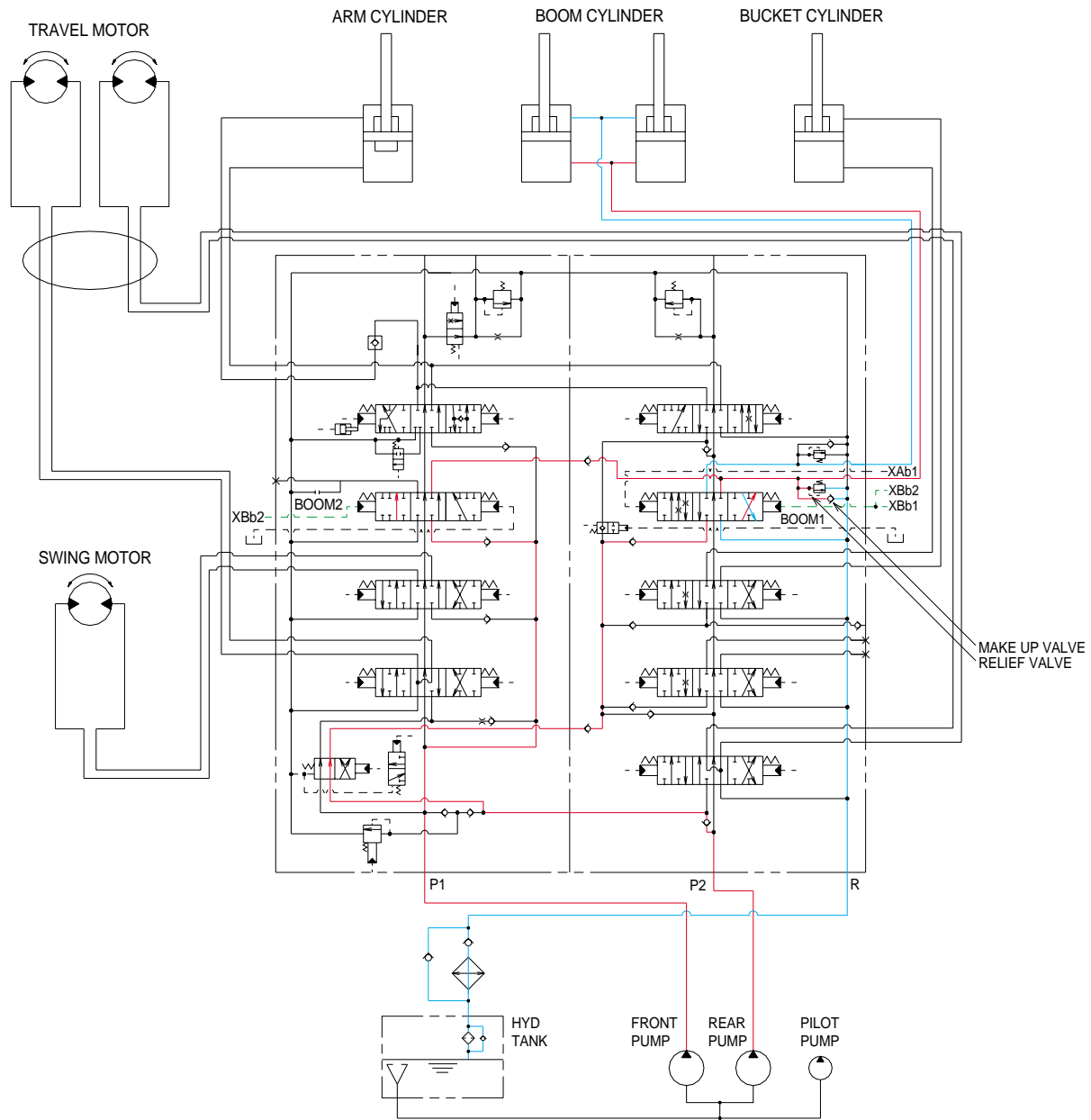


GROUP 4 SINGLE OPERATION

1. BOOM RAISE CIRCUIT OPERATION



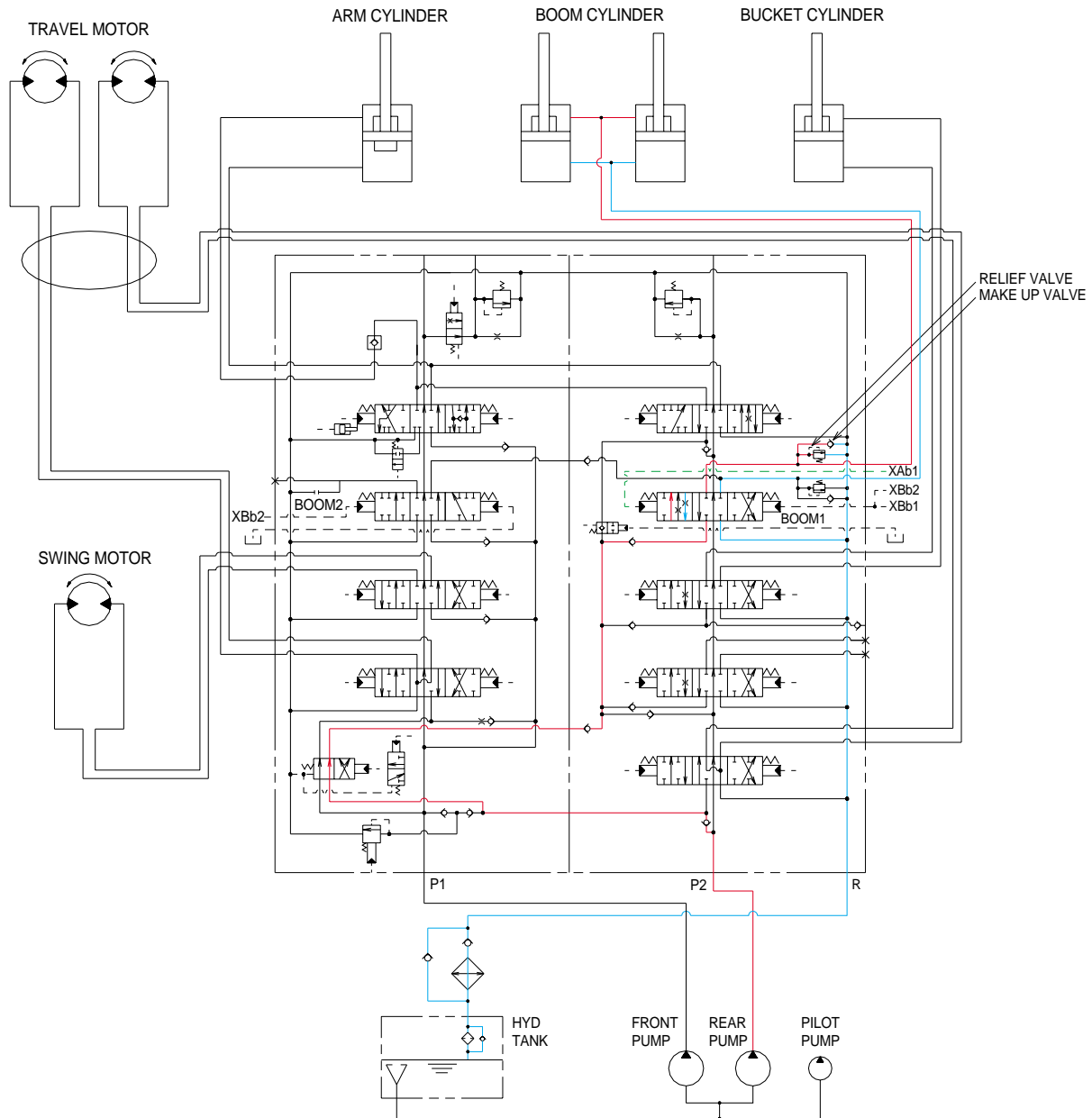
When the right control lever is pulled to boom raise position, the oil flows from pilot pump through the remote control valve to boom sections of the main control valve.

Here, the spool positions are moved to the boom raise position, and the boom circuits are opened.

The oil flows from the rod end of the cylinders are directed to the tank through the boom1 section of the main control valve.

Cavitation and excessive pressure in the boom cylinder bottom end circuit is prevented by a overload relief and make up valve in the main control valve.

2. BOOM DOWN CIRCUIT OPERATION



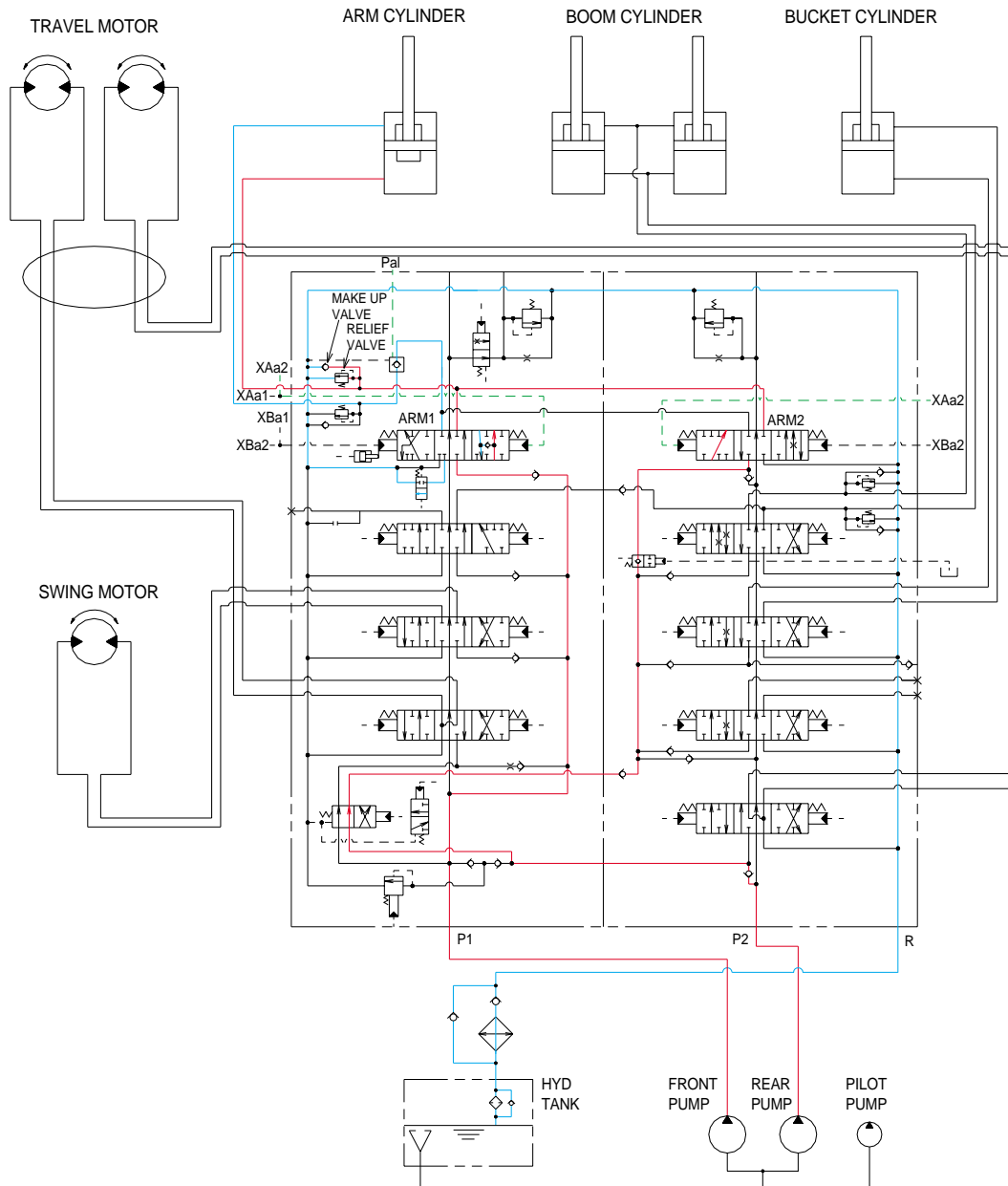
When the right control lever is pushed forward to boom down position, the oil flows from pilot pump through the remote control valve to boom section of the main control valve. Here, the spool positions are move to the boom down position, and the boom down circuit is opened.

Oil flows from rear pump through boom1 section of the main control valve to the rod end of the boom cylinders, and to down the boom.

The return oil flows from the bottom end of the cylinders to the tank through the boom1 section of the main control valve.

Cavitation end excessive pressure in the boom cylinder rod end circuit is prevented by a overload relief and make up valve in the control valve.

3. ARM ROLL IN CIRCUIT OPERATION



When the left control lever manually is placed in the arm roll in position.

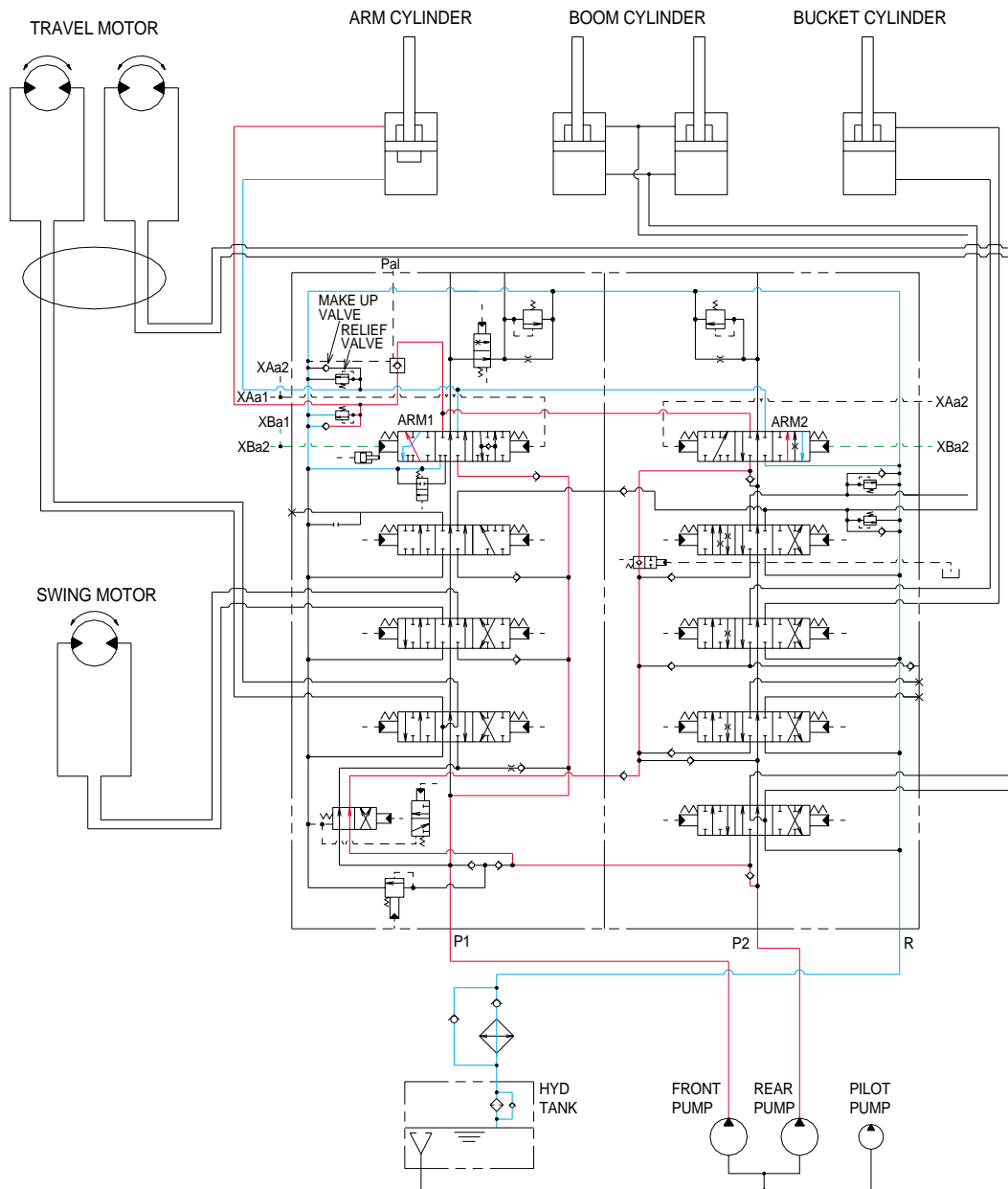
Then the oil flows from pilot pump through the remote control valve to arm sections of the main control valve. Here, the spool positions are moved to arm roll in position.

The oil flows from both main pump through arm section of the main control valve to the bottom end of the arm cylinder, and to roll in arm.

The return oil flows from the rod end of the cylinder through the arm1 section returned to the tank.

Then cavitation which will happen to the bottom of the arm cylinder is prevented by a make up valve, on other hand. The excessive pressure is also prevented by an overload relief valve in the main control valve.

4. ARM ROLL OUT CIRCUIT OPERATION



When the left control lever manually is placed in the arm roll out position.

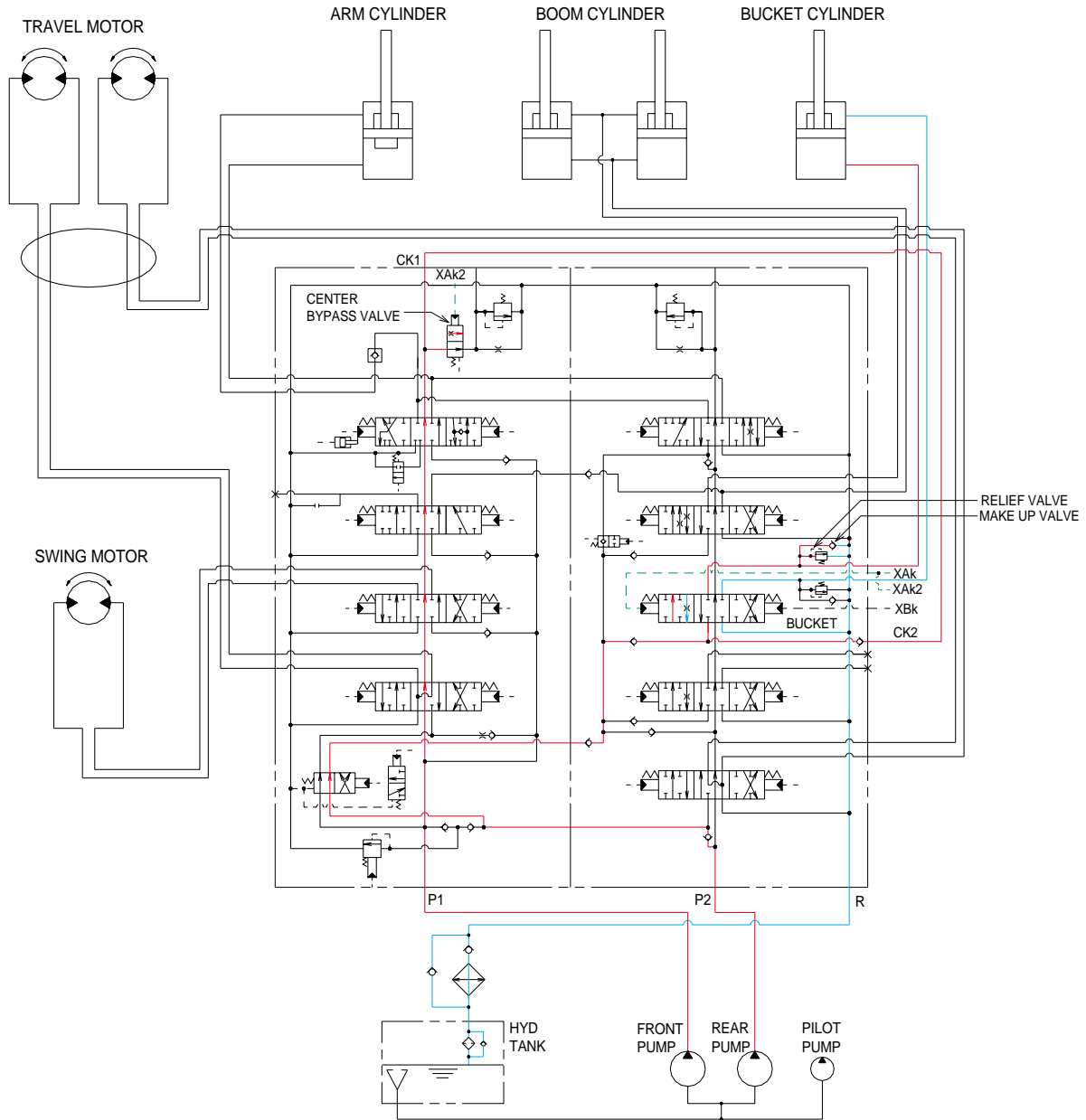
Then the oil flows from pilot pump through the remote control valve to arm sections of the main control valve. Here, the spool positions are moved to arm roll out position.

The oil flows from both pump through arm section of main control valve to the rod end of the arm cylinder, and to roll out arm.

The return oil flows from the bottom end of the cylinder through the arm section returned to the tank.

The cavitation which will happen to the rod of the arm cylinder is prevented by a make up valve, on other hand. The excessive pressure is also prevented by and overload relief valve in the main control valve.

5. BUCKET ROLL IN CIRCUIT OPERATION



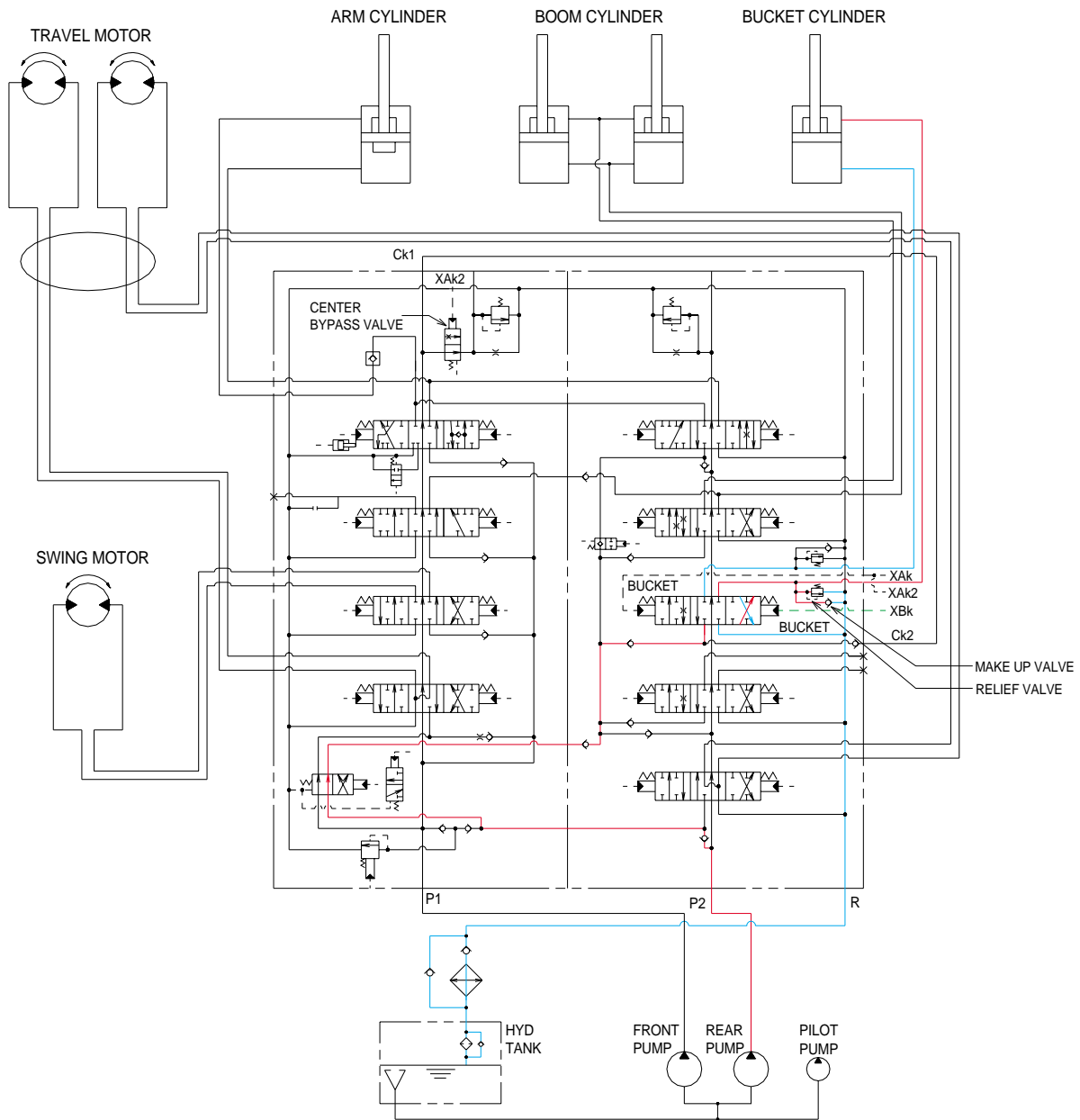
When the right control lever is manually placed in the bucket roll in position. Then the oil flows from pilot through the pilot valve to bucket section of the main control valve. Here the spool position is moved to bucket roll in position.

The center bypass valve is change over by the pilot pressure (XAk2) and then the oil from front pump is joint to the flow of rear pump via confluence passage.

The oil flows from both pump through rod end of the cylinder through the bucket section returned to the tank.

The cavitation which will happen to the bottom of the bucket cylinder is prevented by a make up valve, on other hand. The excessive pressure is also prevented by an overload relief valve in the main control valve.

6. BUCKET ROLL OUT CIRCUIT OPERATION



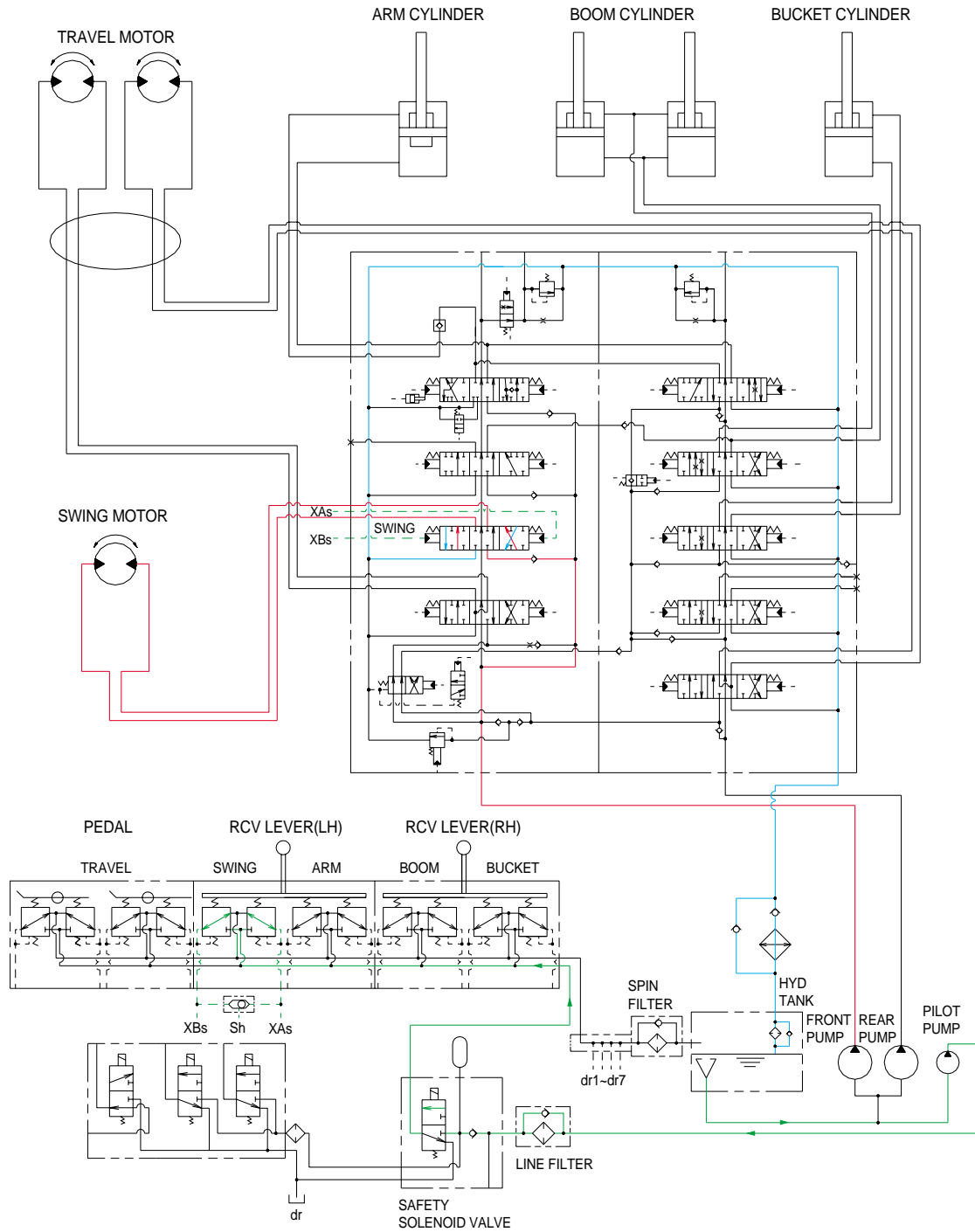
When the right control lever is manually placed in the bucket roll out position. Then the oil flows from pilot pump through the pilot valve to bucket section of the main control valve. Here the spool position is moved to bucket roll out position.

The oil flows from rear pump through bucket section of main control valve to the rod end of the bucket cylinder, and to roll out bucket.

The return oil flows from the bottom end of the cylinder through the bucket section returned to the tank.

The cavitation which will happen to the rod of the bucket cylinder is prevented by a make up valve, on other hand. The excessive pressure is also prevented by an overload relief valve in the main control valve.

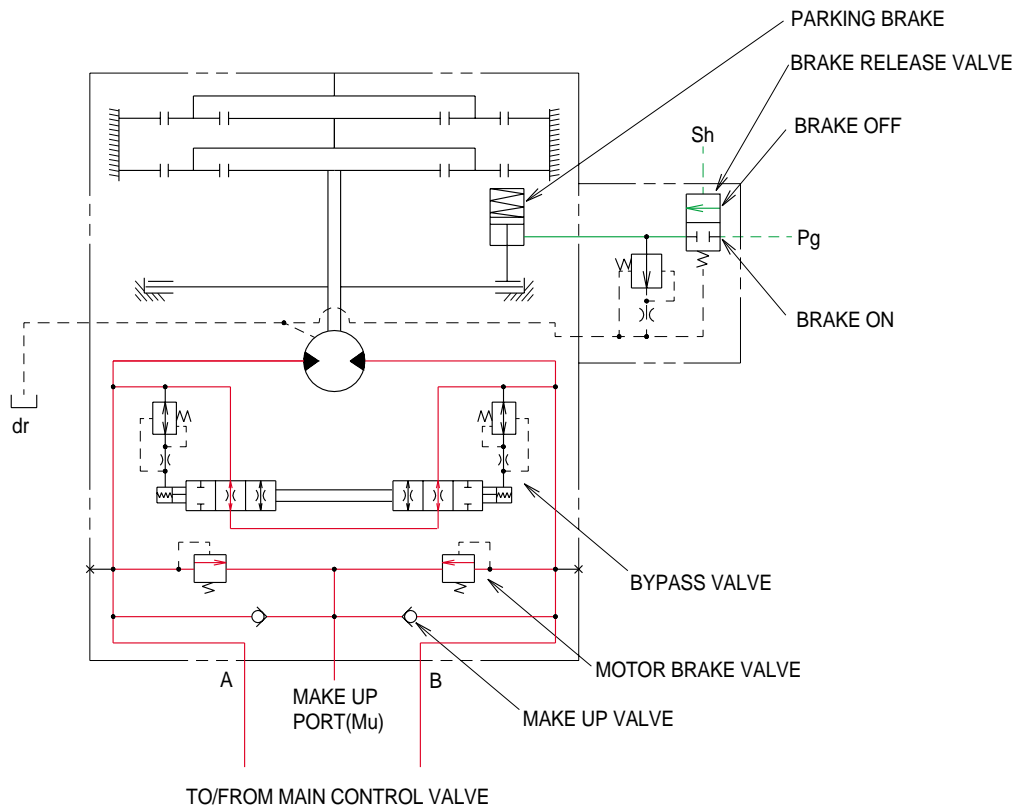
7. SWING OPERATION



When the left control lever is manually placed in the left(right) swing position. Then the oil flows from front pump through the swing section of the main control valve to swing motor to left(right) swing the superstructure. The return oil flows from swing motor through the swing section of the main control valve returned to the tank.

When the control lever placed in the neutral position, the pressure of the pilot oil passage down. Then the brake release valve returned to the neutral position and the oil is returned from the brake piston to the tank. And the brake is set to ON.

SWING CIRCUIT OPERATION



1) MOTOR BRAKE VALVE

Motor brake valve for the swing motor limits to cushion the starting and stopping pressure of swing operation.

2) MAKE UP VALVE

The make up valves prevent cavitation by supplying return oil to the vacuum side of the motor.

3) PARKING BRAKE

In case that the parking, of the machine at slope is required during operation, there is the danger of involuntary swing caused by the self weight of the machine. The brake is connected to prevent this involuntary swing.

PARKING BRAKE "OFF" OPERATION

The parking brake is released by the pilot pressure oil from the pilot pump.

When the left control lever placed in the swing position, the pilot pressure at the shuttle valve is transferred to the brake release valve and the brake release valve is change over. Then the pilot pressure lift the brake piston and release the parking brake.

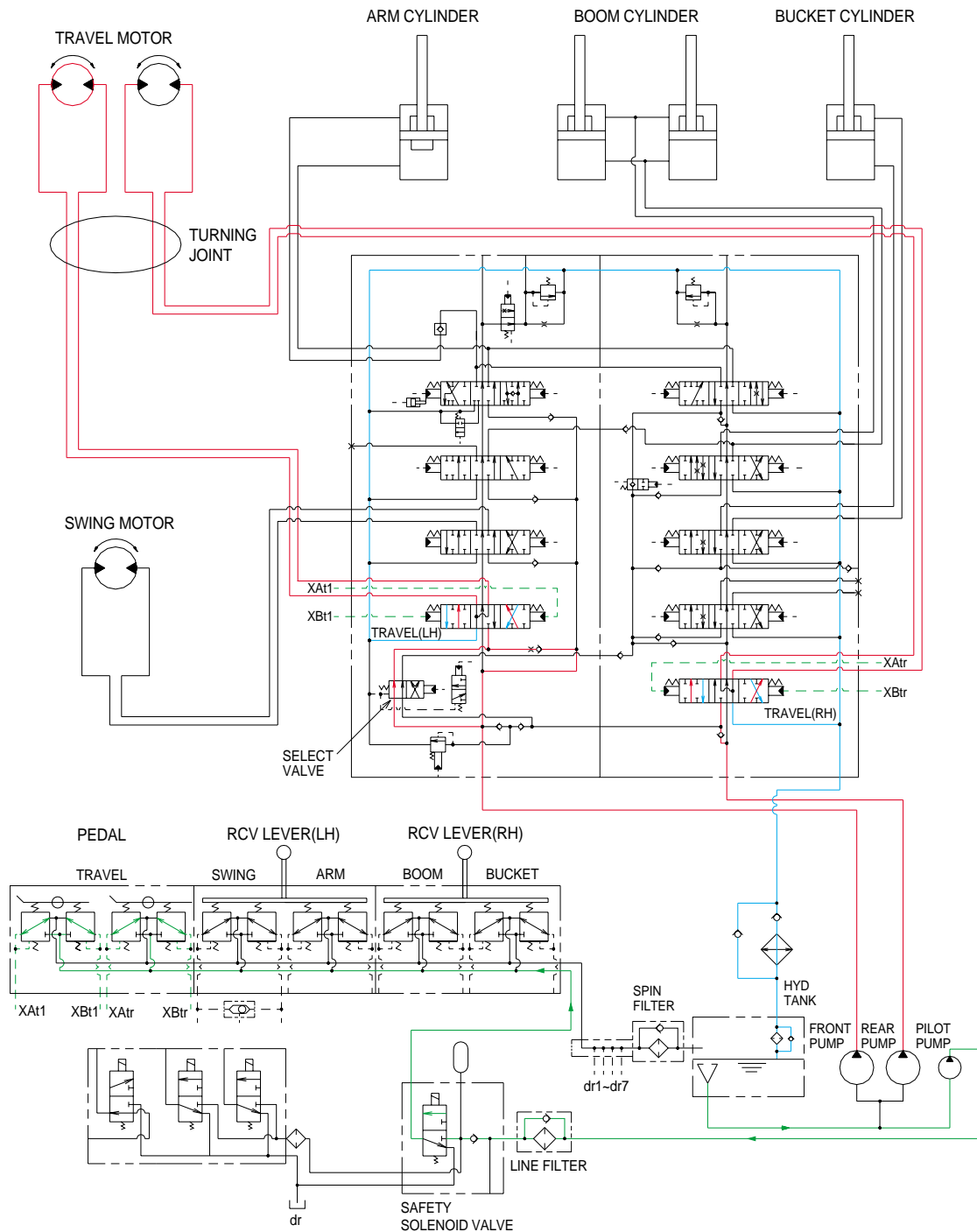
4) PARKING BRAKE "ON" OPERATION

When the control lever placed in the neutral position, the pressure of the pilot oil passage down. Then the brake release valve returned to the neutral position and the oil is returned from the brake piston to the tank. And the brake is set to "ON".

BYPASS VALVE

This bypass valve absorbs shocks produced as swing motion stops and reduces oscillation cause by swing motion.

8. TRAVEL FORWARD AND REVERSE OPERATION

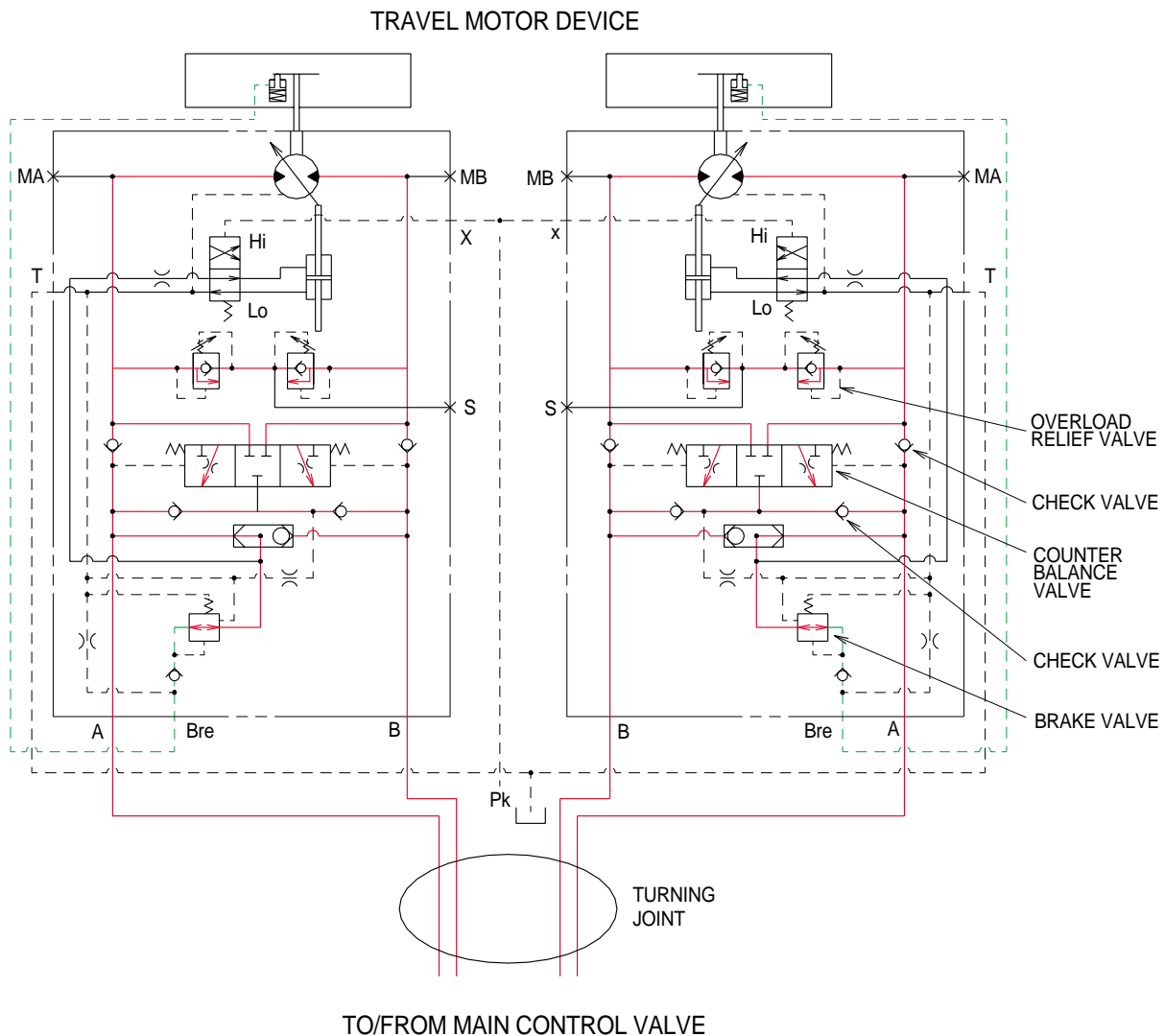


When the right and left travel levers are manually placed to the forward or reverse position. Then the oil flows from pilot pump through the pilot valve to travel sections of the main control valve.

Here, spool position is moved to forward and reverse position. the oil flows from rear pump through the travel(RH) section of the main control valve and turning joint to the right travel motor and oil flows from front pump through the travel(LH) section of the main control valve and turning joint to the left travel motor and move the machine forward and reverse.

The return oil flows from both travel motor through the turning joint and travel(RH,LH) section returned to the tank.

TRAVEL CIRCUIT OPERATION



Brake valves are provided on travel motors to offer the following functions.

1) COUNTER BALANCE VALVE

When stopping the motor of slope descending, this valve to prevent the motor over run.

2) OVERLOAD RELIEF VALVE

Relief valve limit the circuit pressure below 350kgf/cm² to prevent high pressure generated at a time of stooping the machine.

Stopping the motor, this valve sucks the oil from lower pressure passage for preventing the negative pressure and the cavitation of the motor.

3) BRAKE VALVE

When the right or left travel levers placed in the travel position, the oil flow into parking brake via brake valve and then the brake is released.