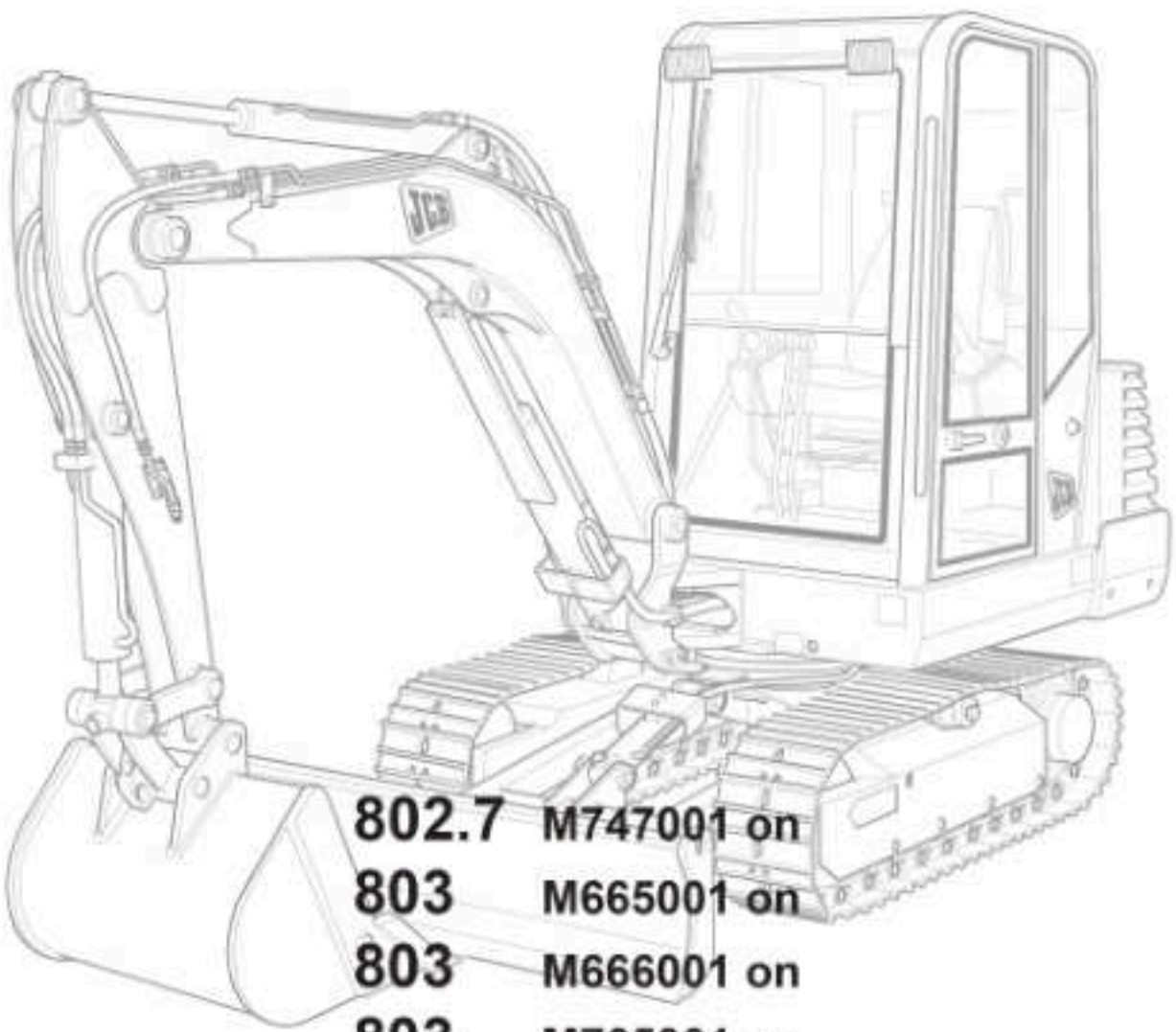
HYDRAPOWER

MINI-EXCAVATOR SERVICE MANUAL



802.7	M747001 on
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804	M734001 on

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Publication 9803/3110

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HYDRAULIC CIRCUIT (SCHEMATIC)
804 machines

Component Key

P1	Pump Section 1
P2	Pump Section 2
P3	Pump Section 3
T	Tank
E	Engine
1A	Swing/Slew/Dozer Main Relief Valve
***1B**	Excavator/Track M.R.V.
1C	Servo Main Relief Valve
1G	Gauge Connection Point
2	Valve Block
2A	Auxiliary Relief Valve
***2B**	RH Track Spool
***2C**	LH Track Spool
2D	Boom Boost Spool
2E	Dipper Spool
2F	Non-return Valve
2G	Auxiliary Couplings (Double Acting)
2H	Auxiliary Couplings (Single Acting)
3	Valve Block
3A	Auxiliary Relief Valve
***3B**	Auxiliary Spool
3C	Boom Spool
3D	Bucket Spool
***3E**	Anti-cavitation Valve
3F	Restrictor
***4B**	Swing Spool
***4C**	Slew Spool
4D	Dozer Spool
5	L.H. Track Motor
5A	Counterbalance Valve
***5B**	Two Speed Tracking Valve
6	R.H. Track Motor
6A	Counterbalance Valve
***6B**	Two Speed Tracking Valve
7	Slew Motor
7A	Brake Valve
8	Rotary Coupling
9	Dipper Ram
10	Boom Ram
11	Bucket Ram
12	Swing Ram
13	Dozer Ram
14	R.H. Servo Hand Controller
14A	Boom Control
14B	Bucket Control
14C	Check Valves (Standard setup)
15	L.H. Servo Hand Controller
15A	Swing / Slew Control
15B	Dipper Control
***16**	Dual Solenoid Valve Slew/Swing Changeover Valve
17	Return Filter
18	Suction Strainer
19	High Speed Selector
20	Accumulator
21	Solenoid Lock Valve
23	Servo Pressure Maintenance Valve Block
23A	Pressure Maintenance Valve
23B	Restrictor
24	Oil Cooler

*The 3.4 Tonne mini-excavator hydraulic circuit is fed from an hydraulic tank **T**, located to the right of the operator's cab.

The system is powered by a single piston pump **P** connected to the engine crankshaft. The supply from the pump is divided into two equal flows **P1** & **P2**. Pump **P3** is a gear pump attached to the back of the piston pump and driven by a common shaft.

When the engine is running, the pump sections **P1/ P2** and **P3** draw fluid from the tank **T**. Oil from sections **P2** and **P3** is routed through the centre inlet section of the six section control valve block **1**, a high pressure carry over (H.P.C.O.) hose **22** allows oil to flow from the six section valve block into the four section valve block **3** to supply the auxiliary circuit, breaker /auger etc., along with flow from gear pump **P3**. Pump section **P3** is routed through a servo pressure maintenance valve block **23** and on into the inlet section of the four spool control valve block.

Pump section **P1** supplies the control valve sections for:

- Right hand track motor, **6**
- Boom ram, **10**
- Bucket ram, **11**

Pump section **P2** supplies the control valve sections for:

- Left hand track motor, **5**
- Dipper ram, **9**
- Boom boost, **2D**
- Auxiliary **2B** (supplied by **P2** & **P3** combined)

Pump section **P3** supplies the control valve sections for:

- Dozer ram, **13**
- Swing ram, **12**
- Slew motor, **7**
- Servo hand controllers
- High speed track selector **19**

The supply line to the high speed track selector and servo hand controllers is via a solenoid lock valve **21**.

Main Relief Valves

The main relief valve for **P1** is located in the front of the centre inlet section of the six spool control valve block. The main relief valve for **P2** is located at the rear of the centre inlet section and both are set to open at 207 bar (3000 lbf/in²). **P3** is located in the inlet section of the four spool valve block and is set to open at 150 bar (2170 lbf/in²). The valves are designed to protect the pumps against over pressurisation when a selected service is stalled or a ram reaches the end of its travel. The M.R.V opens to vent excess pressure to tank **T**. Connections to the pump outlet ports allow the attachment of pressure gauges to permit the setting of the main relief valves.

Auxiliary Relief Valves

Auxiliary relief valves (A.R.V.), are fitted to protect the dipper, boom and the head side only of the dozer ram from damage that might be generated through over-pressure conditions during operation. The A.R.V.'s are set to operate at the following pressures:

- Auxiliary service A.R.V.'s - 172 bar (2500 lbf/in²)
- Dipper ram A.R.V.'s - 248 bar (3600 lbf/in2)
- Boom ram A.R.V.'s - 248 bar (3600 lbf/in²)
- Dozer ram A.R.V.'s - 200 bar (2900 lbf/in²)

When the A.R.V.'s are open, excess pressure is vented back to tank **T**.

The service lines to the dozer ram, the track motors and the pilot line from the high speed selector to the track motors are routed through a rotary coupling **8**. This device allows the machine upper structure to turn without damaging hoses connected to services mounted on the undercarriage.

The remaining service lines connect directly to their relevant devices. Return fluid from services or from the neutral circuit is routed back to tank through an exhaust line, cooler and return filter **17**.

NEUTRAL PRESSURE CIRCUIT

With the engine running, and no services selected oil flow from pumps **P1**, **P2**, and **P3** circulates through the valve blocks.

The valve spools are spring loaded to the centre neutral position allowing the hydraulic fluid to pass through their open centres and back to tank via an oil cooler **24** and filter **17**.

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