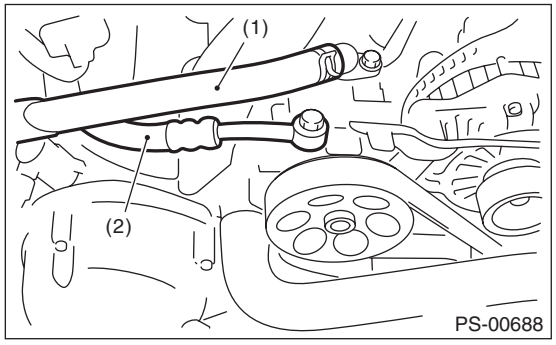
7. Oil Pump

A: REMOVAL

1) Disconnect the ground cable from battery.
2) Remove the V-belts (front side belt). <Ref. to ME(H4SO)-39, FRONT SIDE BELT, REMOVAL, V-belt.> <Ref. to ME(H4DOTC)-40, FRONT SIDE BELT, REMOVAL, V-belt.>
3) Disconnect the connector from power steering pump switch.
4) Disconnect the pressure hose and suction hose from the oil pump.

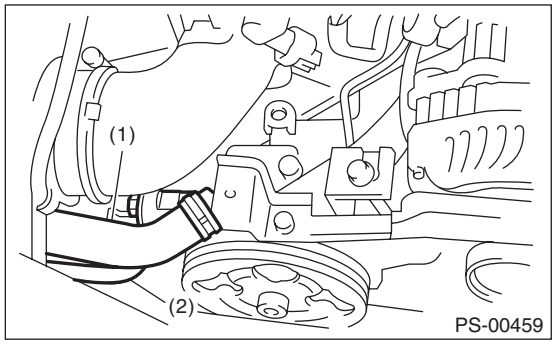
CAUTION:
• Do not allow fluid to come into contact with the pulley belt.
• To prevent foreign matter from entering the hose and pipe, cover the open ends with clean cloth.

• Non-turbo model



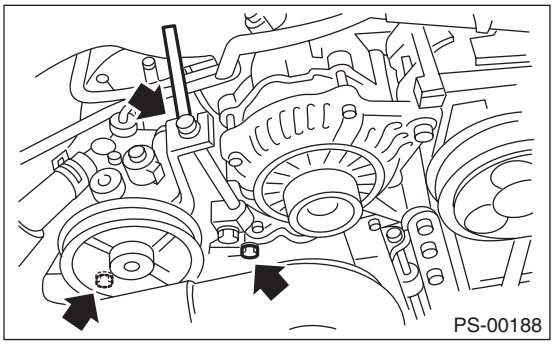
(1) Suction hose
(2) Pressure hose

• Turbo model



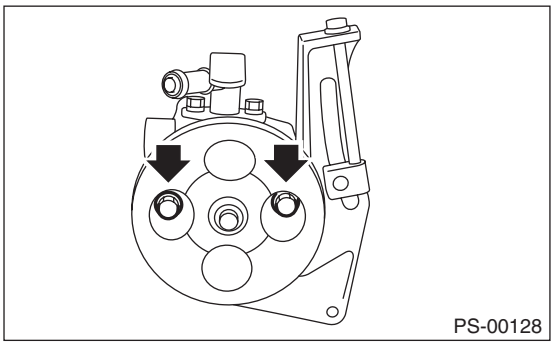
(1) Suction hose
(2) Pressure hose

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

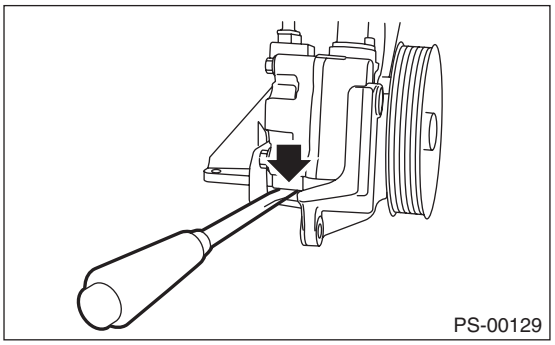


6) Place the oil pump bracket in a vise, and remove the two bolts from the front side of the oil pump.

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



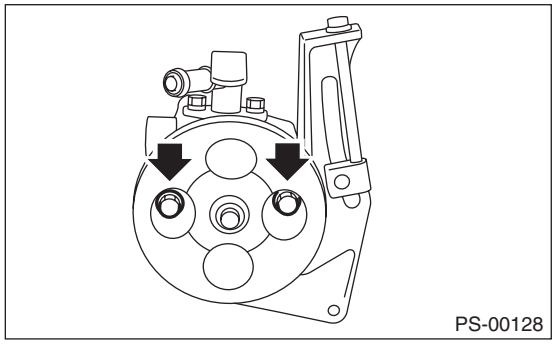
7) Remove the bolt from the rear side of oil pump.
8) Disassemble the oil pump and bracket by inserting a flat tip screwdriver as shown in the figure.



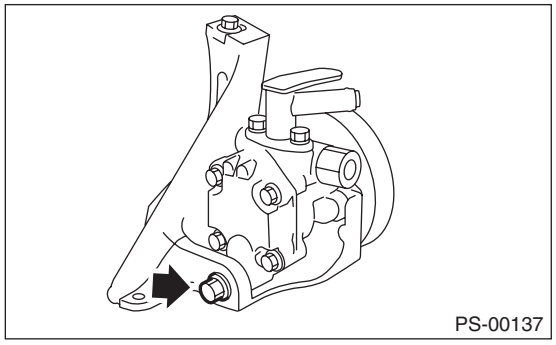
B: INSTALLATION

1) Install the oil pump to bracket.

Tightening torque:
16 N·m (1.6 kgf-m, 11.8 ft-lb)

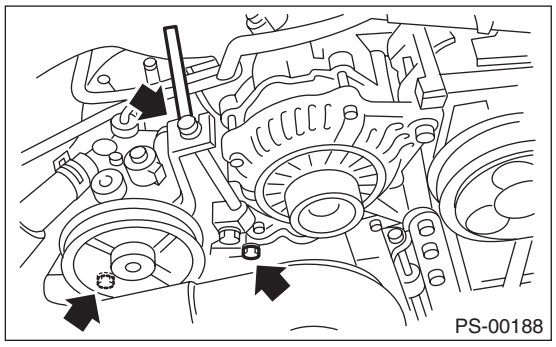


Tightening torque:
36 N·m (3.7 kgf-m, 26.6 ft-lb) (non-turbo model)
48 N·m (4.9 kgf-m, 35.4 ft-lb) (turbo model)



2) Attach the installation bolts of the power steering pump bracket.

Tightening torque:
<Ref. to PS-6, OIL PUMP, COMPONENT, General Description.>



3) 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.

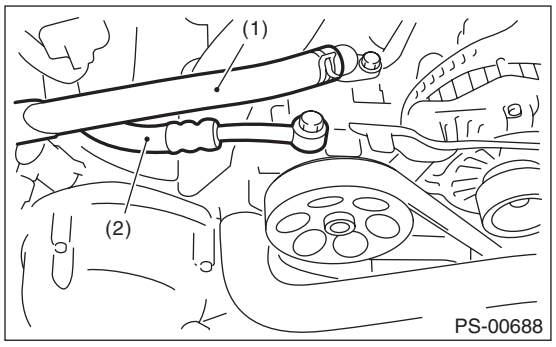
CAUTION:
Always fill the oil pump with the fluid to prevent abnormal noise and seizure of the oil pump.

4) Connect the pressure hose and suction hose.

Tightening torque:
Eye bolt
40 N·m (4.1 kgf-m, 29.5 ft-lb)

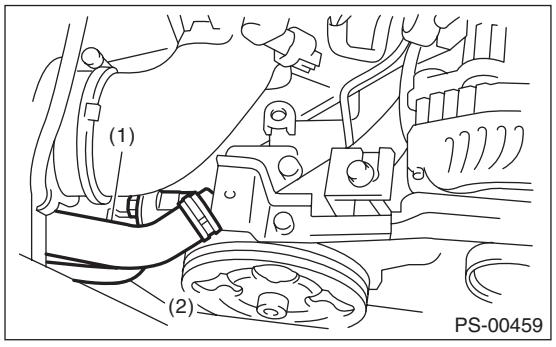
CAUTION:
Be careful when installing; If the hose is twisted it may come into contact with other parts.

- Non-turbo model



(1) Suction hose
(2) Pressure hose

- Turbo model



(1) Suction hose
(2) Pressure hose

5) Connect the power steering pump switch to the connector.
6) Install the V-belts (front side belt). <Ref. to ME(H4SO)-39, FRONT SIDE BELT, INSTALLATION, V-belt.> <Ref. to ME(H4DOTC)-40, FRONT SIDE BELT, INSTALLATION, V-belt.>
7) Connect the ground cable to battery.
8) Fill with the specified power steering fluid. <Ref. to PS-49, 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 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	Crack	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

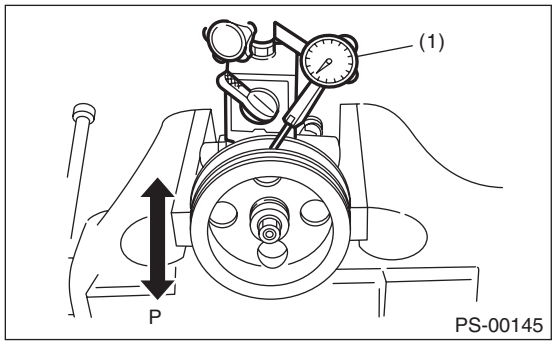
Condition:

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

Service limit:

Play in the radial direction (Direction ⬅ ➡)

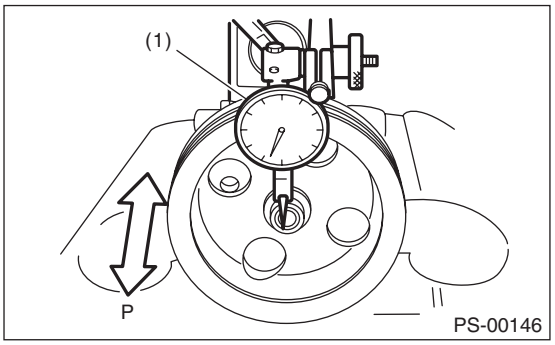
0.4 mm (0.016 in) or less



(1) Dial gauge

Axial play (Direction ⇦ ⇨)

0.9 mm (0.035 in) or less

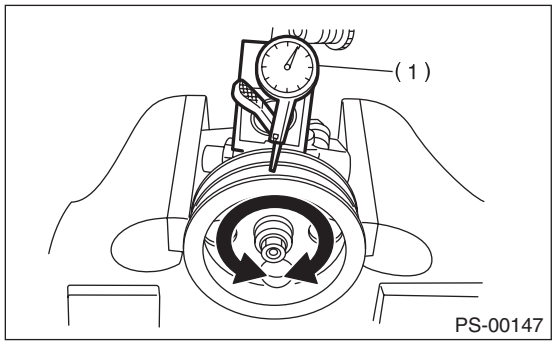


(1) Dial gauge

2) Deflection of the pulley groove

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 gauge.

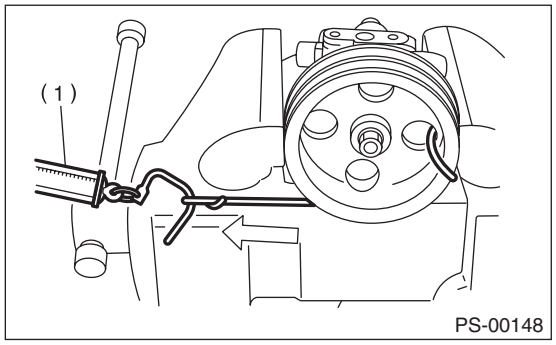


(1) Dial gauge

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 judgement.



(1) Spring scale

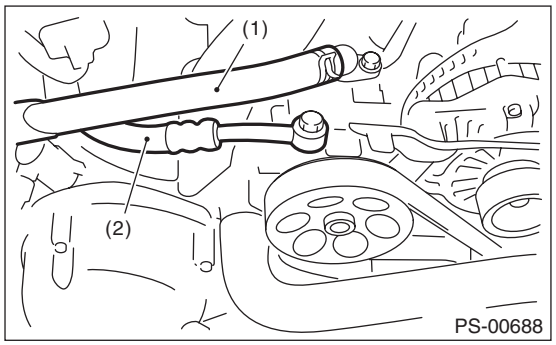
3. HYDRAULIC PRESSURE

NOTE:
• To measure hydraulic pressure correctly, be sure to complete all the items in “INSPECTION”, prior to performing the measurement. <Ref. to PS-50, 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 ST1, ST2 and ST3.

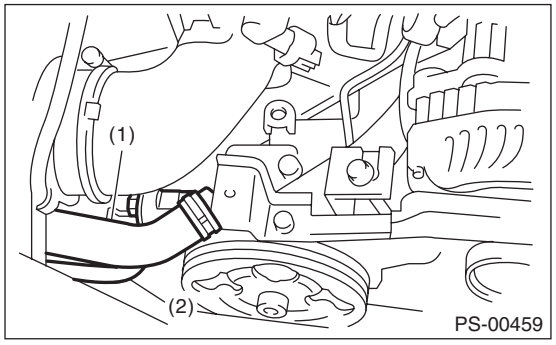
ST1	925711000	PRESSURE GAUGE
ST2	34099AC020	ADAPTER HOSE B
ST3	34099AC010	ADAPTER HOSE A

(2) Remove the air intake duct.
(3) Disconnect the pressure hose from pump.
(4) Using the gasket (Part No. 34621AC021) and bolt (Part No. 34620AC010), install the ST2 to pump instead of pressure hose.
• Non-turbo model



(1) Suction hose
(2) Pressure hose

• Turbo model

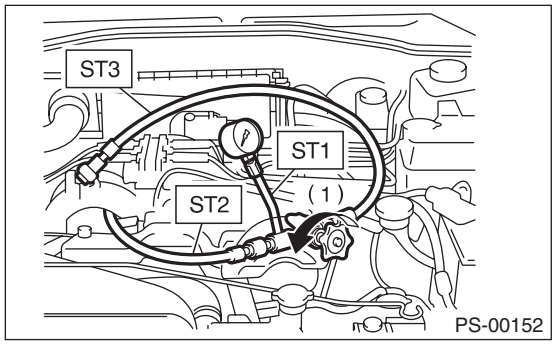


(1) Suction hose
(2) Pressure hose

(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.

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



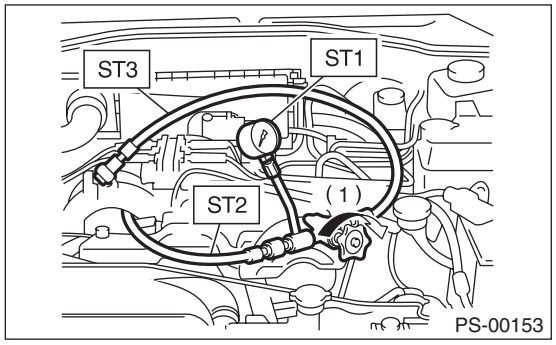
(1) Valve

Service limit:
981 kPa (10 kgf/cm^2, 142 psi) or less

(9) If it is not within the specification, replace the problem 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 STs, measure the relief pressure.
(2) Close the valve.
(3) Measure the relief pressure.

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



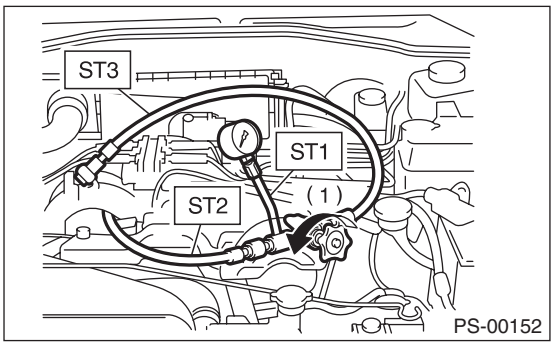
(1) Valve

Service limit:
Non-turbo model:
7,350 — 8,050 kPa (75 — 82 kgf/cm^2, 1,066 — 1,167 psi)
Turbo model:
8,100 — 8,800 kPa (83 — 90 kgf/cm^2, 1,174 — 1,276 psi)

(4) If it is not within the specification, replace the oil pump.

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

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



(1) Valve

Service limit:
Non-turbo model:
7,350 — 8,050 kPa (75 — 82 kgf/cm^2, 1,066 — 1,167 psi)
Turbo model:
8,100 — 8,800 kPa (83 — 90 kgf/cm^2, 1,174 — 1,276 psi)

(4) If it is out of specification, measure the steering effort. <Ref. to PS-53, MEASUREMENT OF STEERING EFFORT, 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.