

SECTION XII—STEERING CLUTCHES AND CONTROLS

Topic Title	Topic No.
General Description	1
Steering Clutches	2
Steering Clutch Throwout Bearing Assemblies	3
Steering Levers and Linkage	4
Hydraulic Steering Control Housing ...	5
Hydraulic Steering Pump	6
Hydraulic Steering System Piping	7

1. GENERAL DESCRIPTION

Two steering clutches, one at each end of the bevel gear shaft, are employed for steering the tractor. Each steering clutch is enclosed in a brake drum which serves in conjunction with the steering clutch for steering, by braking the rotating action of the final drive.

Each steering clutch is actuated by a hand lever which controls a spool valve of the hydraulic piston arrangement. The piston arrangement actuates the steering clutch throwout yoke assembly which in turn disengages the steering clutch.

2. STEERING CLUTCHES

A. Description

The two steering clutches, one on each side, are of the multiple disc type having fourteen (14) friction discs and fourteen (14) steel discs assembled alternately in each clutch assembly. Springs hold the discs tightly together in assembly between the pressure plate and the driving hub. The complete assemblies are contained in the brake drums.

Power is transmitted through these clutches from the bevel gear shaft to the final drive pinions. The steering clutches are disengaged by pulling back on the steering levers directly in front of the operator. This hydraulically forces the corresponding clutch throwout sleeve against the clutch throwout plate in the clutch and compresses the springs, thereby allowing the steel discs and friction discs to separate.

When either clutch is disengaged, the bevel gear shaft turns without driving or supplying power to the final drive pinion shaft on the side disengaged.

B. Clutch Service

Specified time intervals between linkage adjustments can not be established because of the variable operating conditions which determine the

amount of clutch disc wear.

The steering clutch linkage is properly adjusted when the steering levers each have 2" of free travel, measured at the tops of the levers. As the clutch discs wear, this free travel decreases. When the free travel has decreased to 1", an adjustment of the clutch linkage is required. Free travel of the levers is necessary to insure proper clearance between the clutch throwout sleeve and the clutch throwout plate and to insure full engagement of each clutch.

C. Washing Steering Clutches

Oil leaking into the steering clutch compartments may get on the clutch discs and cause the clutches to slip. If this occurs, wash the clutches in the following manner:

1. Install pipe plugs in the two drain holes in the bottom of the steering clutch housing, at each side of the bevel gear compartment drain plug.
2. Remove the brake band adjuster covers from the top of the steering clutch housing and pour about three gallons of solvent into each compartment. Drive the tractor back and

forth in a straight line for approximately five minutes, leaving the steering clutches engaged. The oil on the exterior of the clutches and brakes will be washed off in this operation.

3. Drain the compartments and refill with the same amount of solvent, then drive the tractor back and forth for approximately another five minutes, disengaging one clutch and then the other continually during this period. Disengaging the clutches allows the clutch discs to separate so that the solvent can get in between the discs to wash the oil from their friction surfaces.

4. Drain the compartments and allow the clutches a short time to dry. Operate the tractor with a light load in low gear until the clutches become thoroughly dry, otherwise, they may slip due to the presence of solvent on the discs.

D. Clutch Removal

Remove either steering clutch as follows:

1. Remove the fuel tank (refer to "FUEL TANK REMOVAL" in Section II).
2. Remove the center and rear floor plates. Remove the two (2) bolts attaching the right and left supporting channels for the center and rear floor plates to the supporting channel (cross channel) for the front floor plate. Remove the capscrow attaching the cable clip to the left rear corner of the left supporting channel and remove the channel assembly from the tractor.

3. Remove the jam nut and the brake band support adjusting nut.
4. Remove the steering clutch compartment cover.

5. Turn the brake band adjuster counter clockwise until it is loosened from the brake band adjusting fork.

6. Remove the yoke pin connecting the brake control rear rod to the brake band lever. Remove the pipe plug located in the side of the steering clutch housing, in line with the brake band end pin in the band adjusting

fork, and using a suitable $\frac{3}{8}$ " N.C. capscrow inserted through the hole, turn it into the tapped hole in the end of the brake band end pin. Pull on the capscrow and remove the brake band end pin out through the hole for the pipe plug, then remove the brake band adjusting fork. Lift up on the brake band lever until the pin attaching the lower end of the brake band to the brake band lever can be removed. Push the pin towards the bevel gear compartment and remove, then remove the brake band lever. Do not remove the brake band as it will be used in lifting the steering clutch and brake drum assembly.

7. Remove the capscrows attaching the steering clutch assembly to the driving hub and the brake drum hub. This will necessitate turning the clutch assembly and brake drum which can be accomplished by using a jack under the rear of the track and moving the tractor, or by turning the track sprocket by using a suitable pry bar.

8. Using a small chain hooked around the brake band adjuster and around a suitable $\frac{3}{8}$ " bolt or rod inserted in the lower end of the brake band as shown in Fig. 1, lift the steering clutch assembly out of the compartment: **NOTE: Before lifting the clutch in this manner, turn the brake band on the brake drum so that the brake band adjuster is as far forward as possible, then place the lifting hook on the small chain as near to the adjuster as possible.** With the band turned in this position, the brake band adjustment support (at the rear of the band) will be turned forward far enough so that it will clear the top rear of the clutch housing as the clutch is lifted from the compartment.

E. Disassembly of Steering Clutches

1. Remove the brake drum from the clutch assembly, being careful not to bend the clutch friction disc teeth.
2. Before disassembling the clutch, center punch the pressure plate, the back plate, the hub, and the throwout plate so that they can be reassembled in the same position as they were before disassembly.

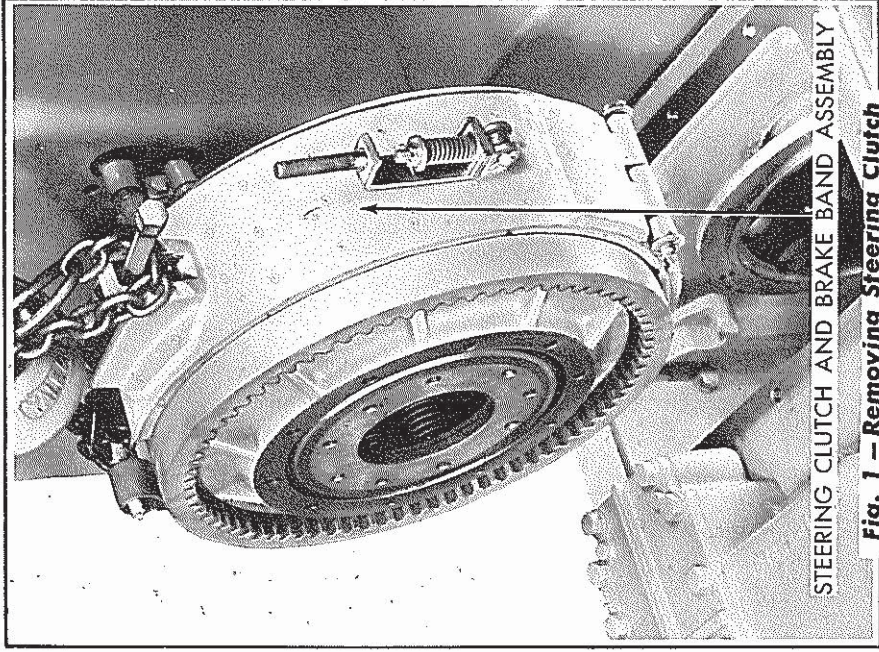


Fig. 1 - Removing Steering Clutch

3. Remove the lockwire and five (5) of the nine (9) drilled head capscrews used in holding the clutch together. **NOTE: It will be necessary to use five (5) studs to hold the load of the compressed steering clutch springs when disassembling the steering clutch. Each stud**

should be $\frac{1}{2}$ " diameter by $11\frac{3}{8}$ " long, having one end threaded $\frac{1}{2}$ " N.F. for a distance of approximately 1". The other end should be machined square for a wrench hold and threaded $\frac{1}{2}$ " N.F. for a distance of approximately $8\frac{1}{2}$ " (refer to Fig. 3).

4. Install the five studs with the short threaded end into the throwout plate, followed by flat washers and hex nuts. Turn the nuts down against the pressure plate (refer to Fig. 3).
5. Remove the remaining capscrews, then loosen the stud nuts evenly until all tension is taken off the clutch springs.
6. The throwout plate, discs, springs, etc., can now be separated.

F. Clutch Inspection and Repairs

When the clutches have been disassembled, inspect the following items:

1. Steel Discs

Specified thickness when new is .084" to .096". Inspect the discs for wear and scoring. The discs must be flat within .015."

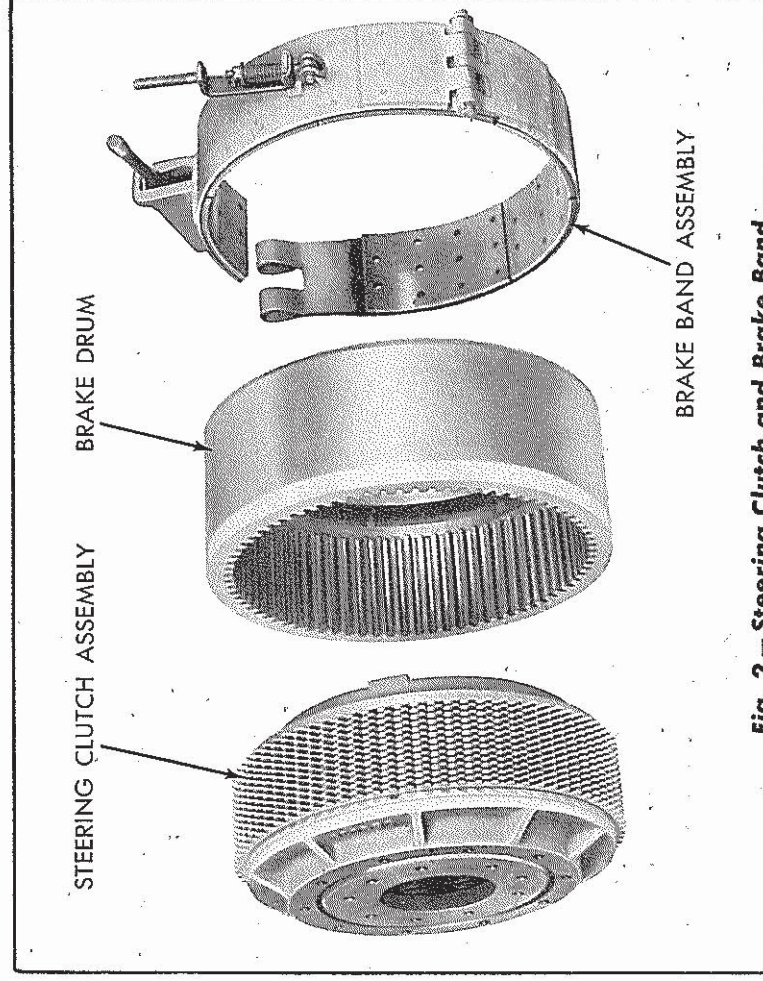


Fig. 2 - Steering Clutch and Brake Band

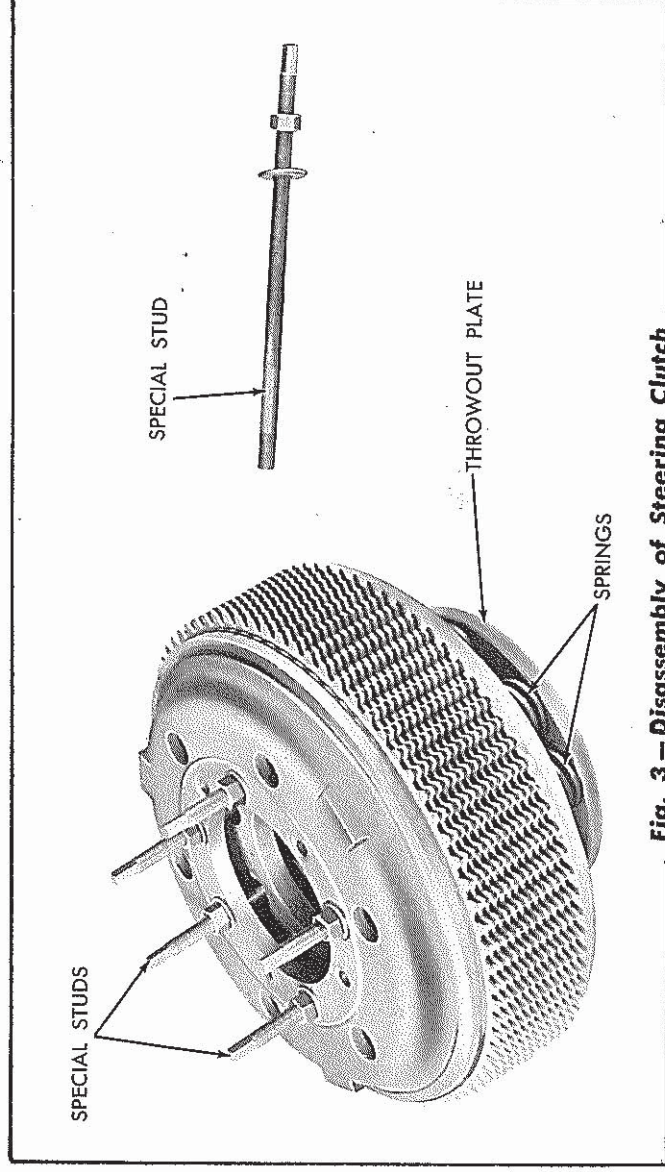


Fig. 3 — Disassembly of Steering Clutch

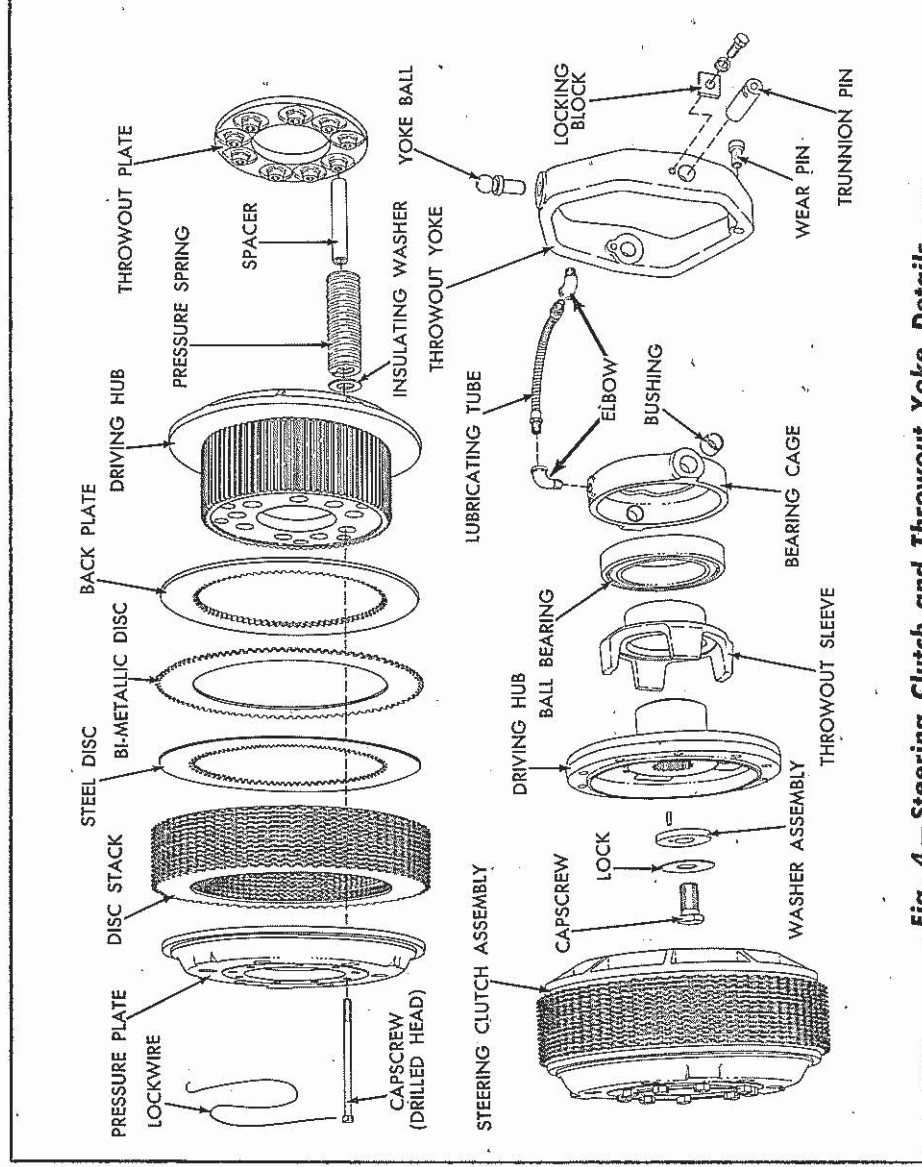


Fig. 4 — Steering Clutch and Throwout Yoke Details

2. Friction Discs

The specified thickness when new is .152" to .157". Inspect the discs for wear, condition of teeth, and scoring. If the thickness of discs is less than .125", or the teeth are in bad

condition, new discs must be installed.

3. Pressure Springs

Each pressure spring when new exerts a pressure of 380 to 420 pounds when compressed

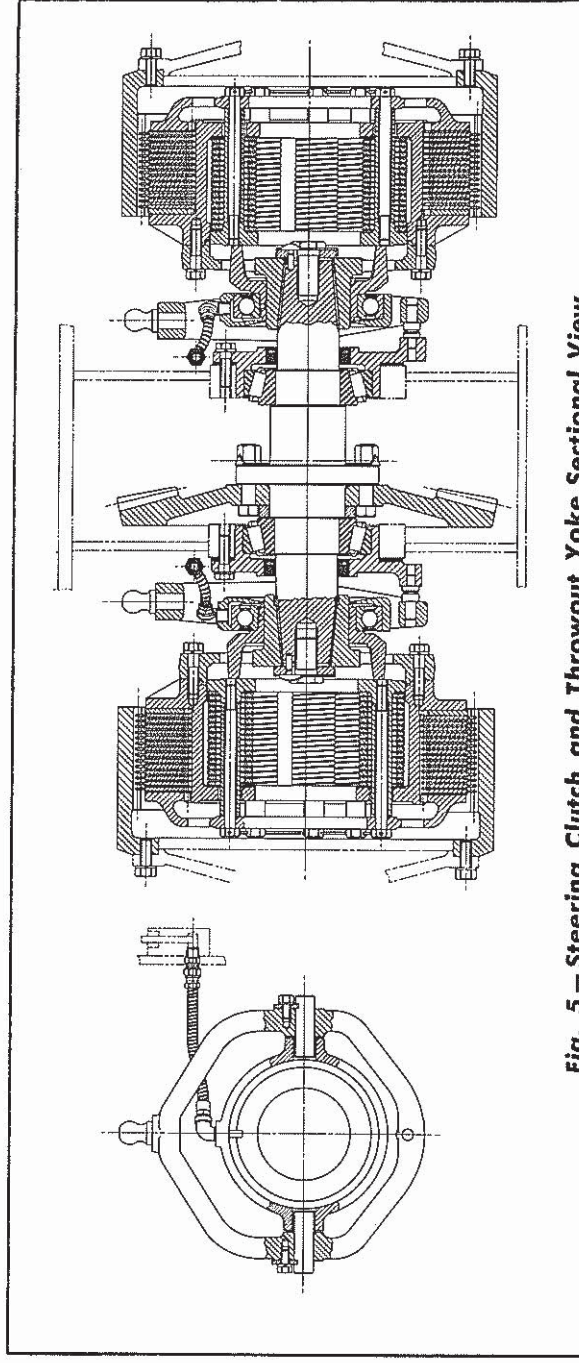


Fig. 5 — Steering Clutch and Throwout Yoke Sectional View

to 4-17/64". If a spring does not check reasonably close to this tolerance, it is an indication that it has lost its tension and a new spring should be installed.

4. **Hub**

Inspect the hub splines for wear as heavy grooving may cause binding of the teeth of the steel discs in the hub splines.

G. **Assembly of Steering Clutch**

Refer to Figs. 4 and 5 showing the parts in their relative position.

1. Lubricate the hub teeth and the extreme outer surface of the throwout plate sparingly with "Supremalube" or its equivalent.
2. Place the throwout plate on a bench with the spring bosses up.
3. Install a spring over each boss and install a throwout plate spacer in each spring.
4. Place an insulating washer on each spring.
5. Place the hub over the springs. Be certain that the center punch marks on the hub and throwout plate are in line.
6. Place the back plate on the hub. Be certain that the center punch marks on these parts are in line.

7. Stack the discs (14 each friction and steel) alternately on the hub beginning with a friction disc next to the back plate. Line up the external teeth as near as possible.

8. Lay the pressure plate in place, being certain that the center punch mark on the pressure plate lines up with the others, and install the five (5) special studs (studs used in disassembly of clutch) into the throwout plate.

9. Place the brake drum over disc stack, then turn the nuts down on the studs, forcing the pressure plate down, until the assembly is securely bolted together. Remove the brake drum from the clutch, then turn the clutch to a vertical position. **CAUTION: Use care and do not damage the clutch disc teeth when standing the clutch on its teeth.**

10. Using a suitable scale or straight edge, measure the distance between the machined end face of the clutch hub (throwout plate end) and the machined flat face of the throwout plate. These faces must be flush within plus or minus .065". If necessary, use steel discs to obtain the proper relation of the hub with the throwout plate; placing the added steel disc next to the pressure plate.

11. Install - four (4) attaching capscrows and tighten them, then remove the five (5) special studs and install the five (5) remaining capscrows. Tighten the nine (9) capscrows securely and install the lockwire.