SERVICE MANUAL

Wheel Loaders LW190.B



NEW HOLLAND
CONSTRUCTION

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3.2 OPERATION

3.2.1 GENERALITIES

Brake system

The brake system is powered by pump (**8**) sucking oil from oil tank (**S**) and forwards it to flow regulation valve, filtered by filter (**7**) located inside brake pedal valve (**15**).
Two hydraulic accumulators (**4** and **13**) and two check valves provide the accumulation of a quantity of oil under pressure sufficient to actuate the brakes a limited amount of times, even with the engine inoperative, thus when the flow of pump (**8**) is nil.

Parking brake

Parking brake (**6**) is composed of a disc brake operating on the output shaft of the transmission.
The equipment receives oil under pressure from the regulation valve.
Pressure switch (**10**) closes the "parking brake engaged" signal electric circuit when the pressure drops below the value of 15 bar, with the consequent engagement of the parking brake.

Service brakes

Of an oil-bath, disc type, they are located inside the final drives of the axles (**1** and **9**). When pressing the brake pedal, valve (**15**) supplies the braking circuit with a controlling pressure (thus a braking force) proportional to the stroke of the brake pedal (Pf Max = 45 bar).
When releasing the pedal, valve (**15**) discharges the brake circuit oil zeroing the braking action on discs (**1** and **9**).
During the braking phase pressure switch (**2**) activates the electric circuit of the stoplights. Pressure switch (**16**) controls the transmission cut-off device.

3.2.2 OPERATING CONDITIONS

Conditions of:

- engine running
- service brakes disengaged
- parking brake engaged
- accumulators during recharging phase

The delivery of pump (**8**) reaches flow regulation valve (**18**). The oil flow opens and passes main check valve (**19**) then opens and passes check valves (**22** and **23**) charging the accumulators of service brakes (**4** and **14**) and parking brake accumulator (**11**).
Controlling spools (**20** and **21**) when brake pedal (**P**) is released, block the flow of the oil coming from the pump and keep the brake disc actuating pistons (**1** and **9**) in discharge. Thus the service brakes are disengaged.
Solenoid valve (**14**) controlling parking brake (**6**) is positioned so that the oil flowing from the parking brake chamber is discharged thus parking brake (**6**) is actuated by the action of the springs.

Conditions of:

- engine running
- service brakes engaged
- parking brake disengaged
- accumulators charged.

This condition occurs when braking while the machine is operating.
The parking brake is disengaged since solenoid valve (**14**) forwarding oil under pressure to the brake piston neutralises the action of the springs.
Brake pedal (**P**), when pressed, presses the springs actuating controlling spools (**20** and **21**) determining the opening of the delivery gaps to the brakes (**1** and **9**).
In the lower part of controlling spool (**21**) the barking pressure starts operating, pushing the disc pack of brakes (**1** and **9**). In this manner, while the pressure on the discs increases, controlling spools (**20** and **21**) are pushed upward and close the delivery gaps. In this manner a pressure is obtained on brake discs (**1** and **9**) thus a braking force proportional to the pressure on pedal (**P**).
The presence of two accumulators (**4** and **13**) and two controlling spools (**20** and **21**) allow the operation of two separate circuits for the front and rear brakes. The failure of one circuit does not influence the operation of the other one.

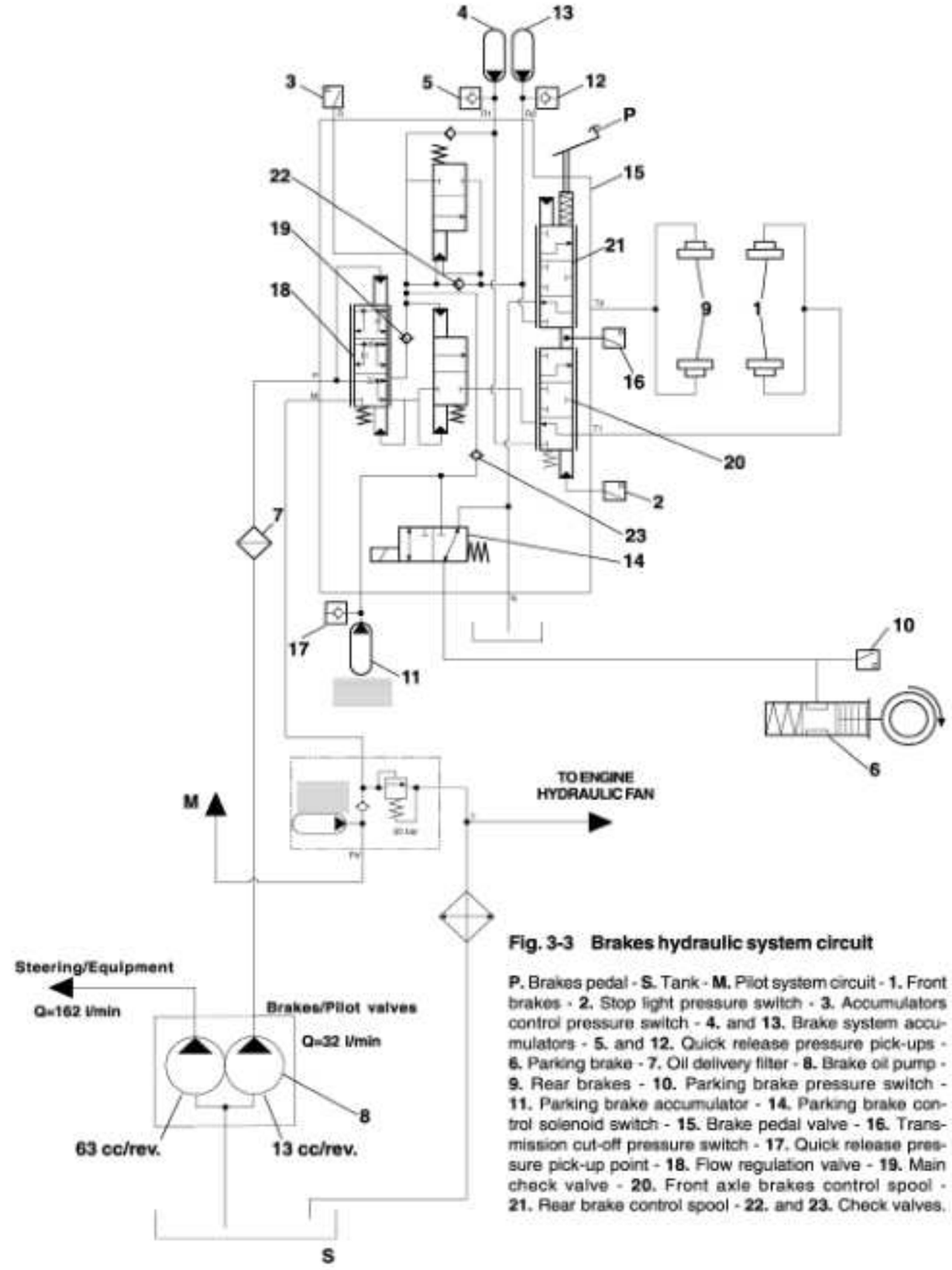


Fig. 3-3 Brakes hydraulic system circuit

P. Brakes pedal - **S.** Tank - **M.** Pilot system circuit - **1.** Front brakes - **2.** Stop light pressure switch - **3.** Accumulators control pressure switch - **4.** and **13.** Brake system accumulators - **5.** and **12.** Quick release pressure pick-ups - **6.** Parking brake - **7.** Oil delivery filter - **8.** Brake oil pump - **9.** Rear brakes - **10.** Parking brake pressure switch - **11.** Parking brake accumulator - **14.** Parking brake control solenoid switch - **15.** Brake pedal valve - **16.** Transmission cut-off pressure switch - **17.** Quick release pressure pick-up point - **18.** Flow regulation valve - **19.** Main check valve - **20.** Front axle brakes control spool - **21.** Rear brake control spool - **22.** and **23.** Check valves.

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