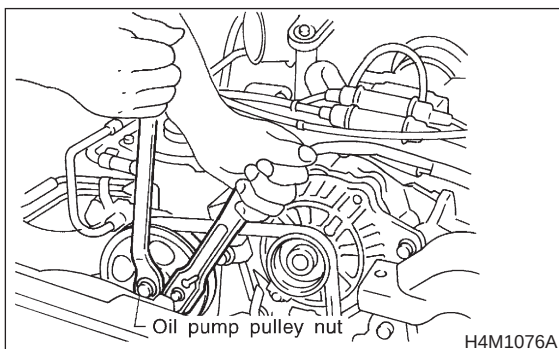


## 6. Oil Pump (Power Steering System)

### A: REMOVAL

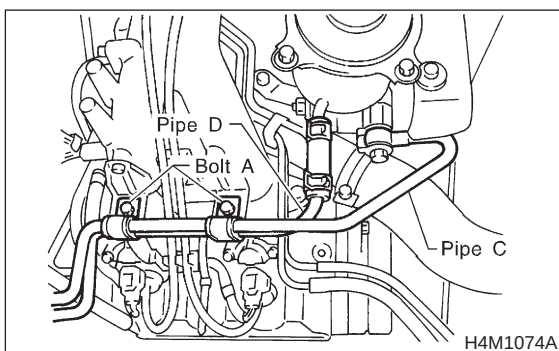
- 1) Remove ground cable from battery.
- 2) Drain the working fluid about 0.3 ℓ (0.3 US qt, 0.3 Imp qt) from oil tank.
- 3) Remove pulley belt cover bracket.
- 4) Loosen oil pump pulley nut, then remove bolts which secure alternator.



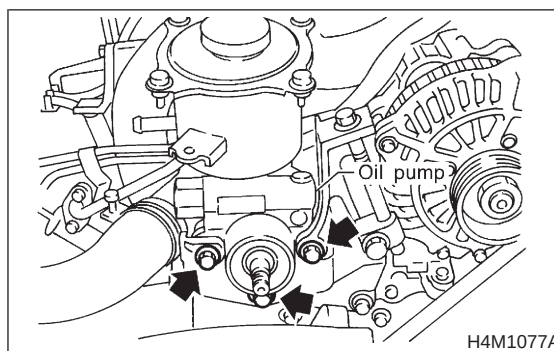
- 5) Loosen pulley belt(s).
- 6) Remove the nut and detach oil pump pulley.
- 7) Disconnect pipe C from oil pump. Disconnect pipe D from oil tank.

#### CAUTION:

- Do not allow fluid from the hose end to come into contact with pulley belt.
- To prevent foreign matter from entering the hose and pipe, cover the open ends of them with a clean cloth.
- Except when only oil tank needs to be inspected, detach oil tank and oil pump as a unit. Then separate one from the other on a work bench to prevent oil from spilling on any part of the engine.



- 8) Remove three bolts from the front side of oil pump and detach the pump.



- 9) Remove three bolts from the lower side of bracket and detach the bracket.

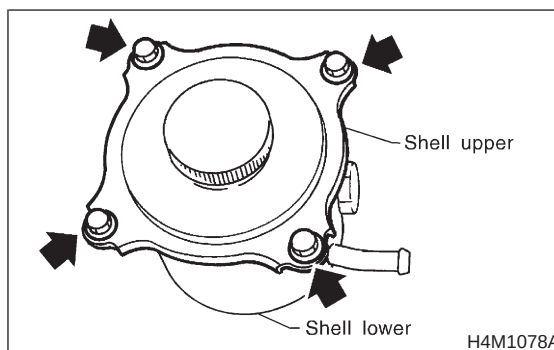
#### CAUTION:

The bracket does not need to be removed unless it is damaged.

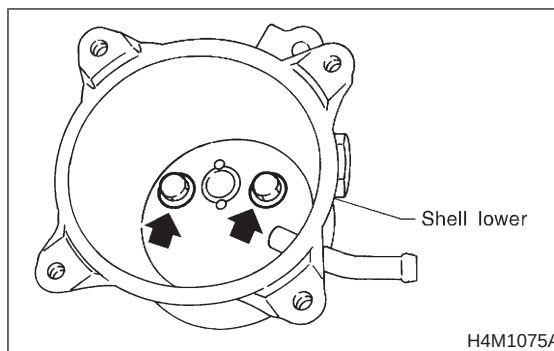
- 10) Place oil pump in a vise, and remove shell upper and baffle from shell lower.

#### CAUTION:

Do not clamp oil pump too hard; otherwise oil pump may be dented.



- 11) Remove shell lower from oil pump.



**B: CHECK**

- In accordance with the following table, check all removed parts for wear and damage, and make repair or replacement if necessary.

| No. | Parts               | Inspection                                 | Corrective action                                                                                                                                                                        |
|-----|---------------------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Oil pump (Exterior) | (1) Crack, damage or oil leakage           | Replace oil pump with a new one.                                                                                                                                                         |
|     |                     | (2) Play of pulley shaft                   | Measure radial play and axial play.<br>If any of these exceeds the service limit, replace oil pump with a new one. <Ref. to 4-3 [W6B1].>                                                 |
| 2   | Pulley              | (1) Damage                                 | Replace it with a new one.                                                                                                                                                               |
|     |                     | (2) Bend                                   | Measure V ditch deflection.<br>If it exceeds the service limit, replace pulley with a new one. <Ref. to 4-3 [W6B1].>                                                                     |
| 3   | Cap                 | Crack or damage                            | Replace it with a new one.                                                                                                                                                               |
| 4   | Strainer            | (1) Clogging with dirt                     | Wash it.                                                                                                                                                                                 |
|     |                     | (2) Breakage                               | Replace it with a new one.                                                                                                                                                               |
| 5   | Oil pump (Interior) | (1) Defect or burning of vane pump         | Check resistance to rotation of pulley.<br>If it is past the service limit, replace oil pump with a new one. <Ref. to 4-3 [W6B1].>                                                       |
|     |                     | (2) Bend in the shaft or damage to bearing | Oil pump emits a noise that is markedly different in tone and loudness from a sound of a new oil pump when turning with a string put around its pulley, replace oil pump with a new one. |
| 6   | O-ring              | Crack or deterioration                     | Replace it with a new one.                                                                                                                                                               |
| 7   | Oil tank            | Crack, damage or oil leakage               | Replace it with a new one.                                                                                                                                                               |
| 8   | Bracket             | Crack                                      | Replace it with a new one.                                                                                                                                                               |

**1. SERVICE LIMIT**

Make a measurement as follows. If it exceeds the specified service limit, replace the parts with new ones.

**CAUTION:**

- Fix oil pump on a vise to make a measurement. At this time, hold oil pump with the least possible force between two wood pieces.
- Do not set outside of flow control valve or pulley on a vise; otherwise outside or pulley might be deformed. Select properly sized wood pieces.

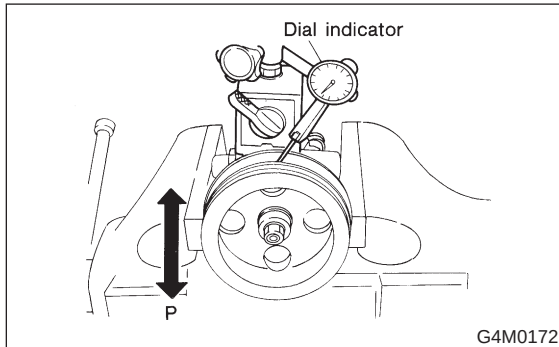
● Play of pulley shaft

**On condition:**

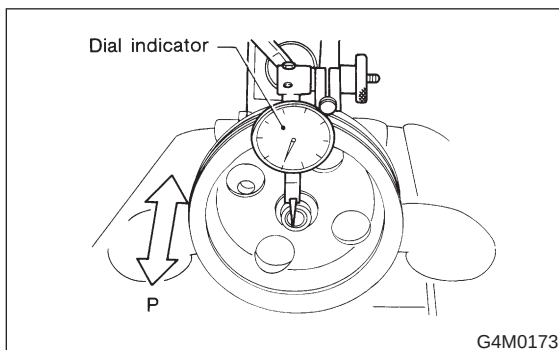
**P: 9.8 N (1.0 kg, 2.2 lb)**

**Service limit:**

**Radial play (Direction  $\updownarrow$  )**  
**0.4 mm (0.016 in) or less**



**Axial play (Direction  $\leftrightarrow$  )**  
**0.9 mm (0.035 in) or less**



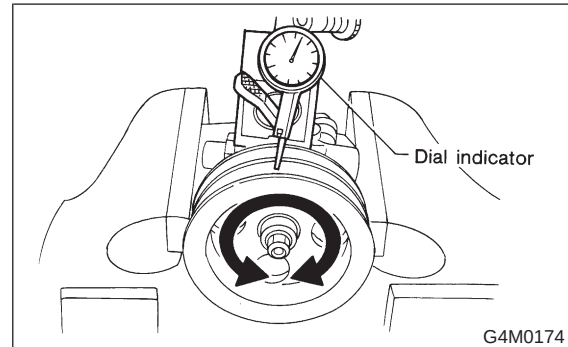
● Ditch deflection of pulley

**Service limit:**

**1.0 mm (0.039 in) or less**

**NOTE:**

Read the value for one surface of V ditch, and then the value for another off the dial.



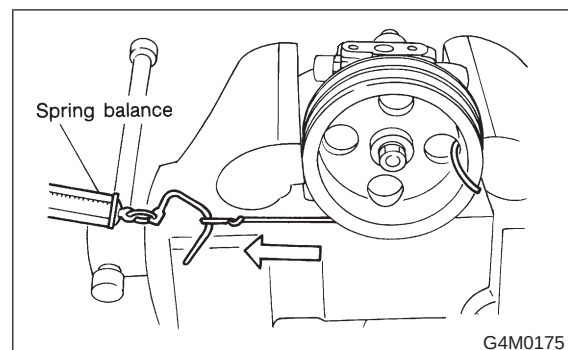
● Resistance to rotation of pulley

**Service limit:**

**Maximum load; 9.22 N (0.94 kg, 2.07 lb)**  
**or less**

**NOTE:**

- A rather higher value may be indicated when pulley starts turning.
- Measure the load during rotation and make a judgment.



**C: INSTALLATION**

- 1) Install bracket on engine.

**Tightening torque:**

**22±2 N·m (2.2±0.2 kg-m, 15.9±1.4 ft-lb)**

- 2) Install oil pump on oil tank as follows outside the vehicle:

**NOTE:**

Prior to installation, make sure that all oil is removed from oil pump, oil tank and pipe.

- (1) Place oil pump in a vise and install stay to oil pump.

**CAUTION:**

Do not place oil pump directly in vise; use soft pads and hold oil pump lightly to protect it.

**Tightening torque:**

$15.7 \pm 2.4 \text{ N}\cdot\text{m}$  ( $1.60 \pm 0.24 \text{ kg}\cdot\text{m}$ ,  $11.6 \pm 1.7 \text{ ft}\cdot\text{lb}$ )

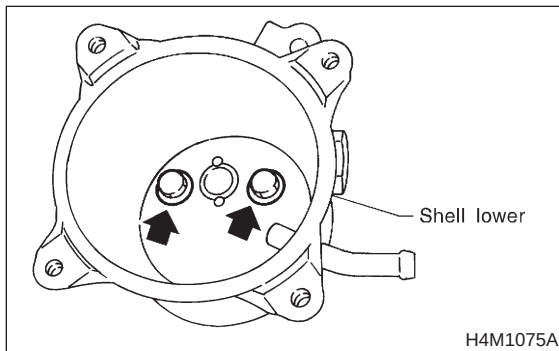
- (2) Install shell lower to oil pump.

**Tightening torque:**

$18^{+5}_{-0} \text{ N}\cdot\text{m}$  ( $1.8^{+0.5}_{-0} \text{ kg}\cdot\text{m}$ ,  $13.0^{+3.6}_{-0} \text{ ft}\cdot\text{lb}$ )

**CAUTION:**

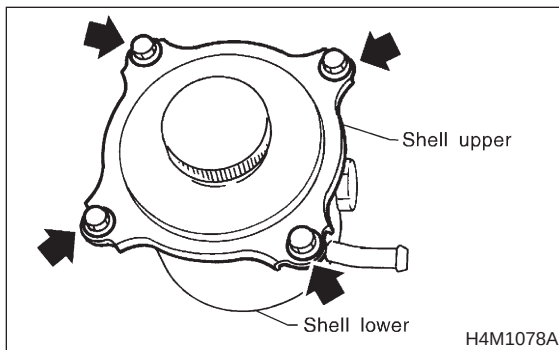
Be sure to use a new seal washer.



- (3) Install shell upper and baffle to shell lower.

**Tightening torque:**

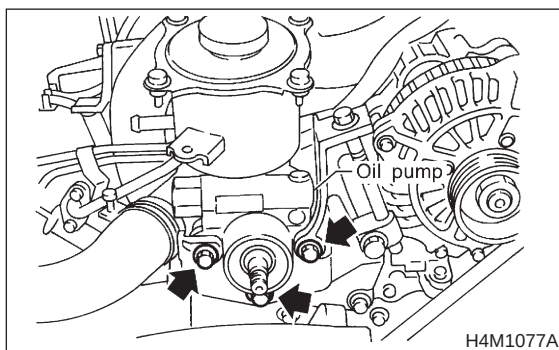
$13 \pm 3 \text{ N}\cdot\text{m}$  ( $1.3 \pm 0.3 \text{ kg}\cdot\text{m}$ ,  $9.4 \pm 2.2 \text{ ft}\cdot\text{lb}$ )



- 3) Install oil pump, previously assembled to oil tank, on bracket.

**Tightening torque:**

$20.1 \pm 2.5 \text{ N}\cdot\text{m}$  ( $2.05 \pm 0.25 \text{ kg}\cdot\text{m}$ ,  $14.8 \pm 1.8 \text{ ft}\cdot\text{lb}$ )



- 4) Place oil pump pulley and tighten pulley nut temporarily.

- 5) Install pulley belt to oil pump.

- 6) Tighten oil pump pulley nut to the specified torque.

**Tightening torque:**

$52 \pm 10 \text{ N}\cdot\text{m}$  ( $5.3 \pm 1.0 \text{ kg}\cdot\text{m}$ ,  $38 \pm 7 \text{ ft}\cdot\text{lb}$ )

- 7) Check pulley belt tension. <Ref. to 1-5 [G2A0].>

- 8) Tighten bolt belt tension.

**Tightening torque:**

$8 \pm 2 \text{ N}\cdot\text{m}$  ( $0.8 \pm 0.2 \text{ kg}\cdot\text{m}$ ,  $5.8 \pm 1.4 \text{ ft}\cdot\text{lb}$ )

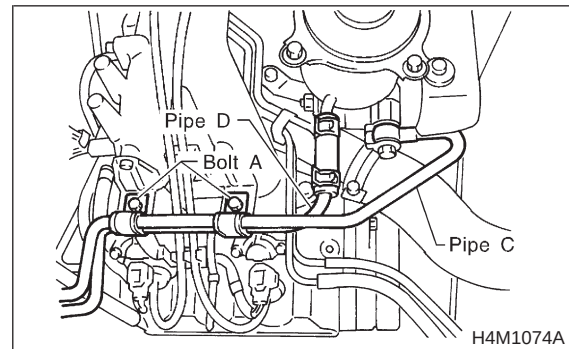
- 9) Interconnect pipes C and D.

**Tightening torque:****Joint nut**

$39 \pm 5 \text{ N}\cdot\text{m}$  ( $4.0 \pm 0.5 \text{ kg}\cdot\text{m}$ ,  $28.9 \pm 3.6 \text{ ft}\cdot\text{lb}$ )

**CAUTION:**

If a hose is twisted at this step, the hose may come into contact with some other parts.



- 10) Install pulley belt cover bracket.

- 11) Connect minus terminal of battery.

- 12) Feed the specified power steering fluid and discharge air.<Ref. to 4-3 [W7A0].>

**CAUTION:**

Never start the engine before feeding the fluid; otherwise vane pump might be seized up.