SERVICE MANUAL

TK4030V / TK4050 / TK4050M / TK4060

Tractor

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Components of the pump units

I Lift pump: draws oil from the transmission
Mod. TK4030 For F5A engine
Mod. TK4050 and TK4060 For NEF engine
Ia Cooler pump for cooling the transmission oil: draws oil in conjunction with oil for the lift
II Steering-O-Matic Full Drive pump: draws oil from the tank under the hood
Mod. TK4030 For F5A engine
Mod. TK4050 and TK4060 For NEF engine

Pump inlet – delivery

A1 Lift pump suction
Mod. TK4030 For F5A engine
Mod. TK4050 and TK4060 For NEF engine
A2 Steering-O-Matic Full Drive pump suction
Mod. TK4030 For F5A engine
Mod. TK4050 and TK4060 For NEF engine

M_1 Delivery to the lift control valves and supplementary control valves
Mod. TK4030 For F5A engine
Mod. TK4050 and TK4060 For NEF engine
M_1 Delivery to the cooler with hot oil and bypass valve closed, to the transmission directly with the by-pass valve open
M_2 Delivery to the Steering-O-Matic Full Drive control valve
Mod. TK4030 For F5A engine
Mod. TK4050 and TK4060 For NEF engine

C_1 Mounting bolt for the cooler pump with lift pump
47 - 55 N·m (34.67 - 40.57 lb ft)
C_2 Mounting bolt for the pump unit
47 - 55 N·m (34.67 - 40.57 lb ft)
C_1 Mounting bolt for the lift pump
47 - 55 N·m (34.67 - 40.57 lb ft)

1. Lift pump base
2. Centering dowels
3. O-ring seal
4. Seal
5. Backup washer
6. Pump body
7. Driven gear
8. Driving gear
9. Centering pin and gear bushings
10. Seal
11. Snap ring
12. O-ring seal
13. Pump base
14. Lacing cable shafts **(8)** and **(15)**
15. Drive shaft of the cooler pump
16. Driven shaft of the Steering-O-Matic Full Drive pump
17. Steering-O-Matic Full Drive pump base

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Wiring harnesses - Electrical schematic sheet 01 – Starting, recharging and grid heater circuit

COMPONENT	DESCRIPTION
C–1	Front power connection (1 PIN)
GND–7	Control panel ground
C–16	Grid heater connection (6 PIN)
BAT–83	Battery
SW–83A	Battery cut-out switch
ALT–84	Alternator
M–85	Starter motor
SOL–94	Engine cut-out electromagnet
SOL–95	Solenoid valve to cut out starting advance, depending on temperature
SEN–96	Starting-advance thermometric cut-out switch
MOD–156	Grid heater module
RLY–157	Grid heater relay (coil)
RLY–158	Grid heater relay (power)
RES–159	Inlet grid heater
F–160	**125 A** maxi-fuse
F–169	**50 A** maxi-fuse
F–001	**10 A** fuse for power supply of memories and safety systems
* – In North American markets, there is no battery cut-off switch. The lines: To the starter motor M–35 (N 50) To the **50 A** maxi-fuse **F–169** (L10) run directly from the positive pole of the battery.	
** – In North American markets there is no battery cut-off switch. This means that there is no memory cable with **5 A** fuse **F–001** direct to the connector **C–31**. See **Wiring harnesses - Electrical schematic sheet 02 (55.100)**.	

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c – RLY−2 pin 87 and RLY−2 pin 30
in case a) there will always be continuity
in case b) and case c) there will be no continuity
If you power pin 86 and you ground pin 85, there will be:
in case b) a continuity interruption
in case c), on the other hand, there will be continuity
If the relays do not show these characteristics, replace the relays.

B. Otherwise, test the continuity between:
a – RLY−3 pin 30, wire 0.5VN and RLY−1 pin 30, wire 0.5VN and RLY−2 pin 30, wire 0.5VN
b – RLY−2 pin 85, wire 0.5N and RLY−1 pin 85, wire 0.5N and ground
c – RLY−3 pin 85, wire 0.5N and ground
If there is no continuity, repair the wire harness. In case a), also look for a short circuit to ground.

C. Then measure between:
RLY−3 pin 30, wire 0.5VN and RLY−1 pin 30, wire 0.5VN
RLY−2 pin 30, wire 0.5VN and ground
If there is continuity, repair the wire harness. Otherwise, proceed to the next step.

D. Disconnect the connector of the operator safety control module **MOD–24** and the operator presence sensor **SEN–32**. Look for continuity between:
MOD–24 pin 8, wire 0.5R and RLY−2 pin 87a and pin 86, wire 0.5R and RLY−3 pin 87a, wire 0.5R
MOD–24 pin 3, wire 1Z, and RLY−1 pin 86, wire 1Z and SEN−32 pin 2, wire 1Z
MOD–24 pin 6, wire 0.5ZN and RLY−1 pin 87a, wire 0.5ZN
If there is no continuity, repair the wire harness.

E. Search for a short circuit to ground between:
MOD–24 pin 8, wire 0.5R and ground
MOD–24 pin 3, wire 1Z and ground
MOD–24 pin 6, wire 0.5ZN and ground
If there is continuity, repair the wire harness.

F. Rotate the ignition switch to the power position. Look for voltage on:
RLY−1 pin 87a, wire 0.5ZN and ground
If a voltage of **12 V** is not found, repair the wire harness or replace the fuse F−25 **5 A** if blown.
Reconnect the three relays RLY−1, RLY−2, and RLY−3.

G. Rotate the switch to the power position. Test the voltage at:
MOD–24 pin 1, wire 0.5AB and ground
MOD–24 pin 4, wire 0.5AB and ground
If a voltage of **12 V** is not found, repair the wire harness or replace the **5 A** fuse F−29 if blown.

H. Disconnect the hand brake switch **SW–39**. Disconnect the power take-off switch **SW−111**. Check for continuity between:
MOD–24 pin 7, wire 1HG and **SW−111** pin 2, wire 1HG
MOD–24 pin 5, wire 1N and ground
MOD–24 pin 2, wire 1BN and **SW–39** pin 1, wire 1BN
If there is no continuity, repair the wire harness. Reconnect the connector to the control module of the grid heater.

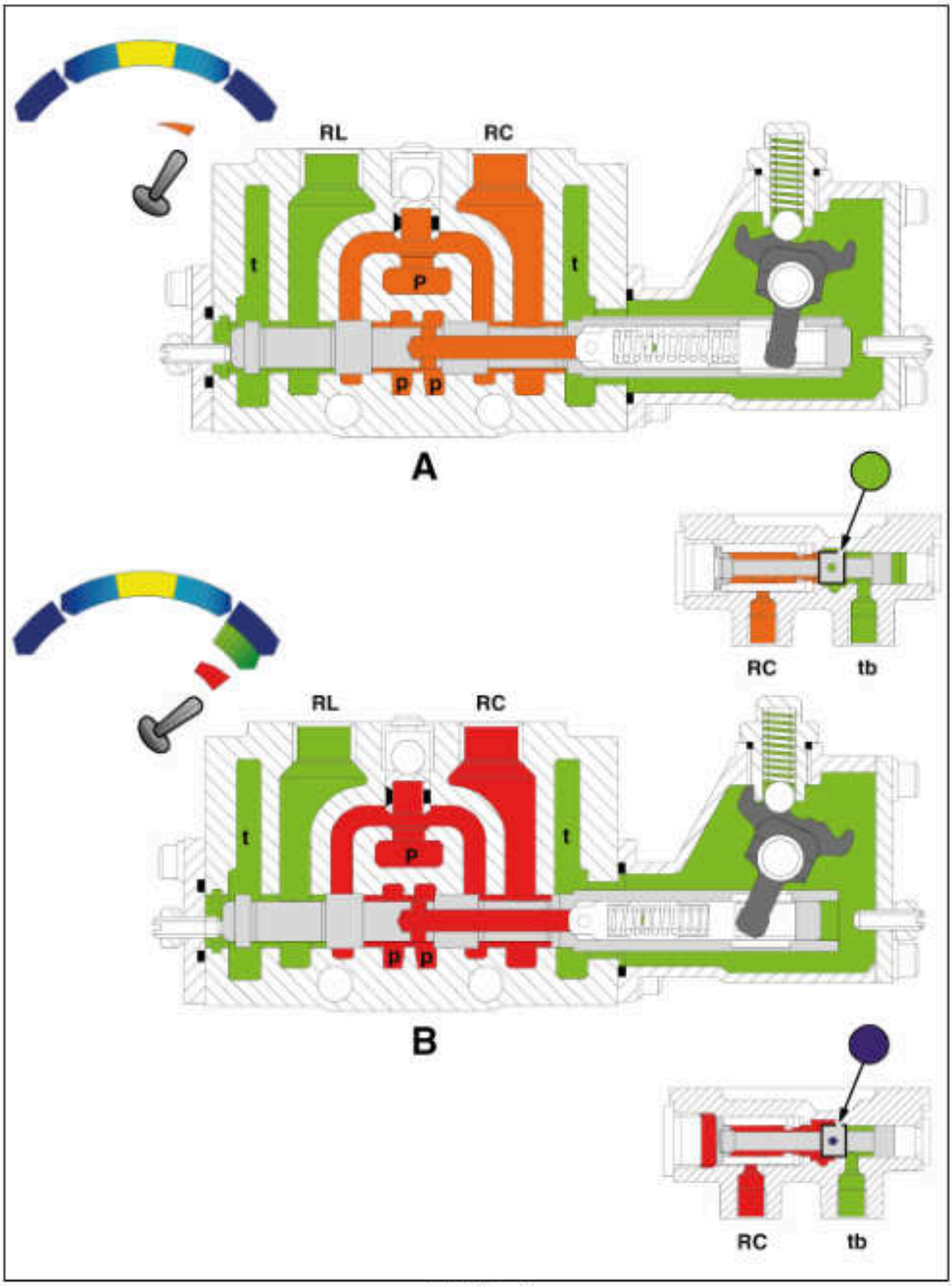
4. Check the power take-off switch and the hand brake switch **SW−111** and **SW–39**.

A. Measure the continuity between:
SW−111 pin 3 and pin 2 (with power take-off engaged, switch push button at rest)
SW–39 pin 1 and pin 4 (with the brake disengaged, switch push button depressed)
SEN–32 pin 1 and pin 2 (with the operator seated, switch closed)
If there is no continuity, replace the push button.

B. Measure the continuity between:
SEN–32 pin 1, wire 1ZN and **SW−111** pin 3, wire 1ZN
SW–39 pin 1, wire 1N and ground
If there is no continuity, repair the wire harness.

C. Search for a short circuit to ground. Measure the continuity between:

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With the spool fully to the left, connect the pipe "c" with the pipe "f" to make the oil reach the bottom ring chamber of the piston "i" (normally on discharge), in the clutch disengagement phase and the brake engagement phase.

The spool and the piston are kept in neutral (with the pipe "c" not connected with "e" and "f") by spring **(5)**. This works between the cups **(4)** (which press the spring when the spool moves to the right) and **(6)** (which press the spring when the spool moves to the left) through a stroke determined by the spacer **(7)**.

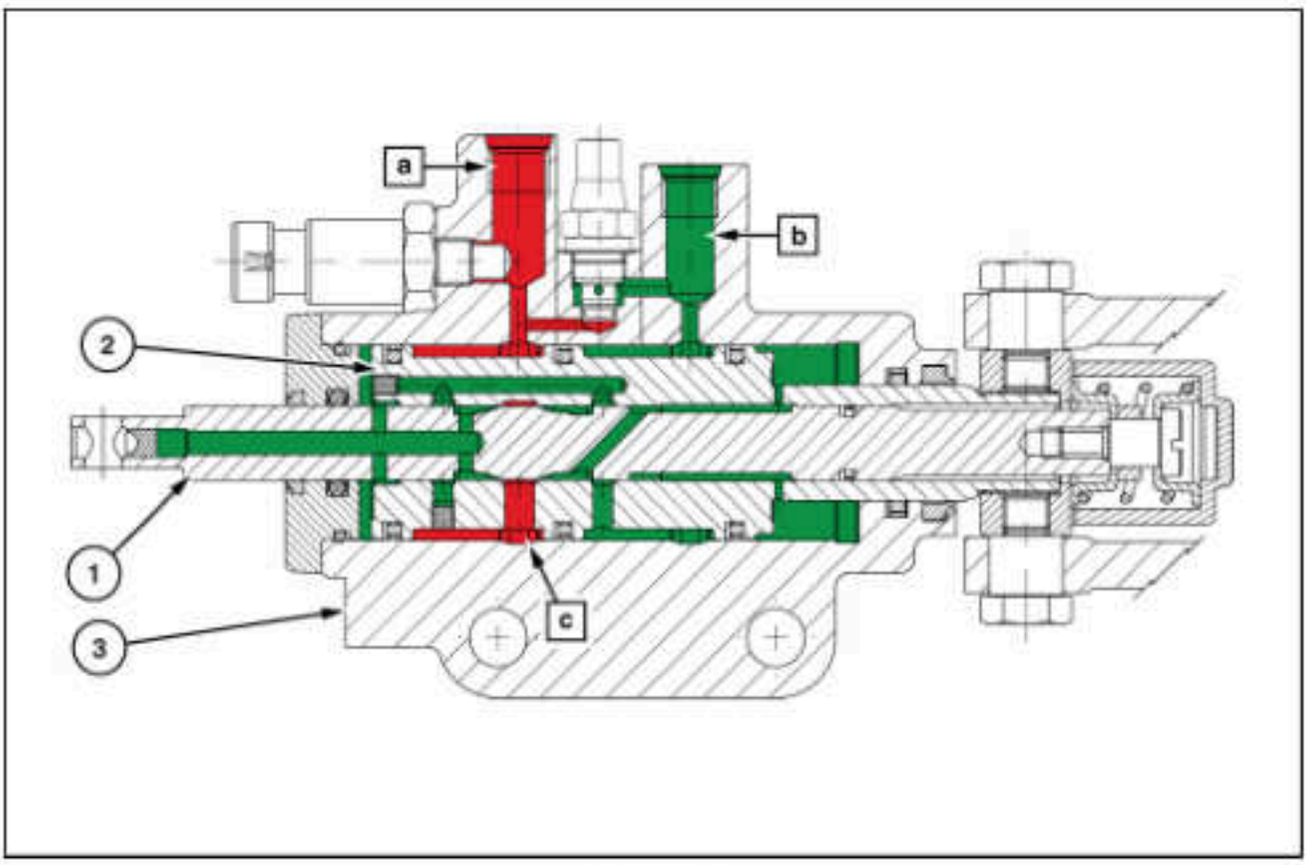
The spring **(13)** (**Clutch hydraulic release control - Special tools (18.104)**/B **Clutch hydraulic release control - Component localization (18.104)**) holds the spool-piston assembly in position in relation to the cylinder. The spring operates between the drive console support **(7)**, (**Clutch hydraulic release control - Special tools (18.104)**/B) and the roller lever **(12)**, (**Clutch hydraulic release control - Special tools (18.104)**). The roller **(14)**, (**Clutch hydraulic release control - Special tools (18.104)**/B **Clutch hydraulic release control - Component localization (18.104)**) runs on the cam **(3)**, (**Clutch hydraulic release control - Special tools (18.104)**/B **Clutch hydraulic release control - Component localization (18.104)**) operated by the longitudinal movement of the joystick.

The roller can have three well-defined positions

A. Clutch disengaged stable position (if the operator releases the joystick it will not change position).
   Position the spool-piston assembly shown in Fig. **1** The roller is placed on the bottom race of the cam (see "a", **Clutch hydraulic release control - Special tools (18.104)**/C **Clutch hydraulic release control - Component localization (18.104)**).

B. Clutch engaged stable position.
   Position the spool-piston assembly shown in Fig. **4** The roller is placed on the top race of the cam (see "b", **Clutch hydraulic release control - Special tools (18.104)**/C **Clutch hydraulic release control - Component localization (18.104)**).

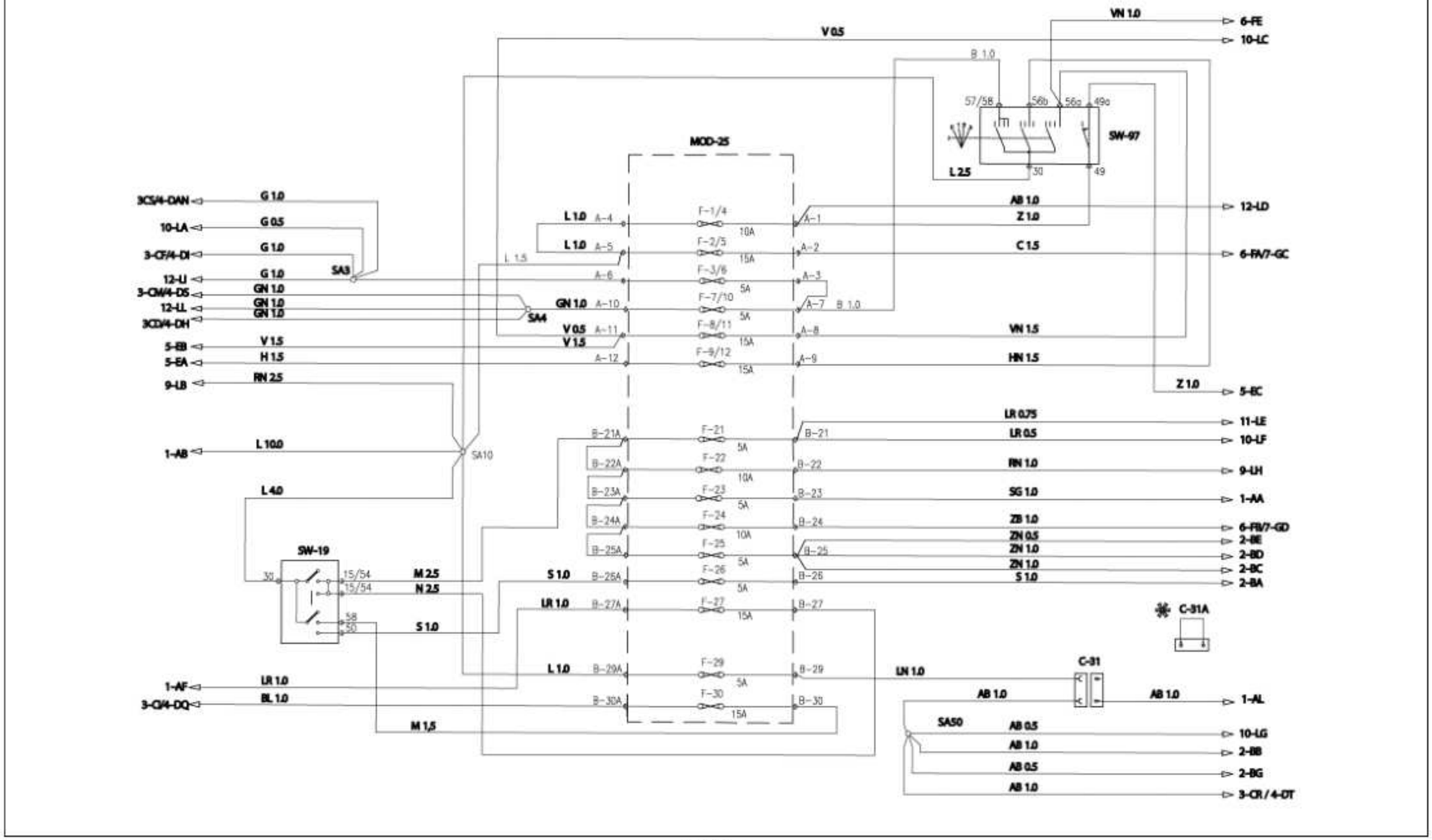
C. Brake engaged unstable position (if the operator releases the joystick it will return to the clutch disengaged position).
   Position the spool-piston assembly shown in Fig. **7** The roller is placed on the bottom ramp of the cam (see "c", **Clutch hydraulic release control - Special tools (18.104)**/C **Clutch hydraulic release control - Component localization (18.104)**). On releasing the joystick the spring tends to close the coils and the roller returns to the clutch disengaged position (see "a", **Clutch hydraulic release control - Special tools (18.104)**/C **Clutch hydraulic release control - Component localization (18.104)**).



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Clutch disengaged

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