

Oil Pump

POWER ASSISTED SYSTEM (POWER STEERING)

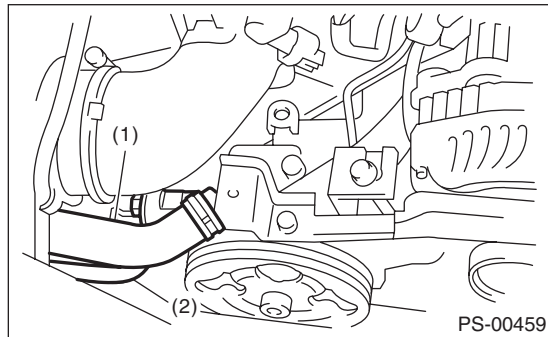
9. Oil Pump

A: REMOVAL

- 1) Disconnect the ground cable from battery.
- 2) Remove the V-belts (front side belt). <Ref. to ME(STI)-41, REMOVAL, V-belt.>
- 3) Disconnect the connector from power steering pump switch.
- 4) Disconnect the pressure hose and suction hose from the oil pump.

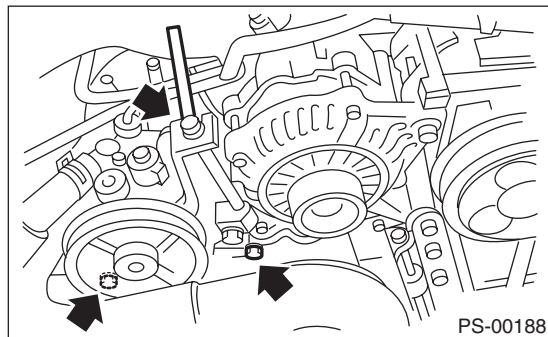
CAUTION:

- Do not allow fluid to come into contact with the pulley belt.
- To prevent foreign matter from entering the hose and pipe, cover the open ends with clean cloth.



- (1) Suction hose
(2) Pressure hose

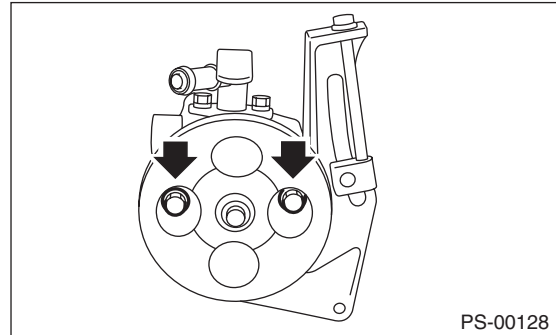
- 5) Remove the installation bolt of the power steering pump bracket.



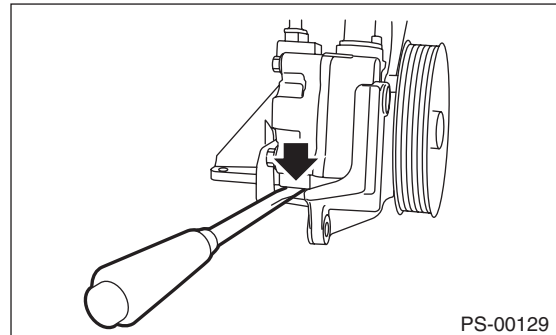
- 6) Place the oil pump bracket in a vise, and remove the two bolts from the front side of the oil pump.

CAUTION:

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



- 7) Remove the bolt from the rear side of oil pump.
- 8) Disassemble the oil pump and bracket by inserting a flat tip screwdriver as shown in the figure.



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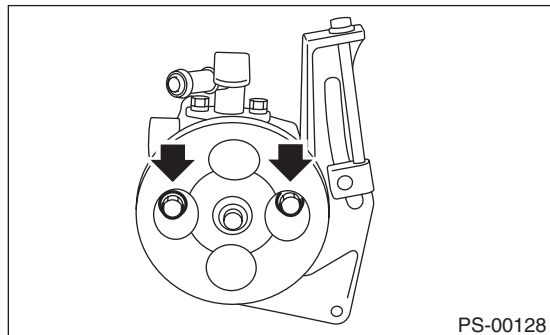
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B: INSTALLATION

- 1) Install the oil pump to bracket.
- 2) Tighten the bolts which hold the oil pump to the bracket.

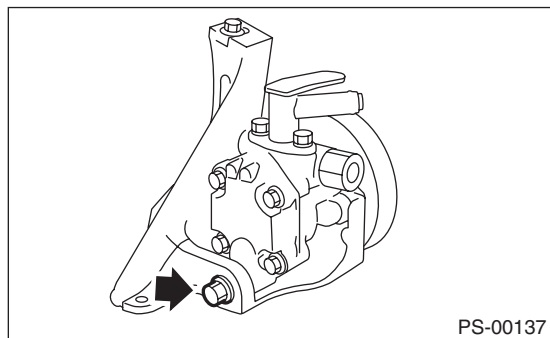
Tightening torque:

16 N·m (1.6 kgf-m, 11.8 ft-lb)



Tightening torque:

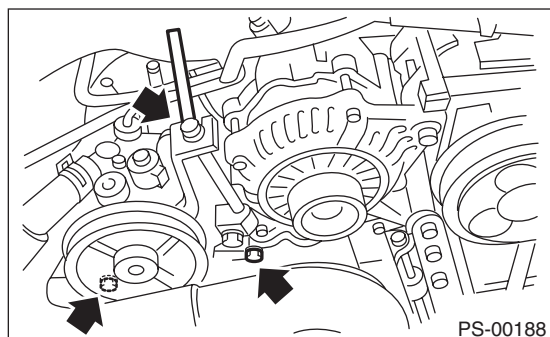
48 N·m (4.9 kgf-m, 35.4 ft-lb)



- 3) Attach the installation bolts of the power steering pump bracket.

Tightening torque:

Refer to "COMPONENT" of "General Description". <Ref. to PS-8, OIL PUMP, COMPONENT, General Description.>



- 4) Connect the pressure hose and suction hose.

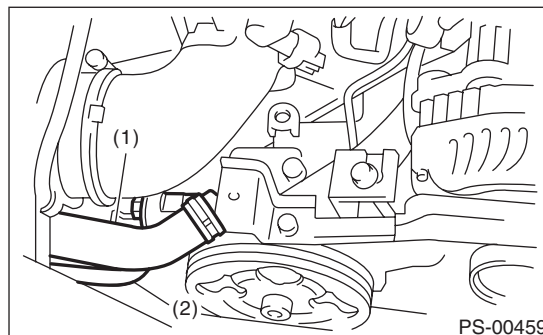
CAUTION:

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

Tightening torque:

Eyebolt

40 N·m (4.1 kgf-m, 29.5 ft-lb)



- (1) Suction hose
- (2) Pressure hose

- 5) Connect the power steering pump switch to the connector.

- 6) 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.

- 7) Install the V-belts (front side belt). <Ref. to ME(STI)-41, INSTALLATION, V-belt.>

- 8) Connect the battery ground terminal.

- 9) Fill with the specified power steering fluid. <Ref. to PS-83, Power Steering Fluid.>

CAUTION:

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

C: INSPECTION

1. BASIC INSPECTION

Perform the following inspection procedures and replace 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 the oil pump with a new part.
		(2) Bend	Measure the V groove deflection. If it exceeds the service limit, replace the oil pump 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 in a vice, 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.

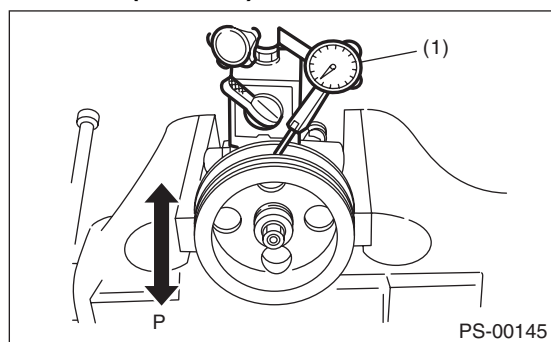
1) Play of the pulley shaft

Condition:

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

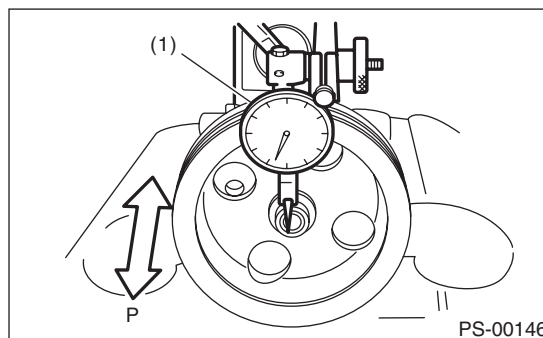
Service limit:

Play in the radial direction (direction ◀ ▶)
0.2 mm (0.008 in) or less



(1) Dial gauge

Axial play (direction ⇐ ⇨)
0.9 mm (0.035 in) or less



(1) Dial gauge

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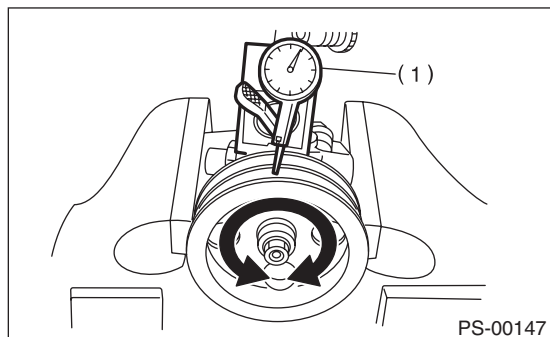
2) Deflection of the pulley groove

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

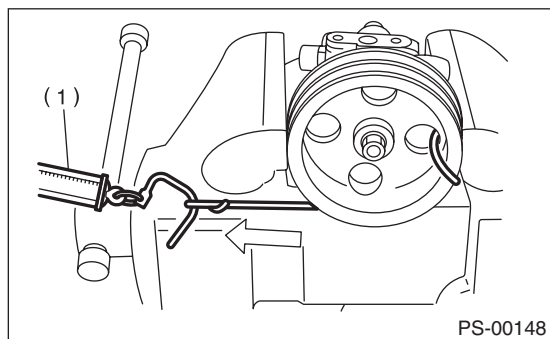
3) Rotating resistance of pulley

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

NOTE:

- To measure hydraulic pressure correctly, be sure to complete all the items in "INSPECTION", prior to performing the measurement. <Ref. to PS-87, 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.

1) Regular pressure measurement

- (1) Connect the ST.

Preparation tool:

ST1: PRESSURE GAUGE (925711000)

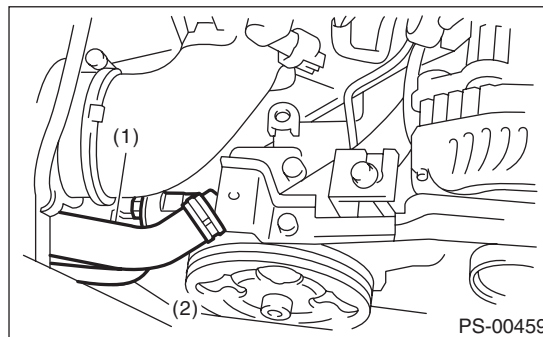
ST2: ADAPTER HOSE B (34099AC020)

ST3: ADAPTER HOSE A (34099AC010)

- (2) Remove the air intake duct. <Ref. to IN(STI)-11, REMOVAL, Air Intake Duct.>

- (3) Disconnect the pressure hose from the pump.

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



- (1) Suction hose
- (2) Pressure hose

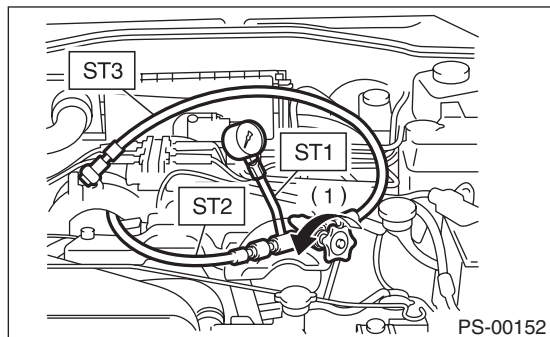
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- (5) Attach the ST3 to the end of pressure hose which is removed from pump.
- (6) Replenish power steering fluid up to the specified level.
- (7) Open the valve, and start the engine.
- (8) Measure the regular pressure.

Preparation tool:

ST1: PRESSURE GAUGE (925711000)
ST2: ADAPTER HOSE B (34099AC020)
ST3: ADAPTER HOSE A (34099AC010)



(1) Valve

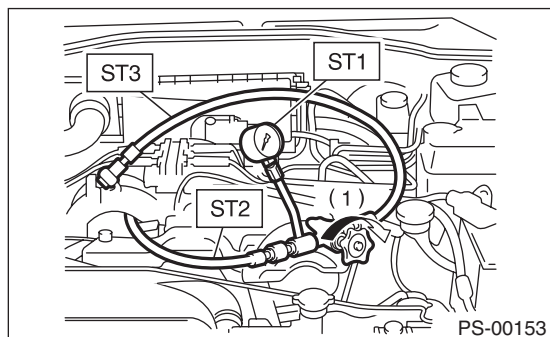
Service limit:

981 kPa (10 kgf/cm², 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)
- 2) Measure the relief pressure.
 - (1) Using the ST, measure the relief pressure.
 - (2) Close the valve.
 - (3) Measure the relief pressure.

Preparation tool:

ST1: PRESSURE GAUGE (925711000)
ST2: ADAPTER HOSE B (34099AC020)
ST3: ADAPTER HOSE A (34099AC010)



(1) Valve

Service limit:

8,300 — 9,000 kPa (85 — 92 kgf/cm², 1,203 — 1,305 psi)

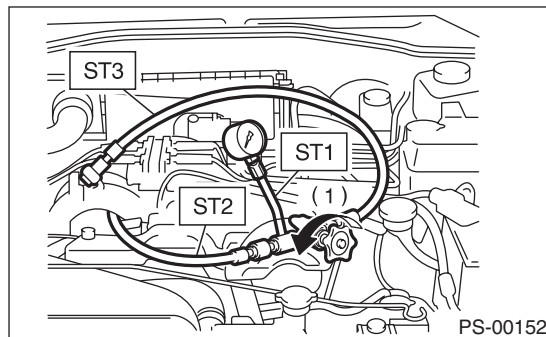
- (4) If the torque is not within specified range, replace the oil pump.

- 3) Measure the operating pressure.

- (1) Using the ST, measure the operating pressure.
- (2) Open the valve.
- (3) Measure the operating pressure of control valve by turning steering wheel from stop to stop.

Preparation tool:

ST1: PRESSURE GAUGE (925711000)
ST2: ADAPTER HOSE B (34099AC020)
ST3: ADAPTER HOSE A (34099AC010)



(1) Valve

Service limit:

8,300 — 9,000 kPa (85 — 92 kgf/cm², 1,203 — 1,305 psi)

- (4) If it is out of specification, measure the steering effort. <Ref. to PS-91, MEASUREMENT OF STEERING EFFORT (HYDRAULIC TYPE), INSPECTION, General Diagnostic Table.>

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