Huber

Service, Parts, & Operator's Manual

M150 Grader

Service Manual

HU-SOP-M150

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Figure 4—Rear View of Maintainer

1. Gear shift lever
2. Parking brake lever
3. Steering wheel
4. Control lever to left cylinder
5. Control lever to right cylinder
6. Control lever to blade shift cylinder or front lift cylinder
7. Throttle control lever
8. Clutch shift lever
9. Starter and light switch
10. Ammeter gauge
11. Starter push button
12. Choke button
13. Engine oil gauge
14. Hydraulic brake pedal
15. Trip pedal—right
16. Trip pedal—left
17. Seat
18. Tail light
19. Transfer valve

(3) CAMSHAFT—The camshaft is supported on four bearings in the crankcase. These bearings are of the removable babbitt type.

(4) LUBRICATING SYSTEM—The oil pump is of the gear type and is fastened to the cylinder block so that the suction end is in the oil pan and needs no priming. The oil under pressure, automatically controlled or regulated by a compression spring which controls a relief or by-pass valve, is delivered through suitable connections to a drilled passage in the crankcase, and this drilled passage extends from the front to the rear of the engine. The passage is closed at either end by means of suitable plugs. Radial holes are drilled from the crankshaft bearing to meet this horizontal oil passage and this permits oil to be delivered under pressure to the main bearings and through drilled holes in the crankshaft to the connecting rod bearings. The cylinder bores, tappets, and valve stems are lubricated by means of the mist of oil thrown off around the connecting rod bearings.

(5) CONNECTING RODS — The connecting rods are of the precision shell type. The cap and rod are split slightly below center so the split in the shell opposite the locking lugs does not match with the split in the forging.

(6) PISTON PINS—The piston pin is clamped in the top of the connecting rod and this construction prevents the piston pin from working loose and scoring the cylinder walls. The piston pin lock screw is prevented from working loose by a shake-proof lock washer.

(7) PISTONS — The pistons are cast iron and have bronze bushings for the piston pin. Each piston has three compression rings, and one oil control ring.

(8) VALVES — Both the intake and exhaust valves are made of special heat-resisting steel.

(9) MAIN BEARINGS — The use of seven main bearings permits a main bearing being placed on each side of each connecting rod. The main bearings are of the precision shell type and there is a

Figure 5—Left-Hand Side of Engine

1. Belt adjusting screw
2. Hydraulic oil supply line
3. Hydraulic oil pressure line
4. Distributor
5. Water pump
6. Oil filler breather
7. Oil level gauge
8. Magnetic switch

removable shell in each cap, as well as for the upper part. The upper shell is interchangeable with the lower shell for each bearing. These precision type shell bearings are completely finished before being put in place and no line reaming or scraping is required.

(10) COOLING SYSTEM — The engine is cooled by means of a large tubular radiator, water circulating pump and cooling fan. The fan is V-belt driven from the engine crankshaft. The water pump is located on the left-hand side of the engine and is driven off the accessory drive shaft. Capacity of cooling system is 3½ gallons.

(11) IGNITION—The distributor is a 6 volt unit. It is driven off the accessory drive shaft at the left-hand side of the engine. The ignition coil is a Delco-Remy, Model 528-C, 6 volt, and is attached to the engine at the left-hand side. The magnetic switch is mounted above the starter motor on the gas tank support bracket.

(a) The generator is a 6 volt unit. A voltage regulator is attached to the side of the generator. The generator is driven by a gear meshing with the camshaft gear.

(b) The spark plugs are 14 mm.

(12) STARTER MOTOR—The starter motor is a 6 volt unit and is operated from the control panel of the maintainer.

(13) CARBURETOR—The carburetor is a Zenith, Series 63AW10, Outline No. S-1172.

(14) GOVERNOR — The governor is a Pierce, Model No. GC-734, flyball type, mounted on the gear cover and driven by a gear meshing with the camshaft gear. The governor has the shaft mounted on Timken bearings. It is set for the proper engine speed at the factory and is lubricated from the engine pressure system.

(15) OIL FILTER—The oil filter (figure 6) is a Purolator, Model No. N-1601, is mounted on the left-hand side of the engine.

(16) AIR CLEANER—The air cleaner is a Donaldson, Model No. A-5320, oil-washed type with pre-cleaner air stack.

(17) FUEL SYSTEM—The fuel tank has a capacity of 16 gallons. The fuel strainer and fuel line to the carburetor are located at the bottom of the tank.

(18) CLUTCH — The master clutch, located in the engine flywheel, is the disc type and is hand operated through an over-center type bearing. The clutch can be adjusted through an opening in the clutch housing.

(19) FRAME AND HEADBLOCK ASSEMBLY—The frame consists of two boxed (5″) steel channels, cross members and upright supports for hydraulic cylinders, all welded into one unit. The headblock assembly is a welded unit and is securely bolted to the two channels at the front end.

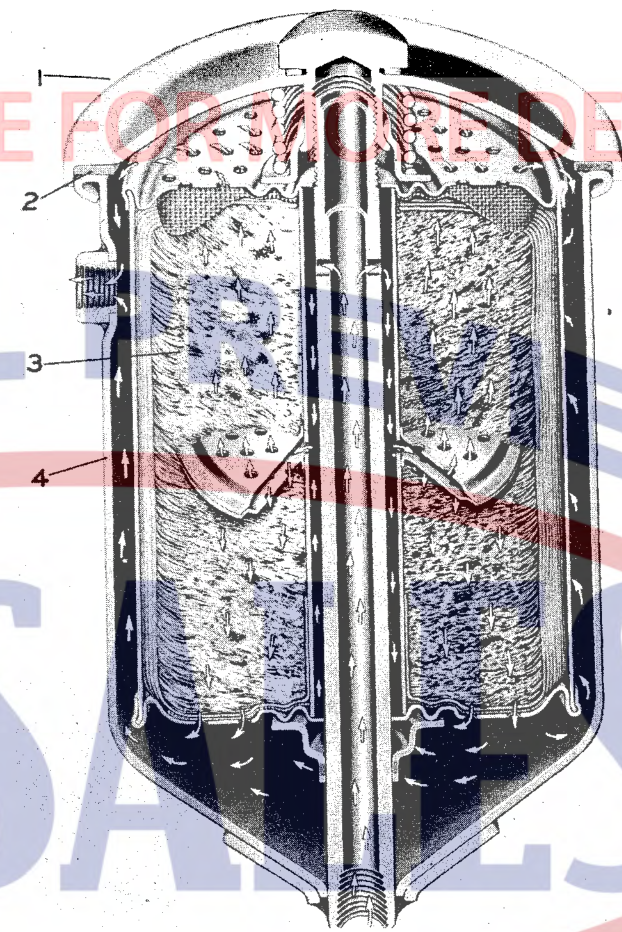

Figure 6—Oil Filter Case and Element N-16

1. Cover assy.
2. Gasket
3. Element N-16
4. Case

(20) TRANSMISSION — The transmission is of the automotive type and is provided with five speeds forward: Low 1.85 mph., second 3.18 mph., third 5.54 mph., fourth 11.30 mph., fifth 14.88 mph., and one reverse speed 1.9 mph. It permits speed changes to meet varying working conditions.

(21) PARKING BRAKE — The parking brake is located at the rear of the transmission case and is mounted on the main drive shaft. It is hand operated from the operator's platform.

(22) UNIVERSAL JOINT — A heavy double universal joint transmits the power from the transmission to the differential. The application of the double universal joint between the two assemblies assures proper functioning of the two units in case of misalignment of either, or both.

(23) DIFFERENTIAL—The differential is of the unit type. Two drive shafts are splined into the hubs of the two differential side gears. The drive pinions located at the outer ends of these shaft drive the final drive gears.

Figure 7—Moldboard and "A" Frame Assy.

1. Moldboard
2. Locker pin
3. Blade trip rod
4. Blade shifting cylinder

(24) REAR AXLE AND FINAL DRIVE ASSEMBLY—the final drive assembly (figures 31 and 32) consists of two short axles keyed to the final drive gear hubs. Each axle is mounted on two Timken roller bearings, one bearing at each end of axle. The final drive gears are bolted to the final drive gear hubs which hubs are keyed to the rear axles. The two pinions on outer ends of drive shafts mesh with final drive gears to complete the drive.

(25) STEERING GEAR—The Ross steering gear, (figure 24) is the cam and lever design. This principle of design embodies a special worm of variable ratio which engages an internal lever on the side of the worm. The worm has a tapered groove which engages tapered studs on the lever. The steering gear is located in front spindle housing and is operated through steering wheel located on operator's platform.

(26) CONTROL PANEL — The control panel, (figure 20) is placed in vertical position on the operators platform, on which are located control levers and gauges. (See Section 2, paragraph (B), (5)).

(27) HYDRAULIC SYSTEM (OTHER THAN HYDRAULIC BRAKES)—The hydraulic system consists of an oil supply tank (total capacity 3 gallons), hydraulic oil pump, special steel tubing for conveying the oil through the system under pressure of from 300 to 350 lbs., a control valve with a series of operating levers and the various operating cylinders. A transfer valve is located in the oil line system to divert the oil to either the blade shifting cylinder or the front lifting cylinder when such a cylinder is supplied for use with Special Equipment units, such as bulldozer, sweeper, etc. as outlined in Section 4, which section is devoted entirely to the operation of these units.

(28) MOLDBOARD AND "A" FRAME ASSEMBLY—The moldboard with blade attached, and the "A" frame, (figure 7) are suspended from beneath the chassis. The moldboard is bolted to two extension members which telescope into the "A" frame members. The top ledges of the moldboard telescoping members and the "A" frame are drilled with a series of holes and by the application of foot operated spring locking pins, one located at each side of the "A" frame. The moldboard telescoping members may be hydraulically shifted in the "A" frame and instantly locked in any position from straight across (right angles to the frame) to 44 degrees at either side, right or left. The moldboard length is 9 ft., height 13½", thickness ½", blade clearance in "up" position 9", cutting depth of blade (below ground level) is 9½", total angularity of blade 88 degrees. The "A" frame is pushed from the rear through a ball-and-socket joint attached to the rear end of chassis. The moldboard and blade may be operated regardless of whether maintainer is traveling, or standing still.

(29) HYDRAULIC BRAKES—The hydraulic brake system is separate and distinct from the hydraulic system employed for blade operations. The hydraulic brakes employed are similar to those used on trucks, etc. One brake is located at each wheel hub. Brakes are applied by depressing foot pedal of master cylinder at bottom of control panel.