DESCRIPTION & OPERATION

The auxiliary control valves serve for control of hydraulic loads external to the tractor.

Up to a maximum of **three** auxiliary control valves can be fitted, fixing them on the back of the transmission at the right-hand side.

- Convertible single/double-acting.
- Convertible single/double-acting + automatic release + float.
- Convertible single/double-acting + automatic release + detent in float.
- Single/double-acting.

The control valves are governed by levers (1, fig. 2) located on the operator's right-hand side.

Each auxiliary control valve lever (1,2 and 3, fig, 3) has three or four positions, depending on the type of control valve it operates.

A Lifting - Pull lever back to lift the implement.

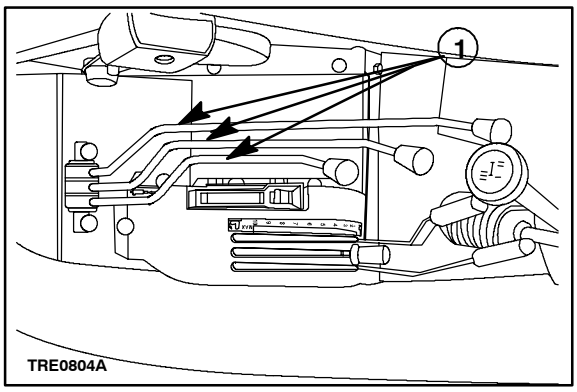
C Lowering - Push the lever forward to lower the implement.

B Neutral - When the lever is released from the lifting and lowering positions it will automatically return to neutral position.

D Float - Push the lever forward beyond the "lowering" position to select "float position." In this position the only force exerted on the implement will be that created by its own weight, thus allowing the implement to follow the profile of the terrain.

Some control valves are fitted with a valve (1, fig. 4), acting on which it is possible to switch over the control valve from double-acting to single-acting.

The operation of the hydraulic control valves is described on the following pages.



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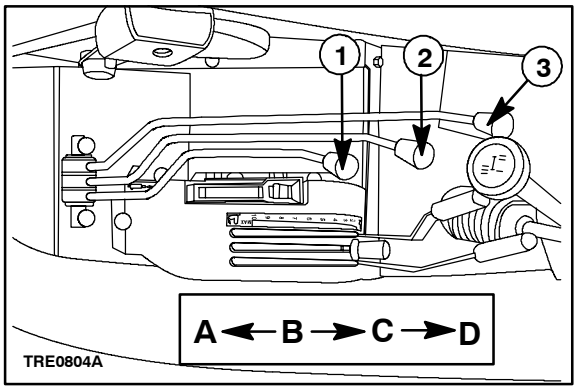

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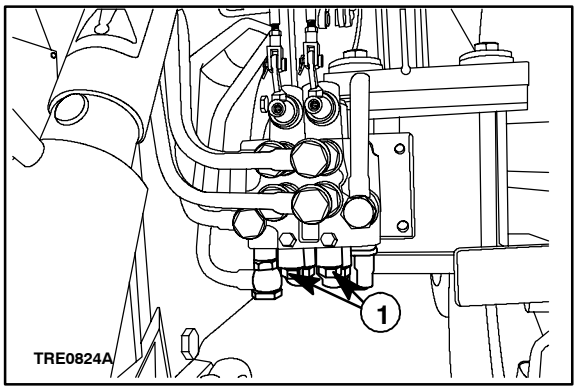

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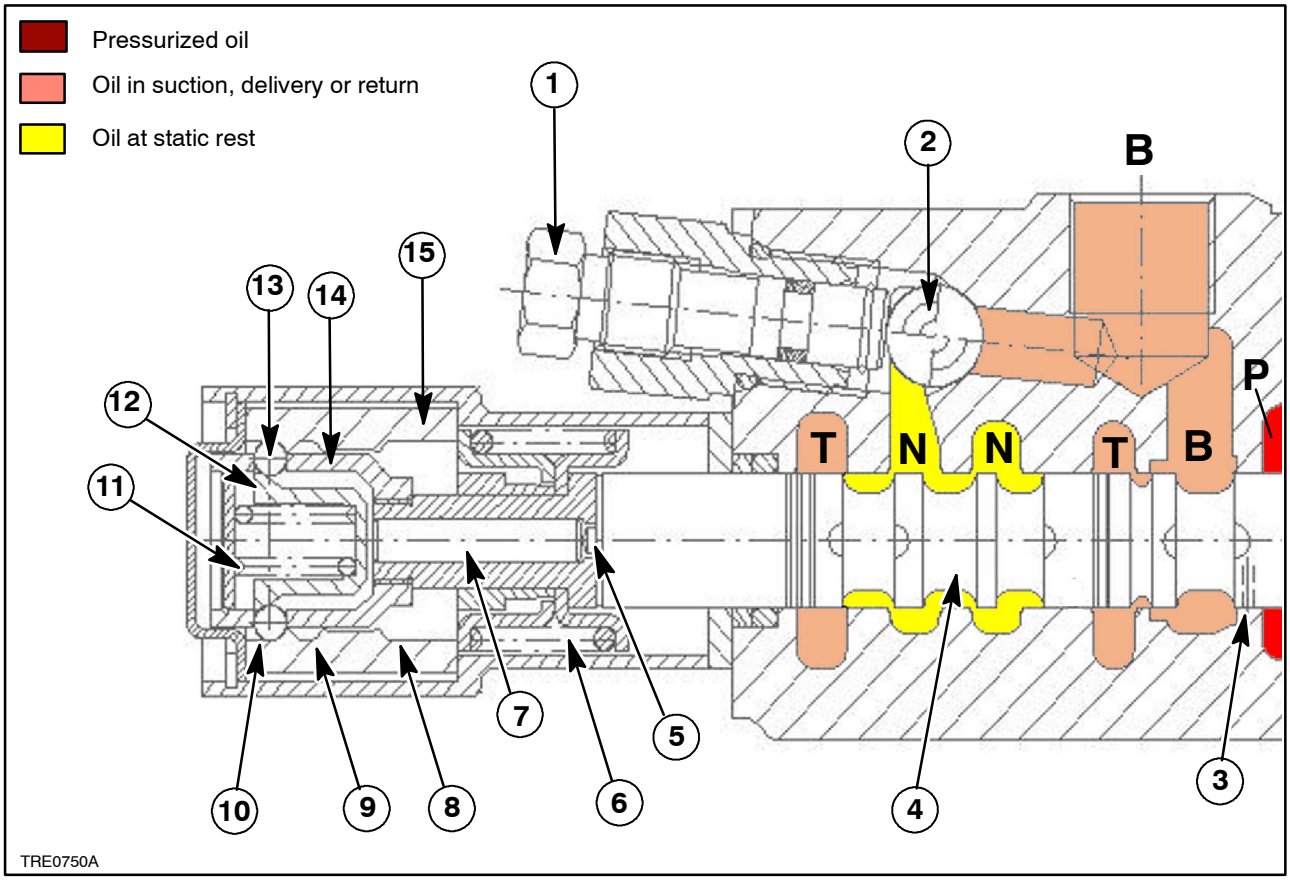
OPERATING STAGES OF A CONVERTIBLE SINGLE/DOUBLE-ACTING AUXILIARY CONTROL VALVE WITH AUTOMATIC RELEASE AND DETENT IN FLOAT
(Detail of automatic release and detent)



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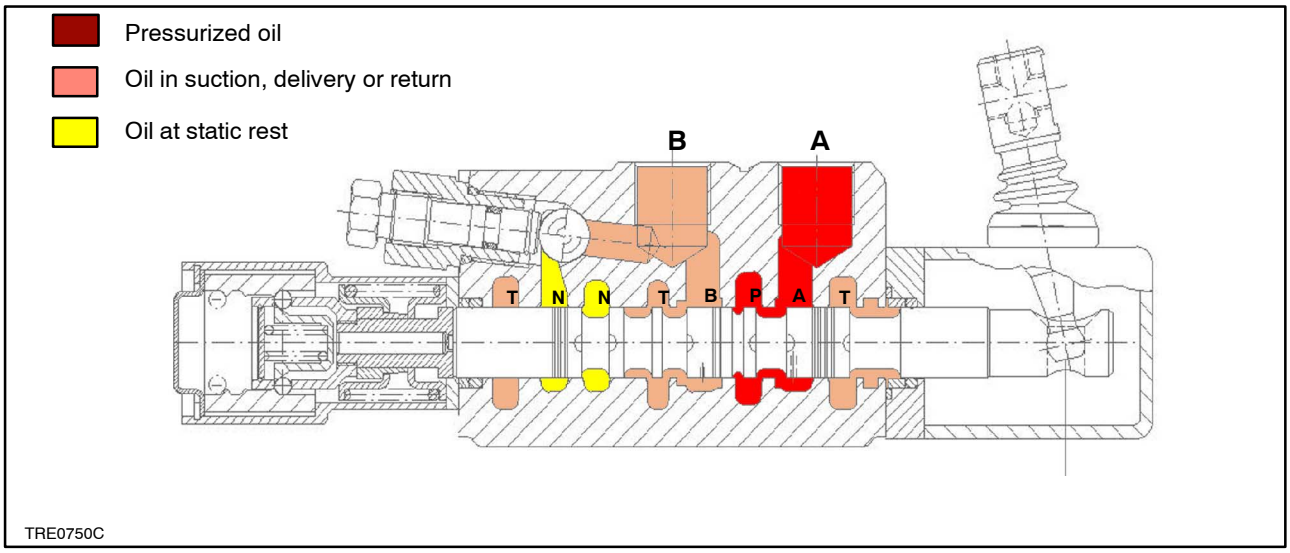
1. Single/double-acting valve switchover screw.
2. Single/double-acting valve switchover ball.
3. HOle on the control valve pin to set the automatic release oil pressure.
4. Control valve pin.
5. Automatic release actuator pin.
6. Spring to return pin into neutral.
7. Automatic release pin.
8. Seat of ball with control valve on lifting.
9. Seat of ball with control valve on lowering.
10. Seat of ball with control valve in float position.
11. Spring to position bracket 12.
12. Bracket to position balls in seat.
13. Ball.
14. Ball positioning ring.
15. Outer ring with ball seat.
B Control valve pressure tap.
N Pressure discharge lines line B with control valve switched over onto single-acting.
P Oil delivery line from the pump.
T Discharge lines.

Automatic release operation

The control valve pin has a hole in it (3, fig. 5) through which the existing pressure on the control valve discharges onto a valve at the end of the pin.

When the pressure reaches the automatic release setting, the actuator pin (5, fig. 5) comes out of the control valve pin pushing the release pin (7, fig. 5) that by acting on the bracket (12, fig. 5) frees the balls and therefore the control valve pin, under the action of the spring (6, fig. 5), returns to neutral; this holds for both lowering and lifting.

In the float phase, as there is no pressure in lines A and B of the control valve, the automatic release does not work automatically; therefore, in order to move the control valve lever into neutral, it must be done manually.



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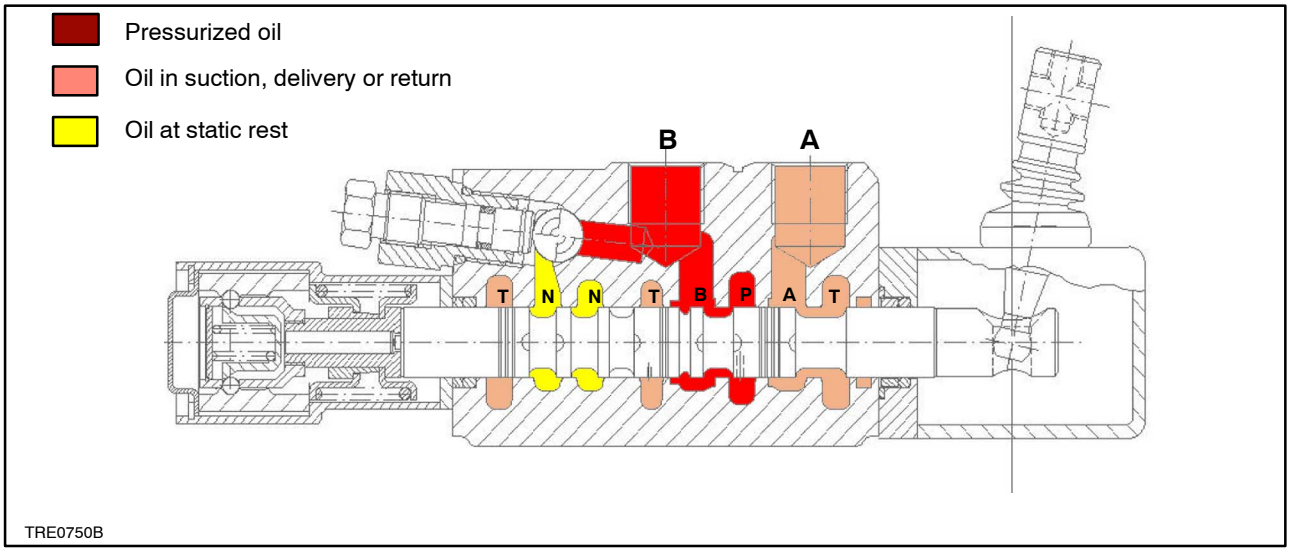
Operation in lifting phase.

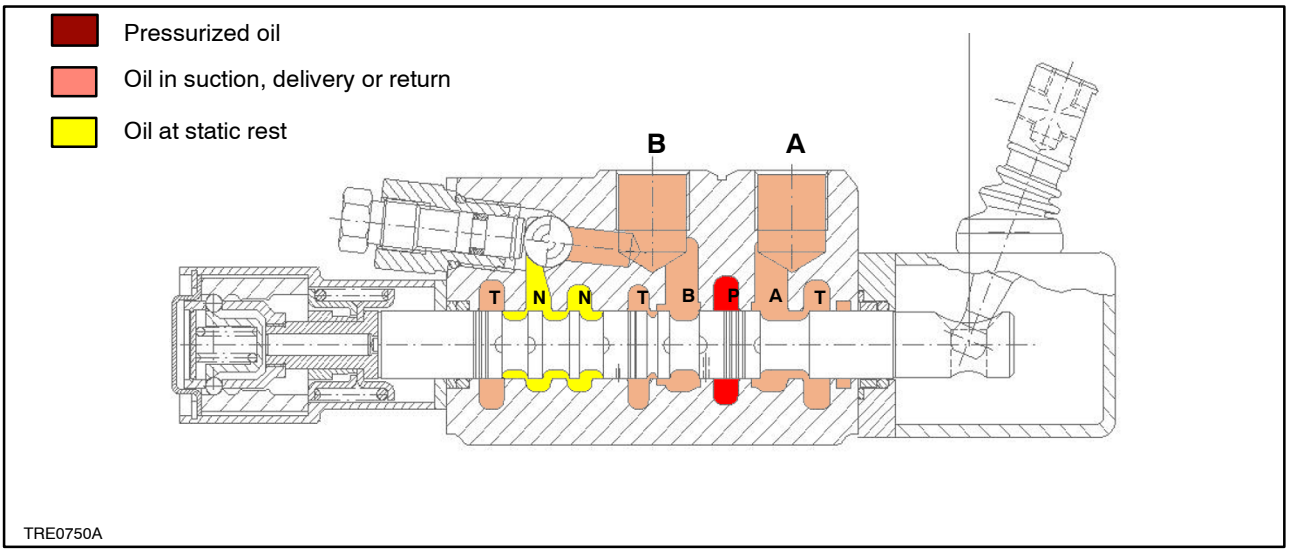
When the pin (4, fig. 5)) moves to the right, the detent balls (10, fig. 5)) enter the slot (8, fig. 5), remaining blocked by the support (12, fig. 5) and the spring (11, fig. 5). In this condition the oil contained in the lower chamber of the cylinder can flow to the exhaust (T) by way of line (B), while the upper chamber is connected with the pressure line (P) by way of line (A). On completion of the lifting operation, the detent will be automatically released as explained on page 4.



7

Operation in lowering phase.

When the pin (4, fig. 5)) moves to the left, the detent balls (10, fig. 5)) enter the slot (9, fig. 5), remaining blocked by the support (12, fig. 5) and the spring (11, fig. 5). The movement of the pin connects the delivery line (P) with the lower line of cylinder (B) and moreover the upper chamber with the discharge line (T), via line (A). The working principle of the automatic release is explained on page 4.



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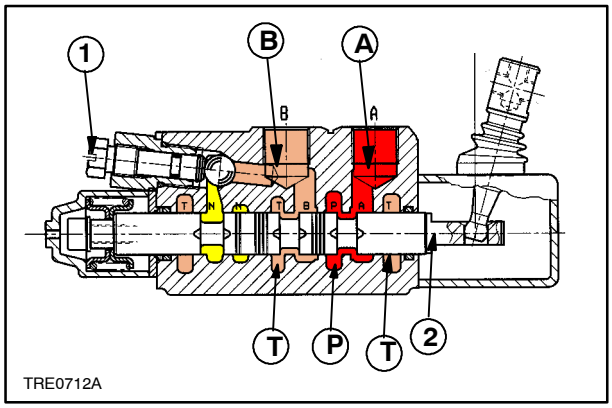
Float function

To select float mode operation, push the control lever in the cab fully forward. The pin of the control valve (4, fig. 5) moves and the detent balls (13, fig. 5) enter the slots (10, fig. 5), remaining blocked by the support (12, fig. 5) and by the spring (11, fig. 5). In this position the control valve pin directs the oil of ports A and B through the pipes to the discharge T. No pressure is applied to either port. In this condition, the only force acting on the attached implement is that of gravity due to its own weight and the weight of the hydraulic lift, which keeps the implement in contact with the terrain, following its contours. Automatic detent release does not occur during float control as there is no pressure inside the auxiliary control valve so the return to neutral is manual.

OPERATING STAGES OF AUXILIARY CONTROL VALVE FOR OPERATION OF A DOUBLE-ACTING CYLINDER (FIGS. 9 and 10) AND A SINGLE-ACTING CYLINDER (FIGS.11 and 12)

1. LIFTING - Pushing the control lever in the cab forwards moves the pin (2), thereby connecting the delivery line (P) with the cylinder lower chamber via line (A) and moreover the discharge line (T), via line (B), with the upper chamber of the cylinder. Keep the lever pulled back, to extend the cylinder to its full stroke. On releasing the lever it will automatically return to neutral position, under the action of the return spring, and the entire flow from the pump will be conveyed to the lift control valve by way of line (P).



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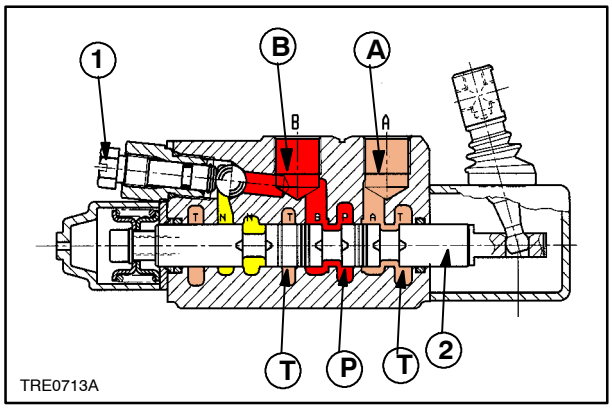
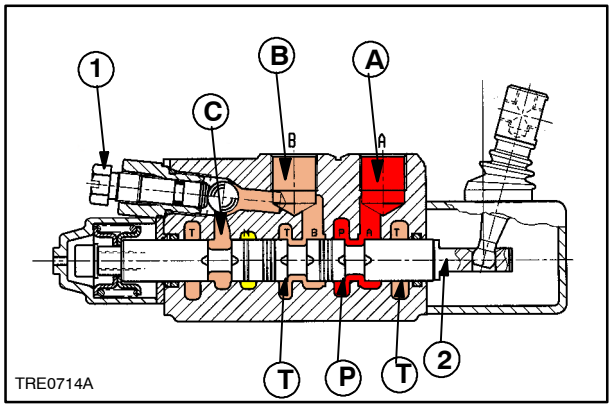
2. LOWERING - To lower the implement, pull the control lever (located in the cab) backward. The control valve pin (2) will move to the position indicated in fig. 10 and allows the oil contained in the lower chamber of the cylinder to flow to the exhaust (T) by way of line (A), while the upper chamber is connected with the pressure line (P) by way of line (B).



10

3. LIFTING - On pushing the control lever forwards, the pin (2) fig. 11 moves to connect the cylinder with the pressure line (P) by way of line (A). Line (C), for the control of single-acting cylinders, is not used as it is permanently connected to the exhaust (T) by the open position of the switching valve (1).



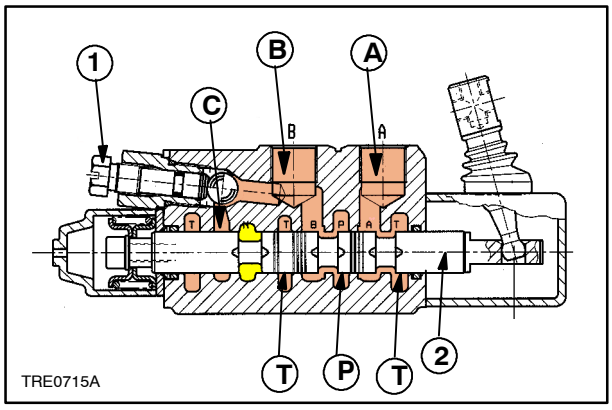
11

4. LOWERING - On pulling the control lever back, the control valve pin (2) moves as shown in fig. 12. The oil contained in the cylinder, pressurised by the weight of the lifted implement, will flow to the exhaust (T) by way of line (A), while the entire flow from the pump is also conveyed to the exhaust (T) through the line (B).

Pressurized oil

Oil in suction, delivery or return

Oil at static rest



12

Note. - To operate a double-acting cylinder, tighten screw (1) fully home. To operate a single-acting cylinder, fully undo screw (1).