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MANUAL PREVIEW

Long
Service Manual
1400

Tractor, Loader & Backhoe
5-11-1 Super II

Service Manual

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LO-S-1400

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**Model 1400
5-N-1 Super II**

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Pages 3-9

Pages 9-18

Know your machine; read the Service Manual carefully; follow all its safety precautions. Always think before you act.
Remember . . . No One Can Practice Safety For You.

NOTE: The Index above lists the major components of the 5-N-1. For additional listings under each component, see the index given at the commencement of each section.

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LONG 5-N-1
GENERAL DATA—continued

Flywheel and starter ring

Maximum thickness of metal to be removed during 'skimming'	$\frac{3}{32}$ in. (2.38 mm.).
'Run-out' of flywheel on assembly	Zero to .003 in. (.08 mm.).
Number of teeth on starter ring	126.
Width of land on engagement face of teeth	.062 to .072 in. (1.57 to 1.83 mm.).
Starter ring to flywheel interference	.021 to .029 in. (.53 to .74 mm.).
Starter ring fitting temperature	275° C. (527° F.).

Oil pump

Driving shaft to pump body clearance	.0025 in. (.063 mm.) maximum.
Rotor end-float	.002 to .0045 in. (.05 to .11 mm.).
Rotor lobe clearance	See Section A.7.
Number of teeth on driving and driven gears	46.
Backlash between gears	.004 in. (.10 mm.).
Thickness of body shims	.002 and .003 in. (.05 and .08 mm.).
Capacity	6 $\frac{3}{4}$ gal./min. (30.7 litres/min.) at 60 lb./sq. in. (4.22 kg./cm. ²) at 1,000 r.p.m.

Main oil relief valve

Spring free length:	
First type	2 $\frac{1}{8}$ in. (54 mm.).
Second type	2 $\frac{15}{16}$ in. (74.5 mm.).
Third type	2 $\frac{17}{64}$ in. (57.6 mm.).
Spring fitted length:	
First type	1 $\frac{1}{16}$ in. (27 mm.).
Second type	1 $\frac{3}{4}$ in. (44.5 mm.).
Third type	2 in. (50.8 mm.).

Load to compress spring to fitted length:

First type	5 lb. (2.27 kg.).
Second	11 lb. 14 oz. (5.4 kg.).
Third type	11 lb. 12 oz. (5.33 kg.).

Valve rocker oil relief valve

Spring free length	$\frac{3}{4}$ in. (19 mm.).
Spring fitted length	$\frac{5}{8}$ in. (16 mm.).
Load to compress spring to fitted length	3 oz. (85 gm.).
Diameter of ball	.236 in. (6 mm.).

Oil pressure (engine hot)

Idling speed	10 to 15 lb./sq. in. (.7 to 1.05 kg./cm. ²).
Normal running speed	35 to 60 lb./sq. in. (2.46 to 4.22 kg./cm. ²).
Oil filter	Purolator or Vokes.

COOLING SYSTEM

Water pump

Impeller vanes to pump body clearance (shim adjustment)	.008 to .010 in. (.2 to .25 mm.).
Shim thickness	.008 in. (.2 mm.), .015 in. (.4 mm.), and .028 in. (.7 mm.).
Fit of fan hub on pump spindle	.0015 to .0028 in. (.04 to .07 mm.) interference.
Fit of impeller on pump spindle	.001 to .0023 in. (.03 to .06 mm.) interference.
Impeller vanes to impeller housing clearance	.010 to .021 in. (.25 to .53 mm.).

Adjust the valve rocker clearance (see Section A.11) and replace the remaining components in the reverse order to that in which they were removed.

Start the engine and inspect the rocker cover joint for oil leaks.

Section A.10

DISMANTLING AND REASSEMBLING THE ROCKER SHAFT ASSEMBLY

Unscrew the two set bolts from the center rocker bracket and separate the two rocker shafts from the center bracket.

Remove the rockers and distance collars and the remaining brackets from the rocker shafts, and unscrew the blanking plug from the end of each shaft.

Release the tab washer from the oil relief valve drain pipe on the front intermediate bracket and unscrew the relief valve from the bracket.

Remove the plug from the relief valve body and withdraw the spring, spring seat, and relief valve ball.

Clean all the dismantled components, paying particular attention to the oil ways.

Inspect the components and check them against the specifications in 'GENERAL DATA'.

When reassembling, which is a reversal of the dismantling procedure, smear all moving parts with new engine oil, renew the tab washer and copper gaskets on the oil pressure relief valve, and fit the drain pipe so that it is directed down the push-rod tunnel. Also ensure that the rocker shaft distance collars are correctly positioned (see 'GENERAL DATA').

Section A.11

VALVE ROCKER CLEARANCE

The clearance between the ends of the valve stems and the valve rockers is checked by means of a feeler gauge.

Crank the engine until No. 3 valve is fully open and check the clearance of No. 1 valve which will now be fully closed.

To adjust the clearance, hold the adjusting screw with a screwdriver and slacken the locknut (see Fig. A.6). Rotate the adjusting screw until the clearance between the valve stem and rocker is as given in 'GENERAL DATA'. Hold the adjusting screw against rotation and lock it in position with the locknut. Then re-check the clearance.

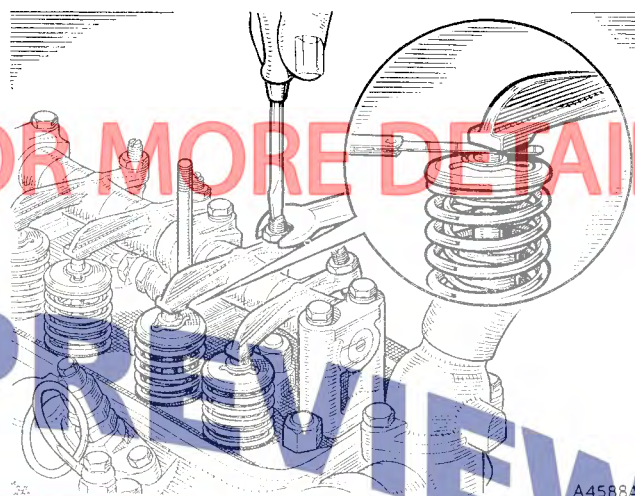


Fig. A.6

Adjusting the valve rocker clearance

Check the remaining rocker clearances by reference to the following table:

- No. 1 valve (ex.) with No. 8 valve fully open
- No. 3 valve (in.) with No. 6 valve fully open
- No. 5 valve (ex.) with No. 4 valve fully open
- No. 2 valve (in.) with No. 7 valve fully open
- No. 8 valve (ex.) with No. 1 valve fully open
- No. 6 valve (in.) with No. 3 valve fully open
- No. 4 valve (ex.) with No. 5 valve fully open
- No. 7 valve (in.) with No. 2 valve fully open

The valve rocker clearance should be checked at every 400 hours.

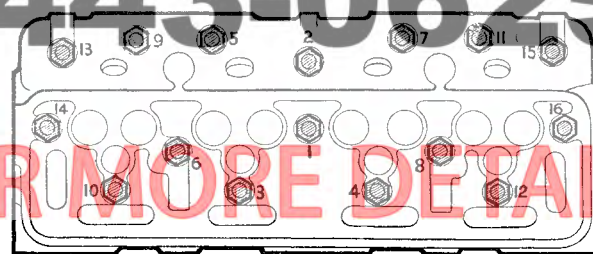
Section A.12

REMOVING AND REPLACING THE CYLINDER HEAD

Remove the valve rocker shaft assembly (see Section A.9) and withdraw the push-rods. As each push-rod is withdrawn it should be labelled and numbered to ensure replacement in its original position.

Drain the cooling system (see Section B.7).

Disconnect the hose from the water outlet pipe and the by-pass hose from the thermostat housing.



AD932

Fig. A.7

Cylinder head nut slackening and tightening sequence

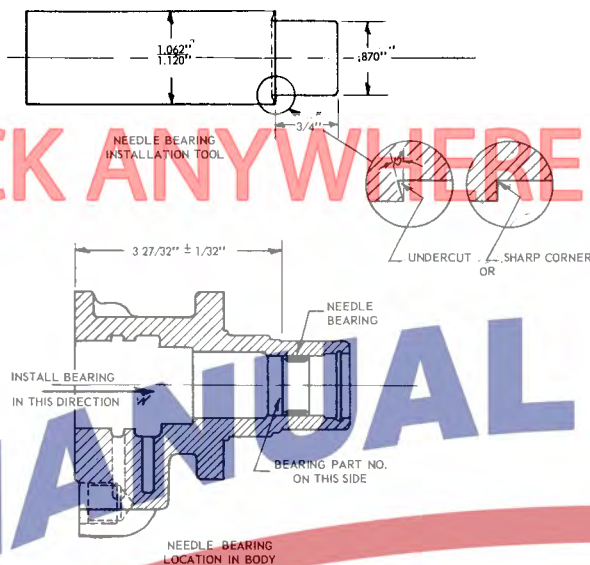


Fig. X.85

slowly and do not misalign bearing. Press bearing into a specific location, $3-27/32'' - 1/32''$ measured from lower end face of pump body to lower end of bearing. (See Figure X.85)

Bearing rolls must turn freely after installation.

2. Carefully clamp pump housing (13) in vise across mounting flange with bottom end up.
3. Assemble needle thrust bearing (11) and bearing race (12) to coupling shaft (10) and assemble shaft in pump body. Seat coupling shaft against bearing and make sure shaft turns freely.
4. Assemble pin (7) in one end of rotor drive link (8) and install pin into slot of coupling shaft.
5. Assemble pin (8A) in commutator (9). Hold in place with grease.
6. Assemble commutator (9) in lightly oiled commutator bore and engage driving pin (8A) in one of the driving slots of the coupling. (Avoid engaging pin in shallow slot.) CAUTION: Commutator must be carefully inserted with a slight rotary motion to avoid cocking and seizure. See Figure: X.87
7. Place spacer plate (6) on end face of pump body and line up so that the channel holes and cap screw holes of both pieces coincide.
8. Assemble pin (7) in upper end of rotor drive link (8).
9. Place rotor of rotor set (5) on spacer plate (6) and engage rotor with pin (7). Then set stator in place and line up cap screw holes.
10. Lightly lubricate edges of seal (4) with grease and assemble with seal retainer (3) to outer diameter of rotor set and spacer plate.

11. Place end plate (2) on rotor set. (Place lapped face against rotor set.) Line up holes.
 12. Assemble the seven special screws (1) loosely, tighten with finger torque, then with torque wrench
- (Continued on page 216)



Fig. X.86



Fig. X.87