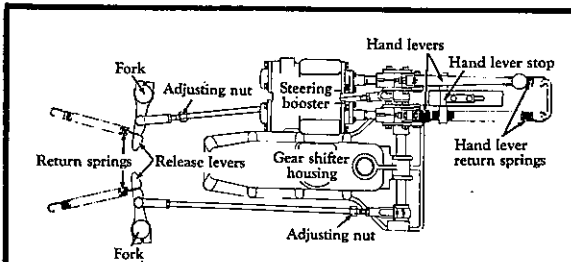


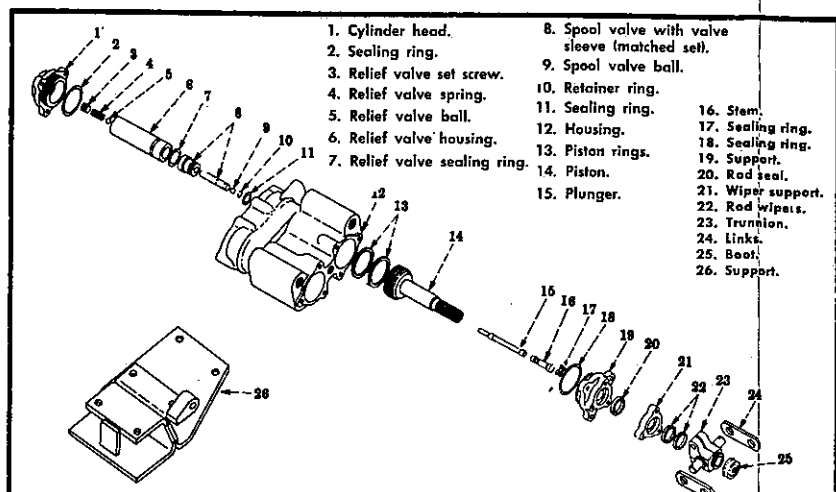
14, 15, 18 AND 20 SERIES CRAWLER TRACTOR HYDRAULIC PUMP AND BOOSTER SERVICE CHART



HYDRAULIC STEERING BOOSTER CONTROLS

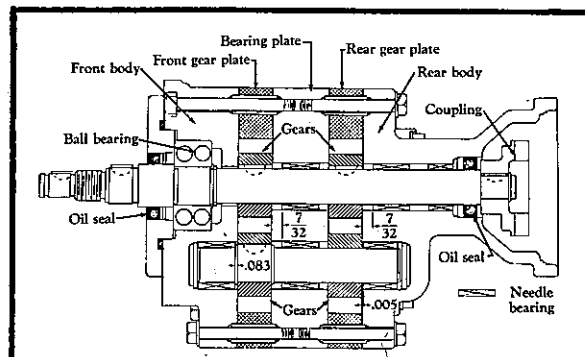
The steering clutch booster used on the 14, 15, 18, and 20 series crawler tractors minimized the effort necessary to disengage the steering clutches. Actuated by hydraulic oil flow through the booster, the clutches are controlled by the operator with two hand levers. Pulling one of the levers, the operator disengages that particular clutch and breaks the flow of power to the one track, partially or fully, depending on the amount of pull.

Releasing the lever automatically returns the lever to the forward position and the clutch will engage.



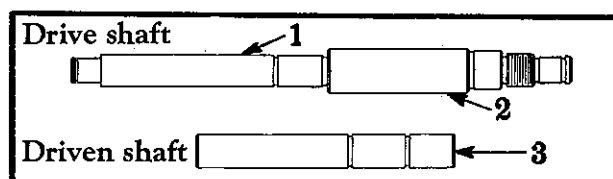
HYDRAULIC BOOSTER TD-15 (151) Series Shown (Others Similar)

Servicing the booster is relatively simple as there are only a few moving parts. Should hard steering develop, and the pump and steering clutches are found to be in good condition, it may be necessary to go into the booster and check out the various components for wear or tolerance.



PUMP RECONDITIONING (Webster shown)

After many hours of use, a pump will lose its efficiency and will require reconditioning to make it serviceable again. All needle bearings are replaceable and must be inserted to the dimensions shown. They must also be replaced with the lettered end exposed.



DRIVE AND DRIVEN SHAFTS (Hydreco)

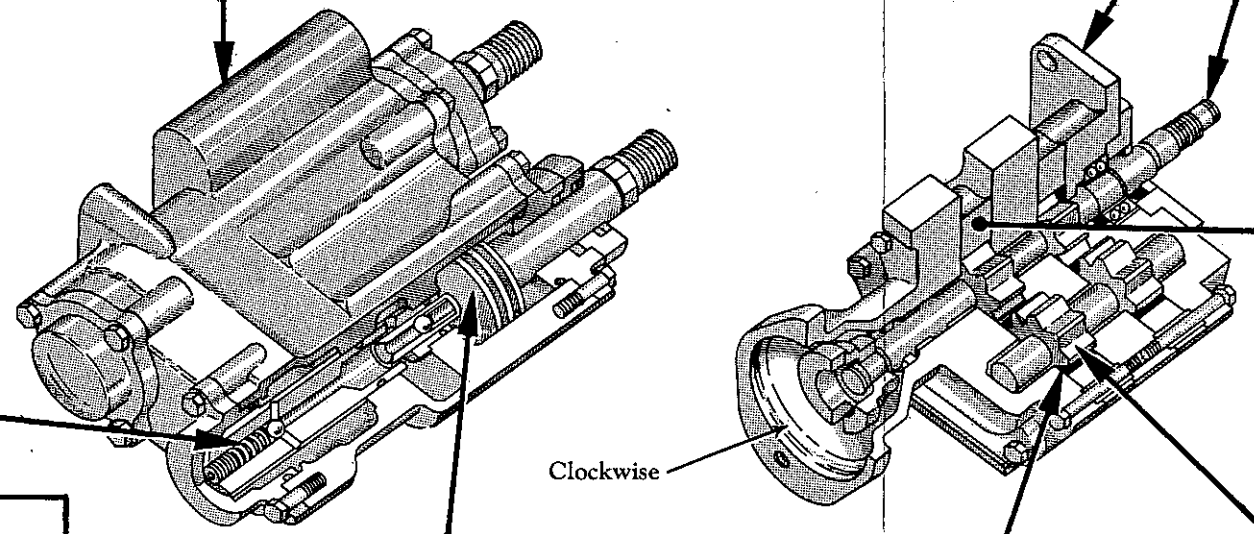
(1) Drive shaft, rear section O.D. - inch	.6240 - .6245
(2) Drive shaft, front section O.D. - inch	.8740 - .8745
(3) Driven shaft, O.D. - inch	.6240 - .6245

Inspect the drive shaft for scratches or excessive wear, particularly on seal surfaces; polishing with crocus cloth will be satisfactory unless the wear is too great. Both shafts should be checked for indications of excessive bearing surface wear, usually recognized by dull surfaces on shaft, indicating the presence of abrasives in the oil. If this condition is found, flush out the lines, change filter and fill the system with the proper grade of oil.

RELIEF VALVE SPRING

Outside diameter, OD, inch	1/2	3/8
Number of coils	11	11
Test load, lbs.	59	25
Test length, inch	1.3165	1.0
Free length, inch	1.4992	1.162

To obtain the proper adjustment, turn the socket head screw in until the spring is solid, then back off 2-1/2 turns.



GEAR HOUSING

(A) Diameter of bore	Webster 1.940 - 1.941 in.	Hydreco 1.752 - 1.754 in.
(B) Gear housing thickness	.7025 - .7030 in.	1.000 - 1.002 in.

Gear housings that show severe score marks (area (A)) from the gear tooth edge, that extends past the dowel hole center line, should be replaced.

HYDRECO: Using dowel hole from which a center line can be established, measure the over-all distance of the gear bores. Should this be greater than 3.259 inches, replace the housing with a new one.

When gears wear down and the difference in thickness between the gears and gear housing becomes more than .002 inch, both gears should be replaced.

WEBSTER: When bearing plates are worn by the gears and require resurfacing, it is frequently necessary to replace the gears. In an emergency the gears can be reground. The respective gear plates should be .001 inch thicker than the gears to give proper clearance.

SPOOL VALVE AND SLEEVE

The spool valve and sleeve are a lapped fit, so replacement is in selected matched pairs only, with a diametral clearance of .0002 - .0004 inch between (A) and (B).

If the fit is too loose, oil that should be under pressure, will leak by into the return chamber.

When steering is difficult and done with no assist from the booster, the sleeve will be found "hanging-up", because dirt is present in the system, and the fit becomes too tight. The booster should then be disassembled and thoroughly checked and cleaned.

PISTON

(1) Piston diameter at lands	2.247 - 2.249 in.
(2) Piston diameter at ring groove	1.996 - 2.006 in.
(3) Piston shaft diameter	.998 - 1.000 in.
Maximum operating clearance of piston to cylinder	.001 - .006 in.

Check the piston rings for wear. Unless there is a tight seal between the rings and cylinder, oil when under pressure will leak past and poor operation or manual steering will result. Use a stone and remove any nicks or scratches on the piston shaft. Check the oil seal and shaft wipers - install new ones if in doubt as to their serviceability.

WEAR PLATE (Hydreco)

Inspect the wear plates carefully and if there is an erosion path in the area of the relief pocket, a new wear plate should be installed.

Excessively worn or warped plates should be replaced. Plates to be reinstalled should not be interchanged but placed in their original position. If the wear plate is steel backed, the bronze side should be next to the gears. The relief pocket is also toward the gears.

PUMP GEARS

Gear thickness	Webster .7014 - .7017 in.	Hydreco 1.0000 - 1.0005 in.
Front gear bore, I.D.	.7502 - .7505 in.	.6230 - .6235 in.
Rear gear bore, I.D.	.7502 - .7505 in.	.6255 - .6260 in.
Backlash between drive and driven gears		.011 - .017 in.

Inspect the drive and driven gears for excessive wear or chipped teeth. Mark the gears with India stone to be able to identify them when ready for reassembly. Indicate which gear is drive or driven, and mating teeth. Keep the gears in original pairs so the original wear pattern may be maintained. Refer to Service Manual for "Pump Reconditioning". Frequently it is necessary to replace the gears when the bearing plates (Webster) or gear plates require resurfacing, or wear plates (Hydreco) need replacing.

When gears wear down (Hydreco) and the difference in thickness between the gears and gear housing becomes more than .002 inch, both gears should be replaced.