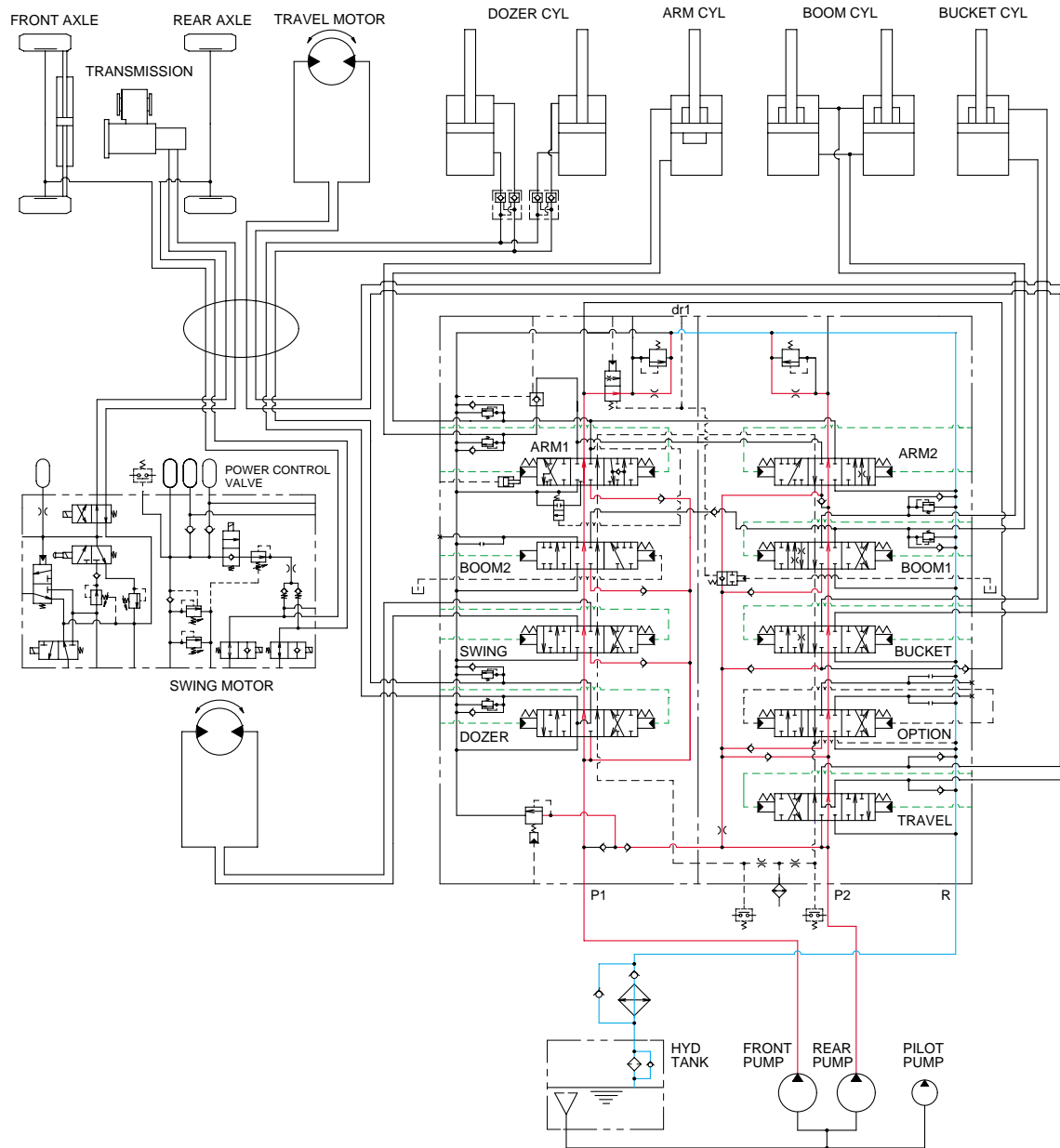


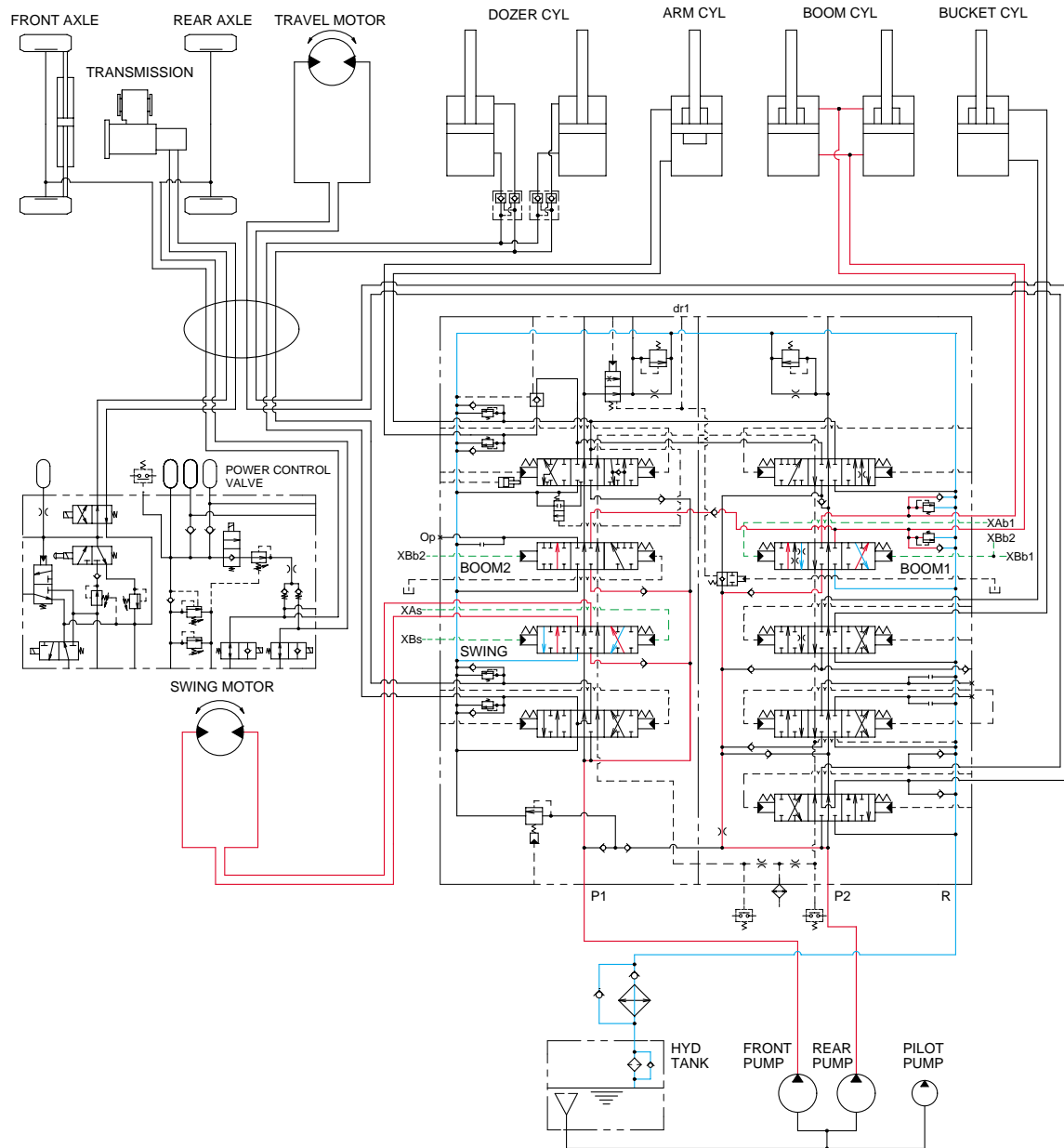
GROUP 5 COMBINED OPERATION

1. OUTLINE



In case operation, the oil flows from both main pumps through the neutral oil passage to bypass oil passage and confluence oil passage. Then the oil is supplied to each actuator and function them. Check valves and orifices are provided with on these flow passage. These control the oil flows from the pump corresponding to the each actuator's state of functioning and smooth the combined operation.

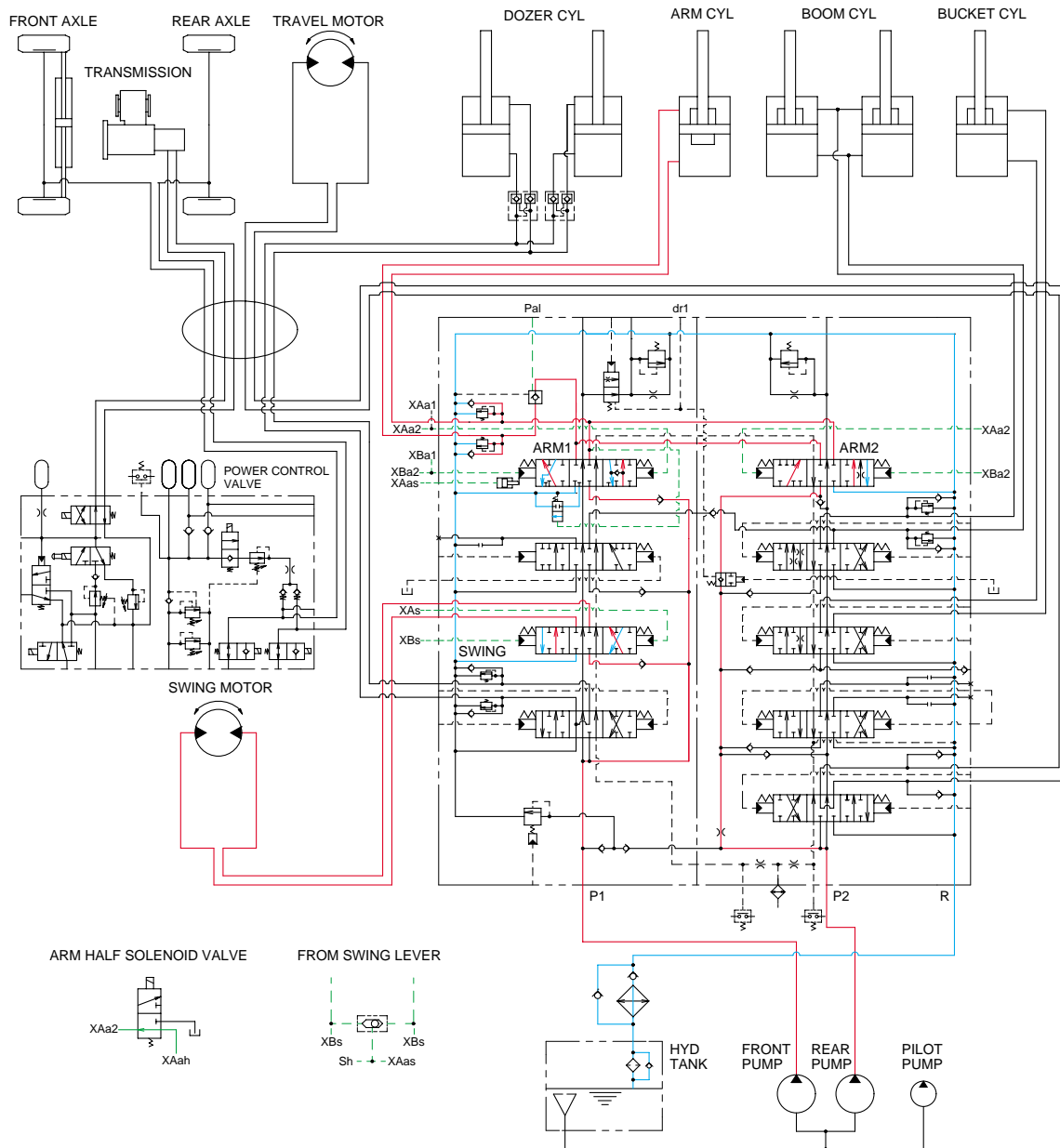
2. COMBINED SWING AND BOOM OPERATION



When the swing and boom functions are operated, simultaneously the swing spool and boom spools changed. The oil flows from the rear pump through boom1 section of the main control valve to boom cylinders and the boom functions.

The oil flows from front pump through swing section to swing motor. At the same time the pressure in the boom circuits can be high while the swing pressure is low therefore the oil flows from front pump to boom cylinders through boom2 section via confluence passage in case boom raise operation.

3. COMBINED SWING AND ARM OPERATION

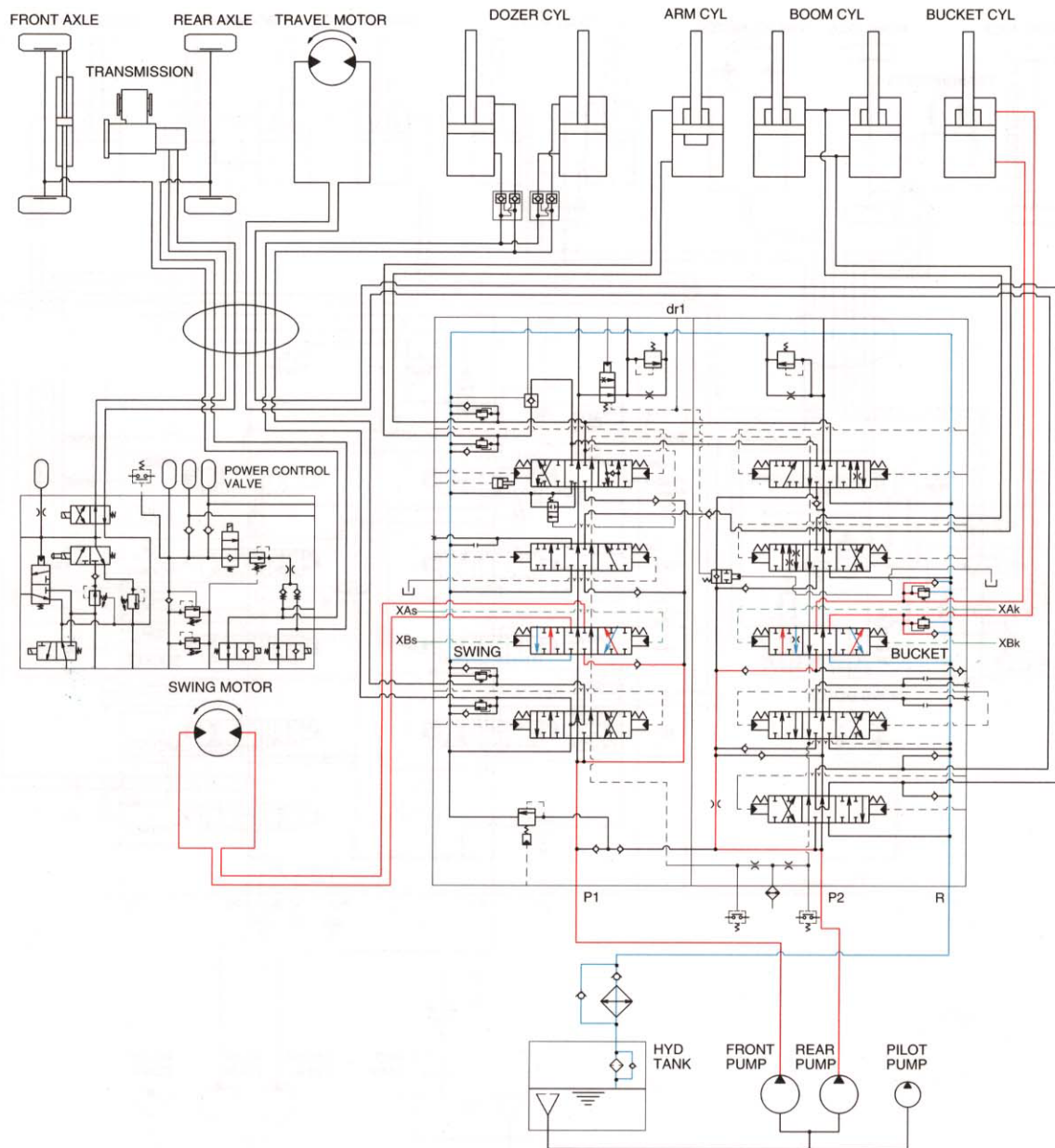


When the swing and arm functions are operated, simultaneously the swing and arm spools changed. The oil flows from the front pump through arm1 and swing section of the main control valve to arm cylinder and swing motor, and the arm and swing functions.

At the same time, the oil flows from the rear pump through arm2 section of the main control valve to arm cylinder.

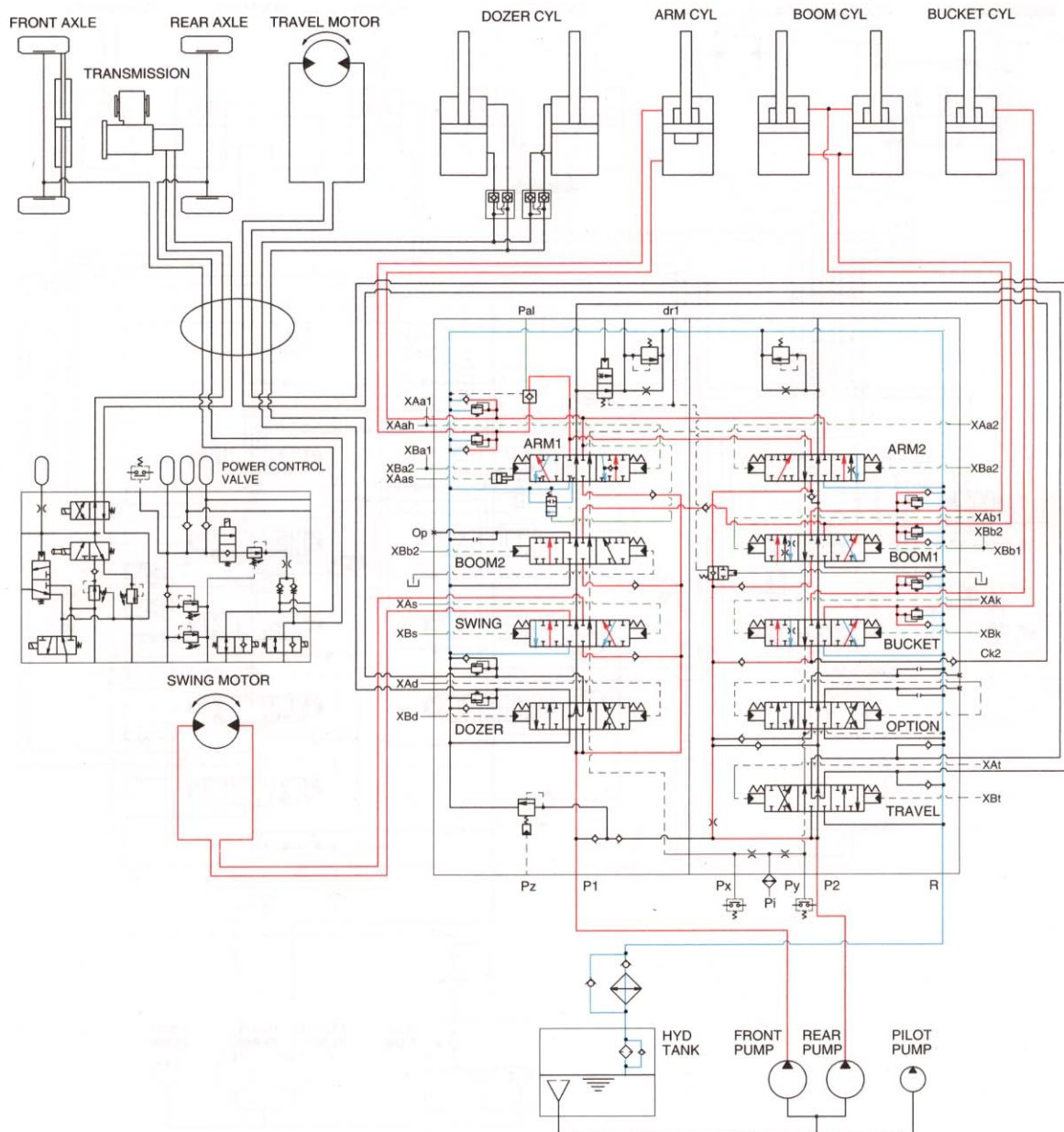
Meanwhile, the pilot oil pressure(XAas) of swing shuttle valve flows into the stroke limiter of arm spool, then the swing priority is maintained.

4. COMBINED SWING AND BUCKET OPERATION



When the swing and bucket functions are operated, the swing and bucket spools changed. The oil flows from the rear pump through the bucket section of the main control valve to the bucket cylinder and the bucket function. The oil flows from front pump through swing section of the main control valve to the swing motor and swing the superstructure.

5. COMBINED SWING, BOOM, ARM AND BUCKET OPERATION



When the swing, boom, arm and bucket functions are operated, the each spool of the main control valve changed.

The oil flows from rear pump through arm2, boom1 and bucket section to boom, arm and bucket cylinders, The oil flows from front pump through swing, boom2 and arm1 section to swing motor, boom and arm cylinder. Then the functions to each actuators.

According to the state of each actuators functioning, the oil flows from front and rear pump through the confluence oil passage to the each actuators.