

DAIHATSU

F300

STEERING

OUTLINE OF STEERING SYSTEM	SR- 2
COMPONENTS	SR-16
TROUBLESHOOTING	SR-18
IN-VEHICLE INSPECTION	SR-19
STEERING WHEEL	SR-31
STEERING COLUMN	SR-34
STEERING LINKAGE	SR-57
STEERING GEAR HOUSING	SR-70
VANE PUMP	SR-85
SSTs (Special Service Tools)	SR-97
SERVICE SPECIFICATION	SR-97
TIGHTENING TORQUE	SR-98

WFE90-SR001

STEERING

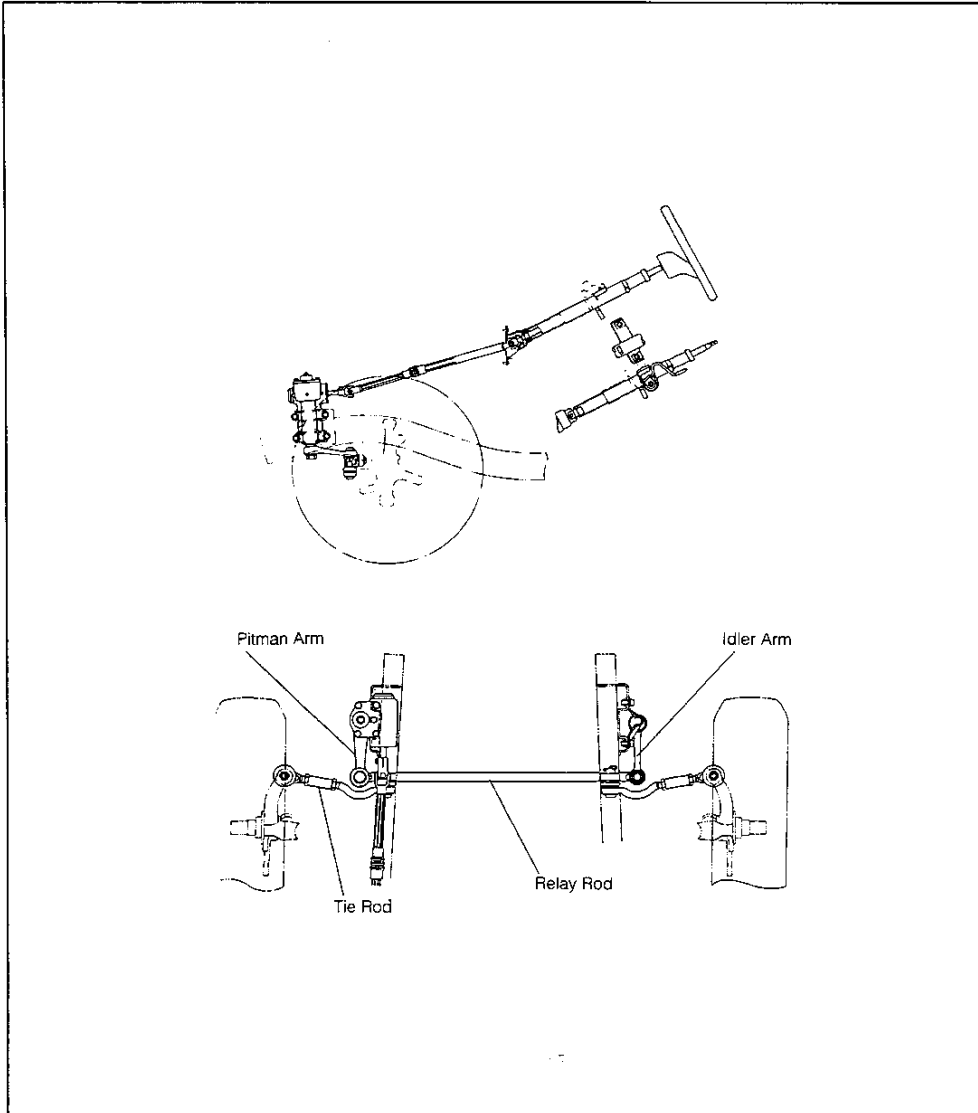
OUTLINE OF STEERING SYSTEM

The steering gear box employs a recirculating ball type. Furthermore, the power steering is available as optional equipment.

The steering column employs a rigid type for the general and Australian specifications and an impact absorption type for the ECE & EEC specifications.

The tilt steering is standard equipment on the EL grade, while it is optional equipment on the DX grade.

The steering linkage consists of a pitman arm, a relay rod, an idler arm and tie rods.



WP690-SR002

STEERING

Steering specifications

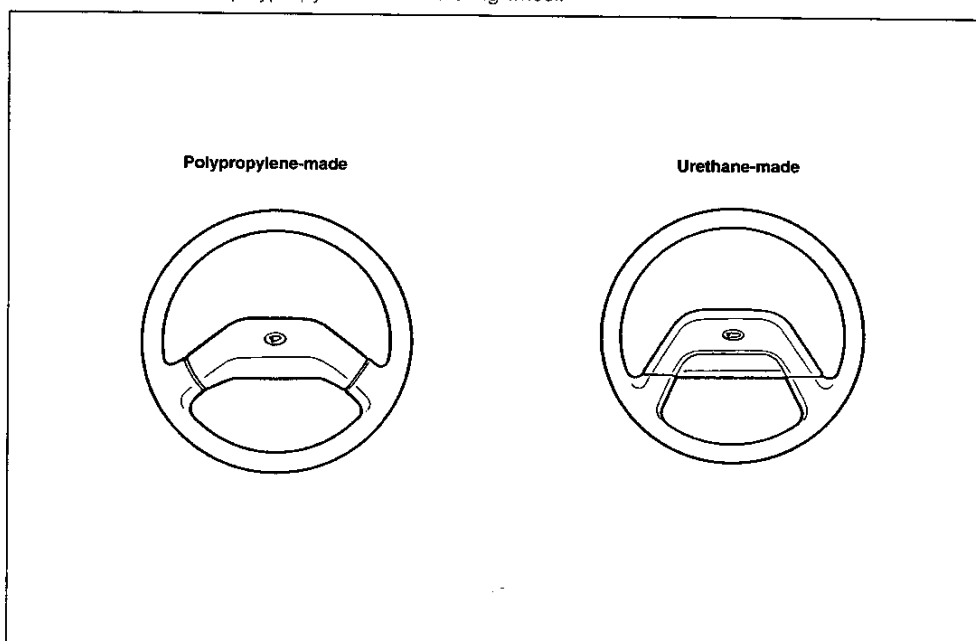
Item		Specifications	
		Tyre size	
		195R15	225/70R15
Turning angle degrees	inner	31°	27°
	Outer	27°	24°
Minimum turning radius	Tire	5.1	5.7
	Body	5.4	6.0

WFE90-SR003

STEERING WHEEL

The steering wheel is available in two materials: urethane and polypropylene.

The urethane-made steering wheel is standard on the EL grade of the resin top vehicle; the EL package of the soft top vehicle. Also, it is optional equipment on the DX grade of the resin top vehicle. (On those vehicles equipped with the urethane made steering wheel, the transmission shift lever knob is also made of urethane.) Other vehicles uses the polypropylene-made steering wheel.

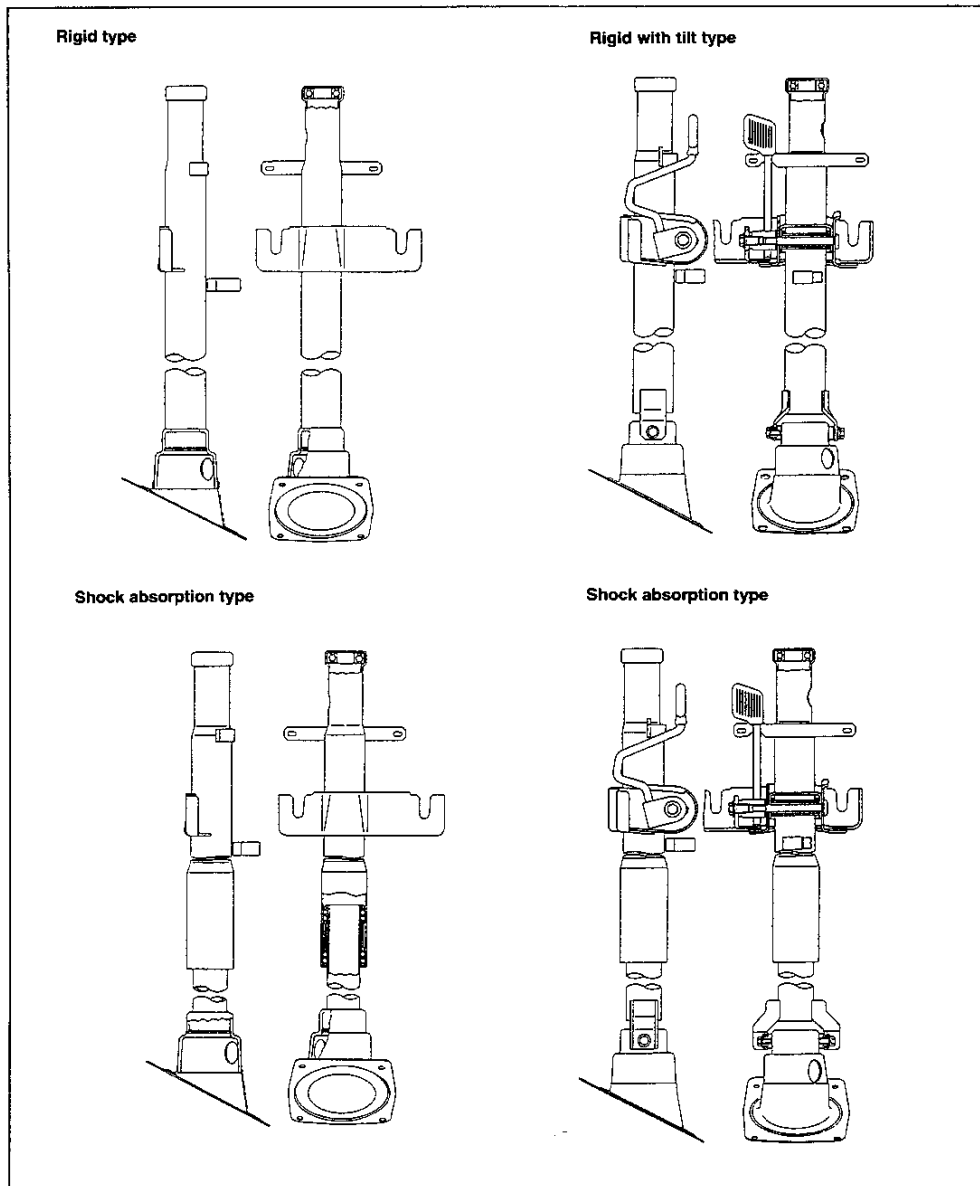


WFE90-SR004

STEERING

STEERING COLUMN

The steering column employs the rigid type for the general and Australian specifications and the shock absorption type for the ECE & EEC and GCC specifications. The tilt steering is provided as standard on the EL grade vehicle.

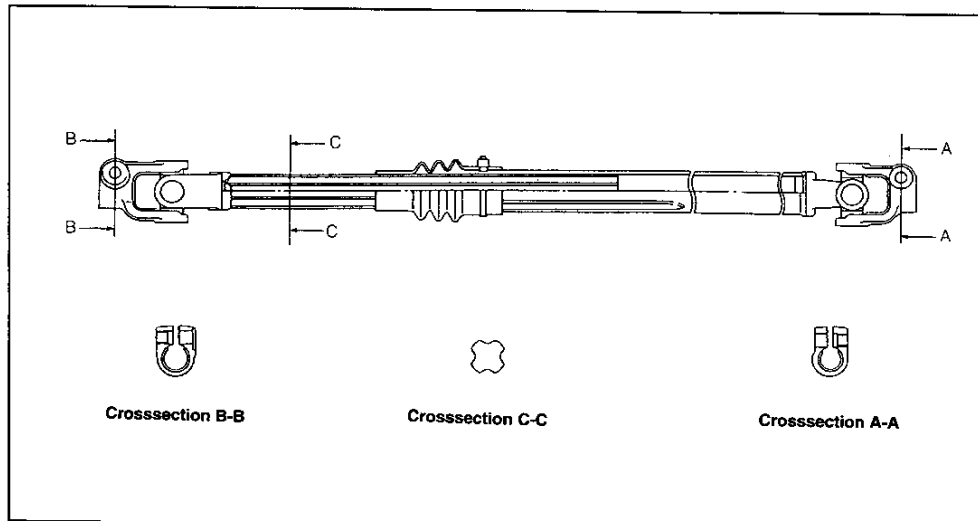


WFE90-SR006

STEERING

INTERMEDIATE SHAFT

The intermediate shaft shown in the figure below is provided between the steering main shaft and the steering gear box.

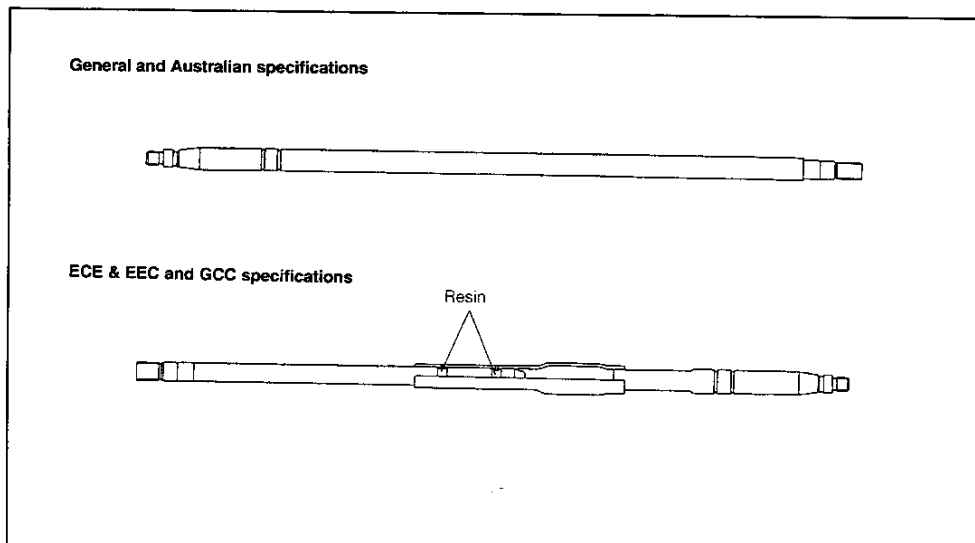


WFE90-SR006

STEERING MAIN SHAFT

The steering main shaft comes in two kinds: one for the general and Australian specifications and the other for the ECE & EEC specifications.

The steering main shaft for the ECE & EEC and GCC specifications employs an impact absorption type steering main shaft which uses resin.

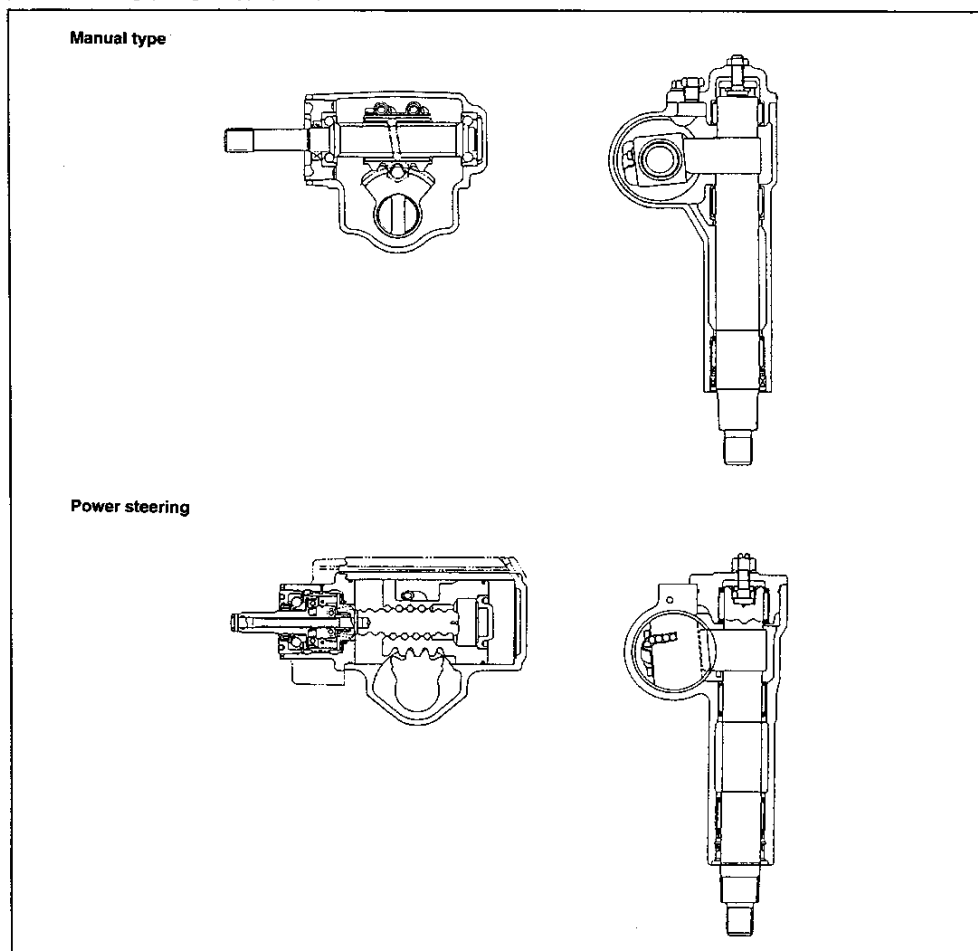


WFE90-SR007

STEERING

STEERING GEAR BOX

As regards the steering gear box, the manual steering (recirculating ball type) is standard, where as the power steering (integral type) is optional.



WFE90-SR008

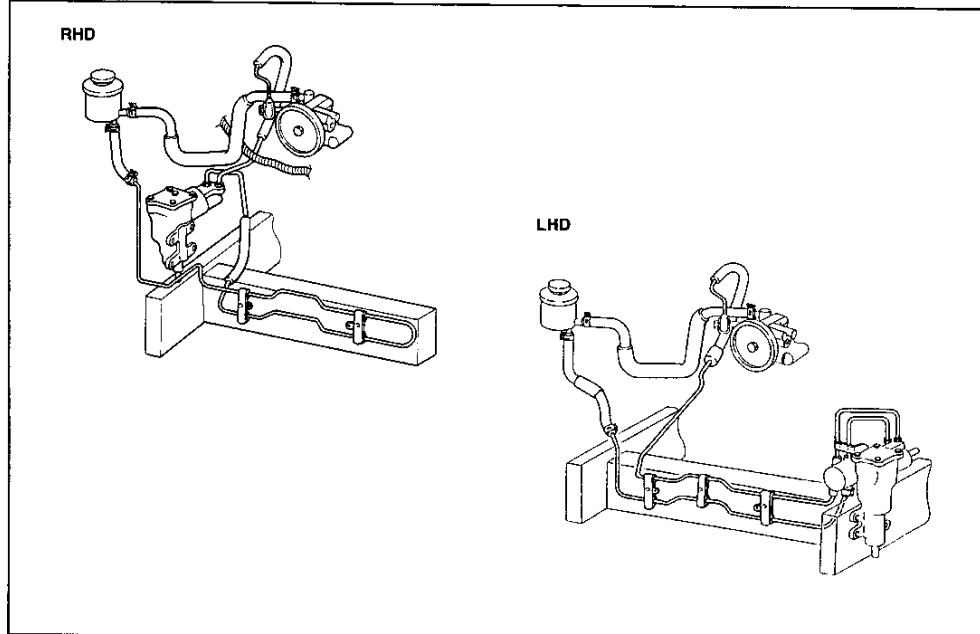
Steering gear box specifications

	Manual Type		Power steering
	Recirculating ball type		Integral type
Gear ratio	24 - 28		19.8
Oil capacity	Upper limit	480 cc	—
	Lower limit	460 cc	

WFE90-SR009

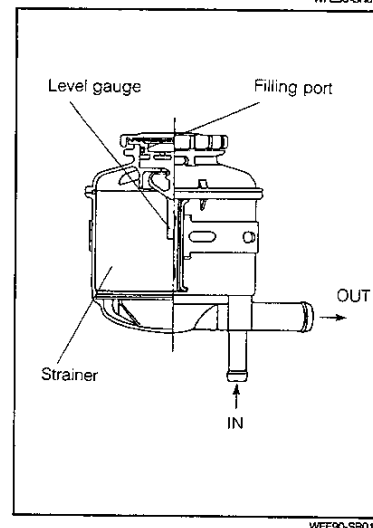
POWER STEERING

The power steering consists of the following components: a vane pump which generates a hydraulic pressure, an integral type gear box which detects a force being applied to the steering system, controls the hydraulic pressure and converts the hydraulic pressure to a mechanical power, an oil reservoir which stores hydraulic fluid, and those hoses, pipes, etc. linking these components.



OIL RESERVOIR

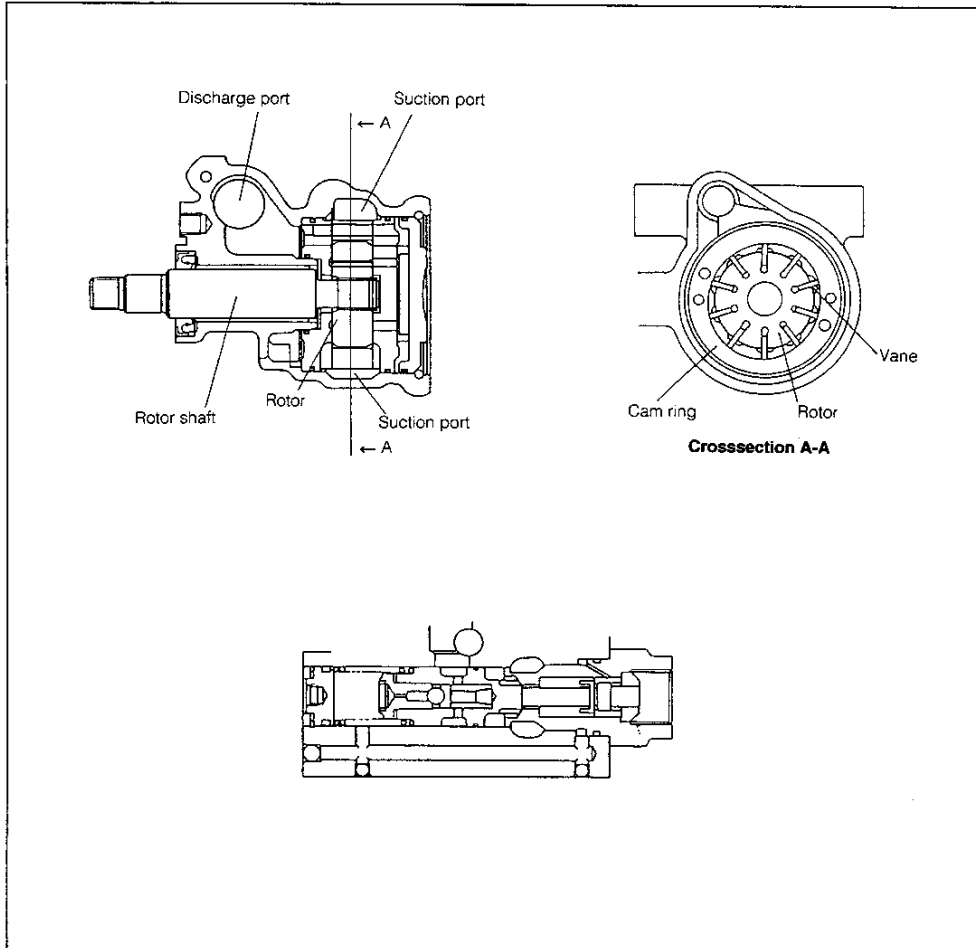
The oil reservoir is a tank which stores the hydraulic fluid sent to and returning from the steering gear box. The oil reservoir consists of a strainer which filtrates hydraulic fluid, a level gauge for checking the fluid level and so forth. This oil reservoir is located in the engine compartment.



STEERING

VANE PUMP

The vane pump consists of a cam ring, a pump rotor, vanes and so forth. A flow control valve which controls the fluid flow rate according to the revolution speed is incorporated at the rear section of the pump.



WFE0-SR012

Vane pump specifications

Revolution speed used	rpm	500 - 7000
Control discharge rate	liter/min	7.0 (at 1000 rpm) [*5.5 (at 1000 rpm)]
Relief set pressure	kg/cm ²	60 - 70 [at 500 rpm]
Fluid		Power steering fluid (DEXRON® II)
Ambient temperature	°C	- 40 - 120

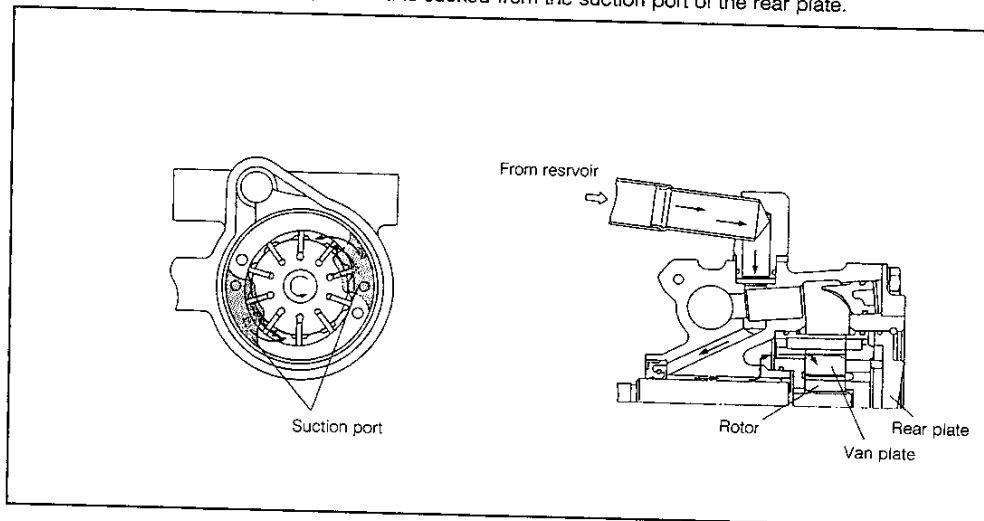
*For the United Kingdom

WFE90-SR013

Suction operation

The volume of a space between the cam ring and the rotor partitioned by a vane plate increases as the rotor rotates.

As the volume starts to increase, the fluid is sucked from the suction port of the rear plate.



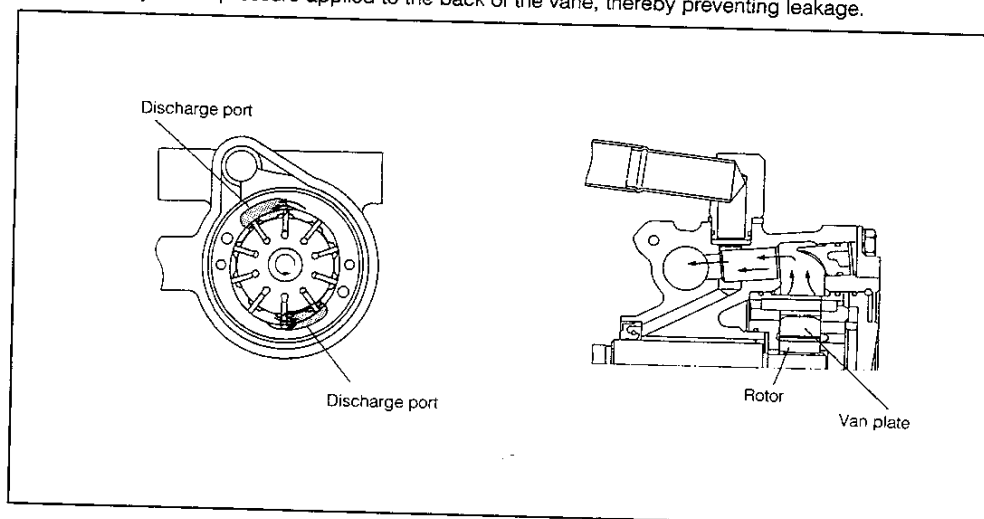
WFE90-SR014

Discharge operation

The volume of a space between the cam ring and the rotor partitioned by a vane plate decreases as the rotor further rotates.

The sucked fluid is, therefore, sent to the flow control valve from the discharge port of the rear plate through the oil passage in the housing. In this way, the fluid flow rate to the gear housing is controlled.

Furthermore, the vane plate is pushed against the cam ring owing to a centrifugal force applied to the vane plate and a hydraulic pressure applied to the back of the vane, thereby preventing leakage.

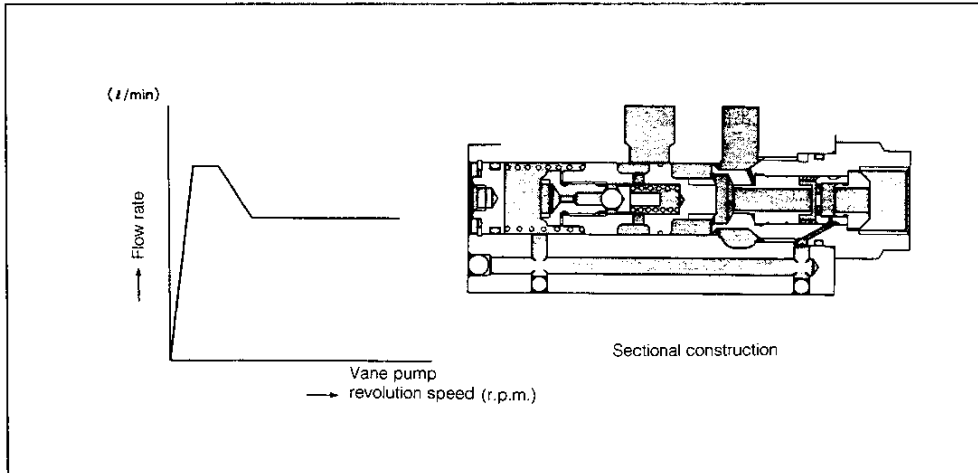


WFE90-SR015

STEERING

FLOW CONTROL VALVE

The flow control valve controls the flow rate of the fluid in accordance with the engine revolution speed (vane pump revolution speed). The flow control valve improves the steering feeling by providing a light steering turning effort during low-speed operations and a certain extent of the steering turning effort during high-speed operations.

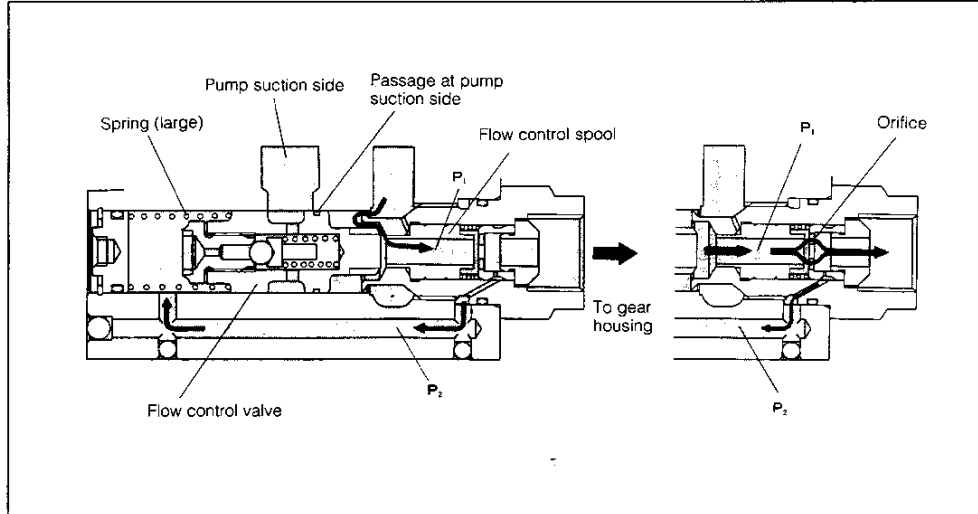


WPE90-SR016

OPERATION OF FLOW CONTROL VALVE

During low revolution speed period

The pump delivery pressure P_1 is applied to the right side of the flow control valve, while the pressure P_2 , i.e. pressure after the fluid has passed through the orifice, is applied to the left side. When the pump revolution speed is low, the passage at the pump suction side is closed. Therefore, the fluid which increases corresponding to the pump revolution speed is directly sent to the gear housing.

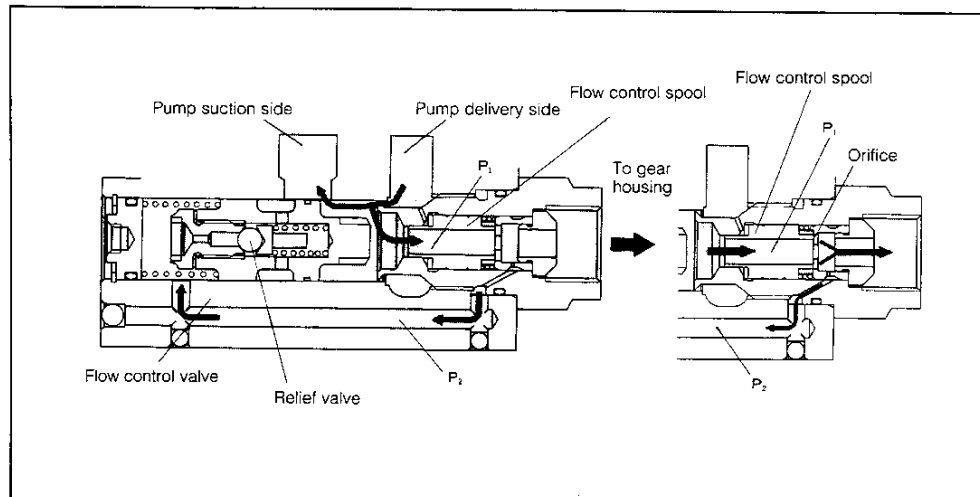


WPE90-SR017

During middle and high revolution speed period

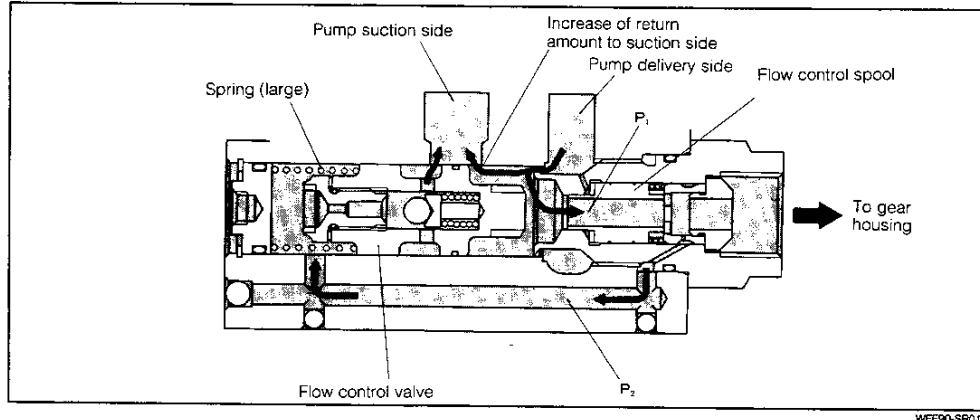
When the pump delivery pressure rises as the pump revolution speed increases, the flow control valve overcomes the spring (large one) tension, thereby moving toward the left side. Consequently, a part of the pump delivery side returns to the suction side, thus controlling the fluid flow rate to the gear housing. Also, the flow control spool moves toward the right side as a result of the rise of the pump delivery pressure P_1 .

When the flow control spool moves toward the right side, the orifice is restricted. This increases difference between the pump delivery pressure P_1 and the pressure P_2 , i.e. pressure after the fluid has passed through the orifice. Consequently, the flow control valve moves farther to the left. Hence, the return amount of the fluid from the pump delivery side to the pump suction side increases, thus reducing the fluid flow rate to the gear housing.



Operation of relief valve

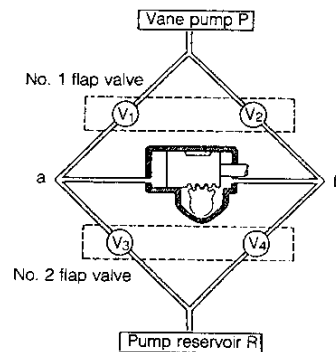
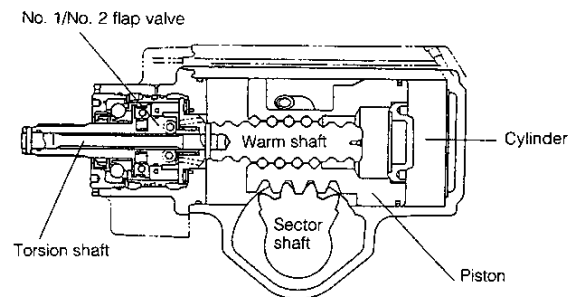
The relief valve is built inside the flow control valve. When the hydraulic pressure during revolution rises, the relief valve is opened. The fluid returns to the pump suction side via the arrowheaded passages. In this manner, the relief valve controls the maximum hydraulic pressure to from 65 to 70 kg/cm².



STEERING

OPERATION PRINCIPLE

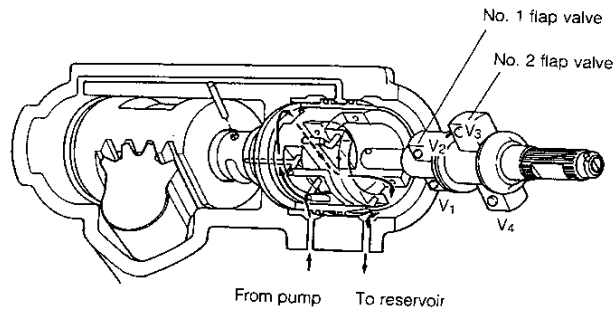
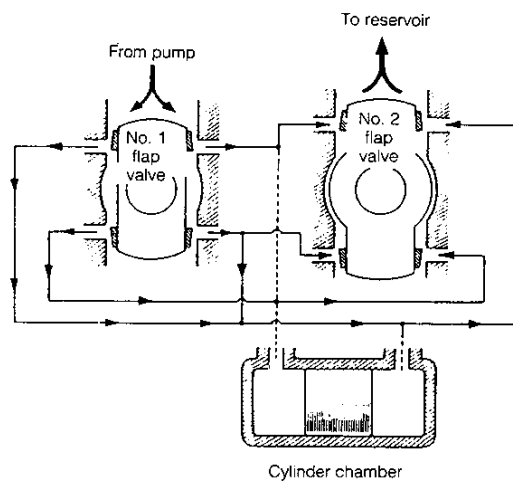
1. The V_1 and V_2 of the No. 1 flap valve are direction controlling valves, which switch the oil passage to either P-a-R or R-b-P, according to the movement of the steering wheel.
The V_3 and V_4 of the No. 2 flap valve are pressure controlling valves, which determines pressures at the points "a" and "b" according to steering.
2. When the steering wheel is in the neutral position, all those valves of V_1 , V_2 , V_3 and V_4 are open and there is no difference in pressure between the points "a" and "b".
3. When the steering wheel is turned to the right, the V_1 closes, V_2 and V_3 open and V_4 almost closes. The hydraulic pressure at the point "b" (in the cylinder) increases. Then the piston is pushed to the left in the figure, thus assisting the driver's steering effort.
The greater the steering effort, the smaller the opening of the V_4 , thus increasing the pressure at the point "b".
4. When the steering wheel is turned to the left, the power steering operation is reverse to that of (3).



OIL PASSAGE

1. When steering wheel is in neutral position:

As both the No. 1 and the No. 2 flap valves are in their neutral positions, the oil passage of the valve body is open. Hence, the fluid coming from the pump is returned to the reservoir through all oil passages. As a result, the hydraulic pressure in the cylinder will not increase and no force will be applied to the power piston.

Oil passage**Operational procedure**

STEERING

2. When steering wheel is turned to right:

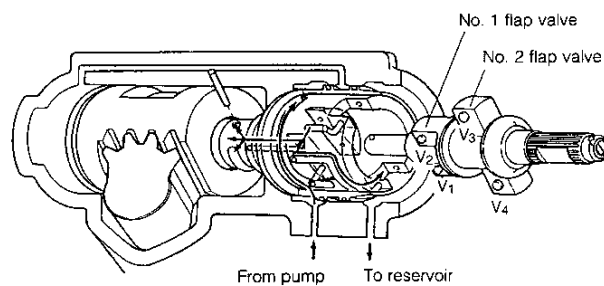
Because the V_2 of the No. 1 flap valve is opened and the V_4 is almost closed, the hydraulic pressure of the oil passage shown in the figure increases. The hydraulic pressure at the right side of the power piston in the figure increases, thus moving the piston to the left.

When the force applied to the worm shaft drops, the twisting angle of the torsion bar decreases. Hence, the clearance of the V_4 becomes large, thereby lowering the hydraulic pressure (a force which pushes the piston).

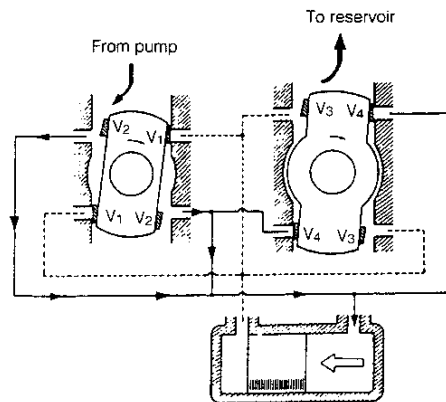
Conversely, when the force applied to the worm shaft becomes large, the V_4 fully closes, thus increasing the hydraulic pressure (a force which pushes the piston).

In this way, the No. 2 flap valve regulates the hydraulic pressure so that the servo force corresponding to the driver's turning effort may be produced.

Oil passage



Operational procedure

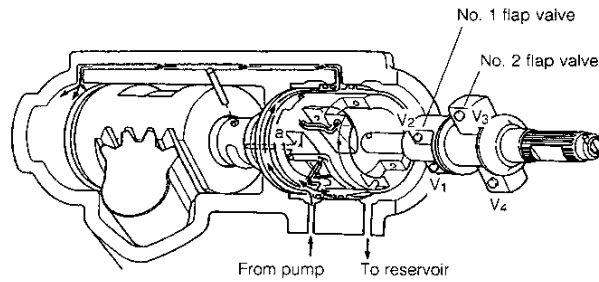


STEERING

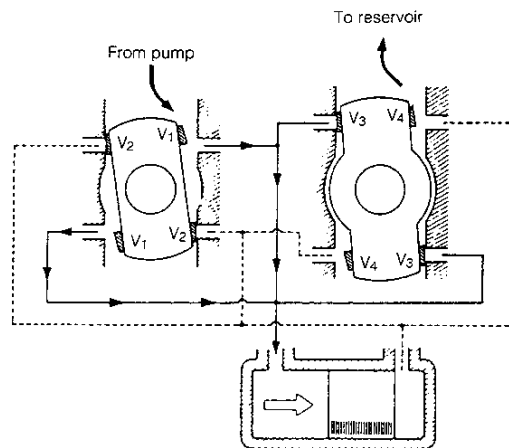
- When steering wheel is turned to left:

Because the V_1 of the No. 1 flap valve opens and the V_3 almost closes, the fluid flows in the following order as shown in the figure: the oil groove of the periphery ring, the oil passage of the valve body housing, and the oil passage of the steering gear housing. Then, the fluid flows into the left side of the power piston, thereby moving the piston to the right.

Oil passage



Operational procedure



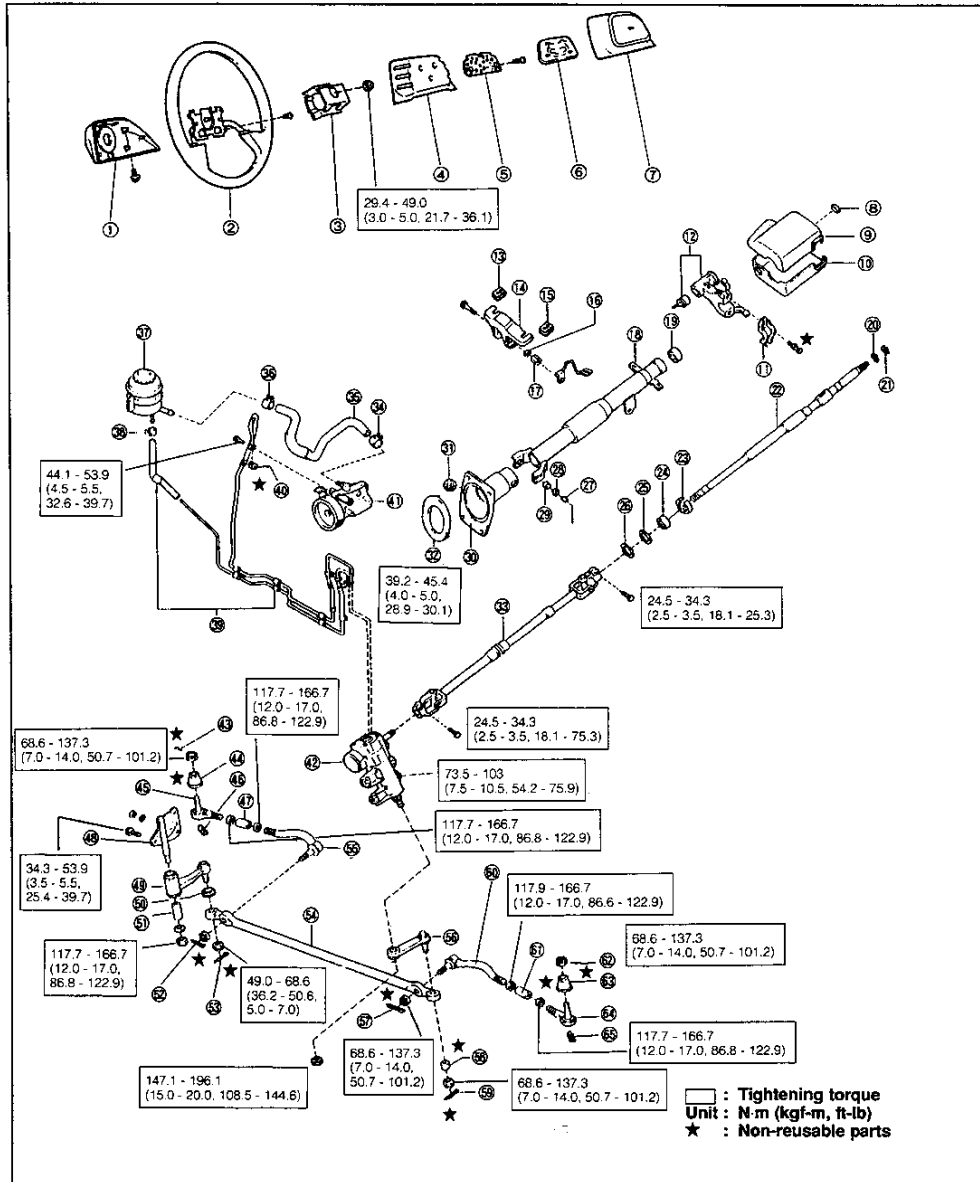
WFE90-SR023

STEERING

COMPONENTS

NOTE:

- This illustration below typically indicates those components of power steering-equipped left hand model.



WPE90-SR024

STEERING

- | | |
|--|-----------------------------------|
| ① Steering wheel cover | ②④ Clip |
| ② Steering wheel sub assembly | ②⑤ Oil reservoir-to-pump hose |
| ③ Energy absorbing pad | ②⑥ Clip |
| ④ Steering wheel lower cover | ②⑦ Oil reservoir assembly |
| ⑤ Horn bottom contact plate | ②⑧ Clip |
| ⑥ Horn bottom contact plate No.2 | ②⑨ Pressure feed tube assembly |
| ⑦ Horn pad sub assembly | ②⑩ Gasket |
| ⑧ Grommet | ②⑪ Vane pump assembly |
| ⑨ Steering column upper cover | ②⑫ Steering gear housing assembly |
| ⑩ Steering column lower cover | ②⑬ Cotter pin |
| ⑪ Steering column housing | ②⑭ Steering link joint dust seal |
| ⑫ Steering column upper w/switch bracket | ②⑮ Tie rod end sub assembly, R.H. |
| ⑬ Steering column upper attachment plate | ②⑯ Fitting grease |
| ⑭ Tilt steering support sub assembly | ②⑰ Tie rod adjusting tube |
| ⑮ Steering column upper attachment plate | ②⑱ Idler arm support pin |
| ⑯ Washer | ②⑲ Steering idler arm assembly |
| ⑰ Bolt | ②⑳ Dust seal |
| ⑱ Steering column tube sub assembly | ②㉑ Collar |
| ⑲ Radial ball bearing | ②㉒ Cotter pin |
| ⑳ Snap ring | ②㉓ Cotter pin |
| ㉑ Snap ring | ②㉔ Steering relay rod |
| ㉒ Steering main shaft sub assembly | ②㉕ Tie rod assembly, R.H. |
| ㉓ Steering shaft thrust stopper sub assembly | ②㉖ Pitman arm sub assembly |
| ㉔ Radial ball bearing | ②㉗ Cotter pin |
| ㉕ Washer | ②㉘ Steering link joint seal |
| ㉖ Snap ring | ②㉙ Cotter pin |
| ㉗ Collar | ②㉚ Tie rod assembly, L.H. |
| ㉘ Bush | ②㉛ Tie rod adjusting tube |
| ㉙ Bush | ②㉜ Cotter pin |
| ㉚ Steering column hole cover | ②㉝ Steering link joint dust seal |
| ㉛ Hole plug | ②㉞ Tie rod end sub assembly, L.H. |
| ㉜ Steering column hole cover shield | ②㉟ Grease fitting |
| ㉝ Steering intermediate shaft | |

STEERING

TROUBLESHOOTING

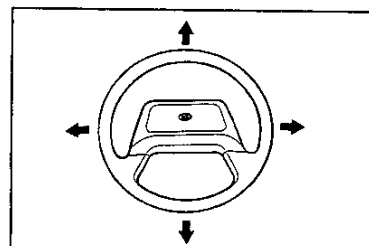
Symptom	Possible causes	Checking points
Hard steering Hard steering persists even after being jacked up.	<ul style="list-style-type: none">Faulty steering gearPreload improperly adjustedFaulty ball joint	<ul style="list-style-type: none">Check steering gear.Check steering linkage.
Steering effort becomes lighter after being jacked up.	<ul style="list-style-type: none">Tire sizeFront wheels improperly aligned	<ul style="list-style-type: none">Check front alignment and tire size.Check tire air pressure.
Excessive play	<ul style="list-style-type: none">Steering wheel improperly installedFaulty steering linkageSuspension improperly installedFaulty steering gearBush worn	<ul style="list-style-type: none">Check steering wheel.Check steering linkage.Check suspension.Check steering gear.Check steering linkage bush.
Abnormal noise	<ul style="list-style-type: none">Faulty steering shaftFaulty steering gearFaulty steering linkage	<ul style="list-style-type: none">Check steering shaft.Check steering gear.Check steering linkage.Check ball joint rattle.

WFE90-SR026

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.



WFE90-SR027

2. Check of steering wheel for free play

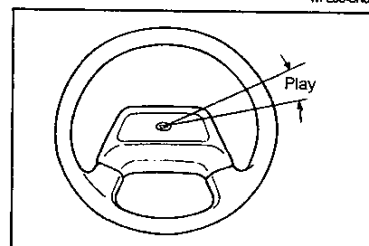
(1) Set the steering wheel to a straight-ahead state.

(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

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.



WFE90-SR028

3. Check of steering gear box fluid level

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

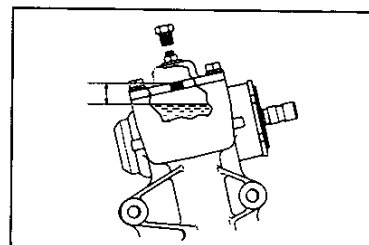
(2) Check the fluid level by inserting a clean screwdriver, etc. from the check hole. Ensure that the height from the fluid level to the upper edge of the check hole conforms to the specified value.

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.

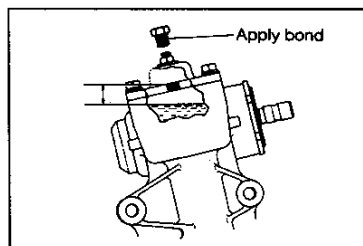


WFE90-SR029

STEERING

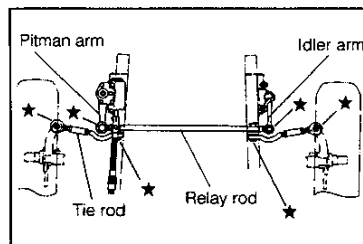
- (3) Clean the plug and plug hole. Furthermore, apply Three Bond 1216 to the threaded portion of the plug. Tighten the plug to the specified torque.

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



WFE90-SR030

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 exhibits 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.

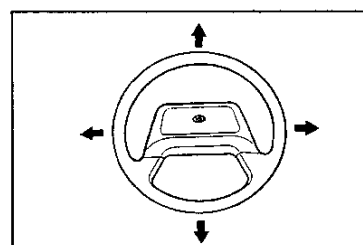


WFE90-SR031

(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.

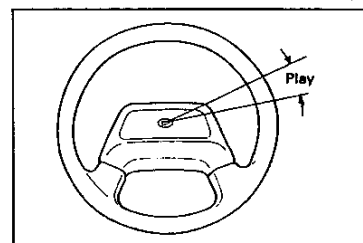


WFE90-SR032

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

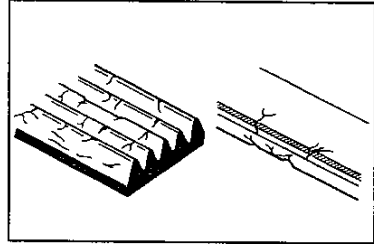
If not, check each joint section for excessive play. If the joints are satisfactory, replace the steering gear box.
If the joint sections exhibit defects, such as excessive play, replace the defective parts.



WFE90-SR033

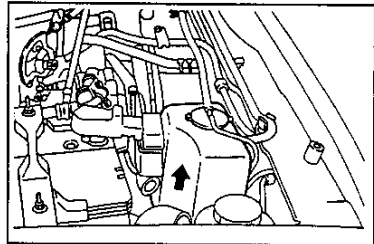
3. Check of power steering vane pump drive belt

- (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 or separation of the ribs, torn or worn ribs or cracks in the inner ridges of the ribs. If necessary, replace the drive belt. (See page SR-87.)



WFE90-SR034

- (2) Remove the radiator reserve tank by raising it. Put the reservoir tank on the radiator.



WFE90-SR035

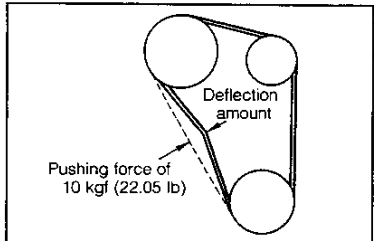
- (3) Check the amount of drive belt deflection when the midpoint of the drive belt between the vane pump pulley and the crankshaft pulley is pushed with a force of 10 kgf.

Specified Belt Deflection: 9 - 11 mm
[When a force of 10 kgf is applied.]

Reference:

Belt Tension: 50 - 75 kgf

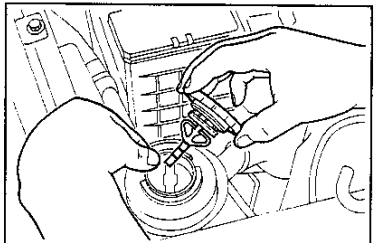
If the amount of belt deflection does not conform to the specified value, adjust the drive belt tension.
(See page SR-96.)



WFE90-SR036

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.



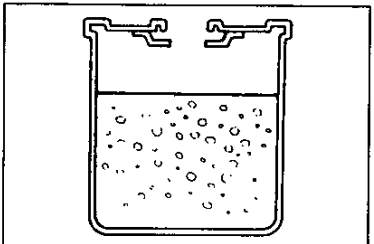
WFE90-SR037

- (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.

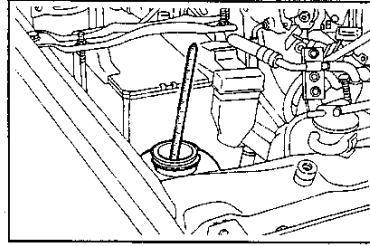
- (4) Close the reservoir tank cap.



WFE90-SR038

STEERING

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



WFE90-SR039

- (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.

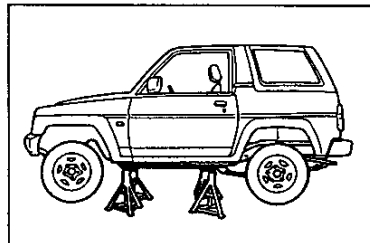
WFE90-SR040

6. Power steering fluid change procedure

CAUTION:

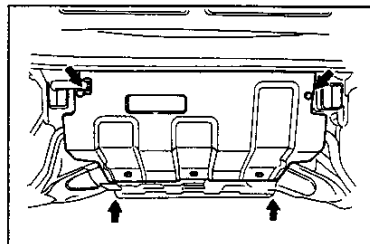
- Never start the engine while the power steering fluid is being drained.

- (1) Place the vehicle on a level floor. Jack up the vehicle and support it with safety stands. (See page G1 section.)



WFE90-SR041

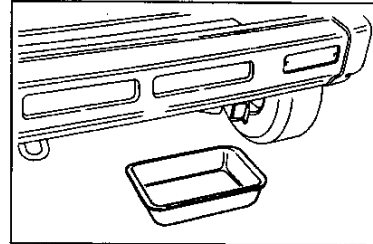
- (2) Detach the engine undercover by removing the engine undercover attaching bolts.



WFE90-SR042

STEERING

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

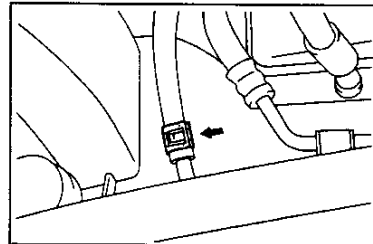


WFE90-SR043

- (4) 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.

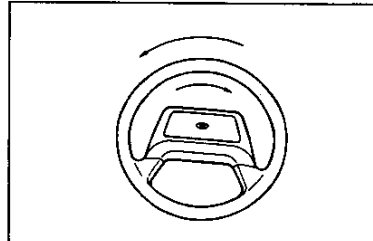


WFE90-SR044

NOTE:

- Be very careful not to deform the return pipe.

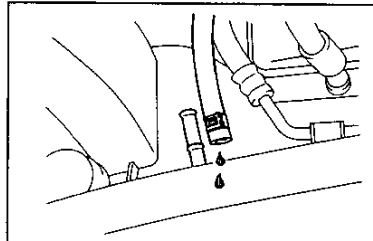
- (5) Turn the steering wheel fully clockwise or counterclockwise from the lock to the lock several times so as to drain the fluid inside the steering gear box.



WFE90-SR045

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.

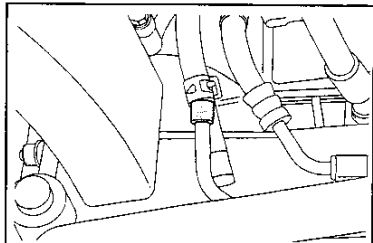


WFE90-SR046

- (6) 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.



WFE90-SR047

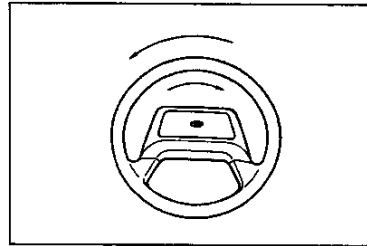
Specified Power Steering Fluid: ATF DEXRON® II

STEERING

- (7) 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.

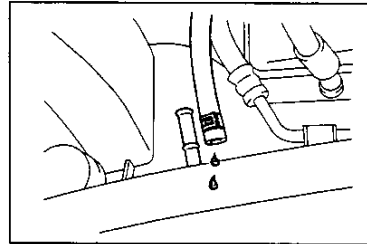


WFE90-SR048

- (8) 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.

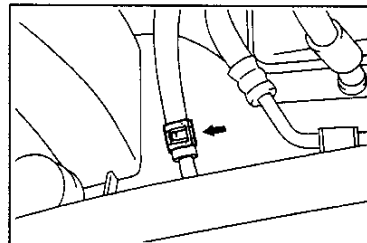


WFE90-SR049

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

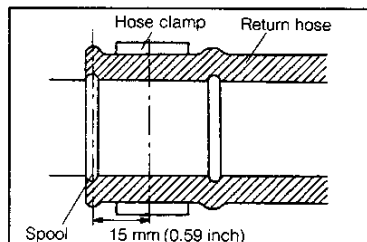
NOTE:

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



WFE90-SR050

- 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.

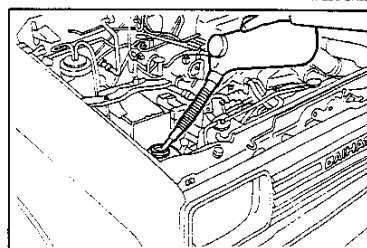


WFE90-SR051

- (10) 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.



WFE90-SR052

STEERING

- (11) Start the engine. Keep running the engine at the idle speed.
- (12) 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.

- (13) Repeat the operations described in the step (12) onward three or four times.
- (14) 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 (4) onward.

- (15) 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 exceeds the specified value.

Specified Value: 5 mm

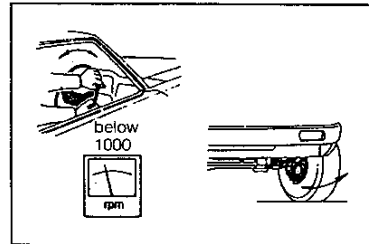
If the difference in fluid level exceeds the specified value, again perform air bleeding.

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

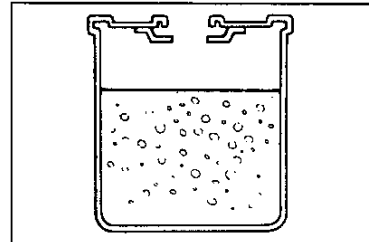
- (16) Check the fluid level.
(See page SR-20, step SR-21.)
- (17) Start the engine. Ensure that no fluid leakage is present.

- (18) 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.

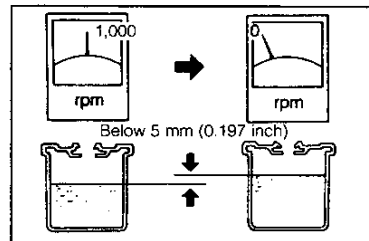
If any abnormality is present, perform air bleeding again.



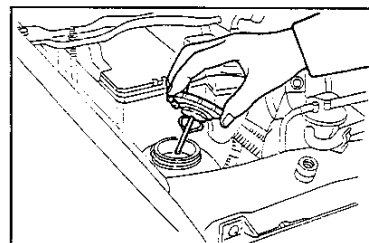
WFES0-SR053



WFES0-SR054



WFES0-SR055



WFES0-SR056

WFES0-SR057

STEERING

7. Check of power steering turning effort

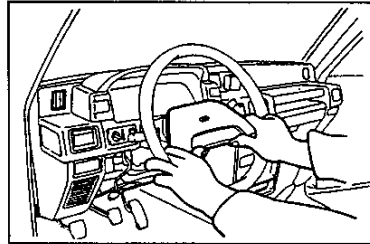
NOTE:

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.

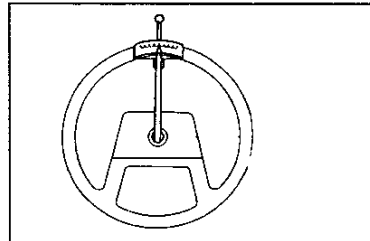
WFE90-SR058

- (1) Remove the steering wheel cover assembly from the steering wheel.
(See page SR-32.)



WFE90-SR059

- (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.



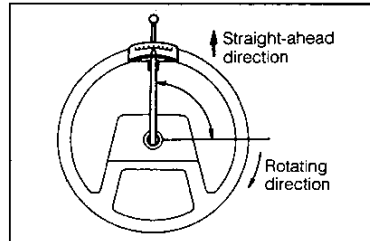
WFE90-SR060

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



WFE90-SR061

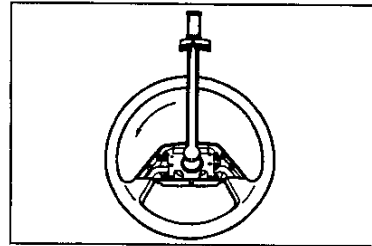
STEERING

- (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.



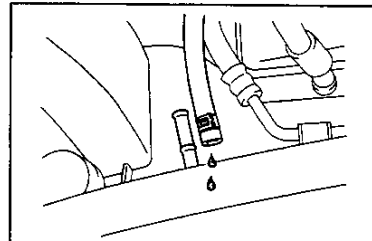
WFE90-SR062

8. Check of power steering hydraulic pressure

(1) Installation of pressure gauge

- ① Drain the power steering fluid.

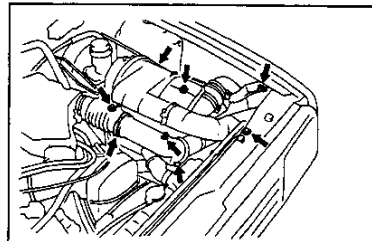
(See page SR-22, step (1) to step (5).)



WFE90-SR063

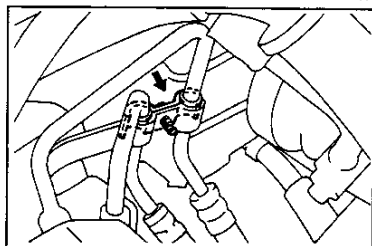
- ② Remove the attaching bolts for the air cleaner and air cleaner hose. Also, remove the clutch cable clamp bolts and hose bands. Remove the air cleaner and air hose as an assembly from the vehicle.

(For further details, see the Engine section.)



WFE90-SR064

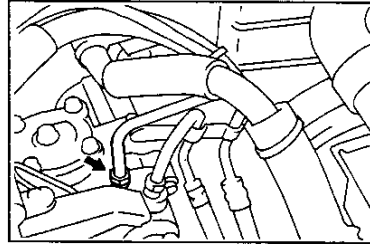
- ③ Detach the pressure tube clamp by removing the clamp screw.



WFE90-SR065

STEERING

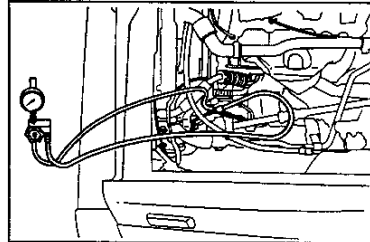
- ④ Disconnect the pressure side tube from the steering gear box.



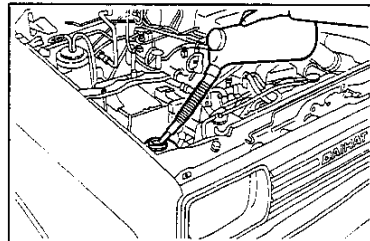
- ⑤ Connect the pressure gauge midway between the disconnected tube and the steering gear box.

NOTE:

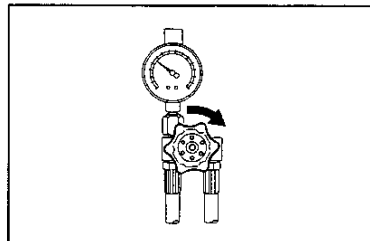
- Connect the pressure gauge in accordance with the pressure gauge manufacturer's instructions.



- (2) Fill power steering fluid.
(See page SR-24.)



- (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.

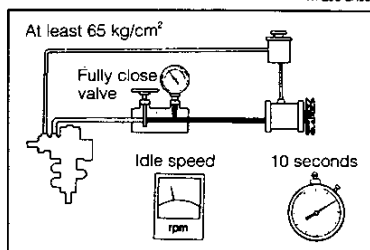


- (5) Check of vane pump hydraulic pressure
Close the valve of the pressure gauge temporarily and fully. Ensure that the pressure exceeds the specified pressure.
Specified Pressure: 65 kg/cm² or more

CAUTION:

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

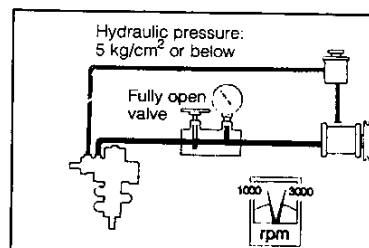
If the vane pump fails to deliver the specified pressure, replace the vane pump.



- (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

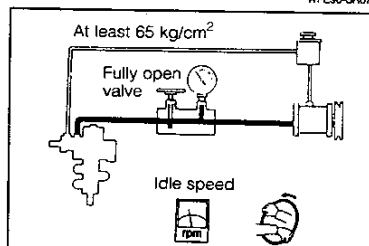
If the difference in pressure exceeds the specified value, replace the vane pump.



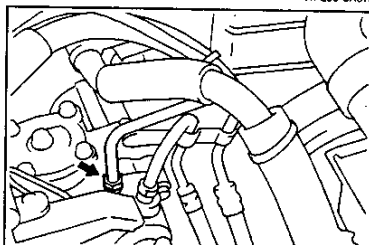
- (7) Check of steering gear housing hydraulic pressure
- ① Open the valve of the pressure gauge fully.
 - ② Turn the steering wheel fully either clockwise or counterclockwise and hold the steering wheel at the fully turned state. Ensure that the hydraulic pressure under this state exceeds the specified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

Specified Value: 65 kg/cm² or more

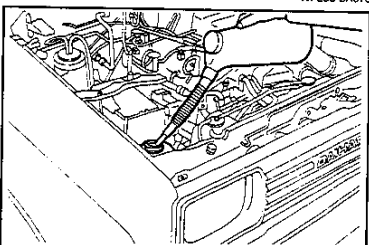
If the hydraulic pressure is below the specified value, replace the steering gear box.



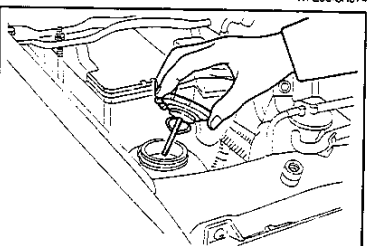
- (8) Remove the pressure gauge.
- (9) Connect the pressure side tube to the steering gear box.
- (See page SR-84.)
- Tightening Torque: 39.2 - 49.0 N·m
(4.0 - 5.0 kgf-m, 28.9 - 36.2 ft-lb)



- (10) Replenish the power steering fluid to the reservoir tank. Perform air bleeding. For the air bleeding procedure, refer to page SR-24 to SR-25.



- (11) Check the fluid level.
(See page SR-22.)
- (12) Start the engine. Ensure that no fluid leakage is present.



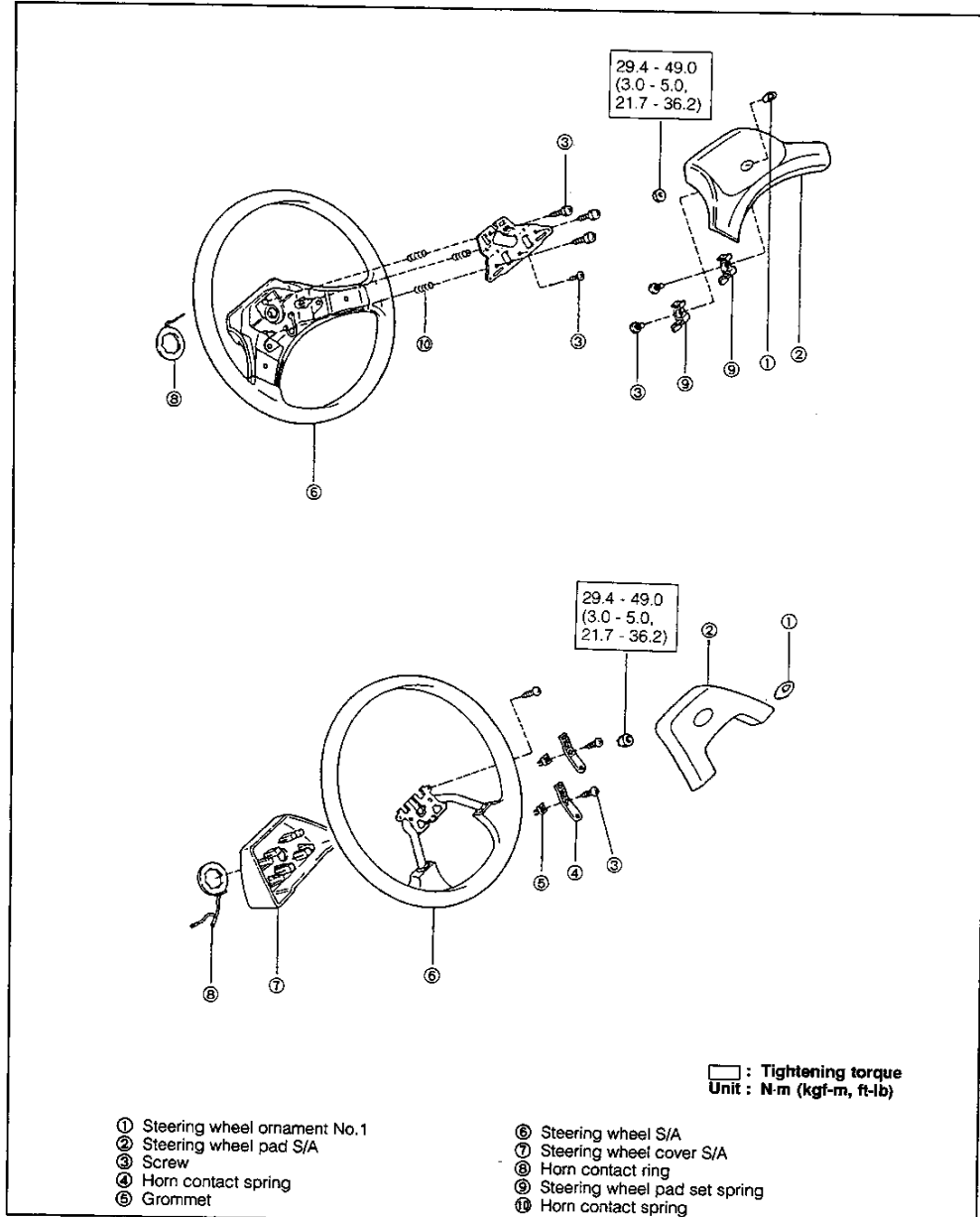
STEERING

Inspection of idle-up VSV

1. When turning the steering wheel, ensure that air continuity exists.
2. When the steering wheel is set to a straight-ahead position, ensure that no air continuity exists.
If not, replace the vane pump.

WFE90-SR076

STEERING WHEEL COMPONENTS

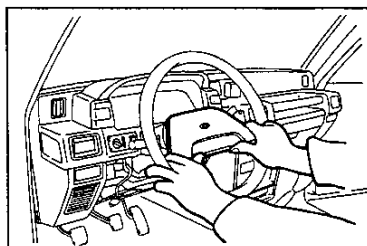


WFE90-SR077

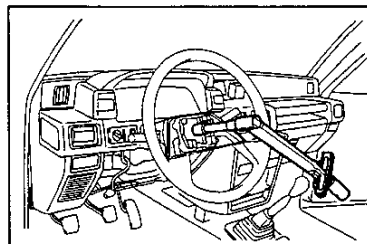
STEERING

REMOVAL

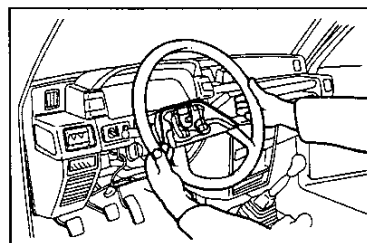
1. Remove the horn pad by pulling it horizontally together with the steering shaft.



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

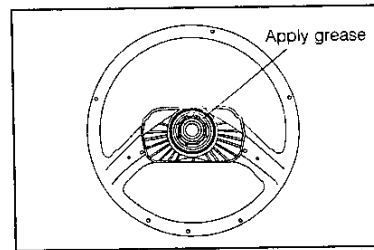


3. Disconnect the steering wheel by applying an impact to it with the palms of your hands.
4. Remove the steering wheel attaching nut.
5. Remove the steering wheel.



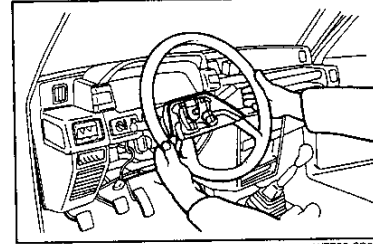
INSTALLATION

1. Apply about 2 grams of rubber grease to the horn contact plate.



WFE90-SR081

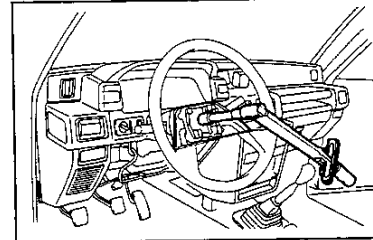
2. Align the hole of the steering wheel with the protruding section of the cancel cam. Install the steering wheel in such a way that it may be set to the straight-ahead position when the tires are in the straight-ahead position.



WFE90-SR082

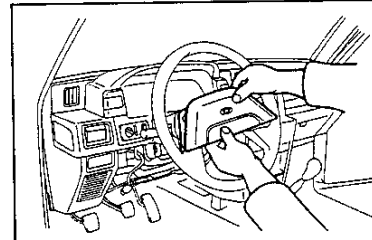
3. Install a new steering wheel attaching nut and tighten it to the specified torque.

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



WFE90-SR083

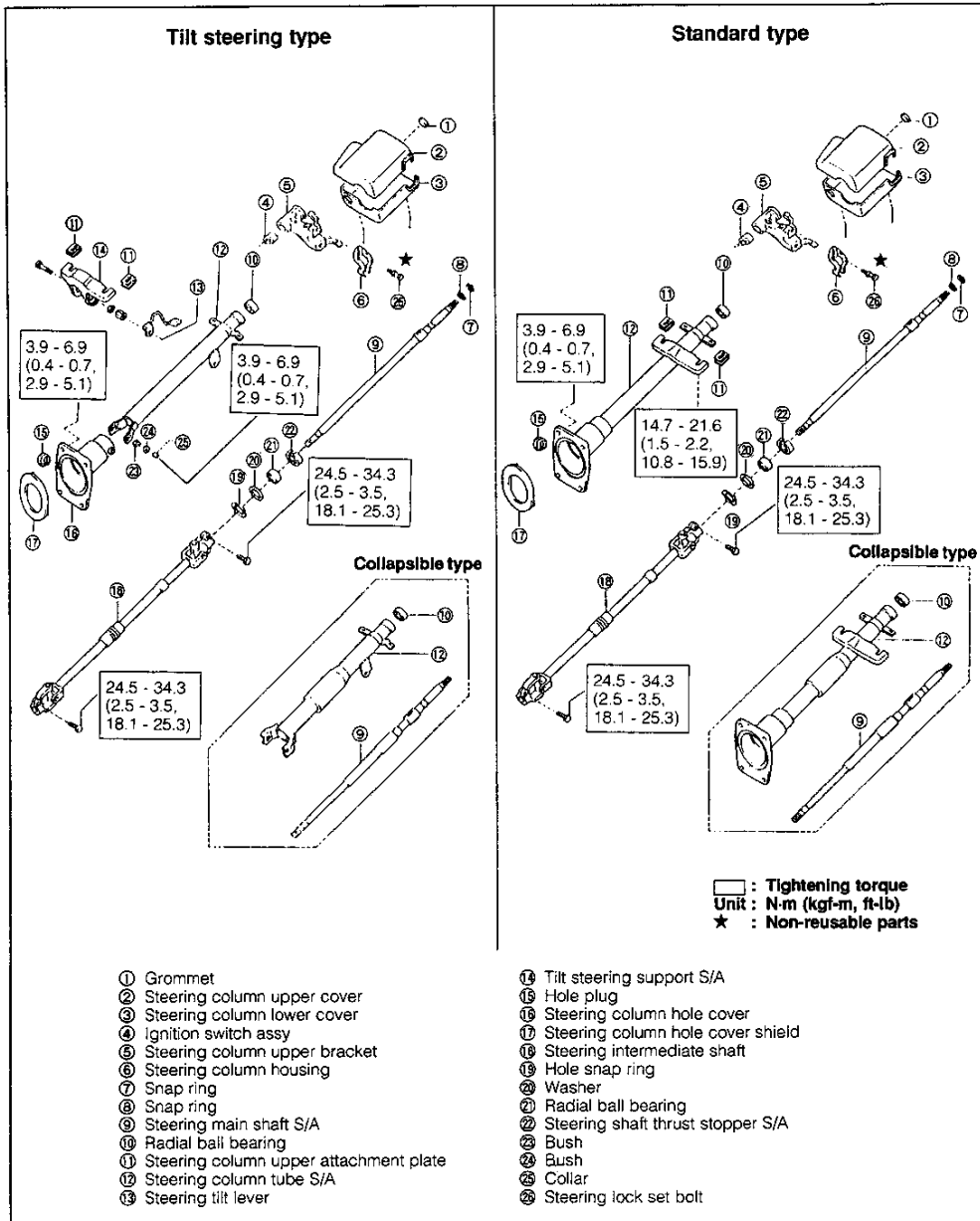
4. Install the horn pad while aligning it with the steering wheel attaching hole. Push the horn pad, until it is locked.



WFE90-SR084

STEERING

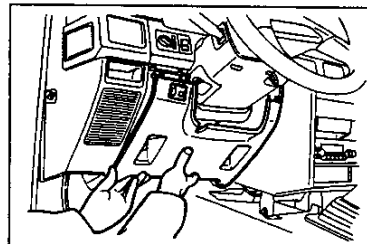
STEERING COLUMN COMPONENTS



WFE90-SR085

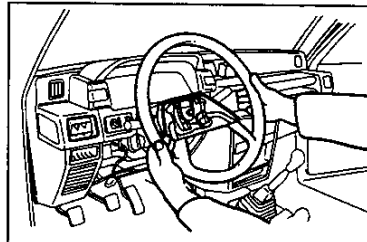
REMOVAL

1. Remove the instrument panel finish lower panel.
(For details, refer to the Body section.)



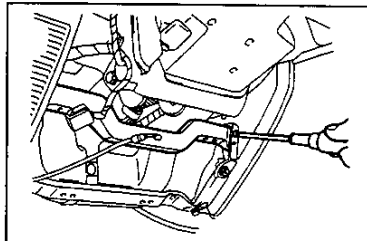
WFE90-SR086

2. Remove the steering wheel
(See page SR-32.)



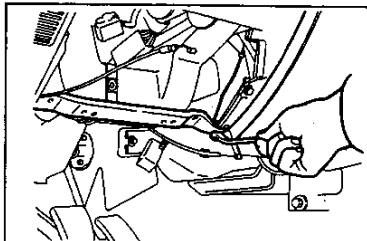
WFE90-SR087

3. Remove the instrument panel finish panel 1.



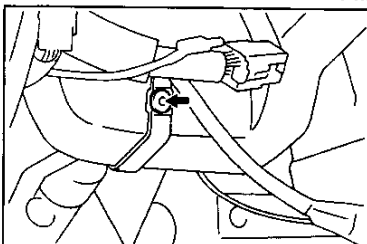
WFE90-SR088

4. Remove the instrument panel reinforcement subassembly.



WFE90-SR089

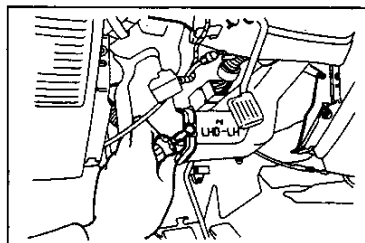
5. Removal of air duct assembly No. 1
(1) Push the center of the clip by the forward end of a Phillips screwdriver or the like.



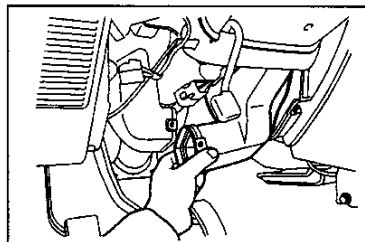
WFE90-SR090

STEERING

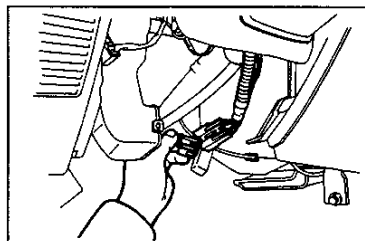
- (2) Detach the clip from the duct.



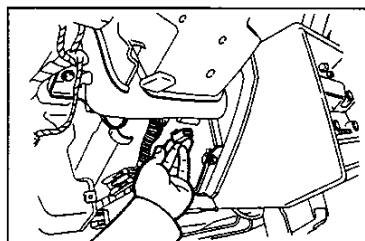
- (3) Remove the air duct assembly No. 1.



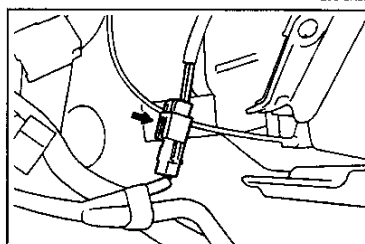
6. Disconnect the connector of the turn signal switch.



7. Disconnect the connector from the ignition switch.

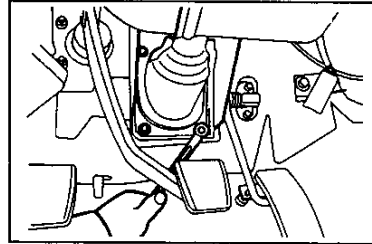


8. Disconnect the connector of the key reminder switch (if so equipped).



STEERING

9. Remove the attaching bolts at the steering column tube hole cover side.

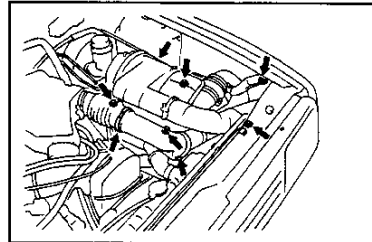


WFE90-SR096

10. Removal of air cleaner

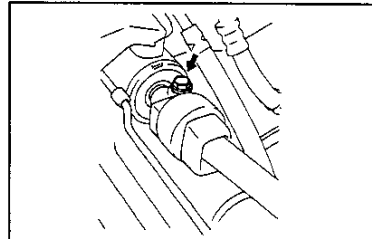
NOTE:

- For details, refer to the Engine section.
- The air cleaner assembly has been removed so that the disconnection/reconnection of the intermediate shaft may be performed easily.



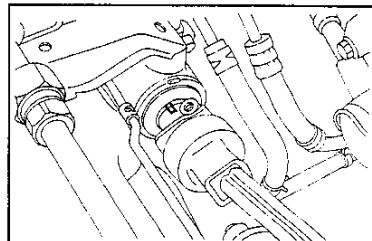
WFE90-SR097

- (1) Remove the attaching bolts of the air cleaner and air hoses.
 - (2) Loosen the hose band.
 - (3) Remove the air cleaner and air hose as an assembly from the vehicle.
11. Disconnection of intermediate shaft from steering gear housing



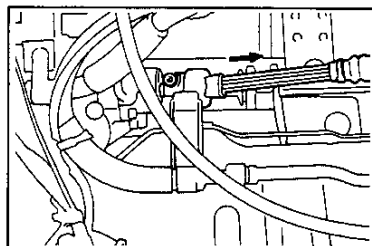
WFE90-SR098

- (1) Remove the connecting bolts at the universal joint of the intermediate shaft.
- (2) Put mating marks on the universal joint of the intermediate shaft and the shaft at the steering gear housing side.



WFE90-SR099

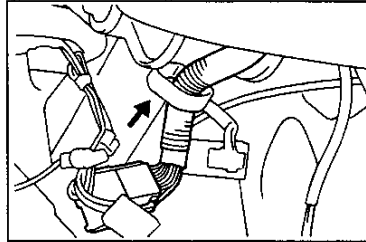
- (3) Disconnect the intermediate shaft from the steering gear housing by contracting the intermediate shaft.



WFE90-SR100

STEERING

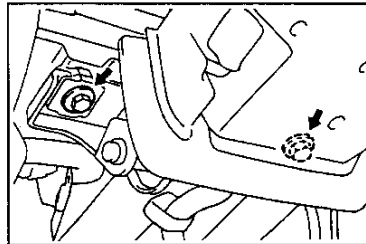
12. Detach the wiring harness which is clamped to the steering column.



13. Remove the steering column attaching bolts.

NOTE:

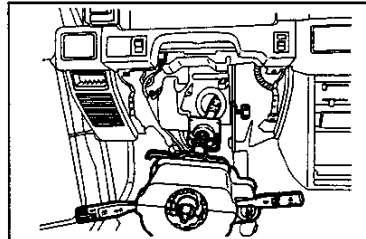
- Be very careful not to drop the steering column.
- Care must be exercised not to soil the seat.



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

NOTE:

- Care must be exercised so that the spline connecting section of the intermediate shaft may not be disconnected.

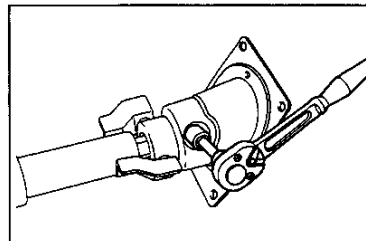


15. Remove the hole plug. Remove the bolts which connect the steering shaft to the intermediate shaft.

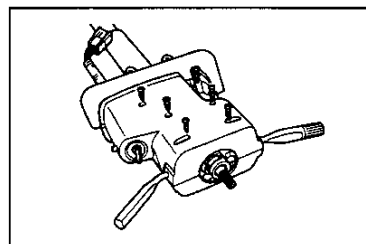
16. Pull out the intermediate shaft from the steering shaft.

NOTE:

- Be sure to put a mating mark on both the steering shaft and intermediate shaft so that the assembling position may be known readily.

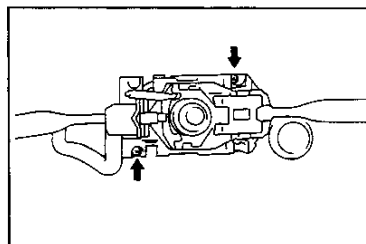


17. Remove the six attaching screws of the steering column cover. Remove the steering column cover from the steering column.



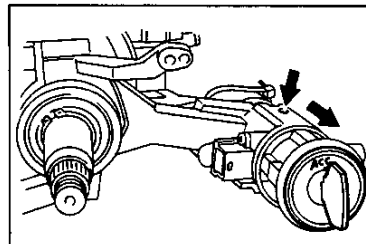
STEERING

18. Remove the attaching screws of the turn signal lamp switch assembly. Remove the turn signal lamp switch assembly from the steering column.



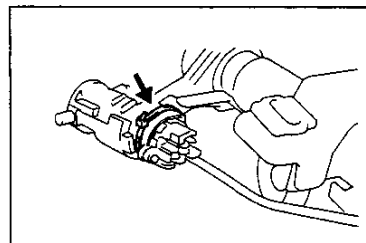
WFE90-SR108

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



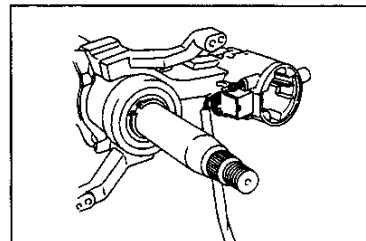
WFE90-SR109

20. Detach the key reminder switch cord coat clamp.
 (Key reminder switch-equipped vehicle only)



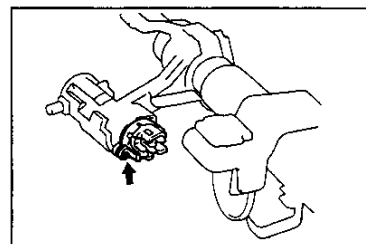
WFE90-SR110

21. Remove the attaching screw of the key reminder switch. Remove the key reminder switch from the pawl section of the steering column upper bracket by turning the switch clockwise. In this way, remove the key reminder switch from the steering column upper bracket.
 (Key reminder switch-equipped vehicle only)



WFE90-SR111

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



WFE90-SR112

STEERING

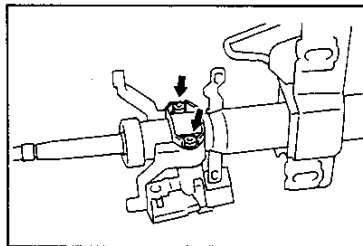
23. Removal of steering column upper bracket

- (1) Make a recessed mark at the center of the steering lock set bolt with a punch.
- (2) Remove the head of the set bolt by drilling the center of the set bolt with a drill of about 17 mm diameter.

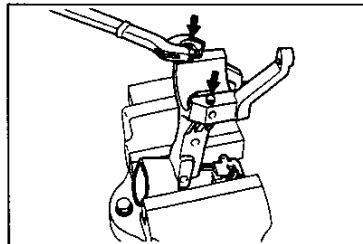
NOTE:

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

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



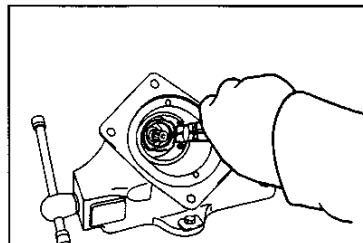
WFE90-SR113



WFE90-SR114

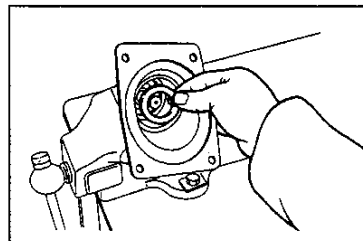
24. Disassembly of steering column

- (1) Detach the hole snap ring.



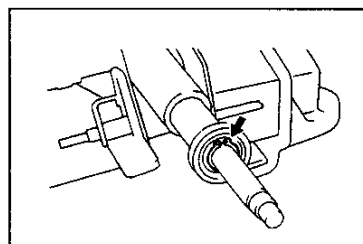
WFE90-SR115

- (2) Remove the washer plate.



WFE90-SR116

- (3) Detach the shaft snap ring.



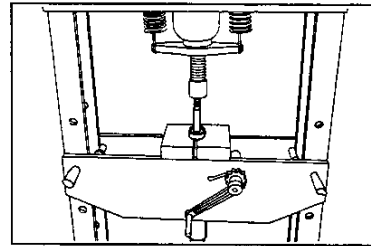
WFE90-SR117

STEERING

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

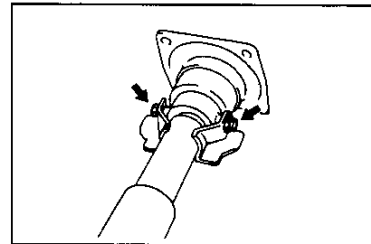
NOTE:

- 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.



WFE90-SR116

- (5) Remove the attaching bolts of the steering column hole cover. Remove the steering shaft together with the steering column hole cover. (Tilt steering type only)

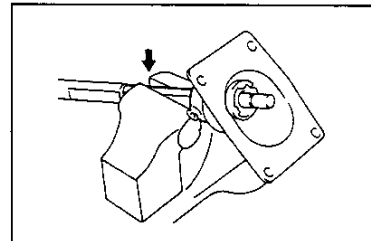


WFE90-SR119

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

NOTE:

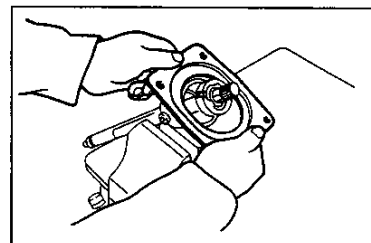
- Be sure to clamp the lower shaft only in a vice. Never clamp the upper shaft (hollow shaft) in a vice.



WFE90-SR120

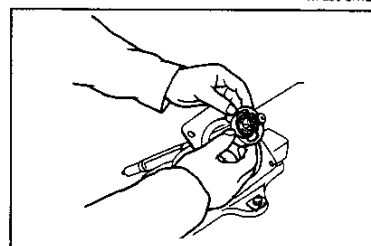
- (7) Remove the steering column hole cover from the steering shaft while prying and lowering the cover. (Tilt steering type only)

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



WFE90-SR121

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



WFE90-SR122

STEERING

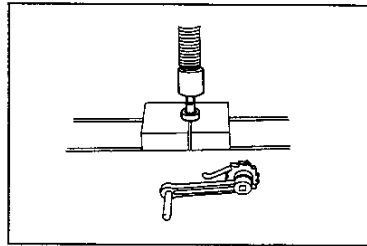
26. Removal of radial ball bearing

(Only cases where such operation is required, see page SR-43)

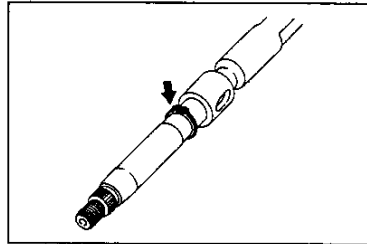
Pull out the radial ball bearing from the steering shaft, using a hydraulic press.

NOTE:

- Be very careful not to drop the steering shaft. If the shaft should be dropped, the connecting section of the steering shaft will be broken.
- Never reuse the removed bearing.

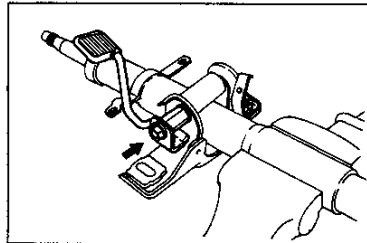


27. Detach the snap ring from the steering shaft. (Only cases where such operation is required)



28. Removal of tilt steering support

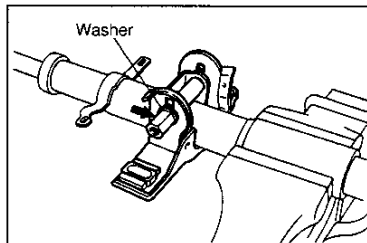
- (1) Remove the steering tilt lever attaching nut, while applying a spanner to the long nut to prevent the nut from turning.
- (2) Remove the steering tilt lever.



- (3) Remove the long nut and washer. Pull out the attaching shaft. Remove the tilt steering support.

NOTE:

- The long nut is a left-hand threaded nut.



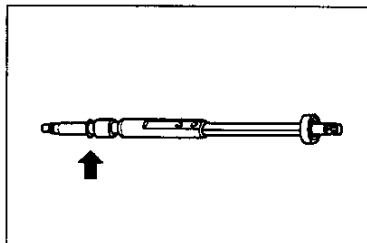
INSPECTION

1. Inspection of steering shaft

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

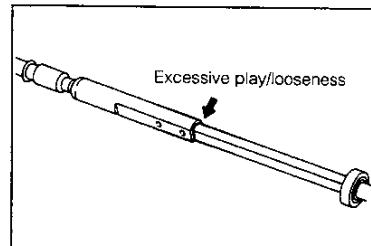
NOTE:

- If the snap ring is damaged, remove the snap ring. (See step 27 above.)



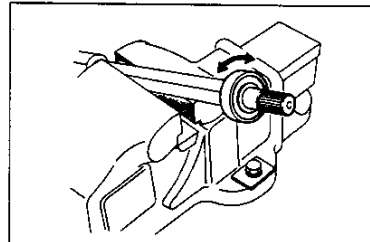
STEERING

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



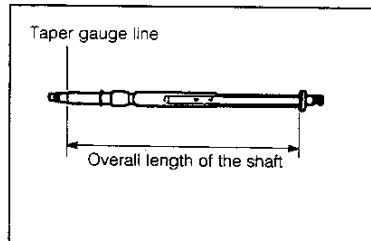
WFE90-SR128

- (3) Ensure that the radial ball bearing of the steering shaft exhibits no defect, such as abnormal binding.
If any defect is present, replace the radial ball bearing.
(See page SR-42 and SR-47.)



WFE90-SR129

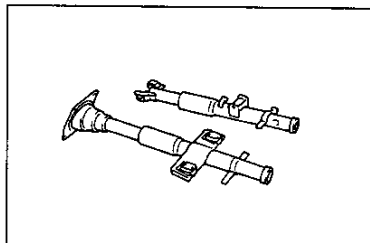
- (4) Ensure that the overall length of the steering shaft is within the specified value.
(Tilt steering-equipped vehicle only)
Specified Value: About 545.5 mm



WFE90-SR130

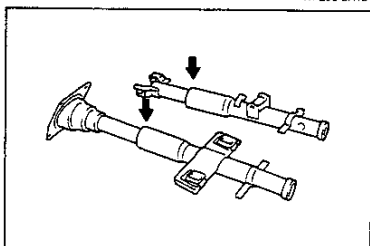
2. Steering column tube

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



WFE90-SR131

- (2) Ensure that no excessive play or looseness is present at the connecting section between the upper and lower sections of the steering column tube.
(Tilt steering-equipped vehicle only.)



WFE90-SR132

STEERING

- (3) Ensure that the overall length of the steering column tube is within the specified value. (Tilt steering-equipped vehicle only)

Specified Value:

Standard Type: About 313 mm*¹

Tilt Steering Type: About 559 mm*²

NOTE:

*1 Dimension between centers of bolt holes

*2 Dimension between the center of the hole at column hole cover and the bearing end section

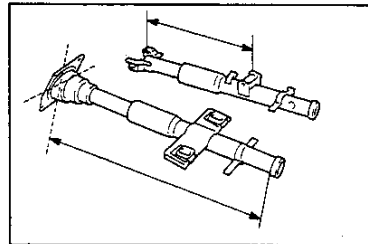
- (4) Ensure that the radial ball bearing assembled in the steering column tube exhibits no defect, such as abnormal binding.
If any defect is present, replace the steering column tube.

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

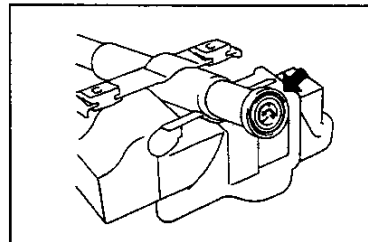
4. Ensure that the steering column hole cover shield exhibits no damage, such as cracks.

5. Inspection of intermediate shaft

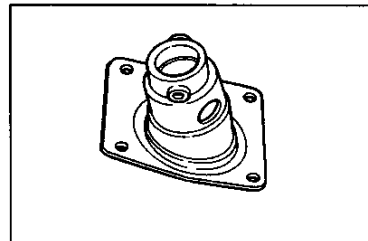
- (1) Ensure that the intermediate shaft exhibits no defect, such as excessive play at the spline section.



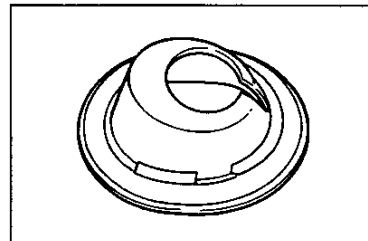
WFE90-SR133



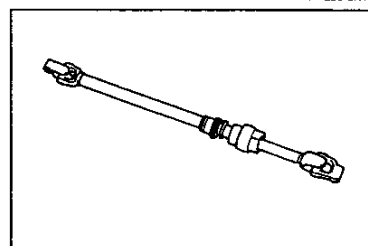
WFE90-SR134



WFE90-SR135



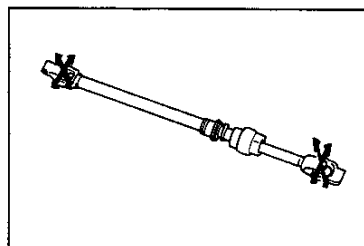
WFE90-SR136



WFE90-SR137

STEERING

- (2) Ensure that the intermediate shaft exhibits no defect, such as excessive play at the joint section of the universal joint.

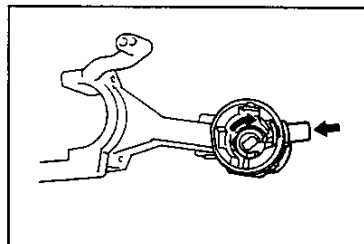


WFE90-SR138

6. Inspection of steering column upper bracket
 (1) While holding the pushbutton, turn the cam inside the steering column upper bracket, using a standard screwdriver, until the cam assumes the positional relationship as indicated in the right figure.

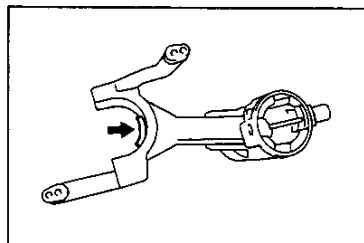
NOTE:

- Do not pull out the cam.



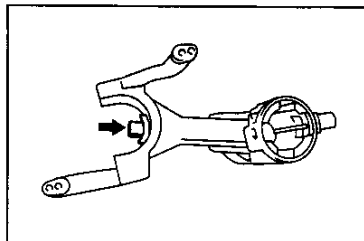
WFE90-SR139

- (2) Ensure that the pawl of the steering lock is not protruded under the condition (1).



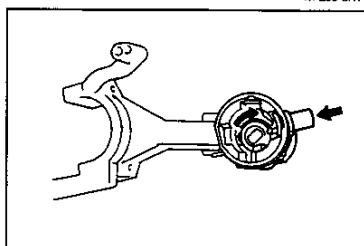
WFE90-SR140

- (3) Under the condition (1), push the pushbutton. Ensure that the pawl for steering shaft lock jumps out.



WFE90-SR141

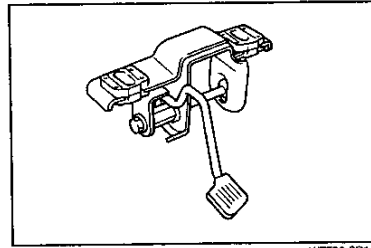
- (4) Return the steering column upper bracket to the condition (1).



WFE90-SR142

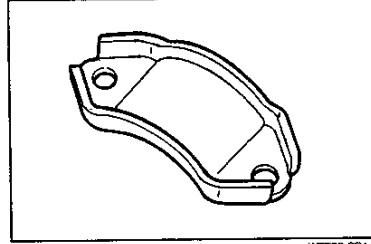
STEERING

7. Ensure that no damage is present at the tilt steering support, plain washer, lock nut and steering tilt lever. Replace any damaged part.



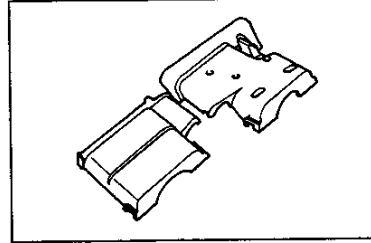
WFE90-SR143

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



WFE90-SR144

9. Inspection of steering column cover
Ensure that the steering column cover exhibits no damage, such as scratch, wear and/or deformation.



WFE90-SR145

10. Perform unit inspection for each switch.
(Refer to the Body Electrical System section.)

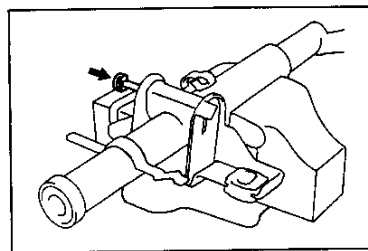
WFE90-SR146

INSTALLATION

1. Installation of tilt steering support
(Tilt steering-equipped vehicle only)
(1) Install the steering shaft support to the steering column tube through the attaching shaft.

NOTE:

- Be sure to align the shaft with the column tube groove during the assembling.



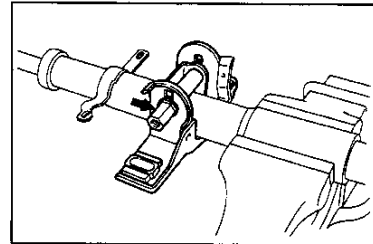
WFE90-SR147

STEERING

- (2) Install the long nut to the shaft with the washer interposed. Temporarily tighten the long nut.

NOTE:

- The long nut is a left-hand threaded nut.

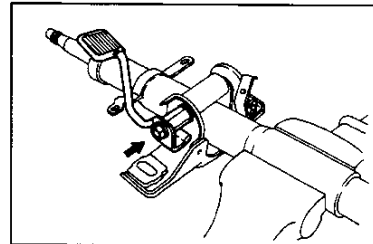


WFE90-SR148

- (3) Install the steering tilt lever to the shaft. Temporarily tighten the attaching bolt with a new spring washer interposed.

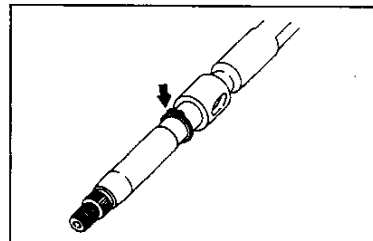
NOTE:

- Never reuse the spring washer.
- Be sure to insert the spring washer between the tilt lever and the long nut.



WFE90-SR149

2. Install a new snap ring to the steering shaft (if it was removed.)



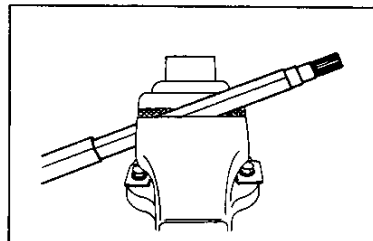
WFE90-SR150

3. Assembling of radial ball bearing (Only when it was removed)

- (1) Clamp the steering shaft lower shaft in a vice or the like.

NOTE:

- Never clamp the steering shaft upper shaft.



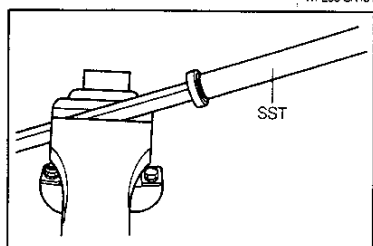
WFE90-SR151

- (2) Press a new radial ball bearing into the steering shaft, using the handle section of the following SST.

SST: 09648-87201-000

NOTE:

- When pressing the radial ball bearing, be sure to drive the inner race. Never apply force to the outer race and bearing cover, etc.



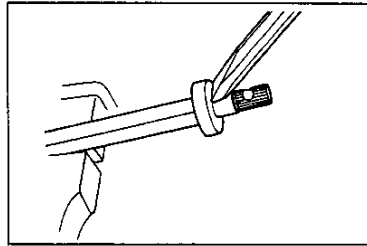
WFE90-SR152

STEERING

- (3) To prevent the steering shaft radial ball bearing from dropping, lightly prevent the steering shaft from turning with a chisel. At this time, be careful not to deform the steering shaft.

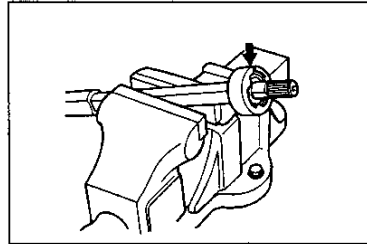
NOTE:

- Be very carefull not to bent the steering shaft.



WFE90-SR153

4. Install the steering shaft thrust stopper to the radial ball bearing.
5. Apply a thin film of Sunper[®] 150 to the steering shaft thrust stopper surface.

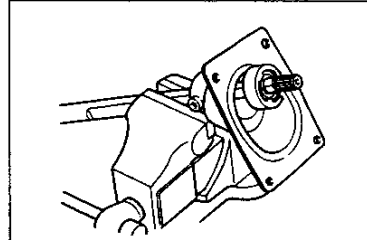


WFE90-SR154

6. 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.

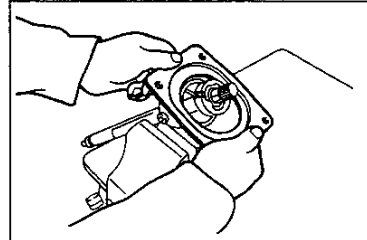


WFE90-SR155

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

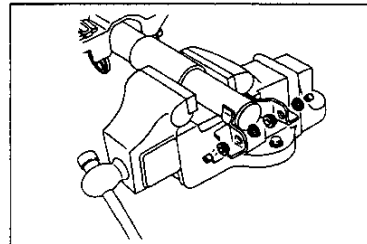
NOTE:

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



WFE90-SR156

7. 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.



WFE90-SR157

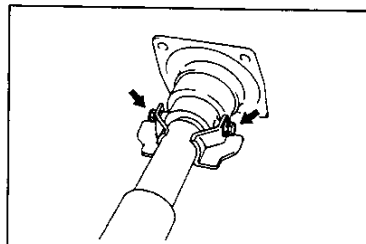
STEERING

- (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.



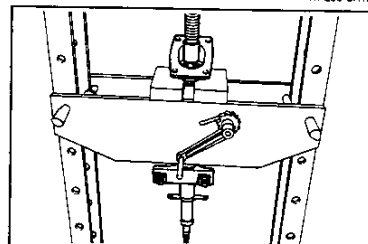
WFE90-SR158

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

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

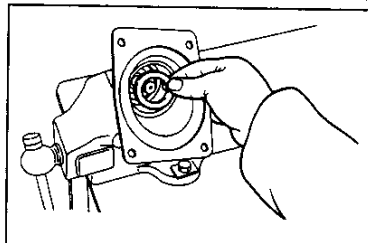
NOTE:

- 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.



WFE90-SR159

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

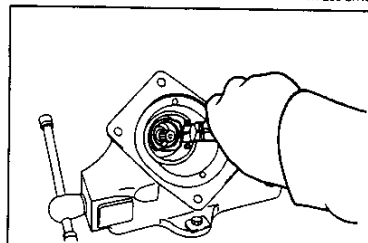


WFE90-SR160

10. Attach a new snap ring.

NOTE:

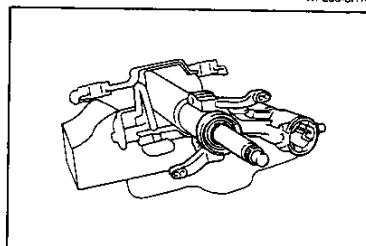
- Make sure that the snap ring is fitted in the snap ring groove of the steering column tube or steering column hole cover.



WFE90-SR161

11. Install the new shaft snap ring

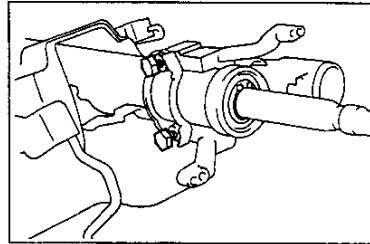
12. Install the steering column upper bracket to the steering column tube, while aligning it with the hole of the pawl for steering column tube locking use.



WFE90-SR162

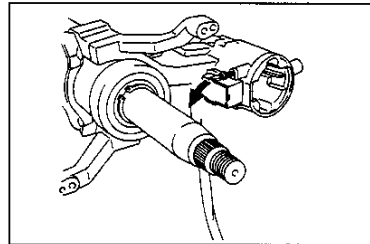
STEERING

13. Install the steering column housing. Connect the steering column upper bracket with the steering column by attaching a new bolt.
14. Tighten the attaching bolts evenly, until the hexagonal section of the bolts are broken.



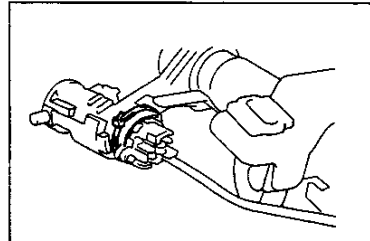
WFE90-SR163

15. Installation of key reminder switch
(Key reminder switch equipped vehicle only)
 - (1) Insert the key reminder switch into the installation section of the steering column upper bracket. Hook the key reminder switch to the pawl of the steering column upper bracket.
 - (2) Tighten the attaching screw.



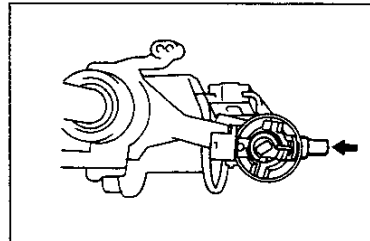
WFE90-SR164

- (3) Install the harness to the steering column upper bracket with a clamp band.



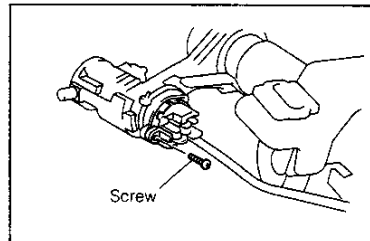
WFE90-SR165

16. Installation of ignition key switch
 - (1) With the pushbutton pushed, turn the shaft of the steering column upper bracket until the shaft assumes the position as indicated in the right figure.



WFE90-SR166

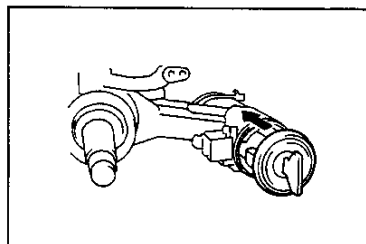
- (2) While aligning the recessed section of the ignition key switch with the pawl of the steering column upper bracket, insert the ignition key switch into the steering column upper bracket. Tighten the attaching screw.



WFE90-SR167

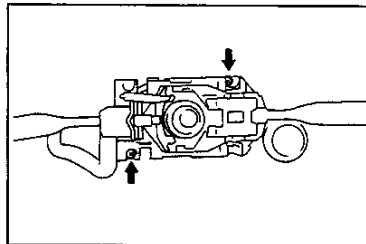
STEERING

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.



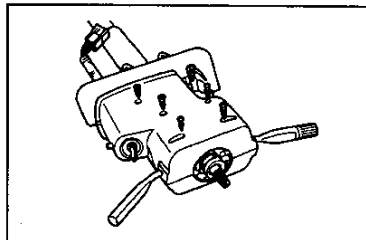
WFE90-SR168

18. Install the turn signal lamp switch assembly (combination switch) to the steering column. Tighten the attaching screws.



WFE90-SR169

19. Install the steering column cover to the steering column. Tighten the attaching screws.

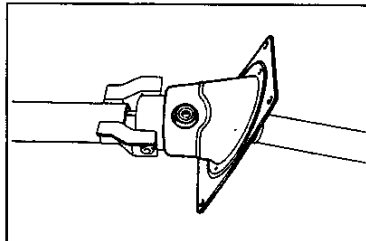


WFE90-SR170

20. Connection of intermediate shaft
(1) Connect the intermediate shaft to the steering shaft in such a way that the cut-out section of the steering shaft may be aligned with the bolt hole of the intermediate shaft.

NOTE:

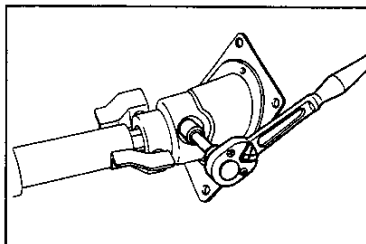
- Be sure to positively connect the universal joint to the serration section as far as it will go, until the serration section of the steering shaft becomes invisible from the universal joint edge surface of the intermediate shaft.
- If the steering shaft and intermediate shaft are reused, assemble them, while aligning the mating mark put during the disassembly.



WFE90-SR171

- (2) Insert the attaching bolts and tighten them to the specified torque.

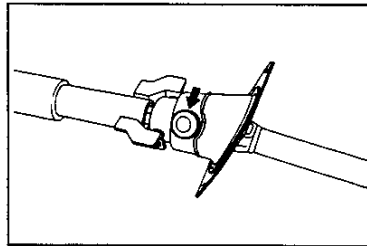
Tightening Torque: 24.5 - 34.3 N·m
(2.5 - 3.5 kgf-m, 18.1 - 25.3 ft-lb)



WFE90-SR172

STEERING

- (3) Install the hole plug.

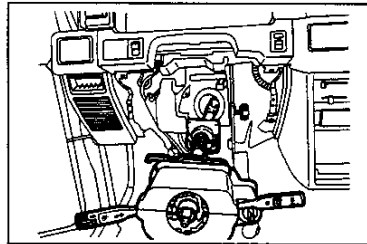


WFE90-SR173

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

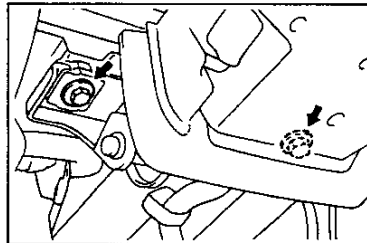
NOTE:

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



WFE90-SR175

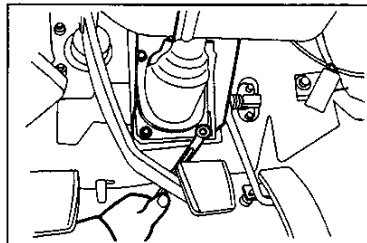
22. Install the steering column to the upper installation section. Temporarily tighten the attaching bolts.



WFE90-SR176

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

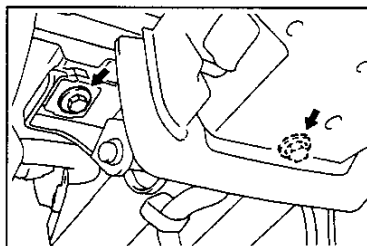
Tightening Torque: 3.9 - 6.9 N·m
(0.4 - 0.7 kgf-m, 2.9 - 5.1 ft-lb)



WFE90-SR178

24. Tighten the upper attaching bolts of the steering column to the specified torque.

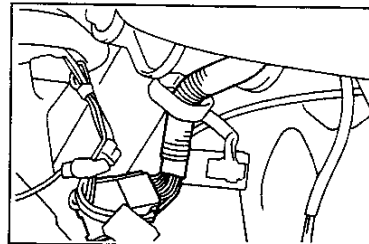
Tightening Torque: 14.7 - 21.6 N·m
(1.5 - 2.2 kgf-m, 10.8 - 15.9 ft-lb)



WFE90-SR179

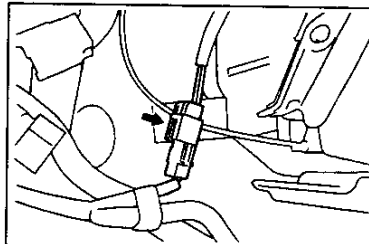
STEERING

25. Clamp the wire harness to the steering column.



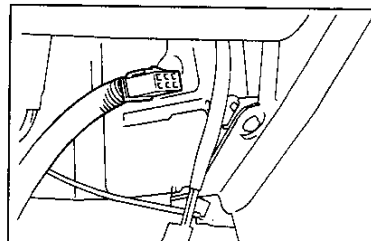
WFE90-SR180

26. Connect the key reminder switch connector (if so equipped).



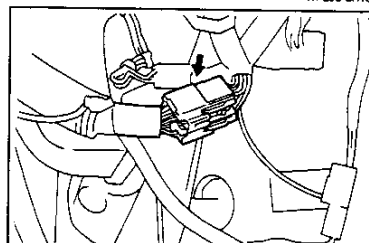
WFE90-SR181

27. Connect the connector to the ignition switch.



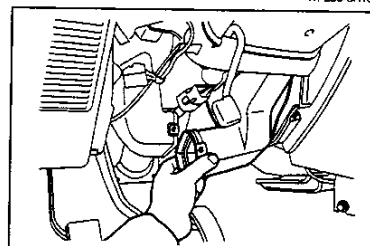
WFE90-SR182

28. Connect the connector of the turn signal switch.



WFE90-SR183

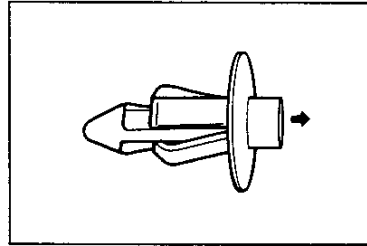
29. Install the air duct No. 1.



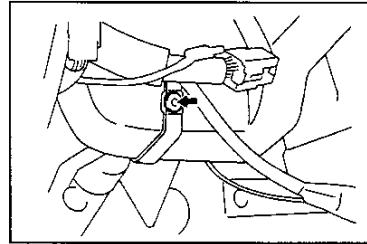
WFE90-SR184

STEERING

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



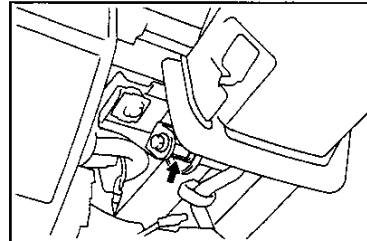
31. Install the clip to the air duct No. 1. Push down the shaft at the clip central section until it becomes flush with the clip surface. Then, lock the clip.



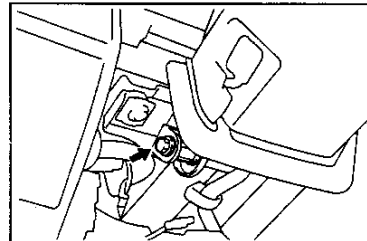
32. Tighten the long nut of the tilt steering support.
Tightening Torque: 12.7 N·m (1.3 kgf-m, 9.4 ft-lb)

NOTE:

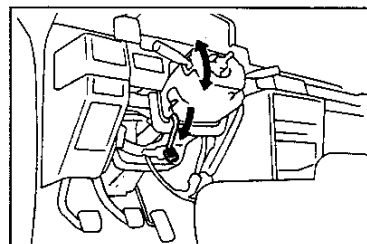
- The long nut is a left-threaded nut.



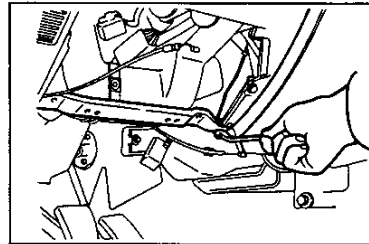
33. Set the tilt steering lever to the upper position. While preventing the lever from turning with the long nut, tighten the tilt steering lever attaching bolt to the specified torque.
Tightening Torque: 29.4 - 49.0 N·m
(3.0 - 4.5 kgf-m, 21.7 - 36.2 ft-lb)



34. Ensure that the steering column is secured.
If not, adjust the tightening torque, as instructed in the step 34.
35. Lower the tilt steering lever. Ensure that the steering tilt function operates properly.
If not, loosen the tilt steering lever attaching bolt while preventing the long nut from turning. Adjust the tightening torque of the long nut and repeat the operations from the step 34.

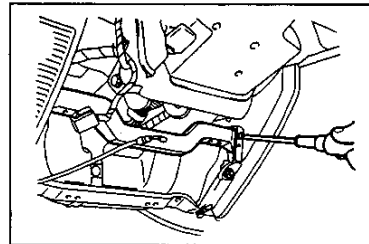


36. Install the instrument panel reinforcement subassembly.
(For details, refer to the Body section.)



WFE90-SR190

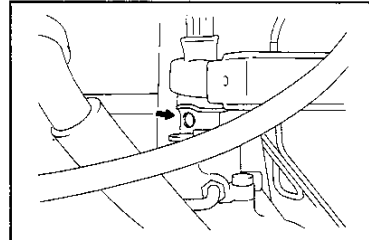
37. Install the instrument panel finish panel No. 1.
(For details, refer to the Body section.)



WFE90-SR191

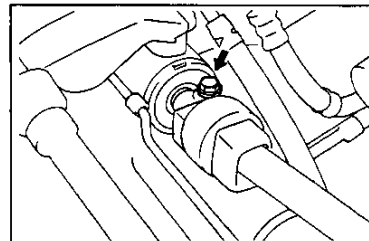
38. Connect the intermediate shaft to the steering gear housing, while aligning the cut-out section of the steering gear housing shaft with the bolt hole of the intermediate shaft.
NOTE:

- Be sure to positively connect the universal joint to the serration section as far as it will go, until the serration section of the shaft at the steering gear box side becomes invisible from the universal joint edge surface of the intermediate shaft.
- If the steering shaft and intermediate shaft are reused, assemble them, while aligning the mating mark put during the disassembly.



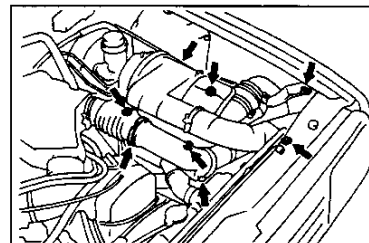
WFE90-SR192

39. Tighten the bolts which connect the intermediate shaft to the steering gear housing to the specified torque.
Tightening Torque: 24.5 - 34.3 N·m
(2.5 - 3.5 kgf-m, 18.1 - 25.3 ft-lb)



WFE90-SR193

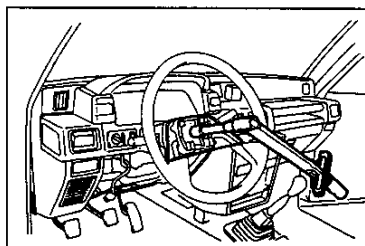
40. Installation of air cleaner and air hose
(For details, refer to the Engine section.)
(1) Install the air cleaner and air hose as an assembly to the vehicle. Tighten the five attaching bolts.
(2) Tighten the hose band.
(3) Tighten the clutch cable clamp bolt.



WFE90-SR194

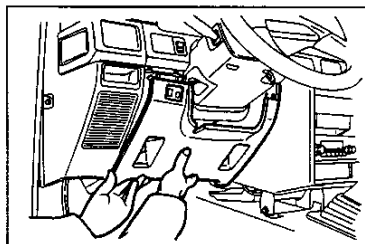
STEERING

41. Installation of steering wheel
(See page SR-33.)



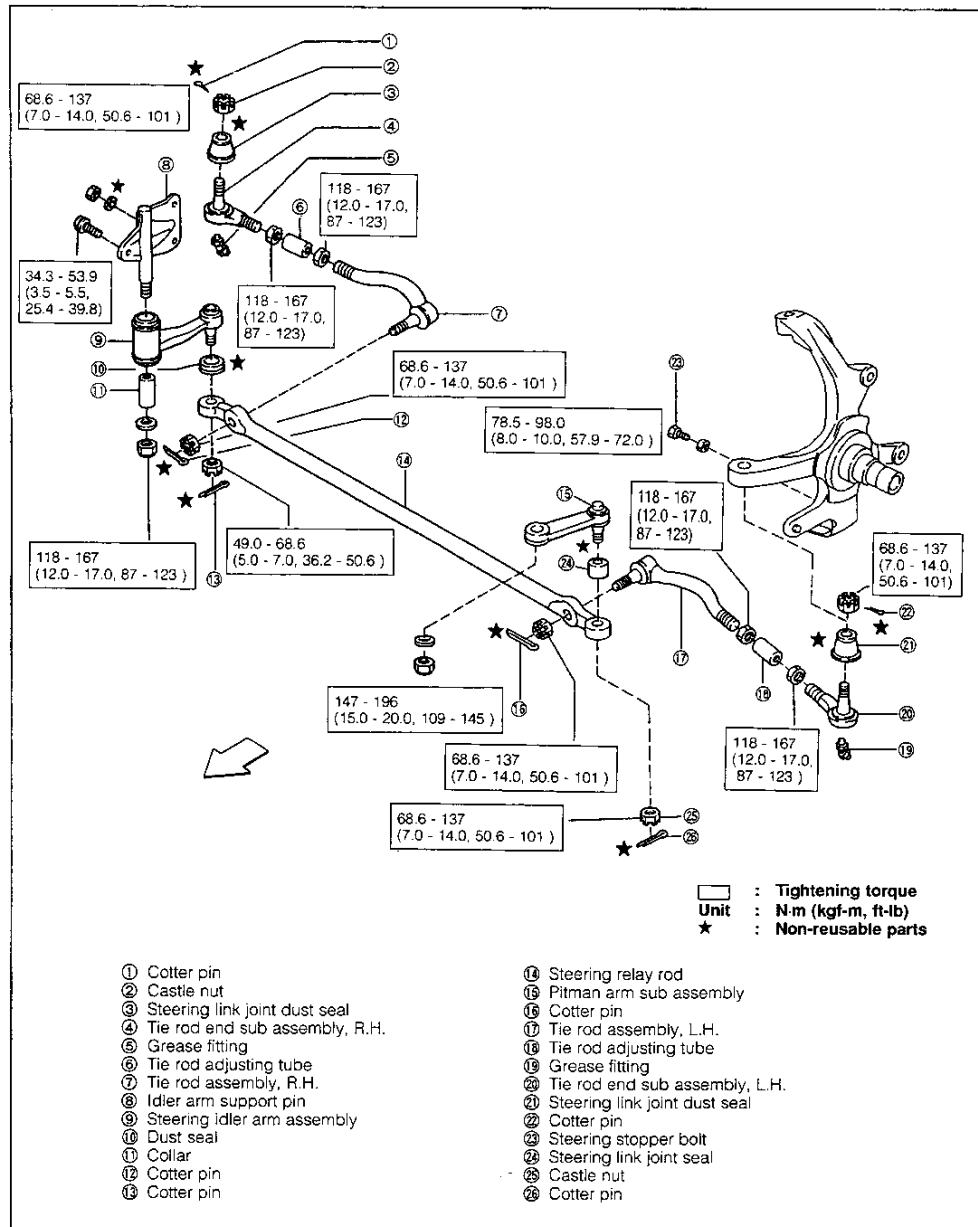
WFE90-SR195

42. Install the instrument panel lower panel.
(For details, see the Body section.)



WFE90-SR196

STEERING LINKAGE COMPONENTS

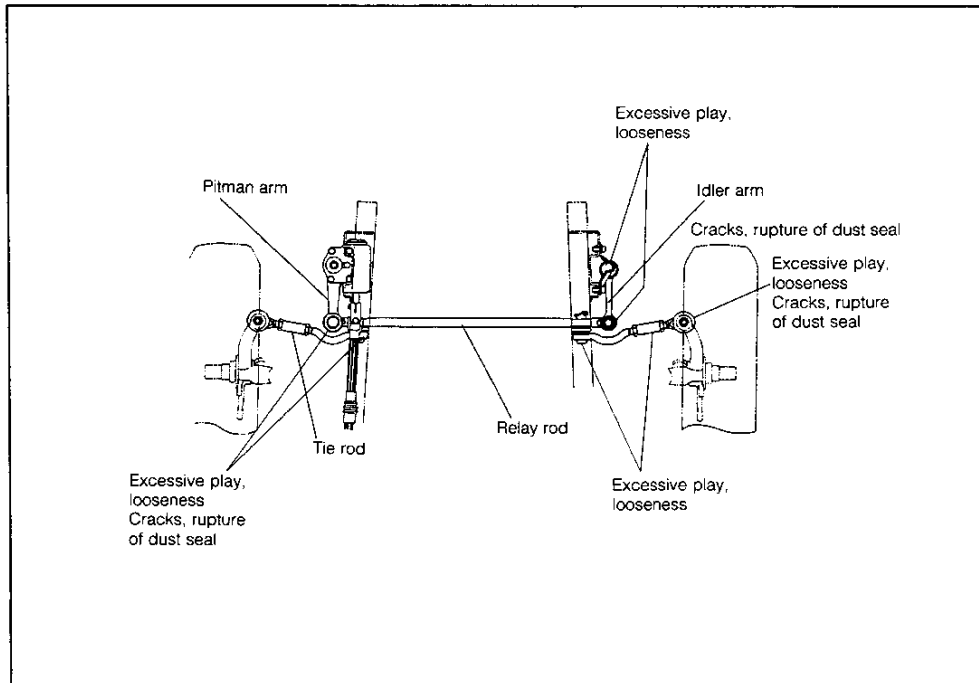


WFE80-SR197

STEERING

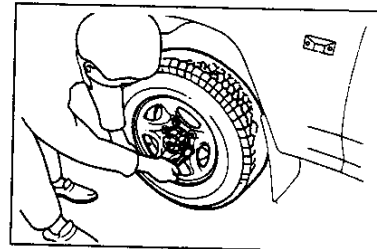
INSPECTION

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



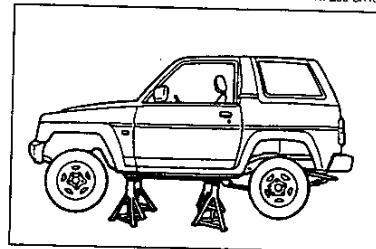
REMOVAL

1. Loosen the front wheel attaching bolts.



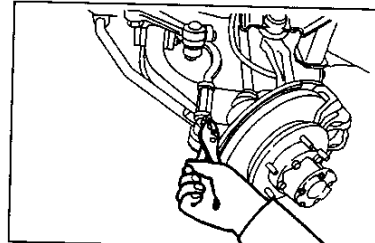
WFE90-SR199

2. Jack up the vehicle and support it with safety stands.



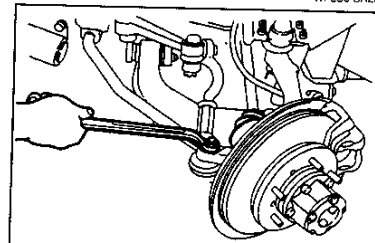
WFE90-SR200

3. Remove the front wheels. (Both right and left sides)
4. Remove the cotter pin at the connecting section of the tie rod end and the steering knuckle. (Both right and left sides)



WFE90-SR201

5. Loosen the castle nut two or three threads at the connecting section of the tie rod end and the steering knuckle. (Both right and left sides)



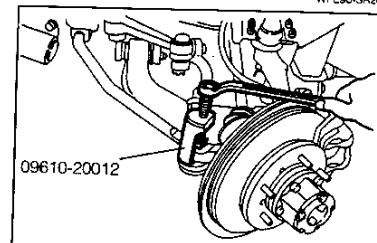
WFE90-SR202

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

SST: 09610-20012-000

NOTE:

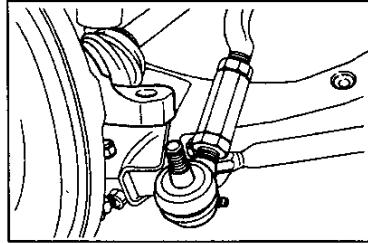
- If any difficulty is encountered during this disconnection, apply a suitable metal rod against the side of the tapered section of the steering knuckle and lightly tap the metal rod with a hammer or the like. This will facilitate the disconnection.



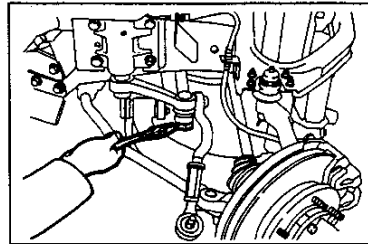
WFE90-SR203

STEERING

7. Remove the castle nut.
8. Separate the tie rod end from the steering knuckle.



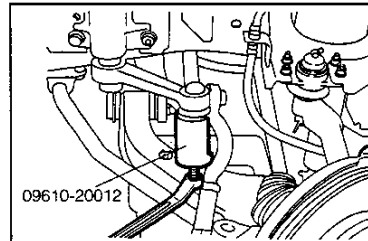
9. Remove the cotter pin at the connecting section of the pitman arm and the relay rod.
10. Loosen the castle nut four or five threads which connects the pitman arm with the relay rod.



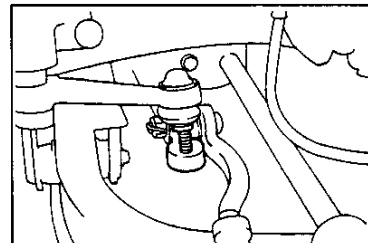
11. Disconnect the connecting section of the pitman arm and the relay rod, using the following SST.
- SST: 09610-20012-000

NOTE:

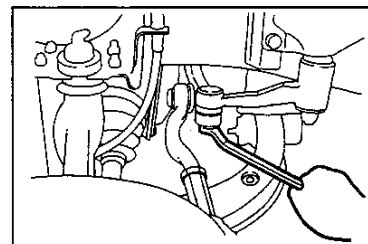
- If any difficulty is encountered during this disconnection, apply a suitable metal rod against the side of the tapered section of the relay rod and lightly tap the metal rod with a hammer or the like to give impact. This will facilitate the disconnection.



12. Remove the castle nut and separate the pitman arm.



13. Remove the cotter pin at the connecting section of the steering idler arm and the relay rod.
14. Loosen the castle nut four or five threads.

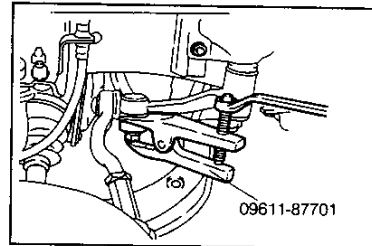


STEERING

15. Disconnect the connecting section of the steering idler arm and the relay rod, using the following SST.
SST: 09611-87701-000

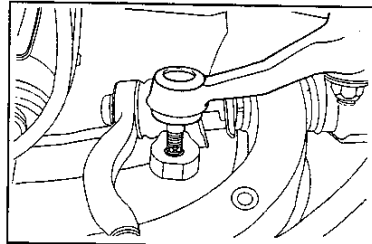
NOTE:

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



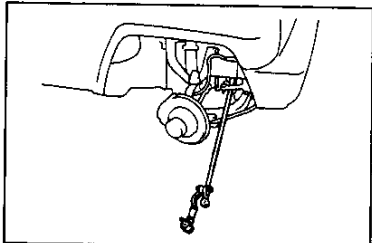
WFE90-SR206

16. Remove the castle nut. Disconnect the idler arm and relay rod.



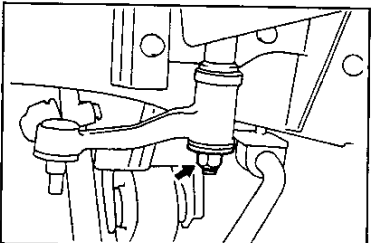
WFE90-SR210

17. Remove the relay rod together with the tie rod end from the vehicle.



WFE90-SR211

18. Remove the idler arm attaching nut. Remove the thrust washer and idler arm.

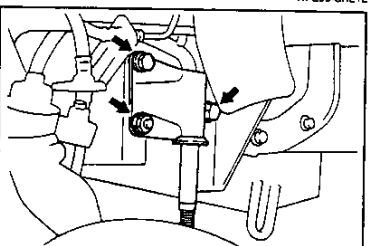


WFE90-SR212

19. Remove the idler arm support pin from the frame. (Never reuse the spring washer.)

NOTE:

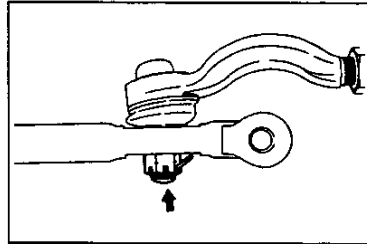
- Do not reuse the used spring washers.



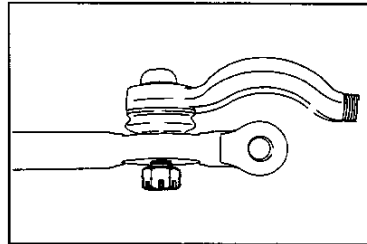
WFE90-SR213

STEERING

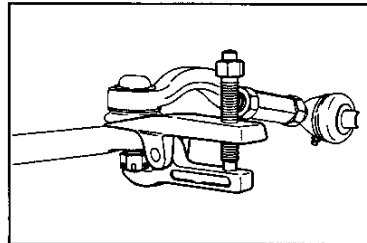
20. Remove the cotter pin at the tie rod assembly attaching nut.



21. Loosen the tie rod assembly attaching nut two or three threads.

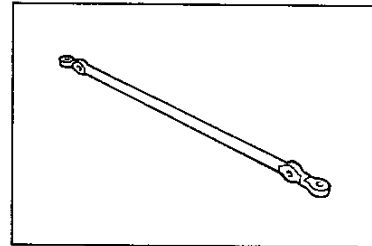


22. Remove the tie rod assembly from the steering rod, using the following SST.
SST: 09611-87701-000

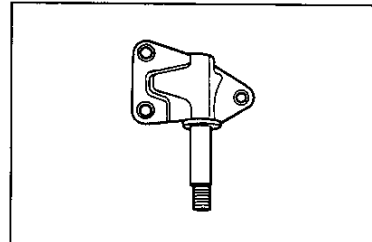


INSPECTION

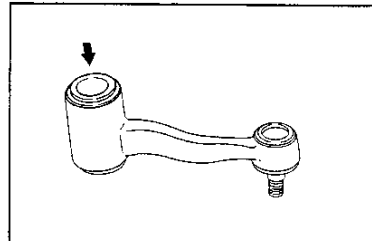
1. Inspection of steering relay rod
Ensure that the steering relay rod exhibits no defect, such as deformation, wear and cracks.
2. Inspection of idler arm support pin
Ensure that the idler arm support pin exhibits no defect, such as deformation, wear and cracks.
3. Inspection of steering idler arm
 - (1) Ensure that the steering idler arm exhibits no defect, such as deformation, wear and cracks.
 - (2) Ensure that the bush section of the steering idler arm exhibits no damage and/or wear.
 - (3) Ensure that the dust seal of the steering idler arm exhibits no damage, such as cracks and/or rupture. If any damage is present, replace the dust seal.
4. Ensure that the collar exhibits no damage, such as cracks and/or wear.



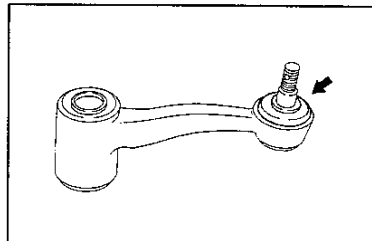
WFE90-SR217



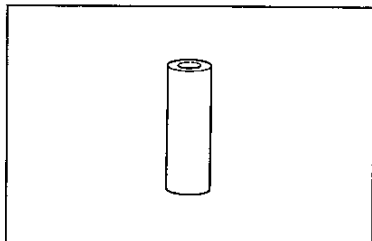
WFE90-SR218



WFE90-SR219



WFE90-SR220

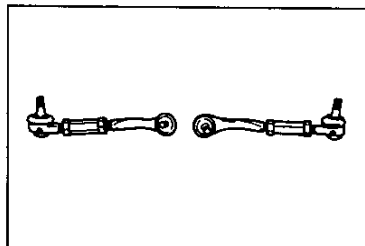


WFE90-SR221

STEERING

5. Inspection of tie rod end

Ensure that each section of the tie rod end exhibits no damage, such as deformation, excessive play and/or cracks.



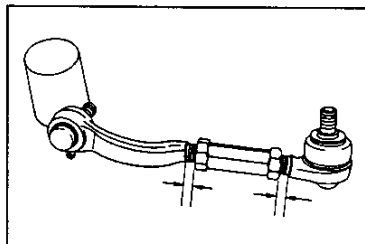
WFE90-SR222

6. Disassembly and assembly of tie rod end

(Only cases where such operation is required)

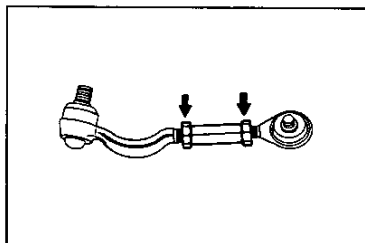
- (1) Measure the distances between the tie rod adjusting tube lock nut and the tie rod end as well as between the tie rod adjusting tube lock nut and the tie rod, respectively.

Reference Value: About 10 mm



WFE90-SR223

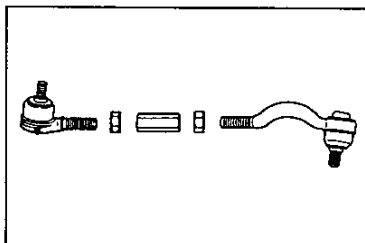
- (2) Loosen the tie rod adjusting tube lock nut.



WFE90-SR224

- (3) Remove the tie rod and tie rod end from the tie rod adjusting screw.

- (4) Remove the lock nut from the tie rod and tie rod end.



WFE90-SR225

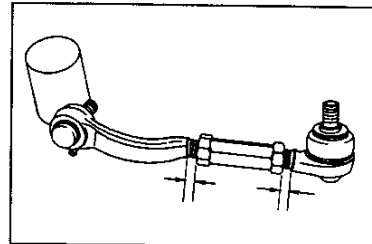
- (5) Install the lock nut to the tie rod and tie rod end, respectively.

- (6) Install the tie rod and tie rod end to the tie rod adjusting screw.

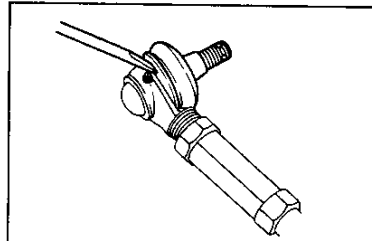
WFE90-SR226

STEERING

- (7) Adjust the distances between the tie rod adjusting tube lock nut and the tie rod end as well as between the tie rod adjusting tube lock nut and the tie rod to the values measured at the step (1), respectively.
- (8) Temporarily tighten the lock nut.
(After this operation, be sure to adjust the side slip.)

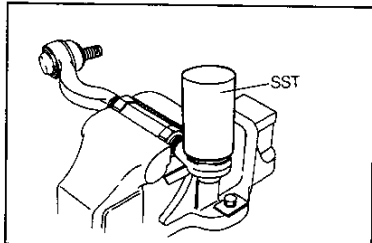


- (9) Replacement of dust seal
(Only cases where such operation is required)
- ① Remove the steering joint dust seat of the tie rod end by prying it with a standard screwdriver.
- ② Remove oil grease or the like.
- ③ Install a new dust seal to the tie rod end.

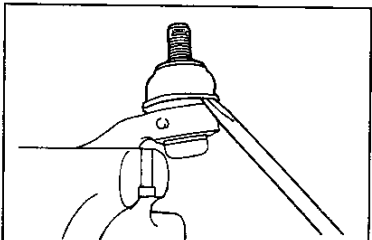


- ④ Drive the new dust seal into position by lightly tapping it with a hammer in combination with the following SST.

SST: 09608-87611-000

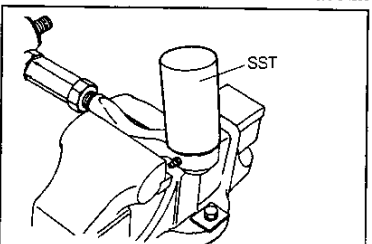


- ⑤ Remove the dust seat of the tie rod by prying it with a standard screwdriver.
- ⑥ Remove old grease or the like.



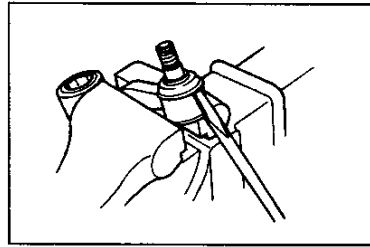
- ⑦ Install a new dust seal to the tie rod end.
- ⑧ Drive the new dust seal into position by lightly tapping it with a hammer in combination with the following SST.

SST: 09608-87613-000



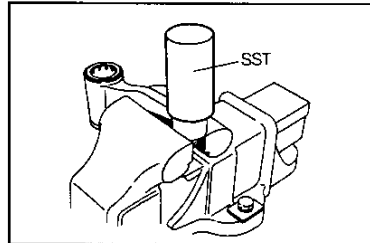
STEERING

7. Replacement of steering idler arm dust seal
(Only cases where such operation is required)
- (1) Remove the steering idler arm dust seal by prying it with a standard screwdriver or the like.
 - (2) Remove old grease or the like.
 - (3) Pack a new dust seal with rubber grease.



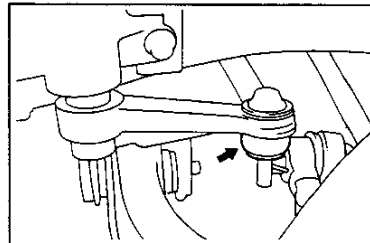
WFE90-SR232

- (4) Install the dust seal to the idler arm.
 - (5) Drive the dust seal into the idler arm by lightly tapping it with a hammer in combination with the following SST.
- SST: 09608-87614-000



WFE90-SR233

8. Ensure that the steering ring joint seal of the pitman arm exhibits no damage.
Replace the joint seal if it is damaged.



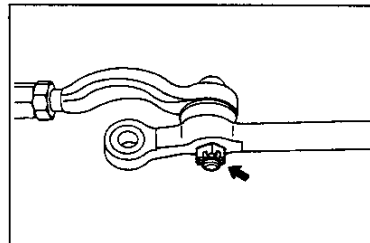
WFE90-SR234

ASSEMBLY

1. Connect the tie rod to the steering relay rod. Install a castle nut.
2. 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)

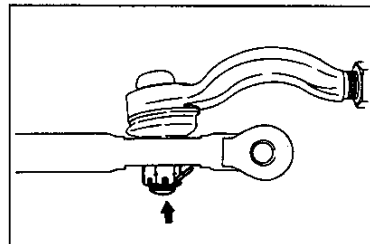
NOTE:

- Be sure to align the cotter pin hole of the tie rod with the cut out section of castle nut after tightening.



WFE90-SR235

3. Insert a cotter pin and bend its legs, as indicated in the right figure.



WFE90-SR236

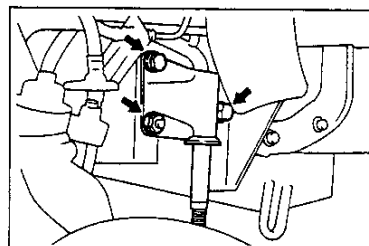
STEERING

4. Install the idler arm support pin to the frame. Tighten the attaching bolts and nuts to the specified torque with new washer interposed.

Tightening Torque: 34.3 - 53.9 N·m
(3.5 - 5.5 kgf-m, 25.4 - 39.8 ft-lb)

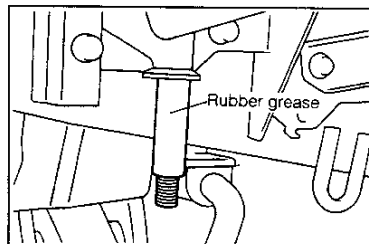
NOTE:

- Do not reuse the washer.



WFE90-SR237

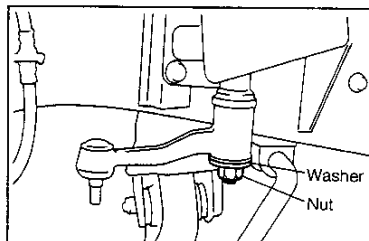
5. Apply rubber grease to the collar. Install it to the idler arm support pin.



WFE90-SR238

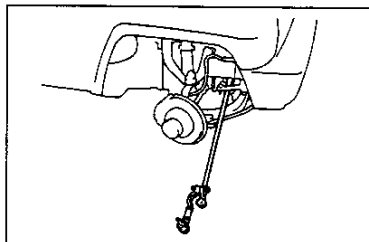
6. Apply rubber grease to the bush section of the idler arm. Install it to the collar with a washer interposed. Tighten the nut to the specified torque.

Tightening Torque: 108 - 167 N·m
(12 - 17 kgf-m, 87 - 123 ft-lb)



WFE90-SR239

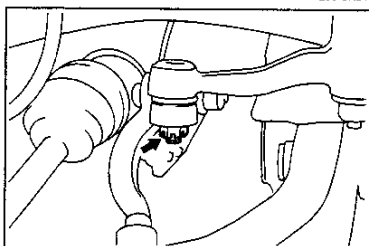
7. Insert the relay rod together with the tie rod onto the vehicle.



WFE90-SR240

8. Connect the relay rod to the idler arm. Install a new castle nut and tighten it to the specified torque.

Tightening Torque: 49.0 - 68.6 N·m
(5.0 - 7.0 kgf-m, 36.2 - 50.6 ft-lb)



WFE90-SR241

NOTE:

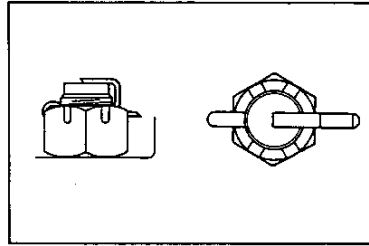
- Be sure to align the cotter pin hole of the idler arm with the cut-out section of the castle nut.

CAUTION:

- Make sure that the tapered and threaded portions of the ball joint are free of grease. If grease exists on these portions, be sure to wipe off the grease prior to reassembling. Failure to observe the caution may cause insufficient tightening torque.

STEERING

9. Bend the legs of the cotter pin, as indicated in the right figure.



WFE90-SR242

10. Connect the relay rod to the pitman arm. Install a new castle nut and tighten it to the specified torque.

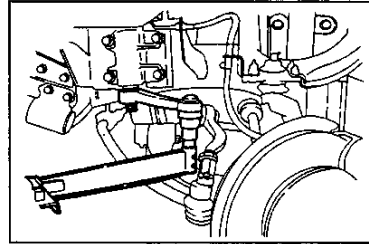
Tightening Torque: 68.6 - 137 N·m
(7.0 - 14.0 kgf-m, 50.6 - 101 ft-lb)

NOTE:

- Be sure to align the cotter pin hole of the pitman arm with the cut out section of the castle nut after tightening.

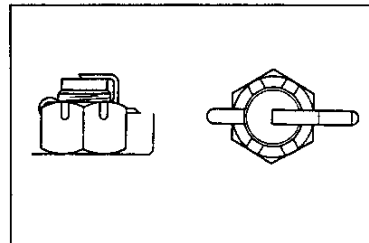
CAUTION:

- Make sure that the tapered and threaded portions of the ball joint are free of grease. If grease exists on these portions, be sure to wipe off the grease prior to reassembling. Failure to observe the caution may cause insufficient tightening torque.



WFE90-SR243

11. Bend the legs of the cotter pin, as indicated in the right figure.



WFE90-SR244

12. Connect the tie rod end to the steering knuckle. Install a new castle nut and tighten it to the specified torque.

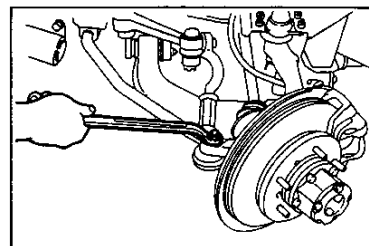
Tightening Torque: 68.6 - 137 N·m
(7.0 - 14.0 kgf-m, 50.6 - 101 ft-lb)

NOTE:

- Be sure to align the cotter pin hole of the tie rod end with the cut out section of the castle nut after tightening.

CAUTION:

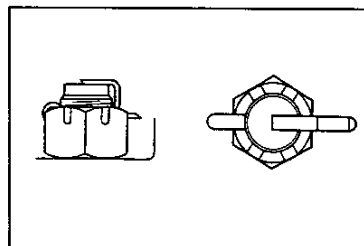
- Make sure that the tapered and threaded portions of the ball joint are free of grease. If grease exists on these portions, be sure to wipe off the grease prior to reassembling. Failure to observe the caution may cause insufficient tightening torque.



WFE90-SR245

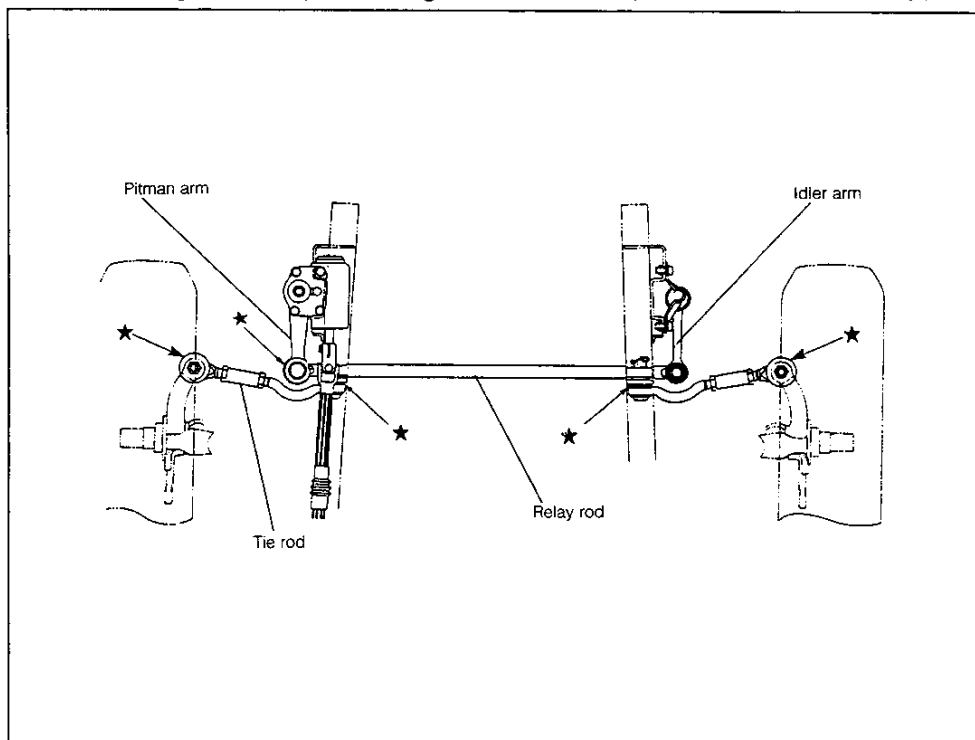
STEERING

13. Bend the legs of the cotter pin, as indicated in the right figure.



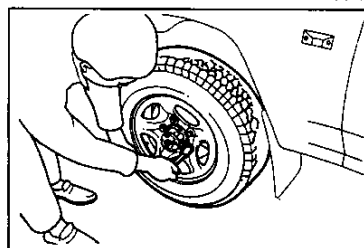
WFE90-SR246

14. Apply chassis grease to the points bearing an asterisk "★" mark, as shown in the illustration below.



WFE90-SR247

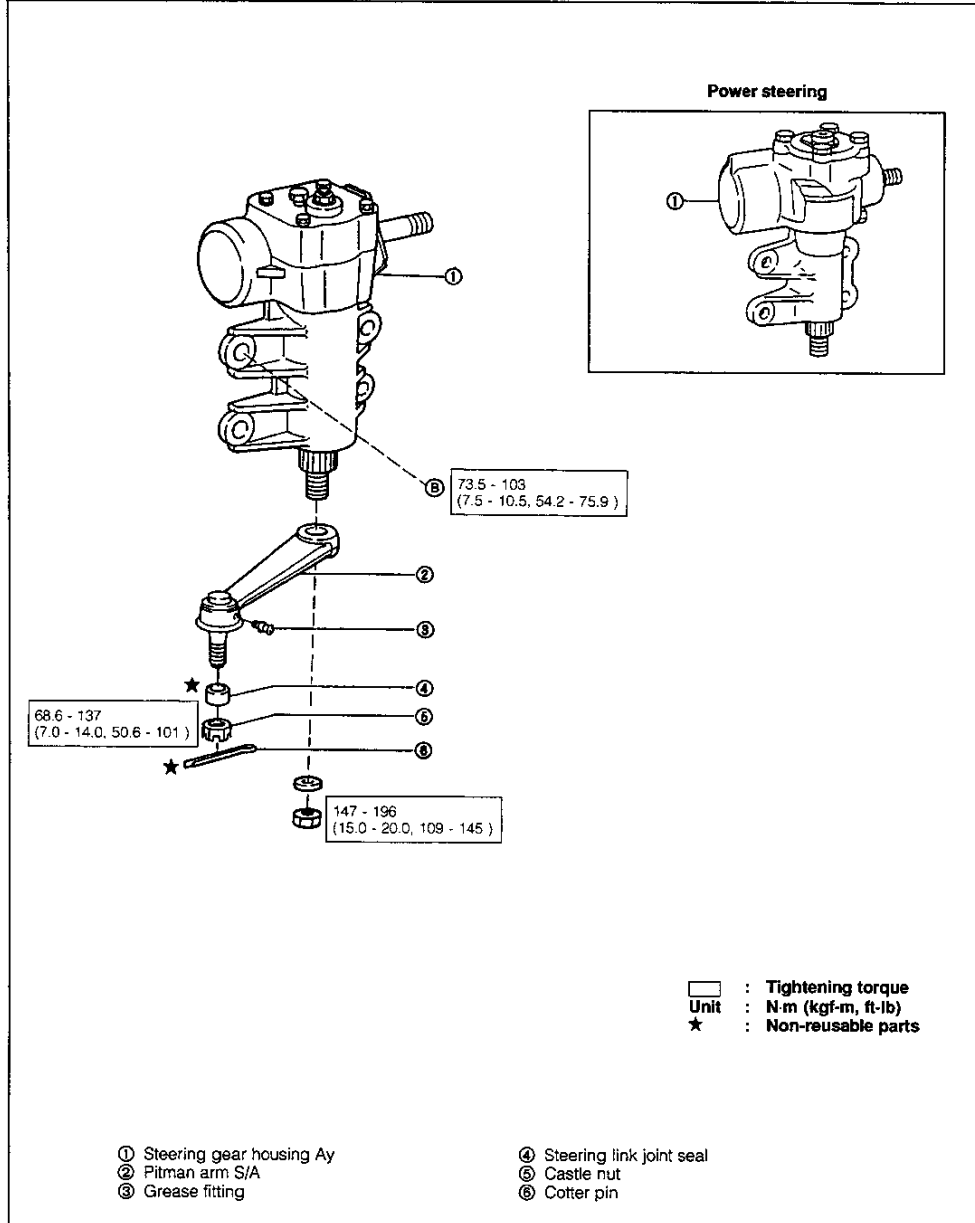
15. Install the front tires and tighten the attaching nuts.
16. Jack down the vehicle.
17. Tighten the front tire attaching nuts to the specified torque evenly over two or three stages.
Tightening Torque: 88.3 - 118 N·m
(9.0 - 12.0 kgf-m, 65.1 - 87.0 ft-lb)
18. Check and adjust the toe-in and side slip.
(For further details, see front axle and suspension section)



WFE90-SR248

STEERING

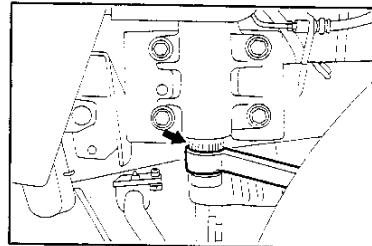
STEERING GEAR HOUSING COMPONENTS



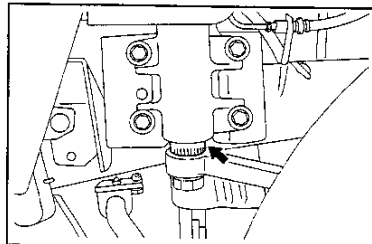
WFE90-SR249

IN-VEHICLE INSPECTION

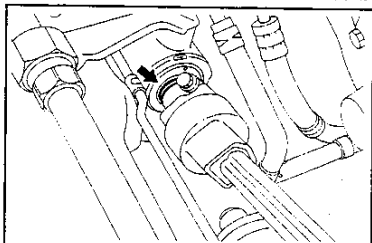
1. Ensure that the connecting section of the pitman arm and steering gear housing exhibits no defect, such as excessive play and looseness.
If any defect is present, check the tightening torque of the nuts and perform retightenings, as required and/or replace defective parts.
2. Ensure that no excessive play, etc. is present between the steering gear housing and the cross shaft.
If 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 the intermediate shaft exhibits no defect, such as excessive play and looseness.
If any defect is present, perform retightenings or replace defective parts.
4. Ensure that no defect, such as excessive play, is present between the steering gear housing and the steering shaft.
If any defect is present, replace the steering gear housing assembly.
5. Check of total preload of steering gear housing
(1) Jack up the vehicle and support it with safety stands.
(See page G1 section.)



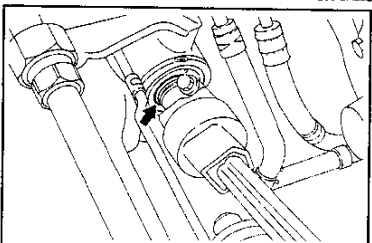
WFE90-SR250



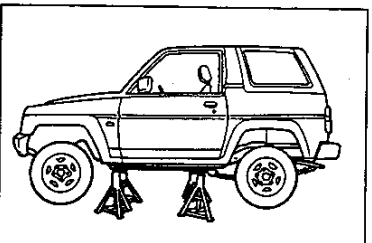
WFE90-SR251



WFE90-SR252



WFE90-SR253



WFE90-SR254

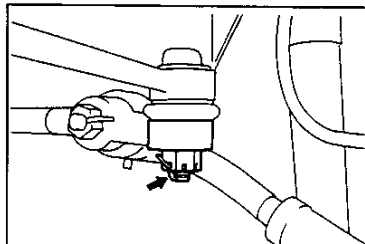
STEERING

- (2) Pull out the cotter pin from the nut which connects the relay rod with the pitman arm.

- (3) Loosen the castle nut.

NOTE:

- The castle nut should be loosened two or three threads.

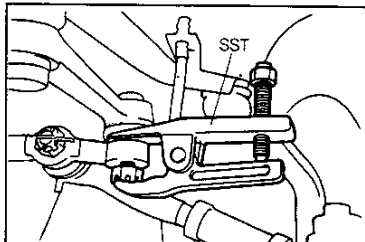


WFE90-SR255

- (4) Disconnect the relay rod from the pitman arm, using the following SST.

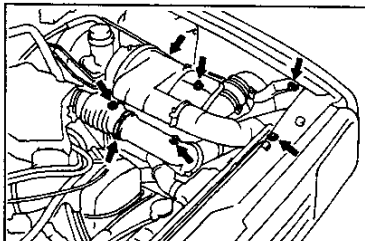
NOTE:

- Be very careful not to apply excessive load, which may lead to damage to the threaded portion and castle nut.
- If the parts will not be disconnected even when load is applied, while applying the load, put a suitable metal rod to the side of the tapered section of the relay rod and tap the rod with a hammer or the like to give impact. This will facilitate the disconnection.



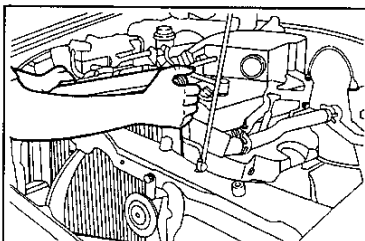
WFE90-SR256

- (5) Remove the attaching bolts and hose bands for the air cleaner and air hose. Also remove the clutch cable clamp bolt. Remove the air cleaner and air hose as an assembly from the vehicle. (L.H.D. vehicle only)
(For details, refer to the Engine section.)



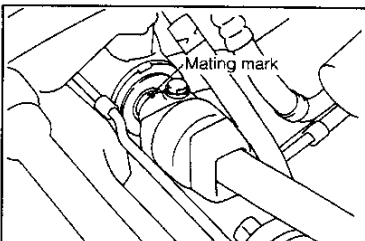
WFE90-SR257

- (6) Remove the reservoir tank. (R.H.D. vehicle only)
(See the Cooling System section.)
- (7) Remove the radiator. (R.H.D. vehicle only)
(See the Cooling System section.)



WFE90-SR258

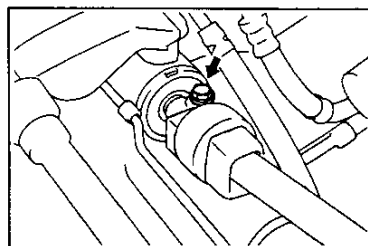
- (8) Put a mating mark on between the intermediate shaft and the steering gear housing.



WFE90-SR259

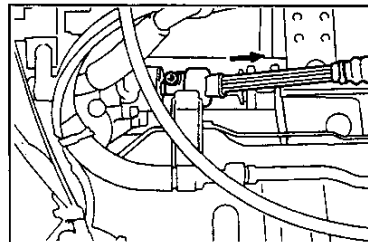
STEERING

- (9) Remove the bolts connecting the intermediate shaft to the steering gear housing.



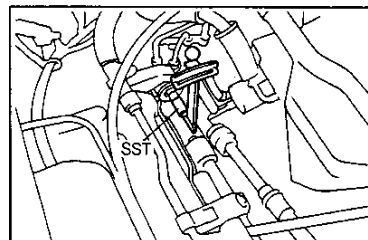
WFE90-SR260

- (10) Disconnect the intermediate shaft from the steering gear housing by contracting the intermediate shaft.



WFE90-SR261

- (11) Install the following SST to the steering shaft with small-sized torque wrench. Locate the center (center of gear meshing) of the rotation of the cross shaft by turning the steering shaft. Turn the steering shaft in such a way that the cross shaft assumes the center position. Keep the steering shaft in this position.
SST: 09616-00010-000



WFE90-SR262

NOTE:

- At this time, the pitman arm becomes virtually parallel with the chassis.

- (12) Install a small-sized torque wrench to the SST. Turn the SST slowly about 90 degrees clockwise and counterclockwise. Ensure that the maximum torque during this operation is within the specified value.

Specified Pre-load

Standard Steering:

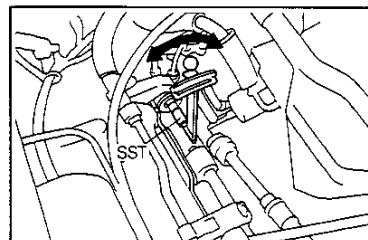
0.7 - 0.98 N·m (7 - 10 kgf-cm, 6.1 - 8.7 inch-lb)

Power Steering:

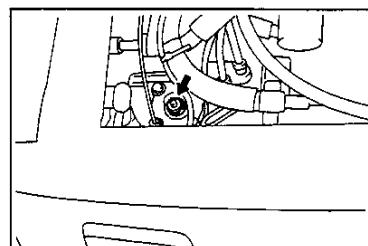
0.6 - 0.9 N·m (6 - 9.5 kgf-cm, 5.2 - 8.2 inch-lb)

If the maximum torque does not conform to the specified value, loosen the lock nut of the cross shaft adjusting screw. Then, adjust the preload to the specified value by means of the cross shaft adjusting screw. Tighten the lock nut to the specified torque.

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



WFE90-SR263



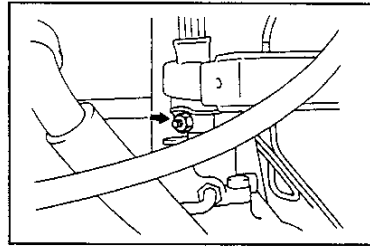
WFE90-SR264

NOTE:

- When tightening the lock nut, prevent the adjusting screw from turning.

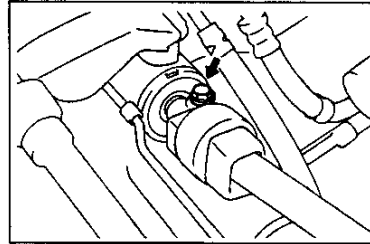
STEERING

- (13) Remove the SST.
- (14) Connect the intermediate shaft in such a way that the shaft cut-out section of the steering gear housing may be aligned with the bolt hole or in such a way that the mating marks put during the removal may be aligned. Tighten the attaching bolts to the specified torque.
- Tightening Torque: 24.5 - 34.3 N·m
(2.5 - 3.5 kgf-m, 18.1 - 25.3 ft-lb)



NOTE:

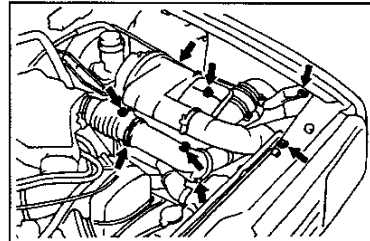
- Ensure that the steering wheel is installed in the correct direction.
- Be sure to positively connect the universal joint to the serration section as far as it will go, until the serration section of the steering shaft becomes invisible from the edge surface of the intermediate shaft.



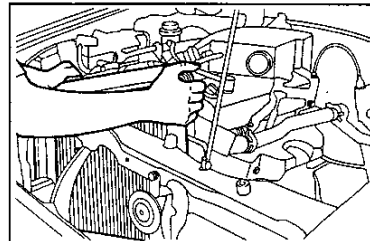
- (15) Install the air cleaner and air hose to the vehicle. Tighten the attaching bolts. (L.H.D. vehicle only)
- (16) Tighten the hose clamp. (L.H.D. vehicle only)
- (17) Install the clutch cable to the air cleaner by means of the clamp bolt. (L.H.D. vehicle only)

NOTE:

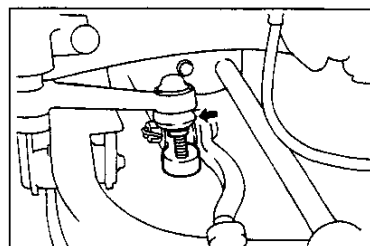
- For details, refer to the Engine section.



- (18) Install the radiator. (R.H.D. vehicle only)
(For details, refer to the Cooling System section.)
- (19) Install the reservoir tank. (R.H.D. vehicle only)
(For details, refer to the Cooling System section.)



- (20) Ensure that the boot of the pitman arm exhibits no damage, such as cracks and/or rupture. If any damage is present, replace the boot with a new one.
(See page SR-81.)



STEERING

(21) Connect the pitman arm to the relay rod.

CAUTION:

- Ensure that no oil nor grease gets to the tapered section and/or threaded portions.

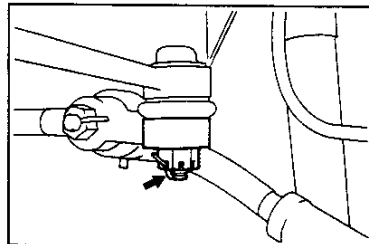
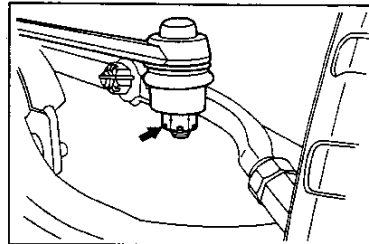
(22) Install the castle nut and tighten it to the specified torque.

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

NOTE:

- Be sure to align the cotter pin hole of the pitman arm with the cut-out section of the castle nut after tightening.

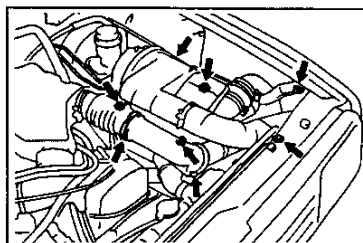
(23) Install a new cotter pin and bend its legs as indicated in the right figure.



STEERING

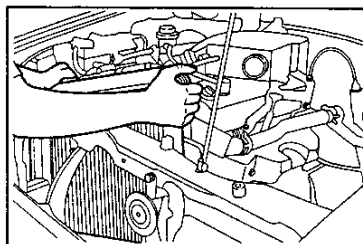
REMOVAL

1. Remove the air cleaner and air hose attaching bolts, hose bands and clutch cable clamp bolt. Remove the air cleaner and air hoses together from the vehicle.
(For details, refer to the Engine section)



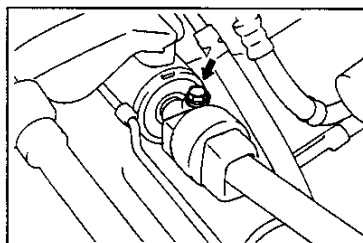
WFE90-SR272

2. Remove the reservoir tank. (R.H.D. vehicle only)
(See the Cooling System section.)
3. Remove the radiator. (R.H.D. vehicle only)
(See the Cooling System section.)



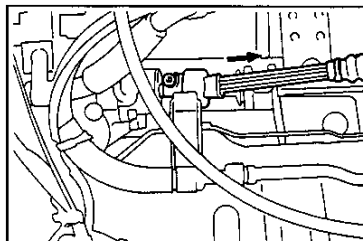
WFE90-SR273

4. Remove the bolts connecting the intermediate shaft to the steering gear housing.



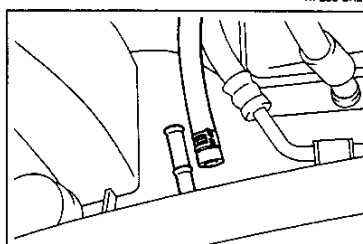
WFE90-SR274

5. Disconnect the intermediate shaft from the steering gear housing by contracting the intermediate shaft.



WFE90-SR275

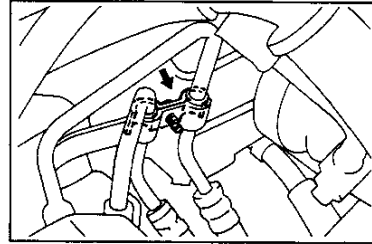
6. Draining of power steering oil
(Power steering-equipped vehicle only)
(As for the draining procedure, see page SR-22.)



WFE90-SR276

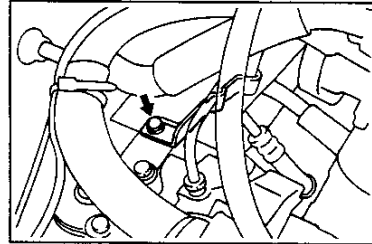
STEERING

7. Removal of pressure feed tube clamp
Detach the clamp by removing the screw.
(Power steering-equipped vehicle only)



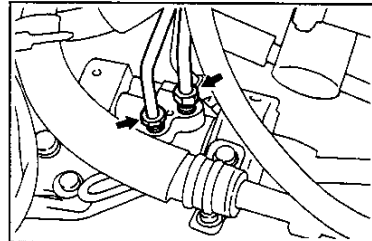
WFE90-SR277

8. Remove the pressure feed tube clamp bracket from the steering gear housing.
(Power steering-equipped vehicle only)



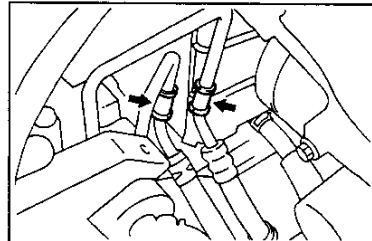
WFE90-SR278

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



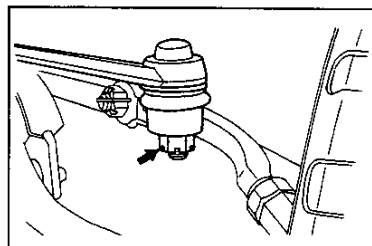
WFE90-SR279

10. Remove the rubber grommet from the pressure feed tube.
(Power steering-equipped vehicle only)



WFE90-SR280

11. Remove the cotter pin.
12. Loosen the castle nut.
NOTE:
 - Loosen the castle nut two or three threads.



WFE90-SR281

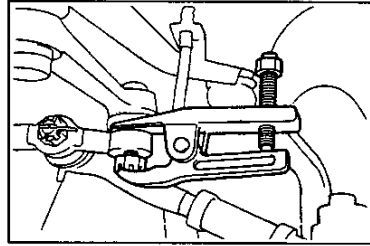
STEERING

13. 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 relay rod and lightly tap the metal rod with a hammer or the like to give impact. This will facilitate the disconnection.

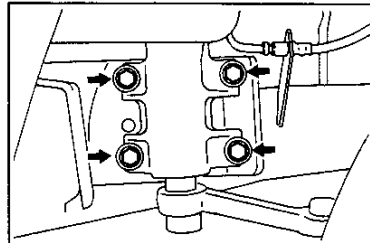


WFE90-SR282

14. Remove the pitman arm attaching nut to the steering gear housing.

WFE90-SR283

15. Loosen the attaching bolts and nuts for the steering gear housing evenly. Remove them.

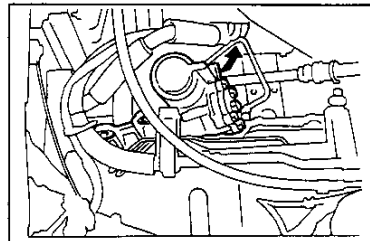


WFE90-SR284

16. Remove the steering gear housing from the vehicle.

NOTE:

- Be very careful not to damage the brake pipe. Also, prevent the steering gear housing from interfering with other parts strongly.

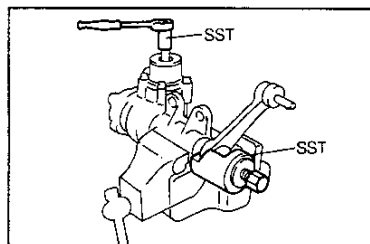


WFE90-SR285

17. While preventing the steering shaft from turning with the SST given below, remove the pitman arm from the cross shaft, using the following SST.

SSTs: 09616-00010-000

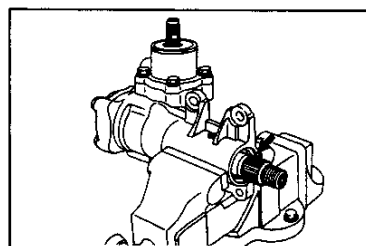
09610-87301-000



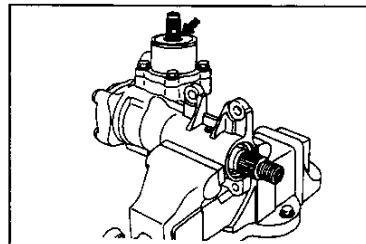
WFE90-SR286

INSPECTION

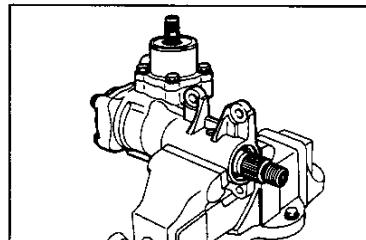
1. Ensure that no abnormal play is present between the cross shaft and the housing.
If abnormal play is present, replace the steering gear housing assembly.
2. Ensure that no excessive play is present between the steering shaft and the housing.
If excessive play is present, replace the steering gear housing.
3. Ensure that the steering gear housing assembly exhibits no damage, such as cracks and oil leakage.
If any damage is present, replace the steering gear housing assembly.
4. Ensure that no damage, such as cracks, wear and deformation, is present at the threaded portion and spline section of the steering gear housing assembly.
If any damage is present, replace the steering gear housing assembly.
5. Ensure that the pitman arm exhibits no damage, such as cracks and/or deformation.



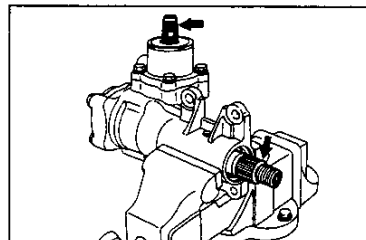
WF90-SR287



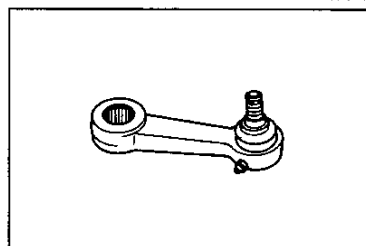
WF90-SR288



WF90-SR289



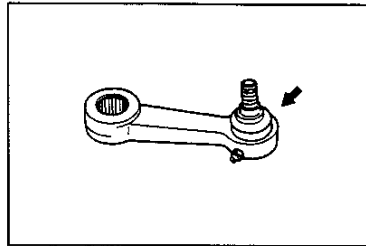
WF90-SR290



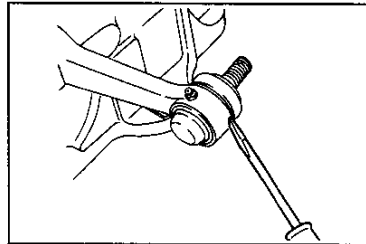
WF90-SR291

STEERING

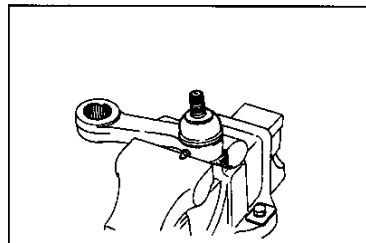
6. Ensure that the ball joint section of the pitman arm exhibits no excessive play.
7. Ensure that no damage is present at the steering link joint seal of the pitman arm ball joint section.
If damage is present, replace the joint seal.



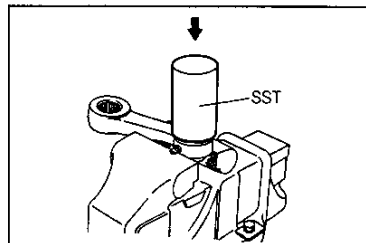
8. Replacement of steering link joint seal
(Only cases where such operation is necessary)
 - (1) Remove the steering link joint seal from the pitman arm with a chisel or the like.



- (2) Remove the old grease.
 - (3) Install a new steering joint seal to the pitman arm.



- (4) Install the following SST on the steering joint seal. Press the steering joint seal to the pitman arm by lightly tapping the SST with a hammer.
SST: 09608-87613-000



NOTE:

- Care must be exercised so that the steering joint seal may not be press-fitted in a tilted state.

ASSEMBLY

CAUTION:

- When connecting the power steering tube, be sure to follow the connecting procedure. Failure to observe this caution may lead to bend of the power steering tube or oil leakage.

- Clamp the steering gear housing in a vice or the like.

NOTE:

- Be very careful not to apply excessive load during the assembly.

- With the cut-out section of the pitman arm aligned with that of the cross shaft, install the pitman arm to the cross shaft.

NOTE:

- At this time, make sure that the mating mark at the pitman arm side is aligned with that at the gear side.

- Install a new spring washer and a nut to the cross shaft temporarily.

- Insert the steering gear housing in the vehicle.

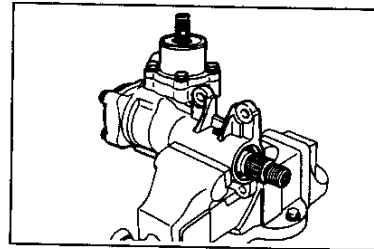
NOTE:

- Be very careful not to damage the brake pipe. Also, prevent the steering gear housing from interfering with other parts strongly.

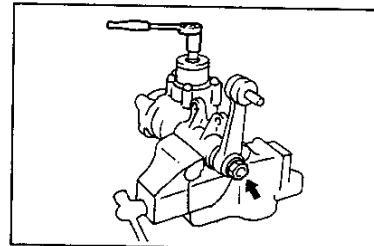
- Install the steering gear housing in the vehicle. Install the attaching bolts and nuts with new spring washers interposed.

- Tighten the attaching bolts and nuts of the steering gear housing evenly over two or three stages to the specified torque.

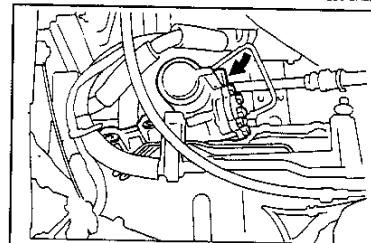
Tightening Torque: 73.5 - 103 N·m
(7.5 - 10.5 kgf-m, 54.2 - 75.9 ft-lb)



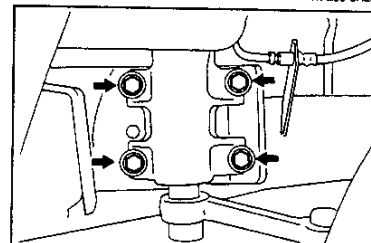
WFE90-SR296



WFE90-SR297



WFE90-SR298

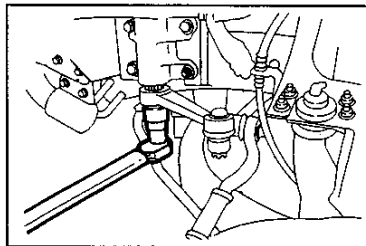


WFE90-SR299

STEERING

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

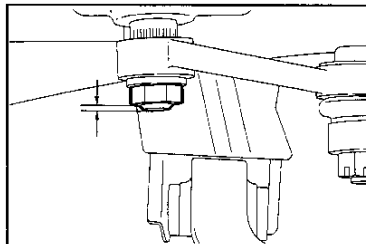
Tightening Torque: 147 - 196 N·m
(15 - 20 kgf-m, 109 - 145 ft-lb)



WFE90-SR300

8. After the pitman arm attaching nut has been tightened, ensure that the shaft is protruding from the nut edge surface by the specified amount given below.

Specified Amount: 2.4 ± 1.5 mm



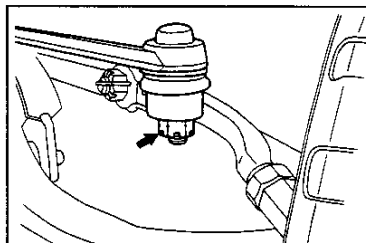
WFE90-SR301

9. Connect the relay rod to the Pitman arm, and tighten the castle nut to the specified torque:

Tightening Torque: 68.6 - 137 N·m
(7.0 - 14 kgf-m, 50.6 - 101 ft-lb)

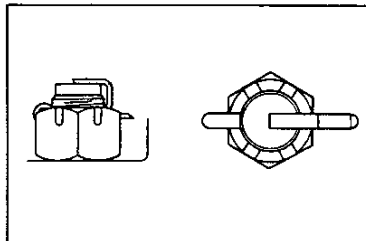
NOTE:

- At this time, align the recess in the castle nut with the hole in the Pitman arm ball joint.



WFE90-SR302

10. Install the cotter pin to the castle nut. Bend the legs as indicated in the right figure.

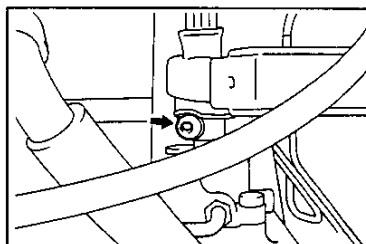


WFE90-SR303

11. Connect the intermediate shaft onto the steering shaft in such a way that the cut-out section of the steering shaft may be aligned with the bolt hole of the intermediate shaft or in such a way that the mating marks put during the removal may be aligned.

NOTE:

- Ensure that the tires are set to a straight-ahead condition and that the steering wheel assumes the normal straight-ahead position.
- Be sure to positively connect the universal joint to the serration section as far as it will go, until the serration section of the steering shaft becomes invisible from the edge surface of the intermediate shaft.

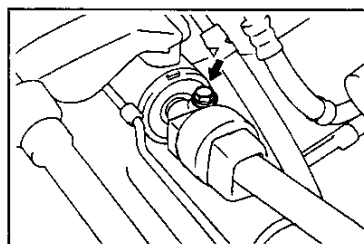


WFE90-SR304

STEERING

12. Insert the connecting bolts of the intermediate shaft and tighten them to the specified torque.

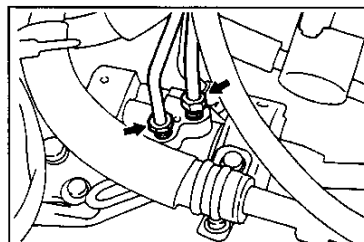
Tightening Torque: 24.5 - 34.3 N·m
(2.5 - 3.5 kgf-m, 18.1 - 25.3 ft-lb)



WFE90-SR305

13. Temporarily install the pressure feed tubes to the power steering gear housing.

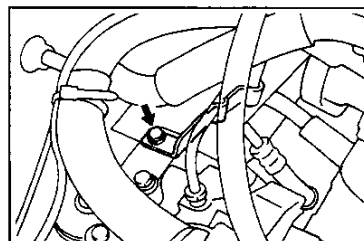
(Power steering-equipped vehicle only)



WFE90-SR306

14. Install the pressure feed tube clamp bracket to the power steering gear housing.

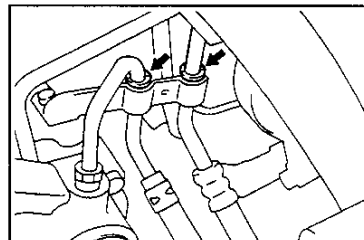
(Power steering-equipped vehicle only)



WFE90-SR307

15. Install the rubber grommets to the pressure feed tubes.

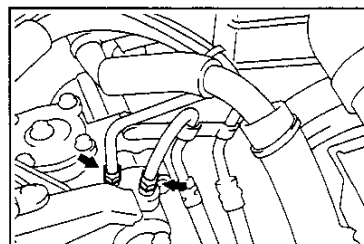
(Power steering-equipped vehicle only)



WFE90-SR308

16. Tighten the flare nuts which attach the pressure feed tubes to the pressure feed tube bracket, until the installed rubber grommet section contacts with the pressure feed tube.

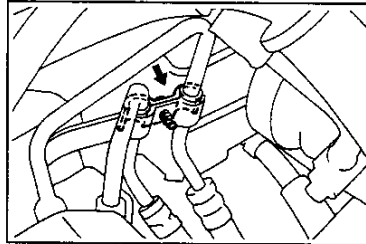
(Power steering-equipped vehicle only)
Tightening Torque: 39.2 - 49.0 N·m
(4.0 - 5.0 kgf-m, 28.9 - 36.2 ft-lb)



WFE90-SR309

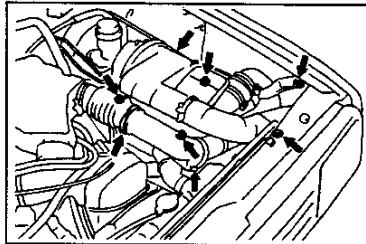
STEERING

17. Install the pressure feed tube clamp and tighten the attaching screws.
(Power steering-equipped vehicle only)



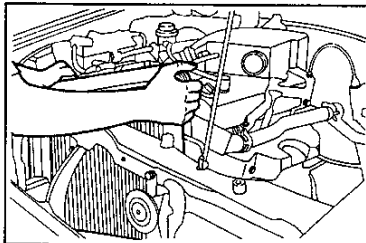
WFE90-SR310

18. Install the air cleaner and air hose assembly to the vehicle. Tighten the attaching bolts. (L.H.D. vehicle only)
(For details, refer to the Engine section.)
19. Tighten the air cleaner hose band. (L.H.D. vehicle only)
(For details, refer to the Engine section.)
20. Clamp the clutch cable to the air cleaner with the clamp bolt. (L.H.D. vehicle only)
(For details, refer to the Engine section.)



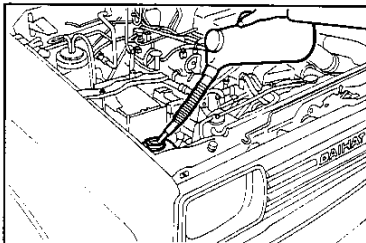
WFE90-SR311

21. Install the radiator. (R.H.D. vehicle only)
(For details, refer to the Cooling System section.)
22. Install the reservoir tank. (R.H.D. vehicle only)
(For details, refer to the Cooling System section.)



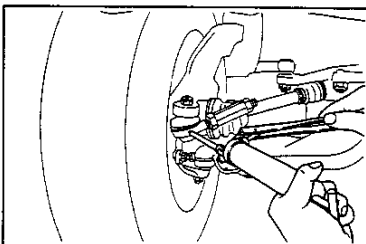
WFE90-SR312

23. Fill power steering fluid.
(Power steering-equipped vehicle only)
(See page SR-24.)



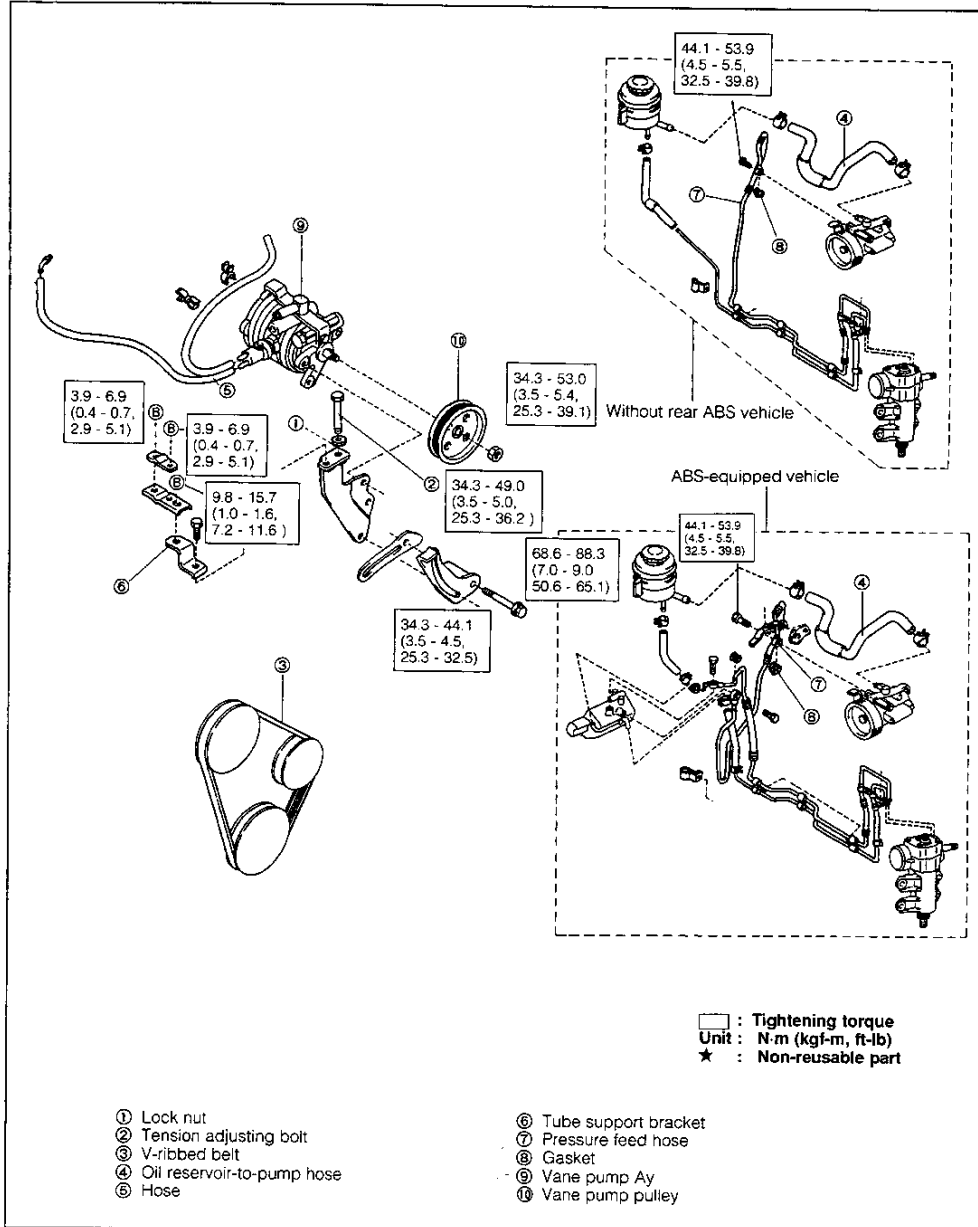
WFE90-SR313

24. Fill lithium-based MP grease to the pitman arm.



WFE90-SR314

VANE PUMP COMPONENTS

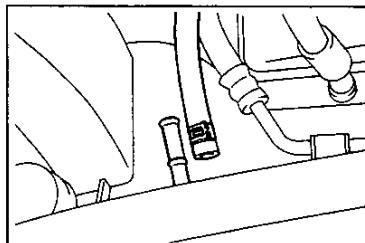


WFE90-SR315

STEERING

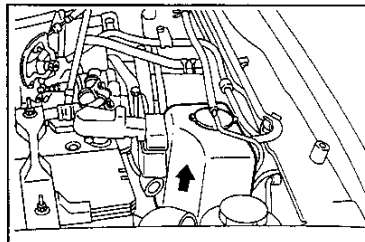
REMOVAL

1. Drain the power steering fluid.
(As for the draining procedure, see page SR-22 to SR-23.)



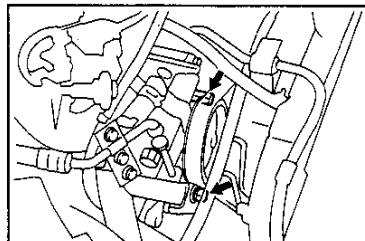
WFE90-SR316

2. Remove the radiator reservoir tank from the vehicle by raising it. Place the tank on the radiator.



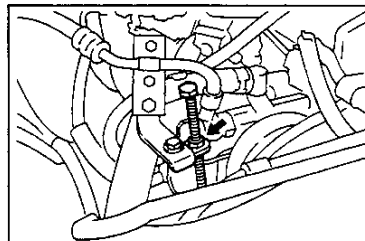
WFE90-SR317

3. Loosen the vane pump attaching bolts.
4. Loosen the vane pump drive belt adjusting set bolt.



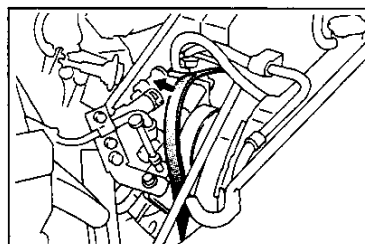
WFE90-SR318

5. Loosen the lock nut of the drive belt adjusting bolt. Loosen the adjusting bolt.



WFE90-SR319

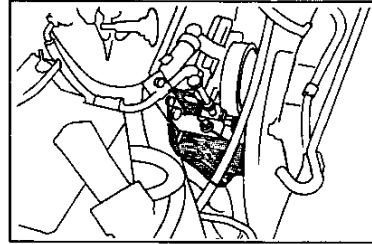
6. Remove the drive belt.



WFE90-SR320

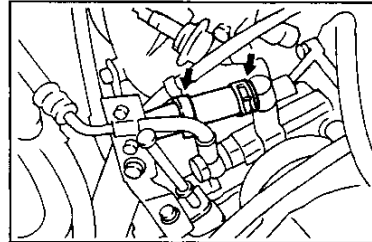
STEERING

7. Place an adequate cloth under the vane pump so as not to soil the alternator and alternator drive belt.



WFE90-SR321

8. Detach the hose clamp from the oil reservoir-to-pump hose.
9. Disconnect the oil reservoir-to-pump hose from the vane pump.

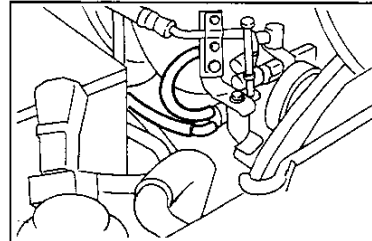


WFE90-SR322

10. Disconnect the air hoses for idle-up use from the air control valve.

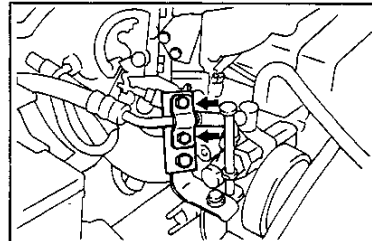
NOTE:

- The carburetor-equipped vehicle has three air hoses.



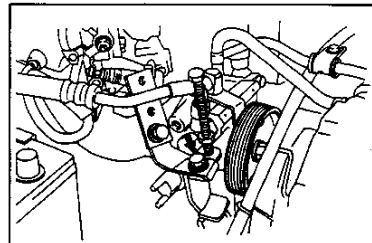
WFE90-SR323

11. Remove the attaching bolt of the pressure feed tube clamp. Detach the clamp.



WFE90-SR324

12. Remove the tube support bracket from the pump front stay.



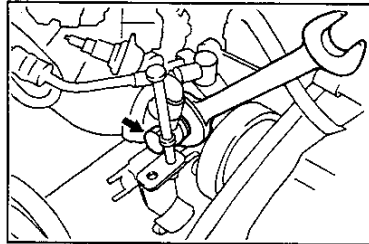
WFE90-SR325

STEERING

13. Loosen and remove the pressure feed tube attaching union bolts, while preventing them from turning at the nut section of the pressure feed pump side.

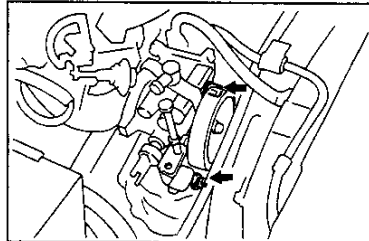
NOTE:

- Never reuse the gasket.



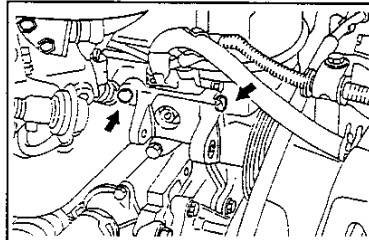
WFE90-SR326

14. Remove the vane pump attaching bolts and set bolt. Remove the vane pump from the engine.



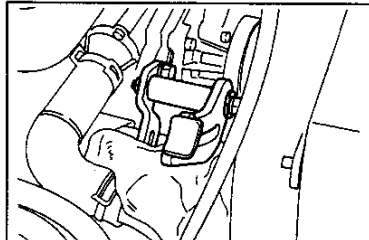
WFE90-SR327

15. Remove the pump bracket attaching bolts.



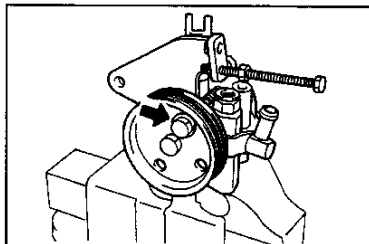
WFE90-SR328

16. Visually inspect the adjusting strut for damage, such as cracks and deformation. If any damage is present, remove the adjusting strut by removing the set bolt and nut.



WFE90-SR329

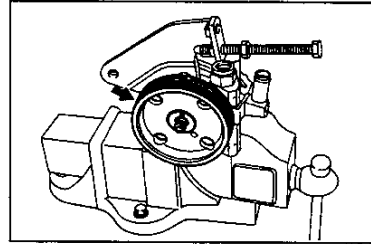
17. Remove the set bolt, while preventing the vane pump pulley from turning by inserting a suitable bolt to the pulley, as indicated in the right figure.



WFE90-SR330

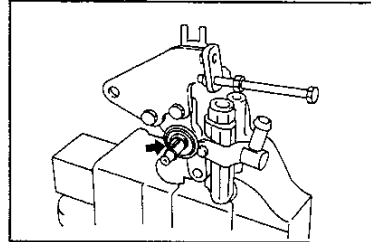
STEERING

18. Remove the pulley from the vane pump.



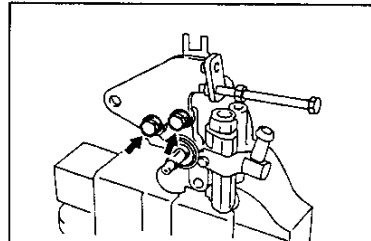
WFE90-SR331

19. Remove the woodruff key from the vane pump.



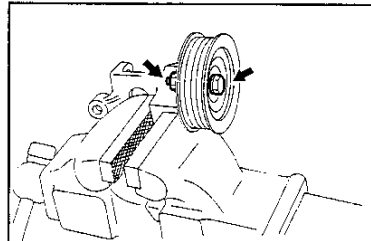
WFE90-SR332

20. Remove the pump front stay from the vane pump.



WFE90-SR333

21. Remove the idle pulley from the vane pump bracket.

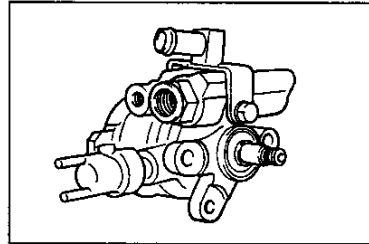


WFE90-SR334

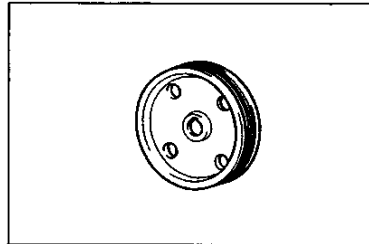
STEERING

INSPECTIONS

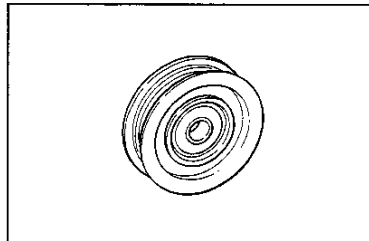
1. Ensure that the vane pump exhibits no damage, such as deformation, breakage and oil leakage.
2. Ensure that the vane pump pulley exhibits no damage, such as deformation and cracks.
3. Ensure that the idle pulley exhibits no damage, such as deformation and cracks. Ensure that the bearing can rotate smoothly.
If not, replace the idle pulley.
4. Ensure that no damage is present at the brackets and attaching bolts.
If any damage is present, replace defective parts.



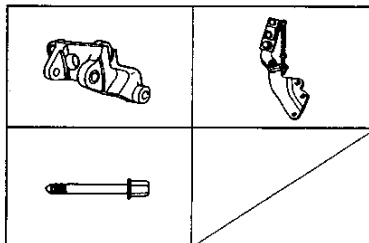
WFE90-SR335



WFE90-SR336



WFE90-SR337

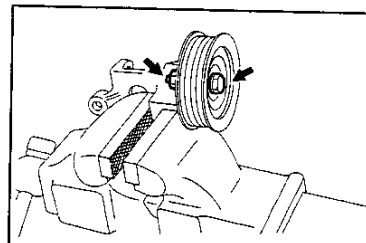


WFE90-SR338

INSTALLATION

1. Install the idle pulley to the vane pump bracket with the bolts and nuts. Tighten the attaching bolts and nuts to the specified torque.

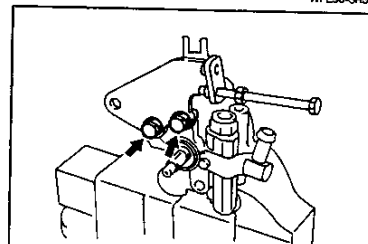
Tightening Torque: 34.3 - 49.0 N·m
(3.5 - 5.0 kgf-m, 25.3 - 36.2 ft-lb)



WFE90-SR339

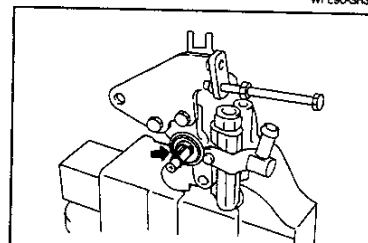
2. Install the pump front stay to the vane pump with the attaching bolts.

Tightening Torque: 34.3 - 49.0 N·m
(3.5 - 5.0 kgf-m, 25.3 - 36.2 ft-lb)



WFE90-SR340

3. Install the woodruff key to the vane pump.

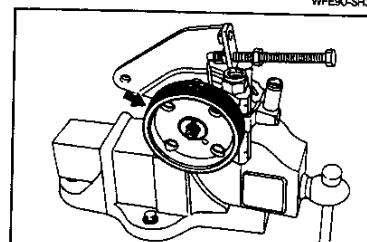


WFE90-SR341

4. Install the pulley to the vane pump.

NOTE:

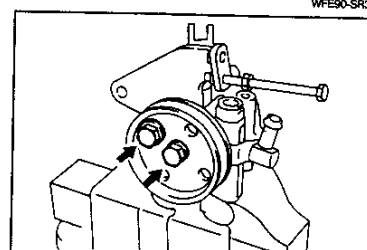
- Make sure that the woodruff key will not be displaced during the installation.



WFE90-SR342

5. Insert a suitable bolt to the vane pump pulley as indicated in the right figure. While preventing the pulley from turning, tighten the set bolt to the specified torque.

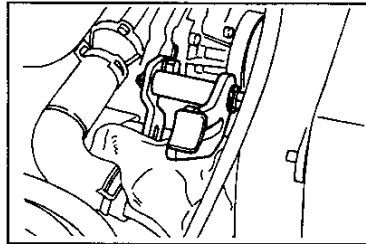
Tightening Torque: 34.3 - 53.0 N·m
(3.5 - 5.4 kgf-m, 25.3 - 39.1 ft-lb)



WFE90-SR343

STEERING

6. Temporarily install the adjusting strut to the alternator adjusting bar.
(Only cases where the adjusting strut was removed)



WFE90-SR344

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

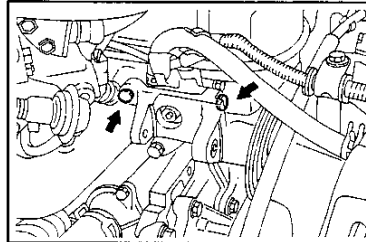
Tightening Torque:

M8 bolt

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

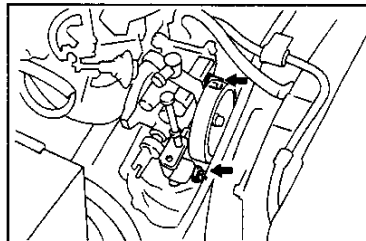
M10 bolt

34.3 - 44.1 N·m (3.5 - 4.5 kgf-m, 25.3 - 32.5 ft-lb)



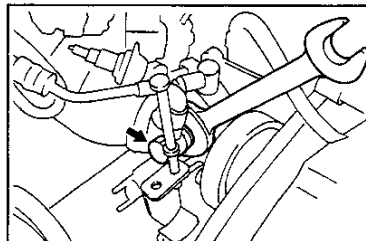
WFE90-SR345

8. Connect the vane pump to the engine. Temporarily tighten the attaching bolt and set bolt.



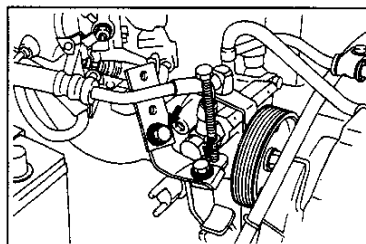
WFE90-SR346

9. Temporarily install the pressure feed tube to the vane pump with a new gasket interposed.



WFE90-SR347

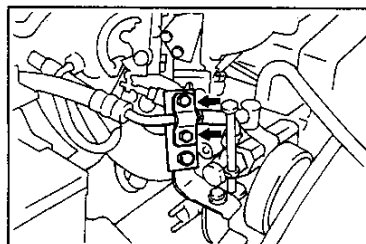
10. Temporarily install the tube support bracket to the pump front stay. Loosen the bolts connecting the tube support bracket to the tube support bracket No. 2.



WFE90-SR348

STEERING

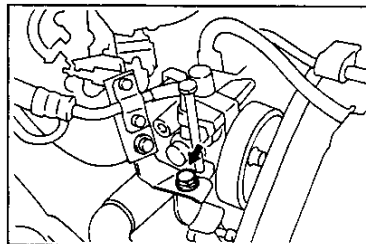
11. Temporarily install the pressure feed tube to the tube support bracket No. 2 with a clamp.



WFE90-SR349

12. Tighten the bolt connecting the tube support bracket to the pump front stay to the specified torque.

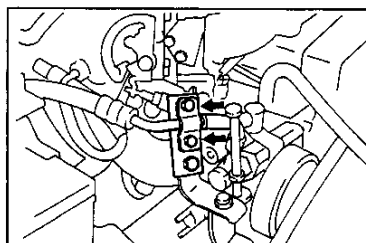
Tightening Torque: 9.8 - 15.7 N·m
(1.0 - 1.6 kgf-m, 7.2 - 11.6 ft-lb)



WFE90-SR350

13. Tighten the clamp attaching 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)



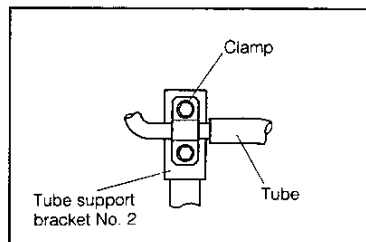
WFE90-SR351

CAUTION:

- Prior to the tightening, make sure that the tube support does not overlap the large diameter section of the tube.

NOTE:

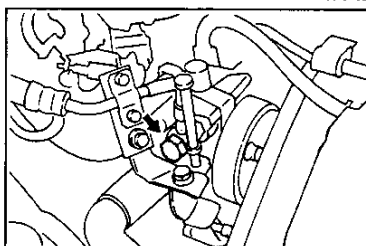
- If the attaching bolts were tightened under the condition that the larger diameter section of the tube rode over the tube support, be sure to replace the tube support bracket and clamp with new parts.



WFE90-SR352

14. Tighten the union bolt to the specified torque, while preventing it from turning at the nut section at the vane pump side.

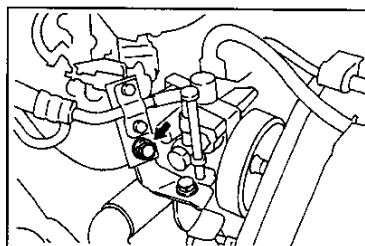
Tightening Torque: 44.1 - 53.9 N·m
(4.5 - 5.5 kgf-m, 32.5 - 39.8 ft-lb)



WFE90-SR353

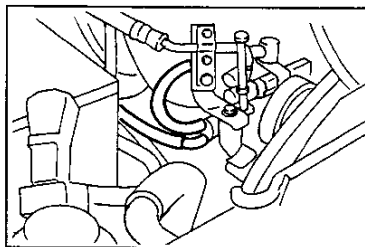
STEERING

15. Tighten the bolts connecting the tube support bracket No.2 to the tube support bracket to the specified torque.
Tightening Torque: 9.8 - 15.7 N·m
(1.0 - 1.6 kgf-m, 7.2 - 11.6 ft-lb)



WFE90-SR354

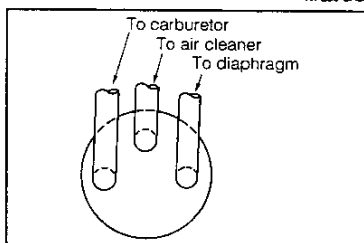
16. Connect the air hoses for idle-up use to the air control valve.



WFE90-SR355

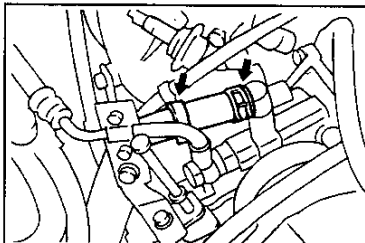
NOTE:

- As for air hoses for the carburetor-equipped vehicle, connect them as shown in the right figure.



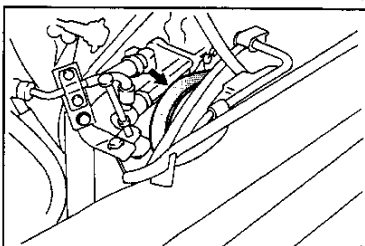
WFE90-SR356

17. Connect the oil reservoir-to-pump hose to the vane pump.
18. Attach the hose clip.
19. Remove the cloth placed during the disassembly.



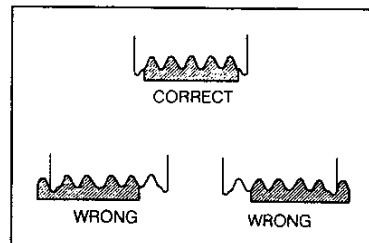
WFE90-SR356

20. Insert the drive belt.



WFE90-SR357

21. Correctly install the drive belt to each pulley.



WFE90-SR358

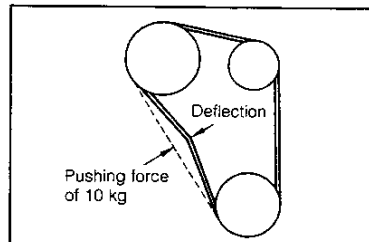
22. Adjust the drive belt tension by tightening the adjusting bolt so that the belt tension may become the specified value. Lock the adjusting bolt with the lock nut.

Specified Belt Deflection: 9 - 11mm

[When a force of 10 kgf is applied]

Tightening Torque (lock nut):

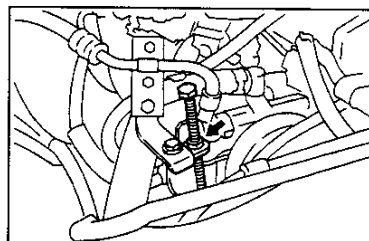
9.8 - 15.7 N·m (1.0 - 1.6 kgf-m, 7.2 - 11.6 ft-lb)



WFE90-SR359

NOTE:

- As for the belt tension of the air conditioner-equipped vehicle, see the Air Conditioner section.

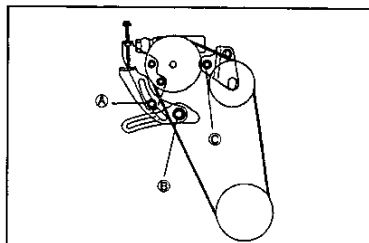


WFE90-SR360

23. Tighten the remaining bolts to the specified torque.

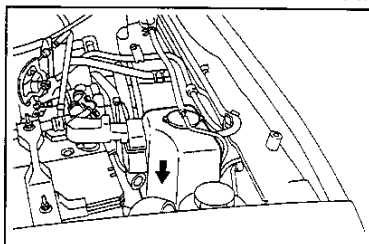
Tightening Torque:

- Ⓐ: 34.3 - 44.1 N·m
(3.5 - 4.5 kgf-m, 25.3 - 32.5 ft-lb)
- Ⓑ: 68.6 - 88.3 N·m
(7.0 - 9.0 kgf-m, 50.6 - 65.1 ft-lb)
- Ⓒ: 49.0 - 68.6 N·m
(5.0 - 7.0 kgf-m, 36.2 - 50.6 ft-lb)



WFE90-SR361

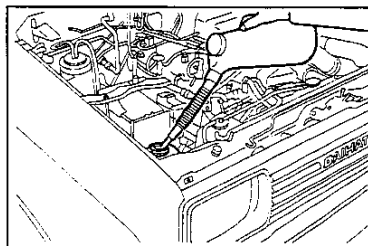
24. Install the radiator reservoir tank by inserting it to the clamp at the vehicle side.



WFE90-SR362

STEERING









25. Fill power steering fluid.
(See page SR-24 to SR-25.)
26. Carry out the in-vehicle inspection of the power steering.
(See page SR-20.)



WFE90-SR963

STEERING

SSTs (Special Service Tools)

Shape	Parts No. and Name	Purpose	Remarks
	09608-87611-000 Lower arm dust cover & tie rod end dust cover replacer	Assembling of tie rod end dust cover	
	09608-87613-000 Pitman arm, tie rod end dust cover & hub cap replacer	Assembling of pitman arm, tie rod end dust cover Assembling of hub cap	Except for hub cap for free wheel hub
	09608-87614-000 Idler arm dust cover replacer	Assembling of idler arm dust cover	
	09610-20012-000 Pitman arm puller	Disconnection of upper arm and lower arm	
	09610-87301-000 Pitman arm puller	Removal of pitman arm	
	09611-87701-000 Tie rod end puller	Disconnection of tie rod end	
	09616-00010-000 Steering pinion bearing adjusting socket	Holding of steering shaft	
	09950-20017-000 Universal puller	Removal of bearing	

WFE90-SR365

SERVICE SPECIFICATION

Steering wheel free play	0 - 30 mm (0 - 1.18 inch)
Steering gear box oil level (Except power steering equipped model)	13 - 23 mm (0.51 - 0.91 inch) from upper side of steering gear box hole
Drive belt tension	9 - 11 mm (0.35 - 0.43 inch) when 10 kgf (22 lb) applied (Except for A/C equipped vehicle)
Maximum steering torque (Only for power steering equipped model)	7.8 N·m (80 kgf-cm, 5.8 ft-lb)
Vane pump hydraulic pressure Difference of hydraulic pressure	65 kg/cm ² (924.5 psi) or more 5 kg/cm ² (71.1 psi) at 1000 and 3000 rpm

WFE90-SR366

STEERING

TIGHTENING TORQUE

Tightening component	N·m	kgf·m	ft·lb
Steering gear housing × Oil filler plug (Except power steering equipped model)	2.0 - 3.9	0.2 - 0.4	1.4 - 2.9
Steering gear box × Pressure tubes (Only power steering equipped model)	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 shaft × Intermediate shaft	24.5 - 34.3	2.5 - 3.5	18.1 - 25.3
Steering hole cover × Floor panel	3.9 - 6.9	0.4 - 0.7	2.9 - 5.1
Steering column tube × Brace (Instrument panel)	14.7 - 21.6	1.5 - 2.2	10.8 - 15.9
Steering column tube × Steering hole cover (Tilt steering equipped model only)	3.9 - 6.9	0.4 - 0.7	2.9 - 5.1
Steering support × long nut (Tilt steering equipped model only)	12.7	1.3	9.4
Steering lever × long nut (Tilt steering equipped model only)	29.4 - 49.0 24.5 - 34.3	3.0 - 4.5 2.5 - 3.5	21.7 - 36.2 18.1 - 25.3
Steering relay rod × Tie rod	68.6 - 137	7.0 - 14.0	50.6 - 101
Idler arm support pin × Frame	34.3 - 53.9	3.5 - 5.5	25.4 - 39.8
Idler arm support pin × Idler arm assembly	108 - 167	12.0 - 17.0	87 - 123
Idler arm × Relay rod	49.0 - 68.6	5.0 - 7.0	36.2 - 50.6
Pitman arm × Relay rod	68.6 - 137	7.0 - 14.0	50.6 - 101
Tie rod × Steering knuckles	68.6 - 137	7.0 - 14.0	68.6 - 137
Wheel hub nuts	88.3 - 118	9.0 - 12.0	65.1 - 87.0
Steering gear housing × Frame	73.5 - 103	7.5 - 10.5	54.2 - 75.9
Steering gear housing × Pitman arm	147-196	15.0 - 20.0	109 - 145
Cross shaft adjust screw × Lock nut	19.6 - 34.3	2.0 - 3.5	14.5 - 25.3
Intermediate shaft × Steering gear housing	24.5 - 34.3	2.5 - 3.5	18.1 - 25.3
Idle pulley × Vane pump bracket	34.3 - 49.0	3.5 - 5.0	25.3 - 36.2
Vane pump × Pump front stay	34.3 - 49.0	3.5 - 5.0	25.3 - 36.2
Vane pump × Pulley	34.3 - 53.0	3.5 - 5.4	25.3 - 39.1
Vane pump bracket × Engine M8 M10	9.8 - 15.7 34.3 - 44.1	1.0 - 1.6 3.5 - 4.5	7.2 - 11.6 25.3 - 32.5
Pump front stay × Tube support bracket	9.8 - 15.7	1.0 - 1.6	7.2 - 11.6
Tube support bracket × Clamp	3.9 - 6.9	0.4 - 0.7	2.9 - 5.1
Vane pump × Union bolt	44.1 - 53.9	4.5 - 5.5	32.5 - 39.8
Tube support bracket × Tube support bracket	9.8 - 15.7	1.0 - 1.6	7.2 - 11.6
Drive belt tension adjust bolt × Lock nut	9.8 - 15.7	1.0 - 1.6	7.2 - 11.6
Vane pump front stay × Adjusting strut	34.3 - 44.1	3.5 - 4.5	25.3 - 32.5
Adjusting strut × Adjusting bar	68.6 - 88.3	7.0 - 9.0	50.6 - 65.1
Vane pump × Vane pump bracket	49.0 - 68.6	5.0 - 7.0	36.2 - 50.6

WFE90-SR367