

SECTION XI — STEERING CLUTCHES AND CONTROLS

Topic Title	Topic No.
General Description	1
Steering Clutches and Controls	2
Steering Clutch Throwout Bearing Assemblies	3

1. GENERAL DESCRIPTION

The two steering clutch assemblies, one located at each end of the steering clutch shaft, are used for steering the tractor. Each steering clutch assembly is enclosed in a brake drum which acts in conjunction with the steering clutch for steering. Each steering clutch is actuated by a steering clutch operating lever connected by linkage to the steering clutch throwout yoke assembly.

The steering controls and linkage mechanism for each clutch consists of an operating lever, control rod, intermediate lever shaft with a lever at each end, clutch yoke assembly, and an intermediate shaft bearing cage. The operating lever and intermediate shaft are mounted on needle bearings that are grease packed and sealed for life at the time of assembly.

2. STEERING CLUTCHES AND CONTROLS

A. Description

Two multiple disc steering clutch assemblies, one located at each end of the steering clutch shaft, are provided for steering the tractor. Each steering clutch assembly is enclosed in a brake drum; each drum is bolted to a brake drum hub which is connected to the corresponding final drive pinion. When the steering clutches are disengaged, the brake drums serve in conjunction with the steering clutches by stopping the rotation of the final drives when the steering brakes are applied. Each clutch

assembly contains 10 friction discs and 10 steel discs, assembled alternately, with pressure springs holding the steel and friction discs tightly together. Pulling back on a steering clutch operating lever disengages the corresponding steering clutch by forcing a throwout sleeve against a throwout plate in the steering clutch assembly, further compressing the steering clutch pressure springs. Compressing the steering clutch pressure springs allows the steel discs and friction discs to separate, therefore, no power is delivered to the corresponding final drive and track drive sprocket.

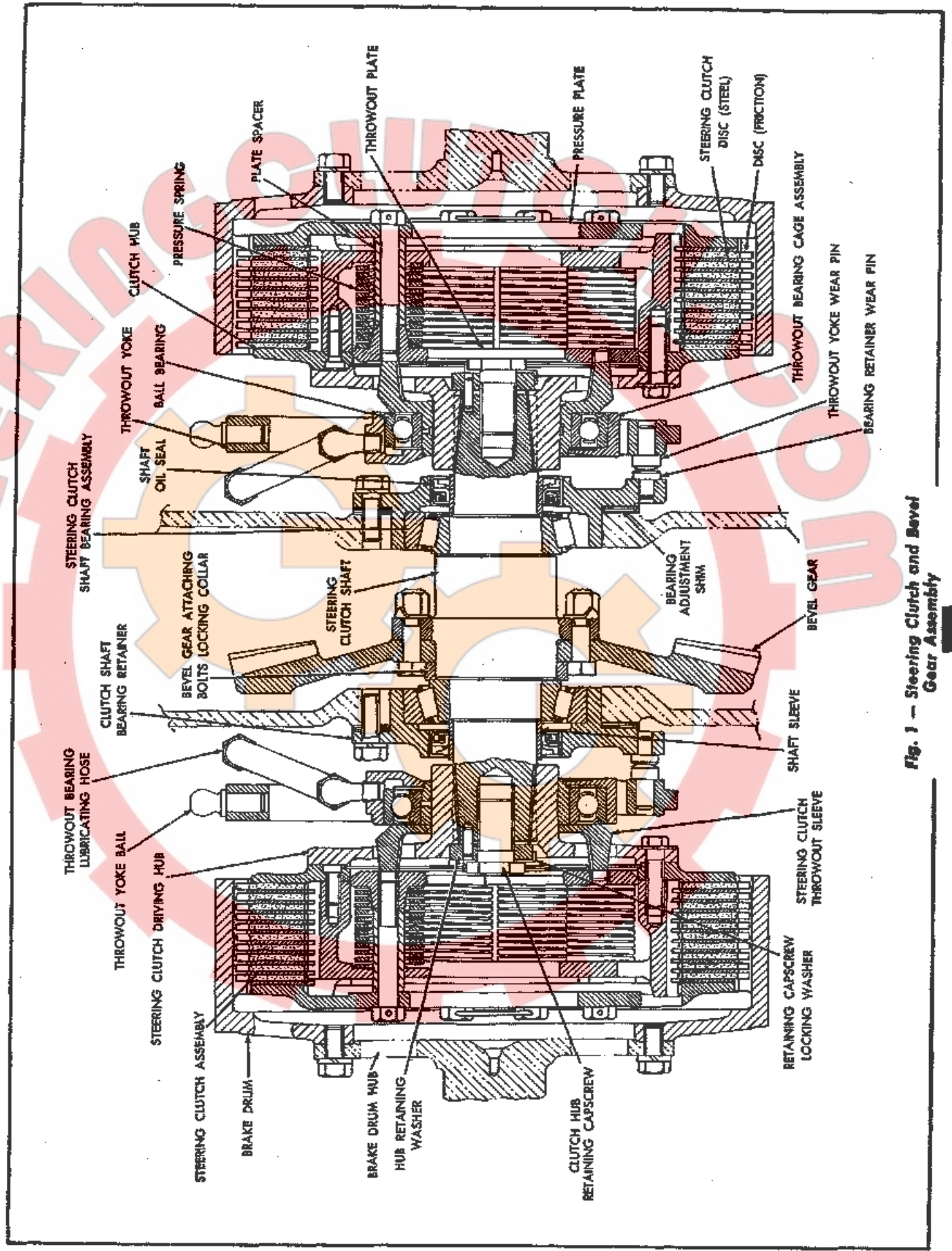


Fig. 1 -- Steering Clutch and Bevel Gear Assembly

B. Steering Clutch Service

Specified time intervals between steering clutch linkage adjustments can not be established because of the variable operating conditions which determine the amount of steering clutch disc wear. The steering clutch control linkage is properly adjusted when the steering clutch operating levers each have 3" of free travel, measured at the tops of the levers (just below operating lever hand grip). As the clutch discs wear, this free travel becomes less and an adjustment is required when the free travel has decreased to less than 1". Free travel of the steering clutch operating levers is necessary to assure clearance between the clutch throwout sleeve and the clutch throwout plate and to assure full engagement of each clutch.

C. Measuring Steering Clutch Operating Lever Free Travel

1. Place one end of a ruler or scale against the cowl so that it projects horizontally past

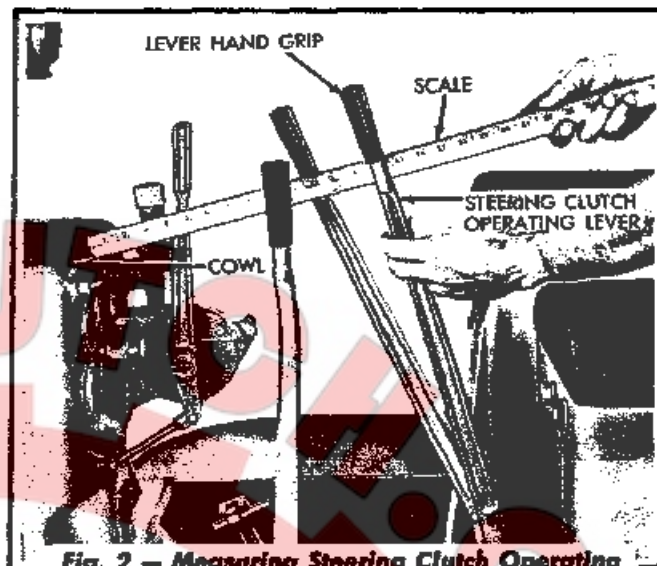


Fig. 2 — Measuring Steering Clutch Operating Lever Free Travel

the top of the steering clutch operating lever as shown in Fig. 2.

2. With the steering clutch operating lever forward against its stop, measure the distance from the cowl to the top of the lever.

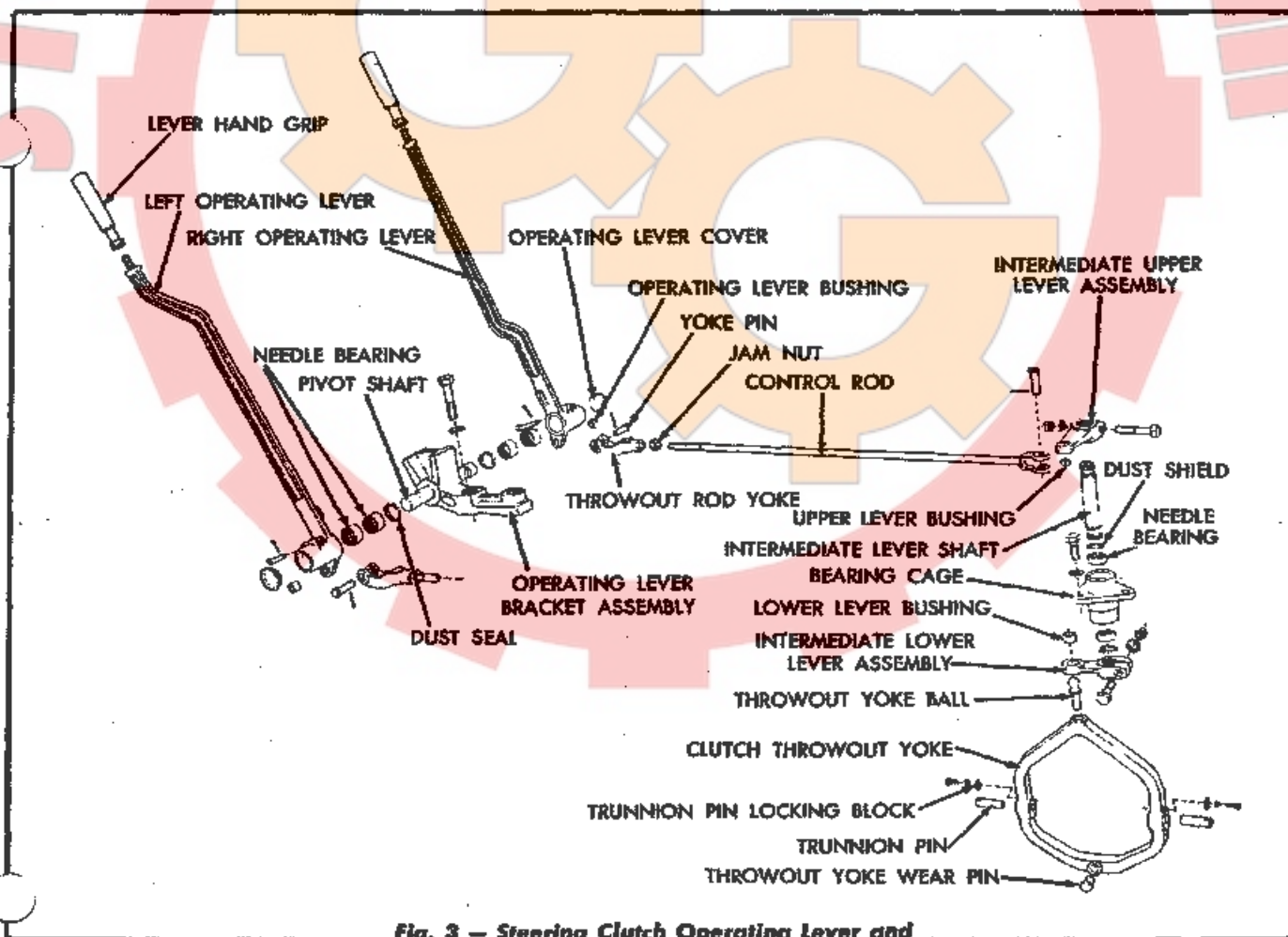


Fig. 3 — Steering Clutch Operating Lever and Linkage Details

3. Pull the steering clutch operating lever back until pressure is felt, which is the point where disengagement of the clutch begins. Note the distance between the cowl and the top of the lever. The difference between the two measurements is the free travel of the lever. If this distance is less than 1" or more than 3", adjustment of the steering clutch control linkage is necessary.

NOTE: There is only a limited amount of adjustment in each control rod. When this has been used, it will be necessary to change the position of the intermediate upper lever assembly (Fig. 3) on the intermediate lever shaft as follows:

- a. Remove the upper lever assembly from the intermediate lever shaft.
- b. Turn the intermediate lever shaft (right shaft clockwise, left shaft counterclockwise) so that the clutch throwout yoke moves the throwout sleeve (Fig. 1) over and the sleeve is contacting the steering clutch throwout plate (Fig. 1).
- c. With the throwout sleeve contacting the throwout plate, install the upper lever assembly on the serrations of the intermediate lever shaft so that the center of the yoke pin hole in the lever is $11/16"$ to the rear of an imaginary line drawn through the centers of the two intermediate lever shafts.

A change of one serration between the upper lever assembly and the intermediate lever shaft amounts to approximately $3/8"$ travel at the end of the upper lever assembly, consequently it may not be possible to obtain the $11/16"$ measurement exactly, but do not position the levers any closer to the imaginary line than $11/16"$.

After changing the position of the upper lever assembly on the intermediate lever shaft (as described above), it will then be necessary to lengthen the control rod to obtain the specified 3" free travel of the steering clutch operating lever.

D. Adjusting Steering Clutch Control Linkage

1. Remove the seat cushion.
2. Loosen the jam nut of the throwout rod yoke at the front end of the steering clutch control rod.
3. Remove the yoke pin connecting the throwout rod yoke of the steering clutch control rod to the steering clutch operating lever, then turn the yoke to lengthen or shorten the rod as necessary to obtain 3" free travel at the top of the operating lever. When the correct adjustment is obtained, connect the yoke to the operating lever, then tighten the jam nut.

E. Washing Steering Clutches

Refer to "STEERING CLUTCHES" Paragraph E, in the HD-6 Tractor Operators Manual.

F. Steering Clutch Removal

NOTE: The following removal procedure applies to either steering clutch.

1. Remove the fuel tank (refer to "FUEL TANK REMOVAL AND INSTALLATION," Section II).
2. Remove the capscrew attaching the battery ground cable to the steering clutch and final drive housing and tape the end of the cable. Remove the bolts attaching the battery box to the fender and move the box outward on the fender to provide clearance for the removal of the steering clutch.
3. Remove the steering clutch compartment cover.
4. Turn the brake band adjuster counterclockwise until it is loosened from the band adjustment fork.

- Remove the two pipe plugs (Fig. 4) located in the side of the steering clutch housing, in line with the brake band assembly end pins. Using a long 5/16" NC capscrew, insert the capscrew through the lower hole and turn it into the tapped hole in the end of the band adjustment fork end pin. Pull the end pin out, as shown in Fig. 4, and remove the band adjustment fork. Insert the long 5/16" NC capscrew through the upper hole in the steering clutch housing and remove the end pin attaching the lower half of the band assembly to the bellcrank. Do not remove the brake band assembly at this time as it will be used to lift the steering clutch and brake drum assembly out of the steering clutch compartment.



Fig. 4 - Removing Brake Band End Pin

- Remove the capscrews attaching the brake drum hub to the brake drum. Remove the capscrews attaching the steering clutch assembly to the steering clutch driving hub. This will necessitate turning the clutch assembly and brake drum, which can be accomplished by either using a jack under a track shoe grouser and moving the tractor or turning the track sprocket with a heavy bar.
- Attach a chain to the brake band, as shown in Fig. 5, and lift the steering clutch and brake drum assembly from the steering clutch compartment.

G. Disassembly of Steering Clutch

NOTE: The following disassembly procedure ap-

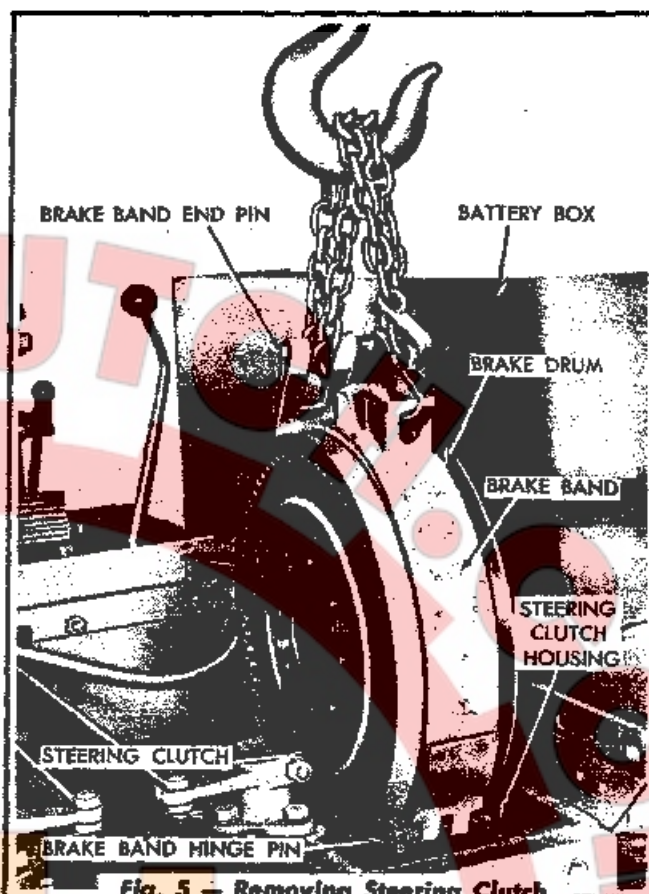


Fig. 5 - Removing Steering Clutch

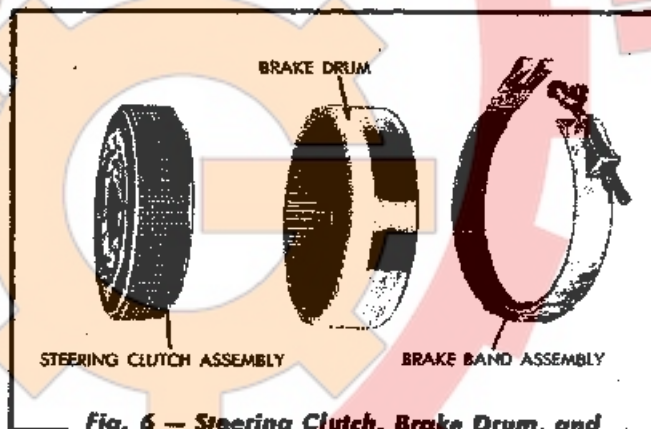


Fig. 6 - Steering Clutch, Brake Drum, and Brake Band

plies to either steering clutch.

- Remove the brake drum from the steering clutch assembly, using care to prevent damage to the clutch disc teeth.
- Before disassembling the steering clutch, refer to Fig. 7 and center punch or mark the pressure plate, clutch hub, and throw-out plate so that they may be reassembled in the same position.
- It will be necessary to use three special

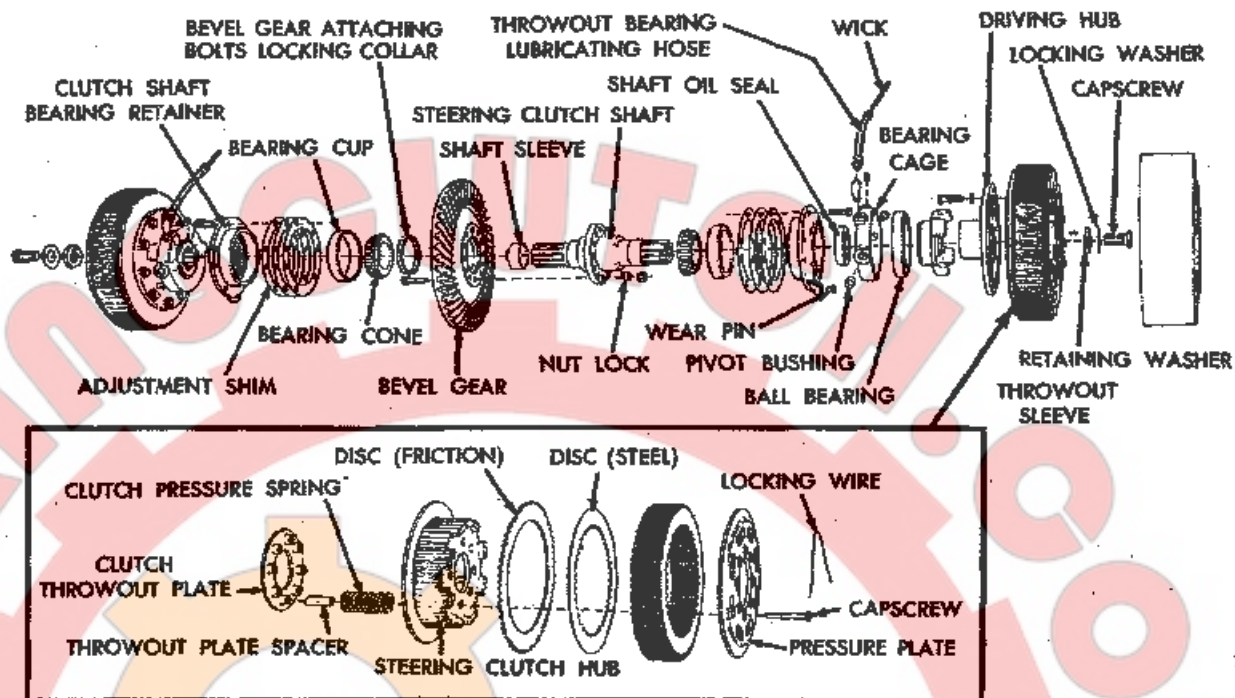


Fig. 7 — Bevel Gear and Steering Clutches

studs to hold the load of the compressed springs when disassembling the steering clutch. Each stud should be $\frac{1}{2}$ " diameter by 6" long, having one end threaded $\frac{1}{2}$ " NC for a distance of approximately 1". The other end should be machined square for a wrench hold, or slotted for a screwdriver, and threaded $\frac{1}{2}$ " NF for a distance of approximately $3\frac{3}{4}$ ".

4. Refer to Fig. 8, remove the locking wires and three of the eight throwout plate cap screws, install the three special studs with the NC threaded end into the throwout plate, and install flat washers and hex nuts on the NF threaded end of the studs. Screw the nuts down tightly against the pressure plate until the tension of the springs is held by the three studs.
5. Remove the remaining cap screws and loosen the stud nuts evenly until all tension is off the clutch pressure springs.
6. Remove the pressure plate, steel and friction discs, throwout plate, throwout plate spacers, and pressure springs from the clutch hub.

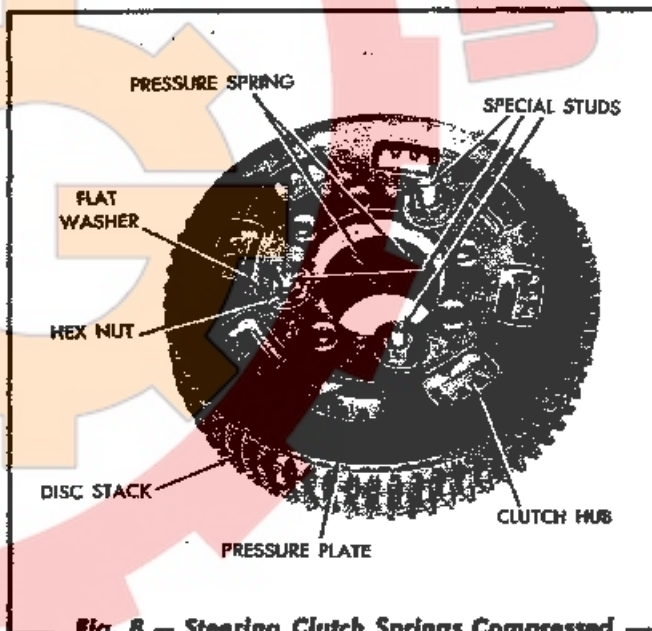


Fig. 8 — Steering Clutch Springs Compressed to Remove Cap screws

H. Steering Clutch Inspection and Repairs

When the steering clutch has been disassembled, inspect the following:

1. Steel Discs

The specified thickness for a new steel disc is .084" to .096". Inspect the discs for wear

and scoring. The discs must be flat within .015".

2. Friction Discs

The specified thickness for a new friction disc is .182" to .187". Inspect the discs for wear, condition of teeth, and oil saturation. If the thickness of the disc is less than .150", or if the teeth are in bad condition, a new disc must be installed.

3. Pressure Springs

Each pressure spring, when new, exerts a pressure of 240 to 260 pounds when compressed to 2-21/64". 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. Steering Clutch Hub

Inspect the teeth of the steering clutch hub for wear. Heavy grooving may cause binding with the teeth of the steel discs.

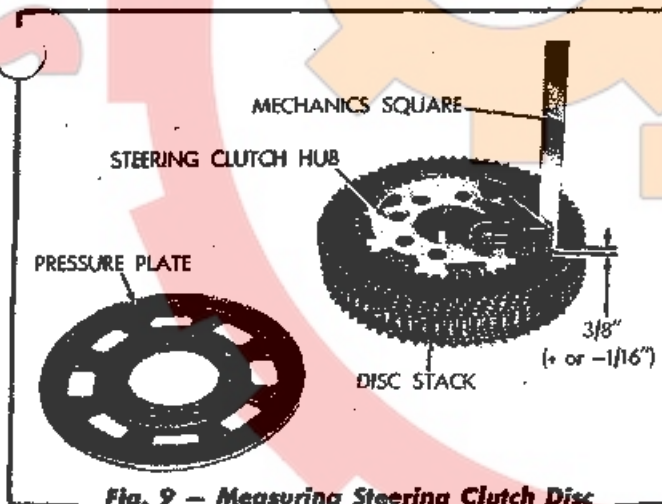


Fig. 9 - Measuring Steering Clutch Disc Stack Height

I. Assembly of Steering Clutch

1. Lubricate the clutch hub teeth sparingly.
2. Place the throwout plate on a bench or flat surface with the pressure spring bosses up.
3. Install a pressure spring over each boss and install a throwout plate spacer in each

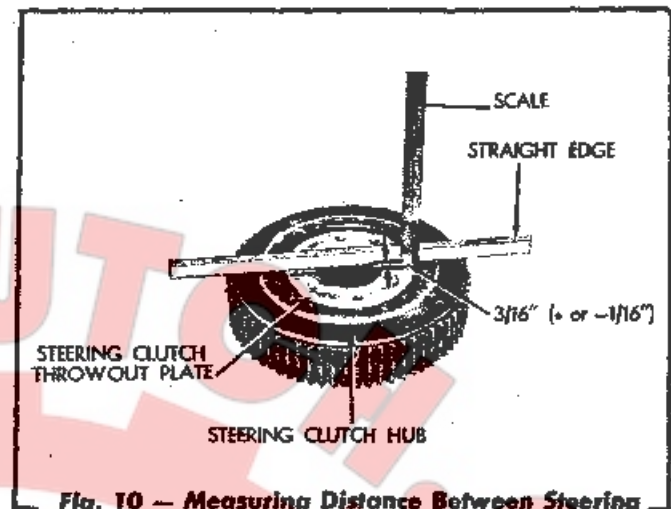


Fig. 10 - Measuring Distance Between Steering Clutch Hub and Throwout Plate

- spring.
4. Place the clutch hub in position over the pressure springs making certain that the punch marks on the hub and throwout plate are aligned.
5. Stack the discs (10 friction and 10 steel) alternately on the hub beginning with a friction disc. Align the external teeth as evenly as possible. Check the stack height of the discs as shown in Fig. 9; the top disc should be 3/8" (+ or - 1/16") below the top of the steering clutch hub.
6. Place the pressure plate in position, making certain that the punch mark on the pressure plate lines up with the punch marks on the throwout plate and the clutch hub. Install the three special studs in position in the throwout plate.
7. Place the brake drum over the disc stack, and run the nuts down on the special studs, forcing the pressure plate down until the assembly is securely bolted together. Remove the brake drum from the clutch.
8. Using a suitable straight edge and scale, measure the distance between the machined end of the steering clutch hub and the machined face of the throwout plate as shown in Fig. 10. The throwout plate must extend IN from the face of the hub 3/16" (+ or - 1/16"). If the distance is less than 1/8", add steel discs as required to obtain