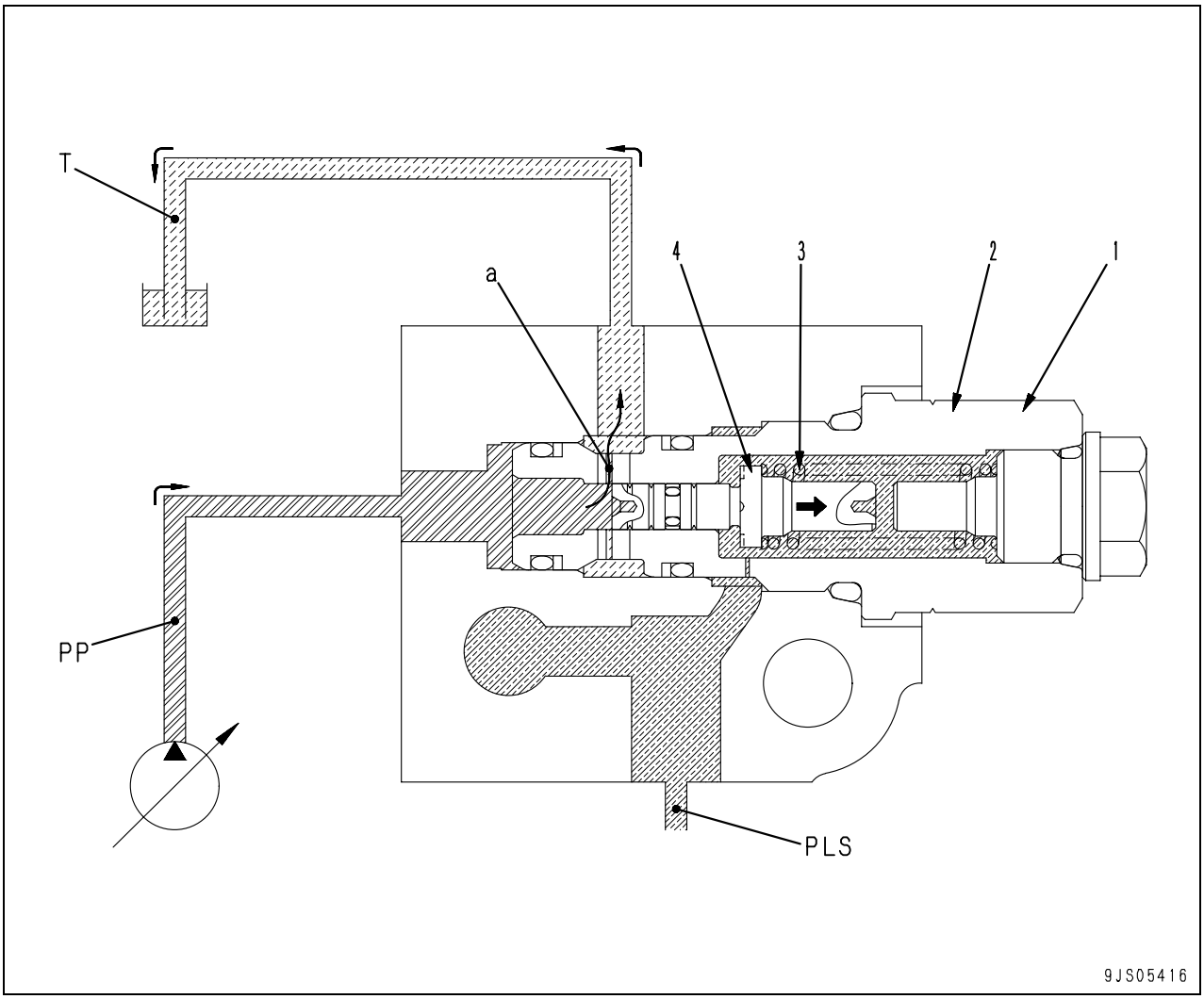
2. When control valve is controlled finely



T: Tank circuit
PP: Pump circuit
PLS: LS circuit

1. Unload valve
2. Sleeve
3. Spring
4. Spool

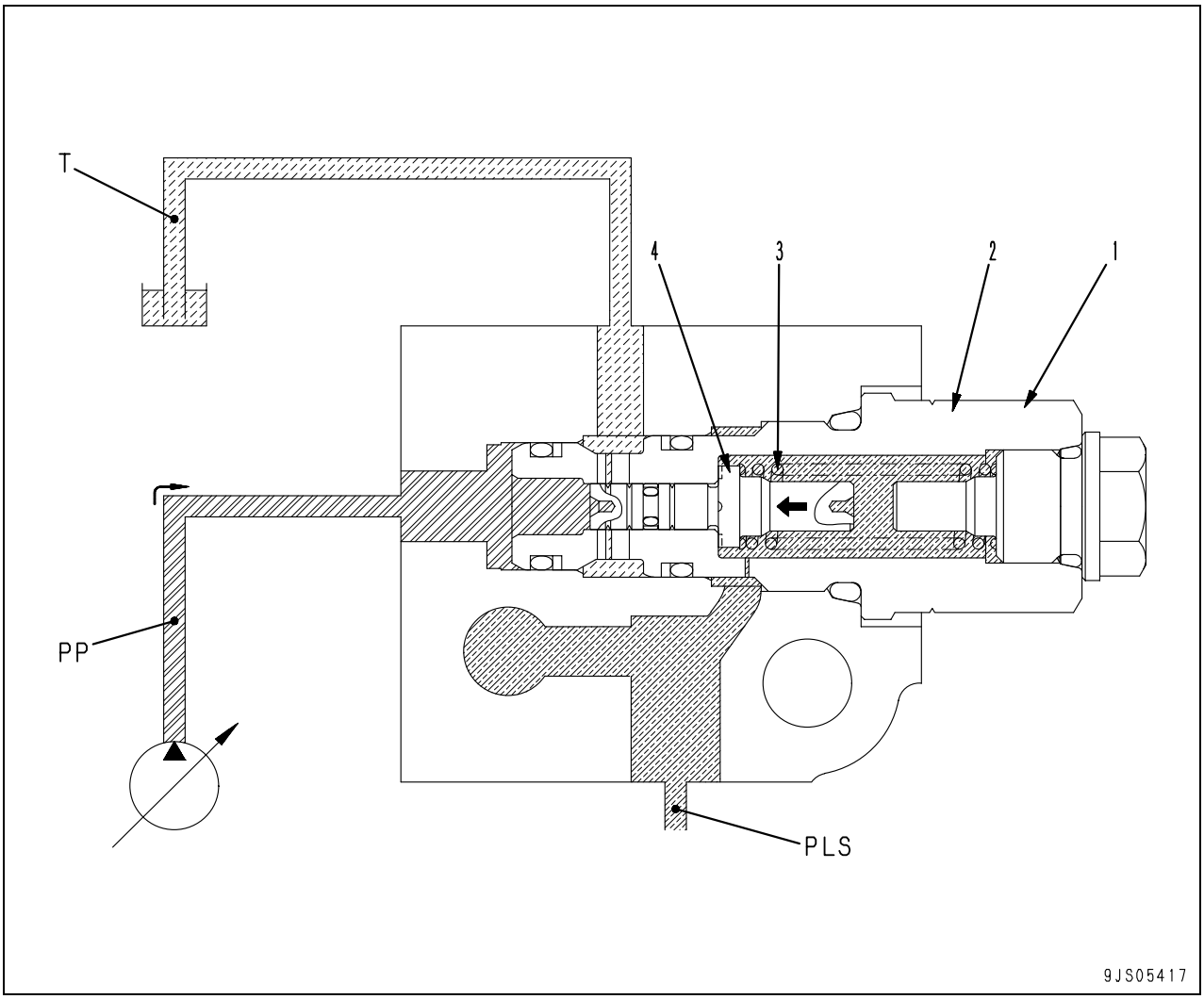
Function

- When the control valve is controlled finely, if the demand flow for the actuator is below the delivery at the minimum pump swash plate angle, pump discharge pressure (PP) is set to LS pressure (PLS) + 1.77 MPa {18.0 kg/cm^2}. If the differential pressure between discharge pressure (PP) and LS pressure (PLS) becomes the spring load of spring (3) (1.77 MPa {18.0 kg/cm^2}), the unload valve opens. Accordingly, LS differential pressure (ΔPLS) becomes 1.77 MPa {18.0 kg/cm^2}.

Operation

- If the control valve is controlled finely, LS pressure (PLS) is generated and applied to the right end of spool (4). Since the open area of the control valve spool is narrow at this time, the difference between the LS pressure (PLS) and pump discharge pressure (PP) is large.
- If the differential pressure between pump discharge pressure (PP) and LS pressure (PLS) reaches the spring load (1.77 MPa {18.0 kg/cm^2}), spool (4) moves to the right and pump circuit (PP) is connected to tank circuit (T).
- Pump discharge pressure (PP) is set to the spring force (1.77 MPa {18.0 kg/cm^2}) + LS pressure (PLS) and the LS differential pressure (ΔPLS) becomes 1.77 MPa {18.0 kg/cm^2}.

3. When control valve is operated



T: Tank circuit
PP: Pump circuit
PLS: LS circuit

1. Unload valve
2. Sleeve
3. Spring
4. Spool

Function

- When the control valve is operated, if the demand flow for the actuator exceeds the delivery at the minimum pump swash plate angle, the oil flow to tank circuit (T) is stopped and all of pump delivery (Q) is supplied to the actuator circuit.

Operation

- If the control valve is operated largely, LS pressure (PLS) is generated and applied to the right end of spool (4). At this time, since the open area of the control valve is wide, the difference between LS pressure (PLS) and pump discharge pressure (PP) is a little.
- Since the differential pressure between pump discharge pressure (PP) and LS pressure (PLS) does not reach the spring load of 1.77 MPa {18.0 kg/cm^2} of spring (3), spool (4) is pushed to the left by spring (3).
- Pump circuit (PP) is disconnected from tank circuit (T) and all of pump delivery (Q) is supplied to the actuator circuit.