

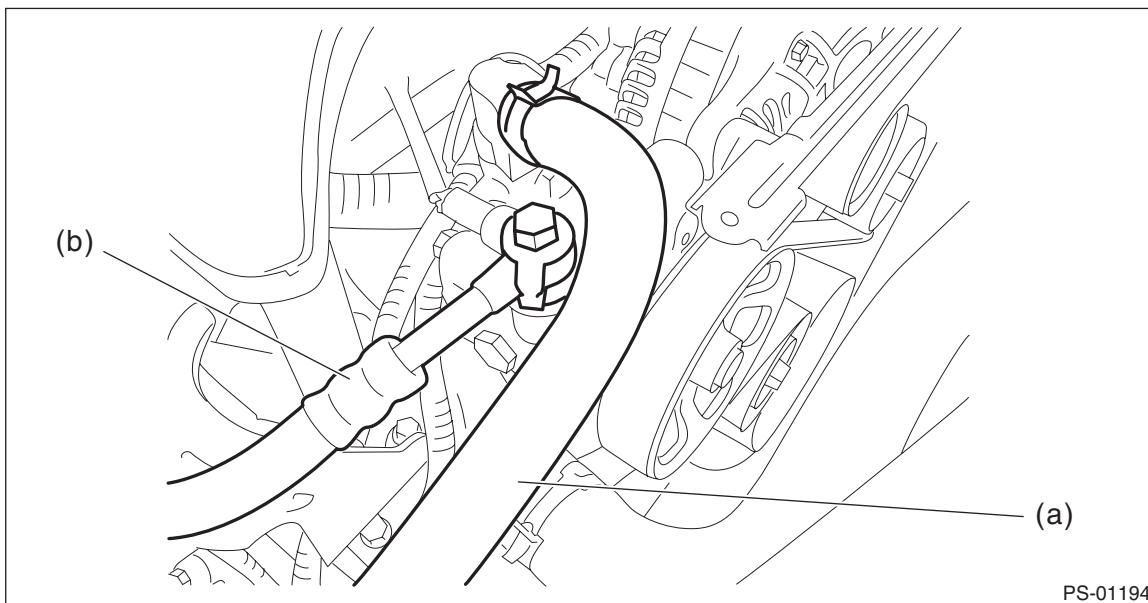
## 7. Oil Pump

### A: REMOVAL

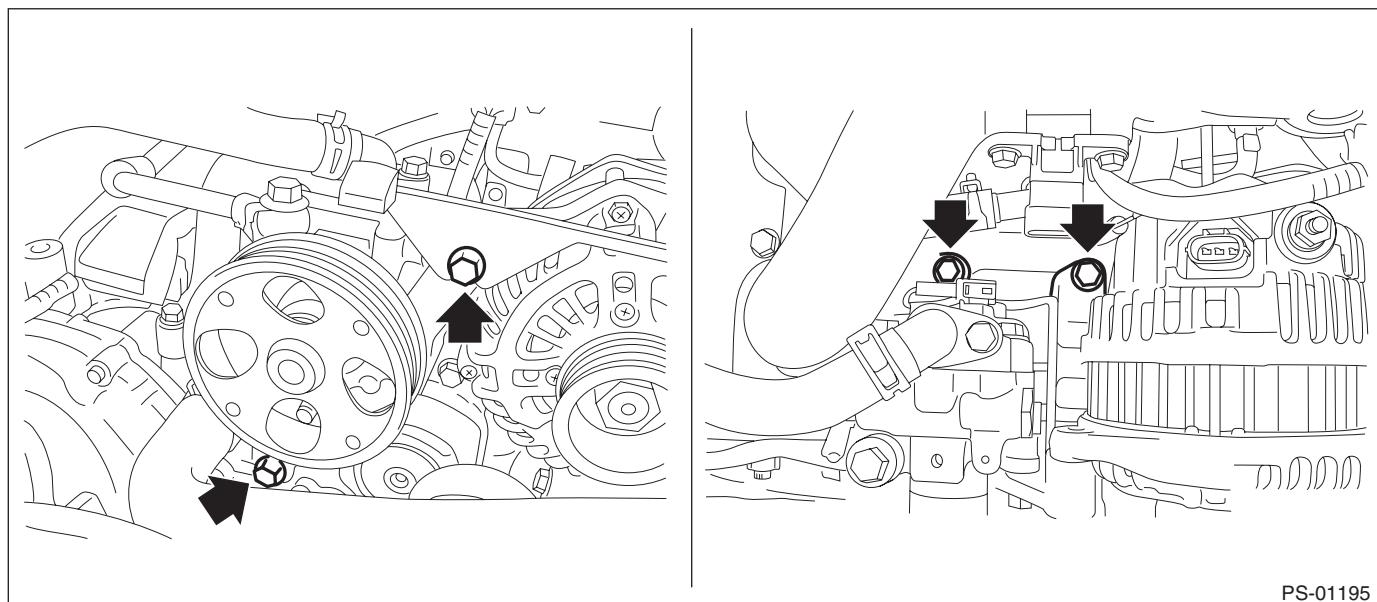
- 1) Disconnect the ground cable from battery.
- 2) Remove the V-belts. <Ref. to ME(H4SO)-42, REMOVAL, V-belt.>
- 3) Remove the power steering oil pump assembly.
  - (1) Disconnect the connector from power steering pump switch.
  - (2) Disconnect the pressure hose (b) and suction hose (a) from power steering oil pump.

**CAUTION:**

- Do not allow fluid to come into contact with the pulley belt.
- Plug the ends of the hose and pipe to prevent foreign matter from entering.



- (3) Remove the bolts, and remove the power steering oil pump assembly.



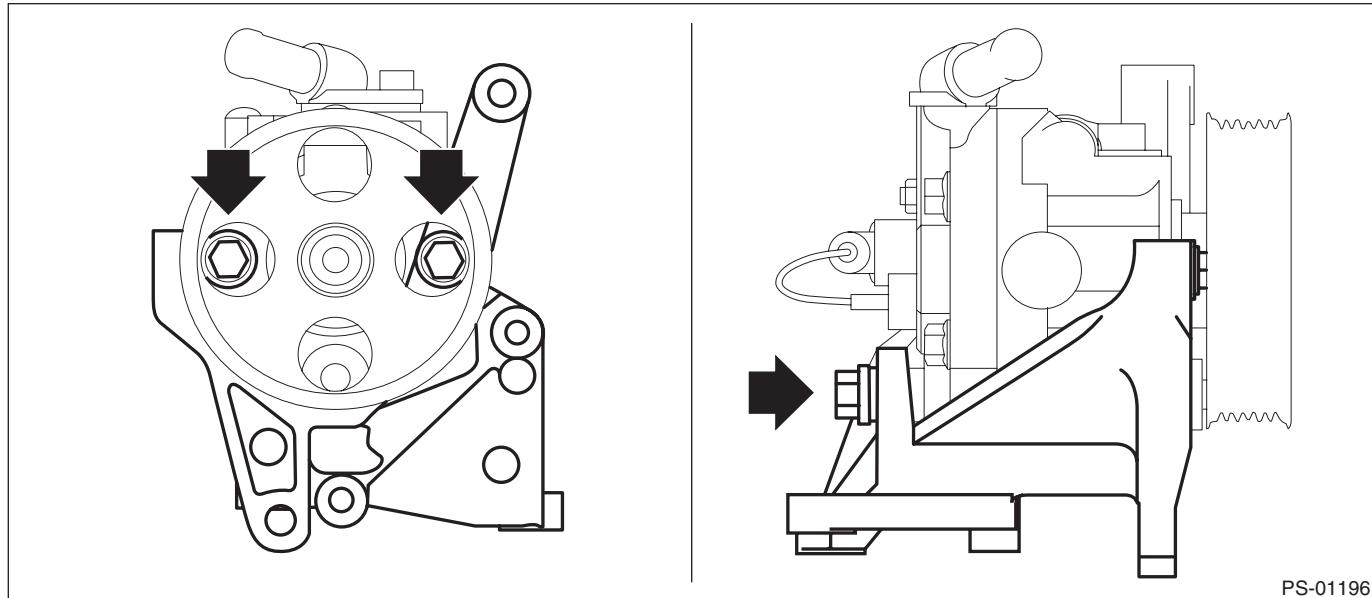
# Oil Pump

## POWER ASSISTED SYSTEM (POWER STEERING)

- 4) Secure the oil pump bracket in a vise, and remove the bolts from both front and rear sides of the oil pump.

**CAUTION:**

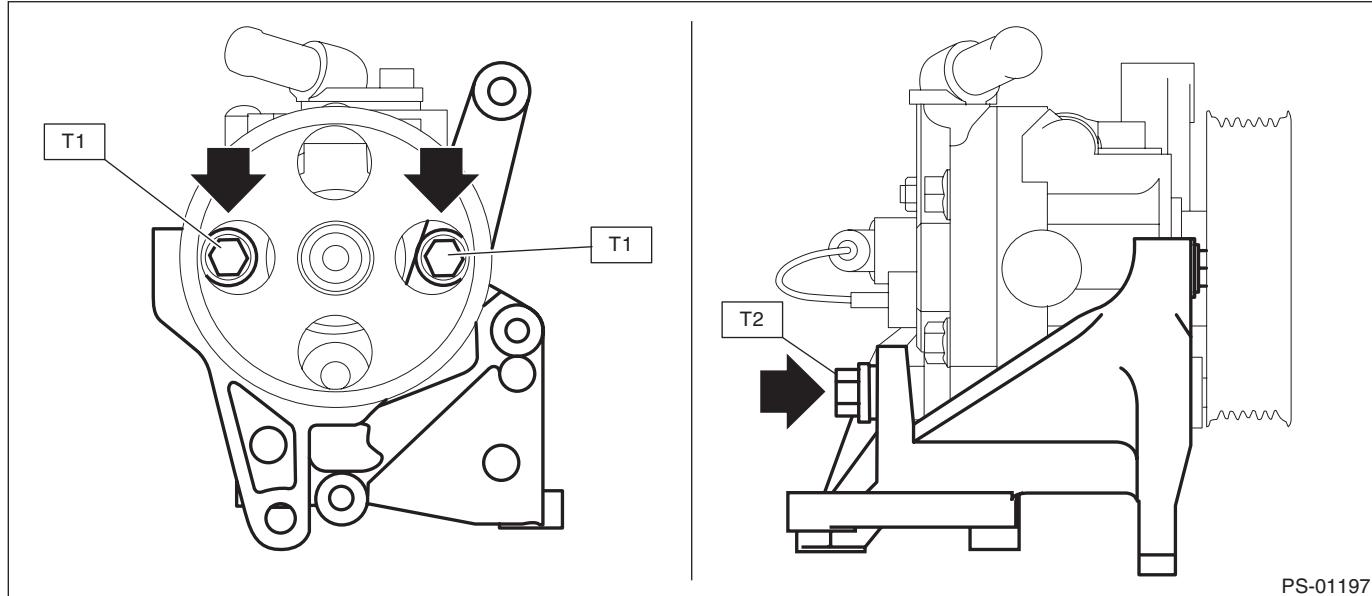
**When securing the oil pump bracket in a vice, hold the oil pump bracket with the least possible force between two pieces of wood.**



- 5) Remove the power steering oil pump assembly from the bracket.

## B: INSTALLATION

- 1) Install the bracket to the power steering oil pump.



**Tightening torque:**

**T1: 16 N·m (1.63 kgf-m, 11.8 ft-lb)**

**T2: 36 N·m (3.67 kgf-m, 26.6 ft-lb)**

- 2) Install the power steering pump bracket.

**Tightening torque:**

**22 N·m (2.24 kgf-m, 16.2 ft-lb)**

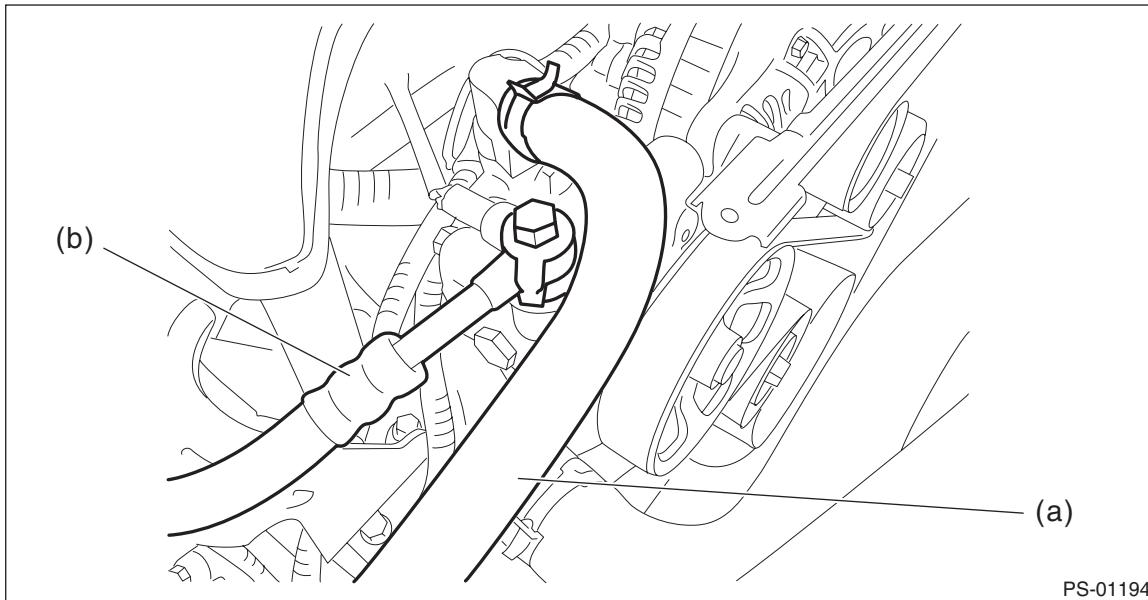
## Oil Pump

### POWER ASSISTED SYSTEM (POWER STEERING)

- 3) Connect the pressure hose (b) and suction hose (a).

**CAUTION:**

**Be careful when installing; If the hose is twisted it may come into contact with other parts.**



**Tightening torque:**

**Eye bolt: 40 N·m (4.08 kgf·m, 29.5 ft-lb)**

- 4) Connect the power steering pump switch to the connector.
- 5) After installing the oil pump, fill the oil pump with fluid while rotating the pulley by hand and bleed the air from the oil pump.

**CAUTION:**

**Always fill the oil pump with the fluid to prevent abnormal noise and seizure of the oil pump.**

- 6) Install the V-belts. <Ref. to ME(H4SO)-42, INSTALLATION, V-belt.>
- 7) Connect the battery ground terminal.
- 8) Fill with recommended power steering fluid and perform air bleeding. <Ref. to PS-75, Power Steering Fluid.>

**CAUTION:**

**Never start the engine before filling with fluid; otherwise the vane pump may become seized.**

# Oil Pump

## POWER ASSISTED SYSTEM (POWER STEERING)

### C: INSPECTION

#### 1. BASIC INSPECTION

Perform the following inspection procedures and replace any faulty parts.

No.	Parts	Inspection	Corrective action
1	Oil pump (Exterior)	(1) Crack, damage or oil leakage	Replace the oil pump with a new part.
		(2) Play of pulley shaft	Measure the radial play and axial play. If any of these exceeds the service limit, replace the oil pump with a new part.
2	Pulley	(1) Damage	Replace with a new part.
		(2) Bend	Measure the V groove deflection. If it exceeds the service limit, replace the pulley with a new part.
3	Oil pump (Interior)	(1) Faulty or seized of vane pump	Check the rotating resistance of pulley. If it exceeds the service limit, replace the oil pump with a new part.
		(2) Bend in the shaft or damage to bearing	If the a string is wrapped on the pulley and rotated, and the oil pump emits a noise that is markedly different in tone and loudness from a sound of a new oil pump, replace the oil pump with a new part.
4	O-ring	Cracking or deterioration	Replace with a new part.
5	Bracket	Cracks	Replace with a new part.

### 2. SERVICE LIMIT

Make a measurements as follows. If it exceeds the service limit, replace with a new part.

#### CAUTION:

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

1) Play of the pulley shaft

#### Condition:

*P: When applying a force of 9.8 N (1.0 kgf, 2.2 lbf)*

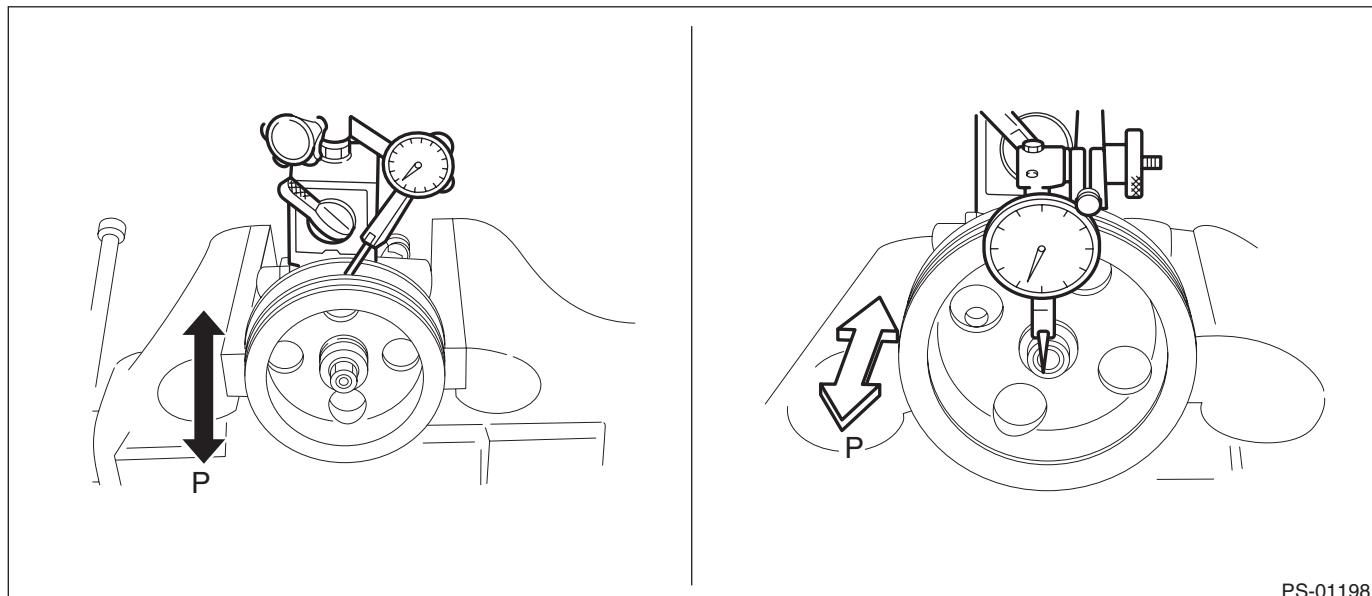
#### Service limit:

*Play in the radial direction (Direction  $\leftarrow \rightarrow$ ):*

*0.2 mm (0.008 in) or less*

*Axial play (Direction  $\uparrow \downarrow$ ):*

*0.9 mm (0.035 in) or less*



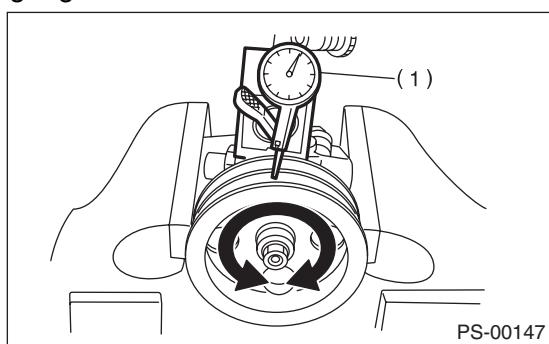
2) Deflection of the pulley groove

#### Service limit:

*1.0 mm (0.039 in) or less*

#### NOTE:

Read the value on one surface of V groove, set the dial gauge on the other surface, and read the value of the dial gauge.



(1) Dial gauge

# Oil Pump

## POWER ASSISTED SYSTEM (POWER STEERING)

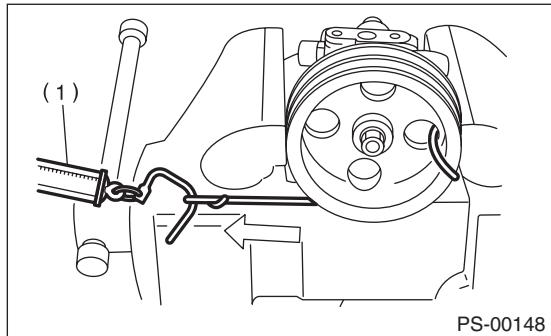
### 3) Rotating resistance of pulley

#### **Service limit:**

**Maximum load: 9.22 N (0.94 kgf, 2.07 lbf) or less**

#### NOTE:

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



(1) Spring scale

## 3. HYDRAULIC PRESSURE

#### **CAUTION:**

- To measure hydraulic pressure correctly, be sure to complete all the items in “INSPECTION”, prior to performing the measurement. <Ref. to PS-76, INSPECTION, General Diagnostic Table.>
- Do not leave the valve of pressure gauge closed or hold the steering wheel at lock for 5 seconds or more in any case, this can damage the oil pump.
- Before attaching a pressure gauge, place cloth at locations where fluid is expected to spill. Wipe off any spilt fluid completely after the measurement.

#### Regular pressure measurement

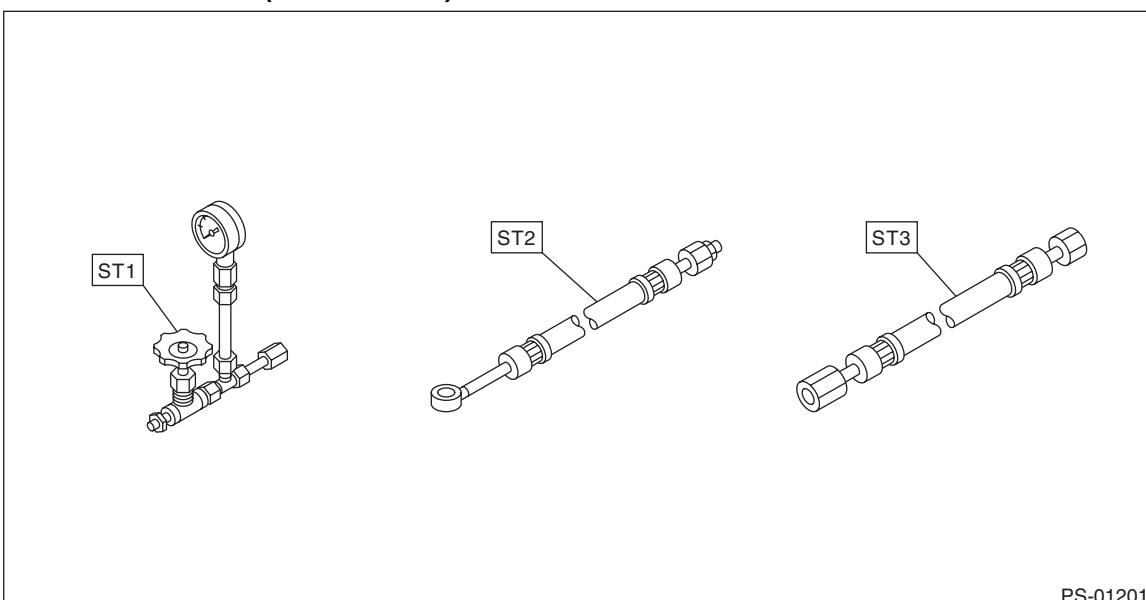
- 1) Connect the ST1, ST2 and ST3.

#### **PREPARATION TOOL:**

**ST1: PRESSURE GAUGE (925711000)**

**ST2: ADAPTER HOSE B (34099AC020)**

**ST3: ADAPTER HOSE A (34099AC010)**

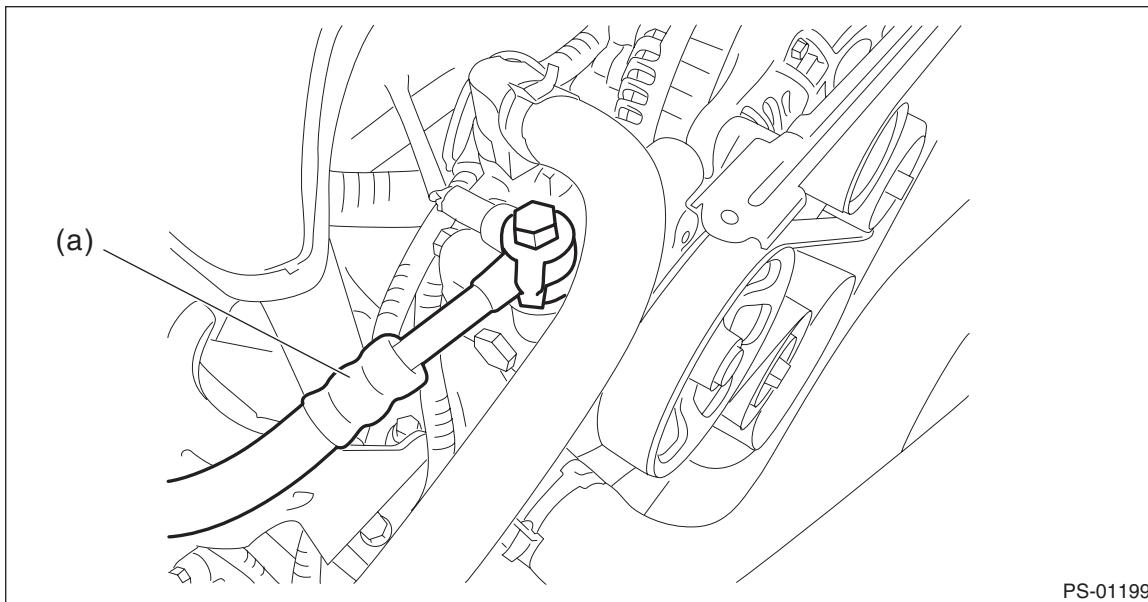


- 2) Remove the air intake duct.

## Oil Pump

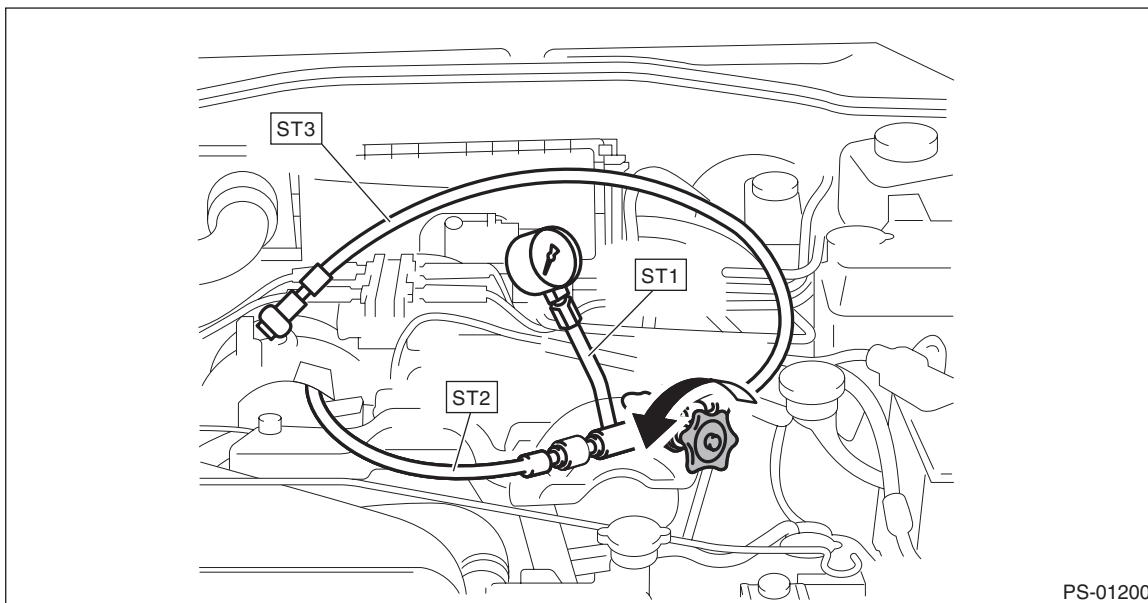
### POWER ASSISTED SYSTEM (POWER STEERING)

- 3) Disconnect the pressure hose (a) from the pump.
- 4) Using the gasket (Part No. 34621AC021) and bolt (Part No. 34620AC010), install the ST2 to pump instead of pressure hose (a).



PS-01199

- 5) Attach the ST3 to the end of pressure hose which is removed from pump.
- 6) Replenish power steering fluid up to the specified level.
- 7) Open the valve, and start the engine.



PS-01200

- 8) Measure the regular pressure.

**Service limit:**

**981 kPa (10 kgf/cm<sup>2</sup>, 142 psi) or less**

- 9) If it is not within the specification, replace the faulty part for the following problems. (Pipe or hose clogged, leaks from fluid line, and mixture of foreign matter in fluid line)

# Oil Pump

## POWER ASSISTED SYSTEM (POWER STEERING)

### Relief pressure measurement

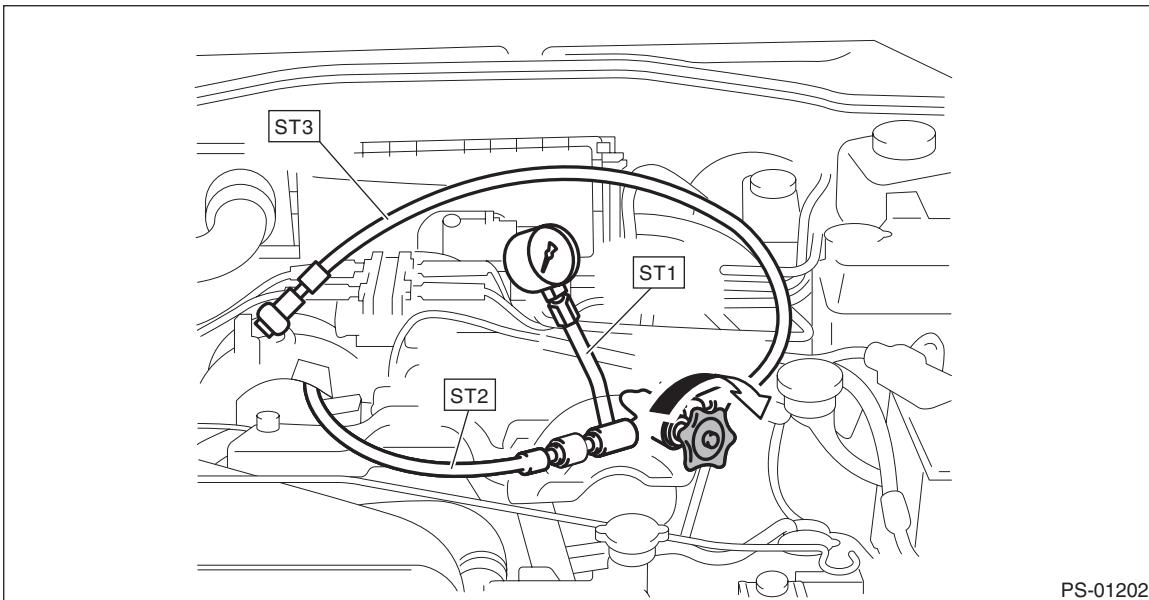
1) Attach ST1, ST2 and ST3 to the vehicle body in the same way as for regular pressure measurement.

#### PREPARATION TOOL:

**ST1: PRESSURE GAUGE (925711000)**

**ST2: ADAPTER HOSE B (34099AC020)**

**ST3: ADAPTER HOSE A (34099AC010)**



2) Close the valve.

3) Measure the relief pressure.

#### Service limit:

**H4 non-turbo model:**

**8,300 — 9,000 kPa (85 — 92 kgf/cm<sup>2</sup>, 1,203 — 1,305 psi)**

**H6, H4 turbo model:**

**8,900 — 9,600 kPa (91 — 98 kgf/cm<sup>2</sup>, 1,290 — 1,392 psi)**

4) If the torque is not within specified range, replace the oil pump.

### Working pressure measurement

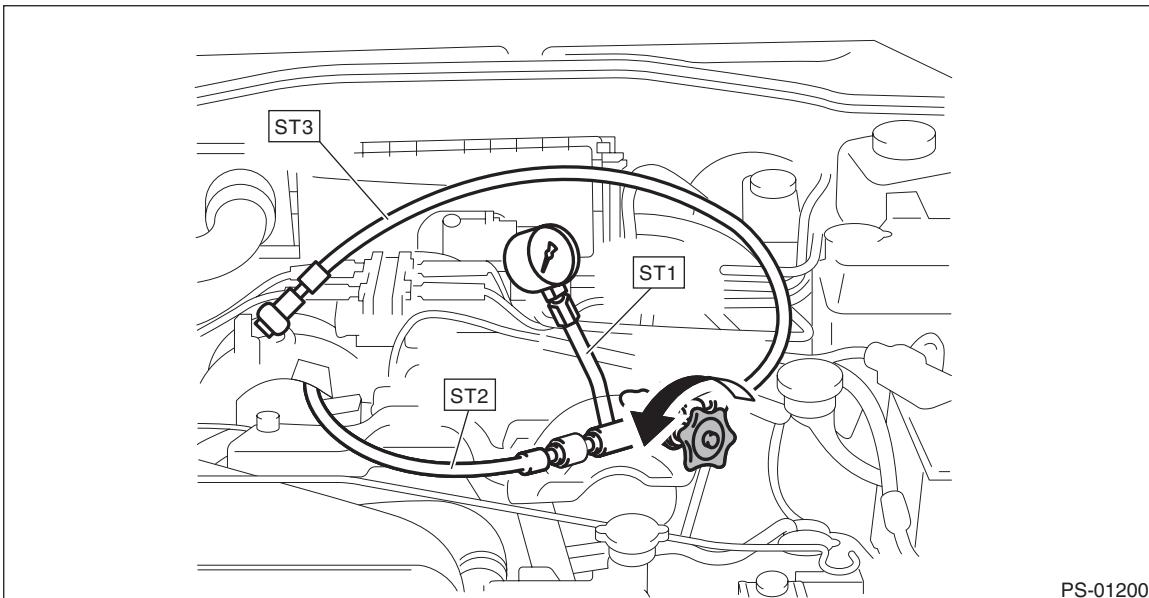
1) Attach ST1, ST2 and ST3 to the vehicle body in the same way as for regular pressure measurement.

#### PREPARATION TOOL:

**ST1: PRESSURE GAUGE (925711000)**

**ST2: ADAPTER HOSE B (34099AC020)**

**ST3: ADAPTER HOSE A (34099AC010)**



2) Open the valve.

3) Measure the working pressure of control valve by turning steering wheel from stop to stop.

#### Service limit:

**H4 non-turbo model:**

**8,300 — 9,000 kPa (85 — 92 kgf/cm<sup>2</sup>, 1,203 — 1,305 psi)**

**H6, H4 turbo model:**

**8,900 — 9,600 kPa (91 — 98 kgf/cm<sup>2</sup>, 1,290 — 1,392 psi)**

4) If it is out of specification, measure the steering effort. <Ref. to PS-79, MEASUREMENT OF STEERING EFFORT, INSPECTION, General Diagnostic Table.>

If the steering wheel effort is not within specification, replace the control valve itself or control valve and pinion as a single unit, using new parts.