

## PRESSURE ADJUSTMENT

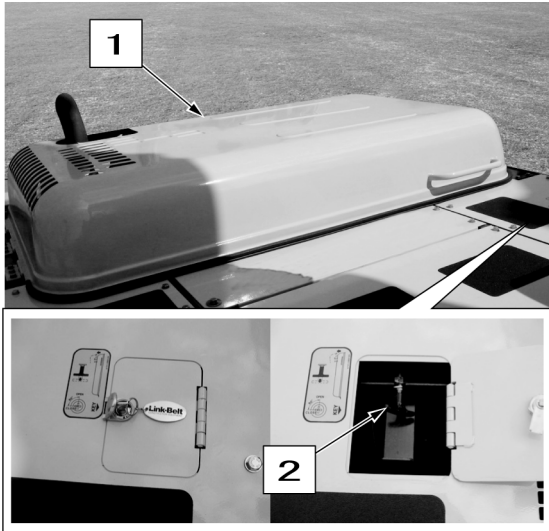
### Main pressure adjustment

#### Adjustment preparation work

Pressure is adjusted with control valves.

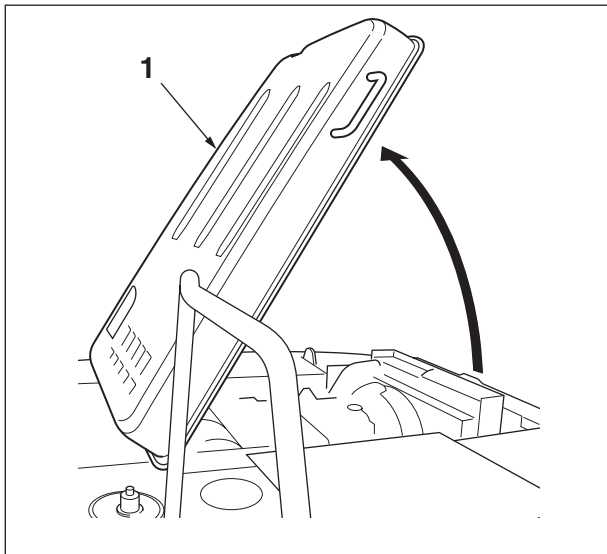
The following preparations are required for adjusting with control valves.

1. Engine hood opening and closing. Release the engine hood lock lever.



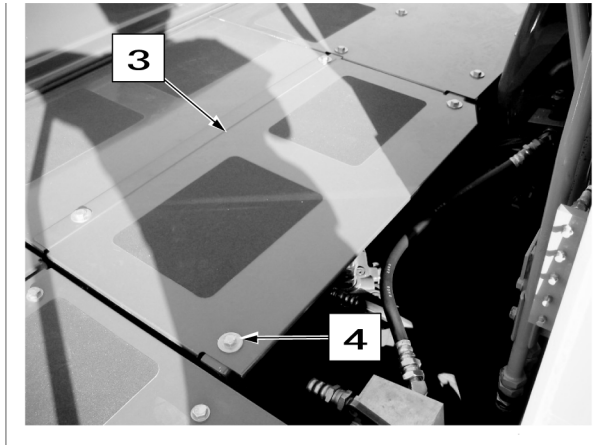
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2. Open the engine hood .



BIO1003-005

3. Remove the bolts (4), then remove the cover (3).



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## Main relief pressure adjustment

Engine speed	1800 min <sup>-1</sup>
Work mode	SP mode
Lever operation	Arm-in relief
Oil temperature	45 to 55°C 113 to 131°F
Measuring port	P1 port
Measurement pressure	Boosted pressure: 36.8 MPa 368 bar 5337 Psi
	Standard: 34.3 MPa 343 bar 4975 Psi
Pressure per rotation of adjusting screw	Boost pressure: 28.4 MPa / rotation 284 bar / rotation 4119 Psi / rotation
	Standard: 21 MPa / rotation 210 bar / rotation 3046 Psi / rotation

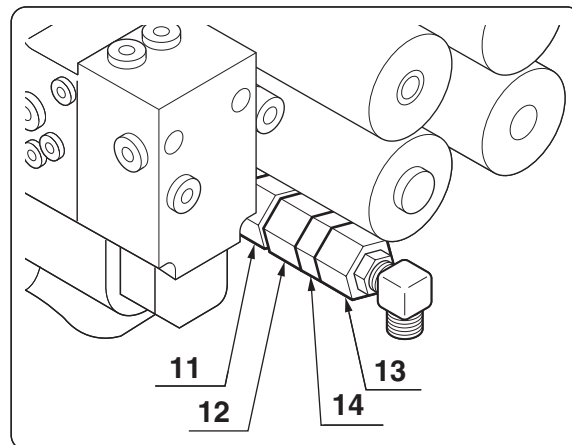
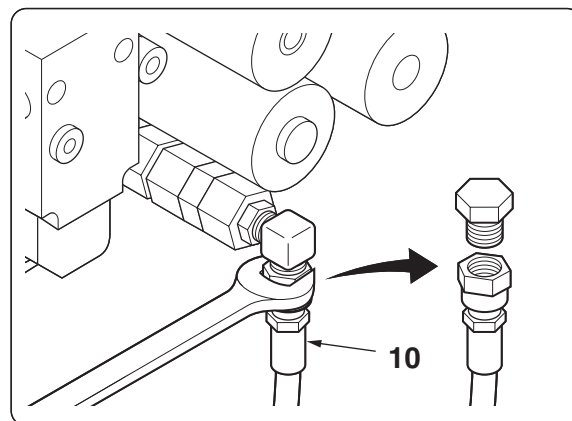
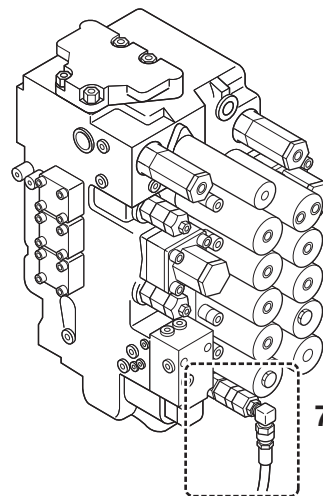
1. Before adjusting, remove the pilot hose (10) for the boosted pressure signal connected to the main relief valve (7), then plug the hose side. The procedures for boosted pressure and standard pressure are different.

### 2. Boosted pressure

- A** Loosen the standard pressure lock nut (14) (27 mm) and tighten the adjusting screw (13) (27 mm, 1.06 in). Fasten with a spanner (27 mm, 1.06 in) so that the boosted pressure adjusting screw (12) does not turn.
- B** After tightening until the adjusting screw (13) stops turning, tighten the lock nut (14).
- C** Start the engine and run it at maximum rotation.
- D** Move the arm lever to the in side, set the relief state, and hold.
- E** Loosen the boosted pressure lock nut (11) (32 mm, 1.26 in) and adjust the set pressure with the adjusting screw (12) (27 mm, 1.06 in).
- When lower than the set pressure, tighten.
  - When higher than the set pressure, first lower below the set pressure, then adjust on the tightening side.
- F** After adjustment, fasten the adjusting screw (12) with a spanner (27 mm, 1.06 in), then tighten the lock nut (11).
- G** After locking, check the boosted pressure side pressure. Repeat A) to F) until the set pressure is correctly adjusted.

### 3. Standard pressure

- H** Loosen the standard pressure lock nut (14) (27 mm, 1.06 in).
- I** Loosen the adjusting screw (13), lower below the set pressure, then adjust on the tightening side.
- J** After adjustment, tighten the lock nut (14) while fastening the adjusting screw (13) with a spanner.
- K** After locking, check the pressure. Repeat H), I), and J) until the set pressure is correctly adjusted.
- L** Stop the engine.



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## Overload relief pressure adjustment

Engine speed	1800 min <sup>-1</sup>
Work mode	SP mode
Oil temperature	45 to 55°C 113 to 131°F
Measuring port	P1 / P2 port
Measurement pressure	Boom down: 29.4 MPa 294 bar 4264 Psi
	Others: 38.7 MPa 387 bar 5613 Psi
Pressure per rotation of adjusting screw	Boom down: 21.1 MPa / rotation 211 bar / rotation 3060 Psi / rotation
	Others: 38.7 MPa / rotation 387bar / rotation 5613 Psi / rotation

15	Control valve
16	Overload relief
17	Boom-up
18	Arm-in
19	Bucket-open
20	Wrench 17 mm
21	Adjusting screw 6 mm
22	Lock nut 17 mm
23	Hexagon wrench 6 mm

1. Since the overload relief pressure is set higher than the main relief pressure, it is necessary to provisionally set the main relief pressure higher than the overload relief pressure. (Except for boom down)

### 2. Main Relief Pressure Provisional Setting

- Using the main pressure adjustment procedure for reference, temporarily set the boosted pressure and standard pressure to at least 38.7 MPa.

**NOTE:** For boom down, since the overload set pressure is lower than the main relief set pressure, there is no need to temporarily set the main relief pressure.

### 3. Pressure adjustment

**NOTE:** For the position of each overload relief, see the "Control Valve Relief Locations".

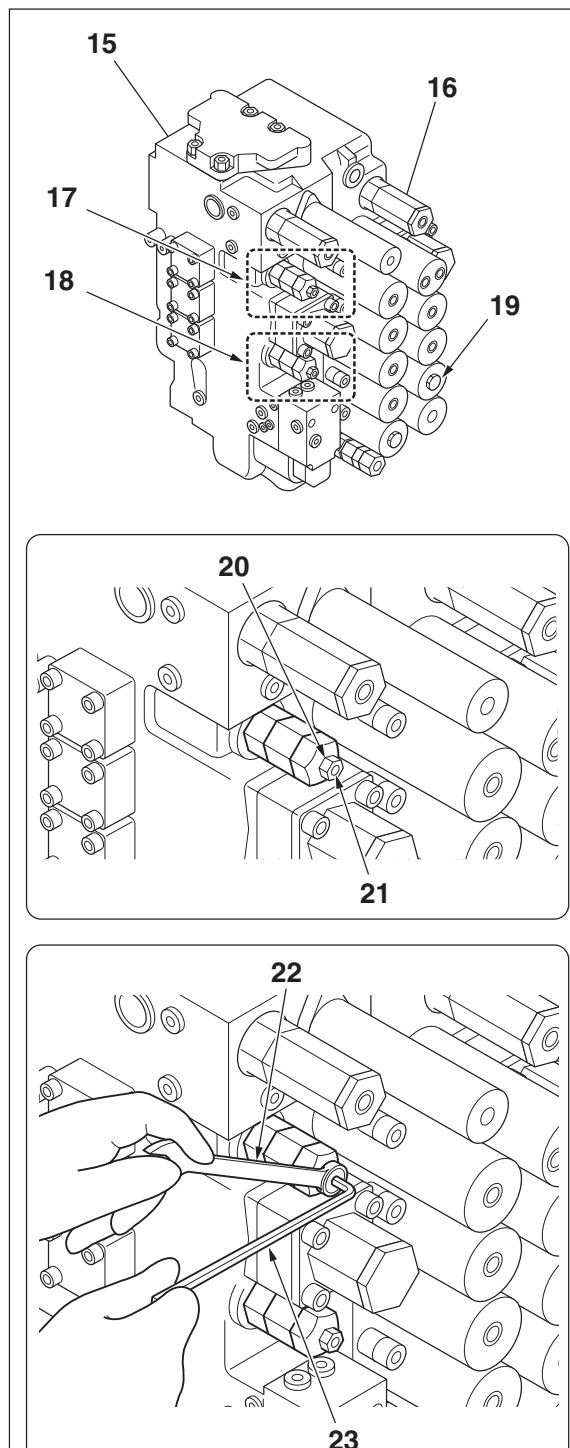
Example: Arm-in overload relief adjustment

**A** Loosen the lock nut (22) and adjust by the turning the adjusting screw (21).

- When lower than the set pressure, tighten.
- When higher than the set pressure, first loosen to a pressure lower than the set pressure, then adjust on the tightening side.

**B** After adjustment, lock the lock nut (22).

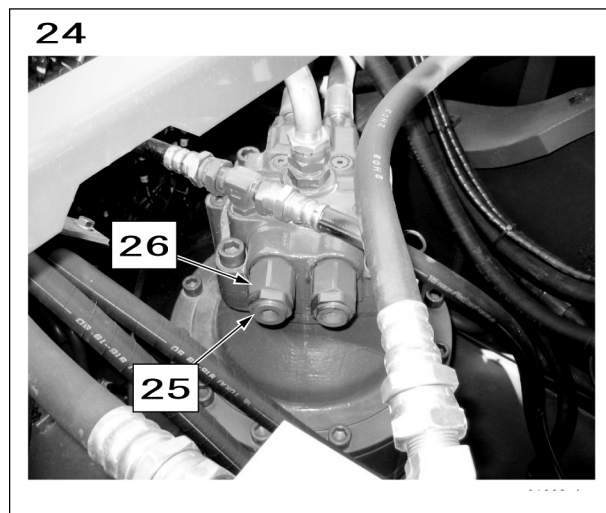
**C** After adjusting the overload relief pressure, adjust the boosted pressure and standard pressure to their normal values referencing the main pressure adjustment procedure.



## Swing relief pressure adjustment

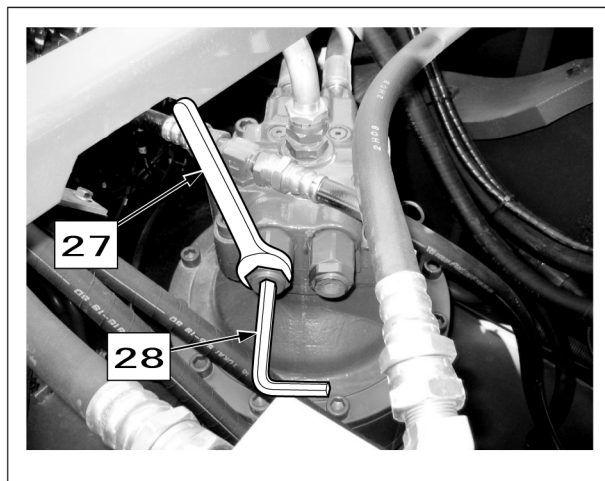
Engine speed	1800 min <sup>-1</sup>
Work mode	SP mode
Oil temperature	45 to 55°C 113 to 131°F
Measuring port	P1 port
Measurement pressure	29.4 MPa 294 bar 4264 Psi
Pressure per rotation of adjusting screw	4.8 MPa 48 bar 696 psi

- Using the swing pressure measurement procedure for reference, lock the swing, and check the swing pressure.



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- Loosen the lock nut and adjust by the turning the adjusting screw.  
When lower than the set pressure, tighten.  
When higher than the set pressure, first loosen to a pressure lower than the set pressure, the adjust on the tightening side.
- After adjustment, lock the lock nut.

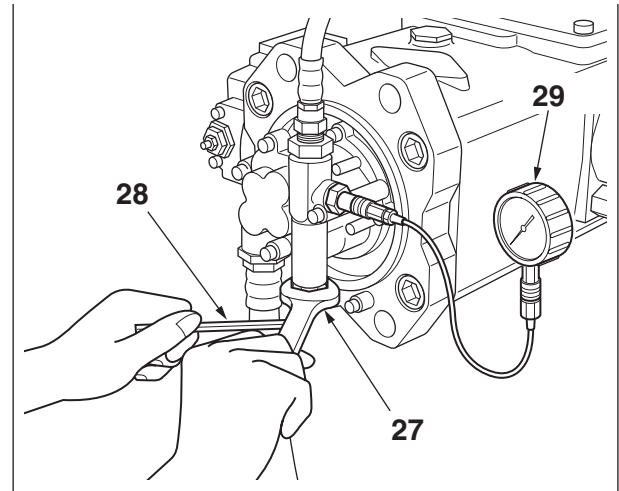


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## Pilot pressure adjustment

Engine speed	1800 min <sup>-1</sup>
Lever operation	Neutral
Measuring port	P3
Set pressure	3.9 MPa 39 bar 565.6 Psi

- Pressure measurement
  - Install the pressure gauge.
  - While holding the plug with a wrench (24 mm 0.94 in), adjust with a hexagon wrench (6 mm 0.24 in).

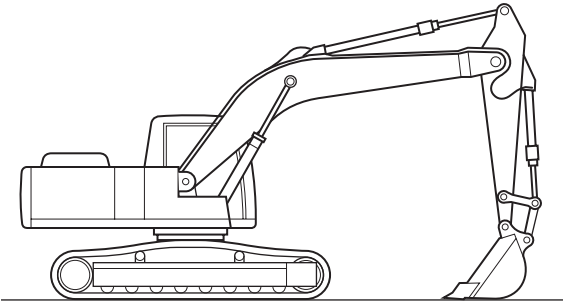


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# HYDRAULIC PUMP FLOW MEASUREMENT PROCEDURE

## Work preparations

1. Check that the main unit is in its work posture (arm-vertical).

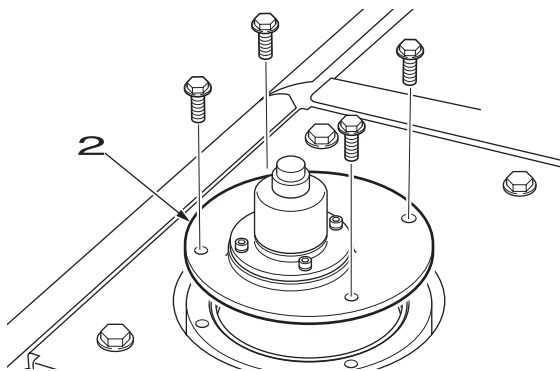


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2. Bleed out the pressure. (See the details on Bleeding Pressure in the Pressure Measurement and Adjustment Procedures.)

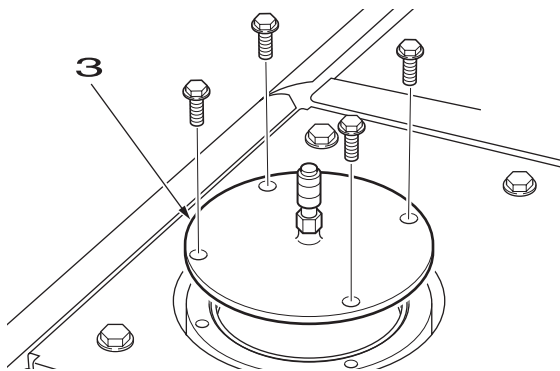
**NOTE:** Check the swing stop.

3. Use a spanner (17 mm, 0.67 in) to remove the feed port cover (2).



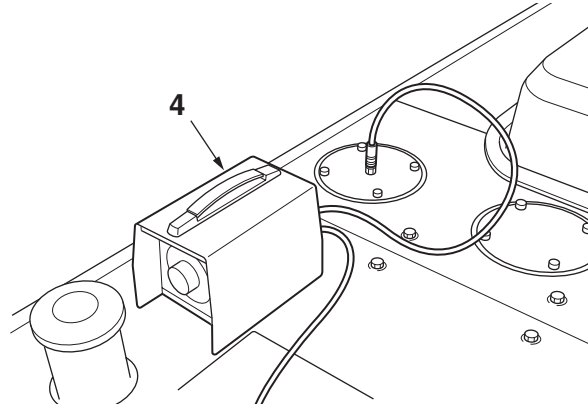
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4. Use the bolts removed in step 3 to install the hydraulic oil tank lid (3).



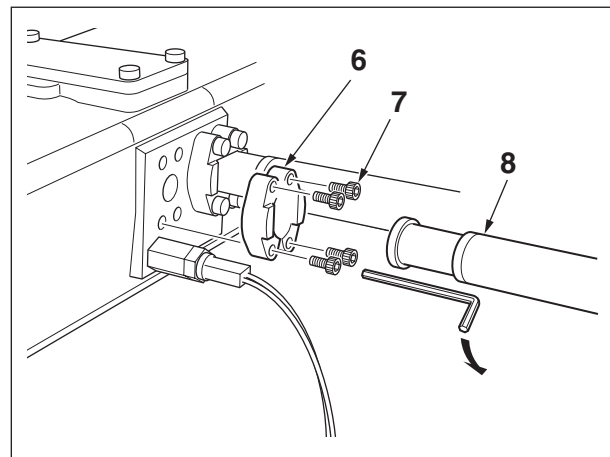
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5. Install the vacuum pump (4) on the hydraulic oil tank lid (3).
6. After setting the vacuum pump (4), switch on the power. (If the cable is too short, use an extension cable.)



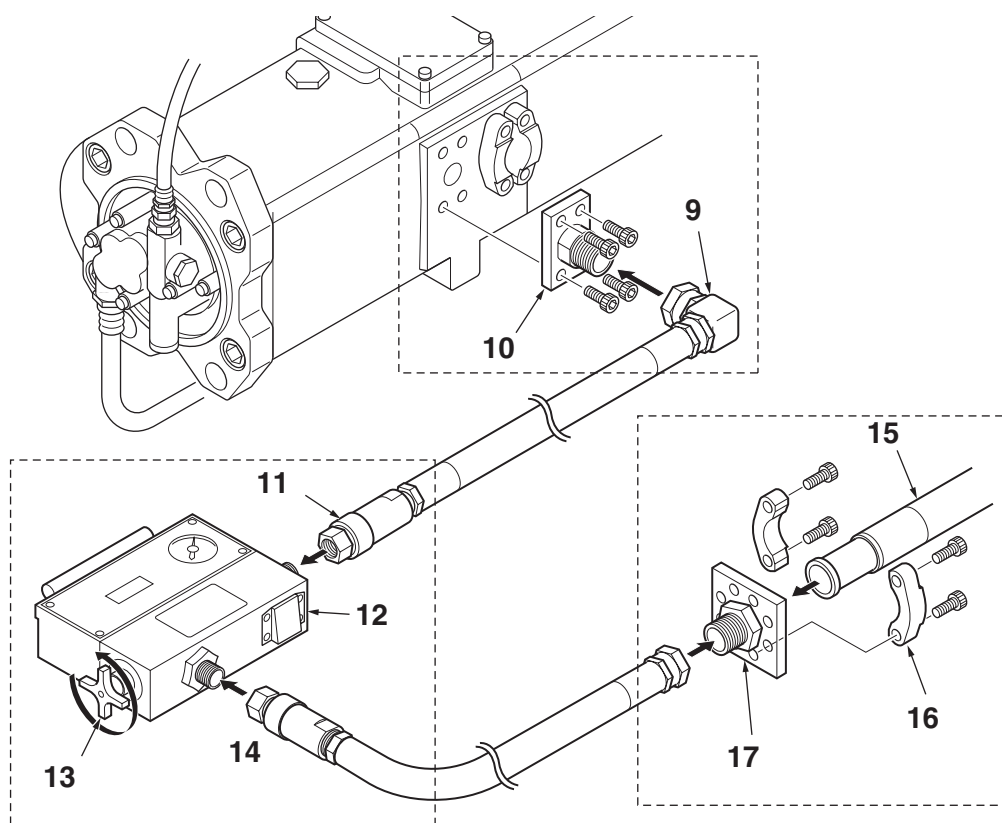
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7. Use a hexagon wrench (8 mm, 0.31 in) to remove the split flange and hydraulic hose. (This explanation uses flow measurement at the P2 pump.)



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8. Use the split flange to install the adaptor (flange type) on the tip of the hydraulic hose removed in step 7.
9. Install the adaptor at the position from which the hydraulic hose was removed.
10. When the parts are set as in the figure above, remove the plug.
11. Use the spanner to connect the adaptor installed on the pump in step 9.
12. If necessary, install an "elbow adaptor" on the (prepared) hydraulic hose connected to the flow meter IN side.
13. Install the hydraulic hose on the flow meter IN side, then fasten with the spanner.
14. Install the (prepared) hydraulic hose on the flow meter OUT side, then fasten with the spanner.
  - When connecting, always check the connection positions.
  - Always have the metering valve fully open.
15. Install pressure gauges on P1 and P2. (See "Main Pressure Measurement".)
16. Remove the vacuum pump and re-install the hydraulic oil tank the same way it was.
17. Open the engine hood. (See "Main Pressure Adjustment".)
18. Remove the cover.
19. Remove the pilot hose for the boosted pressure signal, then plug the hose side. (See "Main Relief Pressure Adjustment".)



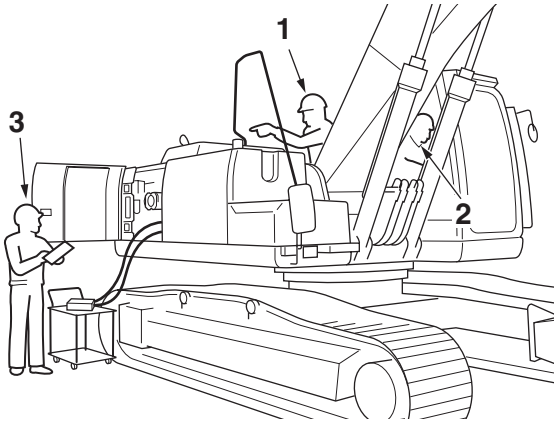
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9	Elbow adaptor	14	Hydraulic hose (OUT)
10	Adapter	15	Hydraulic hose
11	Hydraulic hose (IN)	16	Split flange
12	Flow meter	17	Adapter (flange type)
13	Metering valve		



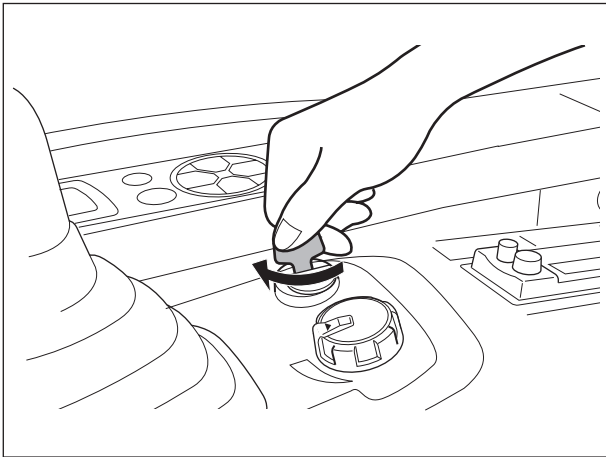
## Flow measurement

1. When measuring the flow, position the workers as in the figure below.
  - Worker 1: Work supervisor, pressure adjustment
  - Worker 2: Operator
  - Worker 3: Flow, pressure measurement, recording



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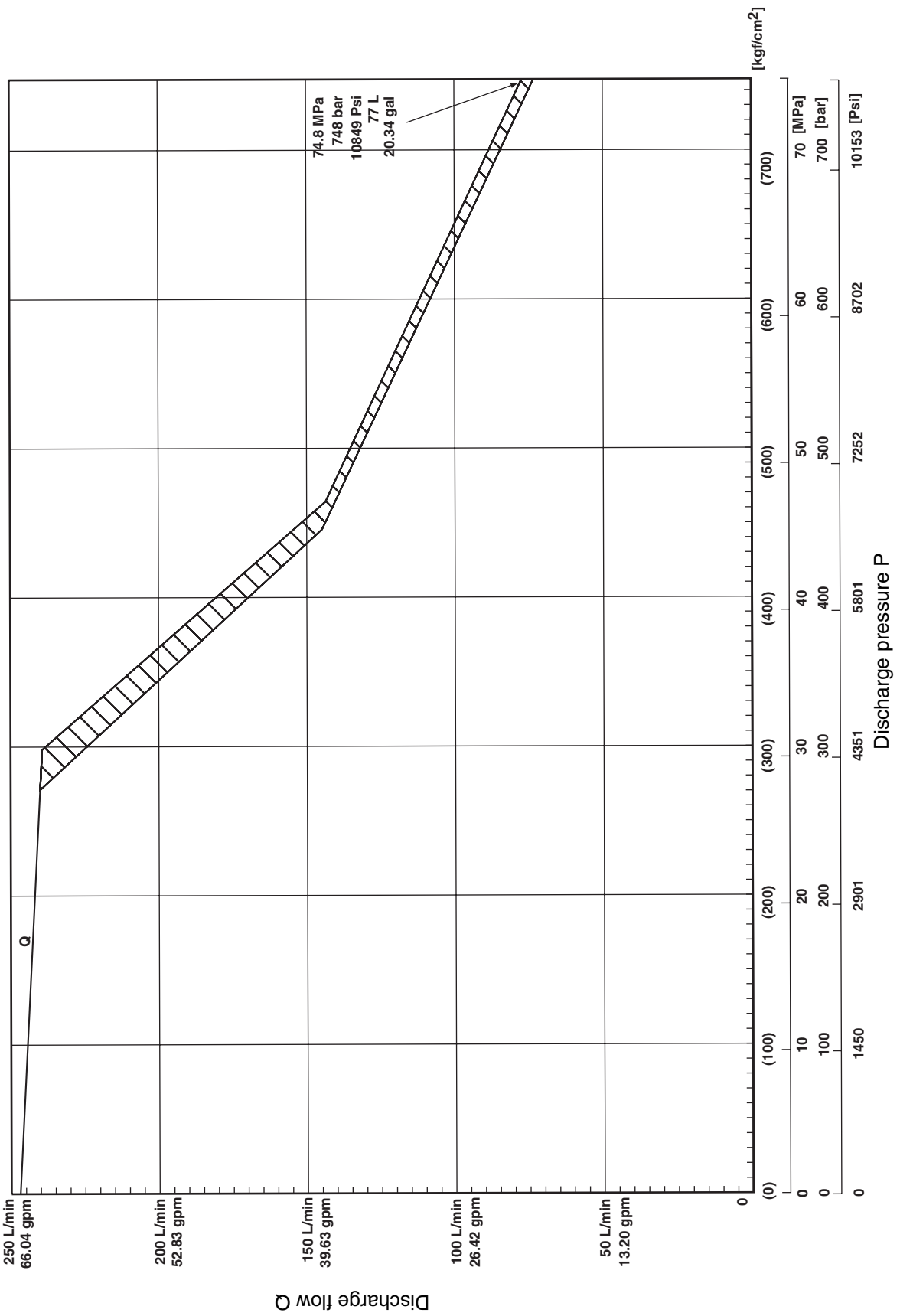
2. At the signal from the work supervisor, the operator starts the engine.



RST-09-02-001J

3. Check the hydraulic oil temperature on the monitor (50°C, 122°F). Check that the engine rotation and pump current are normal.
4. The operator signals the arm-out relief operation to worker 1.
5. Worker 2 lowers the arm-out port relief. (Min: 24 MPa (240 bar, 3481 Psi) (P1 + P2))
6. Start of flow measurement.
7. The arm-out relief operation is carried out.
8. Data measured in units of 2.0 MPa (20 bar, 290Psi) (P1 + P2).
  - The measurement is carried out from 24.0 to 76.0 MPa (240 to 760 bar, 3481 to 11023 Psi) and ends when the maximum pressure is reached.
9. Remove the flow meters.
  - Because from 40 MPa (400 bar, 5802 Psi) the pressure exceeds the permitted value for the flow meter pressure gauge maximum pressure.
10. Reset the arm-in port relief valve to normal pressure. (For details on this adjustment, see "PRESSURE ADJUSTMENT".)
11. Remove the pressure gauges etc. and put everything back to normal.

# Flow curve



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# DRAIN VOLUME MEASUREMENT PROCEDURE

## Preparations

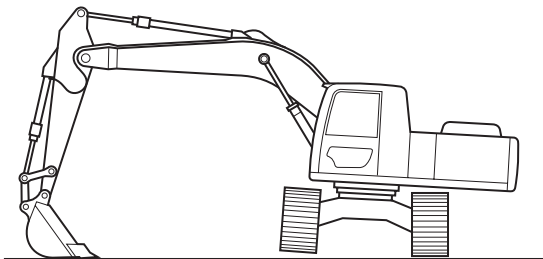
### Measuring conditions

Engine speed	1800 min <sup>-1</sup>
Mode	SP mode
Oil temperature	About 50°C About 122°F

**WARNING:** The drain volume varies greatly with the oil temperature.

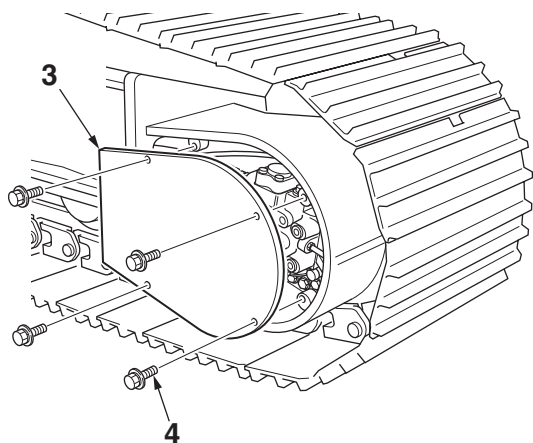
### Travel motor drain volume measurement

1. Ground the arm as in the figure below, then make the shoe crawler on one side float.



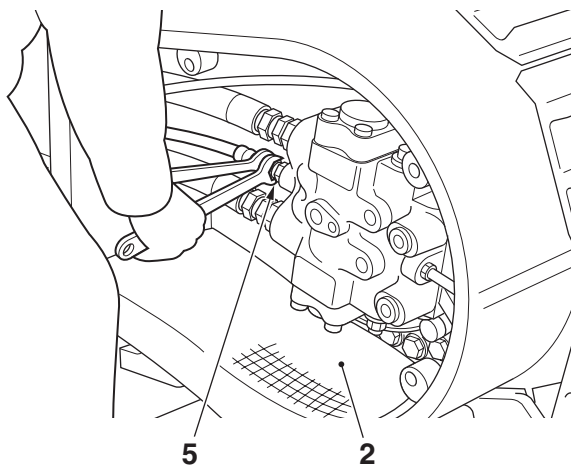
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2. Remove the bolts (4), then remove the cover (3).



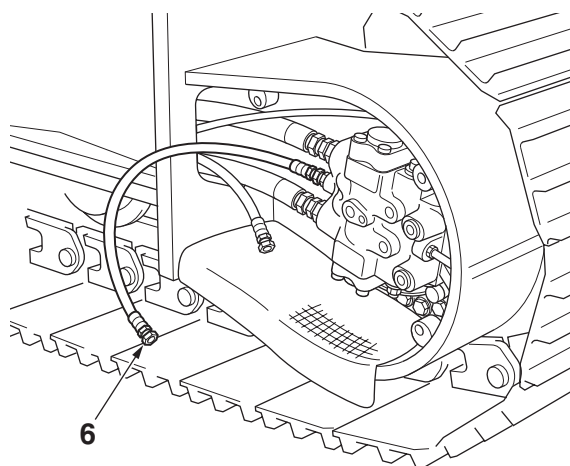
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3. Always lay a rag (2) underneath before removing the drain hose (5).
4. Use a spanner to remove the drain hose (5). (Always install a cap on the drain hose.)



RST-09-03-001C

5. Install the extension hose (6) for measurement on the side of the motor from which the drain hose was removed.



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