John Deere

MODEL:

Power Steering for 2 Cylinder Tractor

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JD-S-SM2050
# Power Steering
for John Deere Waterloo
2-Cylinder Tractors

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The basic design of these components is essentially the same as that described in Group 20 of this section with two exceptions. The steering sleeve actuating screw is replaced by a hardened dowel pin (Fig. 10-25-1) and the width of the worm helix is designed to be adjustable to prevent binding and to compensate for wear. The helix is formed by a milled recess at the rear of the steering worm and a similar one at the front surface of the head of the steering worm shaft. This design provides rigid and stable control of the steering valve actuating mechanism.

Manual steering is accomplished when the actuating sleeve is turned far enough for the dowel pin to reach the end of the helix. Rotary force is then transmitted from the actuating sleeve through the dowel pin to the steering worm, steering gear, steering spindle and front wheels to steer the tractor.

**REMOVAL**

Remove tractor grille and uncouple steering shaft from actuating sleeve.

Drain oil from worm housing by removing plug from bottom of steering valve housing. Drain about 2 quarts of oil from the reservoir.

Disconnect oil pressure hose from steering valve housing. Disconnect and remove valve housing to pedestal pipes.

Detach and remove steering valve housing.

**NOTE:** A scribed line between the steering valve housing and the worm housing will aid at the time of assembly.

Detach and remove steering worm housing. Be careful not to lose or damage shims between the housing and pedestal. They are used to establish backlash between the steering worm and gear.

**DISASSEMBLY**

Detach and remove steering worm front bearing housing. Do not lose or damage shims between pedestal housing and worm housing.

Measure how far the adjusting bushing protrudes from the worm (Fig. 10-25-2). Record this dimension because it will be important when the unit is assembled. Loosen the lock screw and remove the adjusting bushing. Pull the worm off the shaft.

**Fig. 10-25-1—Valve Housing Assembly, Actuating Sleeve, Worm Shaft and Worm**

**Fig. 10-25-2—Removal of Adjusting Bushing**
DISASSEMBLY

Scribe the steering gear shaft quill, cylinder and housing for reference during assembly.

Position unit over a container to catch any remaining oil in the cylinder.

CYLINDER

Detach and remove steering shaft quill (Fig. 20-25-3). Note the location of the two cap screws, which have flat washers and packing washers, so they can be installed in the same holes at assembly. After quill is removed, remove cylinder.

STEERING VANES

Remove stop pins and stationary vane (Fig. 20-25-4).

Detach and remove movable vane bracket and vane. Detach vane from bracket.

GEAR AND SHAFT

Remove end play adjusting screw. Remove cotter pin and loosen gear retaining nut (Fig. 20-25-5). Using the nut as a jack against the housing, tap the end of the shaft with a brass drift to loosen it from the gear. After the shaft is loose, remove the nut and washer and pull shaft from housing.

INSPECTION AND REPAIR

Clean all parts thoroughly with solvent and a stiff brush. Dry with compressed air.

HOUSING

Inspect the housing for cracks, breaks or other damage. Note particularly the lower surface which forms one end of the cylinder. It should be free from scores or uneven wear.

Check the bushing in the lower end of the housing. If excessively worn, replace it. To remove the bushing, remove the O-ring packing and backing washer and use a puller as illustrated in
### STEERING PUMP

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID body</td>
<td>2.066 to 2.067 in.</td>
</tr>
<tr>
<td>Width of body</td>
<td>0.6270 to 0.6280 in.</td>
</tr>
<tr>
<td>OD pump gears</td>
<td>2.0825 to 2.0835 in.</td>
</tr>
<tr>
<td>Width of pump gears</td>
<td>0.6250 to 0.6256 in.</td>
</tr>
<tr>
<td>OD drive shaft</td>
<td>0.9994 to 1.000 in.</td>
</tr>
<tr>
<td>OD follower gear shaft</td>
<td>1.053 to 1.063 in.</td>
</tr>
<tr>
<td>ID drive shaft bushing</td>
<td>1.0025 to 1.0035 in.</td>
</tr>
<tr>
<td>OD follower gear shaft bushings</td>
<td>1.001 to 1.004 in.</td>
</tr>
<tr>
<td>ID steering wheel shaft bushing</td>
<td>0.880 to 0.884 in.</td>
</tr>
<tr>
<td>OD steering wheel shaft</td>
<td>0.875 in.</td>
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### STEERING WORM

- **Steering worm end play**: 0.001 to 0.004 in.
- **Steering worm backlash measured at the rim of the steering wheel**: 1/2 to 1 in.

### STEERING GEAR HOUSING

- **Steering gear shaft end play**: Turn adjusting screw against shaft, back off 1/8 turn and lock
- **ID steering gear shaft bore**: 1.111 to 1.113 in.
- **ID lower steering gear shaft bushing**: 1.127 to 1.129 in.
- **OD steering gear shaft upper journal**: 1.108 to 1.110 in.
- **OD steering gear shaft lower bushing journal**: 1.123 to 1.125 in.

### STEERING CYLINDER

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID cylinder</td>
<td>1.998 to 2.002 in.</td>
</tr>
<tr>
<td>ID piston rod guide</td>
<td>0.998 to 1.002 in.</td>
</tr>
<tr>
<td>OD piston</td>
<td>1.996 to 1.999 in.</td>
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</tbody>
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