Service Manual

3DX Backhoe Loader

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Hammer Master 360

Technical Data

Working weight (including tool and side plates)	405 kg (891 lbs)
Impact Energy	730 Joules
Impact Rate	600 - 1800 blows / min.
Operating pressure	100 - 130 bars (1450 - 1885 lbf/ in)
Pressure relief setting limits of carrier ARV	130 - 220 bar (1885 - 3190 lbf / in)
Oil supply	50 - 150 l min. (11 - 33 gal/ min.)
Return line back pressure (max)	30 bar (435 lbf / in)
Input power (max)	40 kW
Output power (max)	22 kW
Port adapters - Hammer master/ connecting hoses	
Pressure line	3/4" BSP (male)
Return line	1" BSP (male)
Connecting hose inner diameters	
Pressure line	19 mm
Return line	25 mm
Oil temperature range	- 20 °C to + 80 °C
Carrier weight	5 - 8. 5 T
Tools (Moil Point and Chisel)	
Length	730 mm
Weight	20 kg
Shank diameter (new)	70 mm
Shank diameter (minimum allowable)	68 mm
Bushings	
Diameter (new)	70 mm
Diameter (max allowable)	72 mm
Accumulator charging pressure	
Low pressure accumulator	12 bar
High pressure accumulator	40 bar

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Panel harness 4 WD

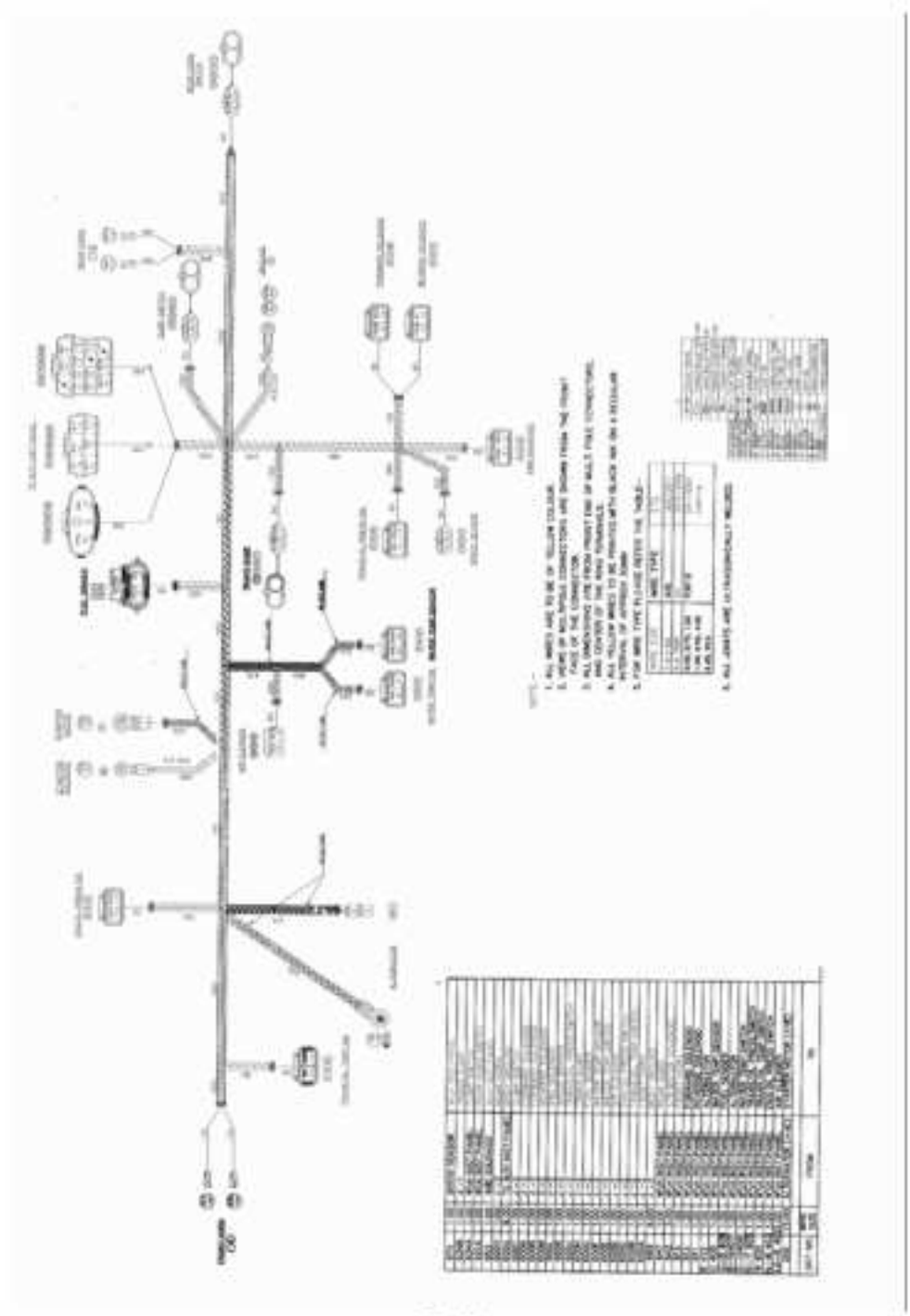


Fig 21.

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Table 9. Poor braking (not pulling to one side).

Possible Cause	Action
22 Friction plates worn beyond limits or distorted.	Renew friction and counter plates - BOTH sides of relevant axle.
23 Master cylinder fault.	See Item **1**.
24 Annular piston fault.	See Item **35**.
25 Incorrect or low axle oil.	Fill axle with correct type of oil.

Table 10. Brakes not releasing.

Possible Cause	Action
26 Brake pedal spring fault.	Fit a new spring.
27 Master cylinder fault (plunger stuck in bore).	See Item **1**.
28 Blocked hole in master cylinder reservoir cap.	Fit a new reservoir cap.
29 Brake pedal free travel incorrect.	Adjust pedal free travel.
30 Fluid contamination and seal damage.	Flush system and renew hydraulic seals.
31 Annular brake piston(s) binding in axle.	– Check that correct brake fluid has been used (incorrect fluid could swell the annular brake piston seals). – Check if annular brake piston seals in good condition. – Check that annular brake piston rotates freely in its housing with no seals fitted. – Check that the annular brake piston seal retracts the piston approximately 0.5 mm (0.020 in).
32 Kinked or crushed brake pipes.	Check and renew pipes as required.
33 Friction and counter plates not free on splines or dowels.	Check friction and counter plates for free movement, renew if required - BOTH sides of relevant axle.

Table 11. Poor braking when hot.

Possible Cause	Action
34 Moisture in system vaporising when axle is hot.	Strip axle and clean annular piston to remove moisture. Remove master cylinder and check for corrosion, service as required. Flush hydraulic brake system.

Table 12. Excessive brake noise in operation.

Possible Cause[1]	Action
35 Deterioration of axle oil or wrong type of axle oil.	Change axle oil.
36 Axle oil loss.	Refill axle with correct oil and check for leaks.
37 Friction plates worn beyond limits.	Renew friction and counter plates.
38 Friction and counter plates in poor condition.	Check for distortion or surface pitting and roughness of friction and counter plates (annular grooving of counter plates is acceptable).

(1) Due to the metal to metal contact of oil immersed brakes, limited noise can be heard which is consistent with this type of design - this is normal.

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2/4 Wheel Drive Clutch Operation

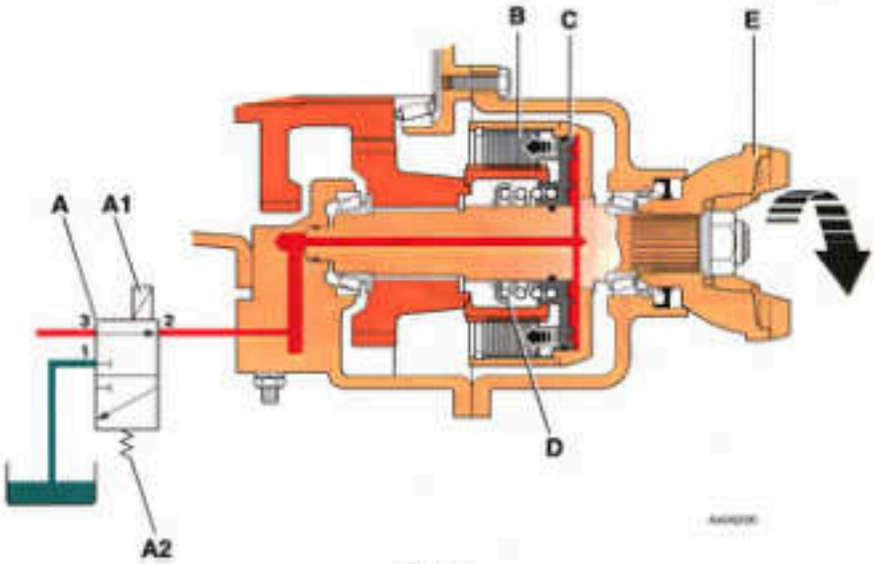


Fig 88.

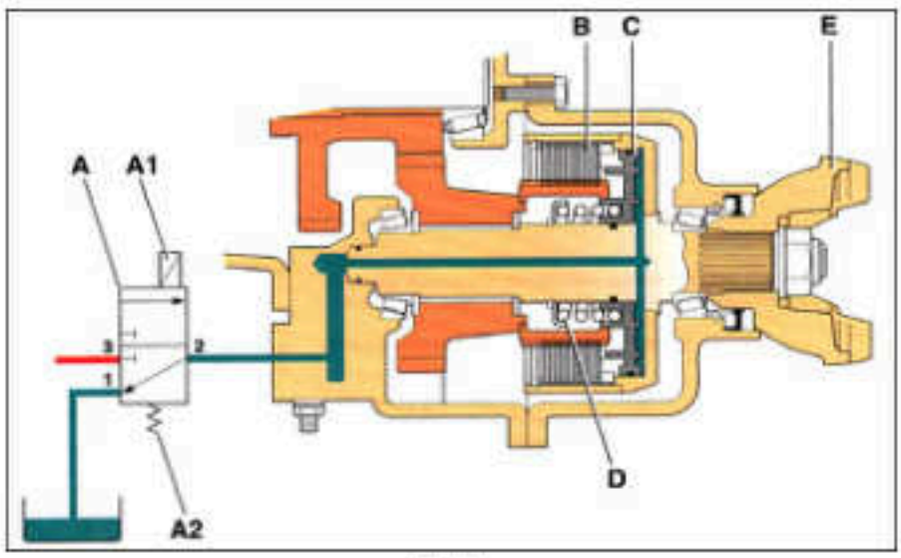


Fig 89.

Synchro Shuttle Gearbox 2/4 Wheel Drive Clutch Operation - Pressure ON/Spring OFF Type 4 Wheel Drive Operation

This clutch is of the 'Pressure-ON (4WD)/Spring-OFF (2WD) type. The clutch is engaged and disengaged by introducing or dumping pressurised oil behind piston C via a solenoid valve A. The solenoid valve is operated by a switch in the cab ⇨ *Fig 88. (🗋 84)*.

When the switch is in the 4 wheel drive position, solenoid valve A is energised. The energised solenoid A1 causes the valve spool to move and form a connection between ports 3 and 2.

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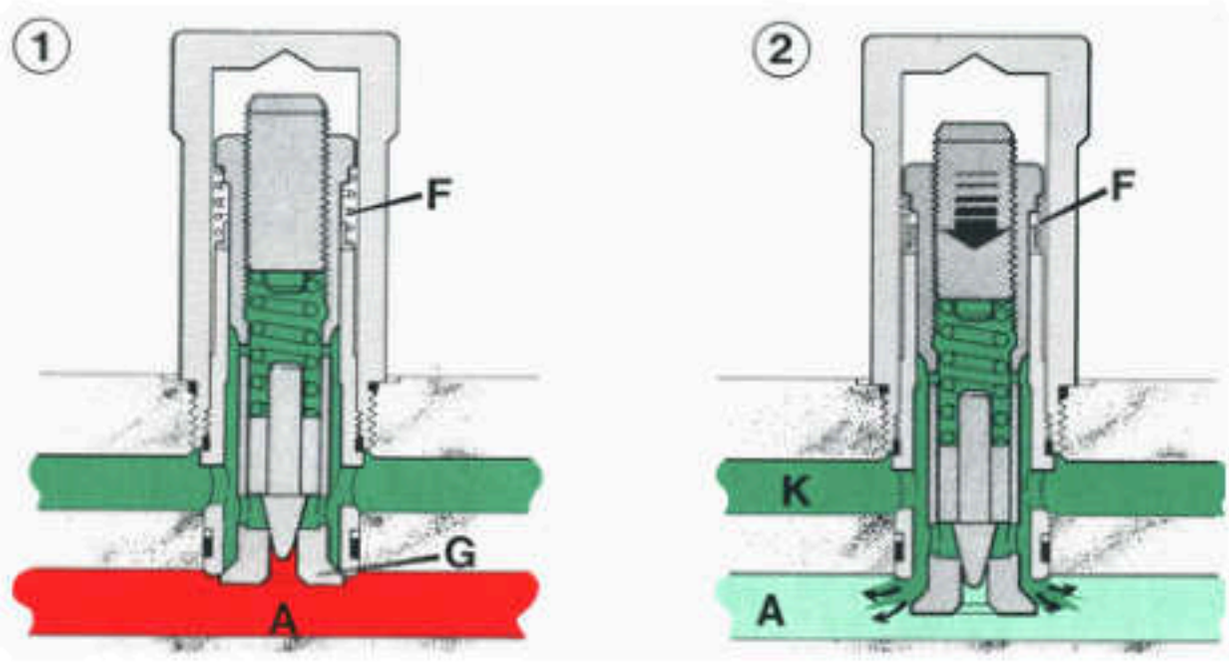


Fig 65.

Excavator Valve - Dipper Make-Up Check Valve and Anti-Cavitation Operation

The illustration shows the dipper spool 4**E** fully selected to lower the loader bucket ⇨ *Fig 66. (🗋 E-80)*.

As the engine is running slowly, and the ram is opening quickly, the pressure in the parallel gallery **B** falls to a lower level than that in the exhaust gallery. This causes A.R.V. 4M to open but the flow past the A.R.V. is insufficient to keep the head side of dipper ram 55 filled with oil.

Additional flow from the exhaust gallery is therefore provided by means of the make-up check valve 4X which opens due to the pressure differential.

The combined flow past A.R.V. and make-up check will ensure that sufficient oil is fed to the head side of the ram to maintain smooth operation of the service as the dipper goes past the vertical.

The make-up check valve will open in the same way to prevent cavitation when other services are operated.

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