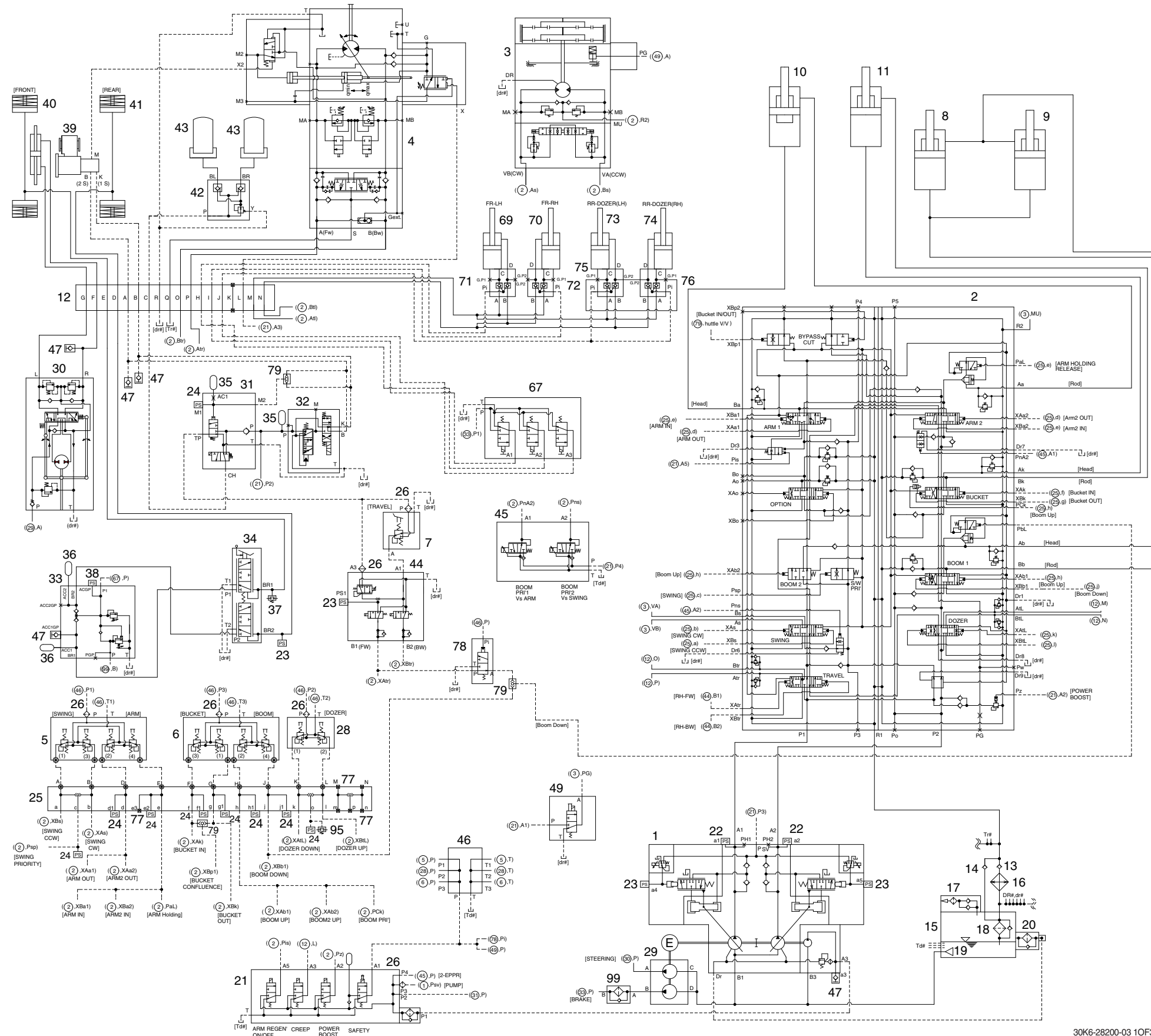


SECTION 3 HYDRAULIC SYSTEM

Group 1	Hydraulic Circuit	3-1
Group 2	Main Circuit	3-4
Group 3	Pilot Circuit	3-7
Group 4	Single Operation	3-18
Group 5	Combined Operation	3-33

GROUP 1 HYDRAULIC CIRCUIT

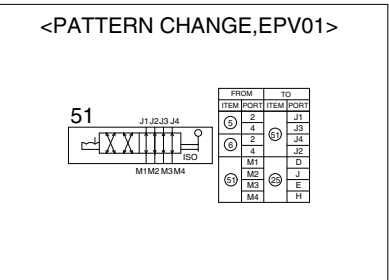
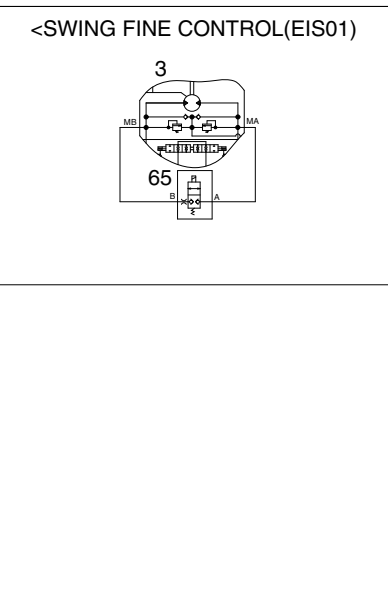
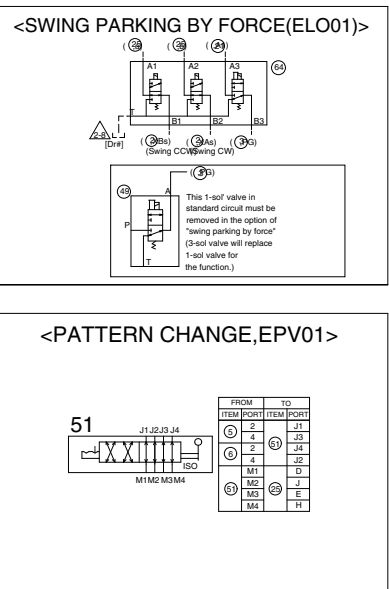
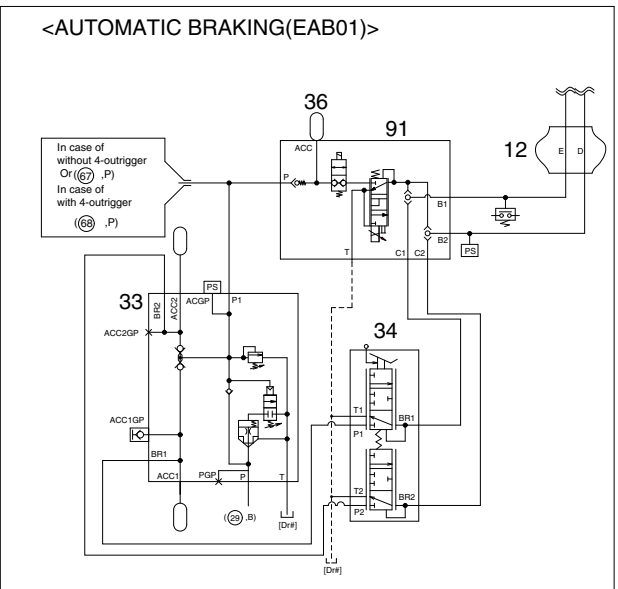
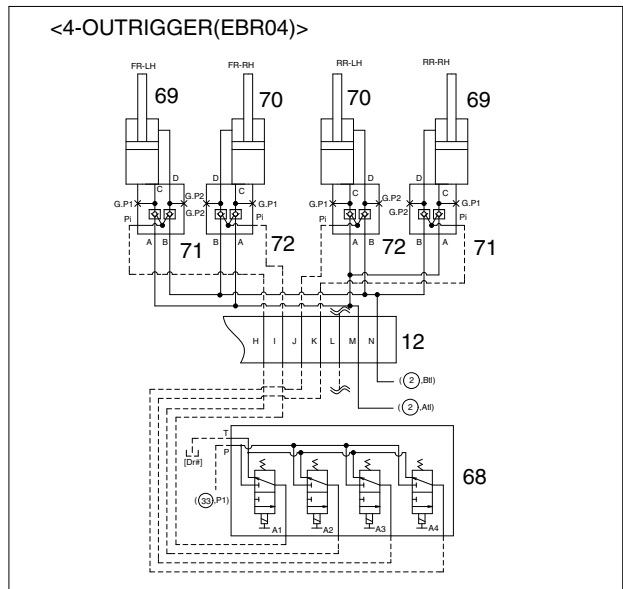
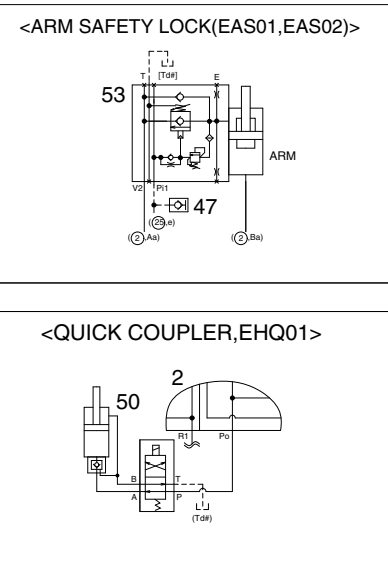
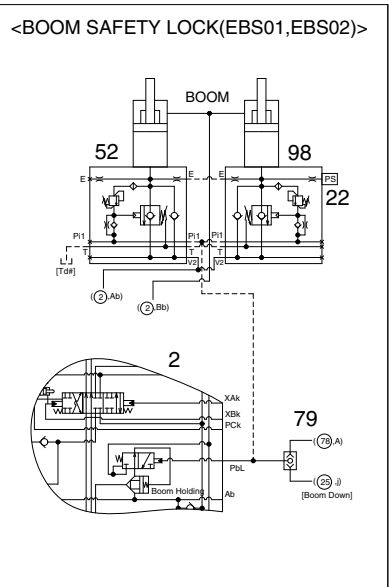
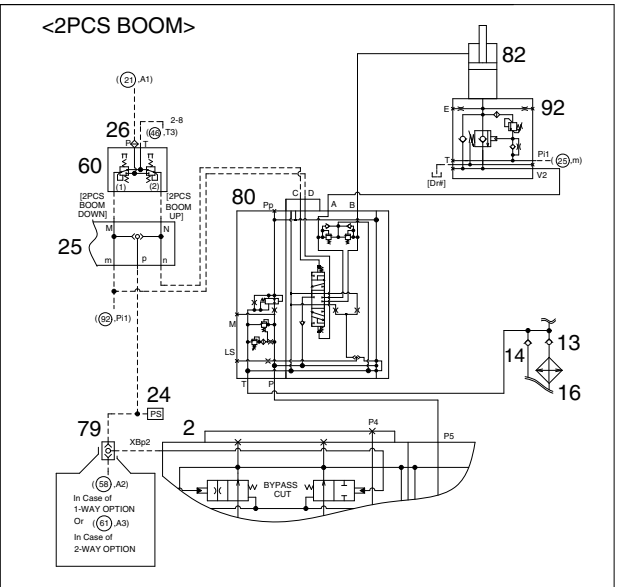
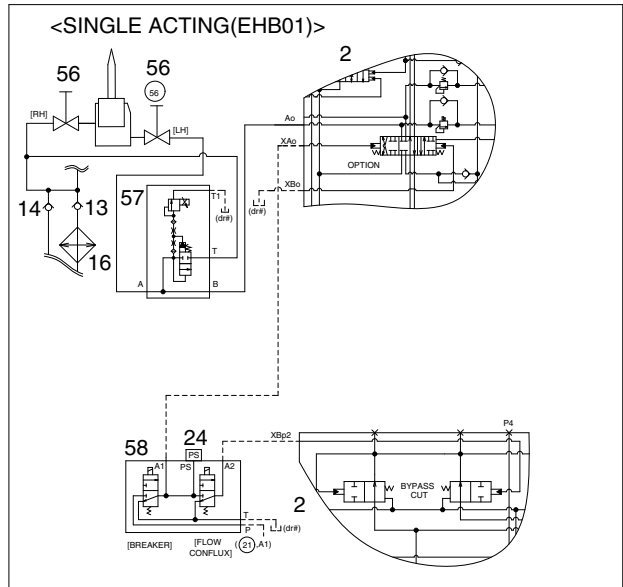
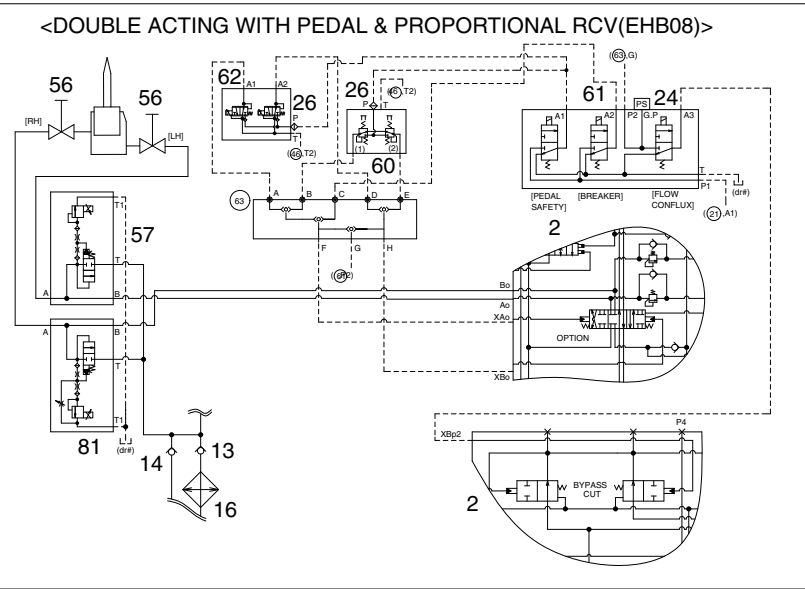
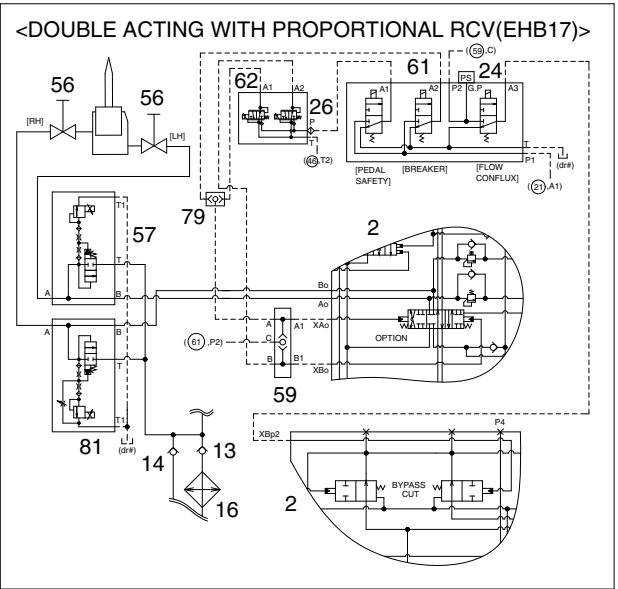
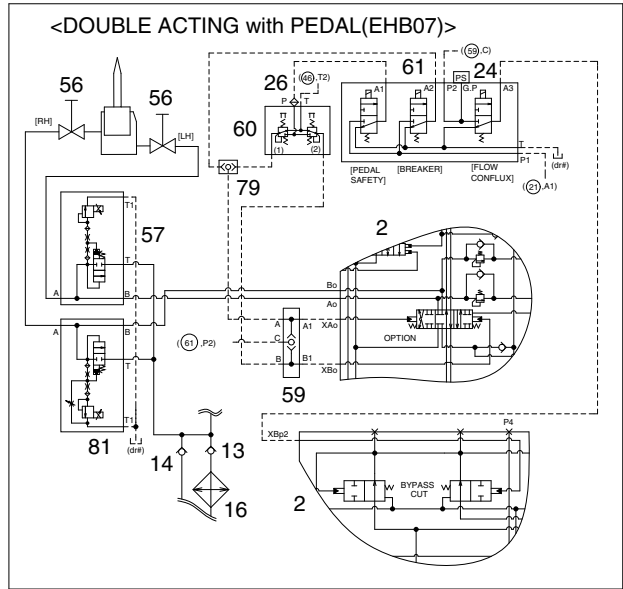
1. HYDRAULIC CIRCUIT (1/3)



- 1 Main pump
- 2 Main control valve
- 3 Swing motor
- 4 Travel motor
- 5 RCV lever (LH)
- 6 RCV lever (RH)
- 7 RCV pedal
- 8 Boom cylinder (LH)
- 9 Boom cylinder (RH)
- 10 Arm cylinder
- 11 Bucket cylinder
- 12 Turning joint
- 13 Check valve
- 14 Check valve
- 15 Hydraulic tank
- 16 Oil cooler
- 17 Air breather
- 18 Return filter w/bypass valve
- 19 Strainer
- 20 Drain filter
- 21 4-cartridge valve
- 22 Pressure sensor
- 23 Pressure sensor
- 24 Pressure sensor
- 25 Terminal block
- 26 Last guard filter
- 28 RCV dozer lever
- 29 Power train pump
- 30 Steering valve
- 31 Travel control valve
- 32 Transmission control valve
- 33 Brake supply valve
- 34 Brake valve
- 35 Accumulator
- 36 Accumulator
- 37 Pressure switch
- 38 Pressure sensor
- 39 Transmission
- 40 Front axle
- 41 Rear axle
- 42 Locking valve
- 43 Oscillating cylinder
- 44 3-cartridge valve
- 45 2-EPPR cartridge valve
- 46 Cross assy
- 47 Screw coupling
- 49 Solenoid valve
- 67 3-cartridge valve
- 69 Outrigger cylinder-L
- 70 Outrigger cylinder-R
- 71 DPC valve-outrigger-L
- 72 DPC valve-outrigger-R
- 73 Dozer cylinder-L
- 74 Dozer cylinder-R
- 75 DPC valve-dozer-L
- 76 DPC valve-dozer-R
- 77 Plug
- 78 Pilot selector valve
- 79 Shuttle tee
- 95 Pressure switch
- 99 Pressure filter

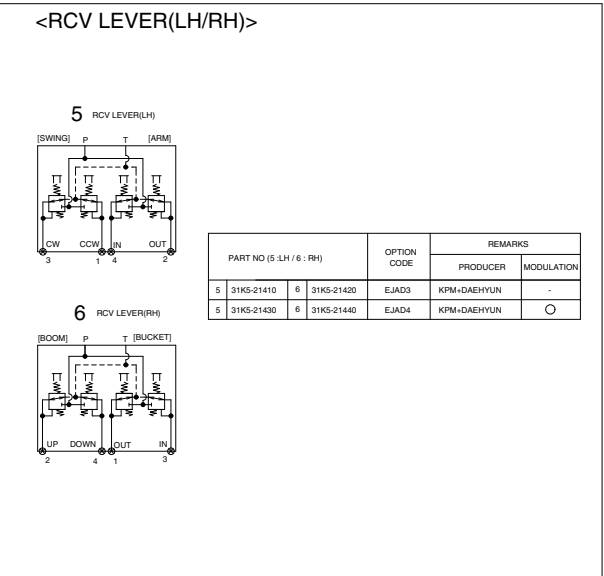
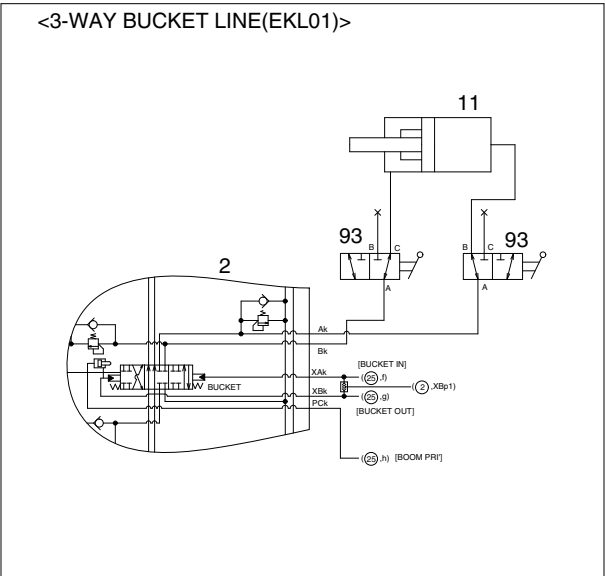
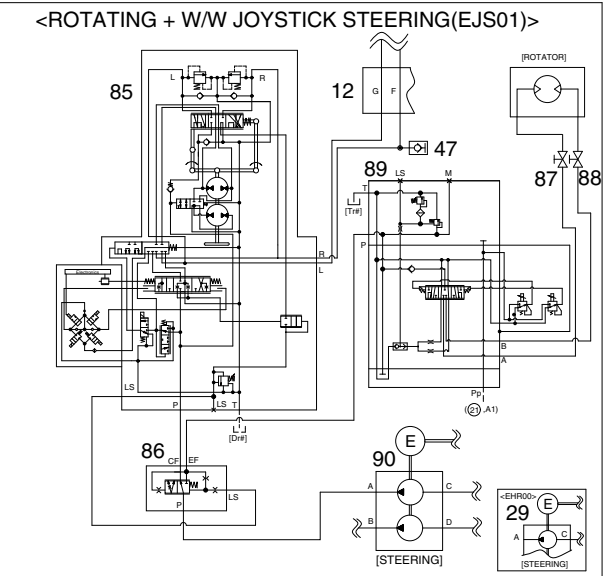
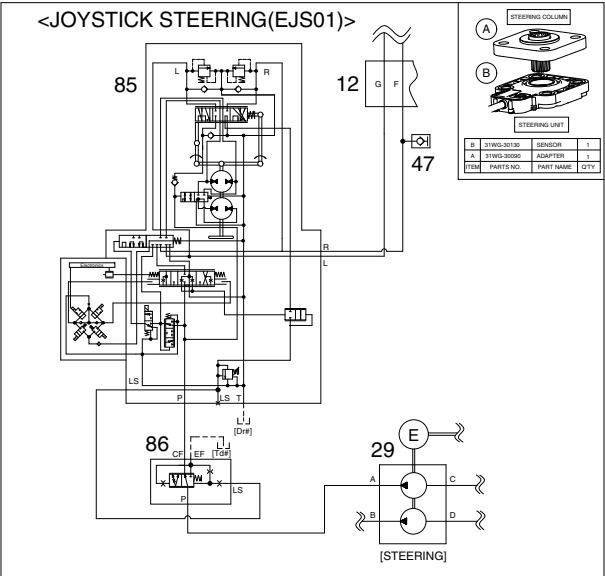
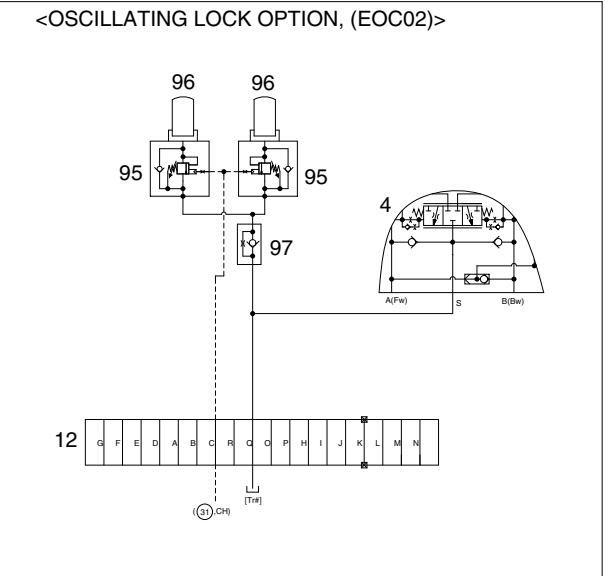
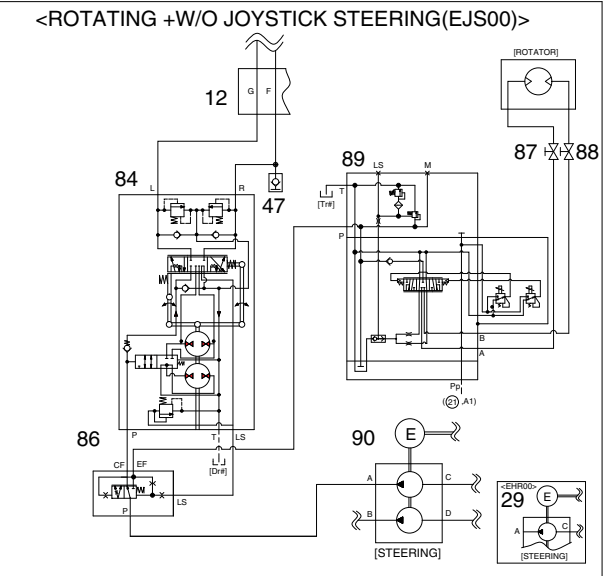
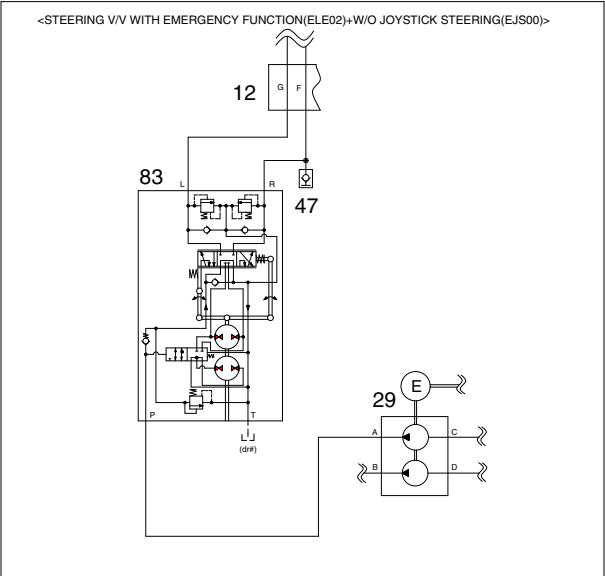
30K6-28200-03 10F3

2. HYDRAULIC CIRCUIT (2/3)



- 2 Main control valve
- 12 Turning joint
- 13 Check valve
- 14 Check valve
- 16 Oil cooler
- 22 Pressure sensor
- 24 Pressure sensor
- 25 Terminal block
- 26 Last guard filter
- 36 Accumulator
- 47 Screw coupling
- 50 Solenoid valve
- 51 Pattern change valve
- 52 Boom cylinder valve-LH
- 53 Arm cylinder valve
- 56 Stop valve
- 57 Pro relief valve
- 58 Solenoid valve
- 59 Shuttle valve
- 60 2-way opt pedal
- 61 Solenoid valve
- 62 2-EPPR valve
- 63 Shuttle block
- 64 Solenoid valve
- 65 Solenoid valve
- 68 4-cartridge valve
- 69 Outtrigger cylinder-L
- 70 Outtrigger cylinder-R
- 71 DPC valve-L
- 72 DPC valve-R
- 79 Shuttle tee
- 80 Control valve
- 81 Pro relief valve
- 82 2 piece boom cylinder
- 91 Auto brake valve
- 92 2 pcs boom cyl safety valve
- 98 Boom cylinder valve-RH

3. HYDRAULIC CIRCUIT (3/3)



- 4 Travel motor
- 5 RCV lever-LH
- 6 RCV lever-RH
- 11 Bucket cylinder
- 12 Turning joint
- 29 Power train pump
- 47 Screw coupling
- 83 Steering valve-ele
- 85 Steering valve-JS steering
- 86 Priority valve
- 87 Stop valve
- 88 Stop valve
- 89 Proportional valve
- 90 Power train pump
- 93 3-way valve
- 95 Locking valve
- 96 Oscilating cylinder
- 97 Orifice and check valve

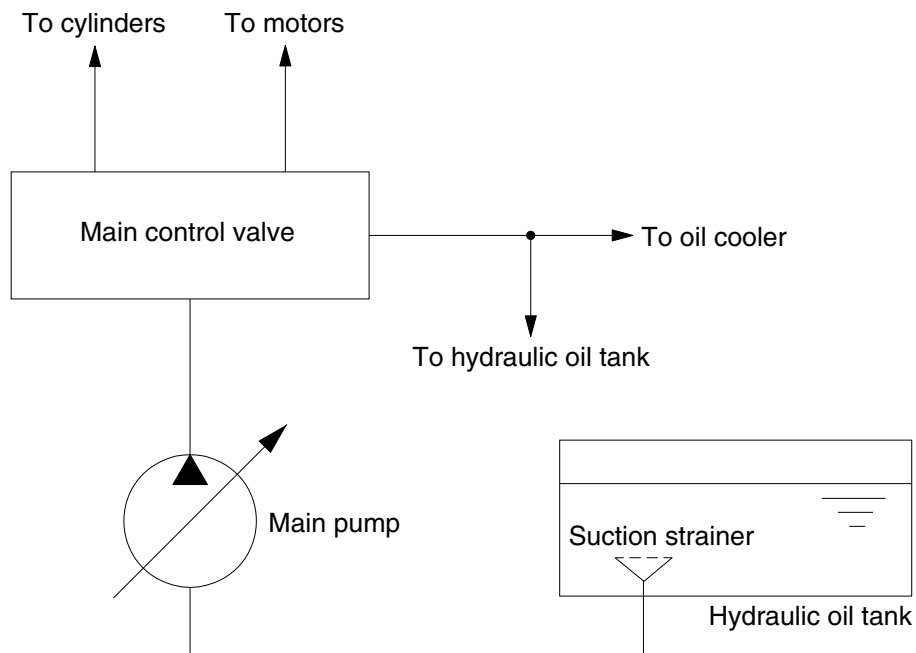
GROUP 2 MAIN CIRCUIT

The main hydraulic circuit consists of suction circuit, delivery circuit, return circuit and drain circuit.

The hydraulic system consists of one main pump, one control valve, one swing motor, four cylinders and two travel motors.

The swash plate type variable displacement axial piston pump is used as the main pump and it is driven by the engine at ratio 1.0 of engine speed.

1. SUCTION AND DELIVERY CIRCUIT



140L3CI01

The pumps receive oil from the hydraulic tank through a suction filter. The discharged oil from the pump flows into the control valve and goes out the tank ports.

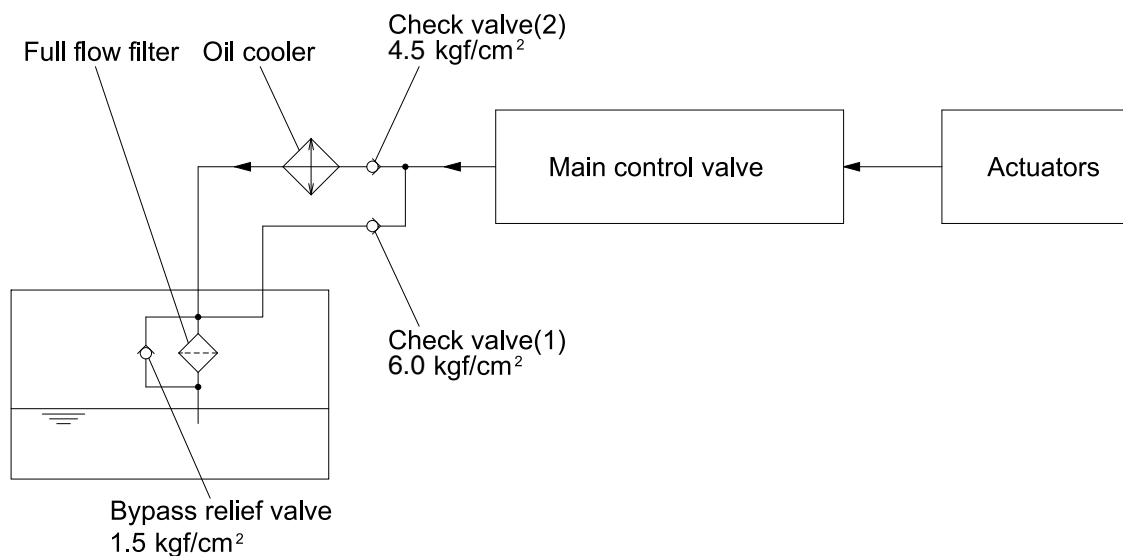
The oil discharged from the main pump flows to the actuators through the control valve.

The control valve controls the hydraulic functions.

The return oil from the actuators flows to the hydraulic tank through the control valve and the oil cooler.

※ The circuit diagram may differ from the equipment, so please check before a repair.

2. RETURN CIRCUIT



210WA3CI02

All oil from each actuator returns to the hydraulic tank through the control valve.

The bypass check valves are provided in the return circuit.

The setting pressure of bypass check valves are 4.5 kgf/cm² (64 psi) and 6.0 kgf/cm² (85 psi). Usually, oil returns to the hydraulic tank from the left side of control valve through oil cooler.

When oil temperature is low, viscosity becomes higher and flow resistance increases when passing through the oil cooler. When the oil pressure exceeds 6.0 kgf/cm² (85 psi), the oil returns directly to the hydraulic tank, resulting in the oil temperature being raised quickly at an appropriate level.

When the oil cooler is clogged, the oil returns directly to the hydraulic tank through bypass check valve (1).

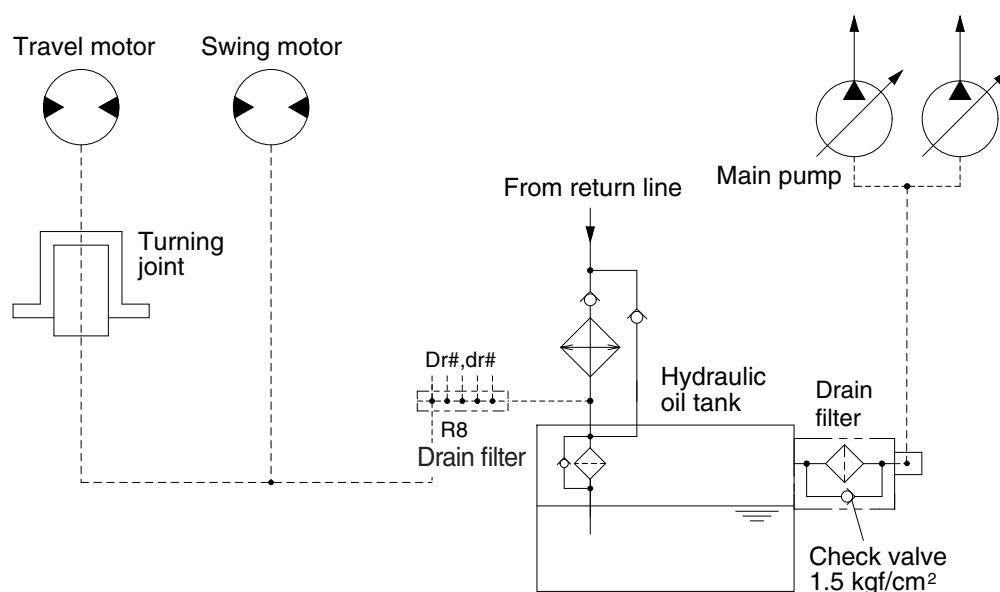
The return filter and bypass relief valve are provided in the hydraulic tank.

The oil returned from right and left side of control valve is combined and filtered by the return filter. A bypass relief valve is provided in the full-flow filter.

When the filter element is clogged, the bypass relief valve opens at 1.5 kgf/cm² (21 psi) differential pressure.

※ The circuit diagram may differ from the equipment, so please check before a repair.

3. DRAIN CIRCUIT



210WA3CI03

Besides internal leaks from the motor, transmission, front and rear axle the oil for lubrication circulates. The main pump drain oil have to be fed to the hydraulic tank passing through drain filter. When the drain oil pressure exceed 1.5 kgf/cm² (21 psi), the oil returns to the hydraulic tank directly.

1) TRAVEL MOTOR DRAIN CIRCUIT

Oil leaking from the travel motor comes out of the drain ports provided in the respective motor casing and joins with each other. This oil passes through turning joint and join with oil leak line of the swing motor and returns to the hydraulic tank after being filtered by the return filter.

2) SWING MOTOR DRAIN CIRCUIT

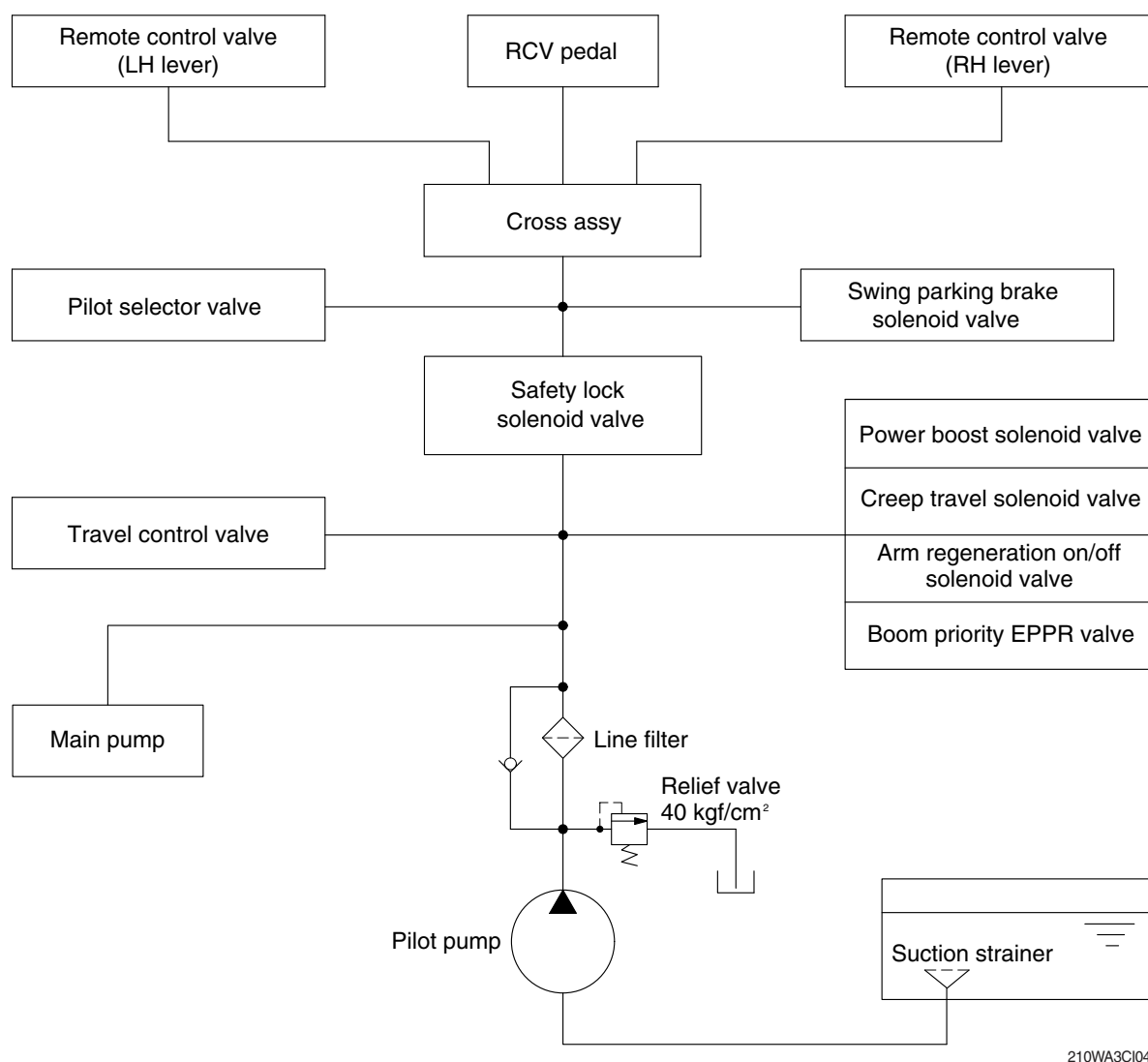
Oil leaking from the swing motor comes out and return to the hydraulic tank passing through the return filter.

3) MAIN PUMP DRAIN CIRCUIT

Oil leaking from main pump come out and return to the hydraulic tank passing through drain filter.

※ The circuit diagram may differ from the equipment, so please check before a repair.

GROUP 3 PILOT CIRCUIT



The pilot circuit consists of suction circuit, delivery circuit and return circuit.

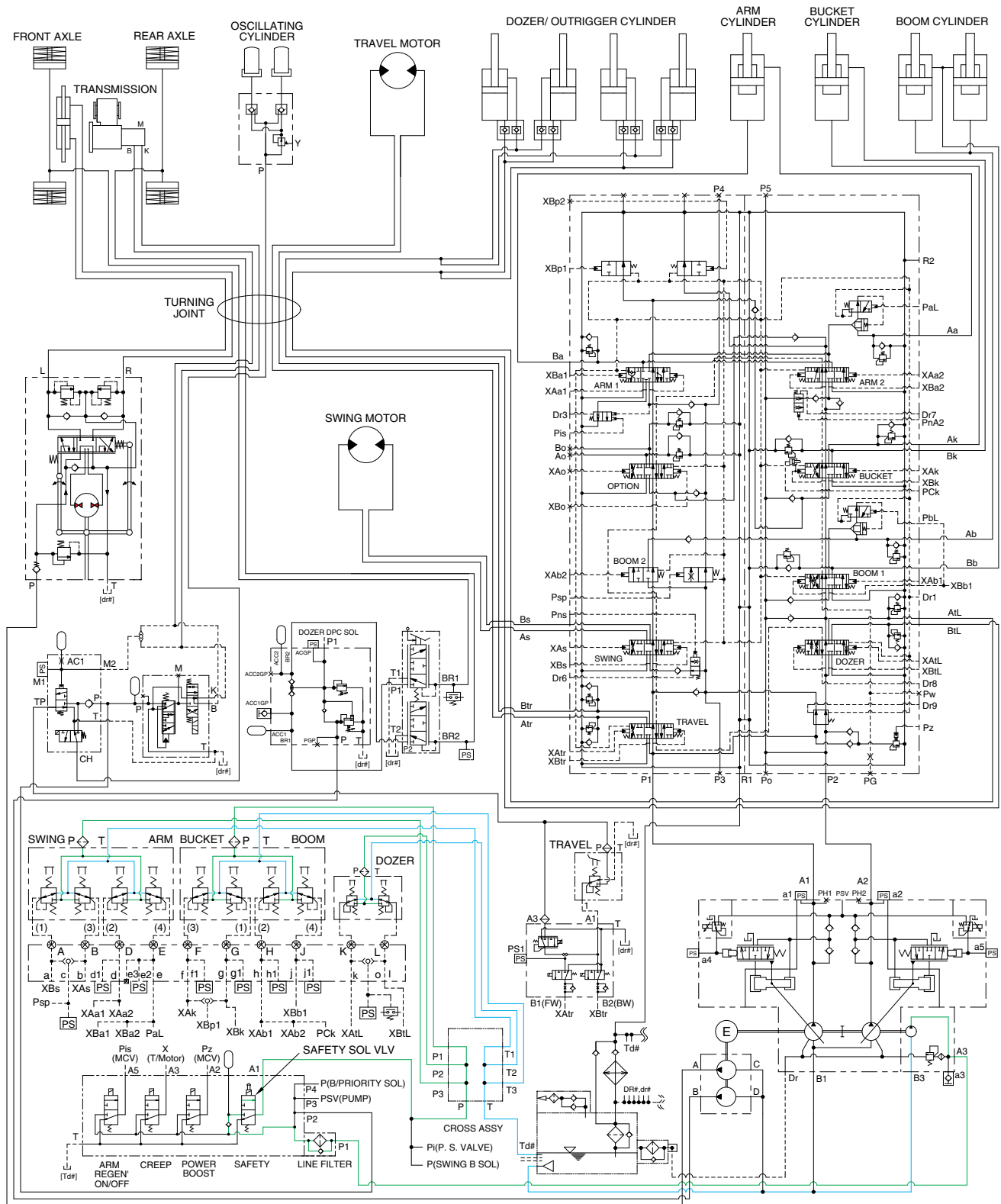
The pilot pump is provided with relief valve, receives the oil from the hydraulic tank through the suction filter.

The discharged oil from the pilot pump flows to the remote control valve, pilot selector valve, swing parking brake solenoid valve through the line filter, safety solenoid valve and/or cross assy.

Also, it flows to the solenoid valve assemblies, travel control valve and main pump through the line filter.

※ The circuit diagram may differ from the equipment, so please check before a repair.

1. SUCTION, DELIVERY AND RETURN CIRCUIT



210WA3HC02

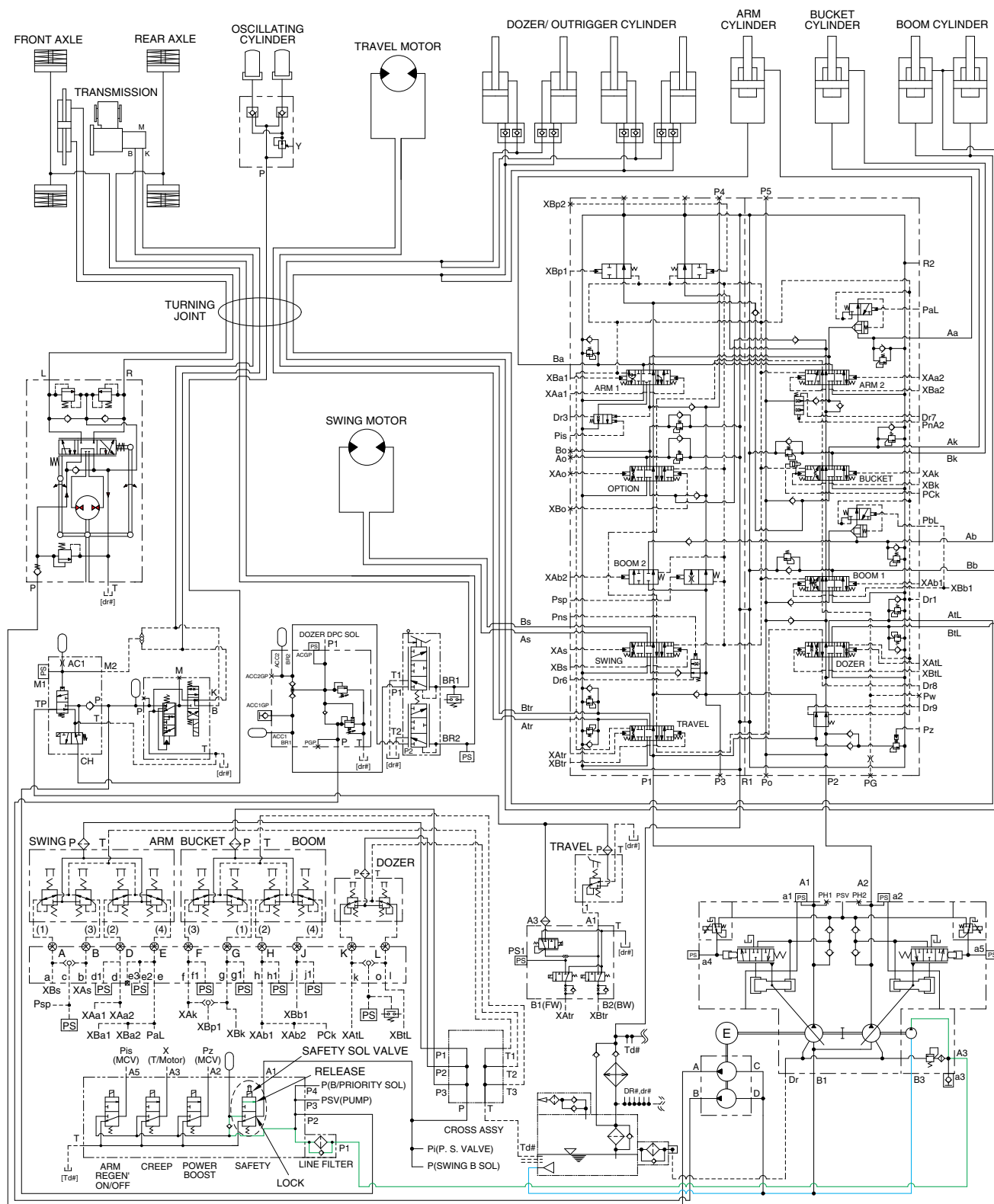
The pilot pump receives oil from the hydraulic tank. The discharged oil from the pilot pump flows to the safety solenoid valve through the line filter. The oil is filtered by the line filter. The pilot relief valve is provided in the pilot pump for limiting the pilot circuit pressure.

The oil filtered by line filter flows remote control valve through safety solenoid valve and cross assy.

The return oil from remote control valve flows into the hydraulic tank through the cross assy.

※ The circuit diagram may differ from the equipment, so please check before a repair.

2. SAFETY SOLENOID VALVE (SAFETY KNOB)



210WA3HC03

When the knob of the safety solenoid valve is in the release position, oil flows into the remote control valve through the line filter, safety solenoid valve and cross assy.

When the knob of the safety solenoid valve is in the lock position, oil does not flows into the remote control valve, because of blocked port.

※ The circuit diagram may differ from the equipment, so please check before a repair.

The diagram is a complex hydraulic schematic for a Hyundai excavator. It illustrates the flow of hydraulic fluid from the main pump (P1) through various valves and cylinders. Key components include:

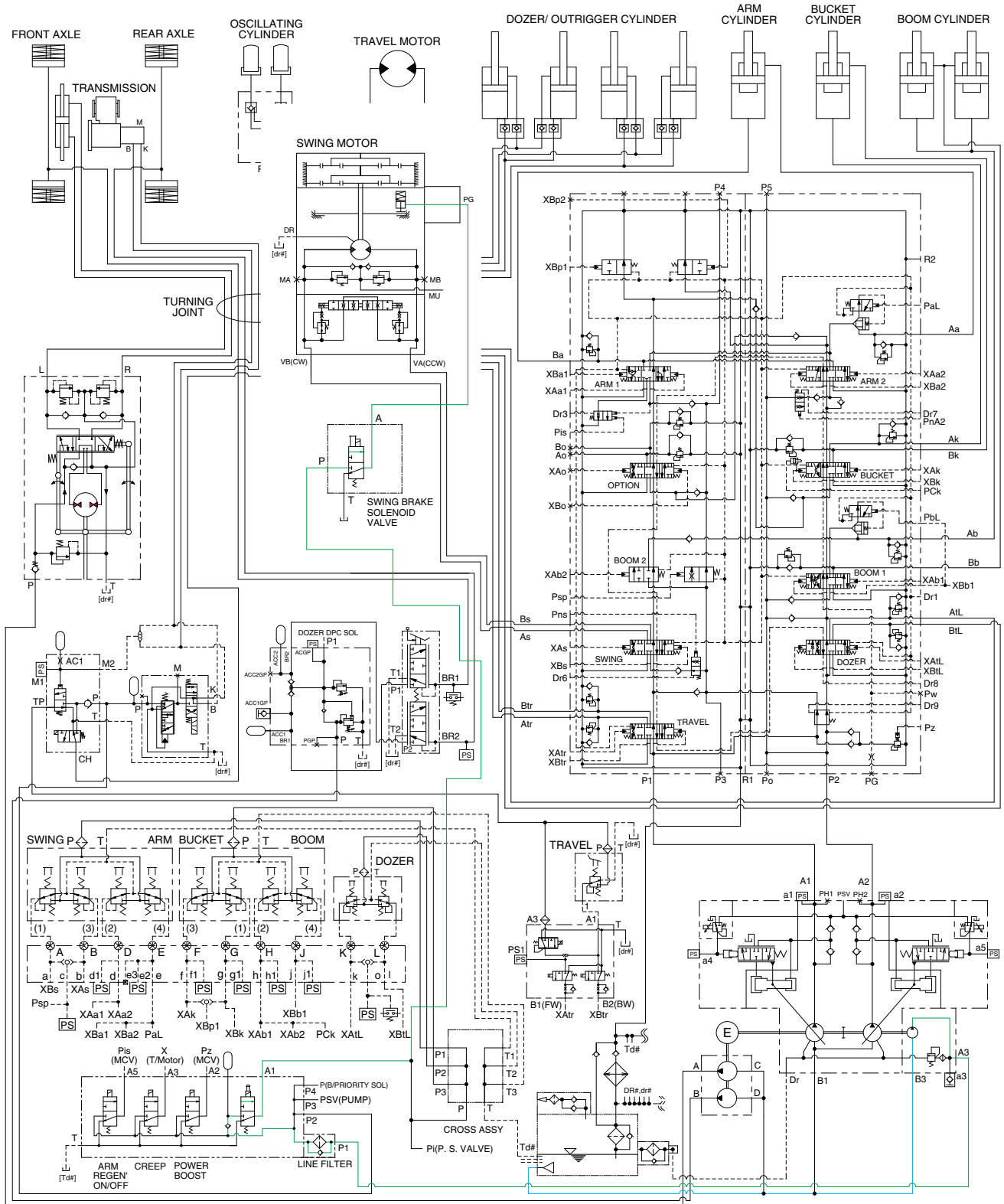
- Hydraulic Cylinders:** DOZER/ OUTRIGGER CYLINDER, ARM CYLINDER, BUCKET CYLINDER, BOOM CYLINDER, TRAVEL MOTOR, and SWING MOTOR.
- Valves and Solenoids:** Various solenoid valves (e.g., XBa1, XBa2, XBo1, XBo2, XBo3, XBo4, XBo5, XBo6, XBo7, XBo8, XBo9, XBo10, XBo11, XBo12, XBo13, XBo14, XBo15, XBo16, XBo17, XBo18, XBo19, XBo20, XBo21, XBo22, XBo23, XBo24, XBo25, XBo26, XBo27, XBo28, XBo29, XBo30, XBo31, XBo32, XBo33, XBo34, XBo35, XBo36, XBo37, XBo38, XBo39, XBo40, XBo41, XBo42, XBo43, XBo44, XBo45, XBo46, XBo47, XBo48, XBo49, XBo50, XBo51, XBo52, XBo53, XBo54, XBo55, XBo56, XBo57, XBo58, XBo59, XBo60, XBo61, XBo62, XBo63, XBo64, XBo65, XBo66, XBo67, XBo68, XBo69, XBo70, XBo71, XBo72, XBo73, XBo74, XBo75, XBo76, XBo77, XBo78, XBo79, XBo80, XBo81, XBo82, XBo83, XBo84, XBo85, XBo86, XBo87, XBo88, XBo89, XBo90, XBo91, XBo92, XBo93, XBo94, XBo95, XBo96, XBo97, XBo98, XBo99, XBo100) and solenoid valves (e.g., P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12, P13, P14, P15, P16, P17, P18, P19, P20, P21, P22, P23, P24, P25, P26, P27, P28, P29, P30, P31, P32, P33, P34, P35, P36, P37, P38, P39, P40, P41, P42, P43, P44, P45, P46, P47, P48, P49, P50, P51, P52, P53, P54, P55, P56, P57, P58, P59, P60, P61, P62, P63, P64, P65, P66, P67, P68, P69, P70, P71, P72, P73, P74, P75, P76, P77, P78, P79, P80, P81, P82, P83, P84, P85, P86, P87, P88, P89, P90, P91, P92, P93, P94, P95, P96, P97, P98, P99, P100).
- Control Panel:** A digital display showing 'Auto power boost' and various hydraulic symbols and labels for components like solenoids, pumps, and filters.
- Hydraulic Symbols:** Various symbols representing different hydraulic components, such as pumps, valves, cylinders, and filters.

The diagram is a detailed technical drawing, likely a service manual or a technical specification, used for understanding the hydraulic system of the excavator.

When the power boost switch on the left control lever is pushed ON, the power boost solenoid valve is actuated, the discharged oil from the pilot pump flows into **Pz** port of the main relief valve in main control valve ; then the setting pressure of the main relief valve is raises from 350 kgf/cm² to 380 kgf/cm² for increasing the digging power. And even when press continuously, it is canceled after 8 seconds.

※ The circuit diagram may differ from the equipment, so please check before a repair.

4. SWING PARKING BRAKE RELEASE



210WA3HC05

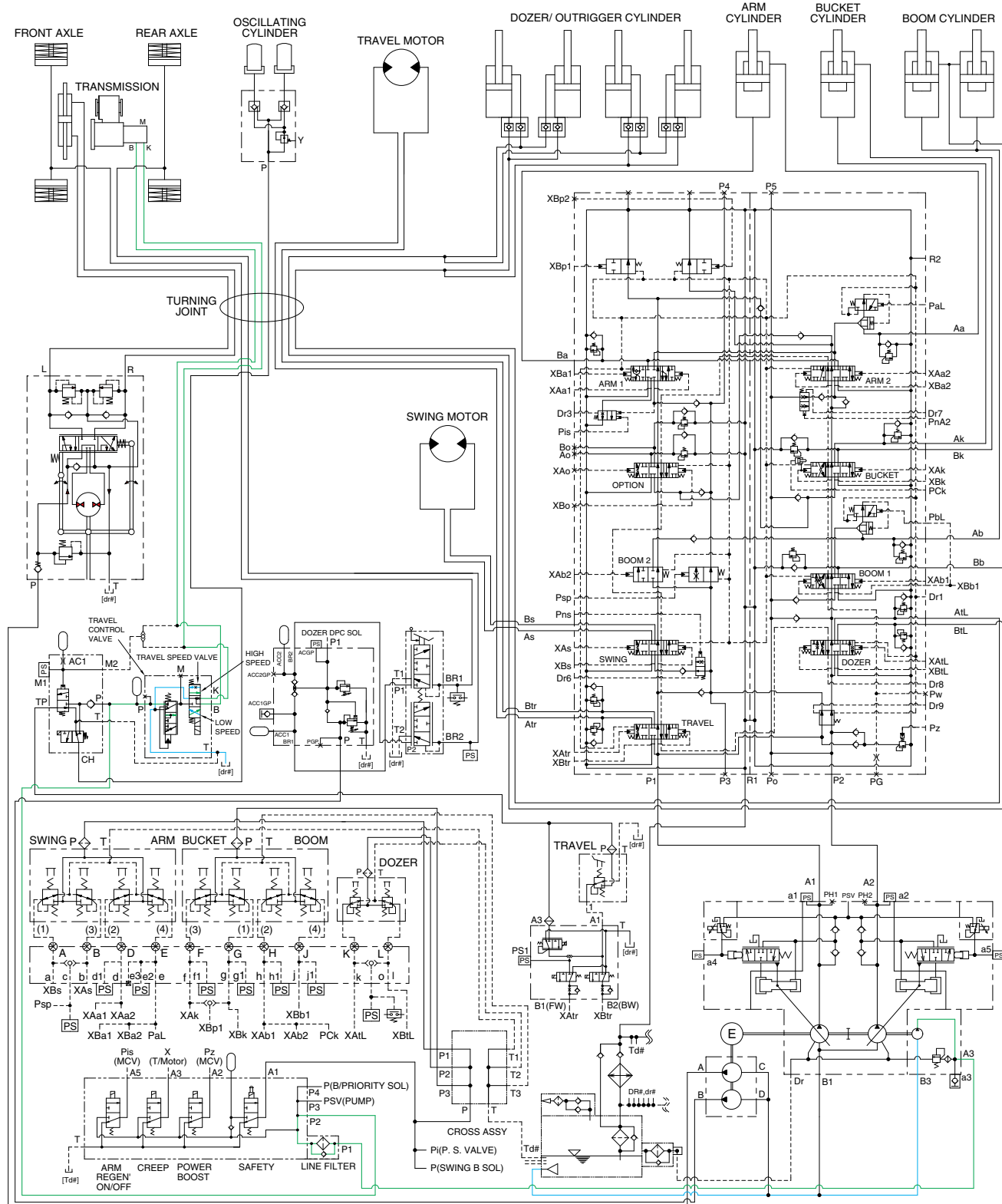
When any one of the swing, arm in or boom up lever is tilted, the swing brake solenoid valve is shifted to the down ward by the MCU that senses the pilot pressure of the swing control lever.

The discharged oil from pilot pump flows to swing motor PG port through the swing brake solenoid valve. This pressure is applied to swing motor disc, thus the brake is released.

When the swing, arm in and boom up lever are set in the neutral position, the swing brake solenoid valve is shifted to the up ward, oil in the swing motor disc cylinder is drained through the the swing brake solenoid valve, thus the brake is applied.

※ The circuit diagram may differ from the equipment, so please check before a repair.

5. TRAVEL SPEED SELECTION SYSTEM

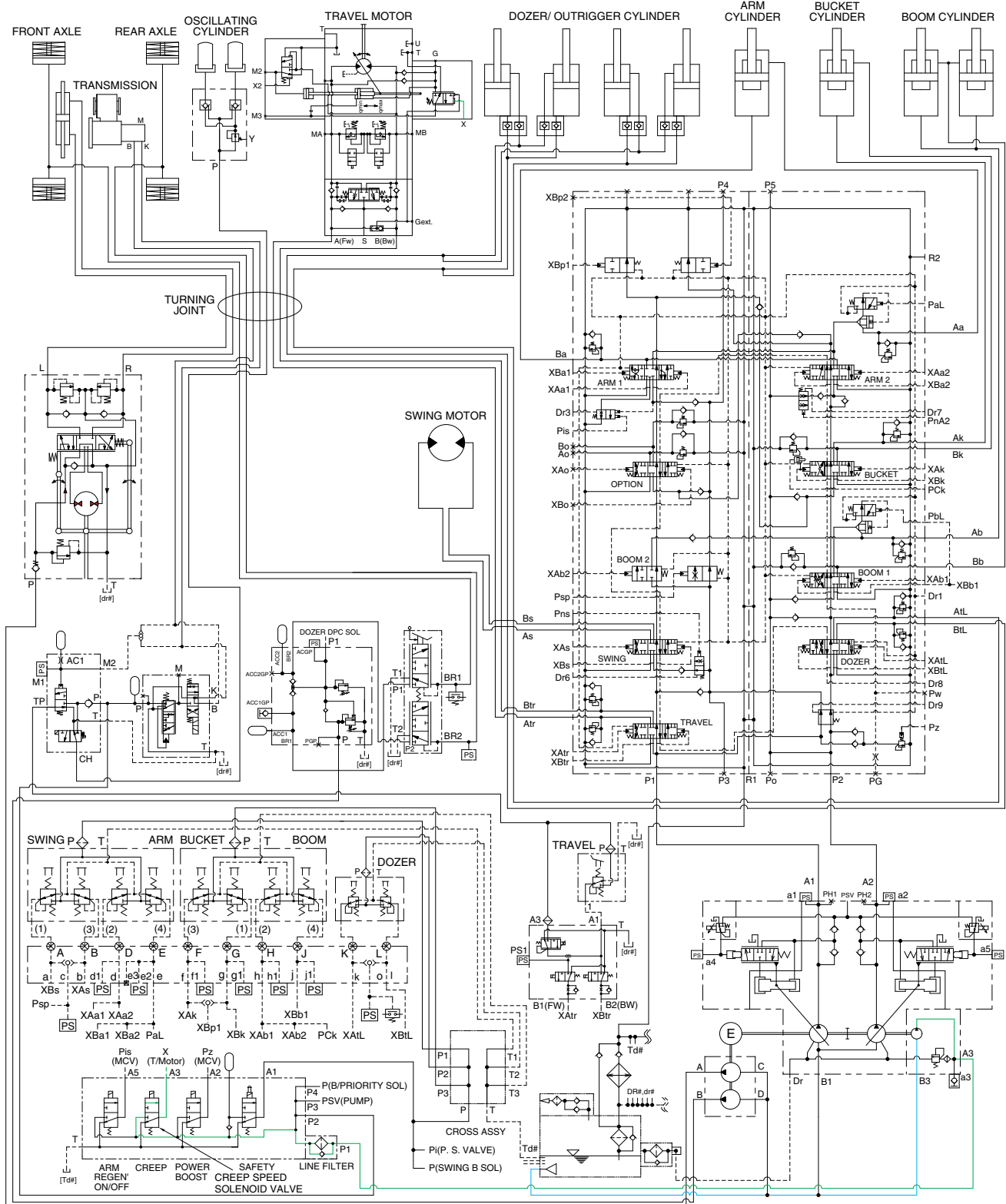


210WA3HC06

When LH multifunction switch was placed in high or low speed position, the pressure oil from pilot pump flows to travel speed solenoid valve through travel control valve, thus the transmission is changed into high (B) or low (K) speed condition.

※ The circuit diagram may differ from the equipment, so please check before a repair.

6. CREEP TRAVEL SYSTEM



210WA3HC07

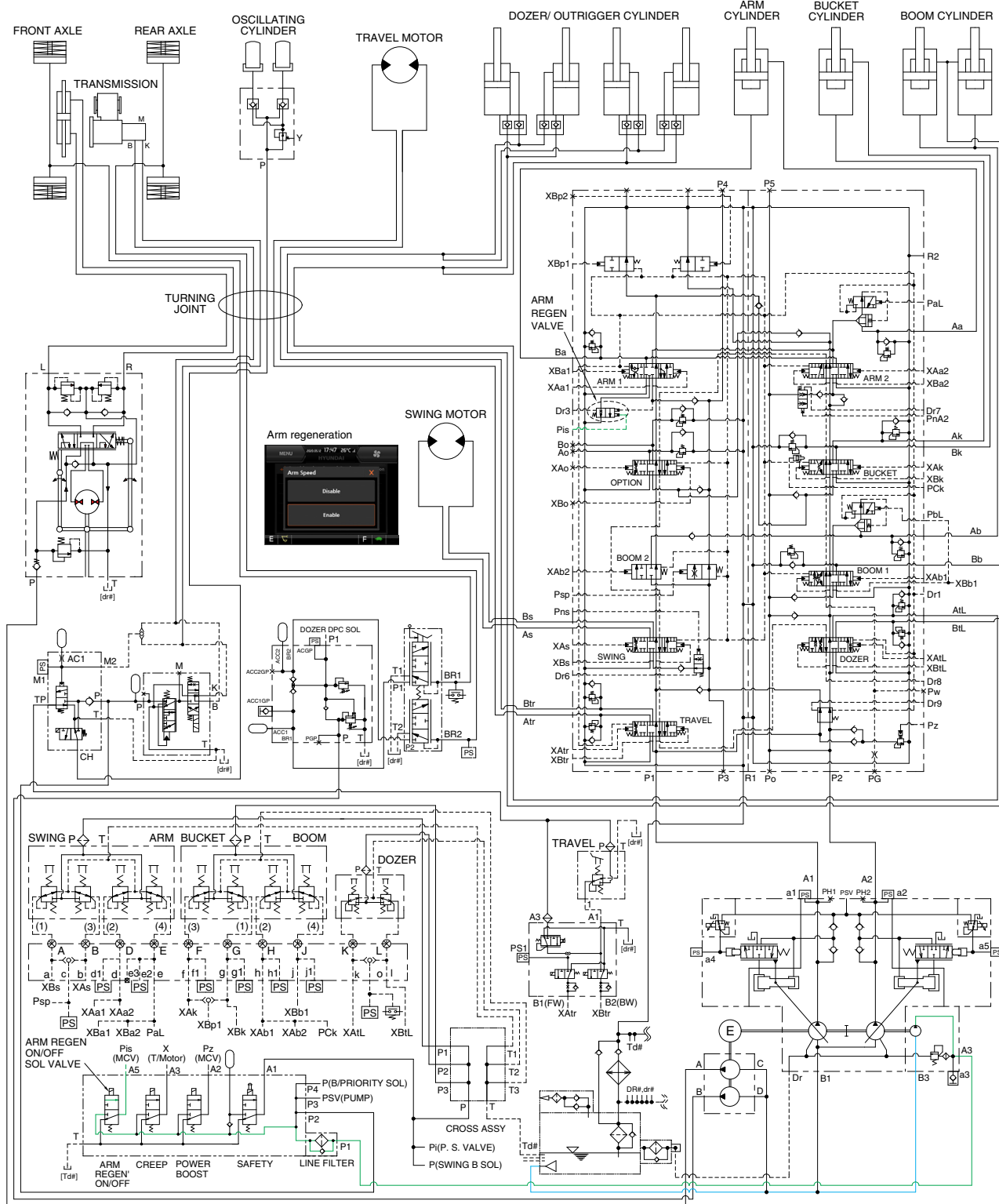
When the creep button on the dashboard of the steering column is pushed ON, the creep travel solenoid valve is actuated.

The discharged oil from the pilot pump flows into X port of travel motor through solenoid valve.

Then, the machine speed is very low travelling more than 1st speed.

※ The circuit diagram may differ from the equipment, so please check before a repair.

7. ARM REGENERATION CUT SYSTEM



210WA3HC08

When the arm regeneration is selected to disable on the cluster, the arm regeneration solenoid valve is activated. The pilot oil from pilot pump flows into **Pis** port in main control valve through solenoid valve and the arm regeneration spool is shifted to left.

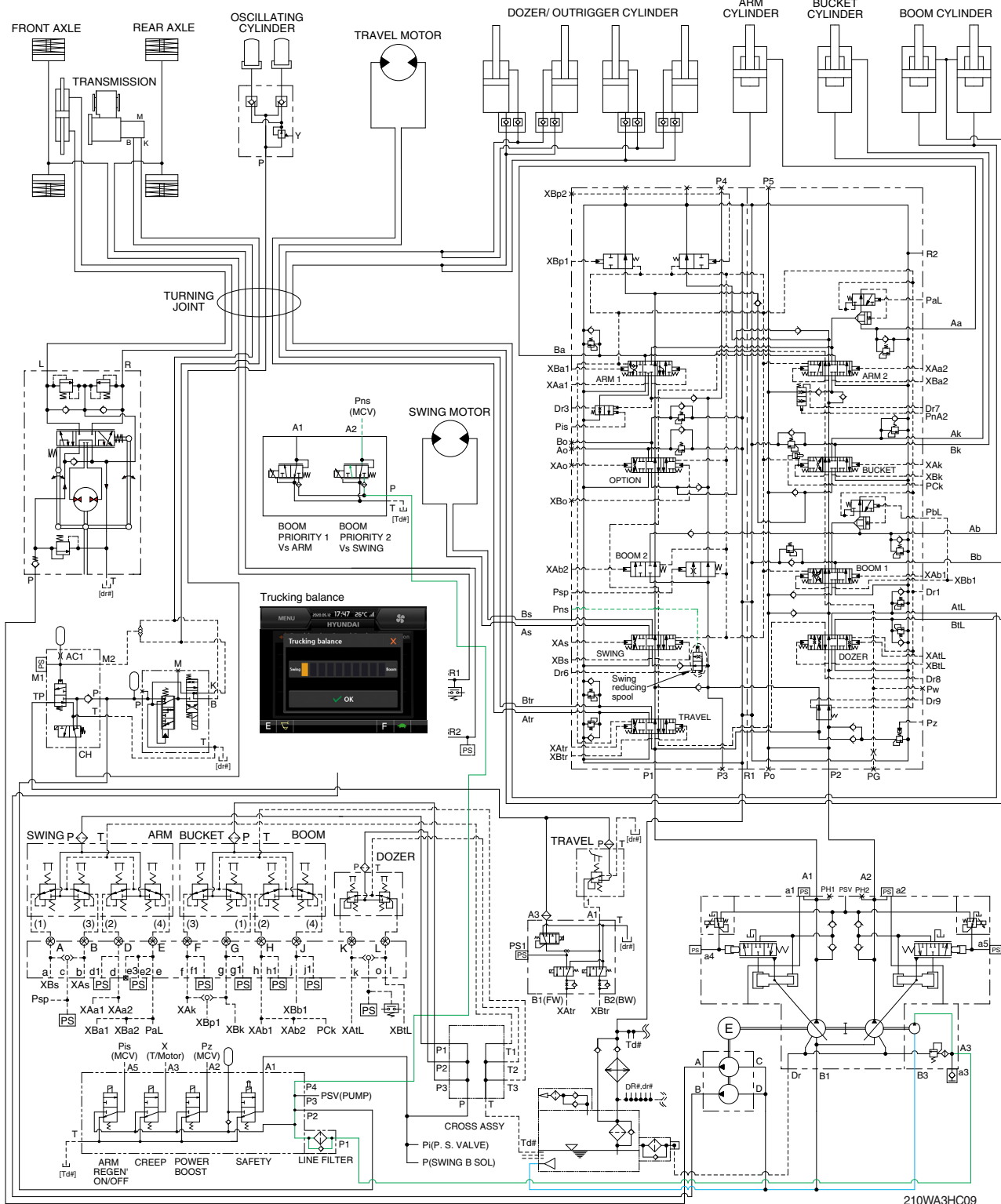
Then, the oil from arm regeneration passage returns to tank and the arm regeneration function is deactivated.

When the arm regeneration is selected to enable on the cluster, the arm regeneration function is activated and arm in operation speed is increased.

Refer to page 2-32 for the arm regeneration function.

※ The circuit diagram may differ from the equipment, so please check before a repair.

8. BOOM PRIORITY SYSTEM



When carrying out the combined operation of swing and boom up, the boom up operating speed is lowered than normal operation.

To increase working efficiency, swing speed reducing system is used.

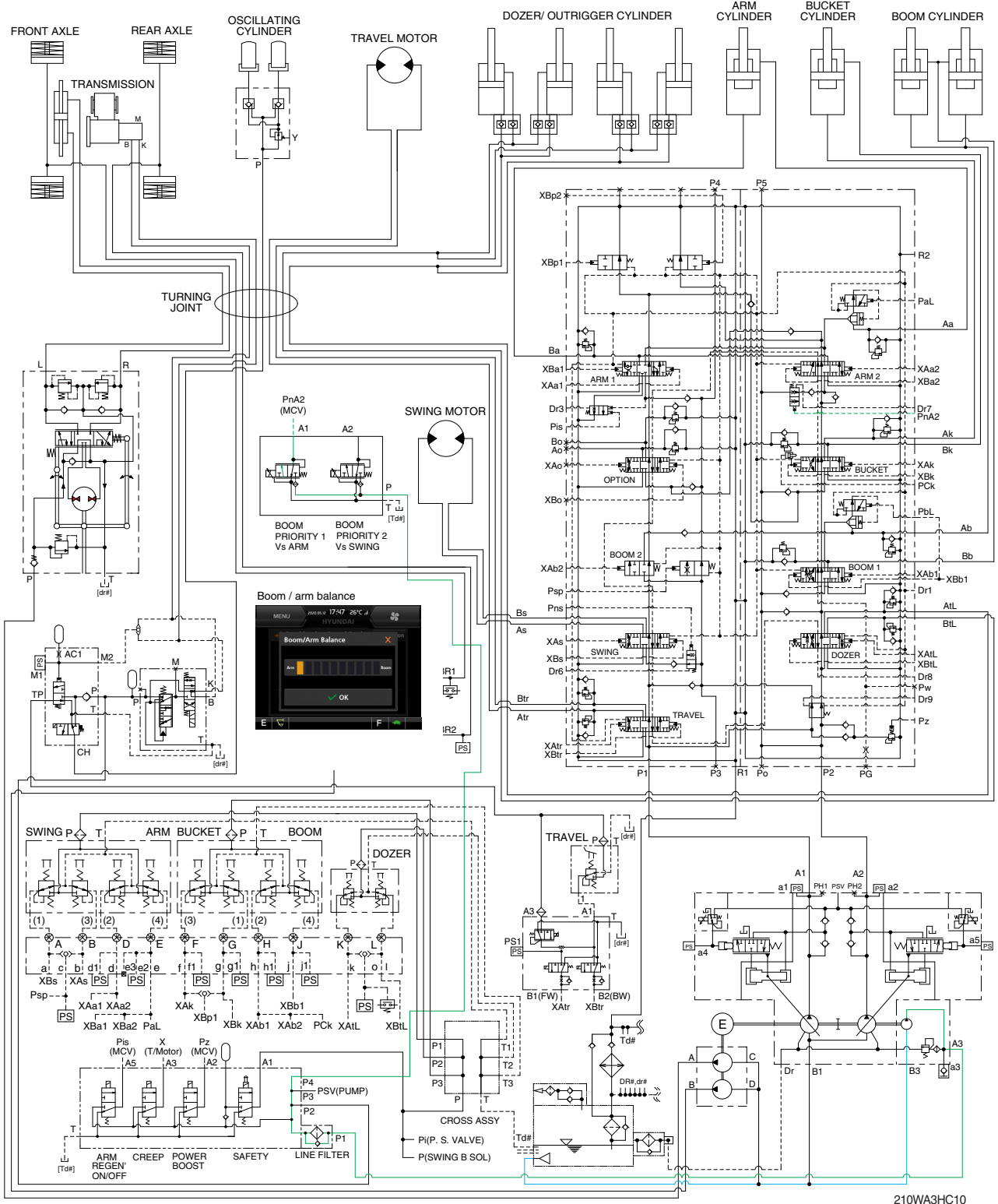
The pilot oil from pilot pump flow into **Pns** port in main control valve through boom priority EPPR valve. **Pns** oil pressure moves swing reducing spool to upper position and oil flow rate to the swing motor decreased.

Then, the boom up speed is increased. This is called the boom priority system.

The boom up and swing speed can be adjusted by the cluster. Refer to page 3-27 of the operator's manual.

※ The circuit diagram may differ from the equipment, so please check before a repair.

9. BOOM PRIORITY SYSTEM (vs arm speed)



When carrying out the combined operation of boom up and arm in, the boom up operating speed is lowered then normal operation.

To increase working efficiency, arm in speed reducing system is used.

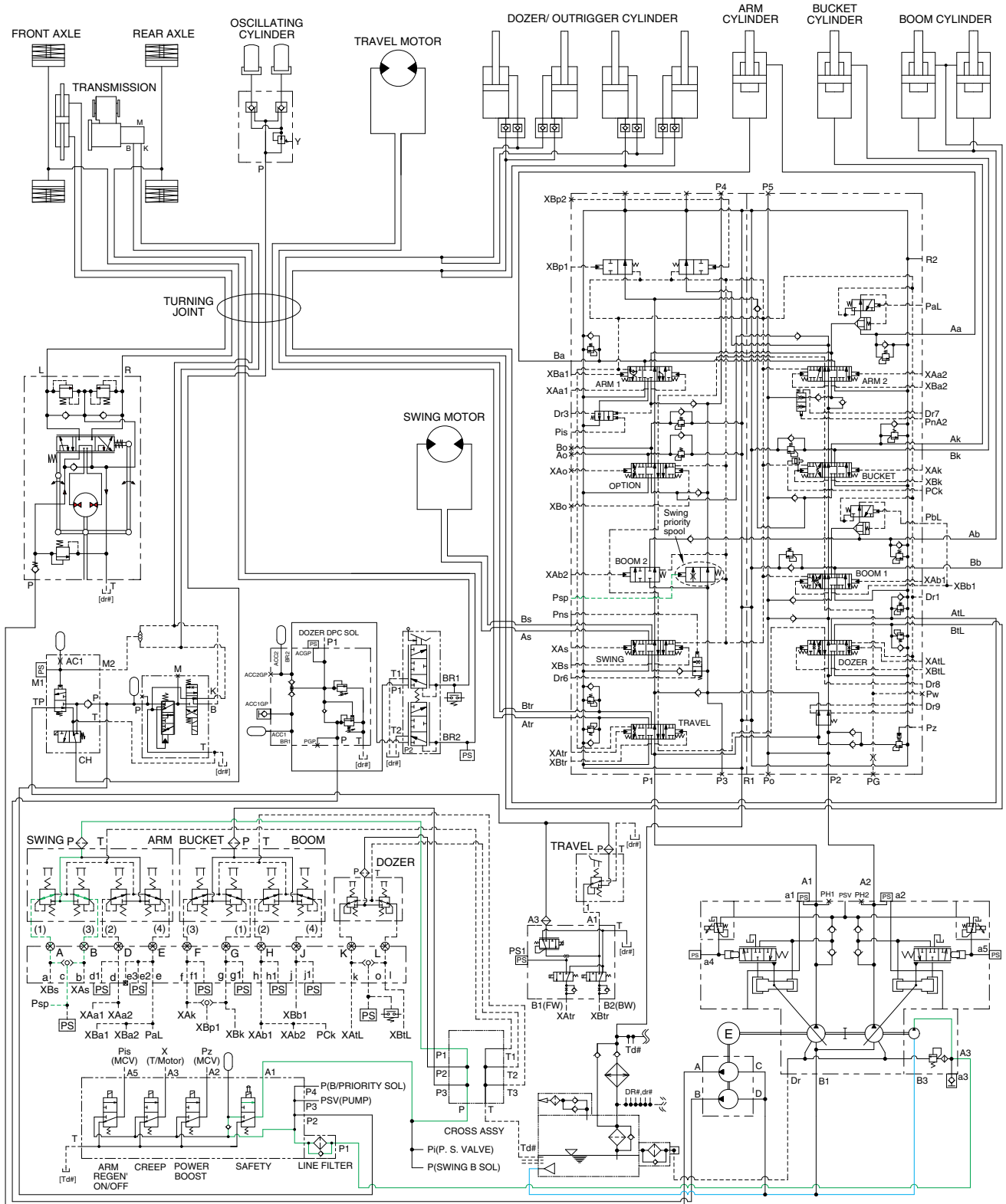
The pilot oil from pilot pump flow into PnA2 port in main control valve through boom priority (vs arm) EPPR valve. PnA2 oil pressure moves the arm 2 logic control valve to up position and the oil flow rate to the arm cylinder decreased.

Then, the boom up speed is increased. This is called the boom priority system (boom/arm balance).

The boom/arm balance can be adjusted by the cluster. Refer to page 5-95-1.

※ The circuit diagram may differ from the equipment, so please check before a repair.

10. SWING PRIORITY SYSTEM



210WA3HC11

When carrying out the combined operation of swing and arm of the left control valve, the swing speed can be lowered than arm speed.

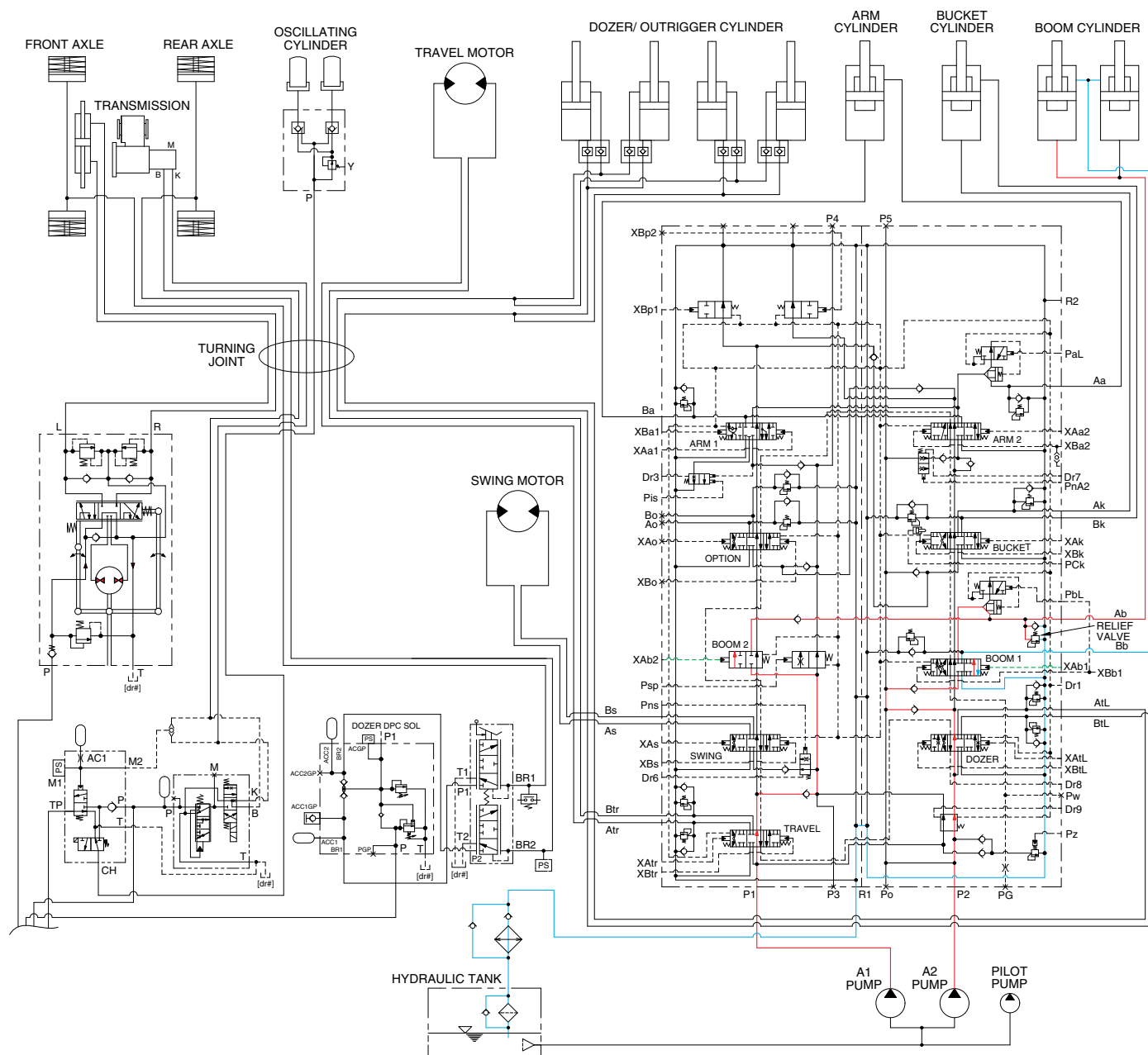
Psp pressure from the swing shuttle block changes the swing priority spool and then the oil flow rate is decreased to the next section to make the swing operation most preferential.

This is called the swing priority system. For details, refer to page 2-38.

※ The circuit diagram may differ from the equipment, so please check before a repair.

GROUP 4 SINGLE OPERATION

1. BOOM UP OPERATION



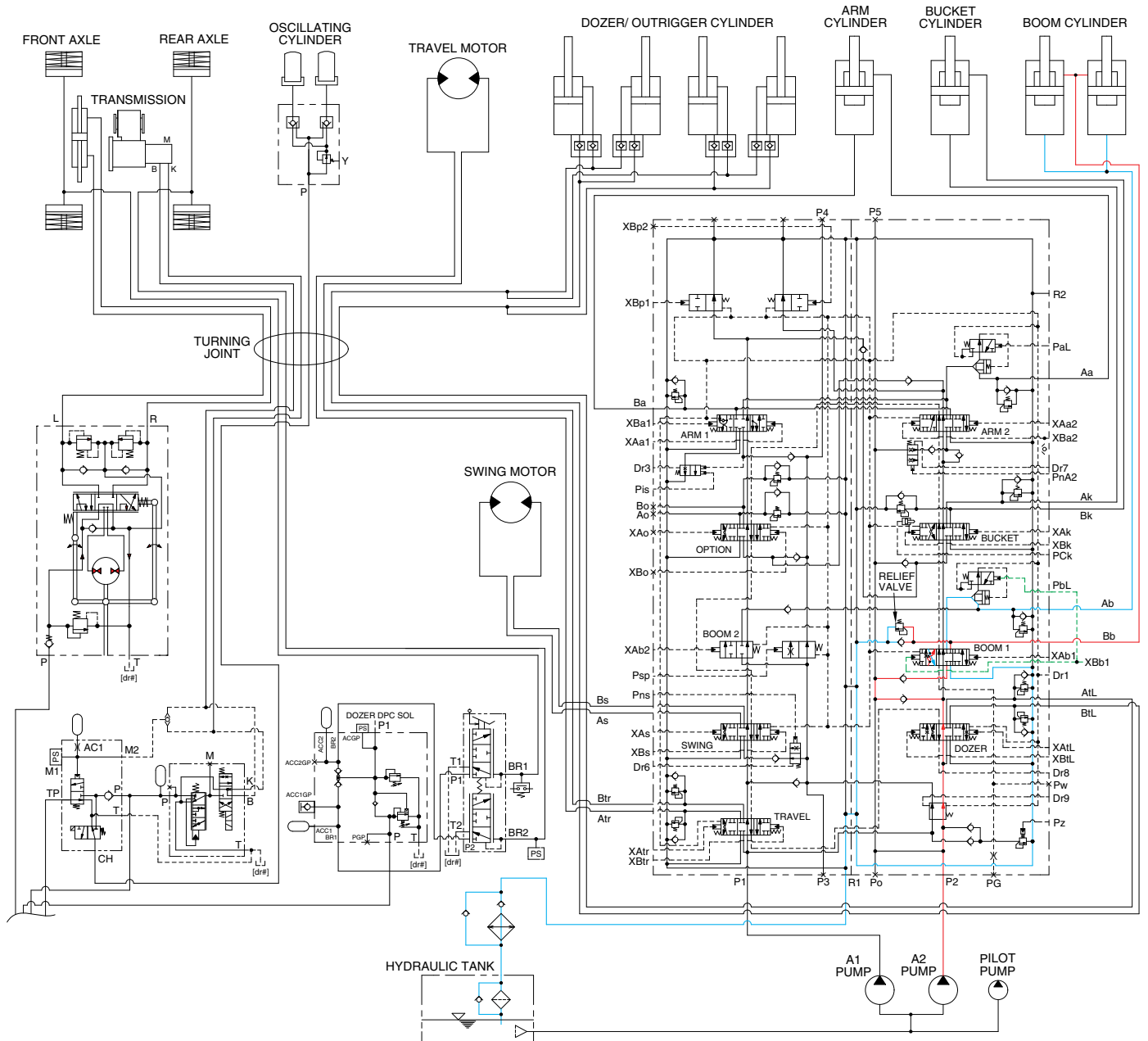
210WA3HC20

When the right control lever is pulled back, the boom spools in the main control valve are moved to the up position by the pilot oil pressure (XAb1, XAb2) from the remote control valve.

The oil from the A1 and A2 pump flows into the main control valve and then goes to the large chamber of boom cylinders. At the same time, the oil from the small chamber of boom cylinders returns to the hydraulic oil tank through the boom 1 spool in the main control valve. When this happens, the boom goes up. The excessive pressure in the boom cylinder head side is prevented by relief valve. When the boom is up and the control lever is returned to neutral position, the circuit for the holding pressure at the head side of the boom cylinder is closed by the boom holding valve. This prevents the hydraulic drift of boom cylinder.

※ The circuit diagram may differ from the equipment, so please check before a repair.

2. BOOM DOWN OPERATION



210WA3HC21

When the right control lever is pushed forward, the boom 1 spool in the main control valve is moved to the down position by the pilot oil pressure (XBb1) from the remote control valve.

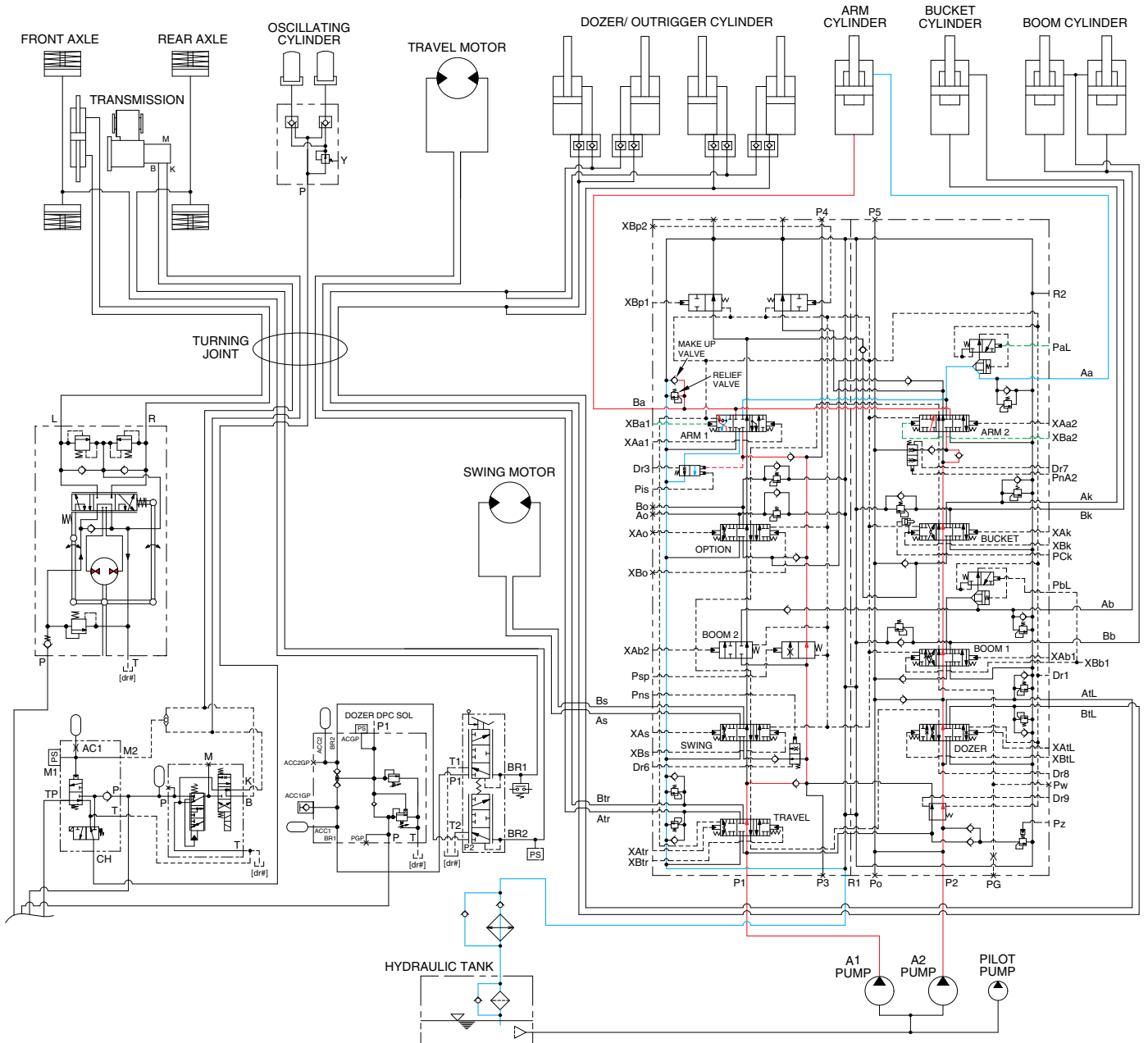
The oil from the A1 pump flows into the main control valve and then goes to the small chamber of boom cylinders. At the same time, the oil from the large chamber of boom cylinders returns to the hydraulic tank through the boom 1 spool in the main control valve.

When the down speed of boom is faster, the oil returned from the large chamber of boom cylinder combines with the oil from the A1 pump, and flows into the small chamber of the cylinder.

This prevents cylinder cavitation by the negative pressure when the A1 pump flow can not match the boom down speed. And the excessive pressure in the boom cylinder rod side is prevented by the relief valve.

※ The circuit diagram may differ from the equipment, so please check before a repair.

3. ARM IN OPERATION



210WA3HC22

When the left control lever is pulled back, the arm spools in the main control valve are moved to the arm in position by the pilot oil pressure (XBa1, XBa2) from the remote control valve.

The oil from the A1 and A2 pump flows into the main control valve and then goes to the large chamber of arm cylinder.

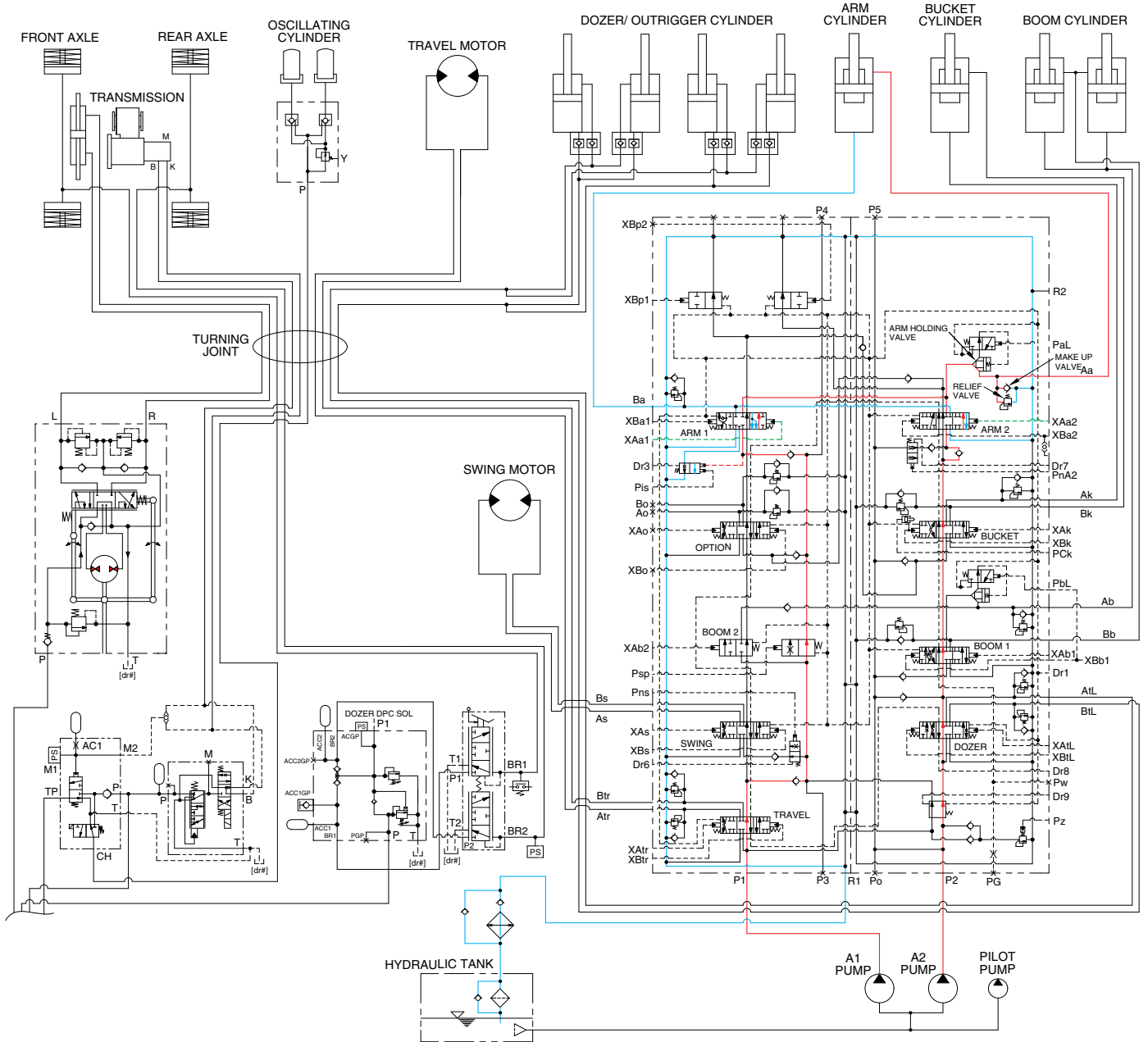
At the same time, the oil from small chamber of arm cylinder returns to the hydraulic oil tank through the arm 1 spool in the main control valve. When this happens, the arm rolls in.

The excessive pressure in the arm cylinder head side is prevented by relief valve.

The cavitation which will happen to the head side of the arm cylinder is also prevented by the make-up valve in the main control valve.

※ The circuit diagram may differ from the equipment, so please check before a repair.

4. ARM OUT OPERATION



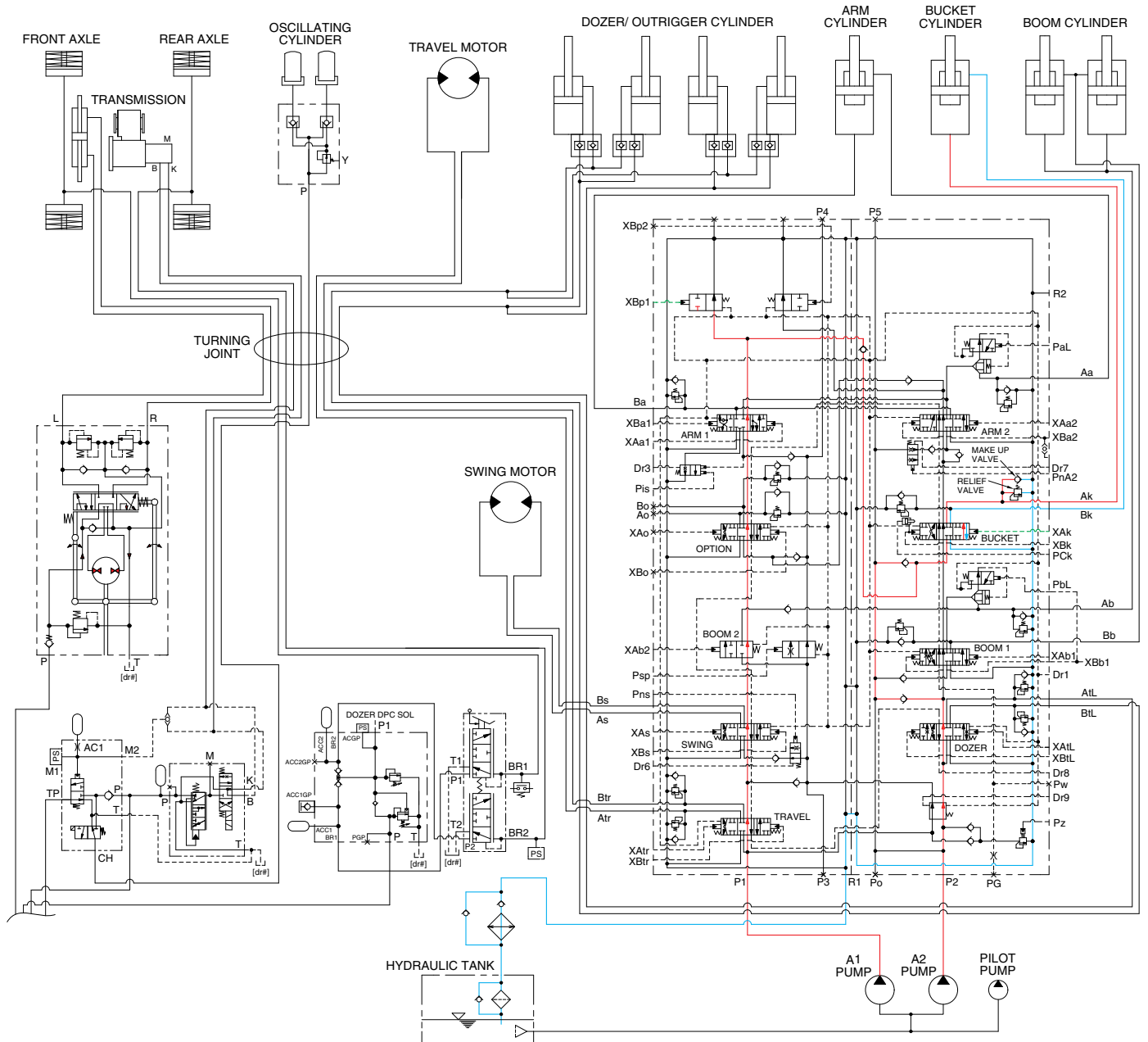
210WA3HC23

When the left control lever is pushed forward, the arm spools in the main control valve are moved to the arm out position by the pilot oil pressure (XAa1, XAa2) from the remote control valve.

The oil from the A1 and A2 pump flows into the main control valve and then goes to the small chamber of arm cylinder. At the same time, the oil from the large chamber of arm cylinder returns to the hydraulic oil tank through the arm spools in the main control valve. When this happens, the arm rolls out. The excessive pressure in the arm cylinder rod side is prevented by relief valve. When the arm is roll out and the control lever is returned to neutral position, the circuit for the holding pressure at the rod side of the arm cylinder is closed by the arm holding valve. This prevent the arm drift of arm cylinder. The cavitation which will happen to the rod side of the arm cylinder is also prevented by the make-up valve in the main control valve.

※ The circuit diagram may differ from the equipment, so please check before a repair.

5. BUCKET IN OPERATION



210WA3HC24

When the right control lever is pulled left, the bucket spool in the main control valve is moved to the roll in position by the pilot oil pressure (XAk) from the remote control valve.

The oil from the A1 pump flows into the main control valve and then goes to the large chamber of bucket cylinder.

The oil from the A2 pump flows into the large chamber of bucket cylinder through confluence oil passage in the main control valve by bypass cut pilot pressure (XBp1).

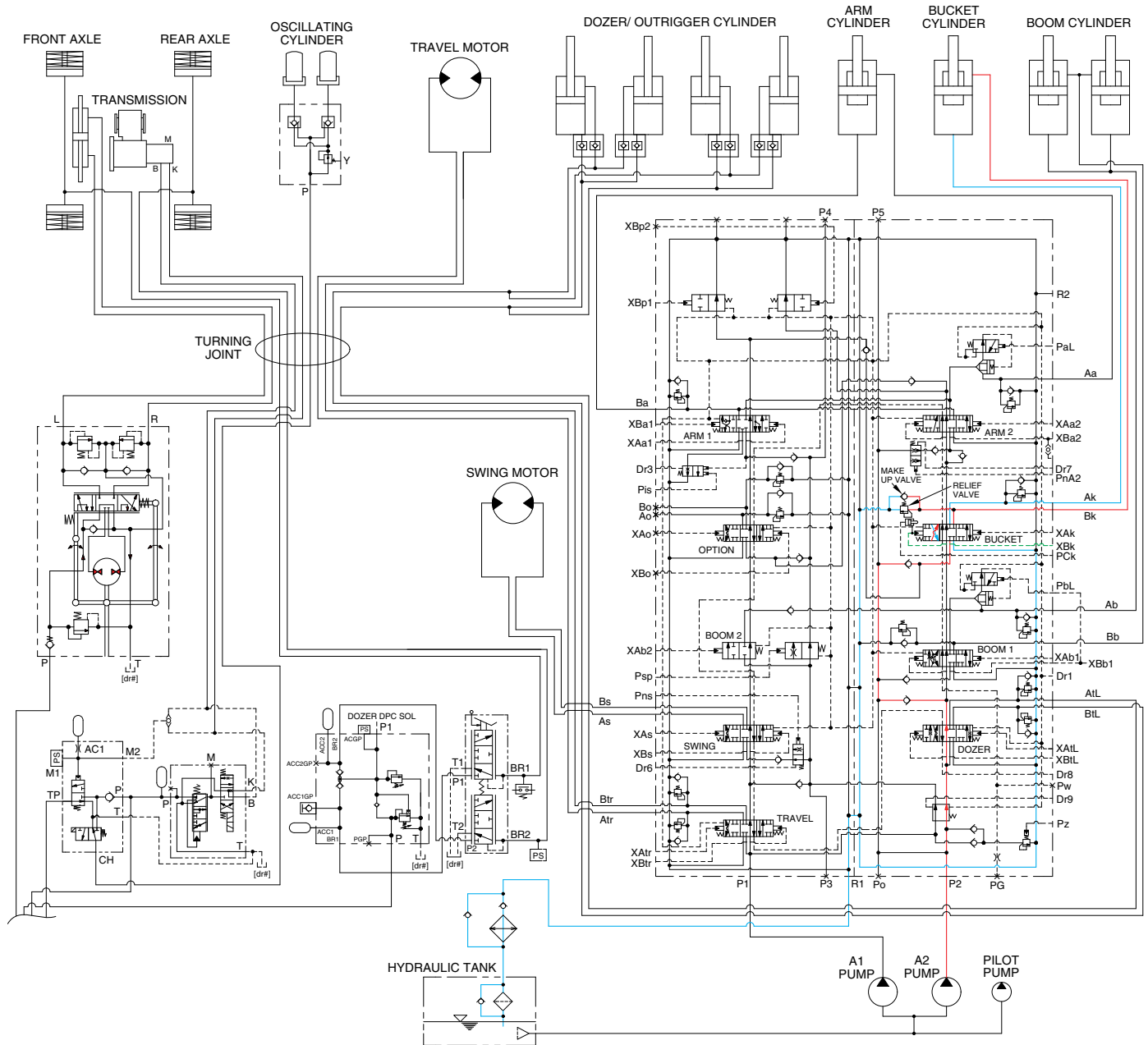
At the same time, the oil from the small chamber of bucket cylinder returns to the hydraulic oil tank through the bucket spool in the main control valve. When this happens, the bucket rolls in.

The excessive pressure in the bucket cylinder head side is prevented by relief valve.

The cavitation which will happen to the head side of the bucket cylinder is also prevented by the make-up valve in the main control valve.

※ The circuit diagram may differ from the equipment, so please check before a repair.

6. BUCKET OUT OPERATION



210WA3HC25

When the right control lever is pushed right, the bucket spool in the main control valve is moved to the bucket out position by the pilot oil pressure (XBk) from the remote control valve.

The oil from the A1 pump flows into the main control valve and then goes to the small chamber of bucket cylinder.

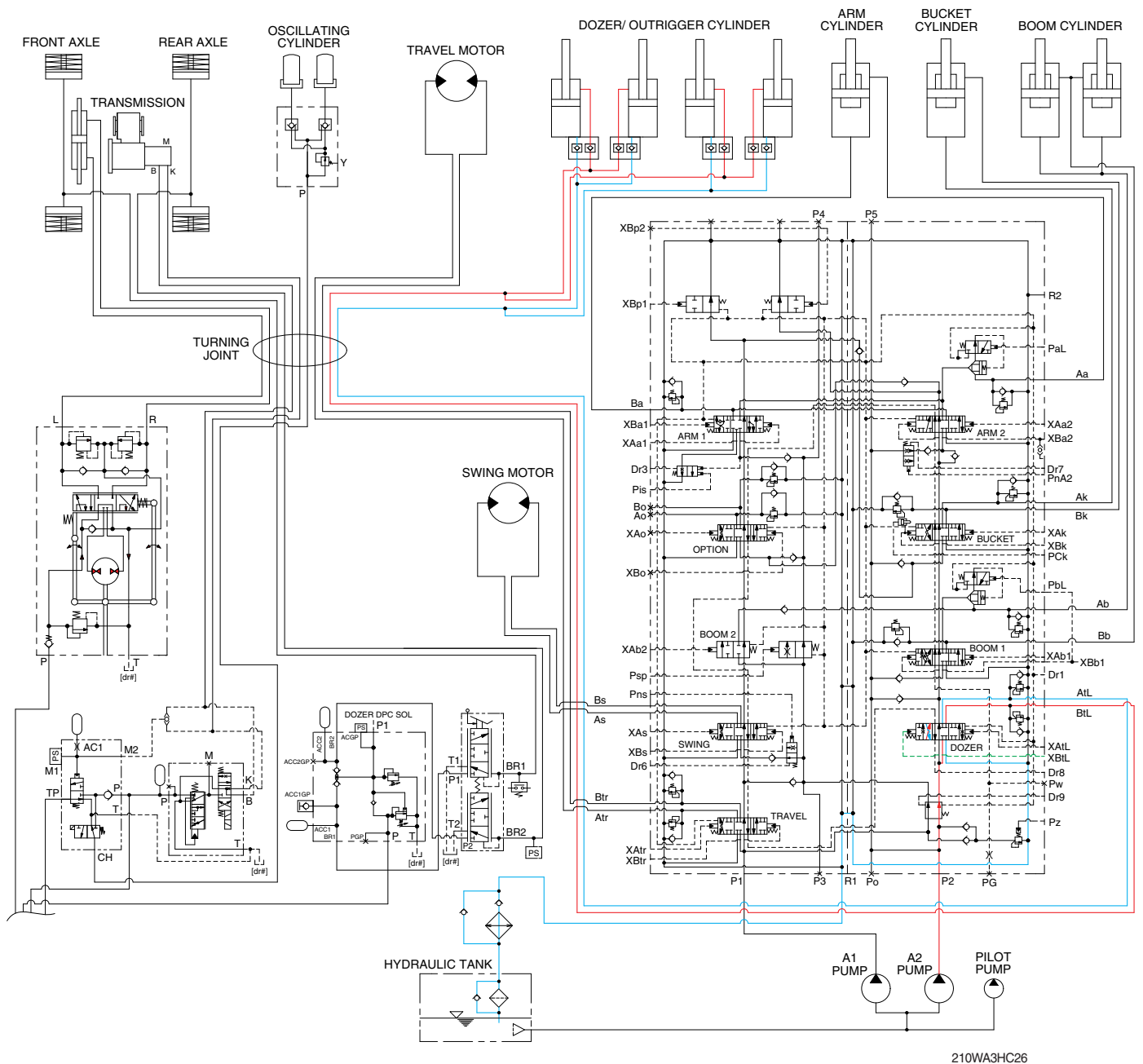
At the same time, the oil from the large chamber of bucket cylinder returns to the hydraulic oil tank through the bucket spool in the main control valve. When this happens, the bucket rolls out.

The excessive pressure in the bucket cylinder rod side is prevented by relief valve.

The cavitation which will happen to the rod side of the bucket cylinder is also prevented by the make-up valve in the main control valve.

※ The circuit diagram may differ from the equipment, so please check before a repair.

7. DOZER/OUTRIGGER UP OPERATION



210WA3HC26

When the dozer control lever is pulled back, the dozer spool in the main control valve is moved to the dozer up position by the pilot oil pressure (XBtL) from the remote control valve.

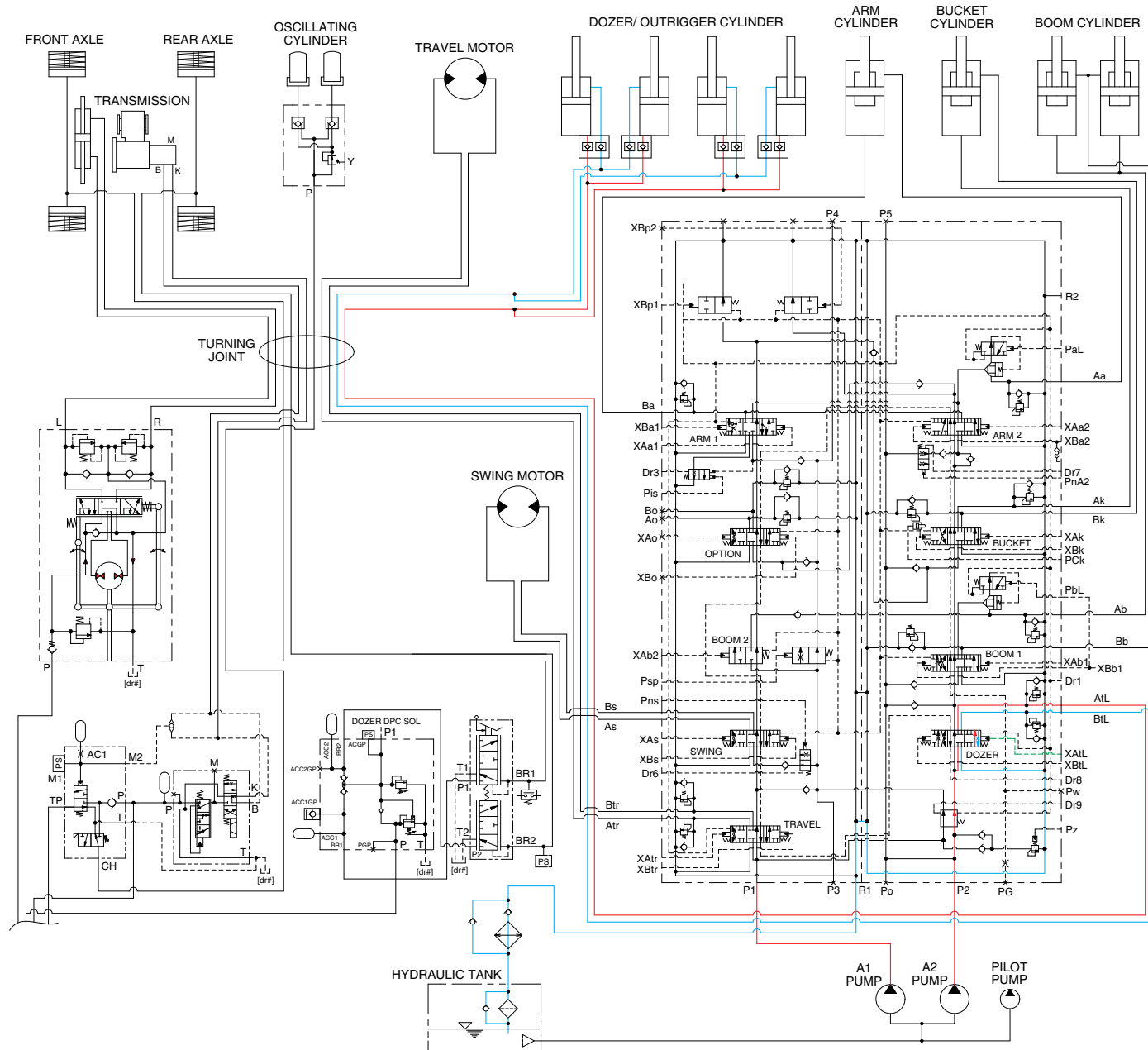
The oil from the A1 pump flows into the main control valve and then goes to the small chamber of rear actuator cylinder (dozer or outrigger).

The other case, the oil flows into the small chamber of front actuator cylinder (dozer or outrigger).

At the same time, the oil from the large chamber of dozer (outrigger) cylinders returns to the hydraulic oil tank through the dozer spool in the main control valve. When this happens, the dozer (outrigger) goes up.

※ The circuit diagram may differ from the equipment, so please check before a repair.

8. DOZER/OUTRIGGER DOWN OPERATION



210WA3HC27

When the dozer control lever is pushed forward, the dozer spool in the main control valve is moved to the dozer down position by the pilot oil pressure (XAtL) from the remote control valve.

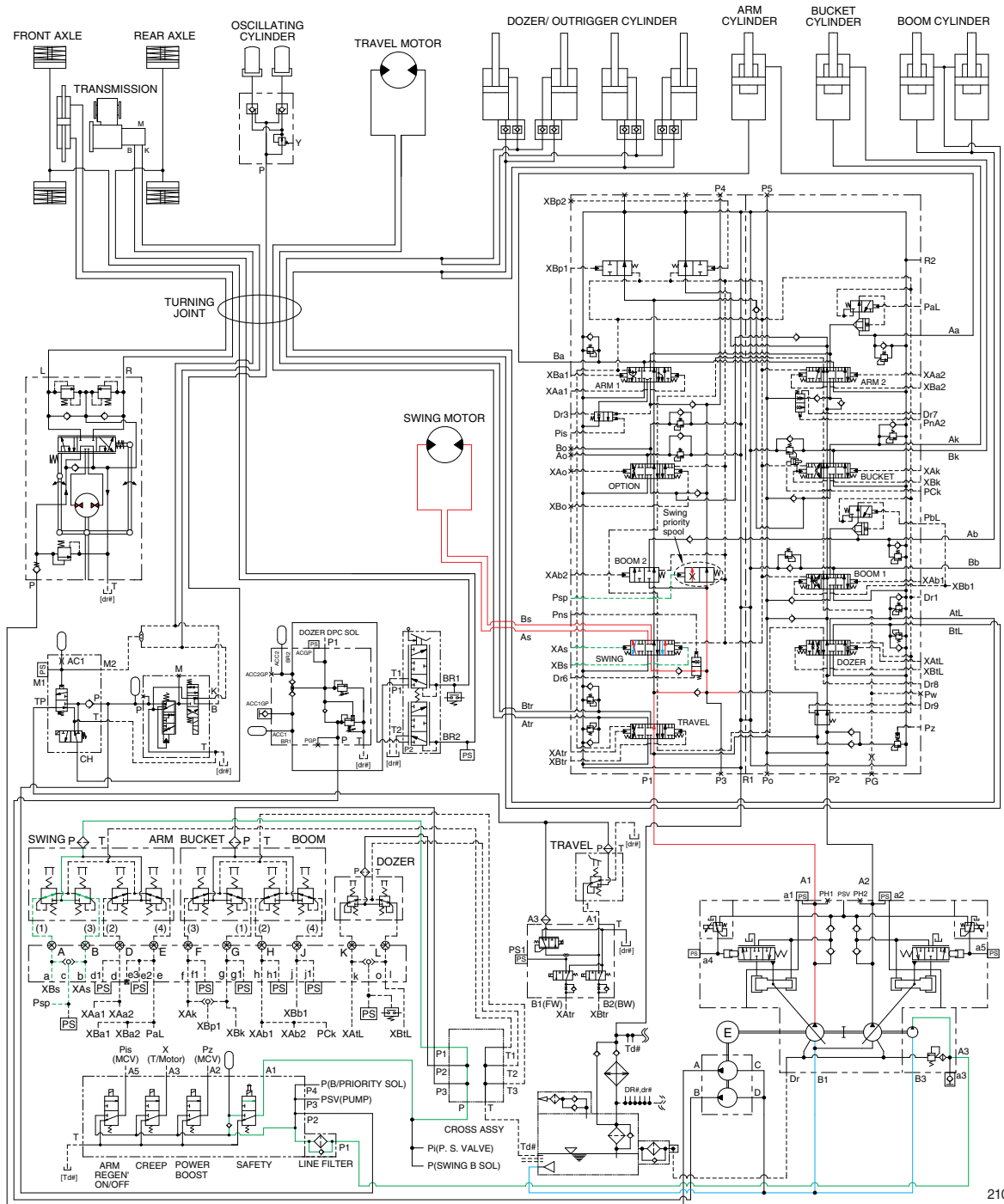
The oil from the A1 pump flows into the main control valve and then goes to the large chamber of rear actuator cylinder (dozer or outrigger).

The other case, the oil flows into the large chamber of front actuator cylinder (dozer or outrigger).

At the same time, the oil from the small chamber of dozer (outrigger) cylinders returns to the hydraulic oil tank through the dozer spool in the main control valve. When this happens, the dozer (outrigger) goes down.

※ The circuit diagram may differ from the equipment, so please check before a repair.

9. SWING OPERATION



When the left control lever is pushed left or right, the swing spool in the main control valve is moved to the left or right swing position by the pilot oil pressure from the remote control valve. Also the swing operation preference function is operated by the pilot pressure **Psp** (refer to page 3-17).

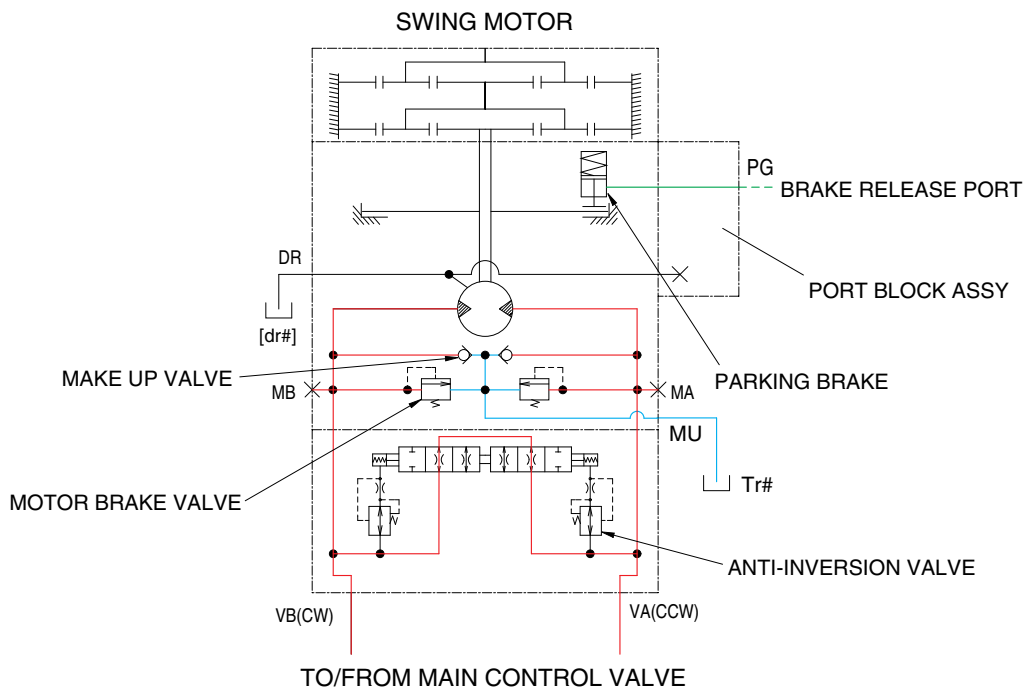
The oil from the A2 pump flows into the main control valve and then goes to the swing motor.

At the same time, the return oil from the swing motor returns to the hydraulic oil tank through the swing spool in the main control valve. When this happens, the upper structure swings to the left or right.

The swing parking brake, make up valve and the motor brake valve are provided in the swing motor. The cavitation which will happen to the swing motor is also prevented by the make up valve in the swing motor itself.

※ The circuit diagram may differ from the equipment, so please check before a repair.

SWING CIRCUIT OPERATION



210WA3HC29

1) MOTOR BRAKE VALVE

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

2) MAKE UP VALVE

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

3) PARKING BRAKE

This function as a parking brake only when the swing, arm in and boom up control lever are not operated.

PARKING BRAKE "OFF" OPERATION

When any of the swing, arm in or boom up control lever is tilted, the swing solenoid valve is energized by the MCU that senses the pilot oil pressure of the swing control lever.

The discharged oil from pilot pump flows to swing motor PG port through the swing solenoid valve. This pressure is applied to swing parking brake piston, thus the brake is released.

PARKING BRAKE "ON" OPERATION

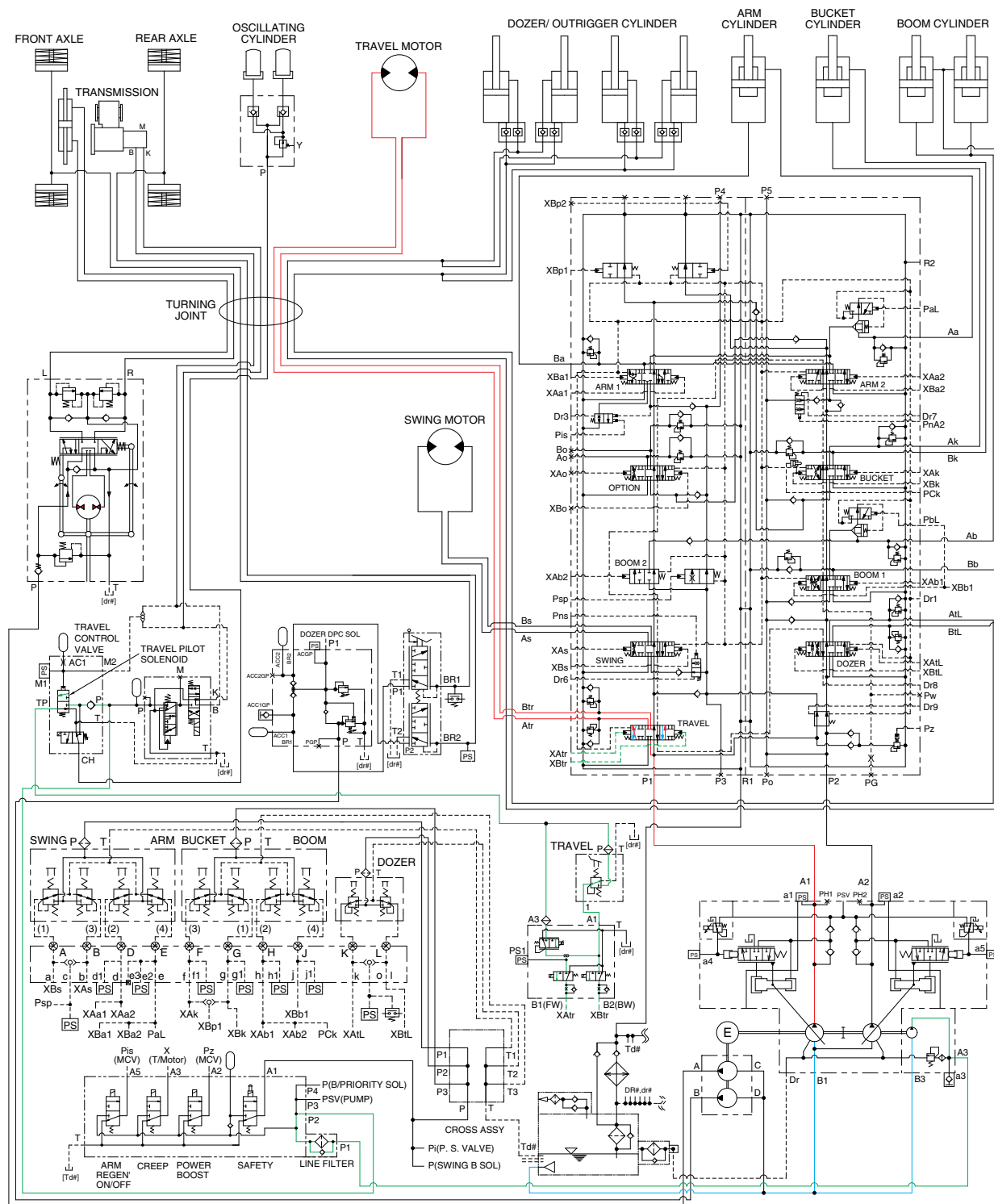
When the swing, arm in and boom up control levers are set in the neutral position, the swing solenoid valve is de-energized, oil in the swing parking brake chamber is drained through the the swing solenoid valve, thus the brake is applied by spring force.

4) ANTI-INVERSION VALVE

This anti-inversion valve absorbs shocks produced as swing motion stops and reduced oscillation cause by swing motion.

※ The circuit diagram may differ from the equipment, so please check before a repair.

10. TRAVEL FORWARD AND REVERSE OPERATION



210WA3HC30

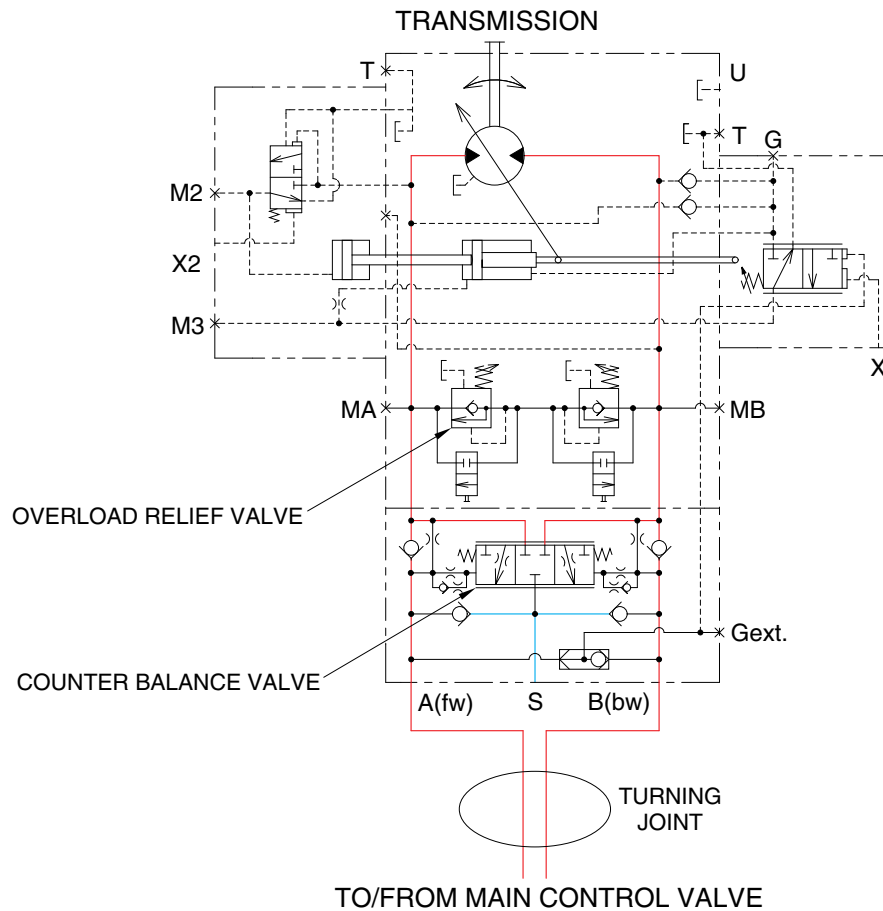
When the FNR switch of the RH RCV lever is placed in forward or reverse position, the travel spool in the main control valve is moved to the forward or reverse position by the pilot oil pressure (XAtr, XBtr) from pilot pump through the travel pilot solenoid of travel control valve. The oil from the A1 pump flows into the main control valve and then goes to the travel motor. At the same time, the oil returned from the travel motor returns to the hydraulic oil tank through the turning joint and travel spool in the main control valve.

When this happens, the machine moves forward or reverse.

The cavitation which will happen to the travel motor is prevented by the make-up valve in the main control valve.

※ The circuit diagram may differ from the equipment, so please check before a repair.

TRAVEL CIRCUIT OPERATION



210WA3HC31

Valves are provided on travel motor to offer the following functions.

1) COUNTER BALANCE VALVE

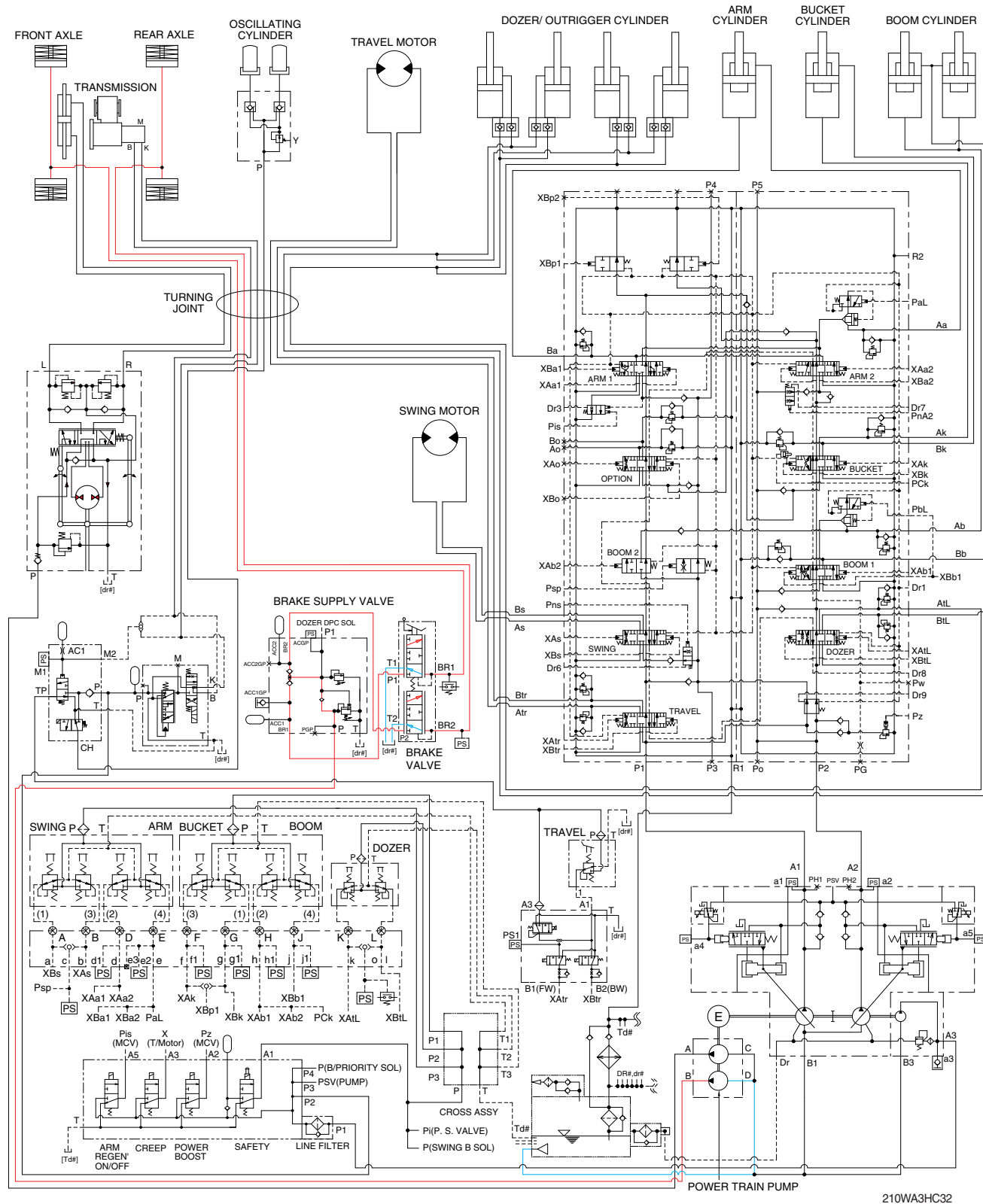
When stopping the motor on a slope descending, this valve prevents the motor from over running.

2) OVERLOAD RELIEF VALVE

Relief valve limits the circuit pressure below 380 kgf/cm² to prevent high pressure from being generated at the time of stopping the machine. When stopping the motor, this valve sucks the oil from lower pressure passage for preventing the negative pressure and the cavitation of the motor.

※ The circuit diagram may differ from the equipment, so please check before a repair.

11. SERVICE BRAKE SYSTEM

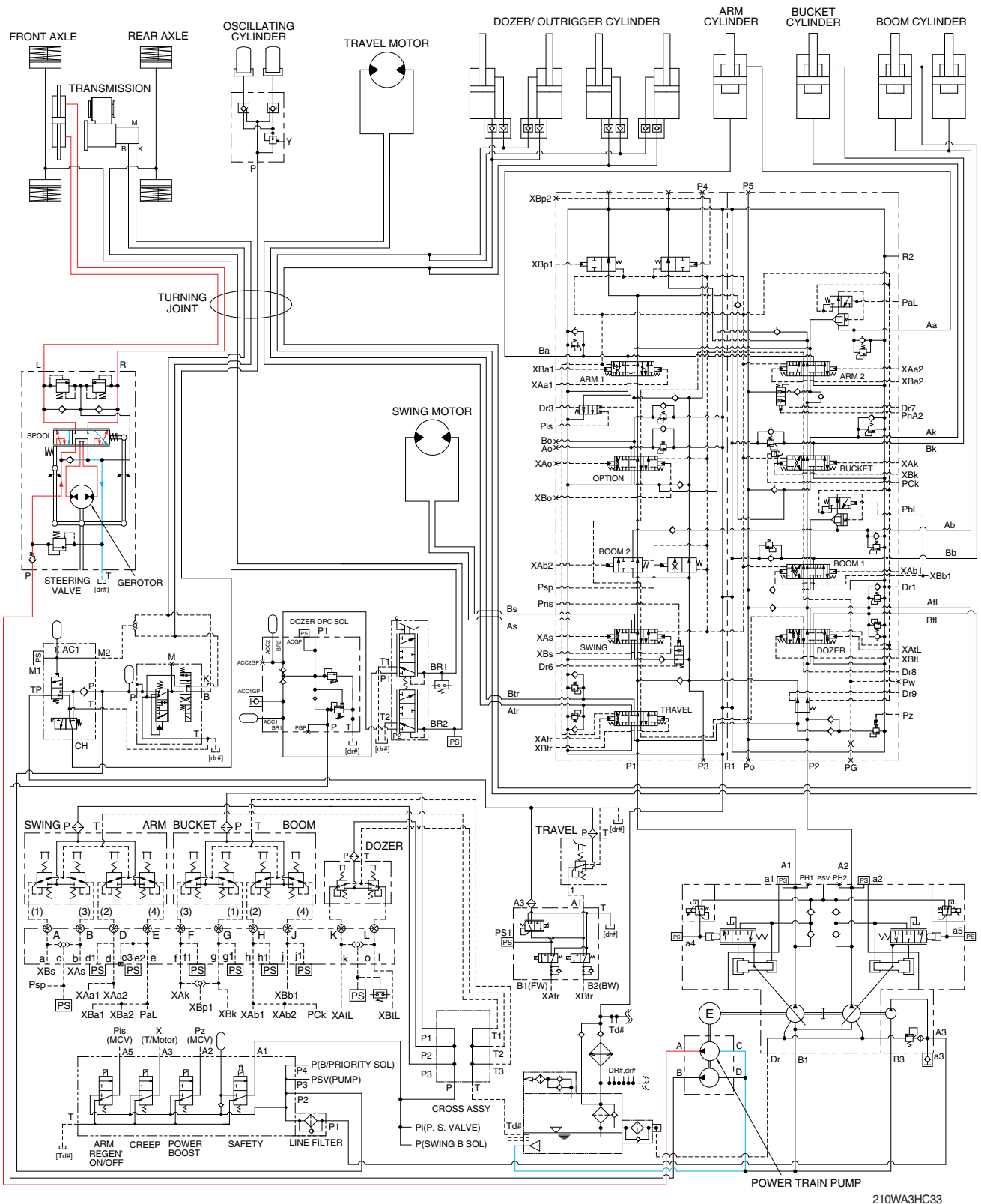


210WA3HC32

When the brake pedal (valve) is pushed, the discharged oil from the power train pump (B) flows into the front and rear axle brake disc through the solenoid valve of brake supply valve. This pressure is applied to axle brake disc, thus the brake is applied.

※ The circuit diagram may differ from the equipment, so please check before a repair.

12. STEERING CIRCUIT OPERATION



210WA3HC33

When the steering wheel is turned to the left or right, the spool within the steering valve turns left or right hand direction : Because the spool is connected with steering column.

At this time, the oil discharged from the power train pump (A) flows into steering cylinder through spool and gerotor within the steering valve.

Then the steering direction is applied.

※ The circuit diagram may differ from the equipment, so please check before a repair.

When the ram lock switch on the dashboard of the steering column is selected to OFF position, the ram lock solenoid is changed over.

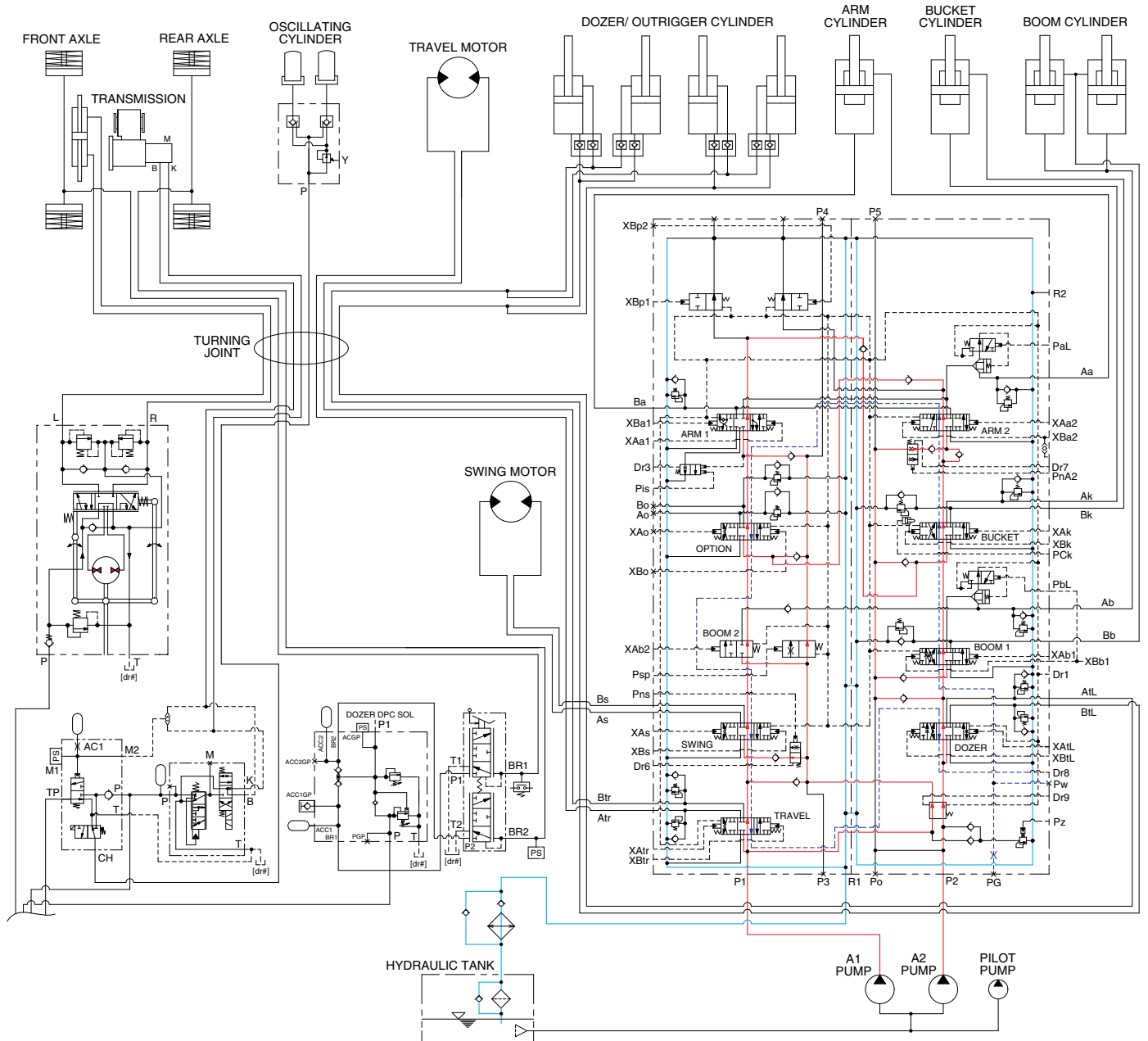
Thus, the oil discharged from the pilot pump flows into oscillating cylinder through ram lock solenoid and locking valve.

This pressure is applied to check valve and oscillating cylinder, thus the oscillating function is operated (Ram lock released).

※ The circuit diagram may differ from the equipment, so please check before a repair.

GROUP 5 COMBINED OPERATION

1. OUTLINE

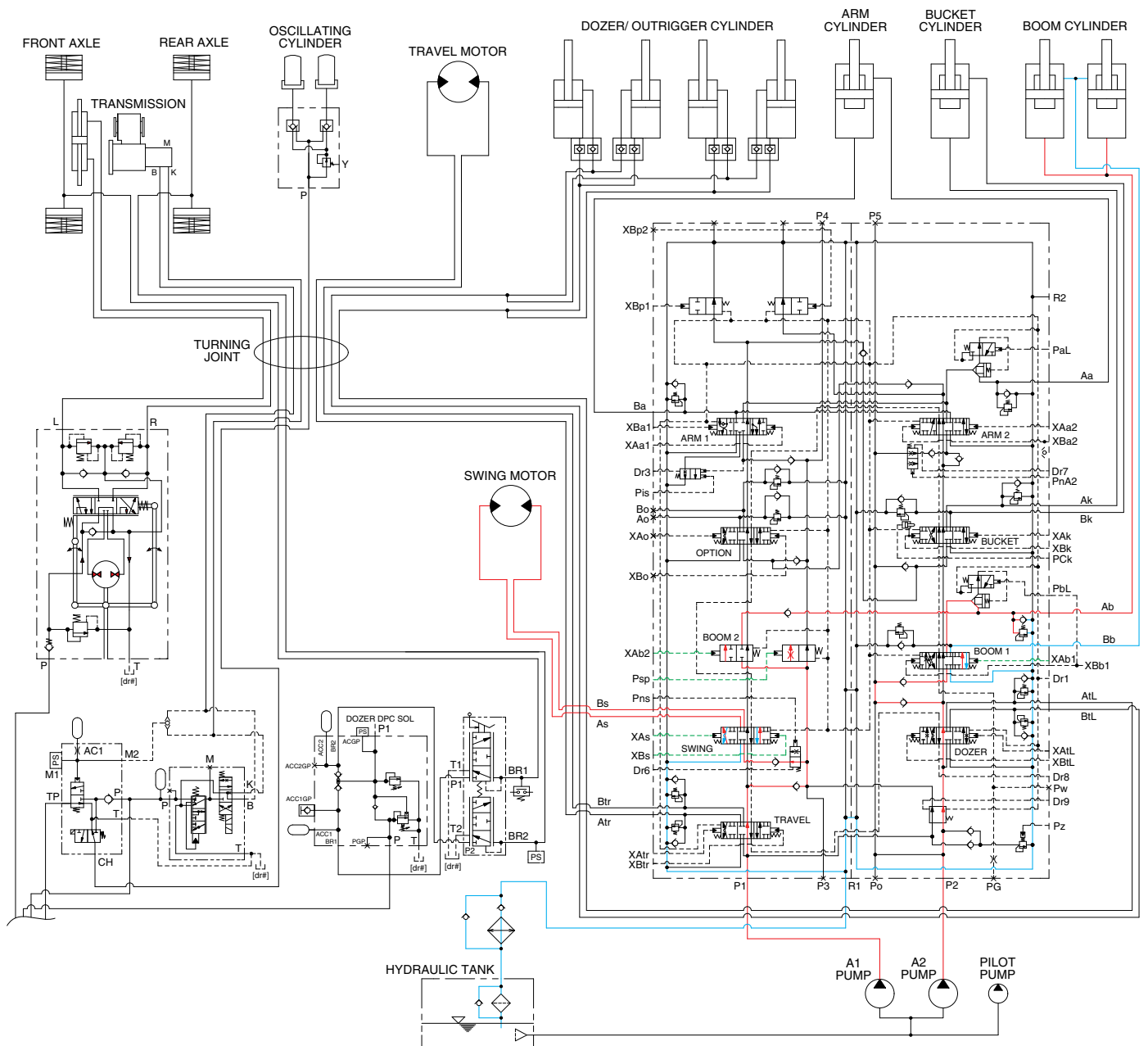


210WA3HC40

The oil from the A1 and A2 pump flows through the neutral oil passage, bypass oil passage and confluence oil passage in the main control valve. Then the oil goes to each actuator and operates them. Check valves and orifices are located on these oil passage in the main control valve. These control the oil from the main pumps so as to correspond to the operation of each actuator and smooth the combined operation.

※ The circuit diagram may differ from the equipment, so please check before a repair.

2. COMBINED SWING AND BOOM UP OPERATION



210WA3HC41

When the swing and boom up functions are operated simultaneously, the swing spool and boom spools in the main control valve are moved to the functional position by the pilot oil pressure (XAs, XBs, XAb1, XAb2) from the remote control valve.

The oil from the A2 pump flows into the swing motor through swing spool and the boom cylinder through boom 2 spool.

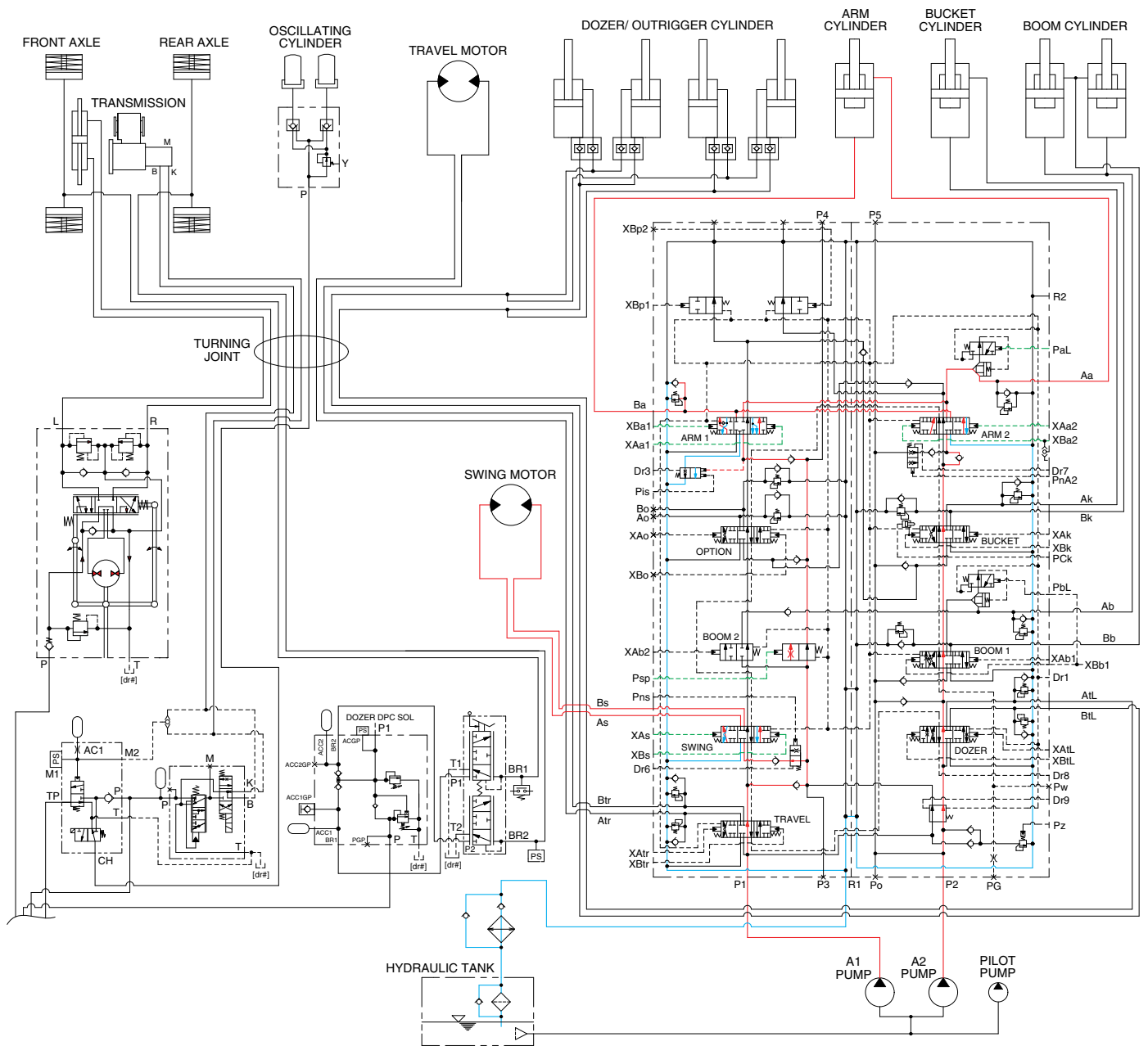
The oil from the A1 pump flows into the boom cylinders through the boom 1 spool in the right control valve.

The super structure swings and the boom is operated.

Refer to page 3-15 for the boom priority system.

※ The circuit diagram may differ from the equipment, so please check before a repair.

3. COMBINED SWING AND ARM OPERATION



210WA3HC42

When the swing and arm functions are operated simultaneously, the swing spool and arm spools in the main control valve are moved to the functional position by the pilot oil pressure (XAs, XBs, XBa1, XBa2, XAa1, XAa2) from the remote control valve.

The oil from the A2 pump flows into the swing motor through swing spool and the arm cylinder through arm 1 spool.

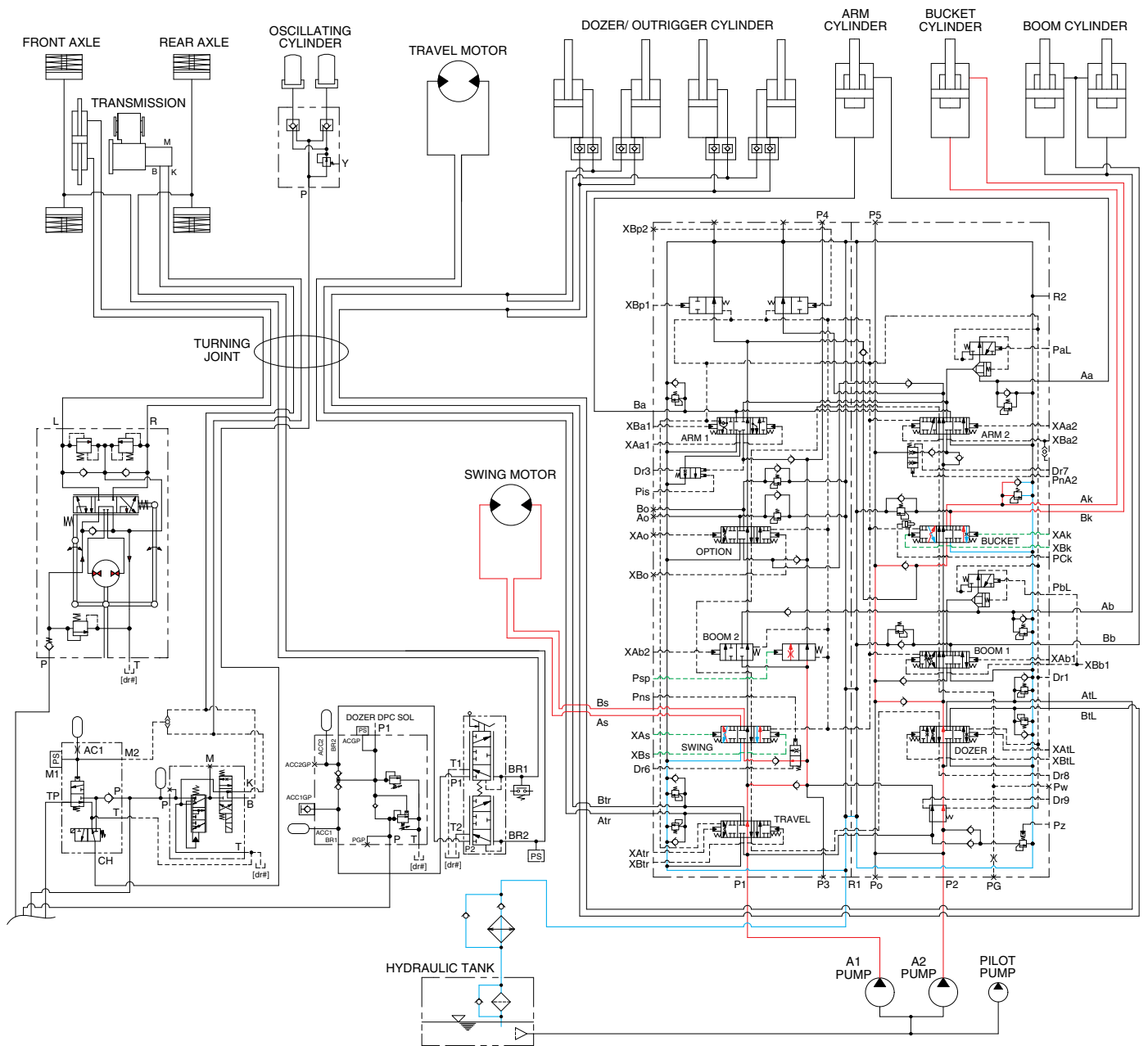
The oil from the A1 pump flows into the arm cylinder through the arm 2 spool of the right control valve.

The super structure swings and the arm is operated.

Refer to page 3-17 for the swing operation preference function.

※ The circuit diagram may differ from the equipment, so please check before a repair.

4. COMBINED SWING AND BUCKET OPERATION



210WA3HC43

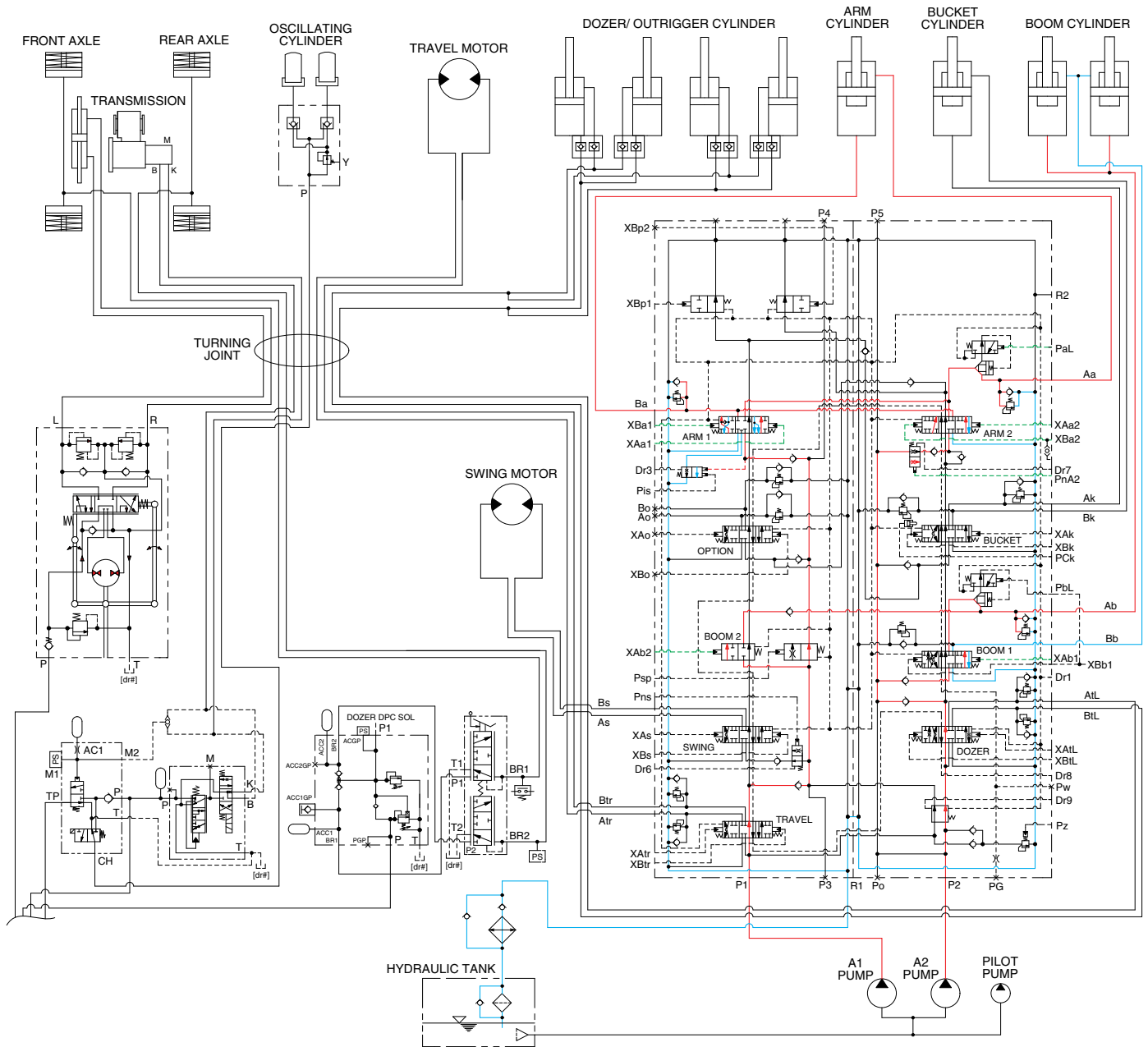
When the swing and bucket functions are operated simultaneously, the swing spool and bucket spool in the main control valve are moved to the functional position by the pilot oil pressure (XAs, XBs, XAk, XBk) from the remote control valve.

The oil from the A2 pump flows into the swing motor through the swing spool in the left control valve. The oil from the A1 pump flows into the bucket cylinder through the bucket spool in the right control valve.

The super structure swings and the bucket is operated.

※ The circuit diagram may differ from the equipment, so please check before a repair.

5. COMBINED BOOM UP AND ARM OPERATION



210WA3HC44

When the boom up and arm functions are operated simultaneously, the boom spools and arm spools in the main control valve are moved to the functional position by the pilot oil pressure (XAb1, XAb2, XBa1, XBa2, XAa1, XAa2) from the remote control valve.

The oil from the A2 pump flows into the boom cylinders and the arm cylinder through the boom 2 spool and arm 1 spool in the left control valve.

The oil from the A1 pump flows into the boom cylinders and arm cylinder through the boom 1 spool and arm 2 spool and the parallel and confluence oil passage in the right control valve.

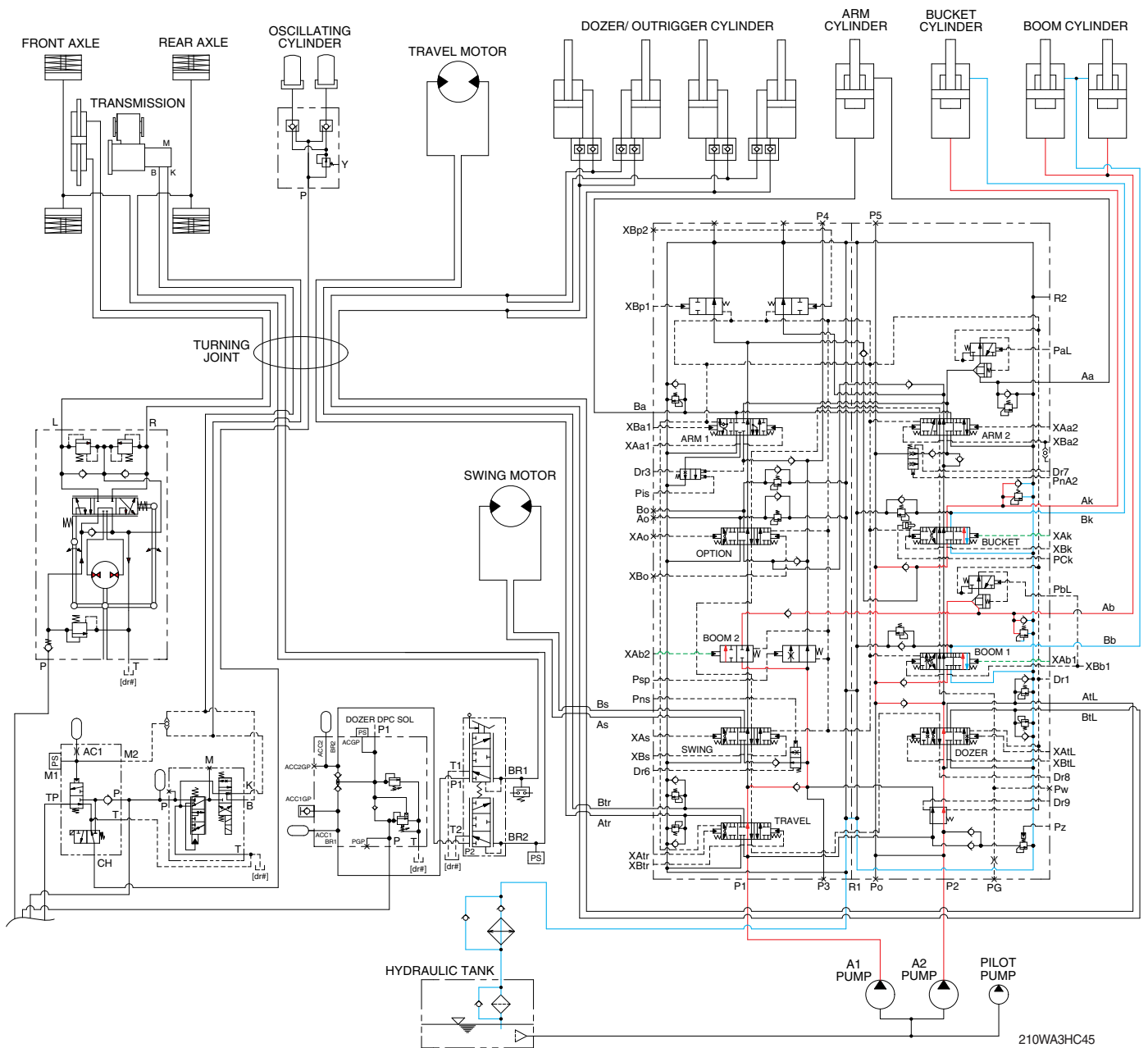
During the boom up and arm in or out functions are operated simultaneously, the pilot oil pressure PnA2 transfers the arm 2 logic spool to the up direction.

Therefore, the most of pressurized oil from the A1 pump flows into boom 1 spool than the arm 2 spool to make the boom up operation more preferential. This is called the boom up operation preference function.

The boom up and arm are operated.

※ The circuit diagram may differ from the equipment, so please check before a repair.

6. COMBINED BOOM UP AND BUCKET IN OPERATION



When the boom up and bucket in functions are operated simultaneously, the boom spools and bucket spool in the main control valve are moved to the functional position by the pilot oil pressure (XAb1, XAb2, XAk) from the remote control valve.

The oil from the A2 pump flows into the boom cylinders through the boom 2 spool in the left control valve.

The oil from the A1 pump flows into the boom cylinders and bucket cylinder through the boom 1 spool and bucket spool and the parallel and confluence oil passage in the right control valve.

During the boom up and bucket in functions are operated simultaneously, the pilot pressure flows into the bucket spool limit piston through port PCK. This transfers the bucket spool in the half stroke not full stroke.

Therefore, the most of pressurized oil from the A1 pump flows into boom 1 spool than the bucket spool to make the boom up operation more preferential. This is called the boom up operation preference function.

The boom up and bucket in are operated.

※ The circuit diagram may differ from the equipment, so please check before a repair.