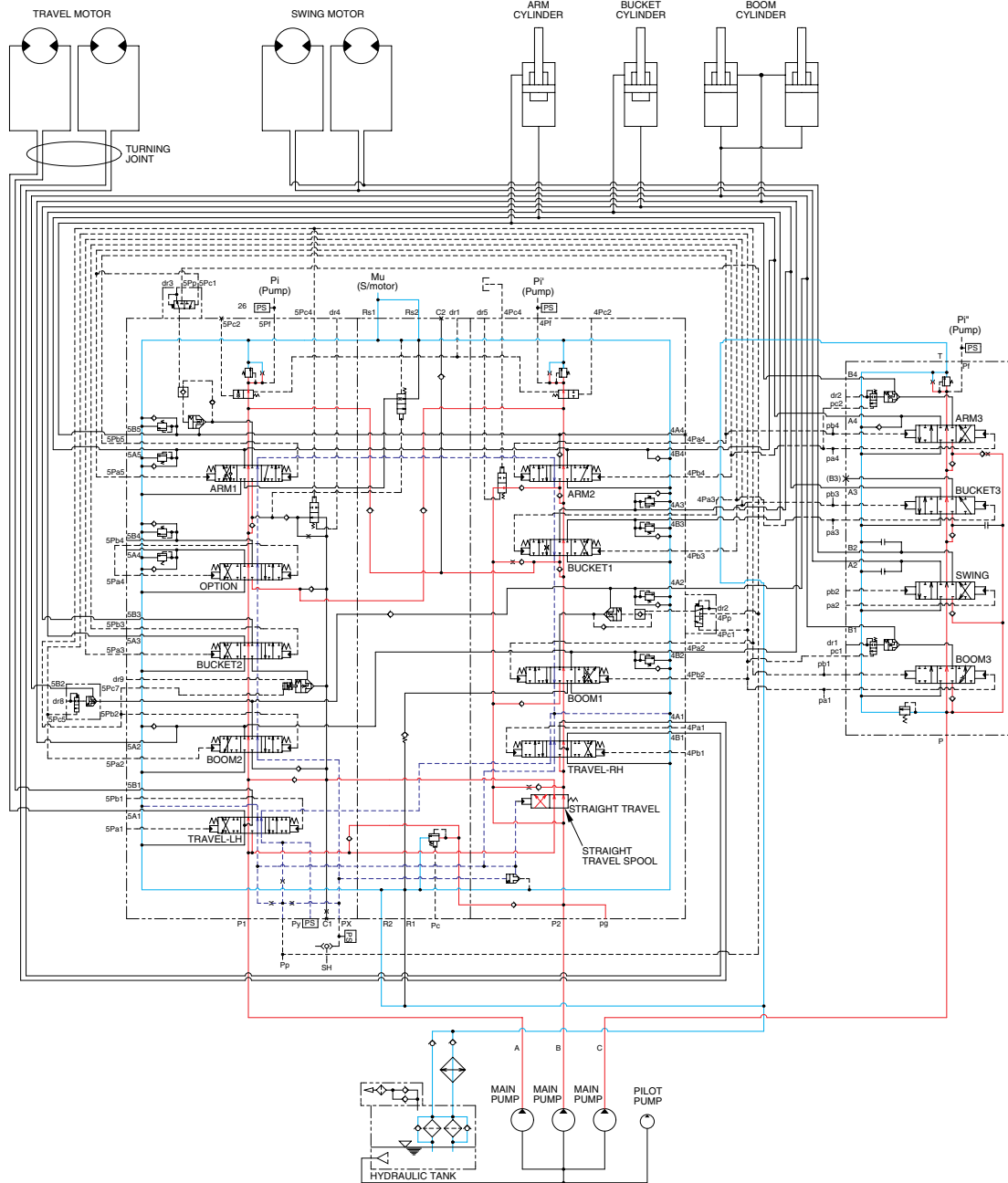


GROUP 5 COMBINED OPERATION

1. OUTLINE



120093HC20

The oil from the A, B and C 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.

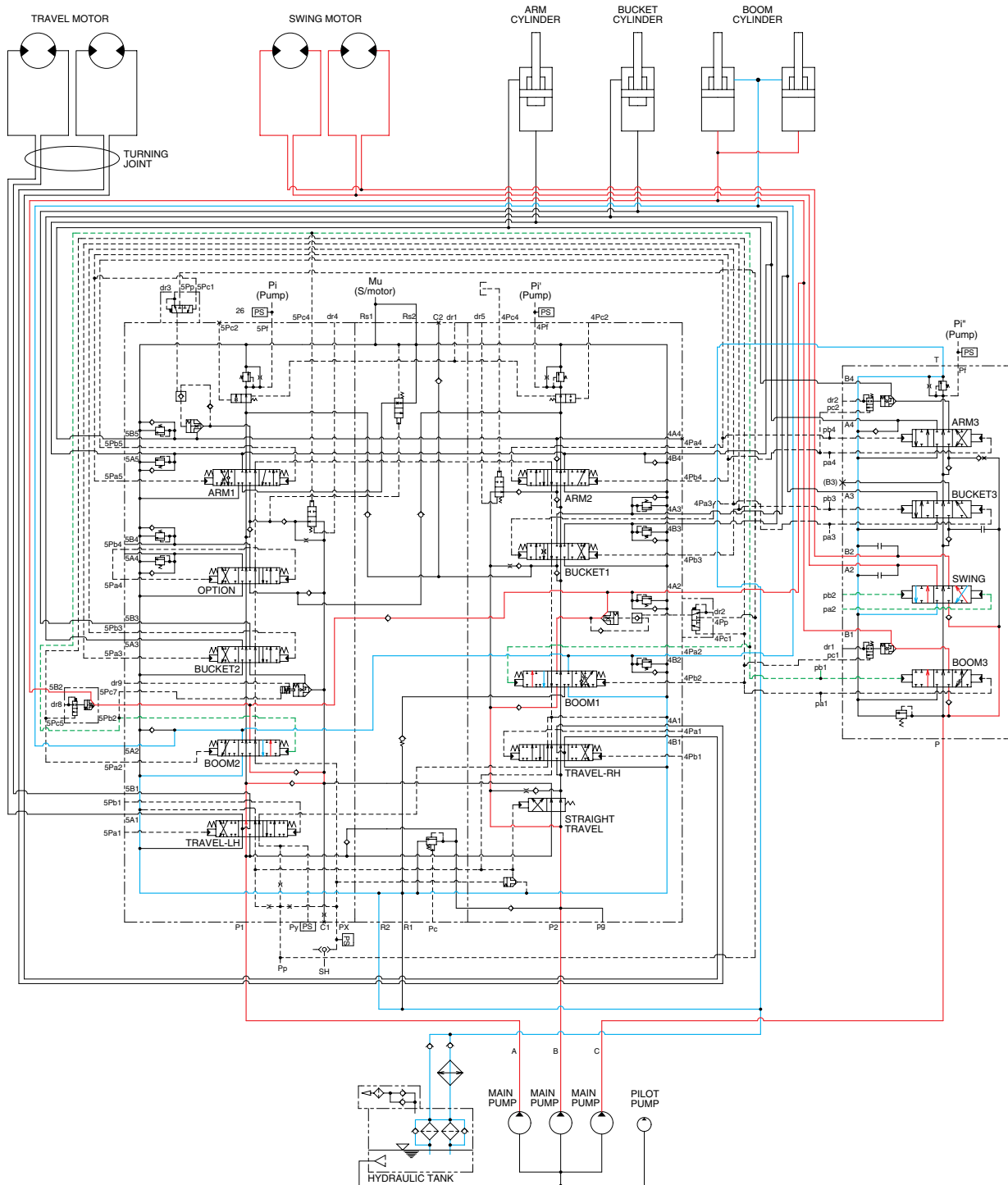
STRAIGHT TRAVEL SPOOL

This straight travel spool is provided in the main control valve.

If any actuator is operated when traveling, the straight travel spool is pushed to the right by the pilot oil pressure from the pilot pump.

Consequently, the left and right travel oil supply passage are connected, and equivalent amount of oil flows into the left and right travel motors. This keeps the straight travel.

2. COMBINED SWING AND BOOM UP OPERATION



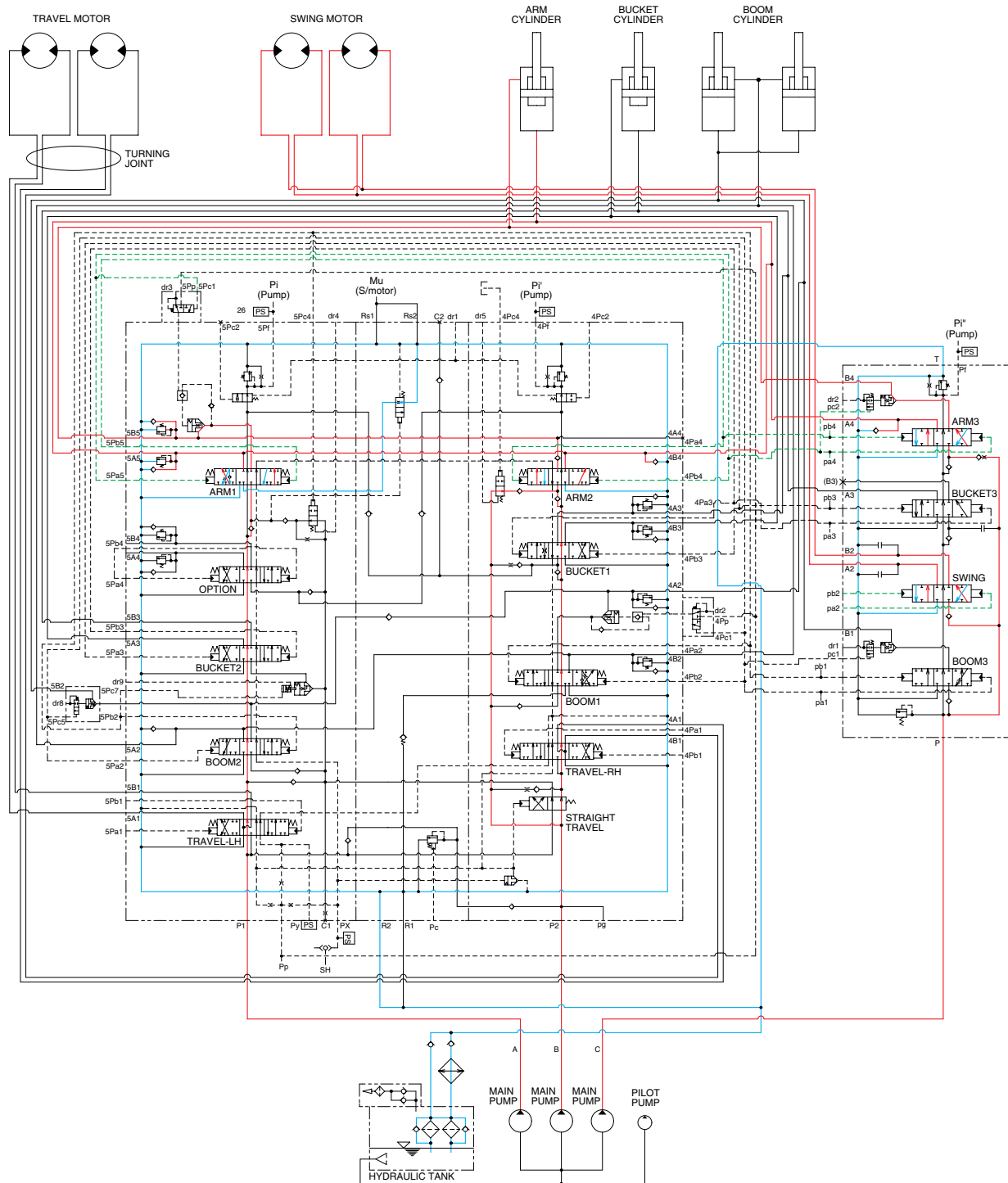
120093HC21

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 from the remote control valve.

The oil from the C pump flows into the swing motor through swing spool and the boom cylinder through boom 3 spool.

The oil from the A and B pump flows into the boom cylinders through the boom 1 and 2 spools in the control valve. The upper structure swings and the boom are operated.

3. COMBINED SWING AND ARM OPERATION



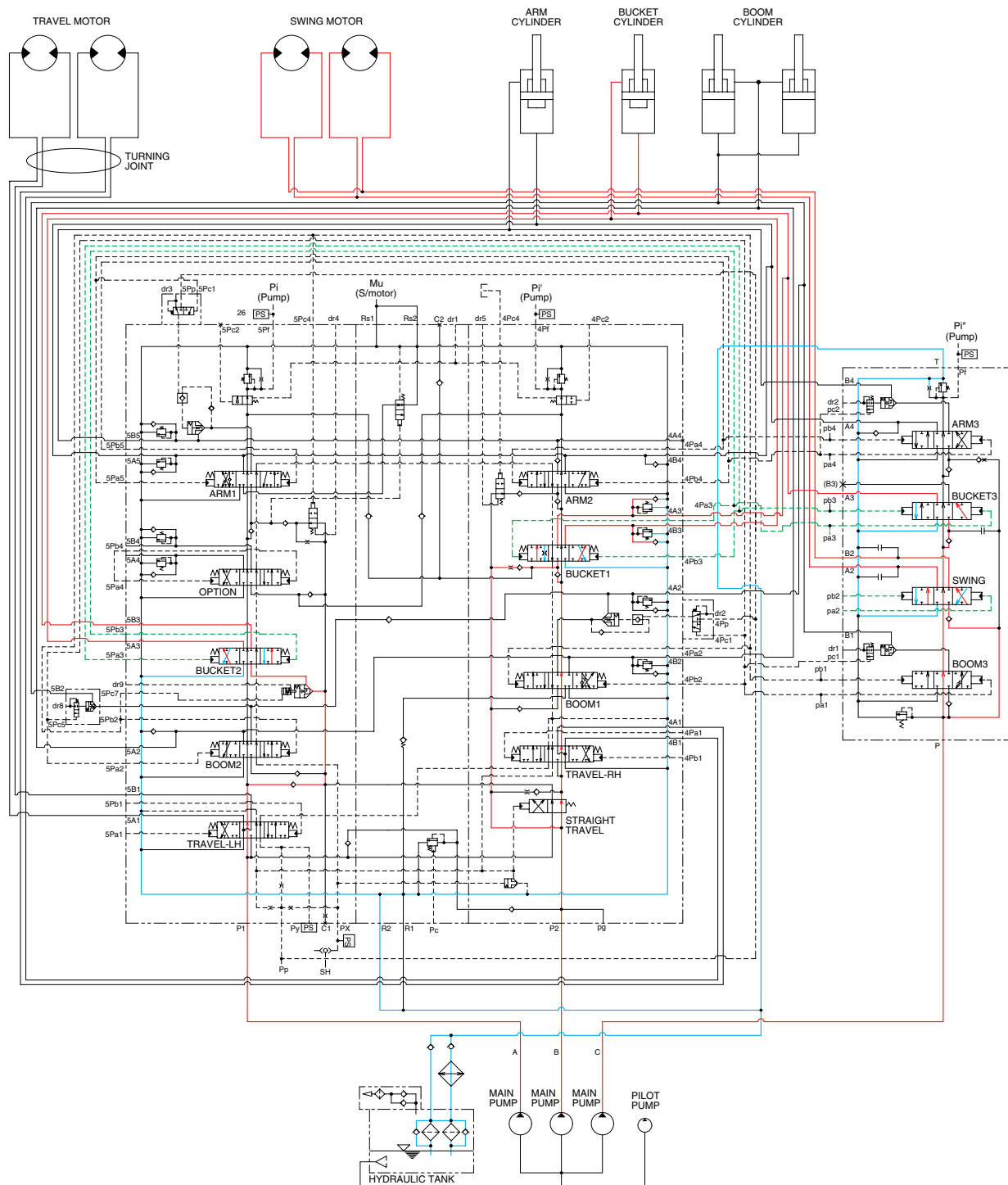
120093HC22

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 from the remote control valve.

The oil from the C pump flows into the swing motor through swing spool and the arm cylinder through arm 3 spool.

The oil from the A and B pump flows into the arm cylinder through the arm 1 and 2 spools of the control valve. The upper structure swings and the arm is operated.

4. COMBINED SWING AND BUCKET OPERATION



120093HC23

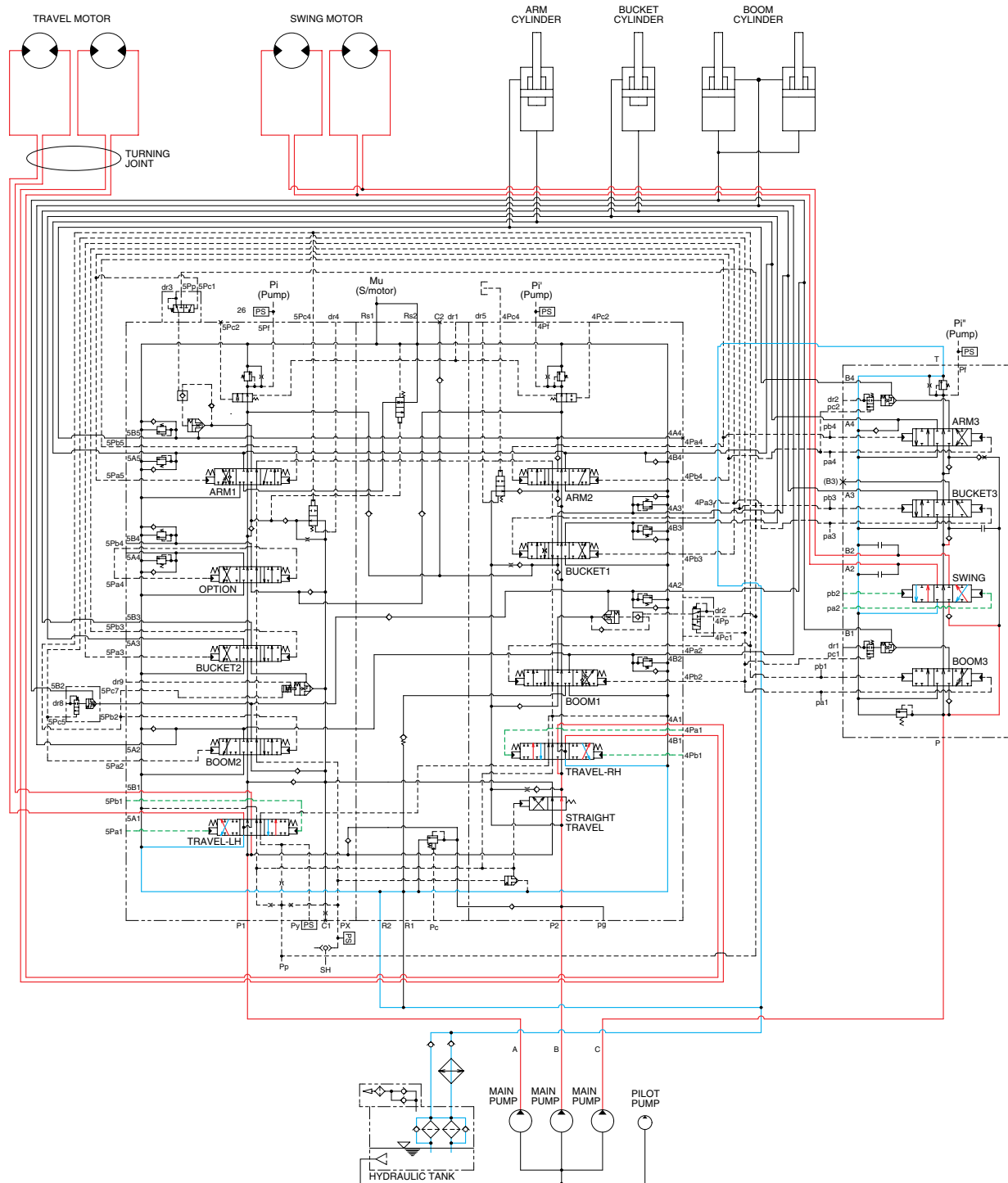
When the swing and bucket functions are operated, simultaneously the swing spool and bucket spools in the main control valve are moved to the functional position by the pilot oil pressure from the remote control valve.

The oil from the C pump flows into the swing motors through the swing spool in the control valve 2.

The oil from the A and B pump flows into the bucket cylinder through the bucket spools in the control valve 1.

The upper structure swings and the bucket is operated.

5. COMBINED SWING AND TRAVEL OPERATION



120093HC24

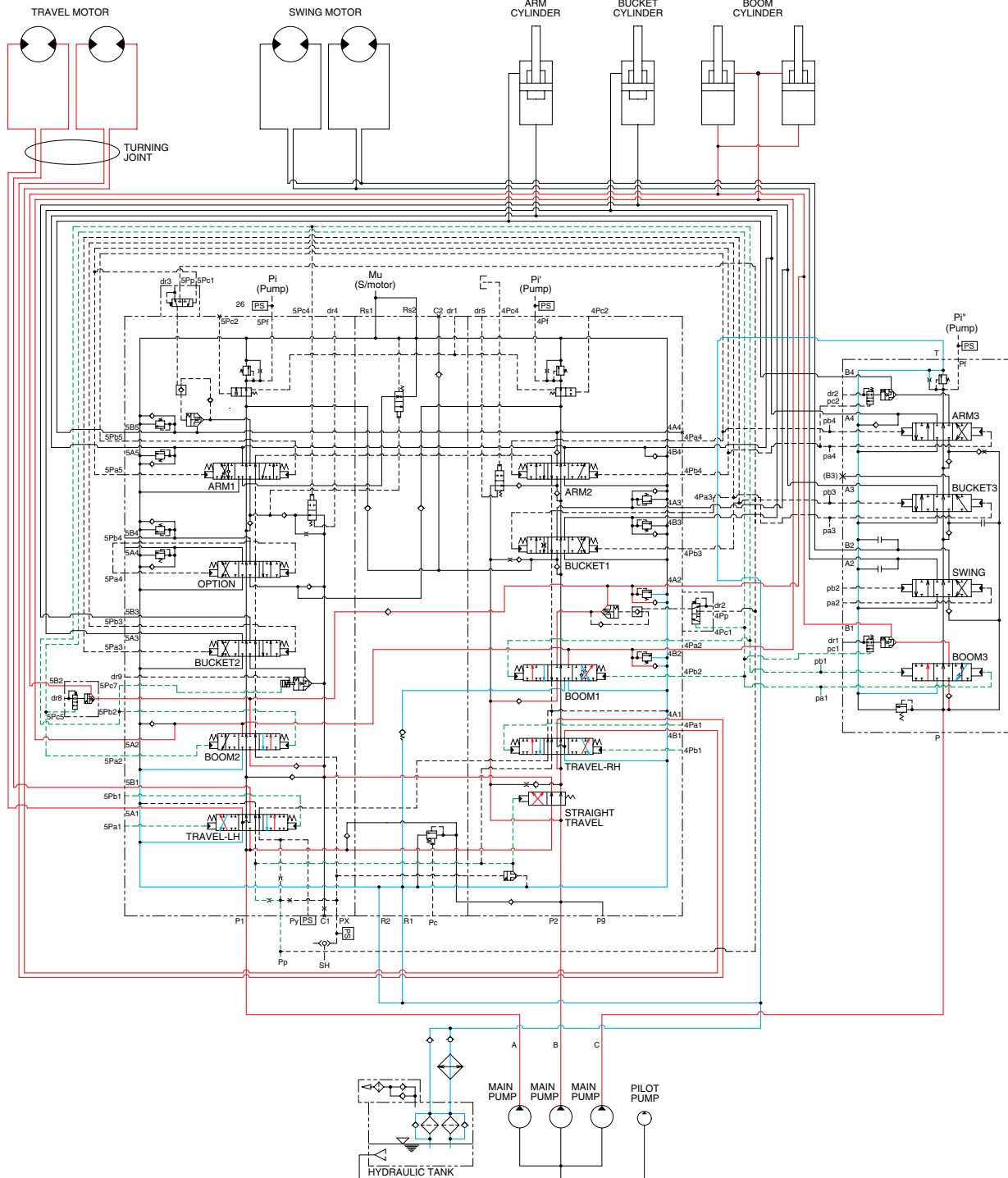
When the swing and travel functions are operated, simultaneously the swing spool and travel spools in the main control valve are moved to the functional position by the pilot oil pressure from the remote control valve and straight travel spool remained its position because the pilot oil pressure from the pilot pump is not applied to the straight travel spool.

The oil from the A pump flows into the LH travel motor through the LH travel spool of the left control valve and the oil from the B pump flows into the RH travel motor through the RH travel spool of the right control valve.

The oil from the C pump flows into the swing motor through the swing spool.

The upper structure swings and the machine travels.

6. COMBINED BOOM AND TRAVEL OPERATION



120093HC25

When the boom and travel functions are operated, simultaneously the boom spools and travel spools in the main control valve are moved to the functional position by the pilot oil pressure from the remote control valve and the straight travel spool is pushed to the right by the oil pressure from pilot pump.

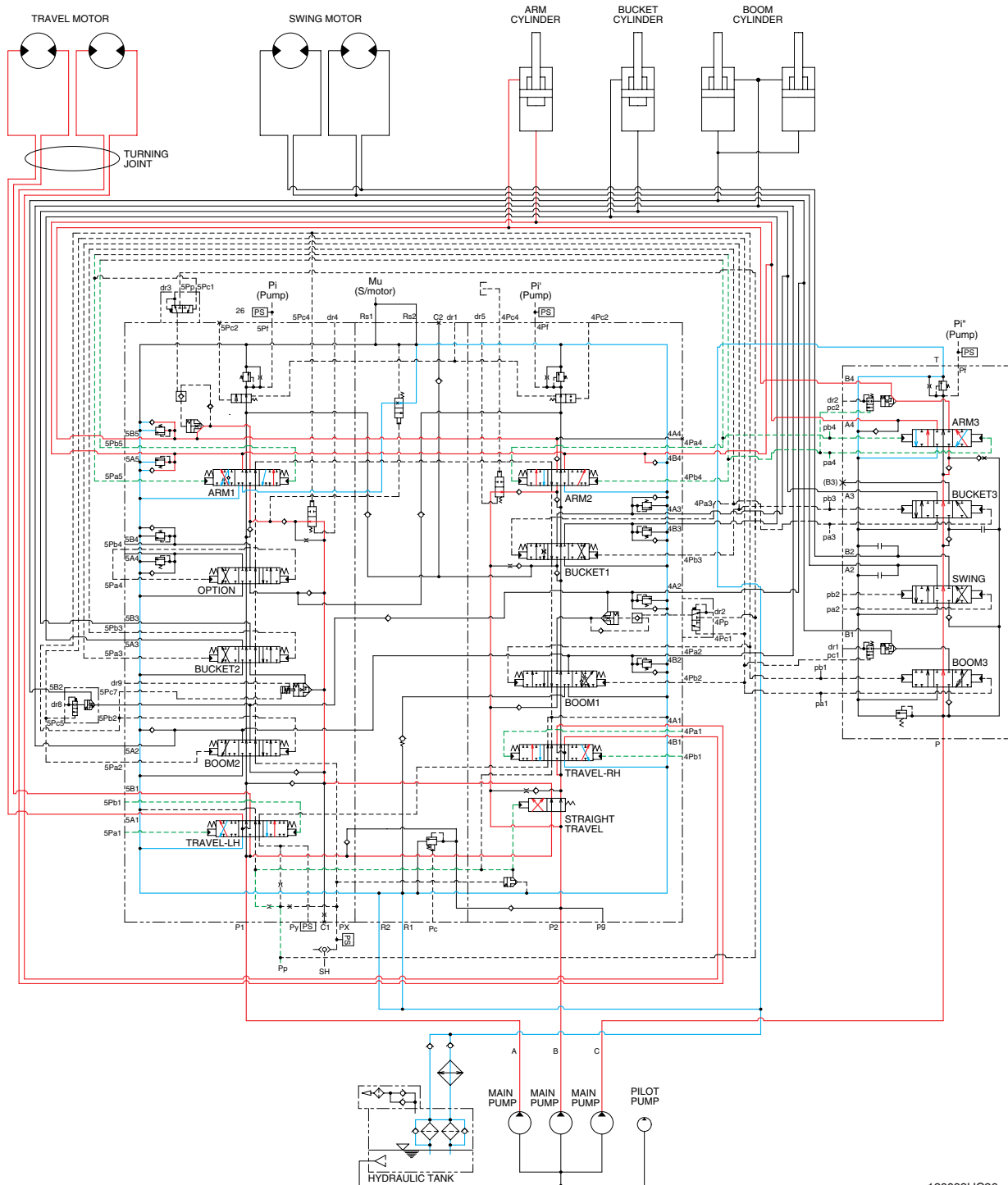
The oil from the A pump flows into the travel motors through the LH travel spool of the left control valve and the RH travel spool of the right control valve via the straight travel spool.

The oil from the B pump flows into the boom cylinders through the boom 1 and boom 2 spools via the parallel passage and the straight travel spool.

Also, the oil from the C pump flows into the boom cylinders through the boom 3 spool spool via confluence oil passage in case boom up operation.

The boom is operated and the machine travels straight.

7. COMBINED ARM AND TRAVEL OPERATION



120093HC26

When the arm and travel functions are operated, simultaneously the arm spools and travel spools in the main control valve are moved to the functional position by the pilot oil pressure from the remote control valve and the straight travel spool is pushed to the right by the oil pressure from pilot pump.

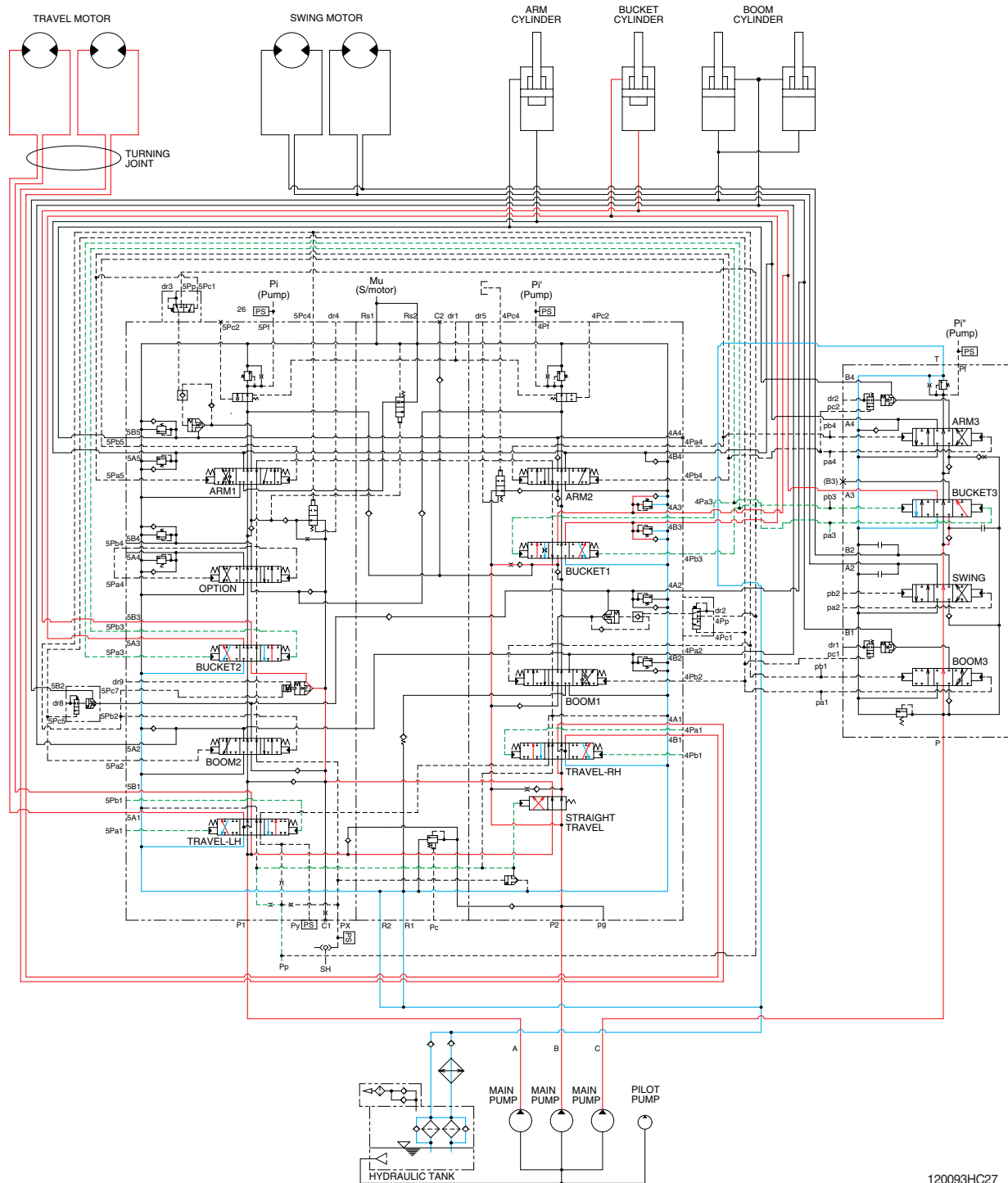
The oil from the A pump flows into the travel motors through the LH travel spool of the left control valve and the RH travel spool of the right control valve via the straight travel spool.

The oil from the B pump flows into the arm cylinders through the arm 2 and arm 1 spools via the parallel passage and the straight travel spool.

Also, the oil from the C pump flows into the arm cylinders through the arm 3 spool via confluence oil passage.

The arm is operated and the machine travels straight.

8. COMBINED BUCKET AND TRAVEL OPERATION



120093HC27

When the bucket and travel functions are operated, simultaneously the bucket spool and travel spools in the main control valve are moved to the functional position by the pilot oil pressure from the remote control valve, and the straight travel spool is pushed to the right by the oil pressure from pilot pump. The oil from the A pump flows into the travel motors through the LH travel spool of the left control valve and the RH travel spool of the right control valve via the straight travel spool of the control valve.

The oil from the B pump flows into the bucket cylinders through the bucket 1 and bucket 2 spools via the parallel passage and the straight travel spool.

Also, the oil from the C pump flows into the bucket cylinder through the bucket 3 spool via the confluence oil passage in case the bucket in operation.

The bucket is operated and the machine travels straight.