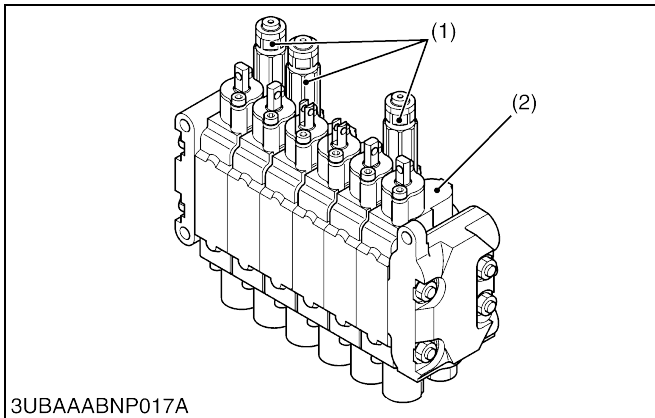
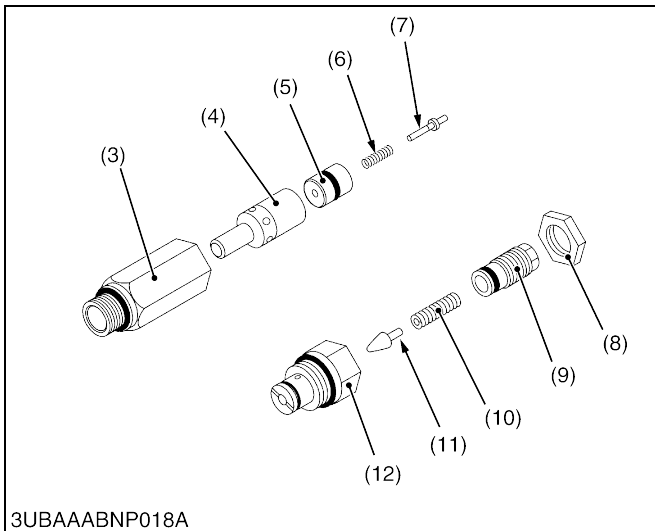


### [3] OVERLOAD RELIEF VALVE

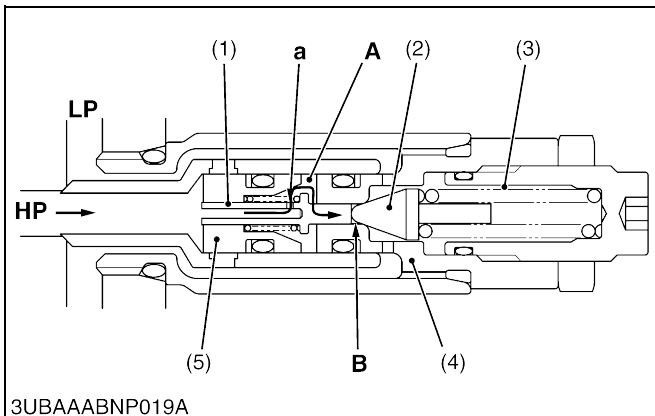


3UBAAABNP017A



3UBAAABNP018A

#### (1) Relief Operation



3UBAAABNP019A

Overload relief valve in this control valve is a combination valve combining a relief operation and anti-cavitation operation.

#### ■ Relief Operation

When the control valve is in the neutral position, both cylinder ports of control valve are blocked by the spool. If an external load is imposed on the cylinder, pressure builds in the circuit.

When the pressure exceeds the set level of the overload relief valve, the relief valve opens and the oil returns to tank. In this way, the hydraulic circuit and actuator are protected from excessive pressures.

#### ■ Anti-cavitation Operation

Overload relief valve also has anti-void function. If a negative pressure takes place in the circuit, the oil is fed from the tank to eliminate the negative pressure.

- |                           |                     |
|---------------------------|---------------------|
| (1) Overload Relief Valve | (7) Piston Poppet   |
| (2) Control Valve         | (8) Lock Nut        |
| (3) Housing               | (9) Adjusting Screw |
| (4) Check Valve Poppet    | (10) Pilot Spring   |
| (5) Relief Valve Poppet   | (11) Pilot Poppet   |
| (6) Piston Spring         | (12) Pilot Section  |

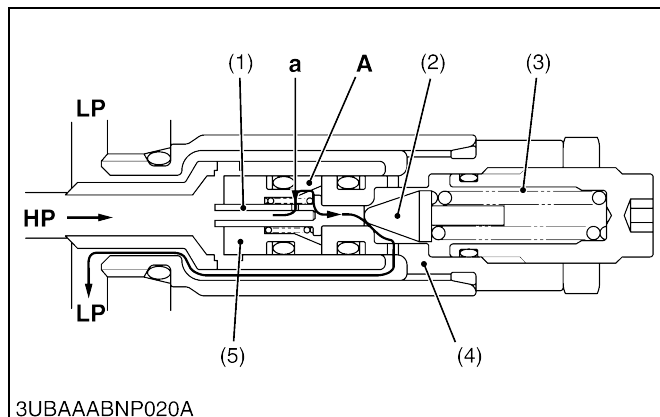
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#### When the Actuator Port Pressure is Lower Than the Setting

The cylinder port **HP** is applied to the seat **B** in the following route: first through the throttle **a** of the piston poppet (1) built in the relief valve poppet (5), second through the spring chamber **A**, and then through the circular clearance between the adjusting screw (4) and the piston poppet (1). This cylinder port **HP** works to open the pilot poppet (2). Because the piston spring (3) has not reached the set pressure, however, the valve stays shut. In this way the seat remains intact and the relief valve poppet (5) stays shut.

- |                         |                          |
|-------------------------|--------------------------|
| (1) Piston Poppet       | <b>HP: High Pressure</b> |
| (2) Pilot Poppet        | <b>LP: Low Pressure</b>  |
| (3) Piston Spring       | <b>A: Chamber</b>        |
| (4) Adjusting Screw     | <b>B: Seat</b>           |
| (5) Relief Valve Poppet | <b>a: Throttle</b>       |

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### When the Actuator Port Pressure is Higher Than the Setting

When the cylinder port **HP** has reached the set pressure of the piston spring (3), the pressurized oil in the spring chamber **A** opens the pilot poppet (2) and flows through the drain passage into the tank passage. This lowers the pressure in the spring chamber **A**, and the pressure difference across the throttle **a** moves the relief valve poppet (5) to the right. Now the seat of the relief valve poppet (5) gets open. The pressurized oil then flows from this seat into the tank, and the circuit pressure is kept at the pressure level set by the overload relief valve.

	Relief valve setting pressure
Dipperstick ( <b>A2</b> port side) Boom ( <b>A5</b> , <b>B5</b> port side)	20.6 to 21.0 MPa 210 to 215 kgf/cm <sup>2</sup> 2990 to 3050 psi
Dipperstick ( <b>B2</b> port side) Swing ( <b>A6</b> , <b>B6</b> port side)	18.2 to 18.6 MPa 185 to 190 kgf/cm <sup>2</sup> 2640 to 2700 psi

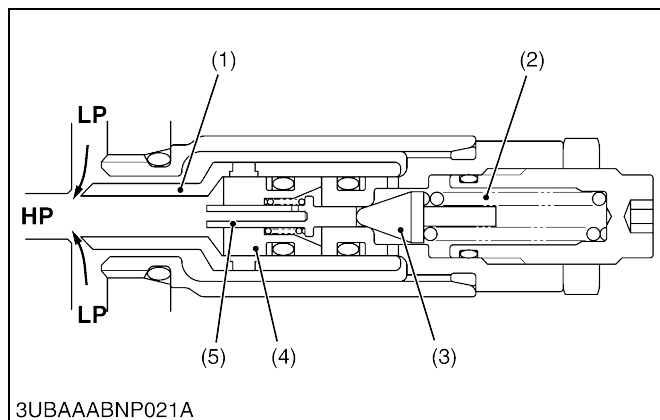
- Oil temperature: 45 to 55 °C (113 to 131 °F)

- (1) Piston Poppet
- (2) Pilot Poppet
- (3) Piston Spring
- (4) Adjusting Screw
- (5) Relief Valve Poppet

**HP: High Pressure**  
**LP: Low Pressure**  
**A: Chamber**  
**a: Throttle**

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## (2) Anti-cavitation Operation



This valve, in operation, prevents a condition – so called cavitation – that arises in the cylinder port **HP** where fluid is not entirely filling out.

That is, this relief valve is combined an anti-cavitation function supplying oil.

The oil at the tank port **LP** opens the check valve poppet, allowing oil to flow through the tank port to prevent negative pressure from being generated in the cylinder.

- (1) Check Valve Poppet
- (2) Piston Spring
- (3) Pilot Poppet
- (4) Relief Valve Poppet
- (5) Piston Poppet

**HP: High Pressure**  
**LP: Low Pressure**

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