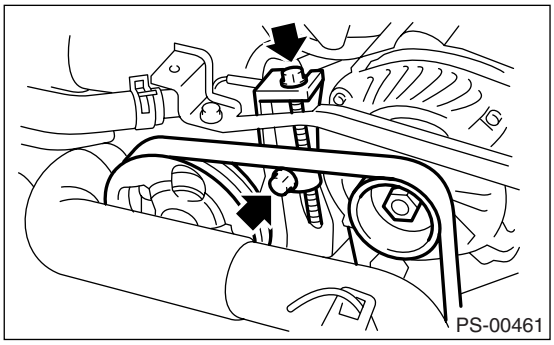
7. Oil Pump

A: REMOVAL

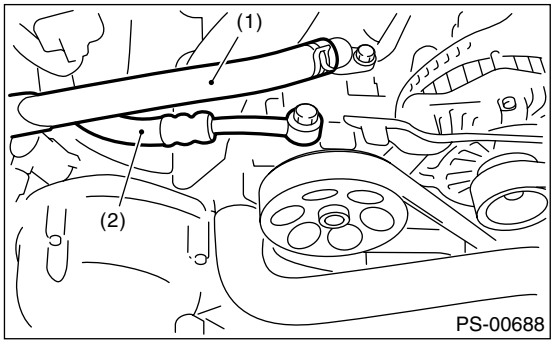
1) Disconnect the ground cable from battery.
2) Remove the air intake duct. <Ref. to IN(H4DOTC)-9, REMOVAL, Air Intake Duct.> <Ref. to IN(H4SO)-10, REMOVAL, Air Intake Duct.>
3) Remove the pulley belt cover.
4) Loosen the belt tension securing bolt and generator securing bolt, and then remove the power steering pump V-belt.



5) Disconnect the connector from power steering pump switch.
6) Disconnect the pressure hose and suction hose from oil pump.

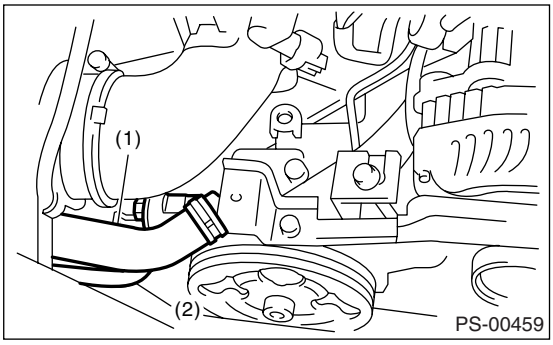
CAUTION:
• Do not allow fluid to come into contact with pulley belt.
• To prevent foreign matter from entering the hose and pipe, cover the open ends with a clean cloth.

• Non-turbo model



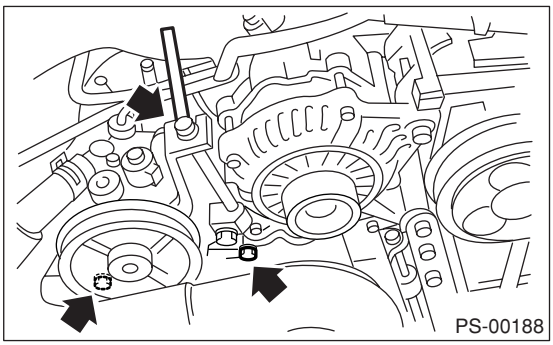
(1) Suction hose
(2) Pressure hose

• Turbo model



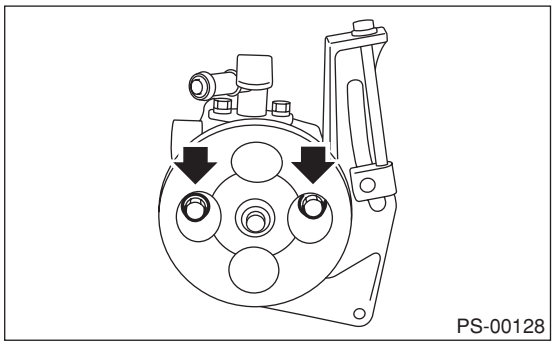
(1) Suction hose
(2) Pressure hose

7) Remove the bolts which hold the power steering pump bracket.



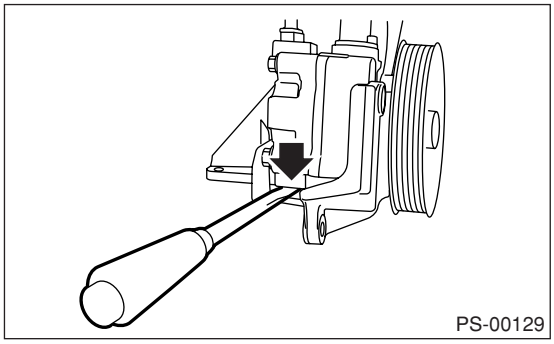
8) Place the oil pump bracket in a vise, and remove the two bolts from the front side of oil pump.

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



9) Remove the bolt from the rear side of oil pump.

10) Disassemble the oil pump and bracket by inserting a flat tip screwdriver as shown in the figure.

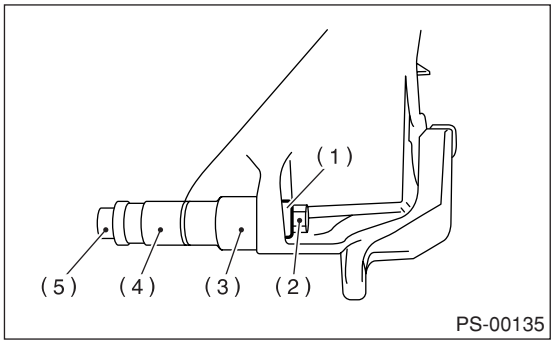


B: INSTALLATION

1) Install the oil pump to bracket.

(1) Place the oil pump bracket in a vise. Tighten the bushing using a 12.7 mm (1/2″) type 14- and 21-mm box wrench until it contact with oil pump mounting surface.

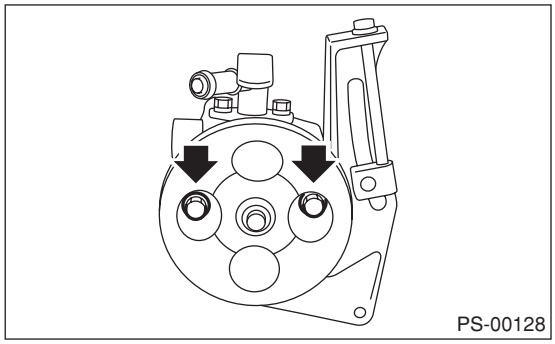
CAUTION:
When securing the oil pump bracket on a vice, hold the oil pump bracket with the least possible force between two wood pieces.



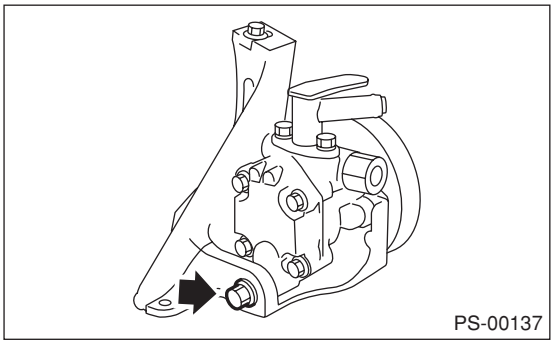
(1) Bushing
(2) Nut
(3) 21 mm
(4) 14 mm
(5) Bolt

(2) Tighten the bolt which holds the oil pump to bracket.

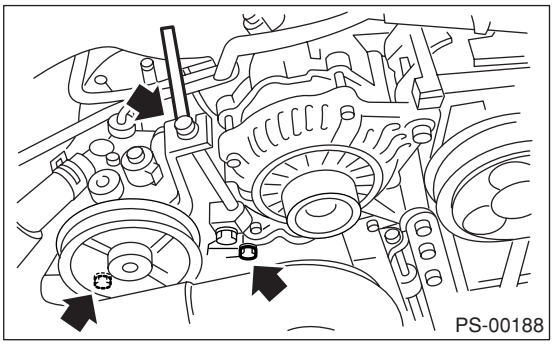
Tightening torque:
15.7 N·m (1.6 kgf-m, 11.6 ft-lb)



Tightening torque:
37.3 N·m (3.8 kgf-m, 27.5 ft-lb)



2) Tighten the bolts which hold the power steering pump bracket.

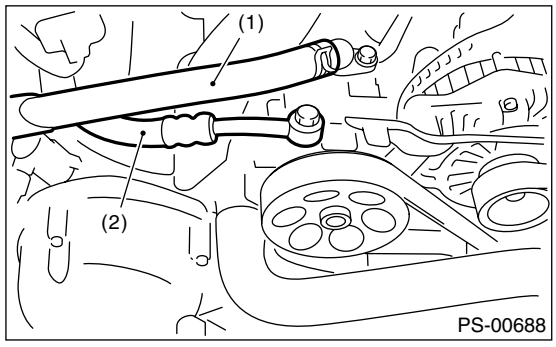


3) Interconnect the pressure hose and suction hose.

Tightening torque:
Eye bolt
39 N·m (3.98 kgf-m, 28.8 ft-lb)

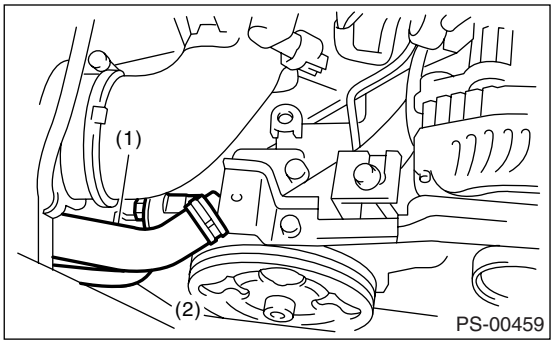
CAUTION:
If a hose is twisted at this step, take care the hose may come into contact with some other parts.

- Non-turbo model



(1) Suction hose
(2) Pressure hose

- Turbo model



(1) Suction hose
(2) Pressure hose

4) Connect the connector to power steering pump switch.
5) Install the V-belts to oil pump.
6) Check the tension of V-belt.
<Ref. to ME(H4SO)-38, INSPECTION, V-belt.>
7) Tighten the belt tension bolt.

Tightening torque:
25 N·m (2.5 kgf-m, 18.1 ft-lb)

8) Install the pulley belt cover.
9) Install the air intake duct.
<Ref. to IN(H4DOTC)-9, INSTALLATION, Air Intake Duct.> <Ref. to IN(H4SO)-10, INSTALLATION, Air Intake Duct.>
10) Connect the battery ground cable to battery.
11) Feed the specified power steering fluid. <Ref. to PS-52, Power Steering Fluid.>

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

C: INSPECTION

1. BASIC INSPECTION

Perform the following inspection procedures and replace defective parts.

No.	Parts	INSPECTION	Corrective action
1	Oil pump (Exterior)	(1) Crack, damage or oil leakage	Replace the oil pump with a new one.
		(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 one.
2	Pulley	(1) Damage	Replace with a new one.
		(2) Bend	Measure the V ditch deflection. If it exceeds the service limit, replace the pulley with a new one.
3	Oil pump (Interior)	(1) Defect or burning of vane pump	Check the resistance to the rotation of pulley. If it exceeds the service limit, replace the oil pump with a new one.
		(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 its pulley which is put around with a string, replace the oil pump with a new one.
4	O-ring	Crack or deterioration	Replace with a new one.
5	Bracket	Crack	Replace with a new one.

2. SERVICE LIMIT

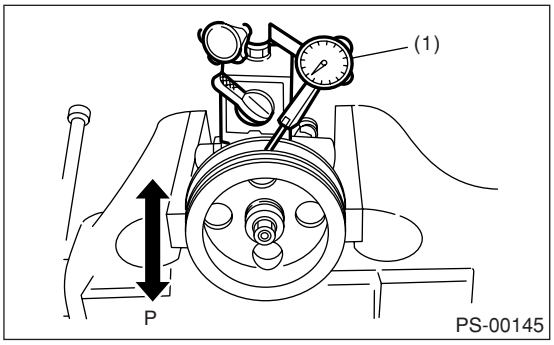
Make a measurement as follows. If it exceeds the service limit, replace with a new one.

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

1) Play of the pulley shaft

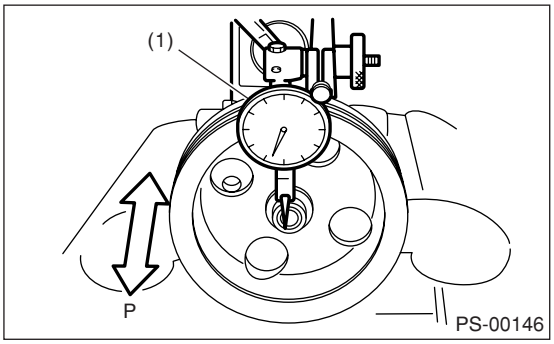
Condition:
P: When applying the force of 9.8 N (1.0 kgf, 2.2 lb)

Service limit:
Radial play (Direction ⇦ ⇨)
0.4 mm (0.016 in) or less



(1) Dial gauge

Axial play (Direction ⇦ ⇨)
0.9 mm (0.035 in) or less

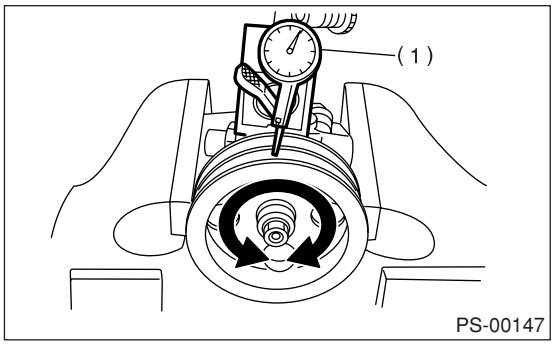


(1) Dial gauge

2) 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.

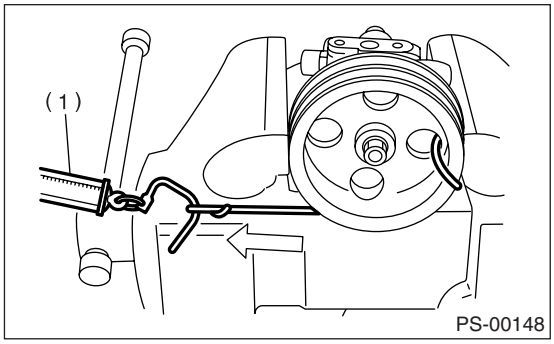


(1) Dial gauge

3) Resistance to rotation of pulley

Service limit:
Maximum load: 9.22 N (0.94 kgf, 2.07 lb) 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 balance

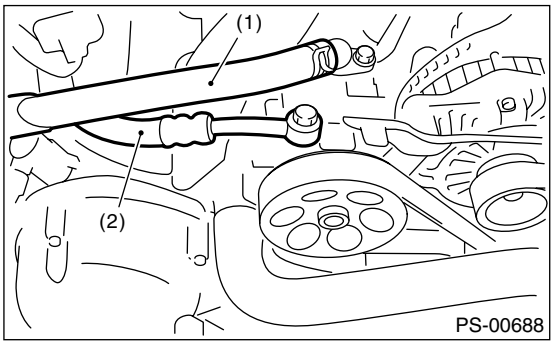
3. HYDRAULIC PRESSURE

NOTE:
• Be sure to complete all items aforementioned in "INSPECTION", prior to measuring hydraulic pressure. Otherwise, pressure cannot be measured correctly. <Ref. to PS-53, INSPECTION, General Diagnostic Table.>
• Do not leave the valve of pressure gauge closed or hold the steering wheel at stop end for 5 seconds or more in any case, as the oil pump may be damaged due to long keep of these conditions.
• Put cloth at a place where fluid drops before pressure gauge is installed. Wipe off spilt fluid thoroughly after the measurement.

1) Regular pressure measurement
(1) Connect ST1, ST2 and ST3.

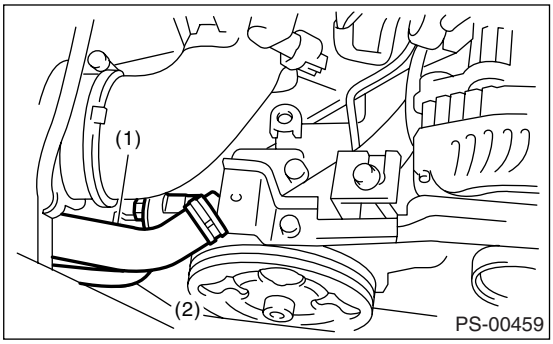
ST1 925711000 PRESSURE GAUGE
ST2 34099AC020 ADAPTER HOSE B
ST3 34099AC010 ADAPTER HOSE A

(2) Remove the air intake duct.
(3) Disconnect the pipe C 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

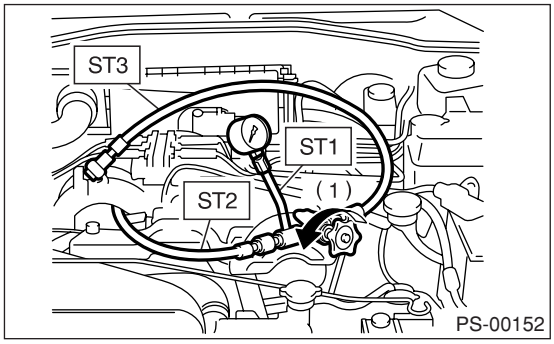


(1) Suction hose
(2) Pressure hose

(5) Install the ST3 to the end of pressure hose which is removed from pump.
(6) Replenish the power steering fluid up to 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



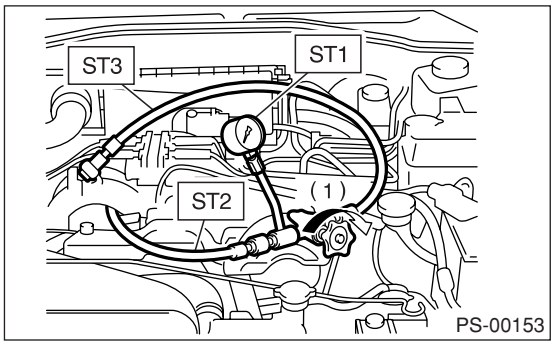
(1) Valve

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

(9) If it is not within the specified value, replace the troubled part caused by following symptoms. (Pipe or hose clogged, leaks from fluid line, and mixture of foreign matters 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



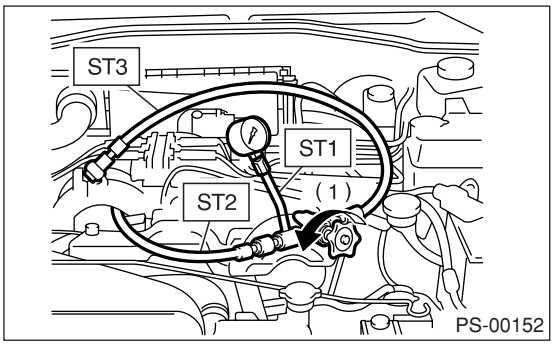
(1) Valve

Service limit:
H4 model:
7,350 — 8,036 kPa (75 — 82 kg/cm^2, 1,067 — 1,165 psi)
H6 model:
8,300 — 9,000 kPa (85 — 92 kg/cm^2, 1,204 — 1,305 psi)

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

3) Measure working pressure.
(1) Using the STs, 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:
7,650 — 8,330 kPa (78 — 85 kg/cm^2 , 1,110 — 1,208 psi)

(4) If it is not within the specified value, measure the steering effort. <Ref. to PS-56, MEASUREMENT OF STEERING EFFORT, INSPECTION, General Diagnostic Table.> If it is not within specified value, replace the control valve itself or control valve and pinion as a single unit with new ones.