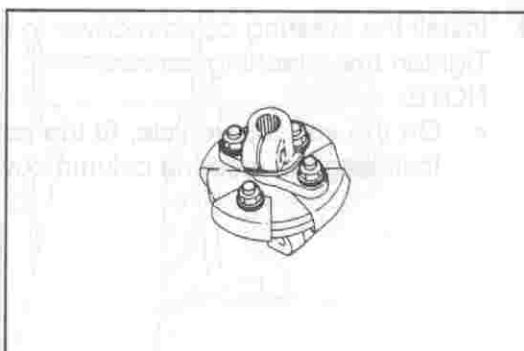
- Connect the terminal of the flexible coupling earth to the flexible coupling assembly side.

- (2) Tighten the nuts to the specified torque.

Tightening Torque: 14.7 - 21.6 N·m
(1.5 - 2.2 kgf-m, 10.8 - 15.9 ft-lb)

NOTE:

- Care must be exercised not to cause open wire in the cord of the flexible coupling earth while tightening the nuts.



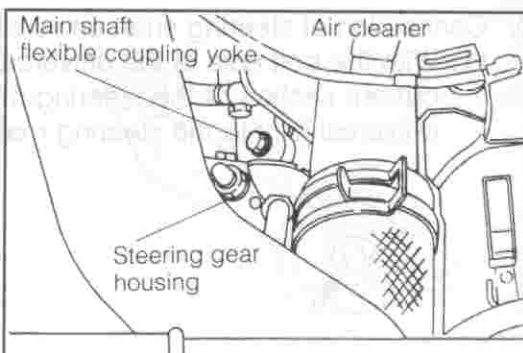
WRE91-SR200

25. Connect the flexible coupling to the steering gear housing. Tighten the attaching bolt to the specified torque with a new washer interposed.

Tightening Torque: 16.7 - 21.6 N·m
(1.7 - 2.2 kgf-m, 12.3 - 15.9 ft-lb)

NOTE:

- Be sure to align the attaching bolt hole with the cut-out section of the worm shaft of the steering gear housing while assembling these parts.

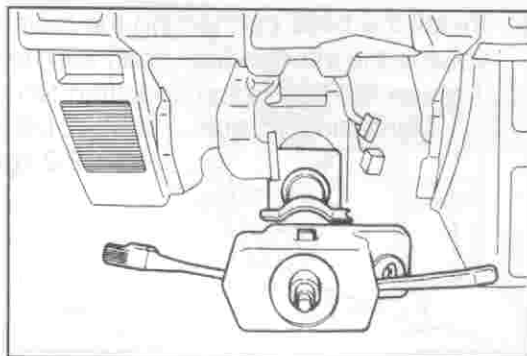


WRE91-SR201

26. Insert the steering column assembly together with the intermediate shaft.

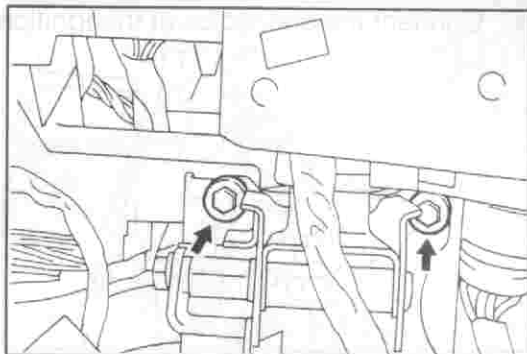
NOTE:

- Care must be exercised so that the intermediate shaft may not interfere with other parts.



WRE91-SR202

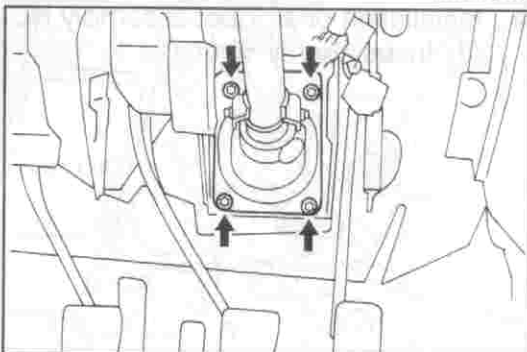
27. While connecting the intermediate shaft to the steering gear housing, temporarily tighten the two attaching bolts at the steering column upper section.



WRE91-SR203

28. Install the attaching bolts at the column cover side of the steering column. Tighten them to the specified torque.

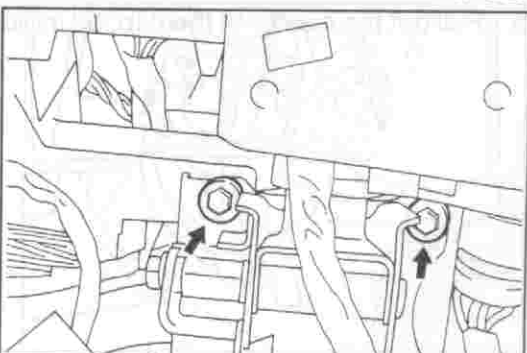
Tightening Torque: 3.9 - 6.9 N·m
(0.4 - 0.7 kgf-m, 2.9 - 5.1 ft-lb)



WRE91-SR204

29. Tighten the two attaching bolts at the steering column upper section to the specified torque.

Tightening Torque: 14.7 - 21.6 N·m
(1.5 - 2.2 kgf-m, 10.8 - 15.9 ft-lb)

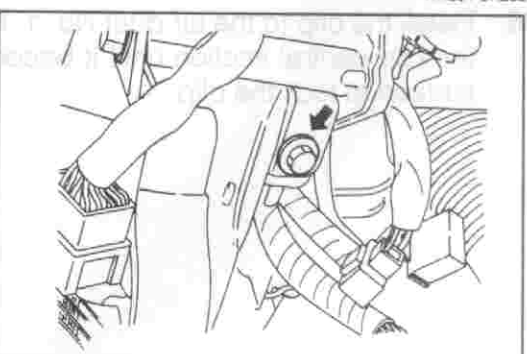


WRE91-SR205

30. Insert the caster wedge into the attaching section of the steering column upper section indicated in the right figure. Install the bolt.

31. While fully pushing the caster wedge by your hand, tighten the attaching bolt to the specified torque.

Tightening Torque: 14.7 - 21.6 N·m
(1.5 - 2.2 kgf-m, 10.8 - 15.9 ft-lb)

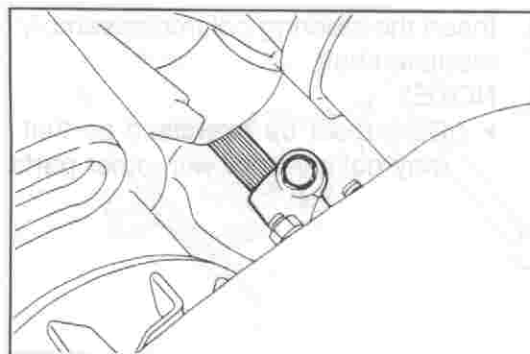


WRE91-SR206

STEERING

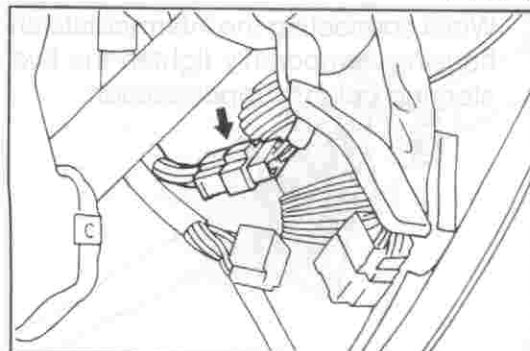
32. Install the bolts connecting the main shaft flexible coupling yoke to the intermediate shaft with new washers interposed. Tighten the bolt to the specified torque.

Tightening Torque: 16.7 - 21.6 N·m
(1.7 - 2.2 kgf-m, 12.3 - 15.9 ft-lb)



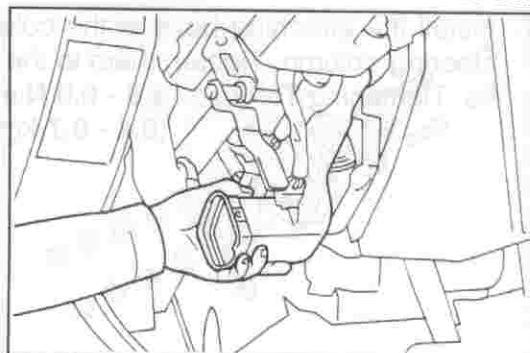
WRE91-SR207

33. Connect the connector of the ignition switch.



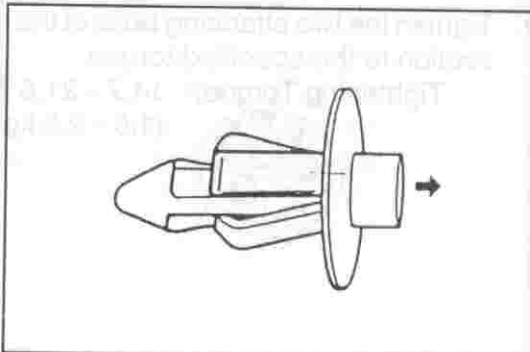
WRE91-SR208

34. Installation of air duct assembly No. 1
(1) Install the air duct No. 1.



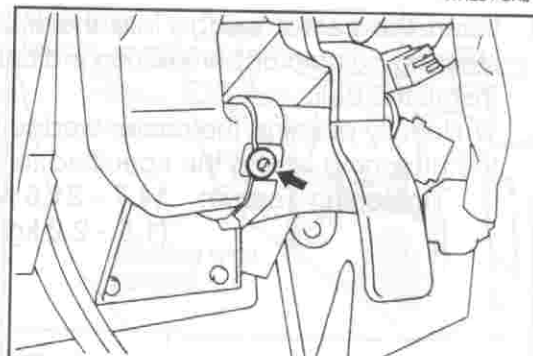
WRE91-SR209

35. Pull out the center of the clip, as indicated in the right figure.



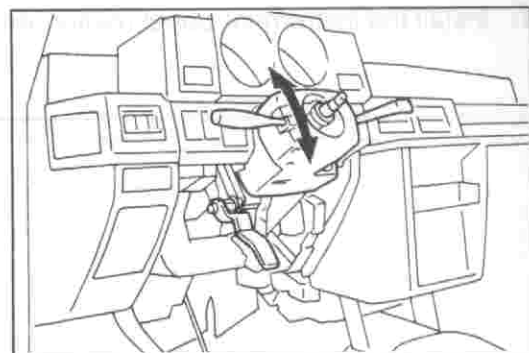
WRE91-SR210

36. Install the clip to the air duct No. 1. Push down the shaft at the clip central section until it becomes flush with the clip surface to lock the clip.



WRE91-SR211

37. Lower the tilt steering lever. Ensure that the steering tilt function operates properly.
(Tilt steering-equipped vehicle only)



WRE91-SR212

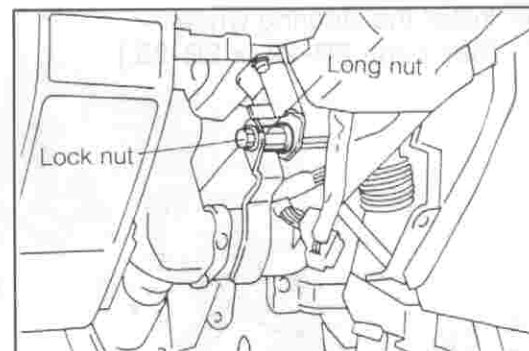
If the steering tilt function will not operate properly, loosen the steering lever attaching bolt while preventing the long nut from turning. Then, retighten the lock nut to the specified torque. With the steering lever attaching bolt applied to the stopper of the steering lever, retighten the steering lever attaching bolt to the specified torque while preventing the long nut from turning. Proceed to check again.

Tightening Torque:

Long Nut: 12.7 N·m (1.3 kgf-m, 9.4 ft-lb)

Bolt: 29.4 - 49.0 N·m

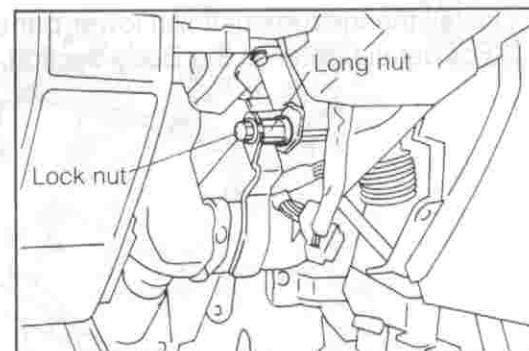
(3.0 - 4.5 kgf-m, 21.7 - 36.2 ft-lb)



WRE91-SR213

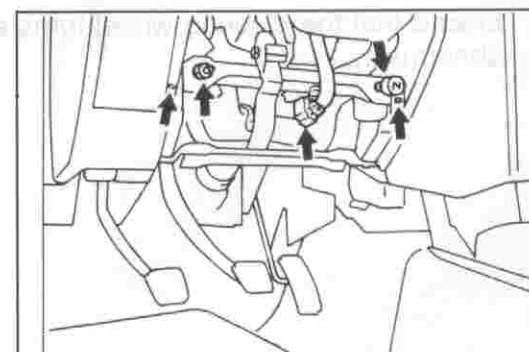
38. Ensure that the steering column is secured when tightening the tilt steering lever.

If not, adjust the tightening torque of the long nut indicated in the step 37. Perform the check described in the step 37 again.



WRE91-SR214

39. Install the instrument panel finish panel No.1 to the instrument panel.



WRE91-SR215

40. Connect the connector of the turn signal switch and clamp the connector to the instrument panel finish panel No. 1.
41. Connect the connector of the headlamp leveling switch.
(Only vehicle so equipped)
42. Install the throttle cable to the instrument panel finish panel No. 1.
43. Install the throttle knob to the throttle cable.

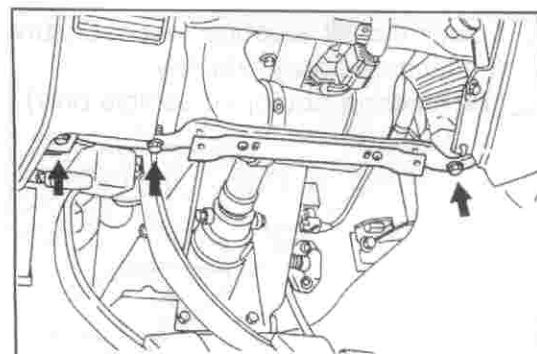
NOTE:

- Tighten the attaching screw while aligning the attaching screw of the throttle knob with the attaching screw hole of the throttle cable.

WRE91-SR216

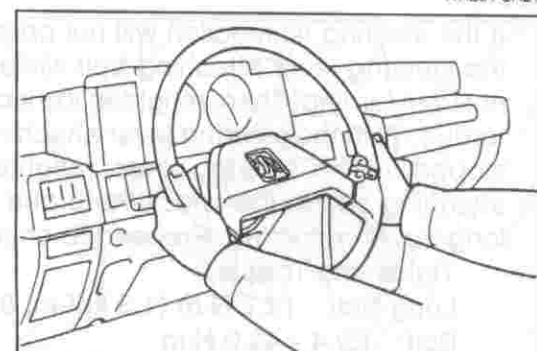
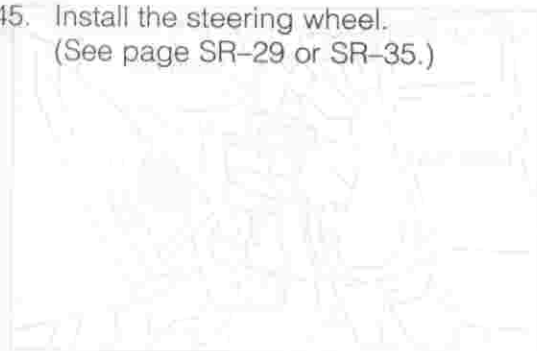
STEERING

44. Install the instrument panel reinforcement subassembly.



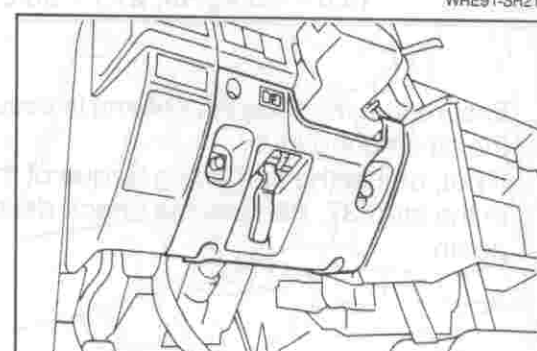
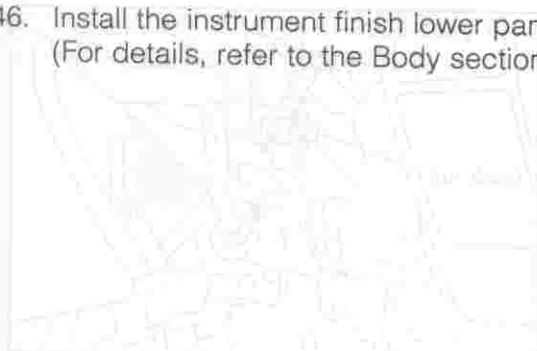
WRE91-SR217

45. Install the steering wheel.
(See page SR-29 or SR-35.)



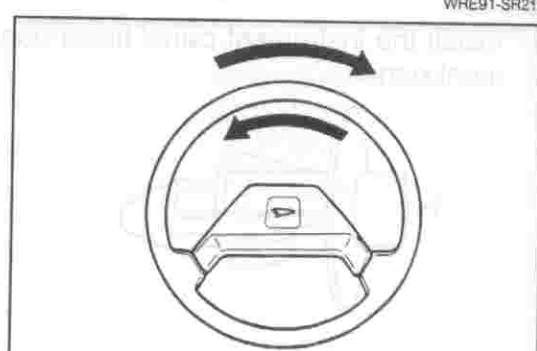
WRE91-SR218

46. Install the instrument finish lower panel.
(For details, refer to the Body section.)



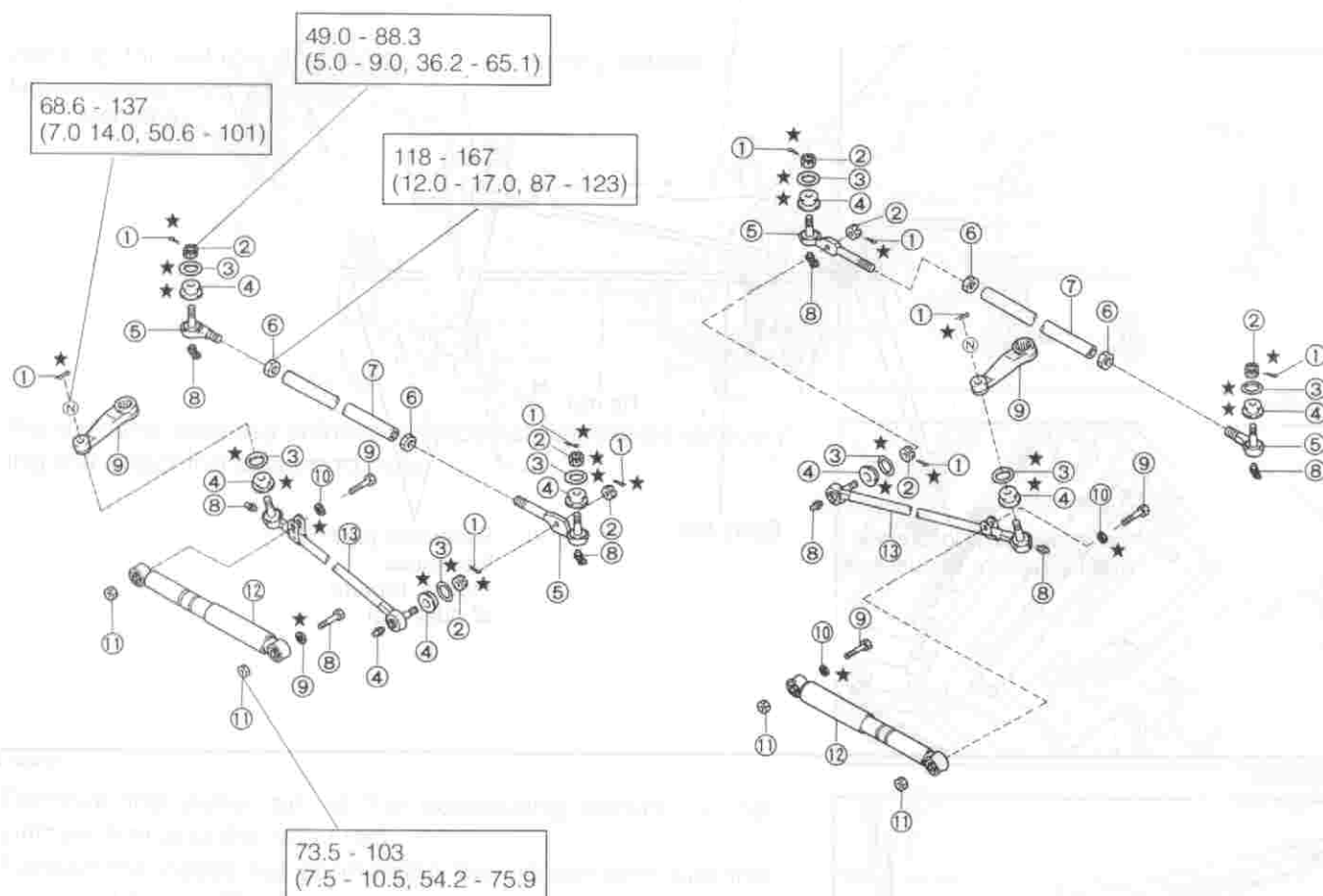
WRE91-SR219

47. Ensure that the steering wheel turns smoothly without any abnormality.



WRE91-SR220

STEERING LINKAGE COMPONENTS

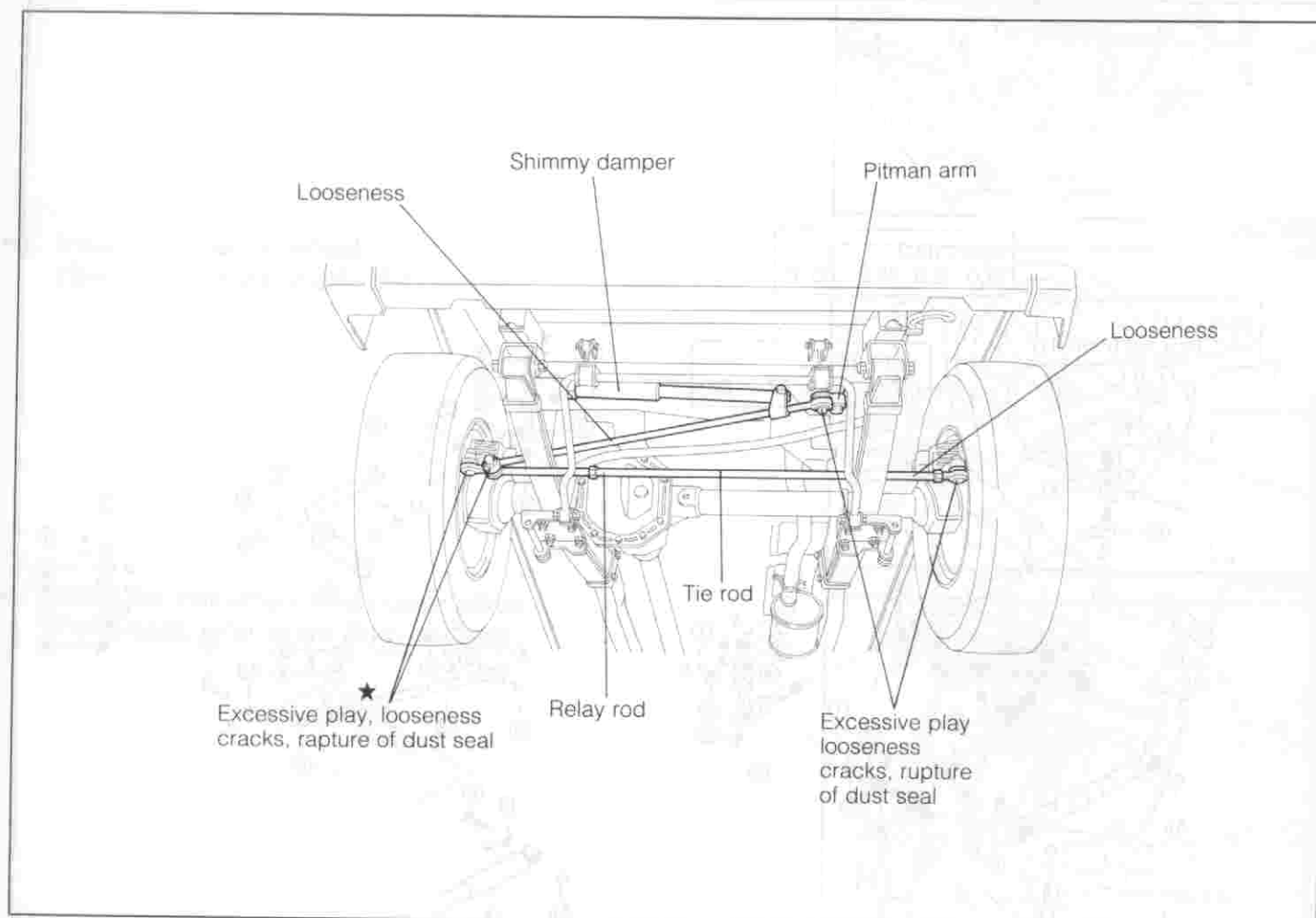


- | | |
|---------------------------------|-----------------------------------|
| ① Cotter pin | ⑧ Grease fitting |
| ② Castle nut | ⑨ Pitman arm |
| ③ Steering joint dust seal band | ⑩ Washer |
| ④ Steering joint dust seal | ⑪ Nut |
| ⑤ Tie-rod end subassembly | ⑫ Steering shimmy damper assembly |
| ⑥ Nut | ⑬ Steering relay rod |
| ⑦ Steering tie-rod | |

STEERING

INSPECTION

Ensure that each section exhibits no abnormality, such as cracks, excessive play, looseness and deformation. Replace any defective part.

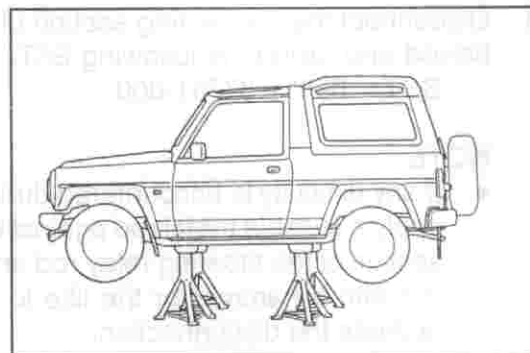


WRE91-SR222

REMOVAL

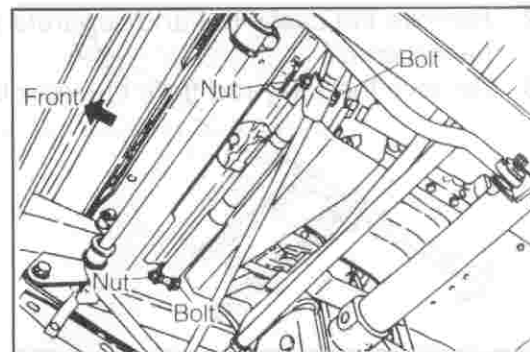
1. Loosen the front wheel attaching bolts evenly.
2. Jack-up the vehicle and support it with safety stands.
3. Remove the front wheels.

WRE91-SR223



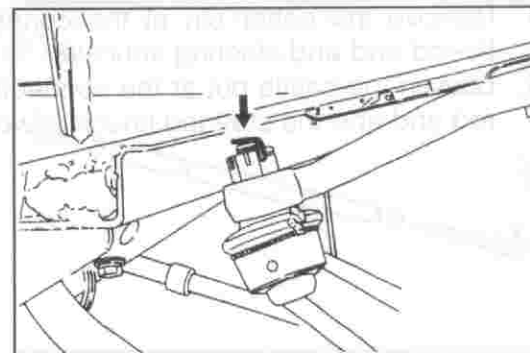
WRE91-SR224

4. Remove the steering shimmy damper assembly by removing the attaching bolts and nuts.



WRE91-SR225

5. Remove the cotter pin at the connecting section of the pitman arm and the relay rod.
6. Loosen the castle nut connecting the pitman arm with the relay rod four or five turns.



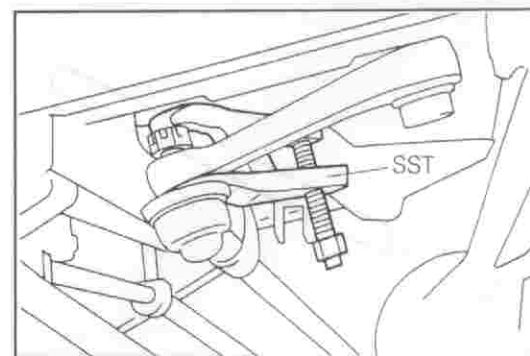
WRE91-SR226

7. Disconnect the connecting section of the pitman arm and the relay rod, using the following SST.

SST: 09611-87701-000

NOTE:

- If any difficulty is encountered during this disconnection, apply a suitable metal rod against the side of the tapered section of the relay rod and lightly tap the metal rod with a hammer or the like to give impact. This will facilitate the disconnection.

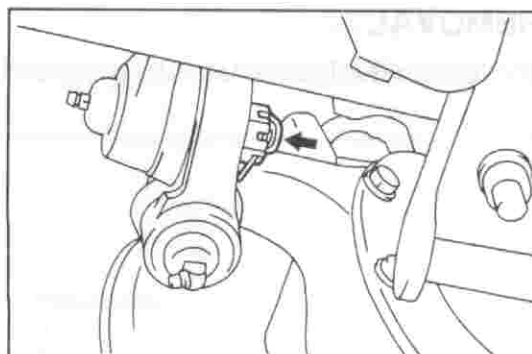


WRE91-SR227

8. Remove the castle nut and separate the relay rod from the pitman arm.

STEERING

9. Remove the cotter pin at the connecting section of the relay rod and the tie-rod end.
10. Loosen the castle nut connecting the relay rod with the tie-rod end four or five turns.



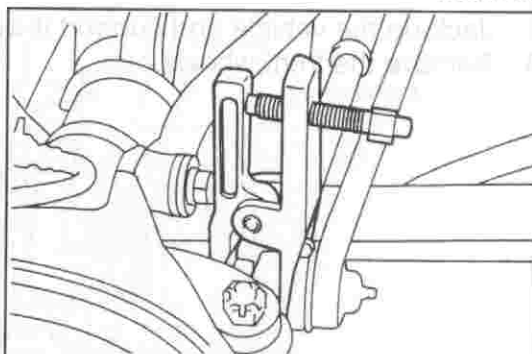
WRE91-SR228

11. Disconnect the connecting section of the relay rod and the tie-rod end, using the following SST.

SST: 09611-87701-000

NOTE:

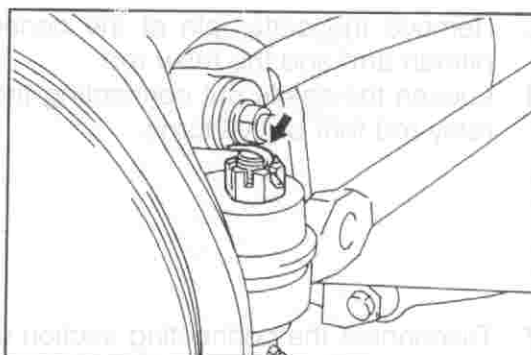
- If any difficulty is encountered during this disconnection, apply a suitable metal rod against the side of the tapered section of the steering relay rod and lightly tap the metal rod with a hammer or the like to give impact. This will facilitate the disconnection.



WRE91-SR229

12. Remove the castle nut and separate the relay rod from the tie-rod end.
13. Remove the relay rod from the vehicle.

14. Remove the cotter pin at the connecting section of the tie-rod end and steering knuckle.
15. Loosen the castle nut at the connecting section of the tie-rod end and the steering knuckle two or three turns.



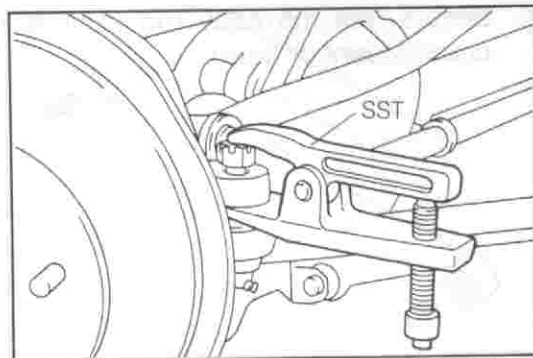
WRE91-SR230

16. Disconnect the connecting section of the tie rod end and the steering knuckle, using the following SST.

SST: 09611-87701-000

NOTE:

- If any difficulty is encountered during this disconnection, apply a suitable metal rod against the side of the tapered section of the steering knuckle and lightly tap the metal rod with a hammer or the like. This will facilitate the disconnection.



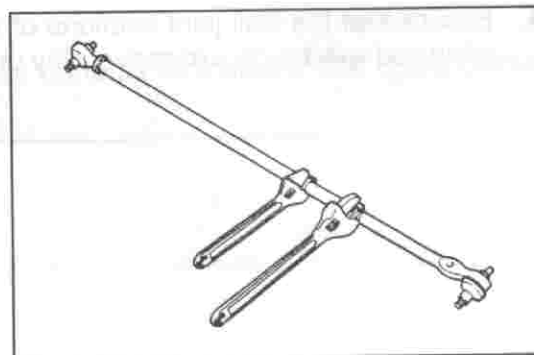
WRE91-SR231

17. Remove the castle nut.
Separate the tie rod end from the steering knuckle.
18. Remove the tie-rod from the vehicle.

19. Loosen the tie-rod end and lock nut of the tie-rod while preventing the tie-rod from turning at the hexagonal section.

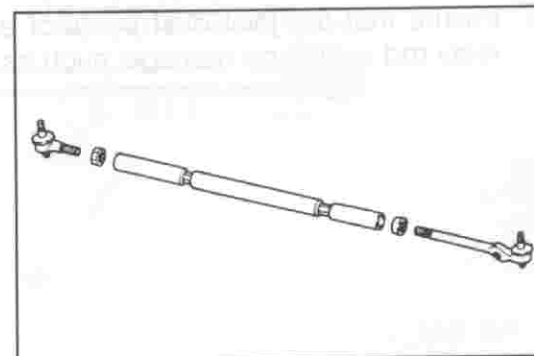
NOTE:

- Loosen the parts above after confirming the direction of the threads.



WRE91-SR232

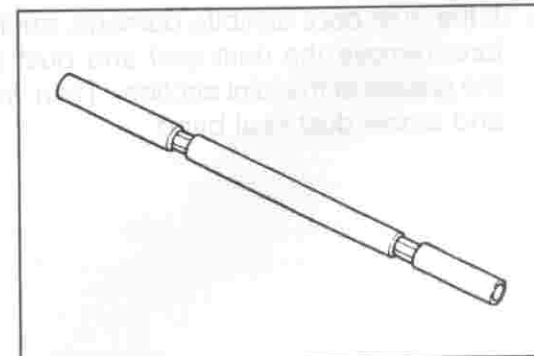
20. Remove the tie-rod end and lock nut from the tie-rod.



WRE91-SR233

INSPECTION

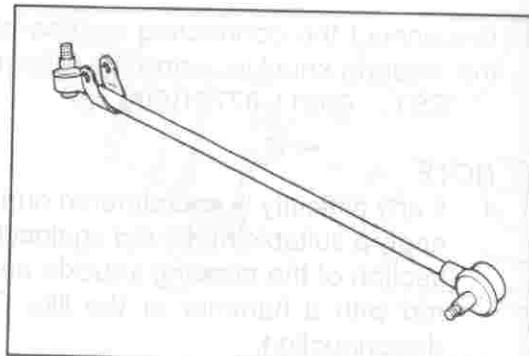
1. Ensure that the tie-rod exhibits no damage, such as cracks, dent or bend.



WRE91-SR234

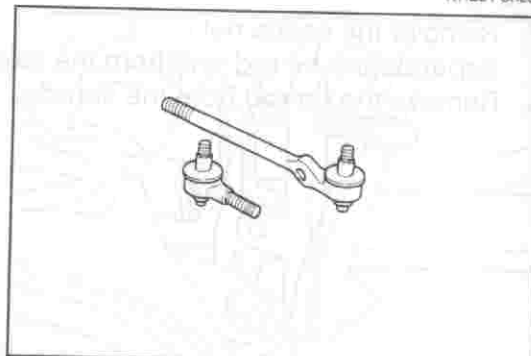
STEERING

2. Ensure that the relay rod exhibits no damage, such as cracks, dent or bend.



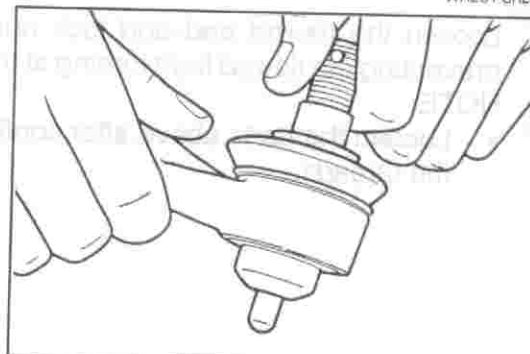
WRE91-SR235

3. Ensure that each tie-rod end exhibits no damage, such as cracks or dent.



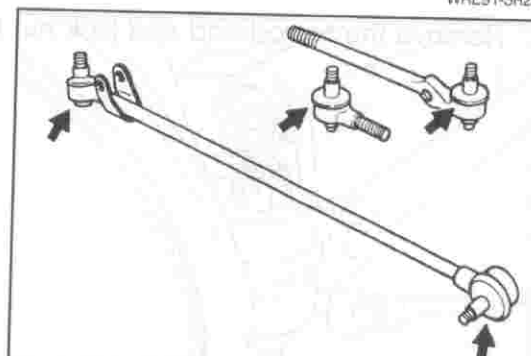
WRE91-SR236

4. Ensure that the ball joint sections of each tie-rod end and relay rod exhibit no excessive play or bending.



WRE91-SR237

5. Ensure that the joint dust boots of each tie-rod end and relay rod exhibit no damage, such as cracks and rupture.

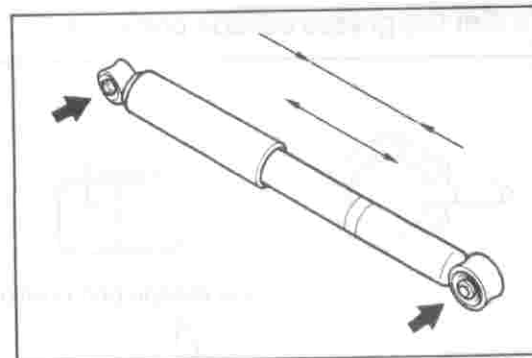


WRE91-SR238

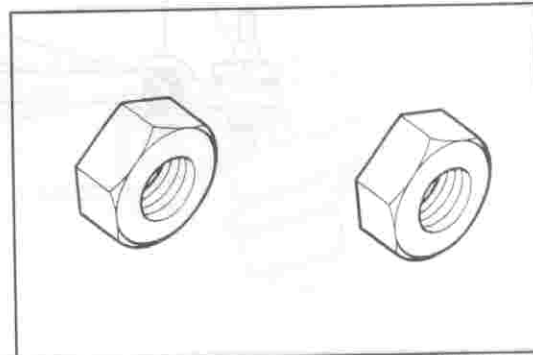
If the dust boot exhibits damage, such as cracks and rupture, remove the dust seal and dust seal band. Wipe off the grease at the joint section. Then, install a new dust boot and a new dust seal band.

WRE91-SR239

6. Ensure that the bush section of the steering shimmy damper exhibits no damage, such as cracks and excessive play. If the bush section exhibits damage, replace the steering shimmy damper with a new one.
7. Compress and extend the steering shimmy damper. At this time, ensure that you can feel a constant resistance without any binding or the like during this operation.
8. Ensure that the grease fittings of each tie-rod end and relay rod exhibit no damage.
9. Ensure that the tie-rod end lock nut exhibits no damage, such as deformation.



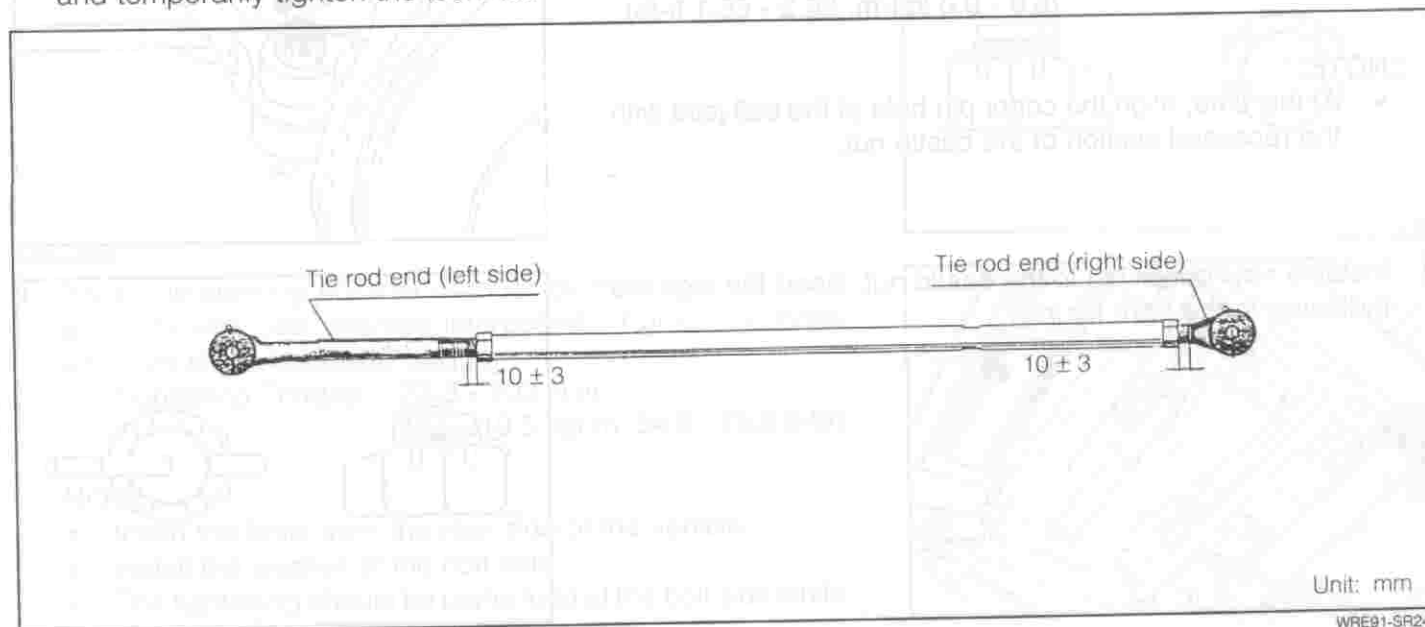
WRE91-SR240



WRE91-SR241

INSTALLATION

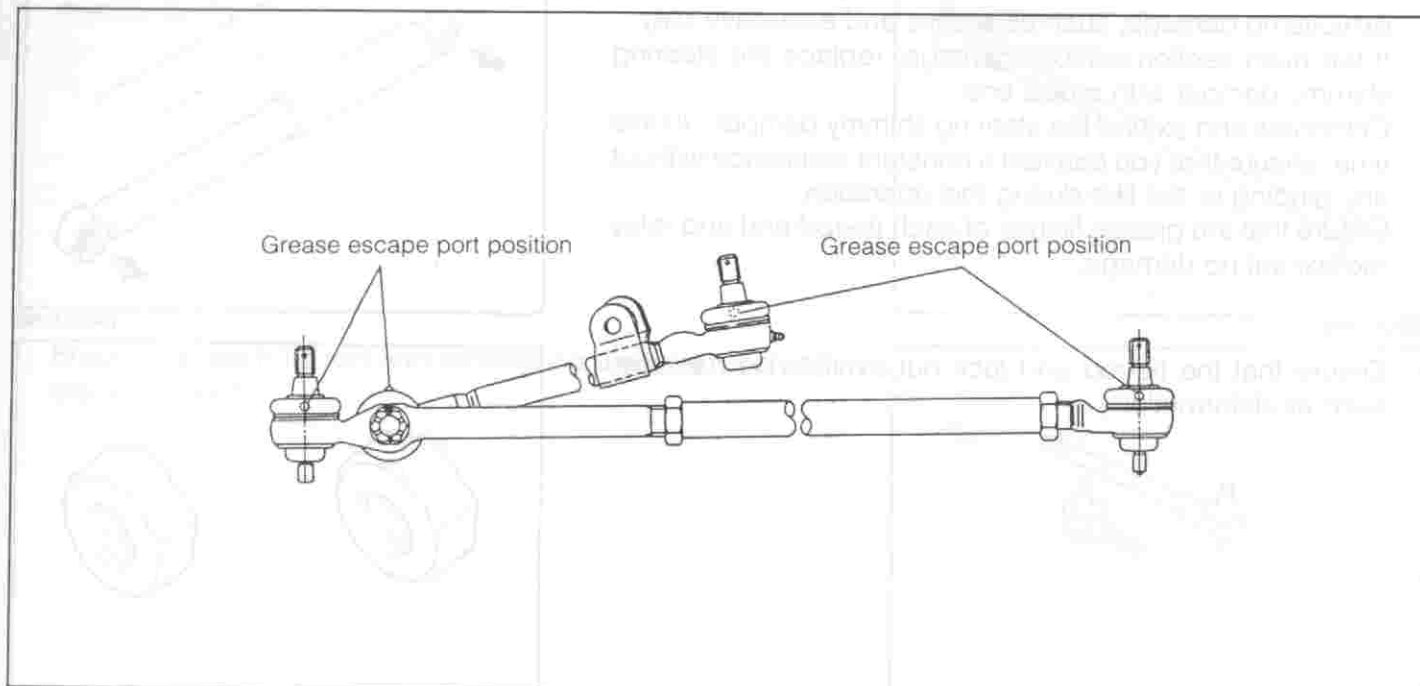
1. Screw-in the lock nut and tie-rod end into the tie-rod. Set these parts as indicated in the figure below and temporarily tighten the lock nut.



WRE91-SR242

STEERING

- Set the grease escape ports in such a way that they become as indicated in the right figure.



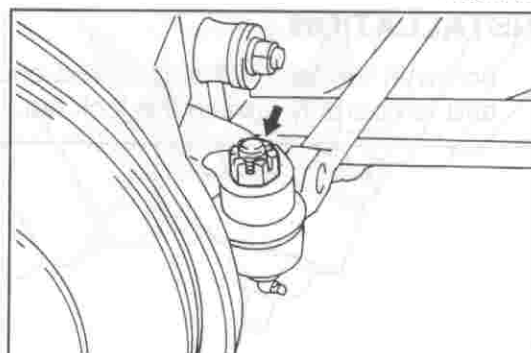
WRE91-SR243

- Connect the tie-rod end to the steering knuckle. Tighten the castle nut to the specified torque.

Tightening Torque: 49.0 - 88.3 N·m
(5.0 - 9.0 kgf-m, 36.2 - 65.1 ft-lb)

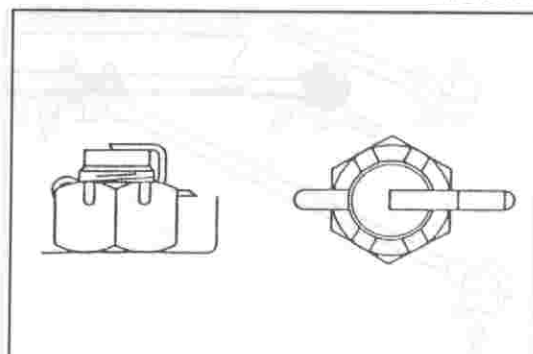
NOTE:

- At this time, align the cotter pin hole of the ball joint with the recessed section of the castle nut.



WRE91-SR244

- Install a new cotter pin to the castle nut. Bend the legs, as indicated in the right figure.



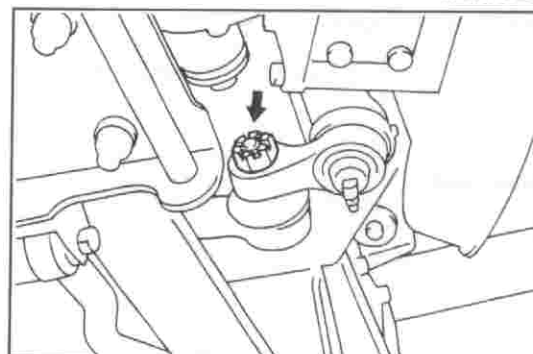
WRE91-SR245

- Connect the relay rod to the tie-rod end. Tighten the attaching nut to the specified torque.

Tightening Torque: 68.6 - 137 N·m
(7.0 - 14.0 kgf-m, 50.6 - 101 ft-lb)

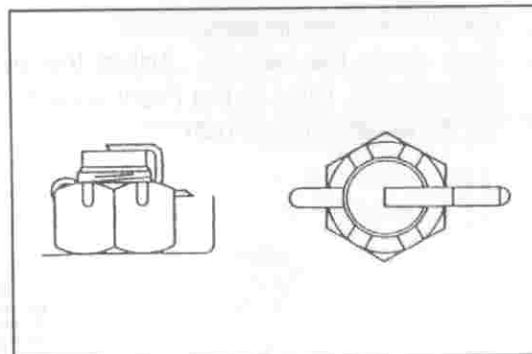
NOTE:

- At this time, align the cotter pin hole of the ball joint with the recessed section of the castle nut.



WRE91-SR246

6. Install a new cotter pin to the castle nut. Bend the legs, as indicated in the right figure.



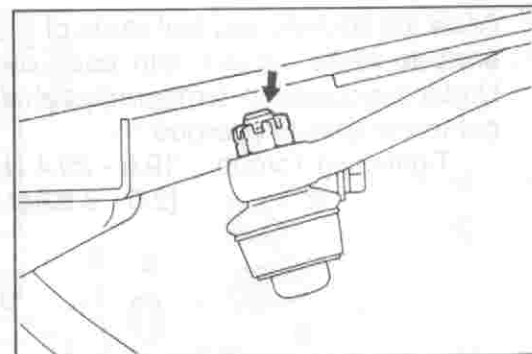
WRE91-SR247

7. Connect the steering relay rod to the pitman arm. Tighten the attaching nut to the specified torque.

Tightening Torque: 68.6 - 137 N·m
(7.0 - 14.0 kgf-m, 50.6 - 101 ft-lb)

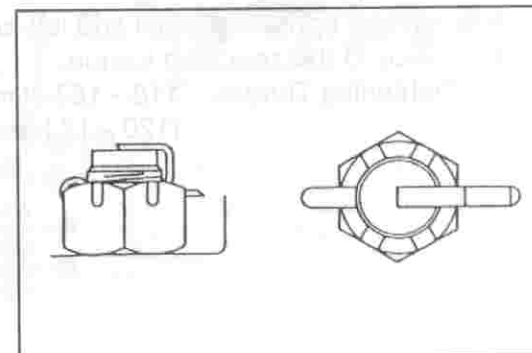
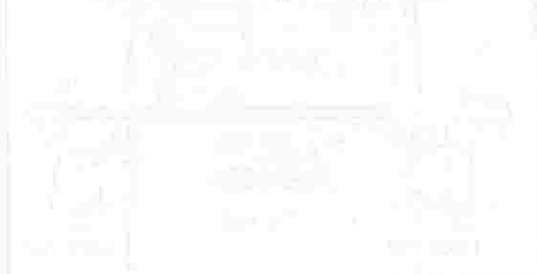
NOTE:

- At this time, align the cotter pin hole of the ball joint with the recessed section of the castle nut.



WRE91-SR248

8. Install a new cotter pin to the castle nut. Bend the legs, as indicated in the right figure.



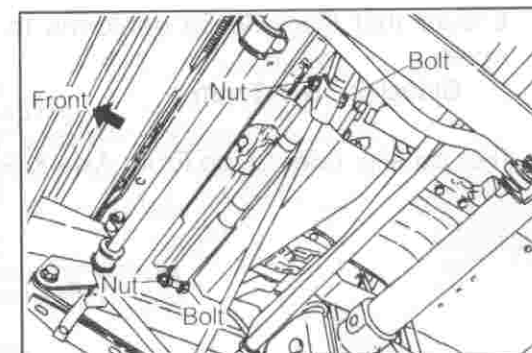
WRE91-SR249

9. Install the steering shimmy damper by means of the bolts and nuts with new washers interposed. Tighten the bolts and nuts to the specified torque.

Tightening Torque: 73.5 - 103 N·m
(7.5 - 10.5 kgf-m, 54.2 - 75.9 ft-lb)

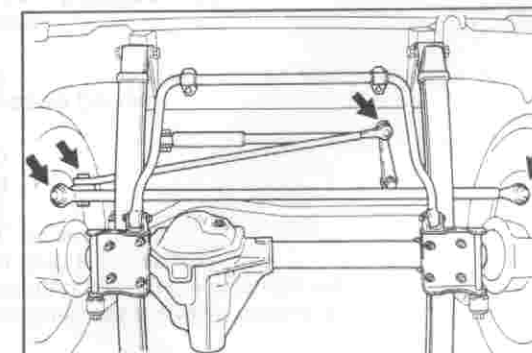
NOTE:

- Insert the bolts from the rear side of the vehicle.
- Install the washer at the bolt side.
- The tightening should be performed at the bolt side while preventing the nut from turning.



WRE91-SR250

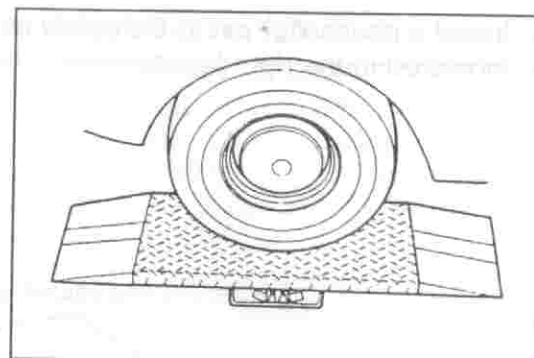
10. Fill lithium-based MP grease from each grease fitting, until the grease oozes out from the grease escape ports.



WRE91-SR251

STEERING

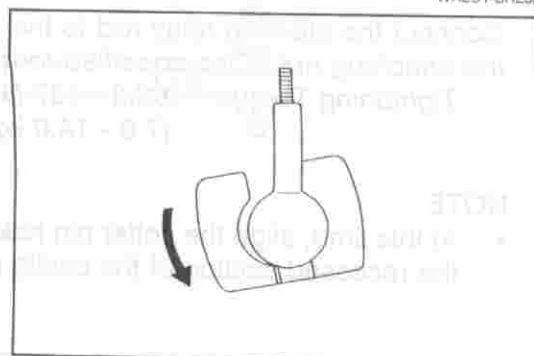
11. Install the front wheels.
12. Jack down the vehicle. Adjust the sideslip.
(For details, refer to the Front Axle & Suspension section.)
Sideslip: 0 ± 3 mm



WRE91-SR252

13. Allow the sockets and ball studs of the right and left tie-rod ends to make contact with each other at the rear side. Under this condition, temporarily tighten the tie-rod end lock nut to the specified torque.

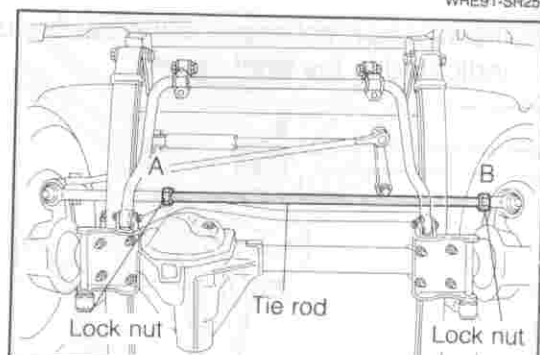
Tightening Torque: 19.6 - 29.4 N·m
(2.0 - 3.0 kgf-m, 14.5 - 21.7 ft-lb)



WRE91-SR253

14. Alternatively tighten the right and left lock nuts of the tie-rod end twice to the specified torque.

Tightening Torque: 118 - 167 N·m
(120 - 17 kgf-m, 87-123 ft-lb)

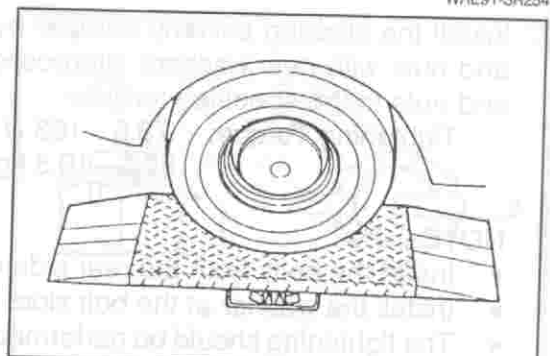


WRE91-SR254

15. Ensure that the sideslip conforms to the specified value again.

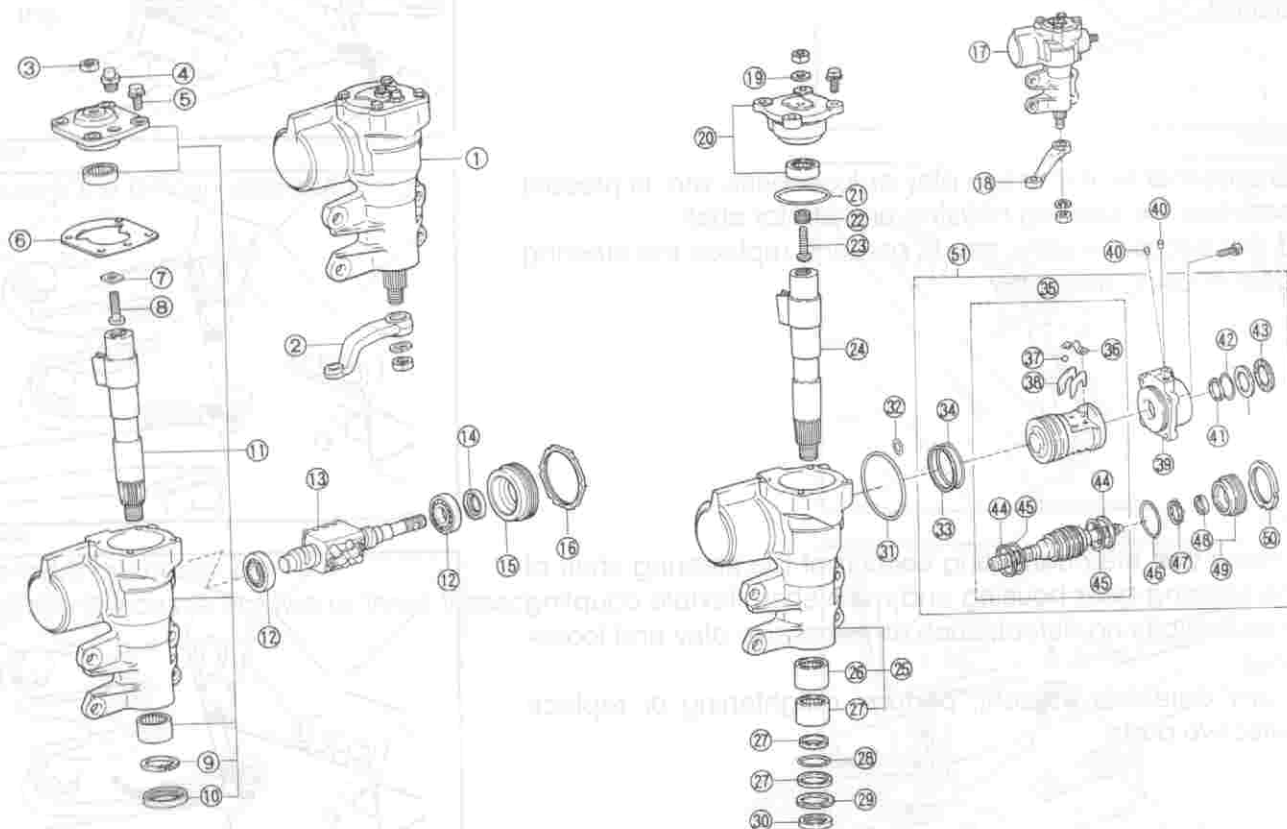
Sideslip: 0 ± 3 mm

(For details, refer to the Front Axle & Suspension section.)



WRE91-SR255

STEERING GEAR HOUSING COMPONENTS

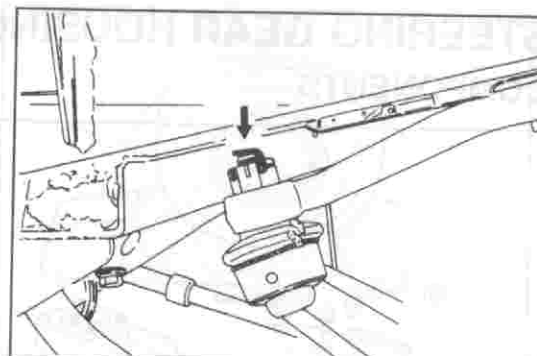


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|----------------------------------|--------------------------|------------------------------|------------------------------|-------------------------------|---------------------------------|------------------------------|--------------------------------|-------------------|---------------------|-------------------------------------|-----------|---|---------------------|--------------------------------|---|--------------------------------|--------------------------|---------------|--------------------------|------------|------------------------------|--------------------------------|---------------|---|-------------------------|--------|------------|------------------|---------------------|------------|------------|--------|------------|---------------------------|--------------------|--------|--------------|-----------------------------|--------------|--------|------------|-------------------------|--------|------------|------------|-----------|---------------------|-----------------------------|---|---|
| ① Steering gear housing assembly | ② Pitman arm subassembly | ③ Sector shaft adjusting nut | ④ Steering gear box oil plug | ⑤ Sector shaft end cover bolt | ⑥ Sector shaft end cover gasket | ⑦ Sector shaft thrust washer | ⑧ Sector shaft adjusting screw | ⑨ Shaft snap ring | ⑩ Type "T" oil seal | ⑪ Steering gear housing subassembly | ⑫ Bearing | ⑬ Steering worm w/ball nut joint assembly | ⑭ Type "T" oil seal | ⑮ Worm bearing adjusting screw | ⑯ Worm bearing adjusting screw lock nut | ⑰ Power steering gear assembly | ⑱ Pitman arm subassembly | ⑲ Seal washer | ⑳ Sector shaft end cover | ㉑ "O" ring | ㉒ Sector shaft adjusting nut | ㉓ Sector shaft adjusting screw | ㉔ Gross shaft | ㉕ Power steering gear housing subassembly | ㉖ Needle roller bearing | ㉗ Ring | ㉘ "O" ring | ㉙ Hole snap ring | ㉚ Type "V" oil seal | ㉛ "O" ring | ㉜ "O" ring | ㉝ Ring | ㉞ "O" ring | ㉟ Power steering worm kit | ㊱ Ball guide clamp | ㊲ Ball | ㊳ Ball guide | ㊴ Valve housing subassembly | ㊵ Union seat | ㊶ Ring | ㊷ "O" ring | ㊸ Thrust needle bearing | ㊹ Ring | ㊺ "O" ring | ㊻ "O" ring | ㊼ Bearing | ㊽ Type "T" oil seal | ㊾ Adjuster plug subassembly | ㊿ Worm bearing adjusting screw lock nut | 1 Power steering control valve assembly |
|----------------------------------|--------------------------|------------------------------|------------------------------|-------------------------------|---------------------------------|------------------------------|--------------------------------|-------------------|---------------------|-------------------------------------|-----------|---|---------------------|--------------------------------|---|--------------------------------|--------------------------|---------------|--------------------------|------------|------------------------------|--------------------------------|---------------|---|-------------------------|--------|------------|------------------|---------------------|------------|------------|--------|------------|---------------------------|--------------------|--------|--------------|-----------------------------|--------------|--------|------------|-------------------------|--------|------------|------------|-----------|---------------------|-----------------------------|---|---|

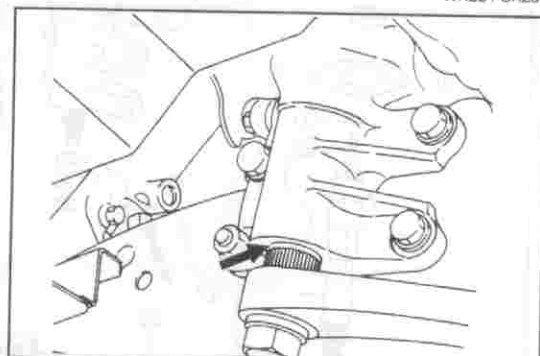
STEERING

IN-VEHICLE INSPECTION

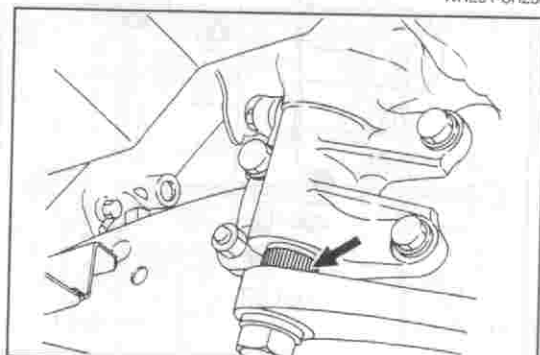
1. Ensure that the connecting section of the pitman arm and steering sector shaft exhibits no defect, such as excessive play and looseness.
If any defect is present, check the tightening torque of the nut. Retighten them or replace the defective parts, as required.
2. Ensure that no excessive play or looseness, etc. is present between the steering housing and sector shaft.
If any excessive play, etc. is present, replace the steering gear housing assembly.
3. Ensure that the connecting section of the steering shaft of the steering gear housing and main shaft flexible coupling yoke exhibits no defect, such as excessive play and looseness.
If any defect is present, perform retightening or replace defective parts.
4. Ensure that no defect, such as excessive play, is present between the steering housing and the main shaft flexible coupling yoke.
If any defect is present, overhaul the steering gear housing.
5. Ensure that the steering gear housing exhibits no oil leakage.
If any oil leakage is present, repair the leaky points.



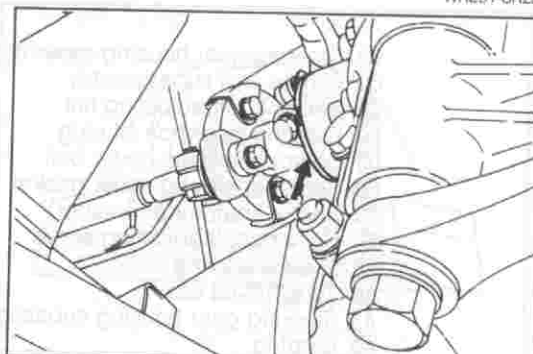
WRE91-SR257



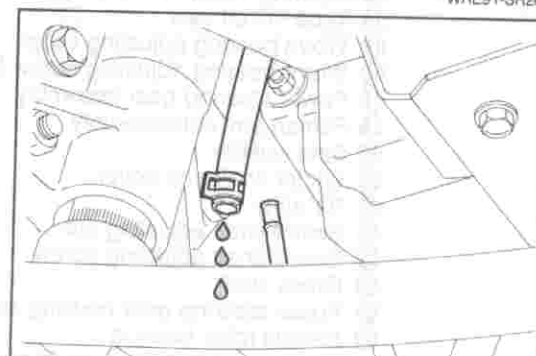
WRE91-SR258



WRE91-SR259



WRE91-SR260



WRE91-SR261

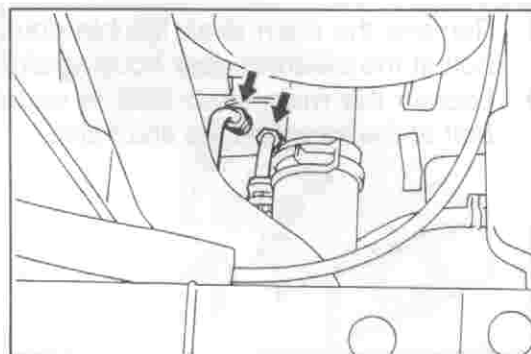
REMOVAL

1. Drain the power steering fluid.
(See page SR-17.)
(Power steering-equipped vehicle only)

2. Disconnect the power steering pressure feed tubes from the power steering gear housing.
(Power steering-equipped vehicle only)

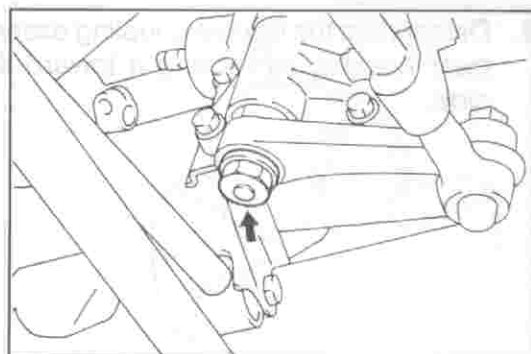
NOTE:

- Since the power steering oil will flow out, be sure to place a suitable container under the power steering gear housing.



WRE91-SR262

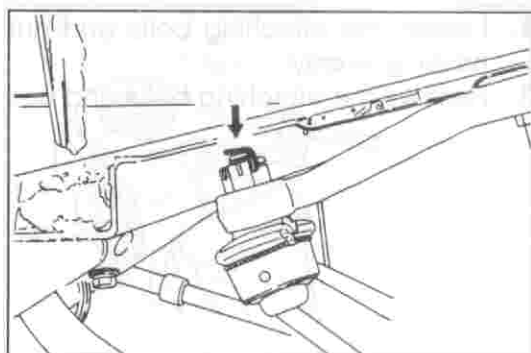
3. Loosen the pitman arm attaching nut.



WRE91-SR263

4. Remove the cotter pin.

5. Loosen the castle nut two or three threads.



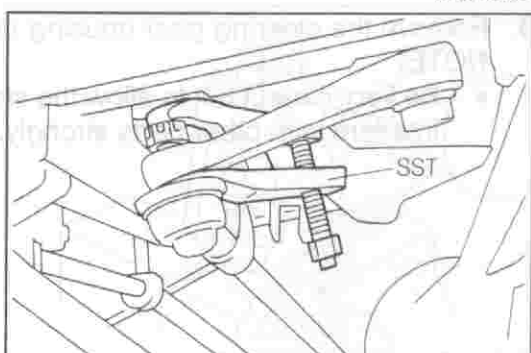
WRE91-SR264

6. Disconnect the pitman arm from the relay rod, using the following SST.

SST: 09611-87701-000

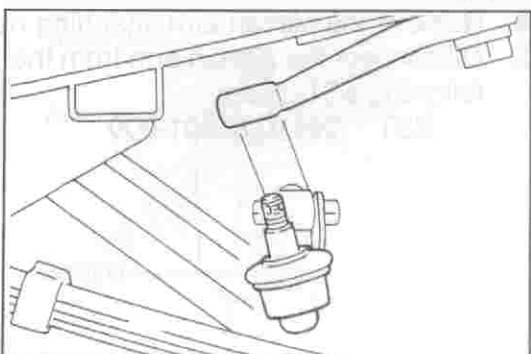
NOTE:

- Be careful not to apply excessive load during the removal.
- If the parts will not be disconnected even if the load is applied, put a suitable metal rod against the side of the tapered section of the pitman arm and lightly tap the metal rod with a hammer or the like to give impact. This will facilitate the disconnection.



WRE91-SR265

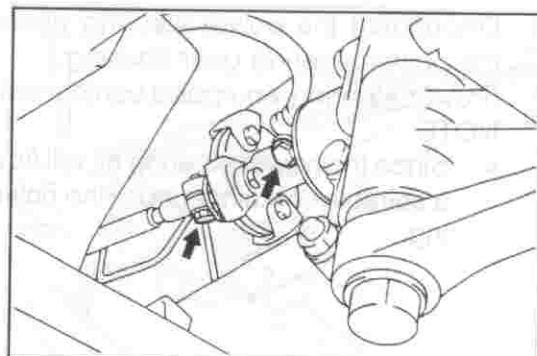
7. Remove the castle nut and disconnect the relay rod from the pitman arm.



WRE91-SR266

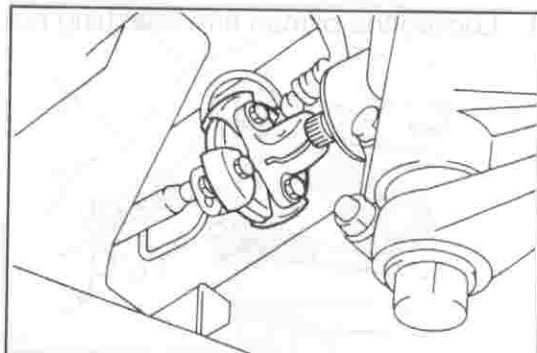
STEERING

8. Remove the main shaft flexible coupling yoke connecting bolt at the steering gear housing side.
9. Loosen the main shaft flexible coupling yoke connecting bolt at the intermediate shaft side.



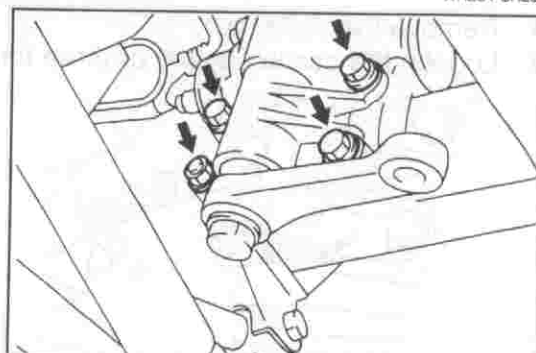
WRE91-SR267

10. Disconnect the flexible coupling assembly from the steering gear housing by moving it toward the intermediate shaft side.



WRE91-SR268

11. Loosen the attaching bolts and nut for the steering gear housing evenly.
12. Remove the attaching bolts and nut.

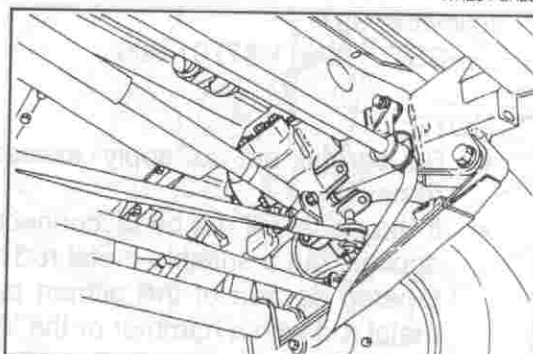


WRE91-SR269

13. Remove the steering gear housing from the vehicle.

NOTE:

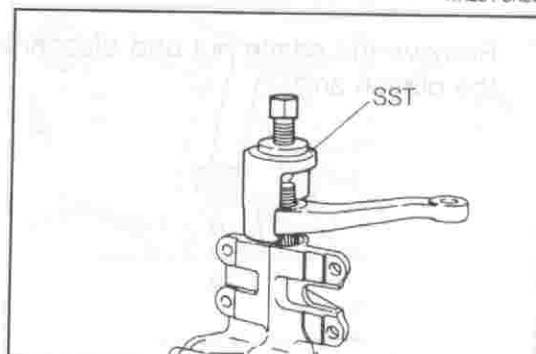
- Be very careful not to allow the steering gear housing to interfere with other parts strongly.



WRE91-SR270

14. Remove the pitman arm attaching nut.
15. Disconnect the pitman arm from the sector shaft, using the following SST.

SST: 09610-87301-000

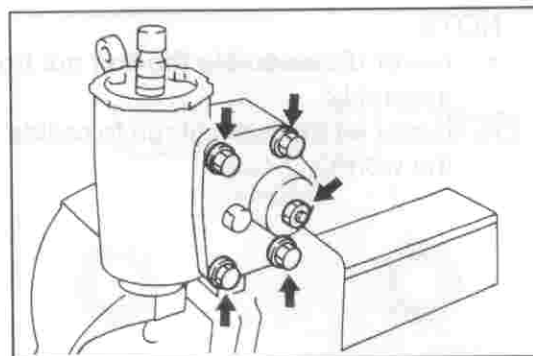


WRE91-SR271

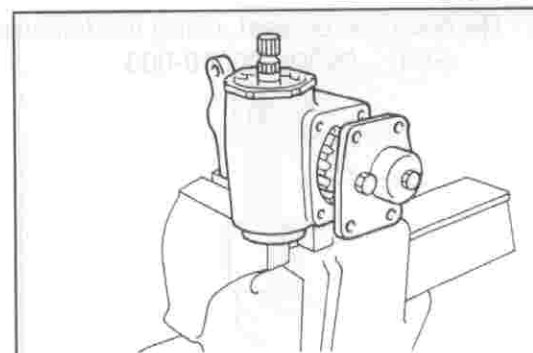
DISASSEMBLY

(Manual Steering Gear Assembly)

1. Remove the sector shaft adjusting screw set nut.
2. Remove the end cover set bolt.
3. Pull out the sector shaft from the steering gear housing with end cover.
4. Disassemble the sector shaft end cover, thrust washer, adjusting screw and end cover by screwing in the sector shaft adjusting screw.



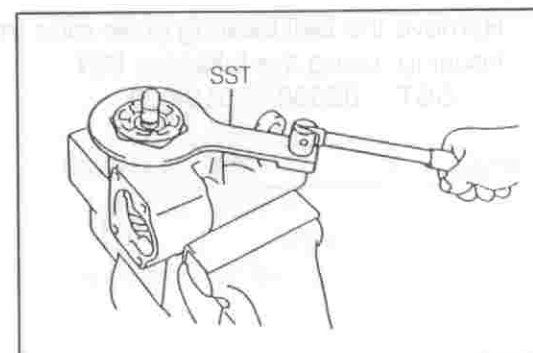
WRE91-SR272



WRE91-SR273

5. Remove the worm bearing adjusting screw locker nut, using the following SST.

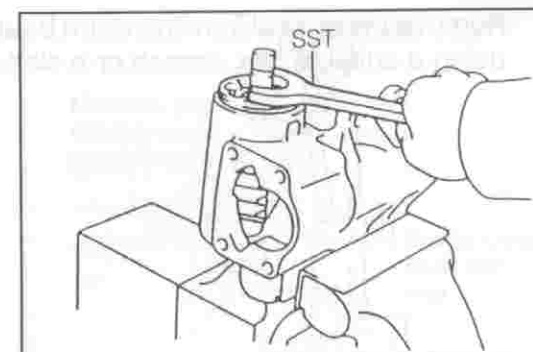
SST: 09617-28010-000



WRE91-SR274

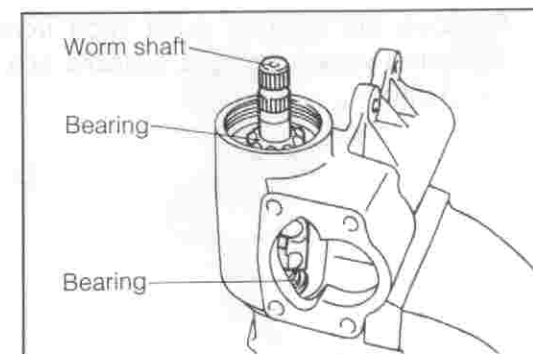
6. Remove the worm bearing adjusting screw, using the following SST.

SST: 09616-30011-000



WRE91-SR275

7. Remove the worm shaft assembly and ball bearings from the steering gear housing.



WRE91-SR276

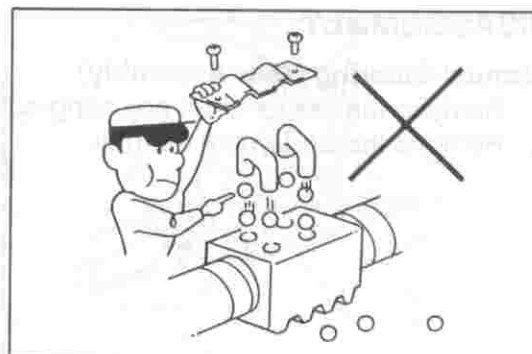
STEERING

NOTE:

- Never disassemble the ball nut from the steering worm assembly.
- Never let the ball nut run to collide with the either end of the worm.

8. Remove the oil seal, using the following SST.

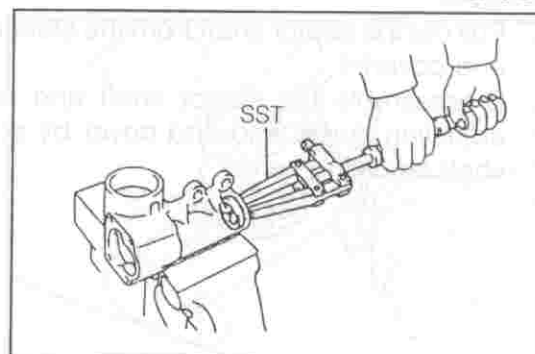
SST: 09308-00010-000



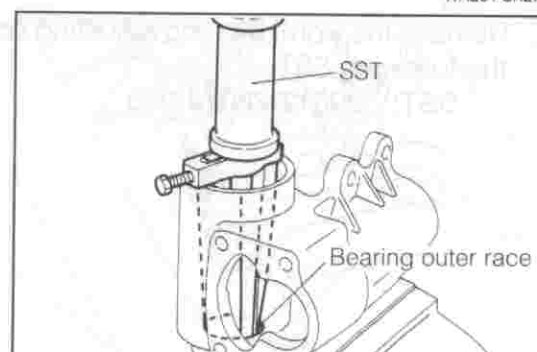
WRE91-SR277

9. Remove the ball bearing outer race from the steering gear housing, using the following SST.

SST: 09308-00010-000

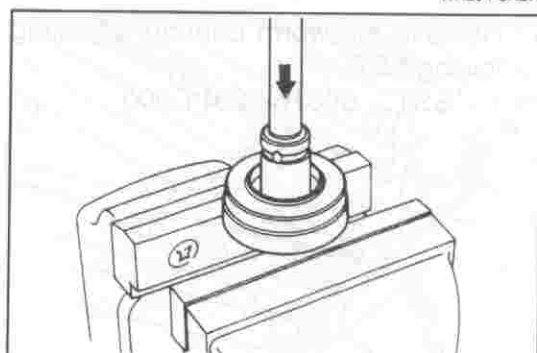


WRE91-SR278



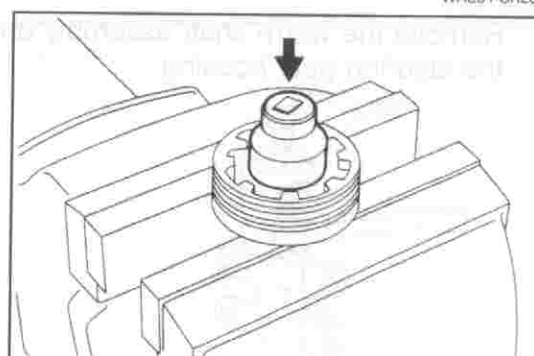
WRE91-SR279

10. Remove the oil seal from the worm bearing adjusting screw, using a suitable box wrench or a slotted pin puller.



WRE91-SR280

11. Remove the bearing outer race from the worm bearing adjusting screw, using a suitable box wrench or a slotted pin puller.



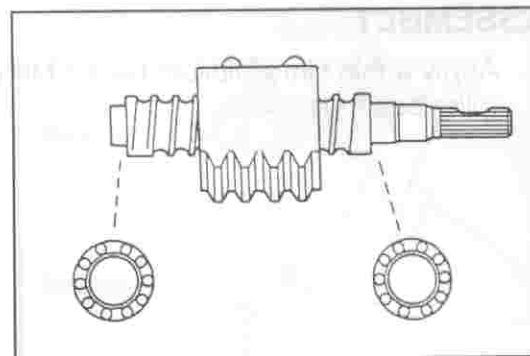
WRE91-SR281

INSPECTION

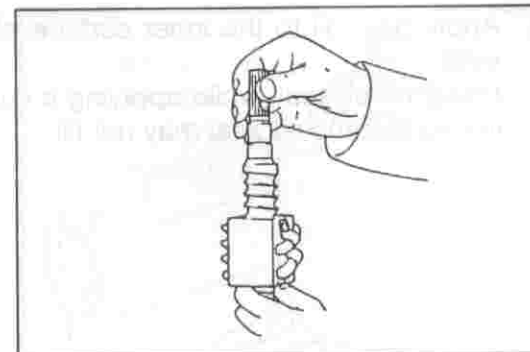
1. Inspection of steering worm shaft assembly
 - (1) Ensure that the worm shaft threaded portion exhibits no damage, such as wear.
 - (2) Ensure that the bearing race section of the worm shaft assembly exhibits no damage, such as wear and cracks.
 - (3) Ensure that the ball nut rack section exhibits no damage, such as scratches, cracks and wear.
 - (4) Ensure that the bearing exhibits no damage such as wear.
 - (5) With the worm shaft held vertically, ensure that the ball nut rotates smoothly by its own weight.

NOTE:

- When the worm nut approaches the end, hold the worm nut by fingers so that it may not hit the worm's end.

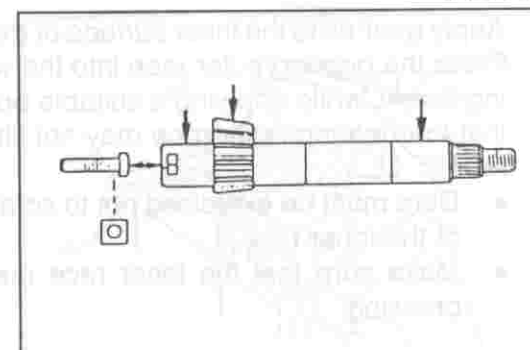


WRE91-SR282



WRE91-SR283

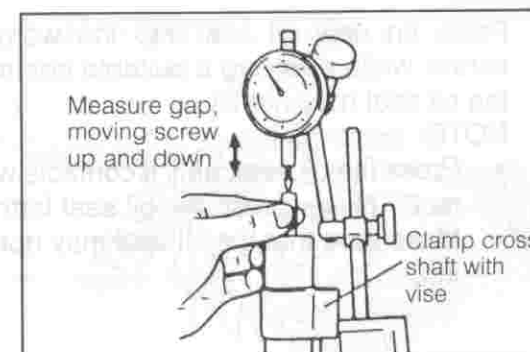
2. Inspection of sector shaft
 - (1) Check the gear section for damage.
 - (2) Check to see if any severe damage is present at the contacting surface of the sector shaft with the adjusting screw.
 - (3) Check the contacting surface of each needle roller bearing for damage.



WRE91-SR284

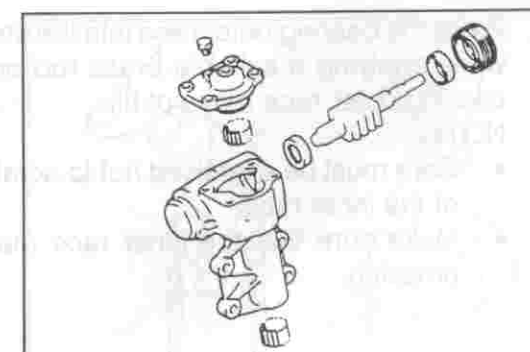
- (4) Measure the gap between the shaft and the adjusting screw.

Specified Value: Not to exceed 0.05 mm



WRE91-SR285

3. Inspection of steering gear housing
 - (1) Check the needle roller bearings for damage.
 - (2) Check the worm bearing outer race for damage or wear.
 - (3) Check the breather plug for clogging.



WRE91-SR286

STEERING

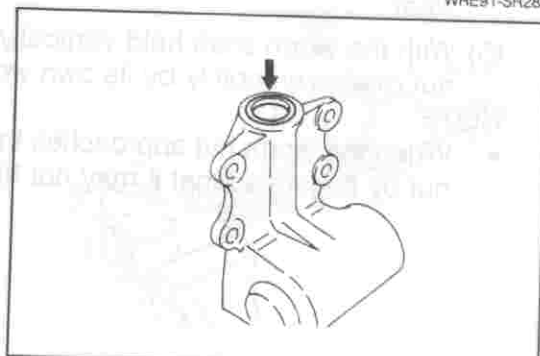
ASSEMBLY

1. Apply a thin film of lithium-based MP grease to the needle roller bearings.



WRE91-SR287

2. Apply gear oil to the inner surface of the sector shaft oil seal.
3. Press the oil seal, while applying a suitable iron rod or the like so that the oil seal may not tilt.

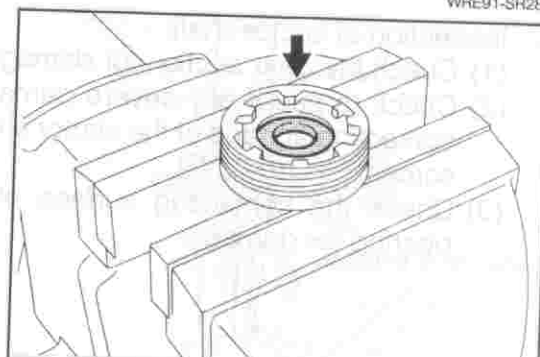


WRE91-SR288

4. Apply gear oil to the inner surface of the worm shaft oil seal.
5. Press the bearing outer race into the worm bearing adjusting screw, while applying a suitable brass rod or the like so that the bearing outer race may not tilt.

NOTE:

- Care must be exercised not to scratch the inner surface of the inner race.
- Make sure that the inner race may not tilt during the pressing.

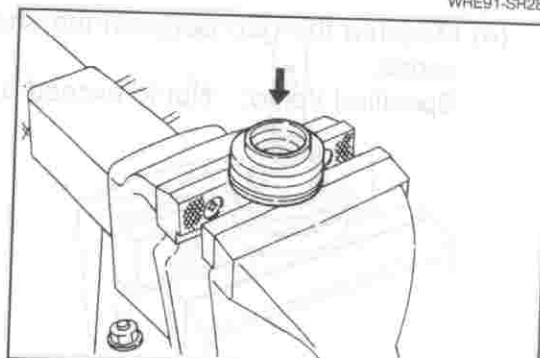


WRE91-SR289

6. Press an new oil seal into the worm bearing adjusting screw, while applying a suitable iron rod or the like so that the oil seal may not tilt.

NOTE:

- Press the oil seal, until it contacts with the bearing outer race. Never press the oil seal farther beyond this limit.
- Make sure that the oil seal may not tilt during the pressing.

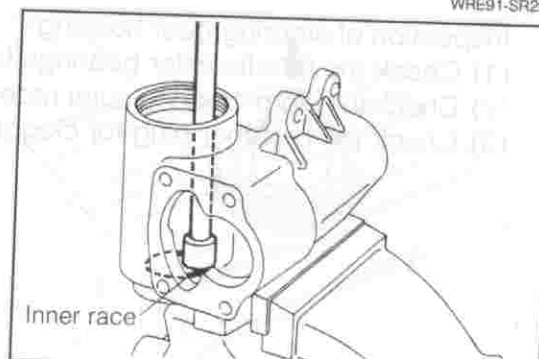


WRE91-SR290

7. Press the bearing outer race into the steering gear housing, while applying a suitable brass rod or the like so that the bearing outer race may not tilt.

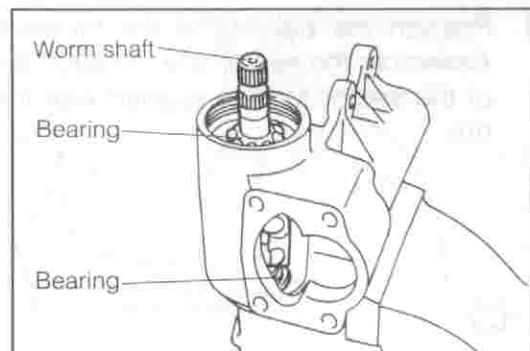
NOTE:

- Care must be exercised not to scratch the inner surface of the inner race.
- Make sure that the inner race may not tilt during the pressing.



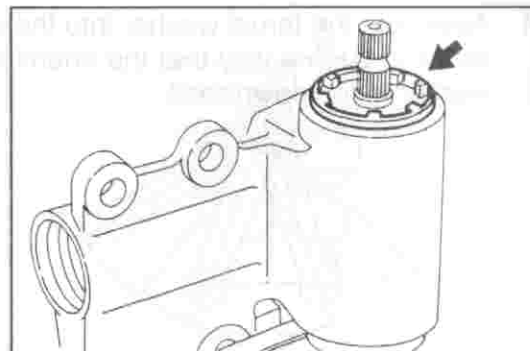
WRE91-SR291

8. Insert the bearings and ball nut into the steering gear housing.



WRE91-SR292

9. Screw in the worm bearing adjusting screw fully by your hand.

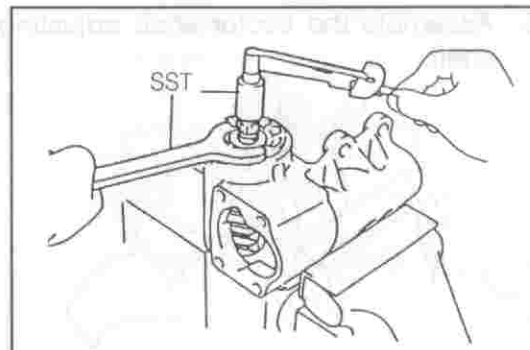


WRE91-SR293

10. Install the SST indicated in the right figure to the worm shaft. Adjust the worm bearing adjusting screw, using the following SSTs, so that the bearing preload may become the specified value.

Starting Torque: 0.29 - 0.49 N·m
(0.03 - 0.05 kgf·m, 0.22 - 0.36 ft·lb)

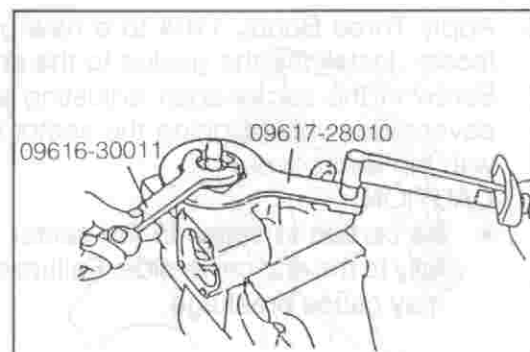
SSTs: 09616-00010-000
09616-30011-000



WRE91-SR294

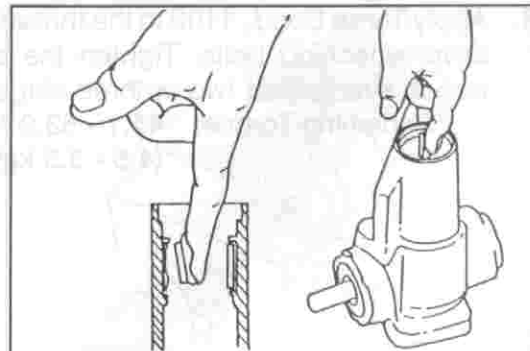
11. While preventing the adjusting screw from turning with the SST, lock the lock nut by tightening it, using the following SST.

SSTs: 09616-30011-000
09617-28010-000



WRE91-SR295

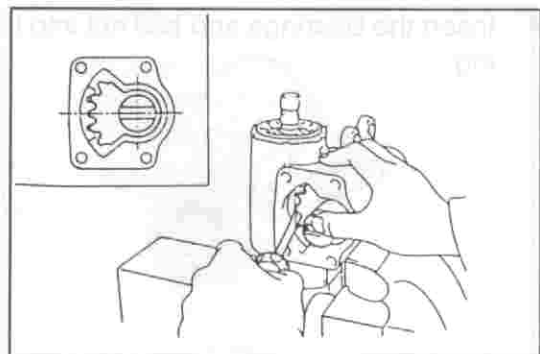
12. Ensure that no needle roller bearing is dropped. If the needle roller bearing should be dropped, apply lithium-based MP grease and install the needle roller bearings in place.



WRE91-SR296

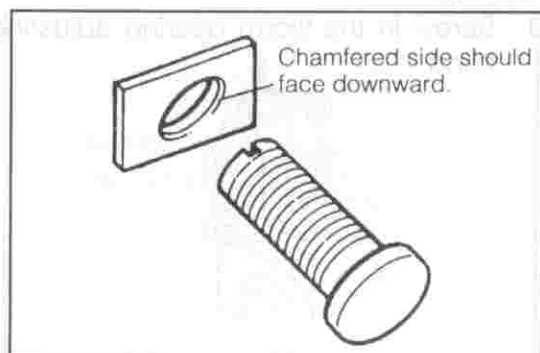
STEERING

13. Position the ball nut at the midpoint of the worm shaft. Assemble the sector shaft in such a way that the midpoint of the sector shaft is aligned with the midpoint of the ball nut.



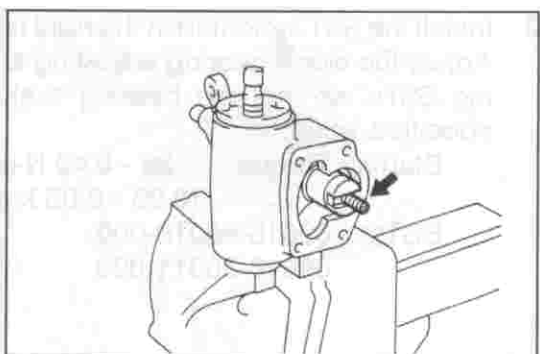
WRE91-SR297

14. Assemble the thrust washer into the sector shaft adjusting screw in such a way that the chamfered side of the thrust washer faces downward.



WRE91-SR298

15. Assemble the sector shaft adjusting screw to the sector shaft.

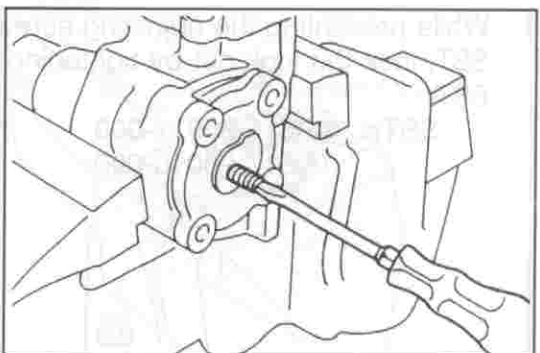


WRE91-SR299

16. Apply Three Bond® 1104 to a new gasket at its both surfaces. Install the the gasket to the end cover.
17. Screw in the sector shaft adjusting screw fully to the end cover side, while aligning the sector shaft adjusting screw with the end cover.

CAUTION:

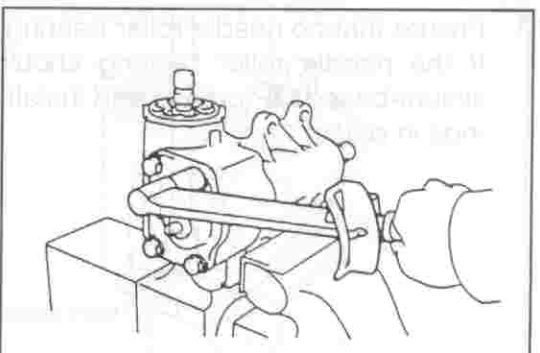
- Be certain to screw-in the sector shaft adjusting screw fully to the end cover side. Failure to observe this caution may cause breakage.



WRE91-SR300

18. Apply Three Bond® 1102 to the threaded portions of the end cover attaching bolts. Tighten the bolts to the specified torque evenly over two or three stages.

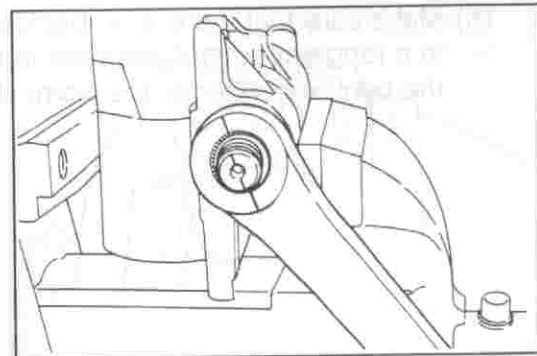
Tightening Torque: 44.1 - 53.9 N-m
(4.5 - 5.5 kgf-m, 32.5 - 39.8 ft-lb)



WRE91-SR301

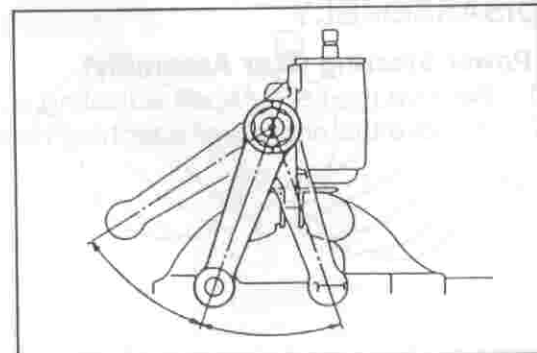
19. Pre-load adjustment of sector shaft

- (1) Install the pitman arm to the sector shaft, making sure that the mate marks on the pitman arm and sector shaft are lined up.
- (2) Temporarily install the pitman arm attaching nut with a new washer interposed.



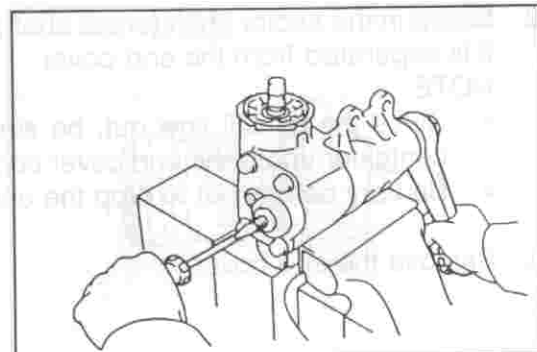
WRE91-SR302

- (3) Determine the rotating center of the sector shaft (the central position of gear's engagement).



WRE91-SR303

- (4) Tighten the sector shaft adjusting screw until the backlash becomes zero.



WRE91-SR304

- (5) While gradually tightening the adjusting screw, measure the preload (starting torque) and set it at the specified value.

SST: 09610-00010-000

Specified Preload (Starting torque):

0.69 - 1.0 N·m (0.07 - 0.1 kgf-m, 0.51 - 0.7 ft-lb)

NOTE:

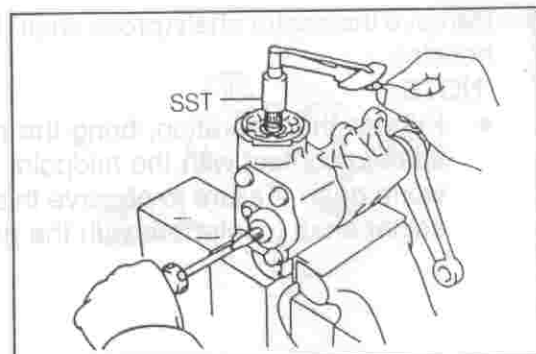
- Measurement should be performed at the central position of the gear's engagement.
- Perform the adjustment in the direction in which the adjusting screw is tightened.

- (6) Tighten the lock nut.

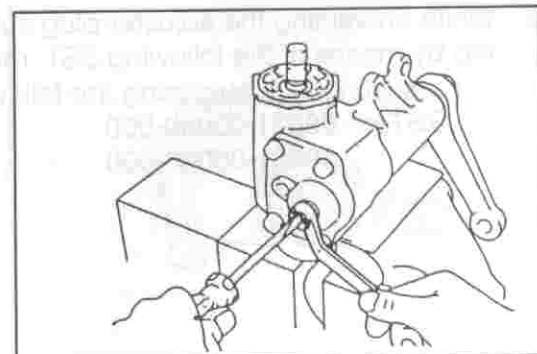
Tightening Torque: 19.6 - 34.3 N·m

(2.0 - 3.5 kgf-m, 14.5 - 25.3 ft-lb)

- (7) Measure the preload again and make sure that it is set within the specified value.



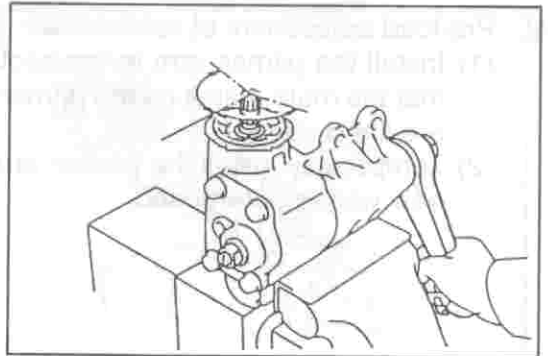
WRE91-SR305



WRE91-SR306

STEERING

- (8) Make sure that there is no backlash of the sector shaft in a range about 100 degrees to the right and left from the central position of the worm shaft.

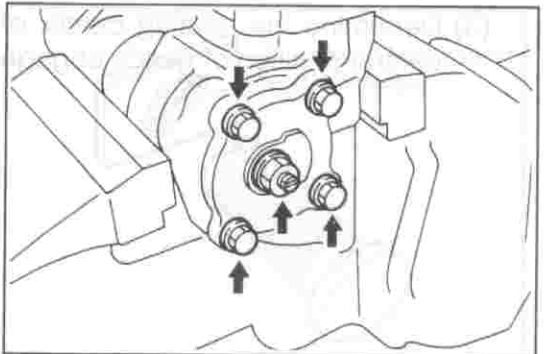


WRE91-SR307

DISASSEMBLY

(Power Steering Gear Assembly)

1. Remove the sector shaft adjusting screw set nut.
2. Remove the end cover attaching bolts.

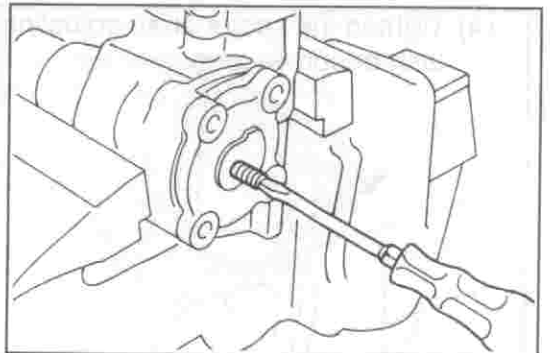


WRE91-SR308

3. Screw in the sector shaft (cross shaft) adjusting screw until it is separated from the end cover.

NOTE:

- Since the oil will flow out, be sure to place a suitable container under the end cover connecting section.
- Be very careful not to drop the end cover.

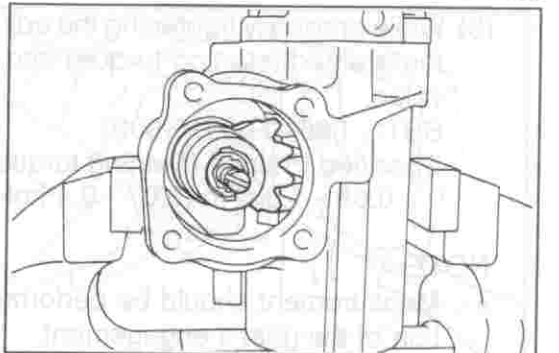


WRE91-SR309

5. Remove the sector shaft (cross shaft) from the steering gear housing.

NOTE:

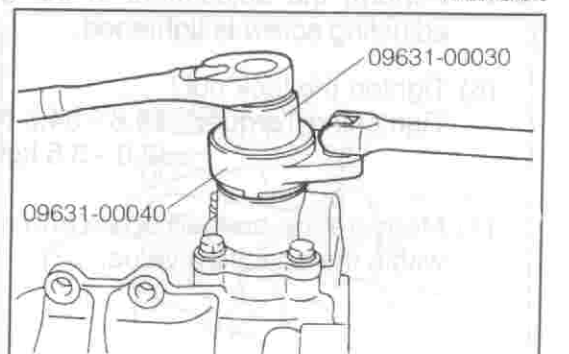
- Prior to this operation, bring the midpoint of the sector shaft in contact with the midpoint of the power steering worm gear. Failure to observe this caution will allow the sector shaft to interfere with the gear housing.



WRE91-SR310

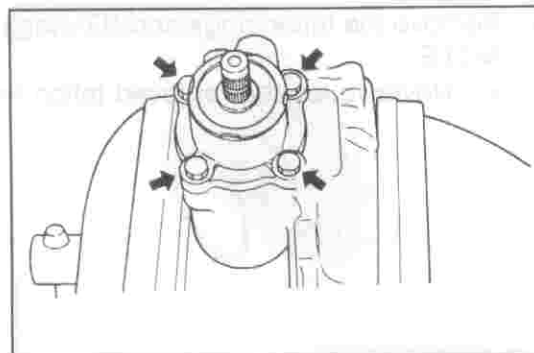
6. While preventing the adjuster plug subassembly from turning by means of the following SST, remove the worm bearing adjusting lock nut, using the following SST.

SSTs: 09631-00030-000
09631-00040-000



WRE91-SR311

7. Remove the valve housing attaching bolts by loosening them evenly.



WRE91-SR312

8. Remove the valve housing from the steering gear housing together with the power piston nut.



WRE91-SR313

9. Remove the ball guide clamp. Remove the ball guide.

NOTE:

- Utmost care must be exercised not to drop the balls.

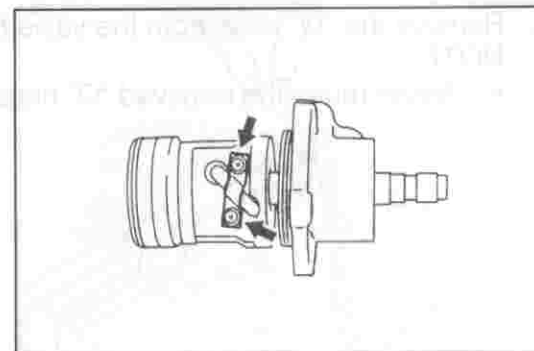
10. Remove the power piston nut from the worm shaft. Pull out the balls.

NOTE:

- Utmost care must be exercised not to drop the balls.

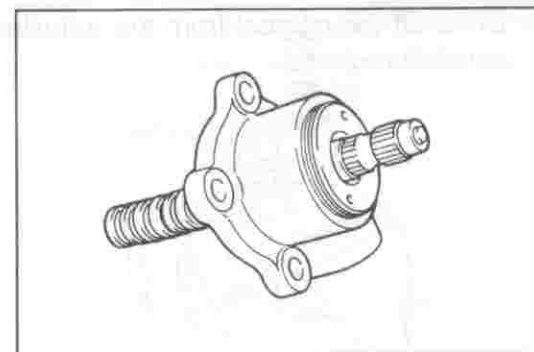
Reference:

- The number of balls is 44.



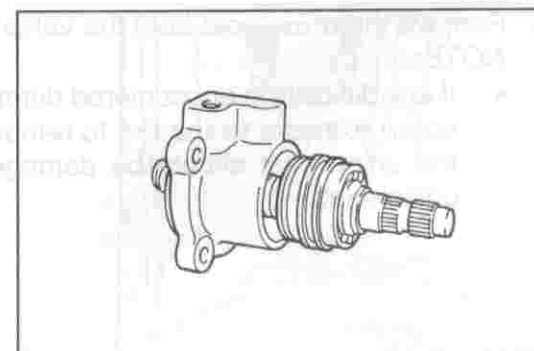
WRE91-SR314

11. Remove the adjuster plug from the valve housing.



WRE91-SR315

12. Remove the worm shaft from the valve housing.



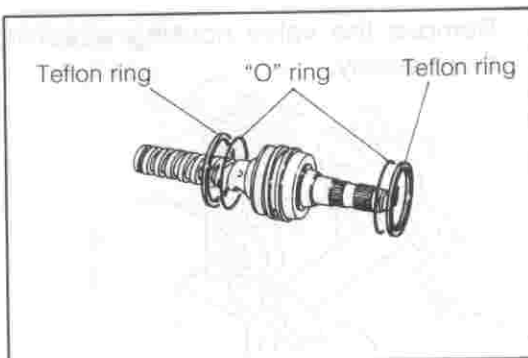
WRE91-SR316

STEERING

13. Remove the teflon rings and "O" rings from the worm shaft.

NOTE:

- Never reuse the removed teflon rings or "O" rings.

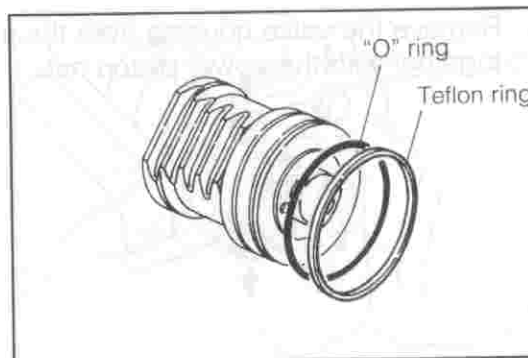


WRE91-SR317

14. Remove the teflon ring and "O" ring from the power piston nut.

NOTE:

- Never reuse the removed teflon ring or "O" ring.

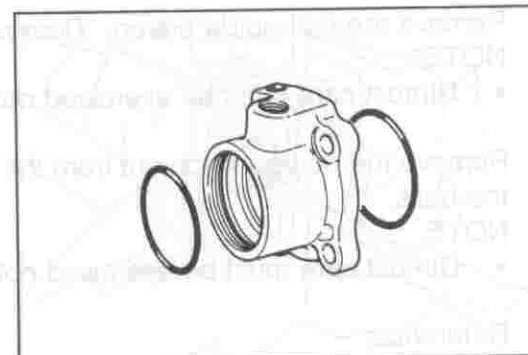


WRE91-SR318

15. Remove the "O" rings from the valve housing.

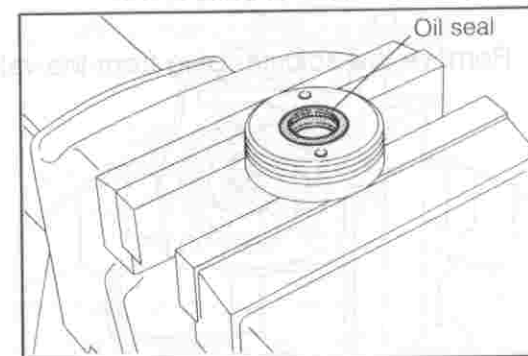
NOTE:

- Never reuse the removed "O" rings.



WRE91-SR319

16. Drive off the oil seal from the adjuster plug by applying a suitable rod.

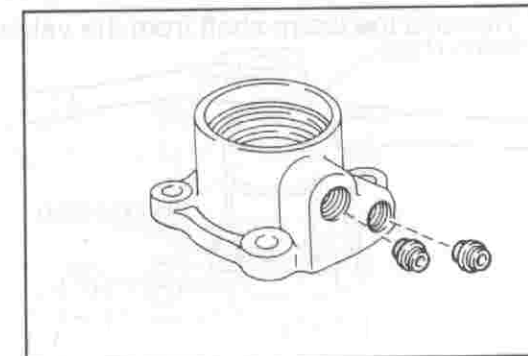


WRE91-SR320

17. Remove the union seat from the valve housing.

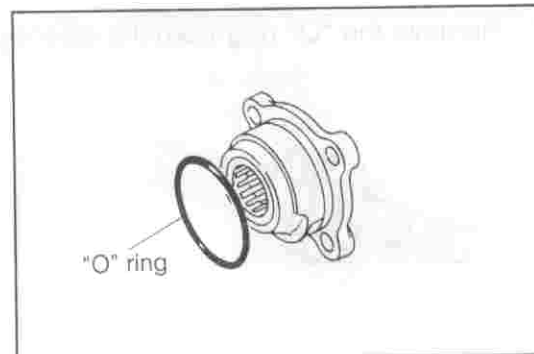
NOTE:

- If any difficulty is encountered during the removal, use a screw extractor or the like to remove the union seat. If the union seat should be damaged, never reuse the union seat.



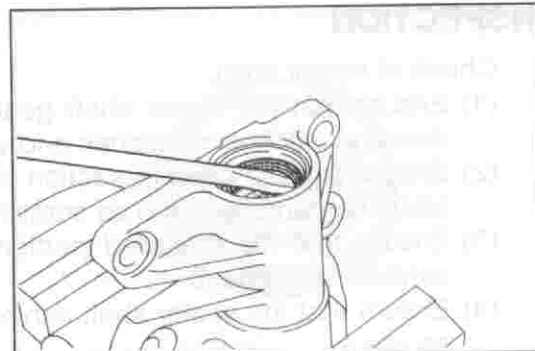
WRE91-SR321

18. Remove the oil seal from the sector shaft end cover.



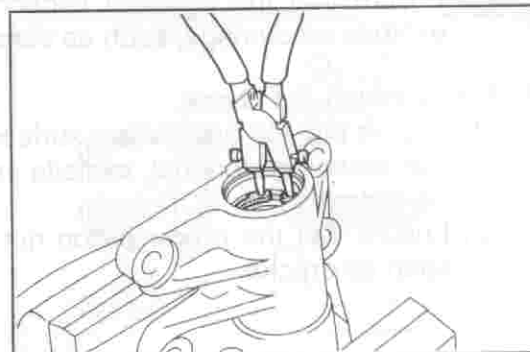
WRE91-SR322

19. Remove the oil seal from the steering gear housing by prying it with a screwdriver or the like.



WRE91-SR323

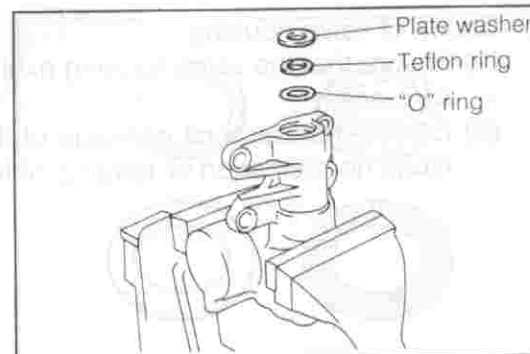
20. Remove the snap ring from the steering gear housing by means of snap ring pliers.



WRE91-SR324

21. Remove the washer plate from the steering gear housing.

22. Remove the "O" ring and teflon ring from the steering gear housing.



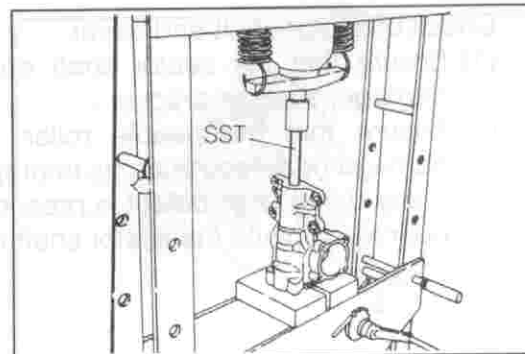
WRE91-SR325

23. Remove the needle roller bearing by pressing the following SST with a press.

SST: 09515-87201-000

NOTE:

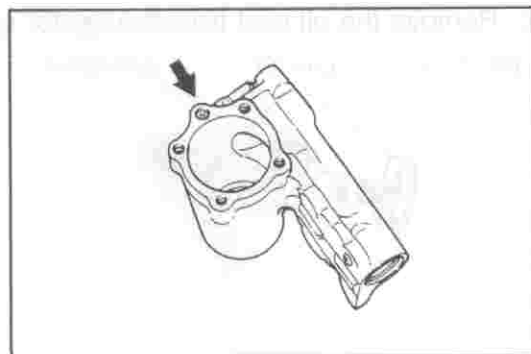
- Never reuse the removed needle roller bearing.



WRE91-SR326

STEERING

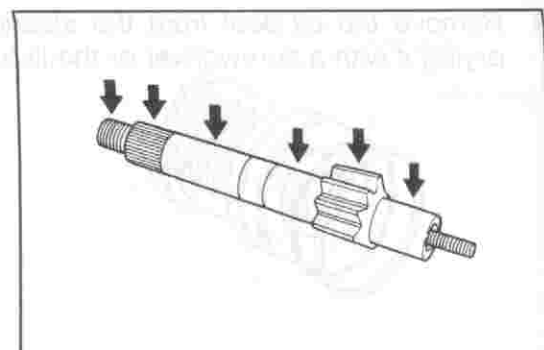
24. Remove the "O" ring from the steering gear housing.



WRE91-SR327

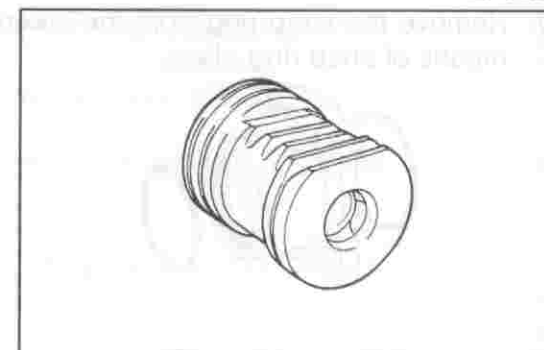
INSPECTION

1. Check of sector shaft
 - (1) Ensure that the sector shaft gear section exhibits no damage, such as scratches and wear.
 - (2) Ensure that the bearing section of the sector shaft exhibits no damage, such as scratches and wear.
 - (3) Ensure that the threaded portion of the sector shaft exhibits no damage.
 - (4) Ensure that the sector shaft exhibits no damage, such as cracks.
 - (5) Ensure that the serration section of the sector shaft exhibits no damage, such as scratches and wear.



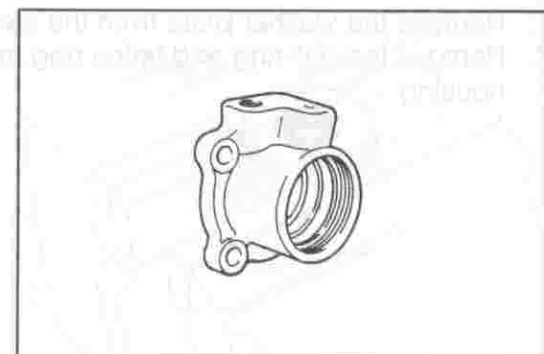
WRE91-SR328

2. Power piston nut check
 - (1) Ensure that the ball contact surface and gear section of the power piston nut exhibits no damage such as scratches.
 - (2) Ensure that the power piston nut exhibits no damage such as cracks.



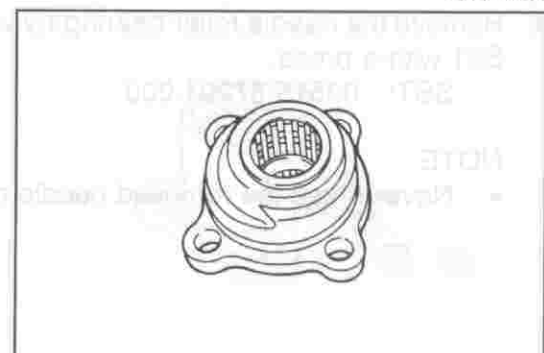
WRE91-SR329

3. Check of valve housing
 - (1) Ensure that the valve housing exhibits no damage such as cracks.
 - (2) Ensure that each oil passage of the valve housing exhibits no restriction or lodging of foreign matters.



WRE91-SR330

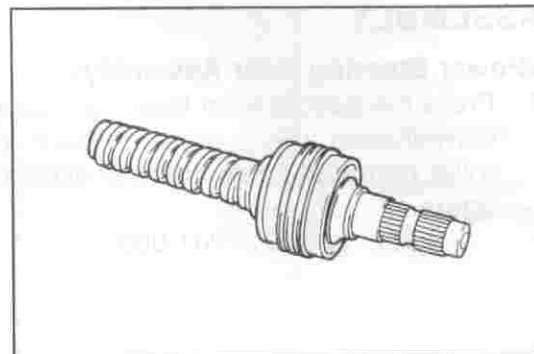
4. Check of sector shaft end cover
 - (1) Ensure that the sector shaft end cover exhibits no damage, such as cracks.
 - (2) Ensure that the needle roller bearing exhibits no damage or defect, such as improper sliding. If any damage or defect is present at the needle roller bearing, replace the sector shaft end cover.



WRE91-SR331

5. Check of worm shaft subassembly

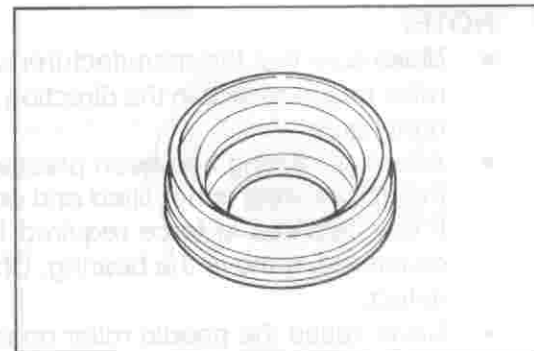
- (1) Ensure that the worm shaft subassembly exhibits no damage, such as cracks and rust formation.
- (2) Ensure that the flap valve section of the worm shaft subassembly exhibits no lodging of foreign matters or restriction of oil passage.
- (3) Ensure that the ball contact surface exhibits no roughness.



WRE91-SR332

6. Inspection of adjuster plug subassembly

- (1) Ensure that the adjuster plug subassembly exhibits no damage, such as cracks. Also, ensure that the threaded portion exhibits no damage.
- (2) Ensure that the outer race of the bearing exhibits no damage.
If the outer race exhibits damage, replace the adjuster plug subassembly.



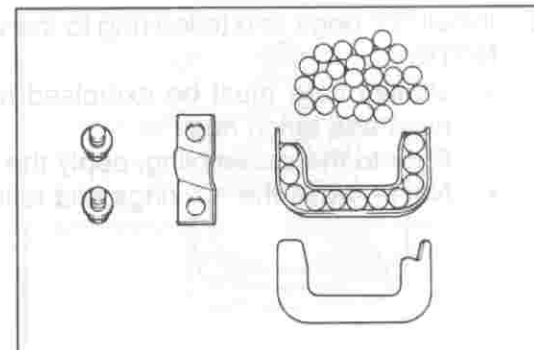
WRE91-SR333

7. Inspection of ball guide clamp, ball guide and ball

- (1) Ensure that the ball guide clamp and ball guide exhibit no damage, such as deformation.
- (2) Ensure that the balls exhibit no damage, such as scratches.

NOTE:

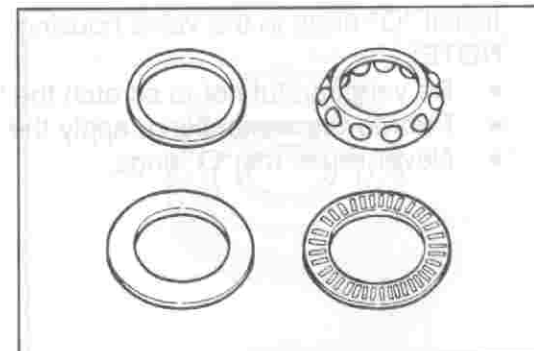
- The number of the balls should be 44.



WRE91-SR334

8. Inspection of washer plate, thrust plate, needle roller thrust bearing and ball bearing

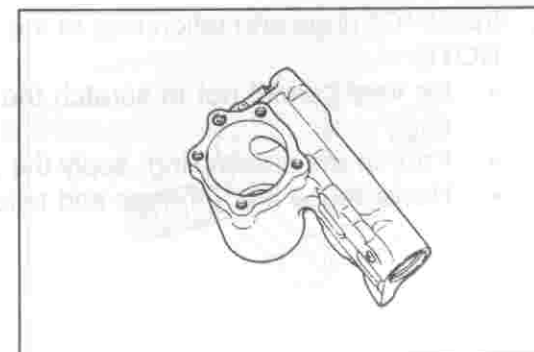
Ensure that each part exhibits no damage, such as deformation and scratches.



WRE91-SR335

9. Inspection of steering gear housing

- (1) Ensure that the steering gear housing exhibits no damage, such as cracks and deformation.
- (2) Ensure that the oil passage exhibits no restriction or lodging of foreign matters.



WRE91-SR336

STEERING

ASSEMBLY

<Power Steering Gear Assembly>

1. Press the needle roller bearings, using the following SST in combination with a press, in such a way that the needle roller bearings come at the positions indicated in the right figure.

SST: 09515-87201-000

NOTE:

- Make sure that the manufacturer's names of the needle roller bearings face in the direction indicated in the upper right figure.
- After the bearing has been pressed slightly, make sure that the bearing is not tilted and continue the operation. If any increase in force required for press-fitting is encountered, remove the bearing. Check each part for any defect.
- Never reuse the needle roller bearings.

2. Install "O" rings and teflon ring to the worm shaft assembly.

NOTE:

- Utmost care must be exercised not to scratch the "O" rings and teflon ring.
- Prior to the assembling, apply the ATF DEXRON® II.
- Never reuse the "O" rings and teflon ring.

3. Install "O" rings to the valve housing.

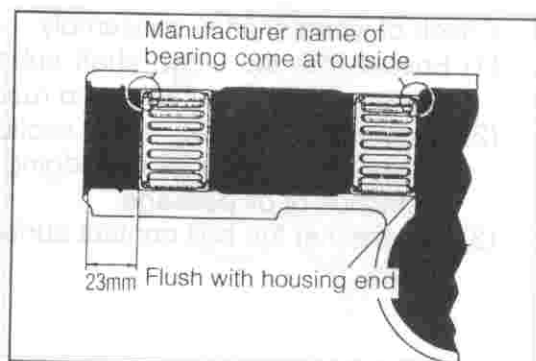
NOTE:

- Be very careful not to scratch the "O" rings.
- Prior to the assembling, apply the ATF DEXRON® II.
- Never reuse the "O" rings.

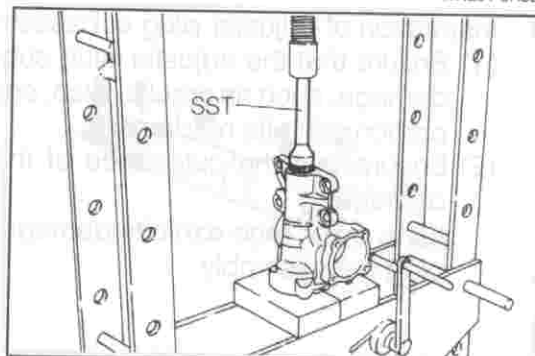
4. Install "O" rings and teflon ring to the power piston nut.

NOTE:

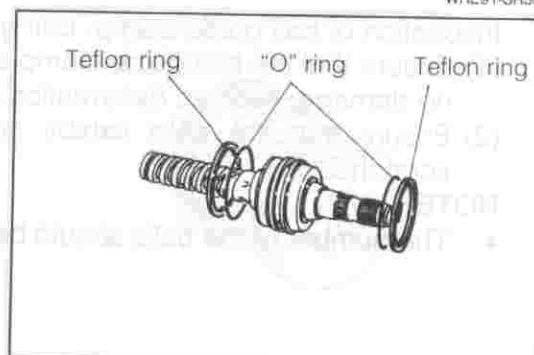
- Be very careful not to scratch the "O" rings and teflon ring.
- Prior to the assembling, apply the ATF DEXRON® II.
- Never reuse the "O" rings and teflon ring.



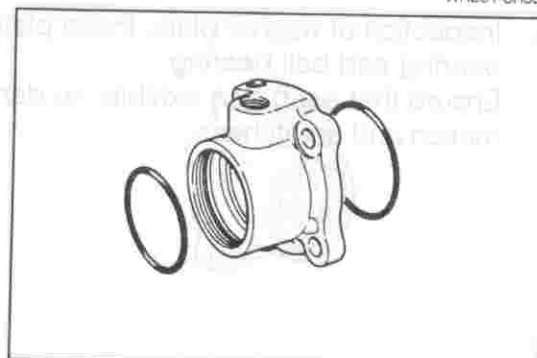
WRE91-SR337



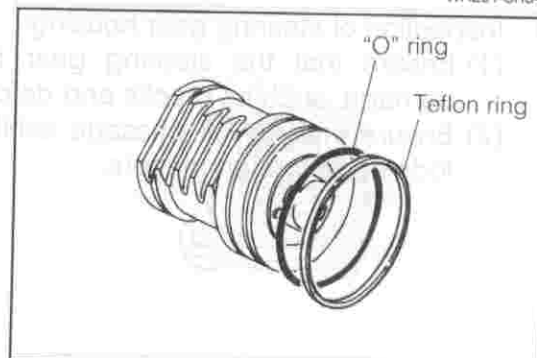
WRE91-SR338



WRE91-SR339



WRE91-SR340

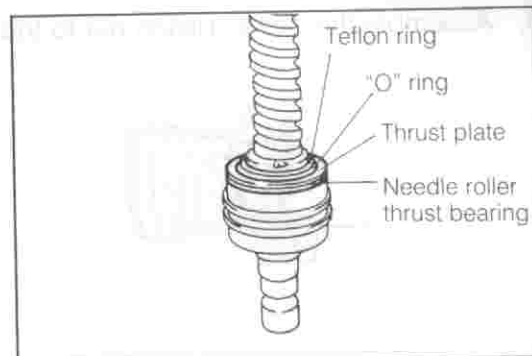


WRE91-SR341

5. Install the needle roller thrust bearing, thrust plate, teflon ring and "O" ring to the worm shaft assembly in this sequence.

NOTE:

- Apply the ATF DEXRON® II to the parts to be installed.
- The "O" ring should be installed by putting it over the teflon ring.
- Never reuse the "O" ring and teflon ring.

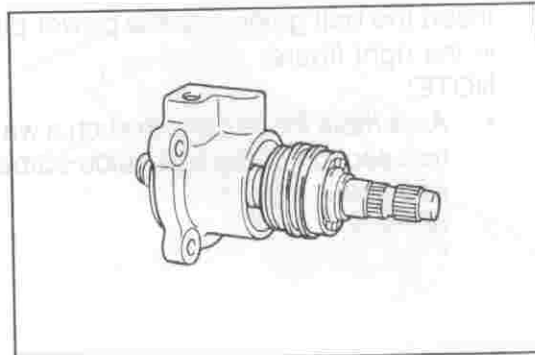


WRE91-SR342

6. Install the valve housing to the worm shaft assembly.

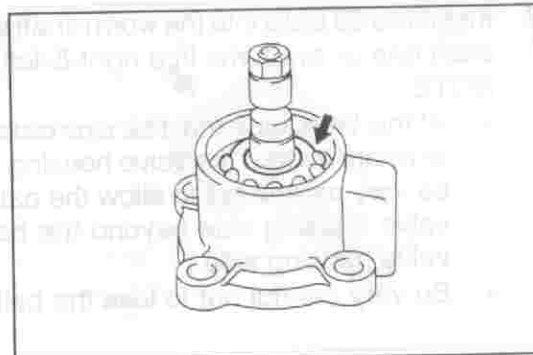
NOTE:

- Care must be exercised not to damage the "O" rings and teflon ring.



WRE91-SR343

7. Install the roller bearing to the worm shaft.

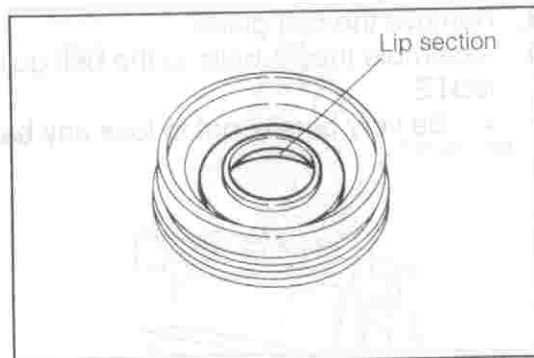


WRE91-SR344

8. Press the oil seal to the adjuster plug with a suitable rod applied.

NOTE:

- Apply the ATF DEXRON® II to the lip section of the oil seal in advance.

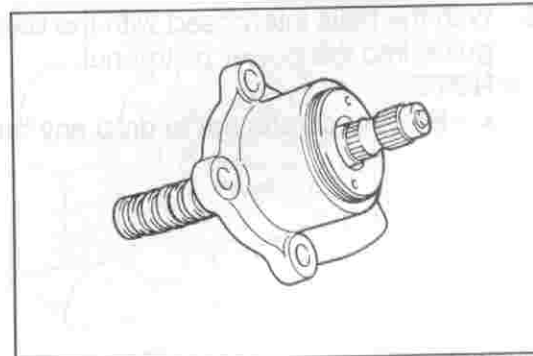


WRE91-SR345

9. Tighten the adjuster plug, by your hand or using the following SST, until the axial play of the worm shaft is eliminated.

NOTE:

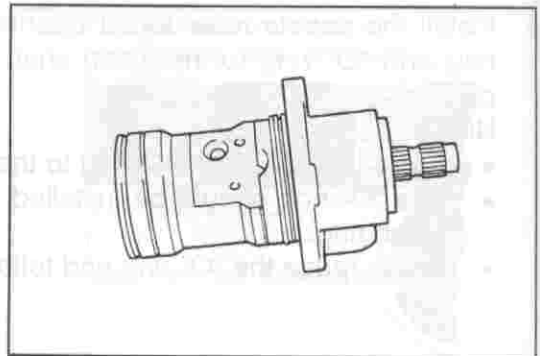
- Make sure that the worm shaft turns lightly by your hand.



WRE91-SR346

STEERING

10. Assemble the power piston nut to the worm shaft.

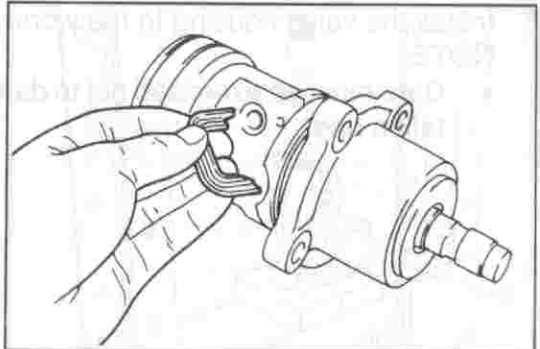


WRE91-SR347

11. Insert the ball guide into the power piston nut, as indicated in the right figure.

NOTE:

- Assemble these parts in such a way that the turn prevention section of the ball guide comes at the power piston end side.

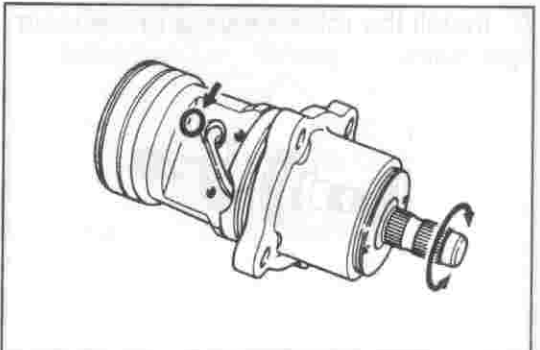


WRE91-SR348

12. Insert the 33 balls into the worm shaft while turning the worm shaft one or two turns in a right-&-left direction.

NOTE:

- At this time, care must be exercised not to allow the balls to rotate toward the valve housing side. (In other words, be very careful not to allow the balls to travel toward the valve housing side beyond the ball hole section at the valve housing side.)
- Be very careful not to lose the balls.



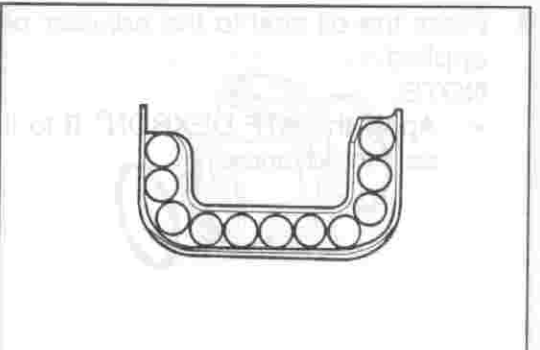
WRE91-SR349

13. Remove the ball guide.

14. Assemble the 11 balls to the ball guide.

NOTE:

- Be very careful not to lose any ball.

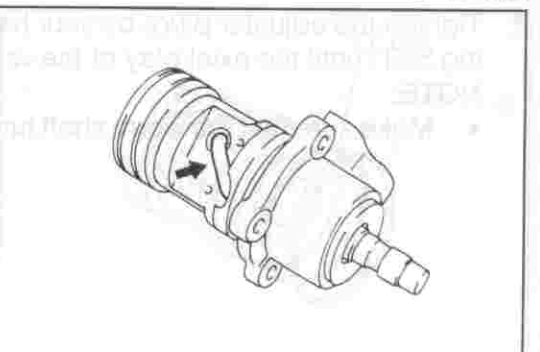


WRE91-SR350

15. With the balls interposed with the ball guide, insert the ball guide into the power piston nut.

NOTE:

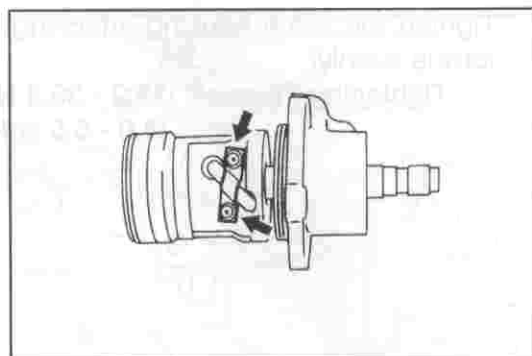
- Be very careful not to drop any ball.



WRE91-SR351

16. Install the ball guide clamp and tighten the attaching screws.

Tightening Torque: 2.0 - 3.9 N·m
(0.2 - 0.4 kgf-m, 1.4 - 2.9 ft-lb)

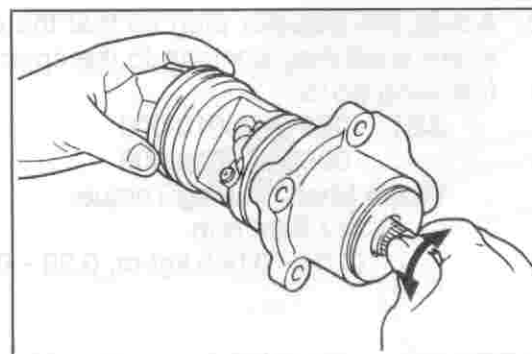


WRE91-SR352

17. Ensure that the power piston nut turns smoothly without any binding.

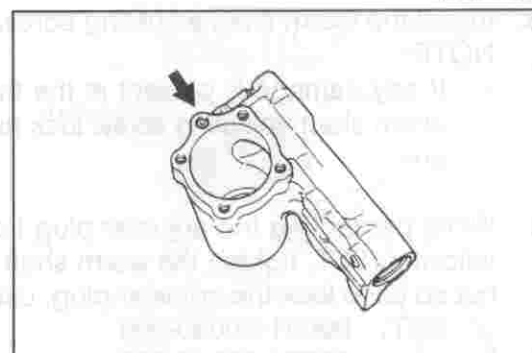
NOTE:

- Do not pull out the piston nut from the worm shaft excessively. Failure to observe this caution may cause the balls to enter the inside of the piston nut.



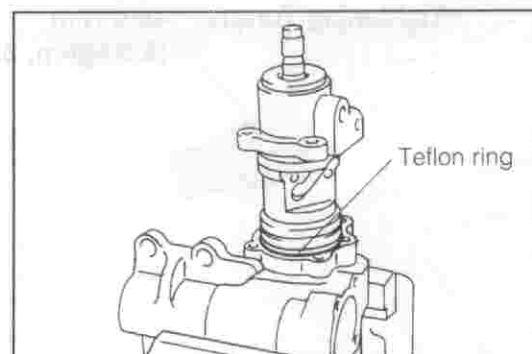
WRE91-SR353

18. Install the "O" ring to the steering gear housing.



WRE91-SR354

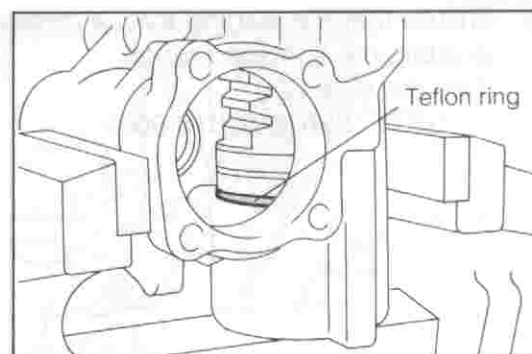
19. Apply the ATF DEXRON® II to the teflon ring of the power piston nut as well as to the inner surface of the steering gear housing.
20. Assemble the power piston nut to the steering gear housing with the gear tooth surface of the power piston nut faced toward the worm shaft side.



WRE91-SR355

NOTE:

- Be very careful not to damage the teflon ring when inserting the power piston nut into the steering gear housing and when the power piston nut enters the cylinder.

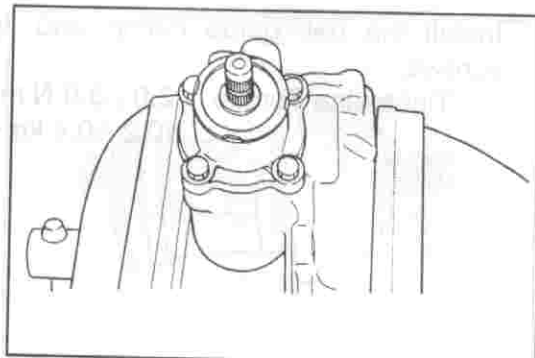


WRE91-SR356

STEERING

21. Tighten the valve housing attaching nuts to the specified torque evenly.

Tightening Torque: 39.2 - 39.8 N·m
(4.0 - 5.5 kgf-m, 28.9 - 53.9 ft-lb)



WRE91-SR357

22. Adjust the adjuster plug so that the starting torque of the worm shaft may conform to the specified value, using the following SSTs.

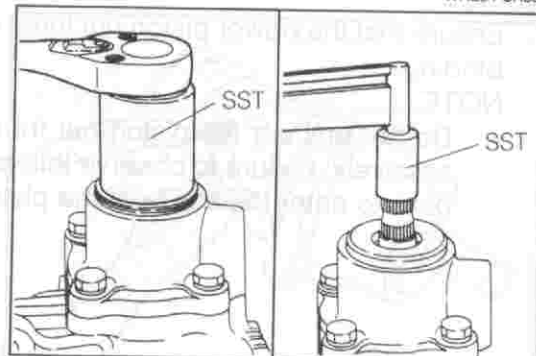
SST: 09616-00010-000

09631-00030-000

Worm Shaft Starting Torque:

0.39 - 0.64 N·m

(0.04 - 0.065 kgf-m, 0.29 - 0.47 ft-lb)



WRE91-SR358

23. Install the worm shaft adjusting screw lock nut.

NOTE:

- If any damage is present at the threaded portion of the worm shaft adjusting screw lock nut, replace it with new one.

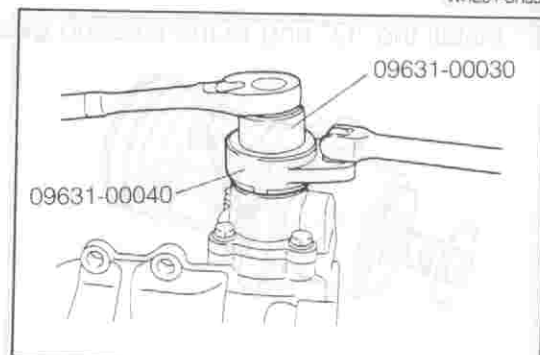
24. While preventing the adjuster plug from turning, using the following SST, tighten the worm shaft adjusting screw lock nut so as to lock the adjuster plug, using the following SST.

SST: 09631-00030-000

09631-00040-000

Tightening Torque: 49.0 N·m

(5.0 kgf-m, 36.2 ft-lb)

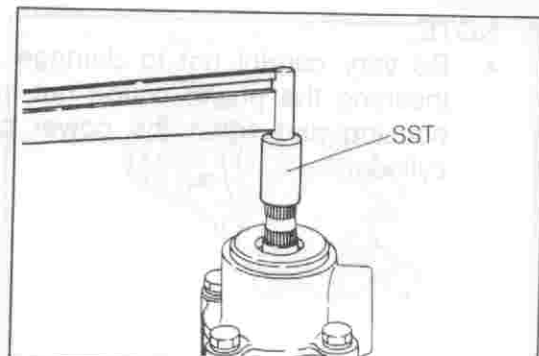


WRE91-SR359

25. Ensure that the starting torque (preload) of the worm shaft is within the specified range.

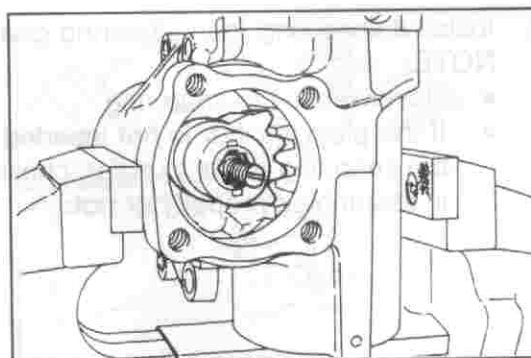
(See the step 22.)

SST: 09616-00010-000



WRE91-SR360

26. Set the power piston nut so that the midpoint of the sector shaft (cross shaft) may engage with the midpoint of the power piston nut gear section. Insert the sector shaft into the steering gear housing.

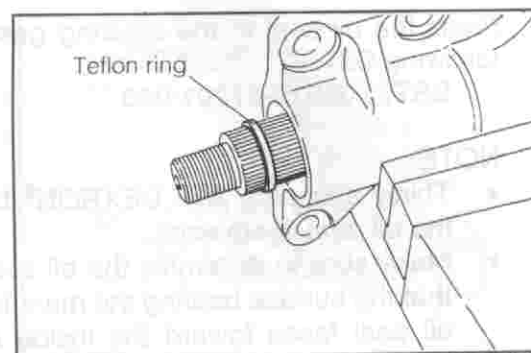


WRE91-SR361

27. Install a teflon ring to the sector shaft.

NOTE:

- Apply the ATF DEXRON® II to the teflon ring in advance.
- Never reuse the teflon ring.
- Be very careful not to scratch the teflon ring.

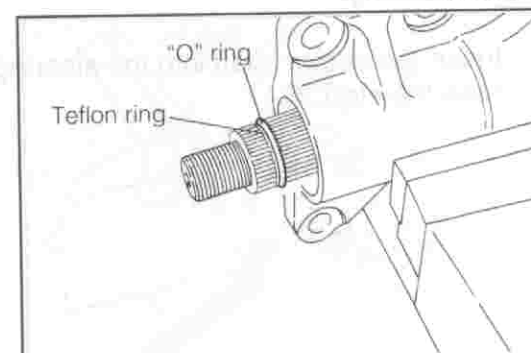


WRE91-SR362

28. Install an "O" ring on the teflon ring which has been installed to the sector shaft.

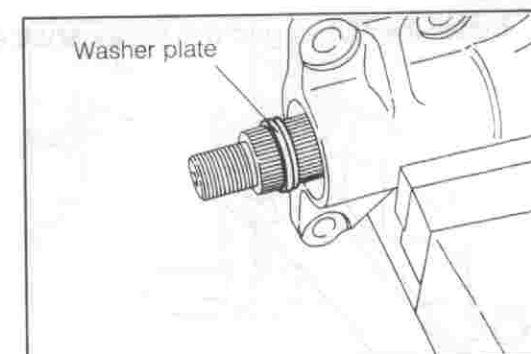
NOTE:

- Apply the ATF DEXRON® II to the "O" ring in advance.
- Be very careful not to scratch the "O" ring.
- Never reuse the "O" ring.



WRE91-SR363

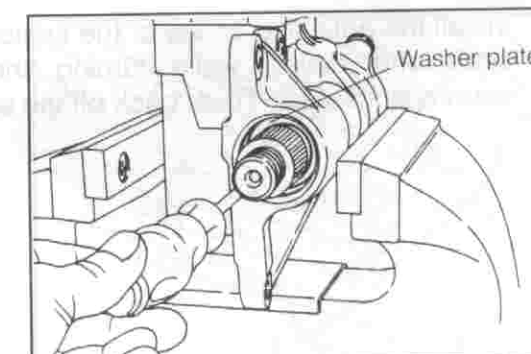
29. Install the plate washer to the sector shaft.



WRE91-SR364

30. Evenly insert the plate washer into the steering gear housing with a suitable rod or the like.

31. Pull out the sector shaft.



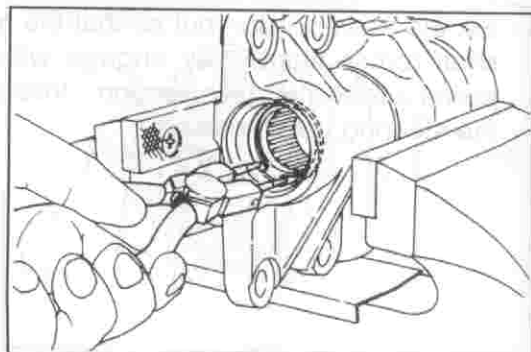
WRE91-SR365

STEERING

32. Install a snap ring to the steering gear housing.

NOTE:

- Never reuse the snap ring.
- If the plate washer is not inserted into the place where the snap ring ought to enter, check to see if the "O" ring is assembled properly or not.



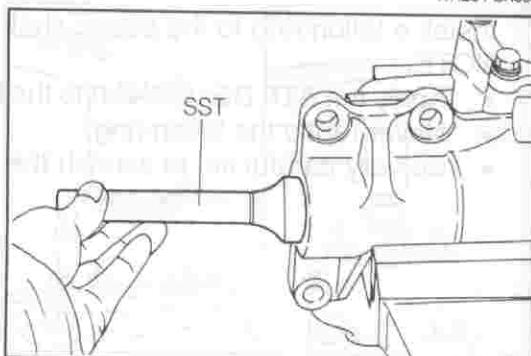
WRE91-SR366

33. Press the oil seal to the steering gear housing, using the following SST.

SST: 09515-87201-000

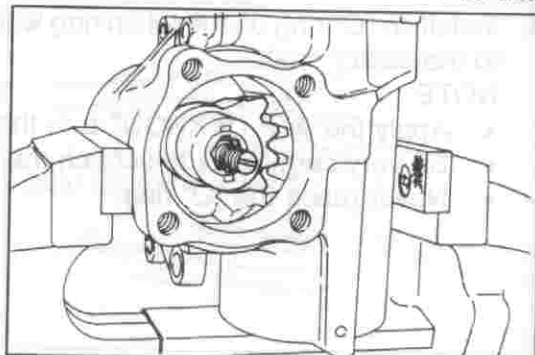
NOTE:

- Thinly apply the ATF DEXRON® II to the lip surface of the oil seal in advance.
- Make sure to assemble the oil seal in such a way that the surface bearing the manufacturer's name of the oil seal faces toward the inside of the steering gear housing.



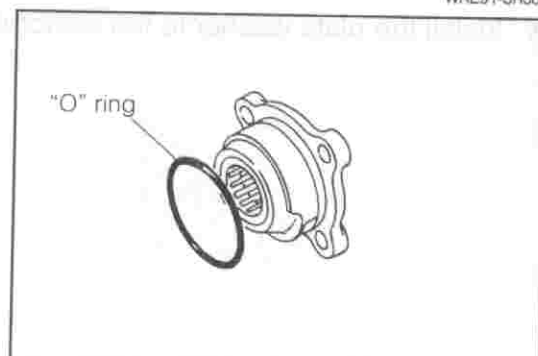
WRE91-SR367

34. Insert the sector shaft into the steering gear housing.
(See the step 26.)



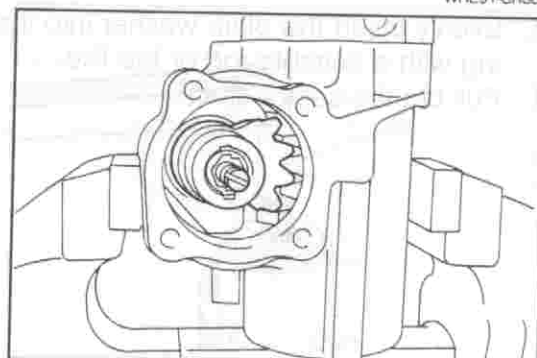
WRE91-SR368

35. Install the "O" ring to the sector shaft end cover.



WRE91-SR369

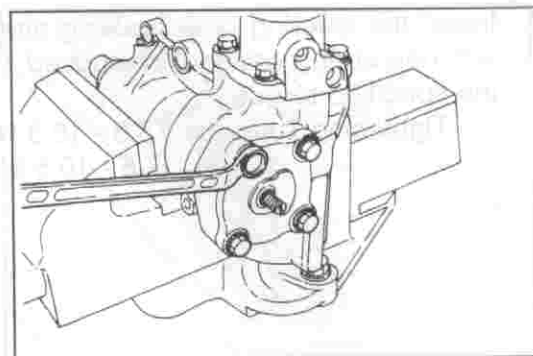
36. Install the adjusting screw of the sector shaft to the sector shaft end cover, while turning the adjusting screw counterclockwise. Thus, back off the adjusting screw fully.



WRE91-SR370

37. Tighten the end cover attaching screws evenly over two or three stages to the specified torque.

Tightening Torque: 44.1 - 53.9 N·m
(4.5 - 5.5 kgf-m, 32.5 - 39.8 ft-lb)

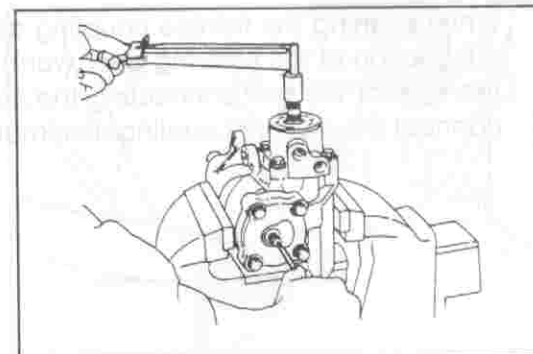


WRE91-SR371

38. While screwing in the adjusting screw of the sector shaft, adjust the starting torque of the worm shaft to the specified value.

SST: 09616-00010-000

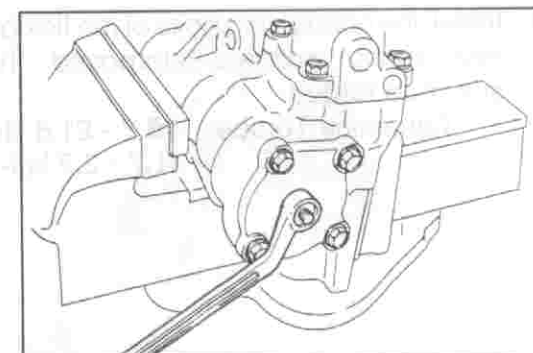
Starting Torque (Preload):
0.59 - 0.93 N·m
(0.06 - 0.095 kgf-m, 0.43 - 0.69 ft-lb)



WRE91-SR372

39. Install the adjusting screw lock nut with a new gasket interposed. Tighten the adjusting screw lock nut to the specified torque while preventing the adjusting screw from turning.

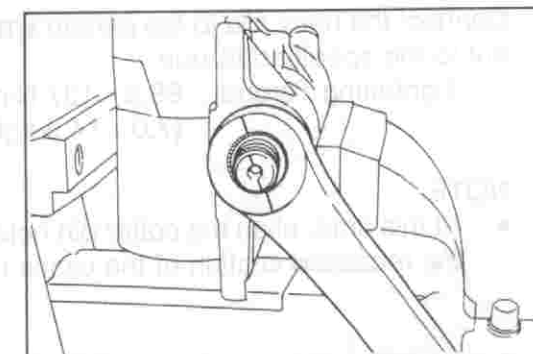
Tightening Torque: 19.6 - 34.3 N·m
(2.0 - 3.5 kgf-m, 14.5 - 25.3 ft-lb)



WRE91-SR373

40. Ensure that the preload conforms to the specified value.
(See the step 38.)

41. Assemble the pitman arm to the sector shaft with the respective mating marks aligned with each other, as indicated in the right figure. Temporarily tighten the attaching nuts with new spring washers interposed.



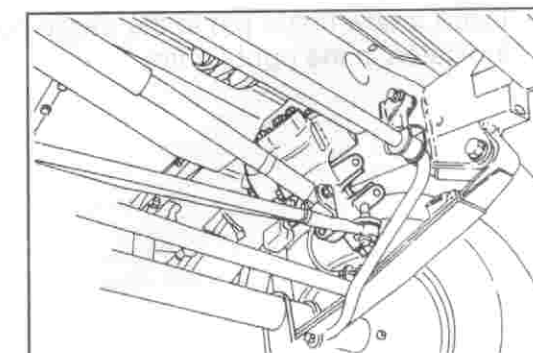
WRE91-SR374

INSTALLATION

1. Install the steering gear housing to the vehicle.

NOTE:

- Be very careful not to allow the steering gear housing to strongly interfere with the other parts.

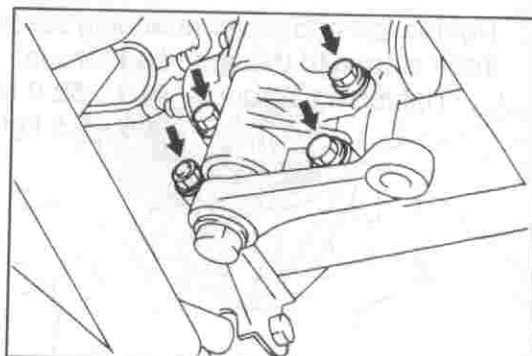


WRE91-SR375

STEERING

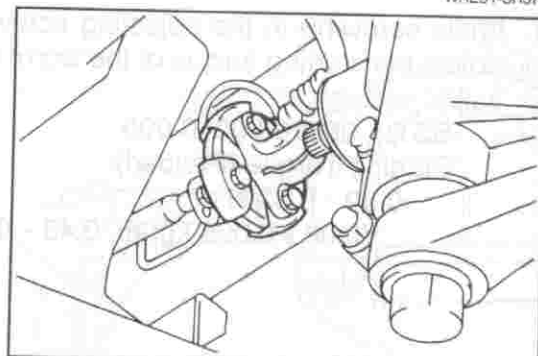
2. Install the steering gear housing attaching nuts and bolts with new spring washers interposed. Evenly tighten them to the specified torque.

Tightening Torque: 73.5 - 10.3 N-m
(7.5 - 10.5 kgf-m, 54.2 - 75.9 ft-lb)



WRE91-SR376

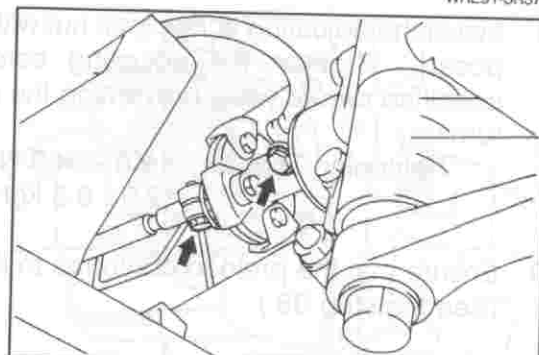
3. While aligning the flexible coupling assembly with the cut-out section of the steering gear worm shaft as well as with the hole of the bolt connecting the flexible coupling yoke, connect the flexible coupling assembly.



WRE91-SR377

4. Install the connecting bolts of the flexible coupling yoke with new spring washers interposed. Tighten them to the specified torque.

Tightening Torque: 16.7 - 21.6 N-m
(1.7 - 2.2 kgf-m, 12.3 - 15.9 ft-lb)



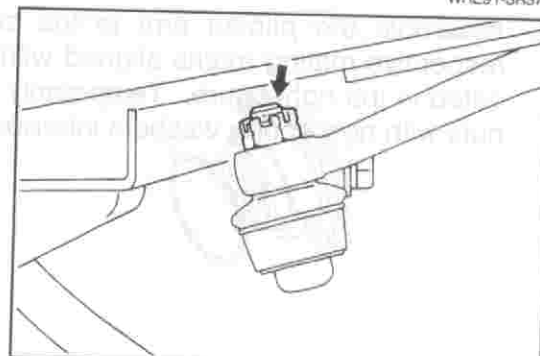
WRE91-SR378

5. Connect the relay rod to the pitman arm. Tighten the castle nut to the specified torque.

Tightening Torque: 68.6 - 137 N-m
(7.0 - 14.0 kgf-m, 50.6 - 101 ft-lb)

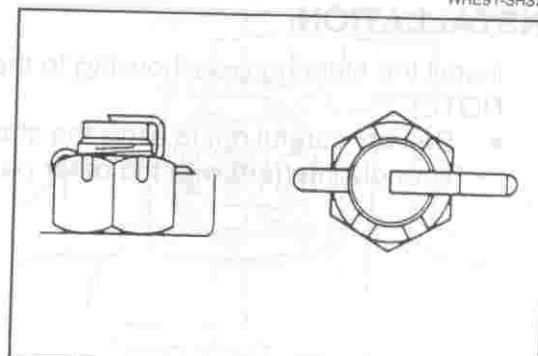
NOTE:

- At this time, align the cotter pin hole of the ball joint with the recessed section of the castle nut.



WRE91-SR379

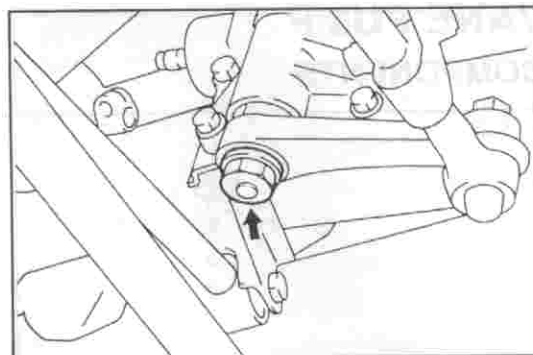
6. Install a new cotter pin to the castle nut. Bend the legs as indicated in the right figure.



WRE91-SR380

7. Tighten the pitman arm attaching nut to the specified torque.

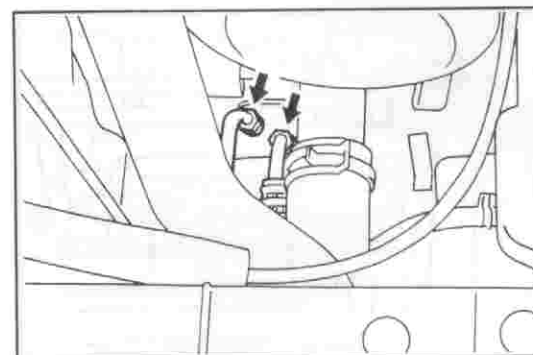
Tightening Torque: 147 - 196 N·m
(15 - 20 kgf-m, 109 - 145 ft-lb.)



WRE91-SR381

8. Connect the power steering pressure feed tubes to the power steering gear housing.
(Power steering-equipped vehicle only)

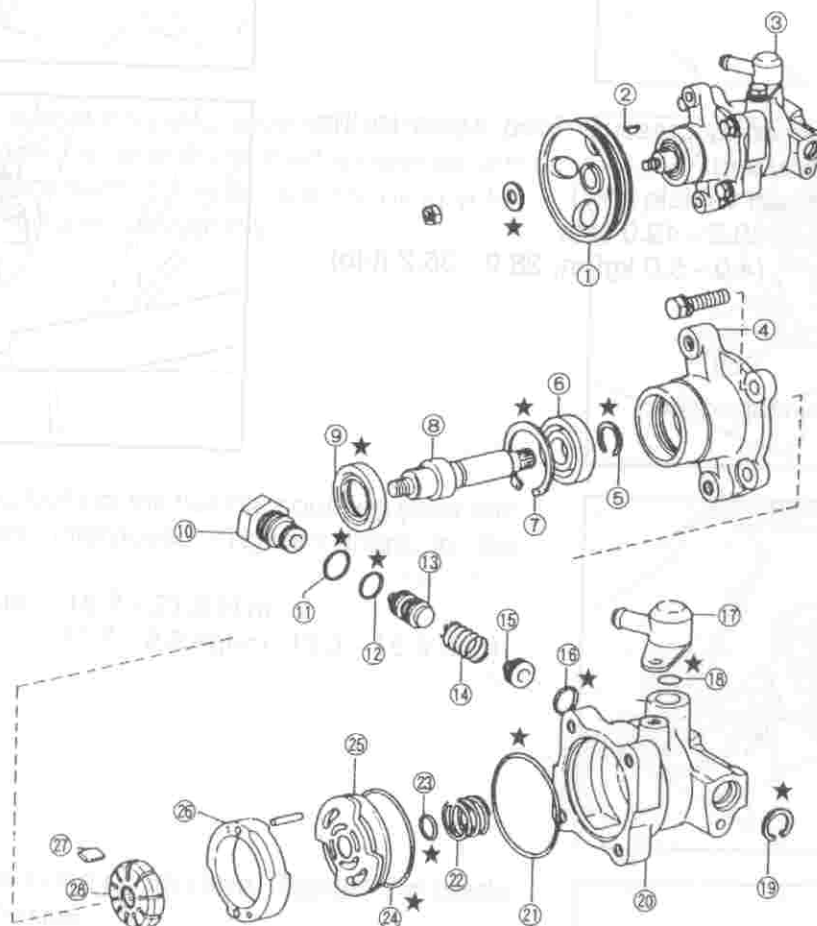
Tightening Torque: 39.2 - 49.0 N·m
(4.0 - 5.0 kgf-m, 28.9 - 36.2 ft-lb)



WRE91-SR473

9. Fill power steering fluid.
(See page SR-17.)
10. Perform the in-vehicle inspection.
(See page SR-15.)

VANE PUMP COMPONENTS



★ : Non-reusable parts

- ① Pulley
- ② Key
- ③ Vane pump assembly
- ④ Pump front housing subassembly
- ⑤ Shaft snap ring
- ⑥ Radial ball bearing
- ⑦ Hole snap ring
- ⑧ Vane pump shaft
- ⑨ Type "T" oil seal
- ⑩ Pressure port union subassembly
- ⑪ "O" ring
- ⑫ "O" ring
- ⑬ Flow control valve assembly
- ⑭ Compression spring

- ⑮ Flow control spring seat
- ⑯ "O" ring
- ⑰ Suction port union
- ⑱ "O" ring
- ⑲ Hole snap ring
- ⑳ Pump rear housing
- ㉑ "O" ring
- ㉒ Compression spring
- ㉓ "O" ring
- ㉔ "O" ring
- ㉕ Side front plate
- ㉖ Cam ring
- ㉗ Vane plate
- ㉘ Vane pump rotor

REMOVAL

1. Drain the power steering fluid.
(See page SR-17.)

2. Remove the engine undercover.

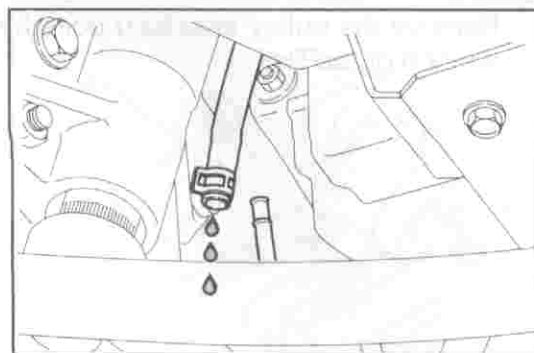
3. Loosen the vane pump attaching bolts.
4. Remove the vane pump drive belt.

5. Disconnect the pressure feed tubes and reservoir-to-pump hose from the vane pump.

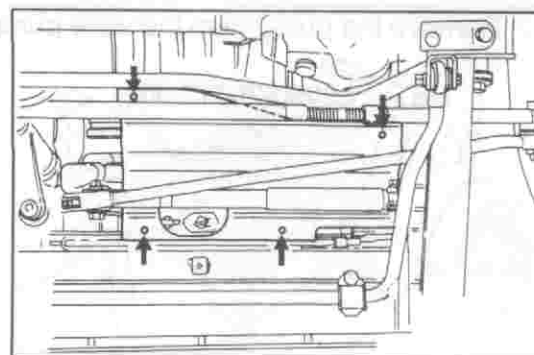
NOTE

- Check the fluid level in the reservoir before disconnecting the reservoir-to-pump hose.
- Do not allow the fluid to spill on the engine or other components.

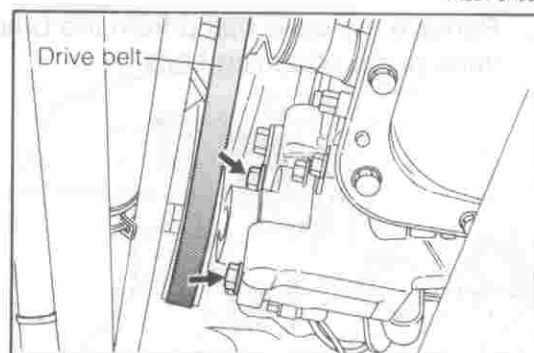
6. Remove the vane pump bracket together with the vane pump by removing the vane pump bracket attaching bolts.



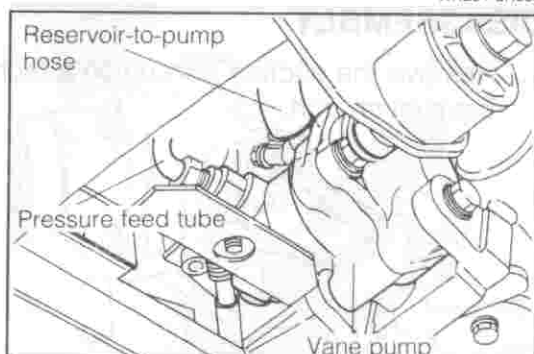
WRE91-SR383



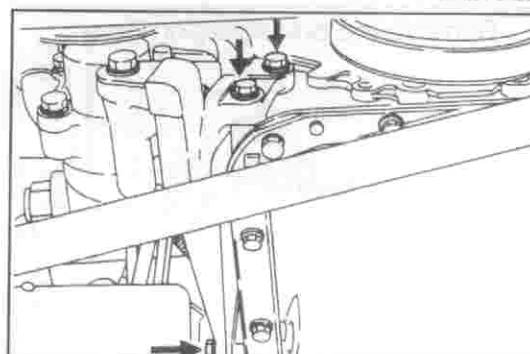
WRE91-SR384



WRE91-SR385



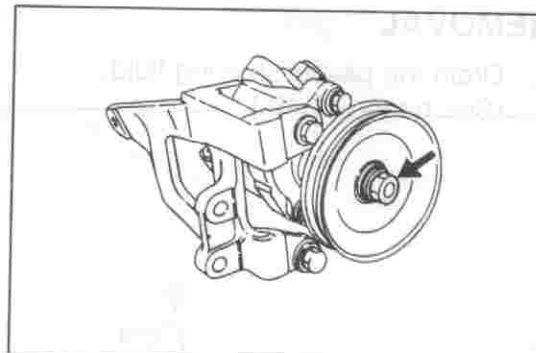
WRE91-SR386



WRE91-SR387

STEERING

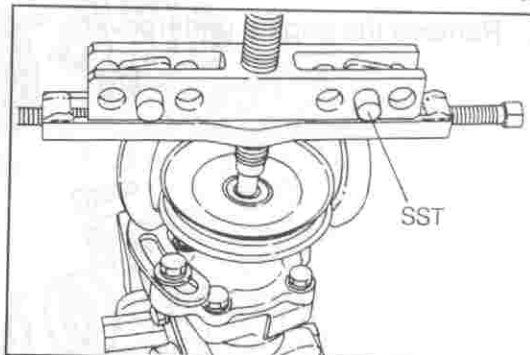
7. Remove the pulley attaching bolts by means of an impact wrench or the like.



WRE91-SR388

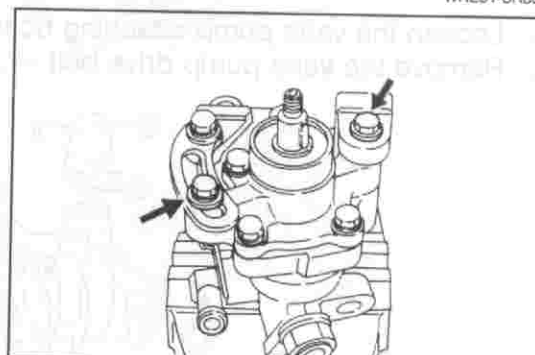
8. Remove the pulley from the vane pump, using the following SST.

SST: 09950-20017-000



WRE91-SR389

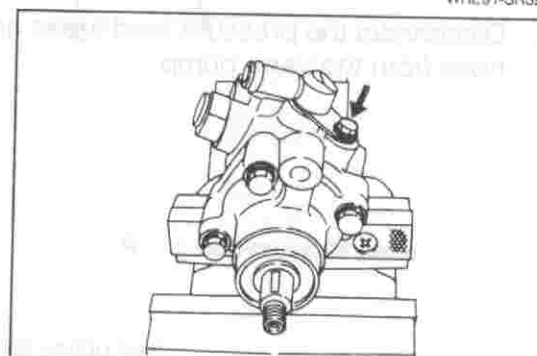
9. Remove the vane pump from the bracket by removing the vane pump attaching bolts.



WRE91-SR390

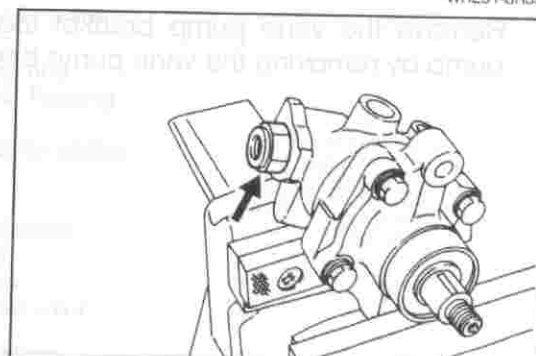
DISASSEMBLY

1. Remove the suction port union attaching bolt and remove the suction port.



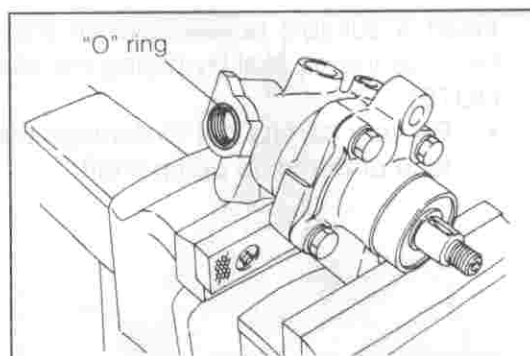
WRE91-SR391

2. Remove the pressure port union.



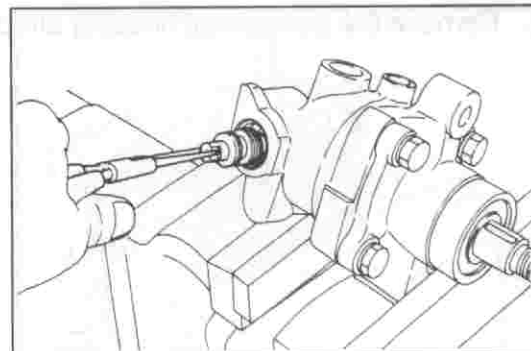
WRE91-SR392

3. Remove the "O" ring from the pump housing.



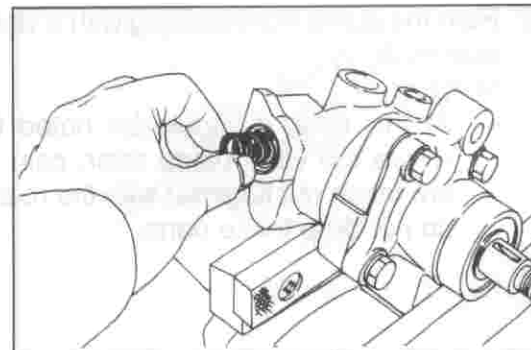
WRE91-SR393

4. Remove the flow control valve from the pump housing.



WRE91-SR394

5. Remove the compression spring from the pump housing.

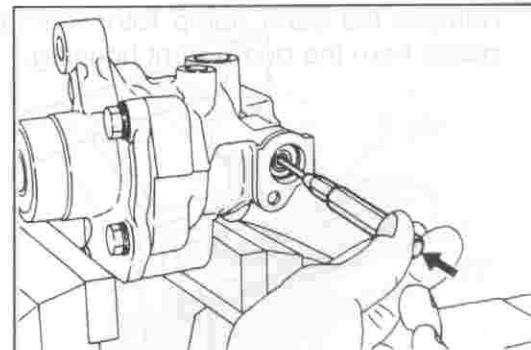


WRE91-SR395

6. Remove the flow control spring seat from the pump housing by pushing the seat with a suitable rod.

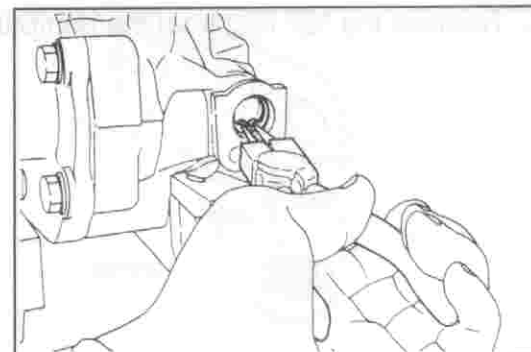
NOTE:

- Care must be exercised not to tilt the flow control spring seat at the inside of the attaching hole.
- Be very careful not to scratch the cylinder inner surface.



WRE91-SR396

7. Detach the snap ring, using snap ring pliers.



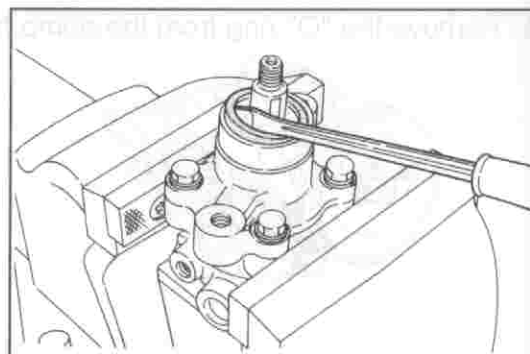
WRE91-SR397

STEERING

8. Insert a suitable screwdriver or the like into the oil seal. Remove the oil seal by prying the oil seal.

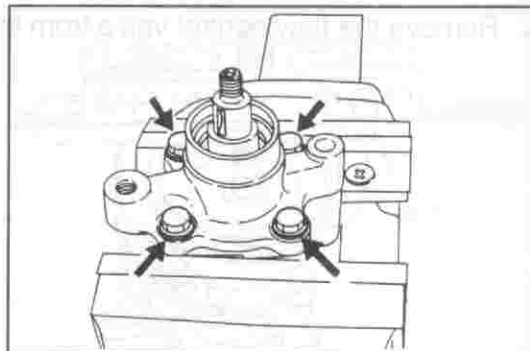
NOTE:

- Be very careful not to damage the oil seal contact surface of the vane pump shaft.



WRE91-SR398

9. Remove the pump front housing attaching bolts.

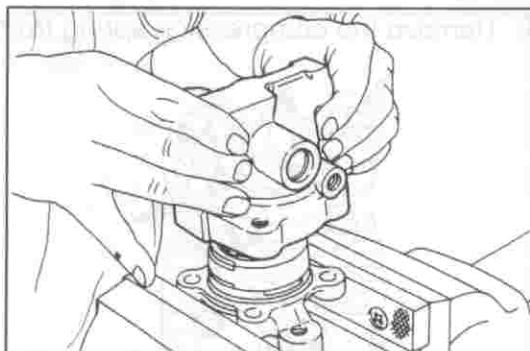


WRE91-SR399

10. Hold the pump front housing with a vice. Remove the pump rear housing.

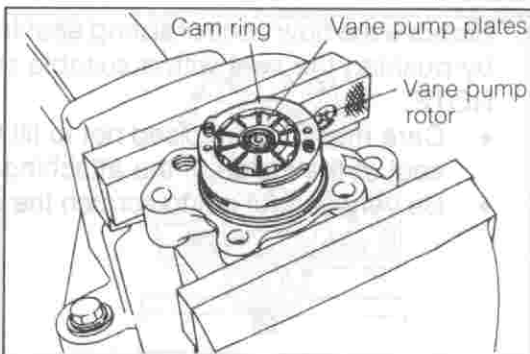
NOTE:

- At this time, it should be noted that there are cases where the vane pump rotor, cam ring and vane plates are taken out together with the rear housing. Therefore, do not drop these parts.



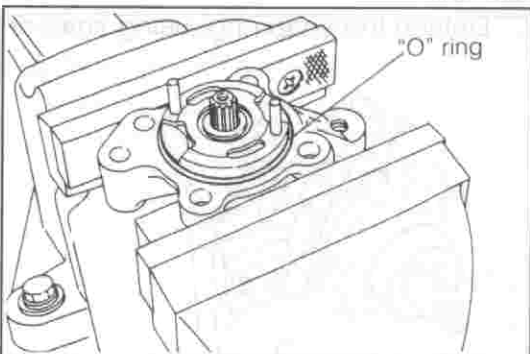
WRE91-SR400

11. Remove the vane pump rotor, cam ring and vane pump plates from the pump front housing.



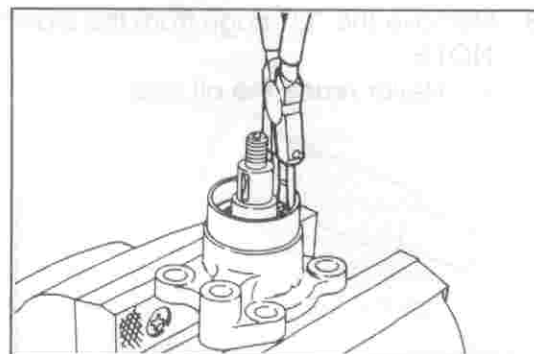
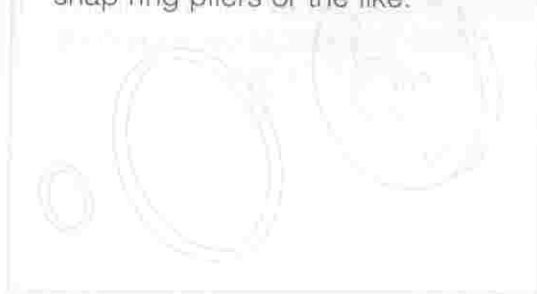
WRE91-SR401

12. Remove the "O" ring from the pump front housing.



WRE91-SR402

13. Remove the snap ring from the pump front housing, using snap ring pliers or the like.

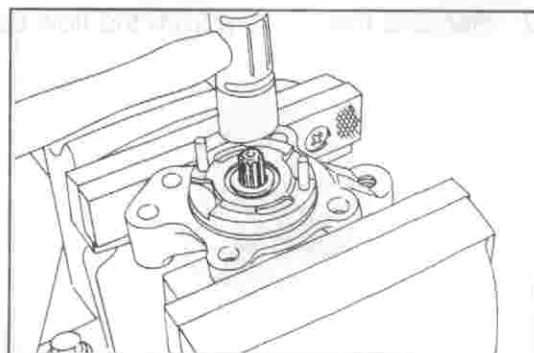
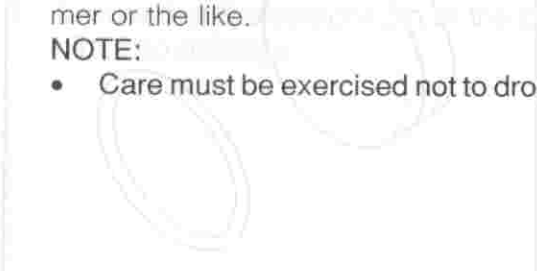


WRE91-SR403

14. Remove the vane pump shaft from the pump front housing by lightly tapping the vane pump shaft with a plastic hammer or the like.

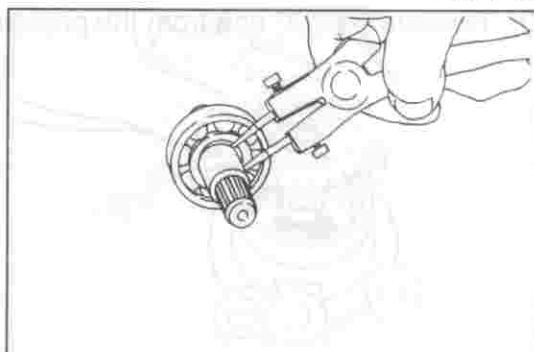
NOTE:

- Care must be exercised not to drop the vane pump shaft.



WRE91-SR404

15. Remove the snap ring from the vane pump shaft.

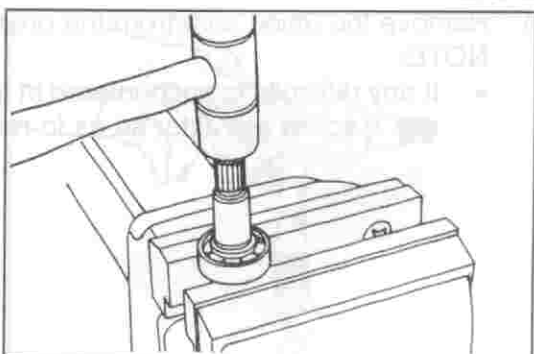
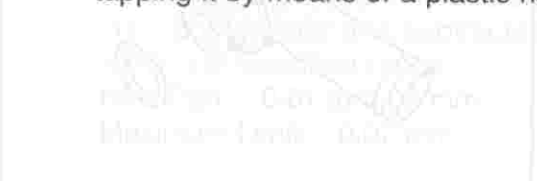


WRE91-SR405

16. Remove the radial ball bearing from the vane pump shaft.

NOTE:

- Hold the inner race of the radial ball bearing with a vice or the like. Pull out the vane pump shaft by lightly tapping it by means of a plastic hammer or the like.

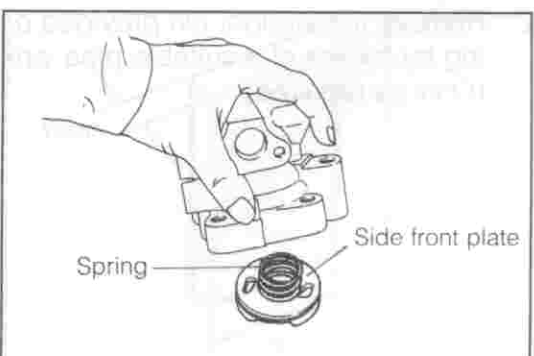


WRE91-SR406

17. Remove the side front plate and spring from the pump rear housing.

NOTE:

- If any difficulty is encountered in removing, turn the pump rear housing up-side down and lightly tap it against the working table so as to remove the parts.
- Be very careful not to damage the side front plate.



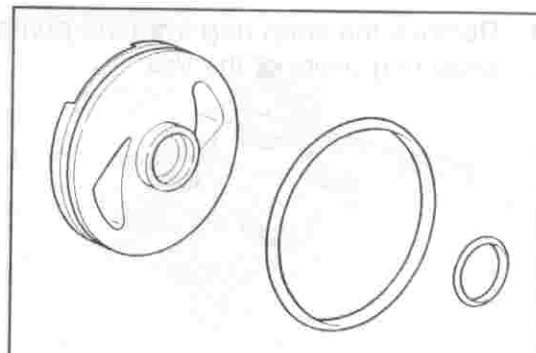
WRE91-SR407

STEERING

18. Remove the "O" rings from the side front plate.

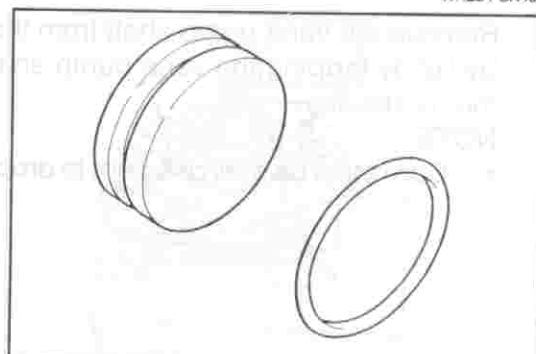
NOTE:

- Never reuse the oil seal.



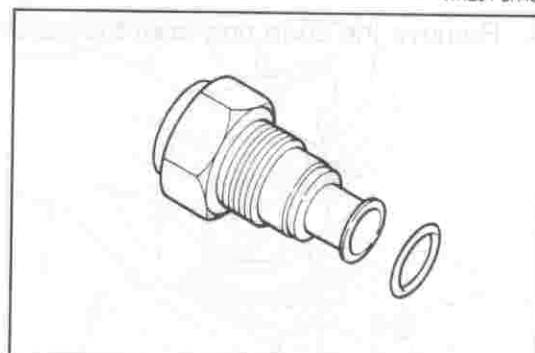
WRE91-SR408

19. Remove the "O" ring from the flow control spring seat.



WRE91-SR409

20. Remove the "O" ring from the pressure port union.

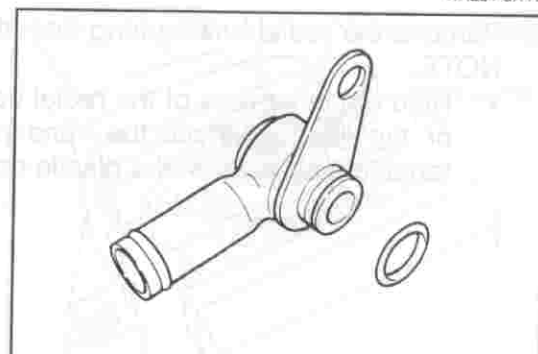


WRE91-SR410

21. Remove the union seat from the pressure port union.

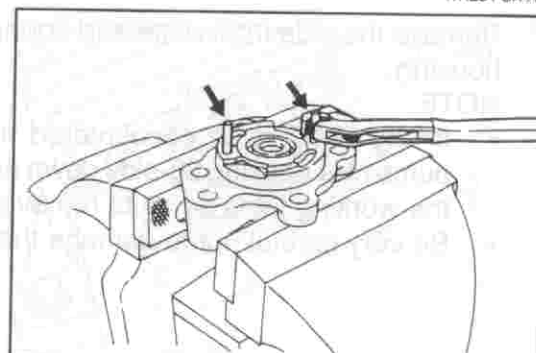
NOTE:

- If any difficulty is encountered in this removal operation, use a screw extractor so as to remove the union seat.



WRE91-SR411

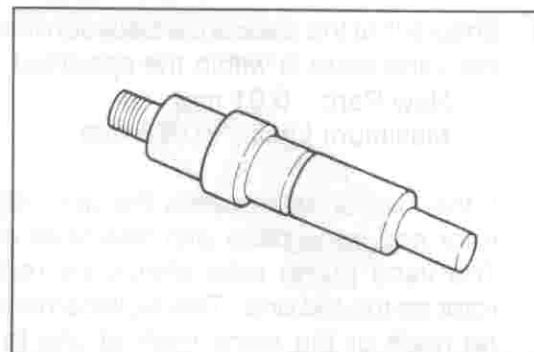
22. Remove the straight pin provided on the front pump housing by means of a suitable pipe wrench or the like.
(Only as required)



WRE91-SR412

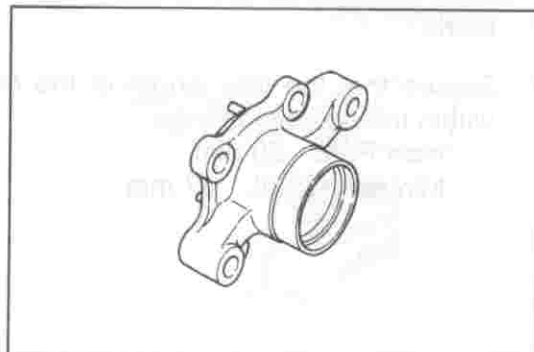
INSPECTION

1. Ensure that the vane pump shaft exhibits no damage, such as cracks, scratches and wear.



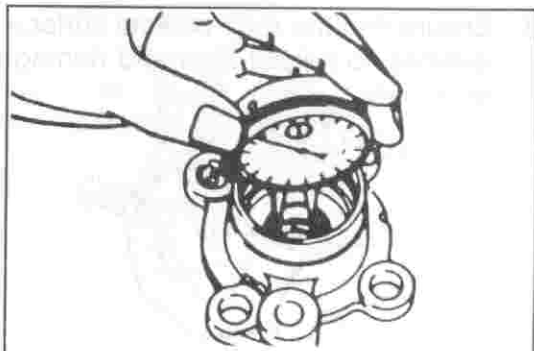
WRE91-SR413

2. Ensure that the pump front housing exhibits no damage, such as cracks, scratches and wear.
3. Ensure that the straight pin of the pump front housing exhibits no damage.



WRE91-SR414

4. Check of pump front housing-to-vane pump shaft clearance
 - (1) Measure the bore diameter of the bush section of the pump front housing in two directions at a total of four points. Record the measurement results.



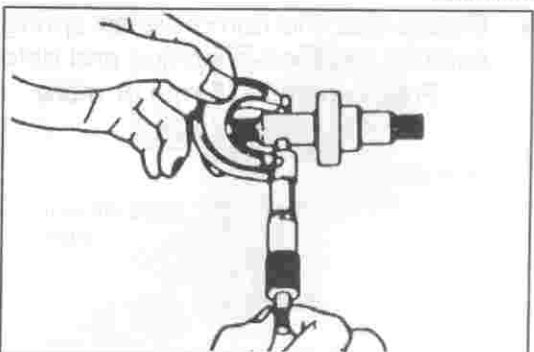
WRE91-SR415

- (2) Measure the outer diameter of the bush contact surface of the vane pump shaft in two directions at a total of four points. Record the measurement results.

- (3) Subtract the maximum measurement value in the step (2) from the minimum measurement value in the step (1). Ensure that this subtracted value (clearance) is within the specified range.

New Part: 0.01 to 0.03 mm

Maximum Limit: 0.07 mm



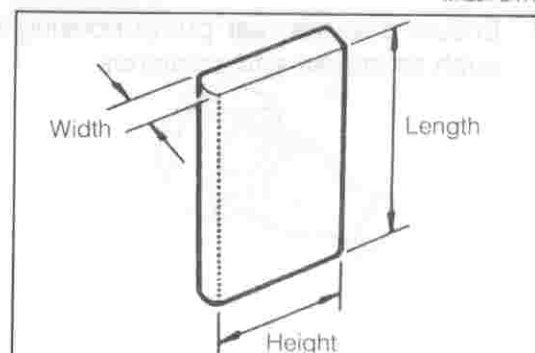
WRE91-SR416

5. Ensure that the vane plate exhibits no damage, such as cracks and scratches.
Also, ensure that the dimensions of the vane plate are within the specified range.

Specified Value

Unit: mm

	Position	Specified Value	Limit
Vane plate	Length	15.00	14.99
	Height	8.2	8.1
	Width	1.800	1.797



WRE91-SR417

STEERING

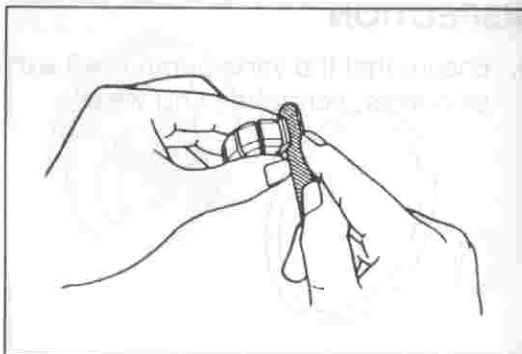
6. Ensure that the clearance between the vane pump rotor and the vane plate is within the specified range.

New Part: 0.01 mm

Maximum Limit: 0.028 mm

If the clearance exceeds the limit, replace the vane pump rotor and vane plate with new ones as a set.

The vane pump rotor should be replaced with the same rotor as the old one. This replacement part must bear either no mark or the same mark of one to four as the old part. Also, be sure to use a vane plate corresponding to the mark.

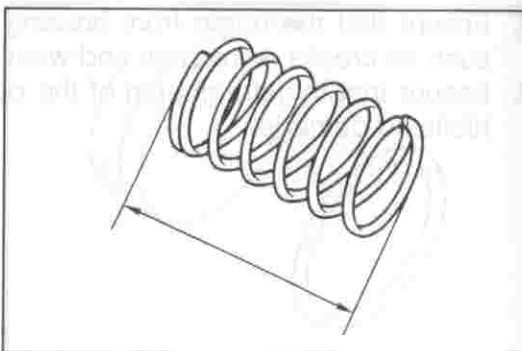


WRE91-SR418

7. Ensure that the free length of the compression spring is within the specified range.

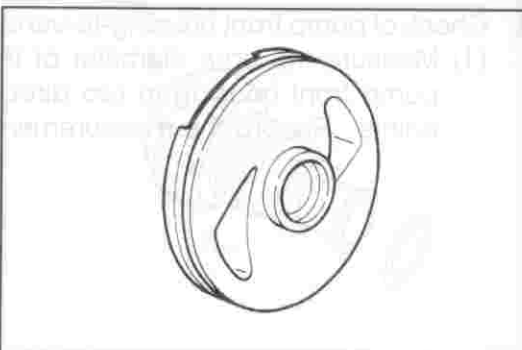
New Part: 50 mm

Minimum Limit: 47 mm



WRE91-SR419

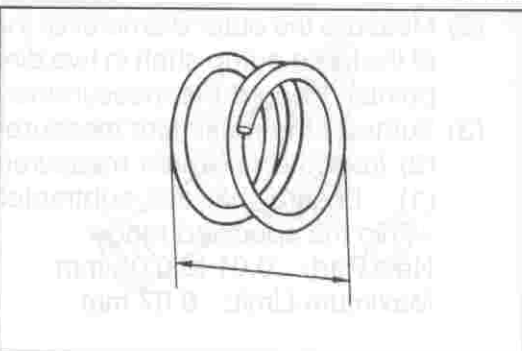
8. Ensure that the rotor contact surface of the front side plate exhibits no ridged wear and damage, such as cracks and scratches.



WRE91-SR420

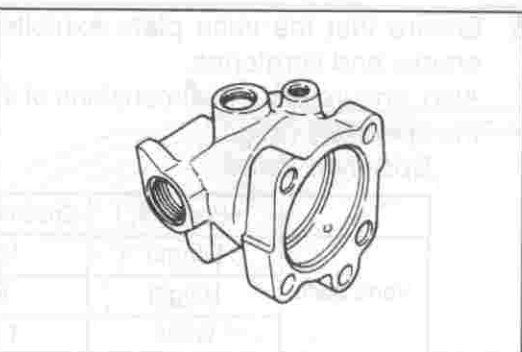
9. Ensure that the compression spring exhibits no damage, such as flattened condition and deformation.

Free Length: 15 mm or more



WRE91-SR421

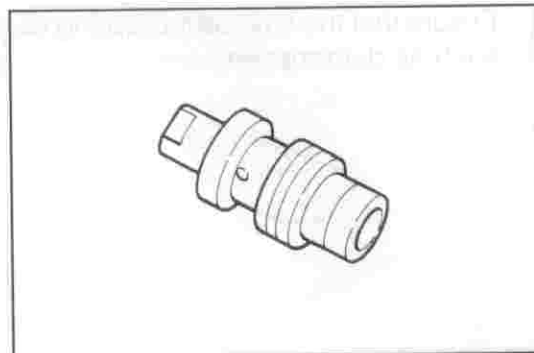
10. Ensure that the rear pump housing exhibits no damage, such as cracks and scratches.



WRE91-SR422

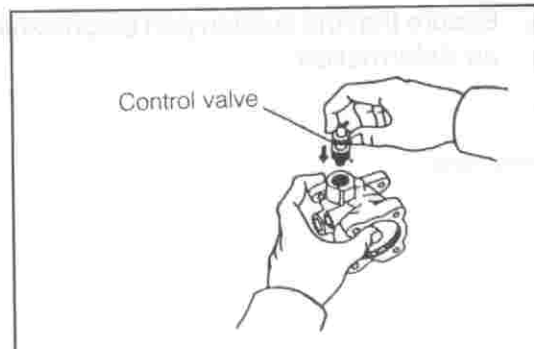
11. Inspection of flow control valve

- (1) Ensure that the flow control valve exhibits no damage, such as cracks, scratches and deformation.
- (2) Ensure that the strainer of the flow control valve exhibits no damage, such as restriction.



WRE91-SR423

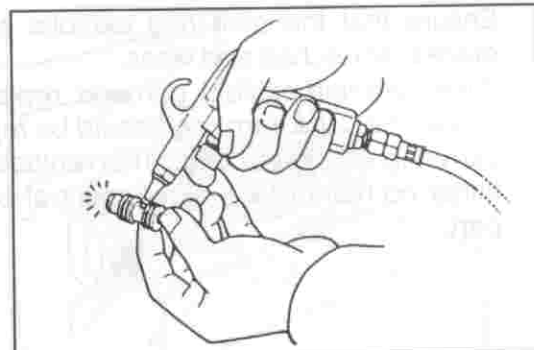
- (3) Apply the ATF DEXRON® II to the flow control valve. Ensure that the flow control valve operates by its own weight when installing it to the pump rear housing.



WRE91-SR424

- (4) The leak check of the flow control valve is performed as follows.

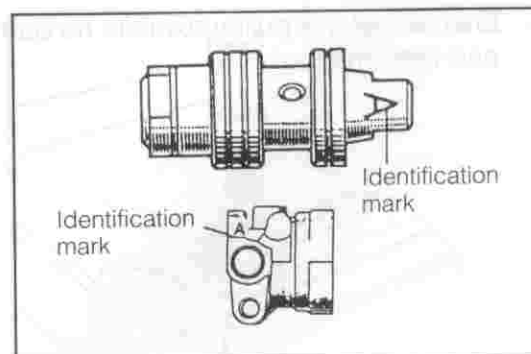
With one side of the hole of the valve plugged by a finger, blow compressed air into the other side of the hole. If no air leaks from the small hole at the rear end, it shows normal operation of the valve.



WRE91-SR425

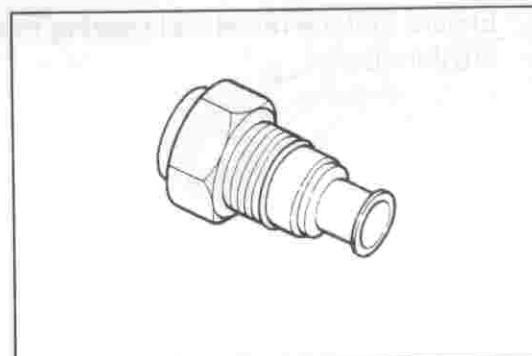
NOTE:

- Never attempt to disassemble the flow control valve.
- When replacing the housing and flow control valve, use parts which bear the same mark (six different marks from A through F).



WRE91-SR426

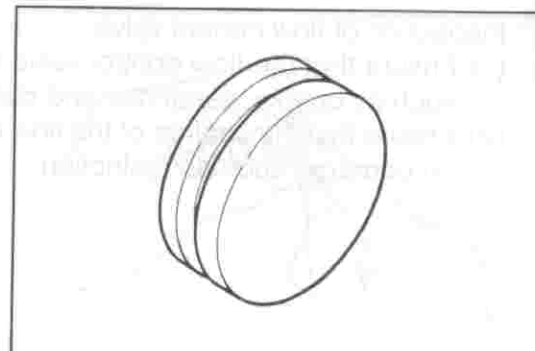
12. Ensure that the pressure port union exhibits no damage, such as restriction and deformation.



WRE91-SR427

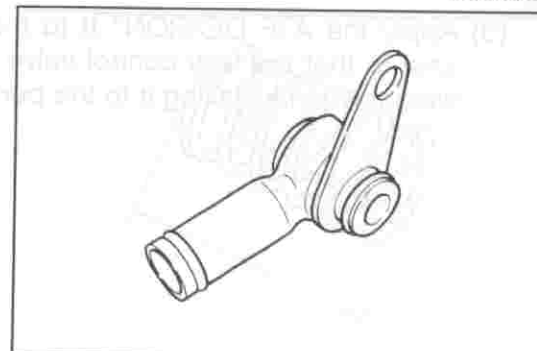
STEERING

13. Ensure that the flow control spring seat exhibits no damage, such as deformation.



WRE91-SR428

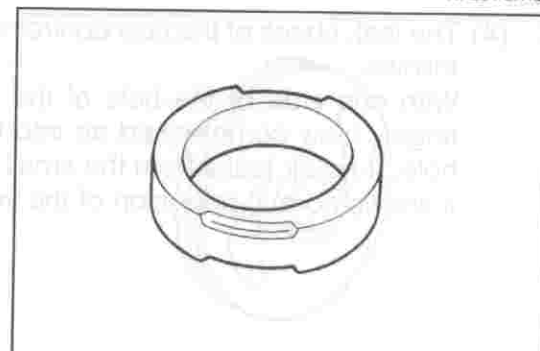
14. Ensure that the suction port union exhibits no damage, such as deformation.



WRE91-SR429

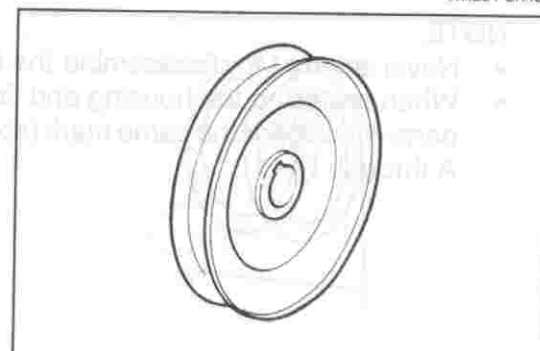
15. Ensure that the cam ring exhibits no damage, such as cracks, scratches and wear.

If the cam ring exhibits damage, replace the cam ring with a new one. The cam ring should be replaced with the same cam ring as the old one. This replacement part must bear either no mark or the same mark of one to four as the old part.



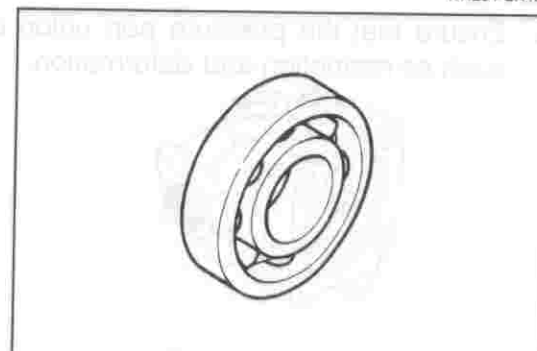
WRE91-SR430

16. Ensure that the pulley exhibits no damage, such as cracks and deformation.



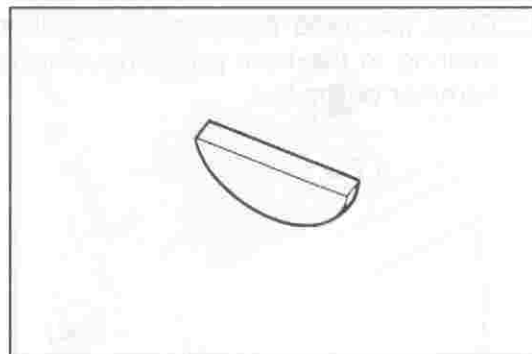
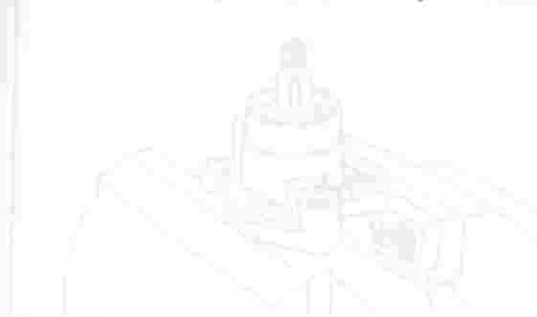
WRE91-SR431

17. Ensure that the radial ball bearing rotates smoothly without any binding.



WRE91-SR432

18. Ensure that the woodruff key exhibits no damage.

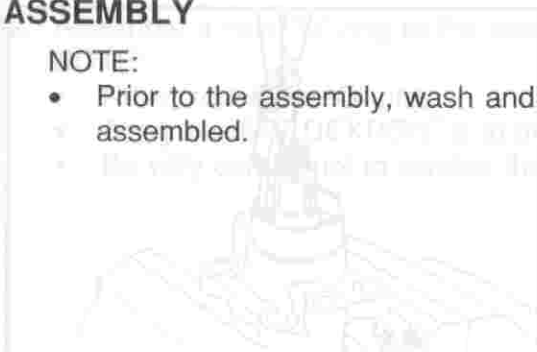


WRE91-SR433

ASSEMBLY

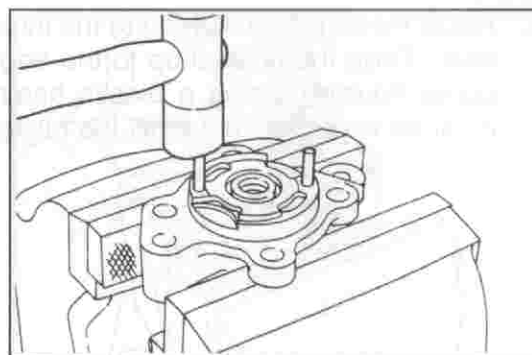
NOTE:

- Prior to the assembly, wash and dry those parts to be assembled.



WRE91-SR434

1. Install the straight pin to the front pump housing. Drive it into position by means of a plastic hammer.

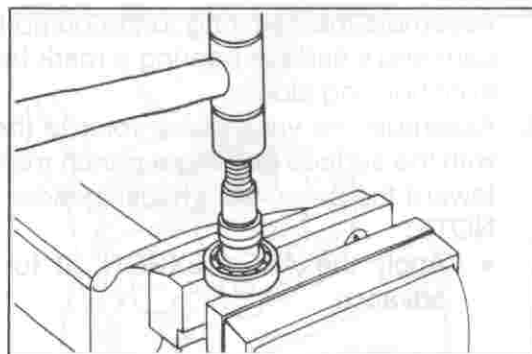
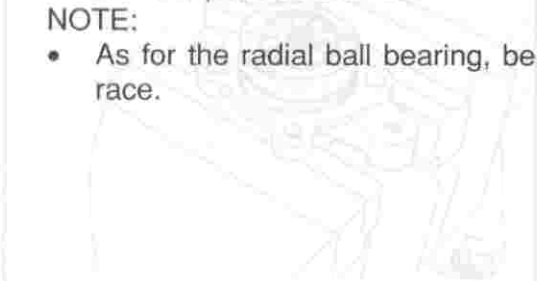


WRE91-SR435

2. Drive the vane pump shaft to the radial ball bearing by means of a plastic hammer.

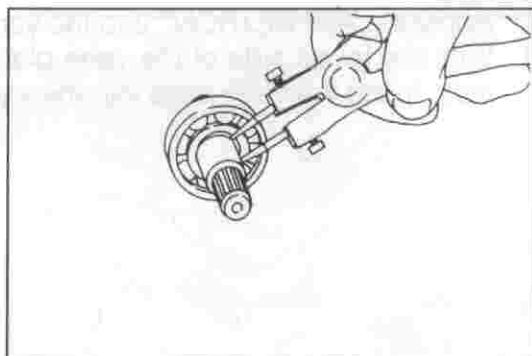
NOTE:

- As for the radial ball bearing, be sure to hold its inner race.



WRE91-SR436

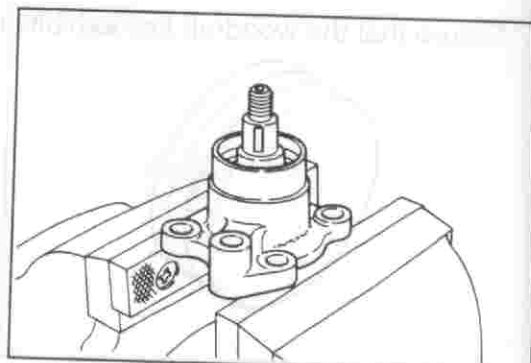
3. Install a new snap ring to the vane pump shaft.



WRE91-SR437

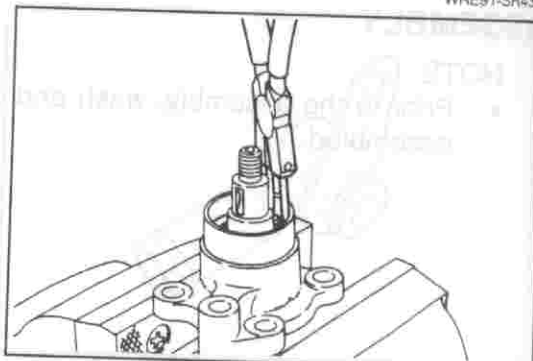
STEERING

4. Drive the vane pump shaft together with the radial ball bearing to the front pump housing by means of a plastic hammer or the like.



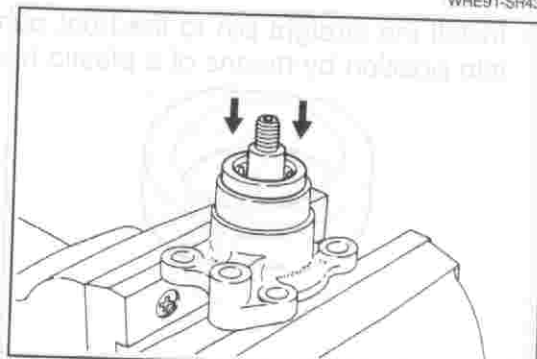
WRE91-SR438

5. Install a new snap ring to the front pump housing, using snap ring pliers.



WRE91-SR439

6. Apply the ATF DEXRON® II to the inner surface of a new oil seal. Drive the oil seal up to the edge surface of the front pump housing, using a plastic hammer or the like. Care must be exercised not to tilt the oil seal during the installation.



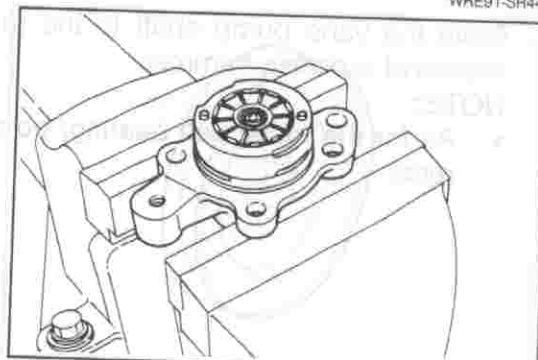
WRE91-SR440

7. Assemble the cam ring to the pump front housing with the cam ring's surface bearing a mark faced toward the pump front housing side.

8. Assemble the vane pump rotor to the pump front housing with the surface bearing a punch mark (drilled mark) faced toward the pump front housing side.

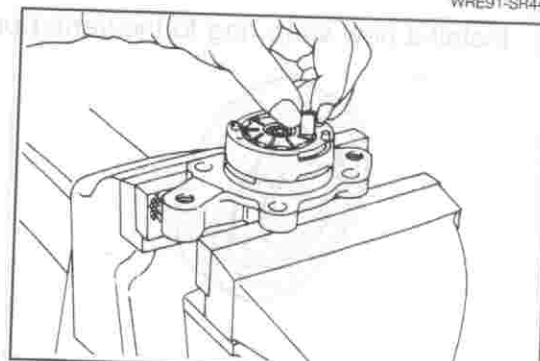
NOTE:

- Apply the ATF DEXRON® II to the thrust surface in advance.



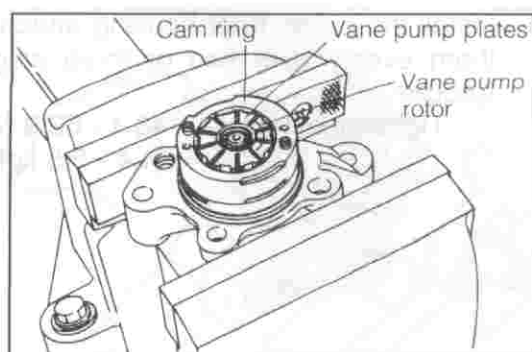
WRE91-SR441

9. Apply the ATF DEXRON® II to the vane plate.
10. With the round side of the vane plate set to the cam ring side, insert the vane plate into the vane pump rotor.



WRE91-SR442

11. Install the "O" ring to the front housing.

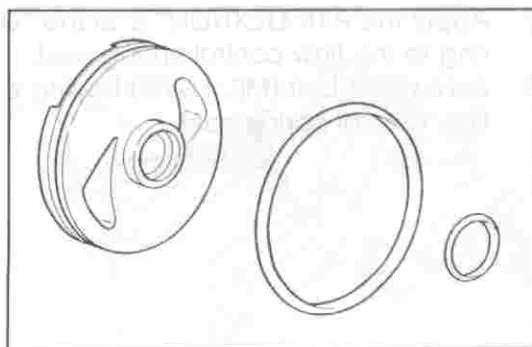


WRE91-SR443

12. Assemble a new "O" ring to the side front plate.

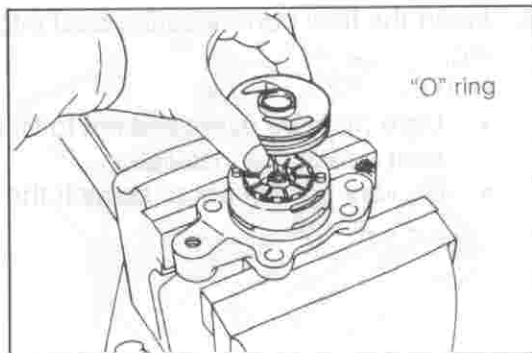
NOTE:

- Never reuse the "O" ring.
- Apply the ATF DEXRON® II to the "O" ring in advance.
- Be very careful not to scratch the "O" ring.



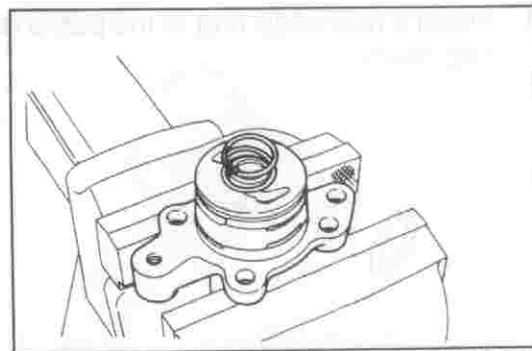
WRE91-SR444

13. While aligning the straight pin hole with the cam ring, install the side front plate.



WRE91-SR445

14. Place the compression spring on the side front plate.

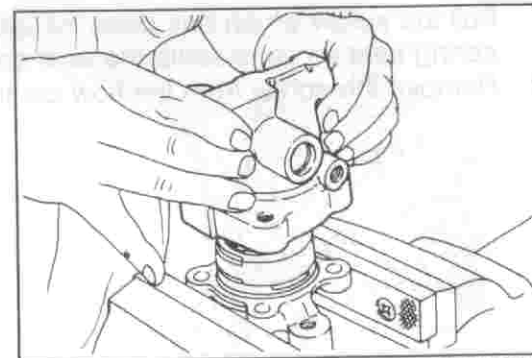
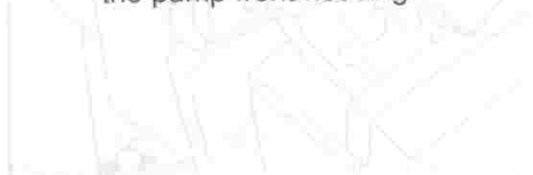


WRE91-SR446

15. Assemble the pump rear housing on the pump front housing.

NOTE:

- Be very careful not to tilt the pump rear housing against the pump front housing.

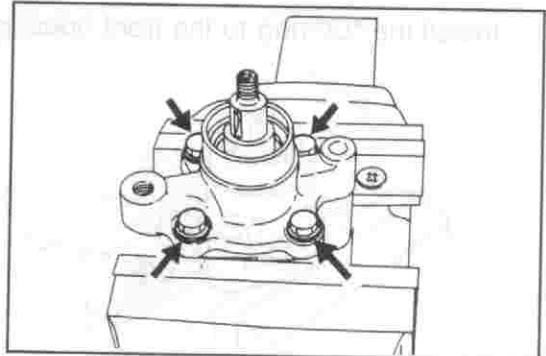


WRE91-SR447

STEERING

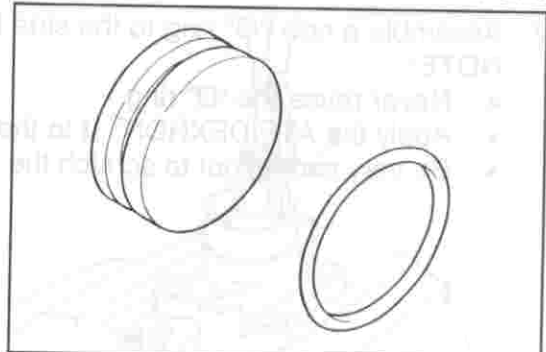
16. Install the pump front housing attaching bolts and tighten them evenly over two or three stages to the specified torque.

Tightening Torque: 43.1 - 53.9 N-m
(4.4 - 5.5 kgf-m, 31.8 - 39.8 ft-lb)



WRE91-SR448

17. Apply the ATF DEXRON® II to the "O" ring. Install the "O" ring to the flow control spring seat.
18. Screw-in a bolt (M6 x 0.85) having a suitable length to the flow control spring seat.

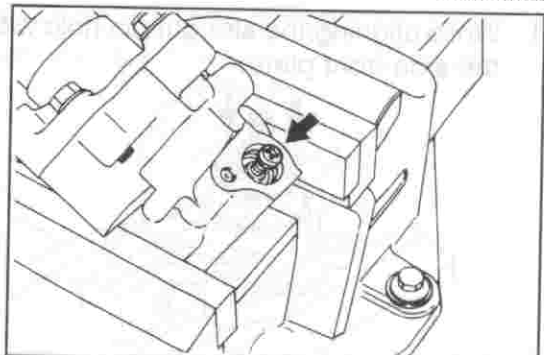


WRE91-SR449

19. Insert the flow control spring seat into the pump housing.

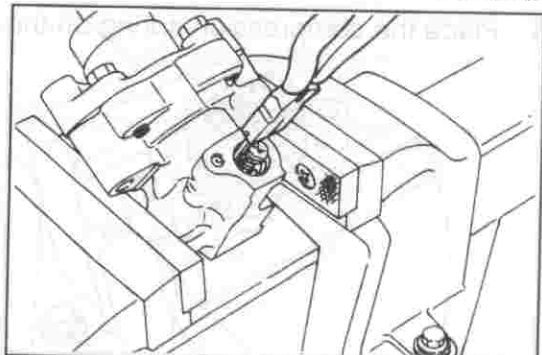
NOTE:

- Care must be exercised not to tilt the flow control spring seat during the installation.
- Be very careful not to scratch the "O" ring.



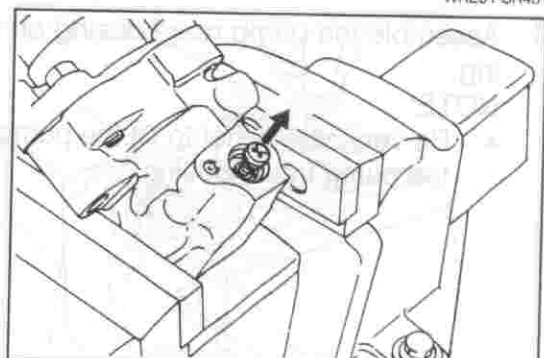
WRE91-SR450

20. Install a new snap ring to the pump rear housing with snap ring pliers.



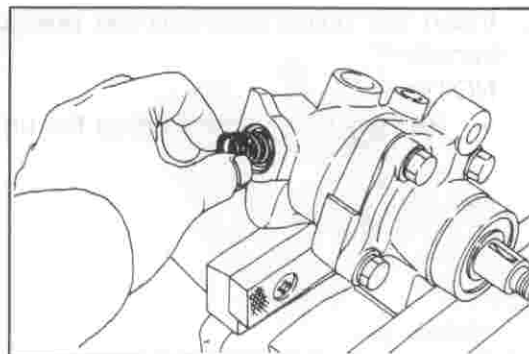
WRE91-SR451

21. Pull the screw which has been installed to the flow control spring seat so as to settle the seat on the snap ring.
22. Remove the screw from the flow control spring seat.



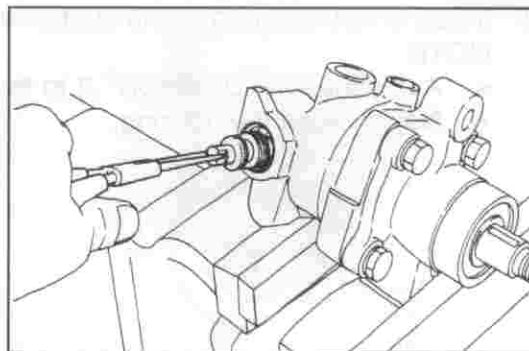
WRE91-SR452

23. Insert the compression spring into the pump rear housing.



WRE91-SR453

24. Insert the flow control valve into the pump rear housing.

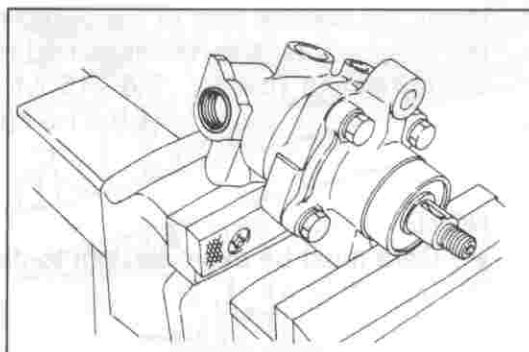


WRE91-SR454

25. Install the "O" ring to the pump rear housing.

NOTE:

- Apply the ATF DEXRON® II to the "O" ring in advance.
- Never reuse the "O" ring.

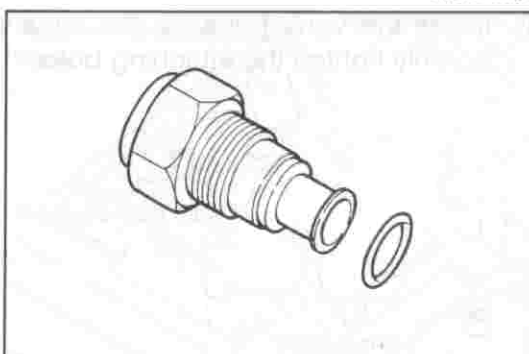


WRE91-SR455

26. Install a new "O" ring to the pressure port union.

NOTE:

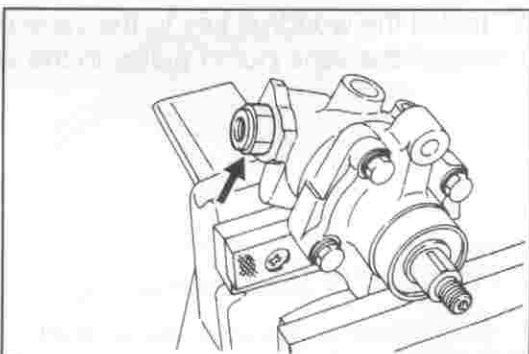
- Apply the ATF DEXRON® II to the "O" ring in advance.
- Never reuse the "O" ring.



WRE91-SR456

27. Install the pressure port union to the pump rear housing and tighten it to the specified torque.

Tightening Torque: 58.8 - 78.5 N·m
(6.0 - 8.0 kgf-m, 43.4 - 57.9 ft-lb)



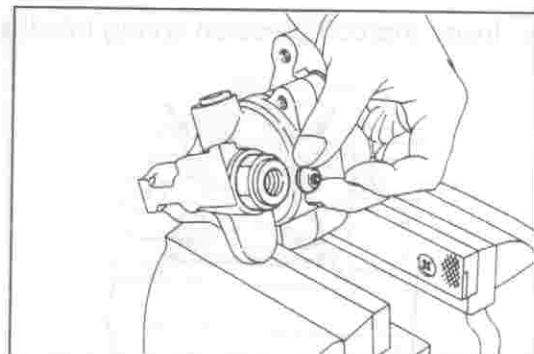
WRE91-SR457

STEERING

28. Insert the union seat into the pressure port union in advance.

NOTE:

- Be very careful not to drop the union seat.

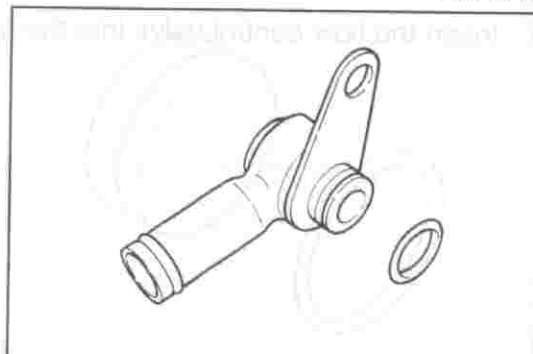


WRE91-SR458

29. Install a new "O" ring to the suction port union.

NOTE:

- Apply the ATF DEXRON® II to the "O" ring.
- Never reuse the "O" ring.



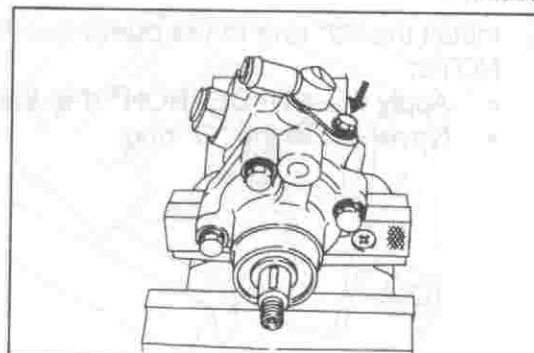
WRE91-SR459

30. Install the suction port to the pump rear housing. Tighten the attaching bolts to the specified torque.

Tightening Torque: 9.8 - 15.7 N·m
(1.0 - 1.6 kgf-m, 7.2 - 11.6 ft-lb)

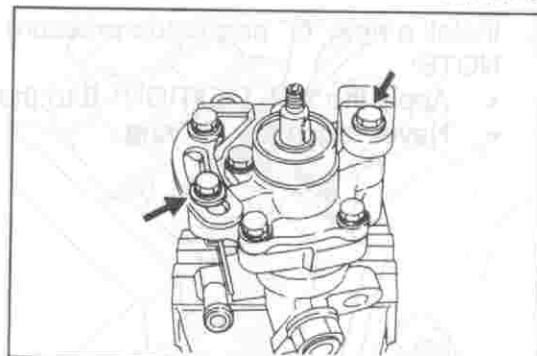
NOTE:

- Care must be exercised not to damage the "O" ring.



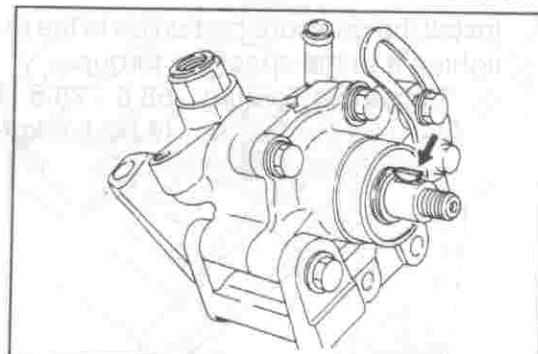
WRE91-SR460

31. Install the vane pump to the vane pump bracket. Temporarily tighten the attaching bolts.



WRE91-SR461

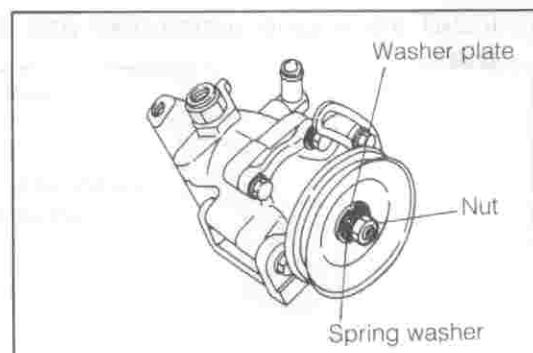
32. Install the woodruff key to the vane pump shaft.
33. Install the vane pump pulley to the vane pump shaft.



WRE91-SR462

34. Install the washer plate, new spring washer and nut to the vane pump shaft. Tighten the attaching nut to the specified torque by means of an impact wrench.

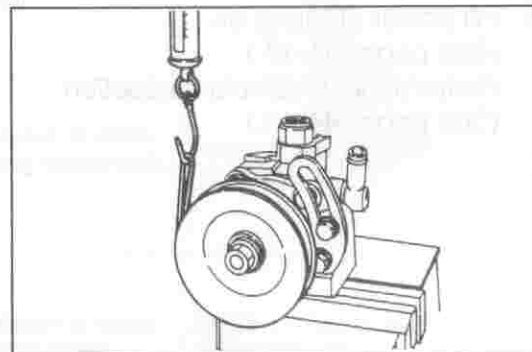
Tightening Torque: 34.3 - 53.0 N·m
(3.5 - 5.4 kgf-m, 25.3 - 39.1 ft-lb)



WRE91-SR463

35. Wind a suitable cord around the pulley. Measure the starting torque by means of a spring balance. Ensure that the starting torque preload is not exceeding the specified value.

Specified Preload: 0.5 kgf

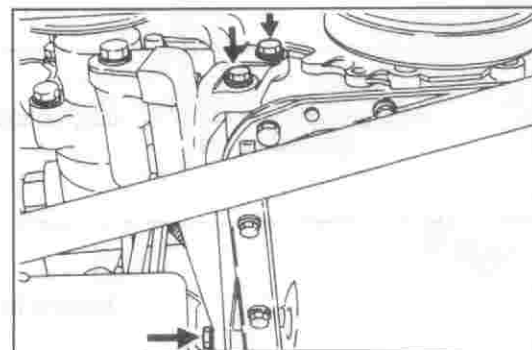


WRE91-SR464

INSTALLATION

1. Install the vane pump bracket to the engine. Tighten the attaching bolts to the specified torque.

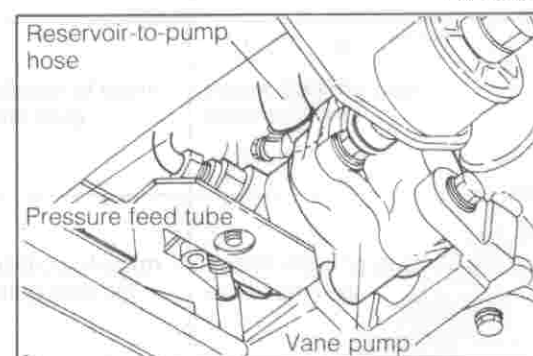
Tightening Torque: M8 bolt 8.34 - 20.1 N·m
(0.85 - 2.05 kgf-m, 6.15 - 14.8 ft-lb)
M10 bolt 17.7 - 41.2 N·m
(1.8 - 4.2 kgf-m, 13.0 - 30.4 ft-lb)



WRE91-SR465

2. Connect the suction tube and pressure tube to the vane pump.

Tightening Torque: 39.2 - 49.0 N·m
(4.0 - 5.0 kgf-m, 28.9 - 36.2 ft-lb)

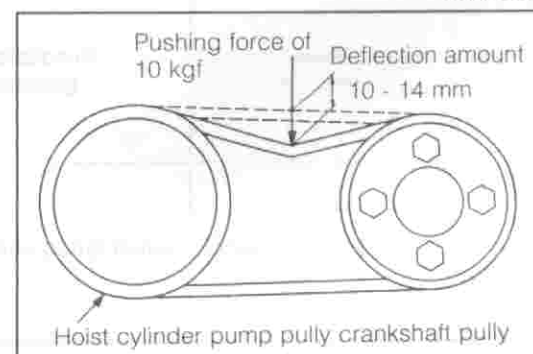


WRE91-SR466

3. Install the vane pump drive belt.

4. Tighten the attaching bolts to the specified torque, while adjusting the belt tension so that the deflection of the belt may become 10 - 14 mm when the midpoint of the vane pump drive belt is pushed with a force of 10 kgf.

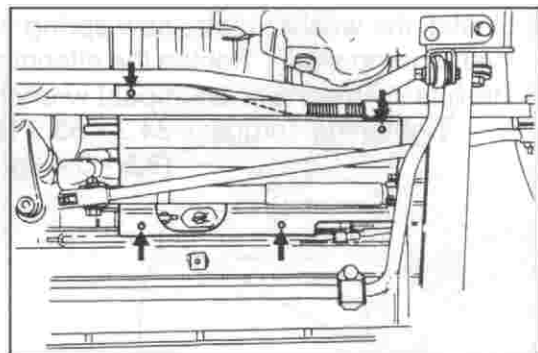
Tightening Torque: 37.3 - 44.1 N·m
(3.8 - 4.5 kgf-m, 27.5 - 32.5 ft-lb)



WRE91-SR467

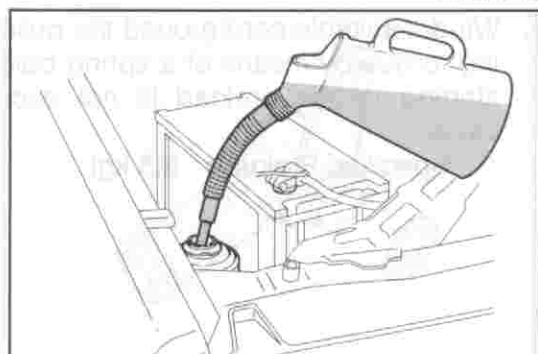
STEERING

5. Install the engine undercover and tighten the attaching bolts.



WRE91-SR468

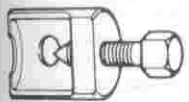
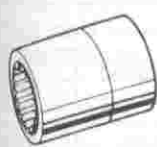
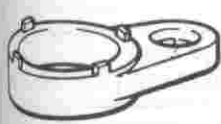
6. Fill power steering oil.
(See page SR-17.)
7. Perform the in-vehicle inspection.
(See page SR-15.)



WRE91-SR469



STs (Special Service Tools)

Shape	Part No. and name	Purpose	Remarks
	09611-87701-000 Tie rod end puller	Disconnection of tie rod end from steering knuckle	
	09610-87301-000 Pitman arm puller	Disconnection of pitman arm from sector shaft	
	09617-28010-000 Worm bearing adjusting screw lock nut wrench	Removal/installation of worm bearing adjusting screw lock nut	Manual steering gear assembly only
	09616-30011-000 Worm bearing adjusting screw wrench	Removal/installation of worm bearing adjusting screw	Manual steering gear assembly only
	09308-00010-000 Oil seal puller	Removal of steering gear box oil seal	Manual steering gear assembly only
	09616-00010-000 Steering pinion bearing adjusting socket	Measurement of preload	
	09631-00030-000 No. 1 wrench	Removal/installation of worm bearing adjuster plug	Power steering gear assembly only
	09631-00040-000 No. 2 wrench	Removal/installation of worm bearing adjusting lock nut	Power steering gear assembly only
	09515-87201-000 Rear axle bearing outer replacer	Removal/installation of needle roller bearing	Power steering gear assembly only
	09950-20017-000 Universal puller	Removal of vane pump pulley	Power steering only

WRE91-SR470

STEERING

SERVICE SPECIFICATIONS

Item														
Steering wheel free play		Not more than 30 mm (1.18 inch)												
Steering gear box fluid level		13 - 23 mm (0.51 - 0.91 inch) From upper edge of check hole center												
Steering gear box oil (except power steering)		Gear oil GL3, SAE30												
Vane pump drive belt	Specified deflection	10 - 14 mm (0.4 - 0.55 inch)												
	Belt tension	50 - 75 kgf												
Power steering fluid		ATF DEXRON® II												
Power steering turning effort		Not to exceed 7.8 N-m (80 kgf-cm, 5.8 ft-lb)												
Vane pump hydraulic pressure		Maximum 75 - 80 kgf/cm ²												
Difference in pressure under unloaded state (at 1000 and 3000 rpm)		Not more than 5 kg/cm ²												
Steering shaft length		Approx. 659.3 mm (25.96 inch)												
Intermediate shaft	Without power steering	472.5 ± 1 mm (18.6 ± 0.4 inch)												
	With power steering	503.5 ± 1 mm (19.8 ± 0.4 inch)												
Manual steering gear box worm shaft starting torque (Worm shaft unit)		0.29 - 0.49 N-m (0.03 - 0.05 kgf-m, 0.22 - 0.36 ft-lb)												
Manual steering gear box worm shaft starting torque (Total preload)		0.69 - 1.0 N-m (0.07 - 0.1 kgf-m, 0.51 - 0.7 ft-lb)												
Power steering gear box worm shaft starting torque (Worm shaft unit)		0.39 - 0.64 N-m (0.04 - 0.065 kgf-m, 0.29 - 0.47 ft-lb)												
Power steering gear box worm shaft starting torque (Total preload)		0.59 - 0.93 N-m (0.06 - 0.095 kgf-m, 0.43 - 0.69 ft-lb)												
Vane plate		Unit: mm (inch)												
		<table> <tr> <th>Position</th><th>Specified Value</th><th>Limit</th></tr> <tr> <td>Length</td><td>15.00 (0.59055)</td><td>14.99 (0.59015)</td></tr> <tr> <td>Height</td><td>8.2 (0.32283)</td><td>8.1 (0.31889)</td></tr> <tr> <td>Width</td><td>1.800 (0.07086)</td><td>1.797 (0.07074)</td></tr> </table>	Position	Specified Value	Limit	Length	15.00 (0.59055)	14.99 (0.59015)	Height	8.2 (0.32283)	8.1 (0.31889)	Width	1.800 (0.07086)	1.797 (0.07074)
Position	Specified Value	Limit												
Length	15.00 (0.59055)	14.99 (0.59015)												
Height	8.2 (0.32283)	8.1 (0.31889)												
Width	1.800 (0.07086)	1.797 (0.07074)												
Vane pump rotor and vane plate clearance	New part	0.01 mm (0.0003937 inch)												
	Maximum limit	0.028 mm (0.0011023 inch)												
Vane pump compression spring free length	New part	50 mm (1.96 inch)												
	Minimum limit	47 mm (1.85 inch)												
Vane pump drive belt deflection (with pushing force of 10 kg)		10 - 14 mm (0.39 - 0.55 inch)												

WRE91-SR471

TIGHTENING TORQUE

Tightening component		N·m	kgf·m	ft·lb	
Steering gear box × Check plug		2.9 - 4.9	0.3 - 0.5	2.2 - 3.6	
Steering gear box × Hydraulic tube (flare nut)		39.2 - 49.0	4.0 - 5.0	28.9 - 36.2	
Steering wheel × Steering shaft		29.4 - 49.0	3.0 - 5.0	21.7 - 36.2	
Steering column tube × Brace		14.7 - 21.6	1.5 - 2.2	10.8 - 15.9	
Steering column hole cover × Floor panel		3.9 - 6.9	0.4 - 0.7	2.9 - 5.1	
Steering shaft universal joint × Intermediate shaft		24.5 - 34.3	2.5 - 3.5	18.1 - 25.3	
Steering column tube × Steering column hole cover		3.6 - 6.9	0.4 - 0.7	2.7 - 5.1	
Flexible coupling × Flexible coupling yoke		14.7 - 21.6	1.5 - 2.2	10.8 - 15.9	
Steering shaft universal joint × Steering shaft		24.5 - 34.3	2.5 - 3.5	18.1 - 25.3	
Flexible coupling yoke × Steering gear box		16.7 - 21.6	1.7 - 2.2	12.3 - 15.9	
Flexible coupling yoke × Intermediate shaft		16.7 - 21.6	1.7 - 2.2	12.3 - 15.9	
Tie rod end subassembly × Steering knuckle		49.0 - 88.3	5.0 - 9.0	36.2 - 65.1	
Tie rod end subassembly × Steering relay rod		68.6 - 137	7.0 - 14.0	50.6 - 101	
Steering relay rod × Pitman arm		68.6 - 137	7.0 - 14.0	50.6 - 101	
Steering relay rod × Shimmy damper		73.5 - 103	7.5 - 10.5	54.2 - 75.9	
Shimmy damper × Frame		73.5 - 103	7.5 - 10.5	54.2 - 75.9	
Pitman arm × Steering gear box		147 - 196	15 - 20	109 - 145	
End cover × Steering gear box		44.1 - 53.9	4.5 - 5.5	32.5 - 39.8	
Sector shaft adjusting screw lock nut		19.6 - 34.3	2.0 - 3.5	14.5 - 25.3	
Steering guide clamp screw (Power steering gear box)		2.0 - 3.9	0.2 - 0.4	1.4 - 2.9	
Valve housing attaching nuts (Power steering gear box)		39.2 - 39.8	4.0 - 5.5	28.9 - 53.9	
Worm shaft adjusting screw lock nut		49.0	5.0	36.2	
Steering gear box × Frame		73.5 - 103	7.5 - 10.5	54.2 - 75.9	
Vane pump front housing × Rear housing		43.1 - 53.9	4.4 - 5.5	31.8 - 39.8	
Vane pump pressure port union		58.8 - 78.5	6.0 - 8.0	43.4 - 57.9	
Suction port union × Vane pump rear housing		9.8 - 15.7	1.0 - 1.6	7.2 - 11.6	
Vane pump shaft × Vane pump pulley		34.3 - 53.0	3.5 - 5.4	25.3 - 39.1	
Vane pump × Pressure tube		39.2 - 49.0	4.0 - 5.0	28.9 - 36.2	
Vane pump bracket × Cylinder block		M8 M10	8.34 - 20.1 17.7 - 4.2	0.85 - 2.05 1.8 - 4.2	6.15 - 14.8 13.0 - 30.4
Vane pump × Adjusting bar		37.3 - 44.1	3.8 - 4.5	27.5 - 32.5	
Vane pump × Vane pump bracket					

WRE91-SR472