

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

1. GENERAL DESCRIPTION

Two steering clutch assemblies, one located at each end of the bevel gear 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 lever connected

by linkage to the steering clutch throwout yoke assembly. An over-center, spring loaded type steering lever booster assembly is attached to the lower end of each steering lever to assist in disengaging the respective clutch.

2. STEERING CLUTCHES

A. Description

The two steering clutch assemblies, one on each side, are of the multiple disc type having seventeen (17) friction discs and seventeen (17) steel discs assembled alternately. Pressure springs hold the steering clutch discs tightly together, between the steering clutch pressure plate and the steering clutch throwout plate, in assembly.

Power is transmitted from the bevel gear shaft through the steering clutches to the final drive pinions. The steering clutches are manually disengaged by pulling back on the steering levers, located directly in front of the operator. Pulling back on a steering lever mechanically forces the corresponding steering clutch throwout sleeve against the steering clutch throwout plate and compresses the pressure springs, thereby allowing

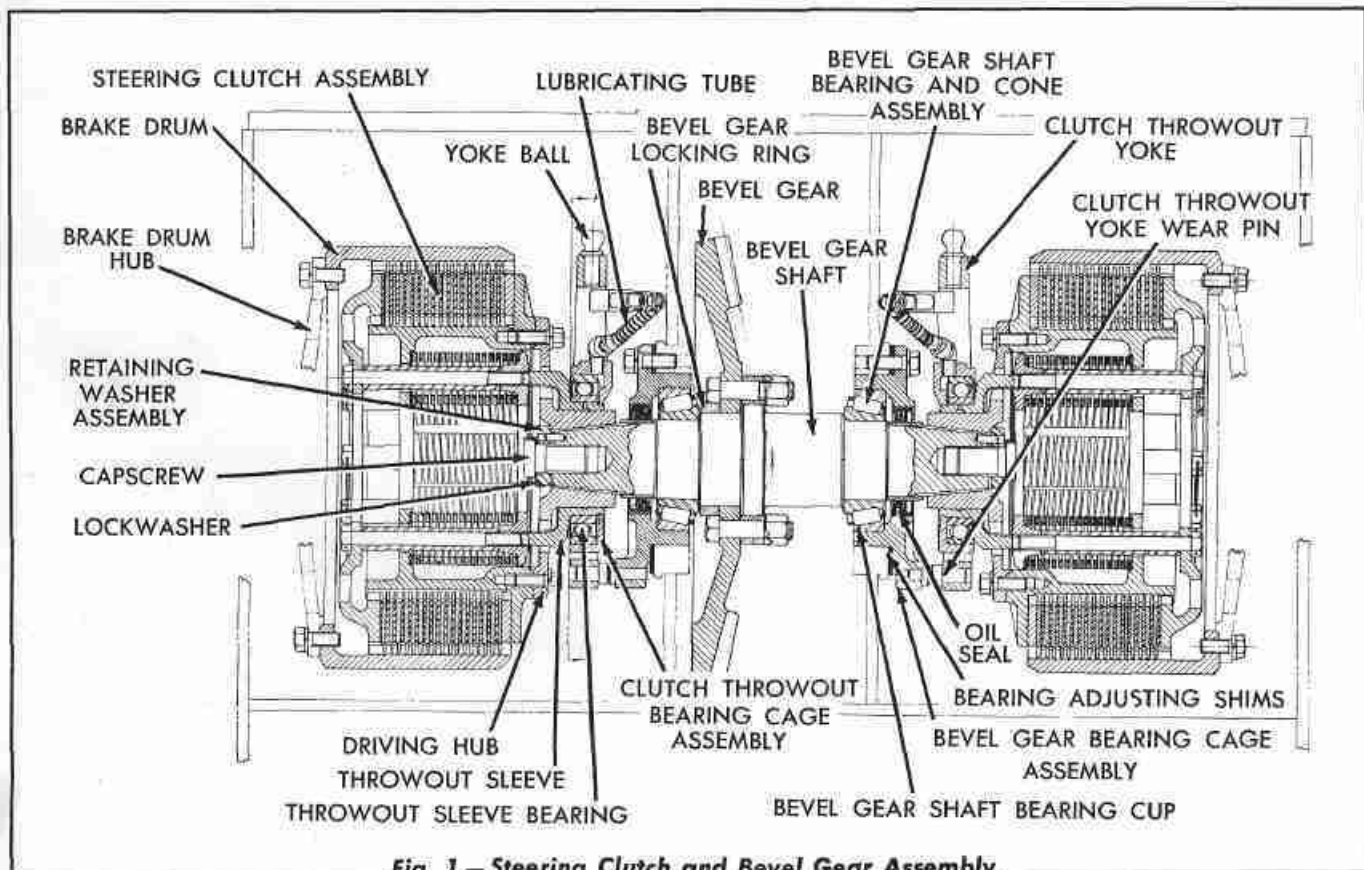


Fig. 1 — Steering Clutch and Bevel Gear Assembly

the steel discs and friction discs of the clutch to separate.

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

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 linkage is properly adjusted when the steering levers each have 3" of free travel, measured at the tops of the steering levers. As the steering clutch discs wear, the steering lever free travel becomes less and an adjustment is required when the free travel has decreased to less than 1". Free travel of the steering levers is necessary to assure proper clearance between the steering clutch throwout sleeve and the steering clutch throwout plate and to assure full engagement of each steering clutch (refer to "STEERING LEVERS AND LINKAGE" in this Section).

C. Washing Steering Clutches

If the steering clutches slip due to oil getting on the clutch discs as a result of oil leaking into the steering clutch compartments, wash the steering clutches with cleaning solvent in the following manner:

1. Install a drain plug in the drain hole located in the bottom of each steering clutch compartment.
2. Remove the brake band adjustment hole covers from the top of the steering clutch housing and pour about three gallons of solvent into each steering clutch 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 steering clutches and brakes will be washed off in this operation.
3. Drain the steering clutch compartments and

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

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

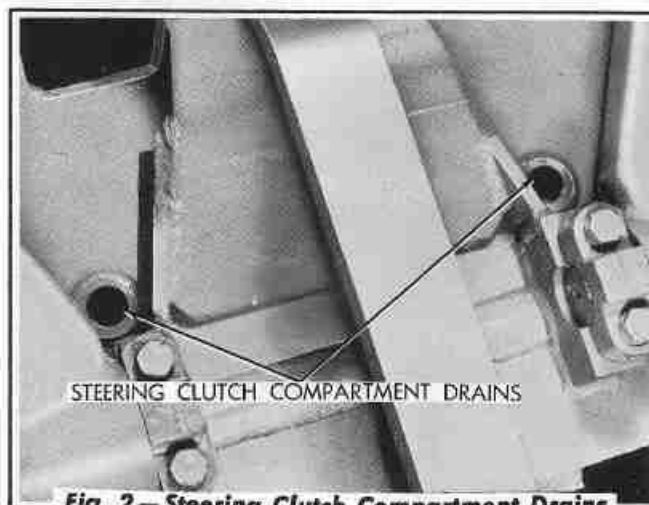


Fig. 2—Steering Clutch Compartment Drains

12

D. Steering Clutch Removal

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

1. Remove the fuel tank (refer to "FUEL TANK REMOVAL," Section II).
2. Remove the seat cushion, tool box, seat cushion frame, brake pedal pads, floor plate, and the floor supporting plates. Loosen the lower end of the battery ground cable and tape the end. Remove the capscrews attaching the battery box to the fender and move the battery box forward on the fender to provide clearance for the removal of the steering clutch.
3. Remove the jam nut and the brake band support 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 yoke.
6. Remove the yoke pin connecting the rear end of the brake control 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 which is located in the brake band adjusting yoke. Using a suitable $\frac{3}{8}$ " NC capscrew inserted through the hole, turn the capscrew into the tapped hole in the end of the brake band end pin. Pull out on the capscrew and remove the brake band end pin as shown in Fig. 3.

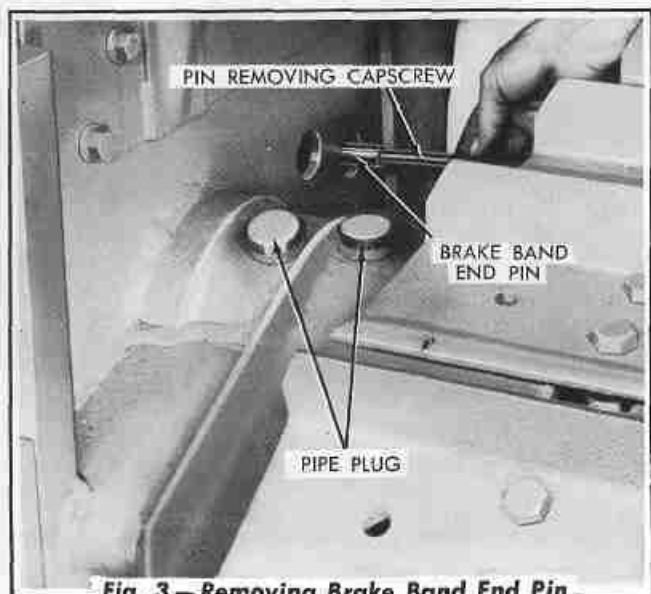


Fig. 3 - Removing Brake Band End Pin

7. Remove the brake band adjusting yoke. 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. 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 from the clutch compartment.
8. Remove the capscrews attaching the steering clutch assembly to the driving hub and to the brake drum hub. This will necessitate turning the steering clutch assembly and

brake drum, which can be accomplished by using a jack placed under the rear of the track and moving the tractor, or by turning the track sprocket by the use of a pry bar.

9. Attach a chain to the brake band as shown in Fig. 4 and lift the steering clutch assembly from the steering clutch 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. With the brake band turned in this position, the brake band 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 steering clutch is lifted from the steering clutch compartment.

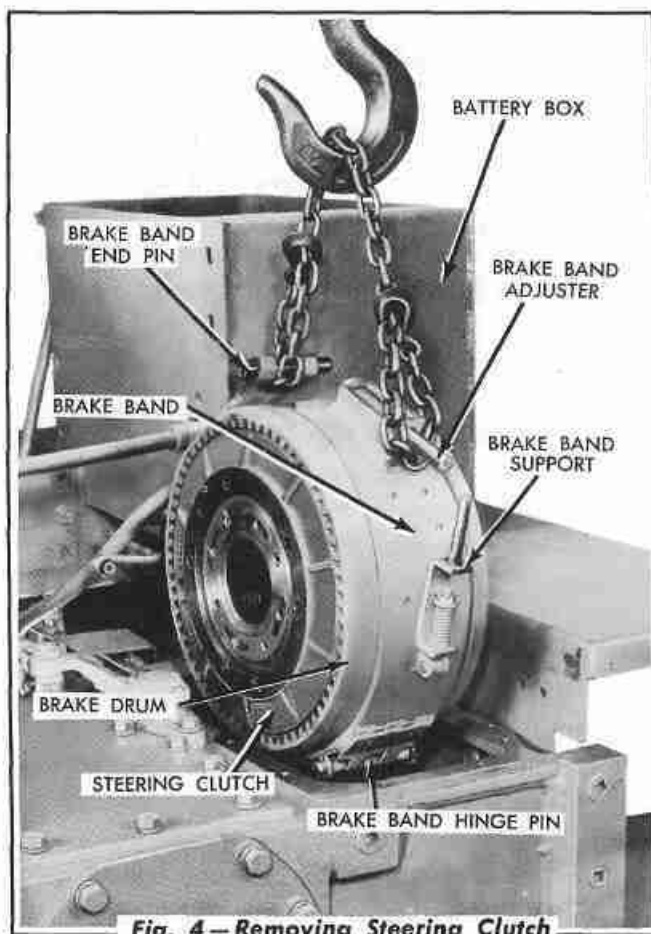


Fig. 4 - Removing Steering Clutch

E. Disassembly of Steering Clutches

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

1. Remove the brake drum from the steering clutch assembly, using care to prevent dam-

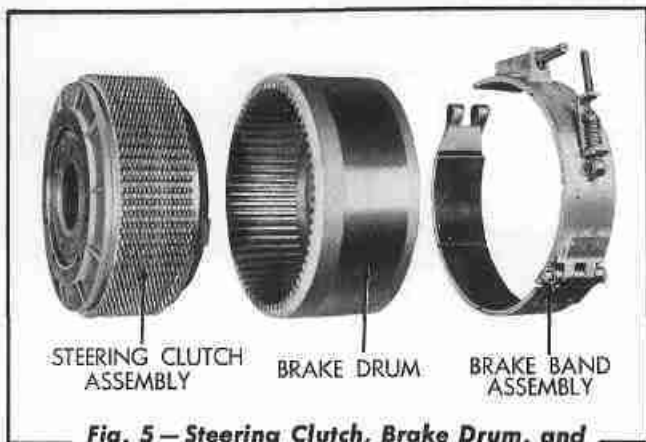


Fig. 5 — Steering Clutch, Brake Drum, and Brake Band

age to the clutch friction disc teeth.

2. Before disassembling the steering clutch, refer to Fig. 8 and center punch or mark the clutch pressure plate, back plate, hub, and the throwout plate so that they can be reassembled in their same relative position.
3. Remove the lockwire from the eight (8) drilled-head capscrews used in holding the steering clutch assembly together. Compress the steering clutch pressure springs using special tools similar to the ones shown in Figs. 6 and 7 and remove drilled-head capscrews. Release the pressure from hydraulic ram, allowing the assembly to separate until all tension is taken off of the steering clutch pressure springs. The clutch throwout plate, discs, springs, etc. can now be separated.

F. Steering Clutch Inspection and Repairs

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

1. Steel Discs

The specified thickness of a steel disc when new is .083" to .096". Inspect the discs for wear and scoring. The discs must be flat within .015".

2. Friction Discs

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

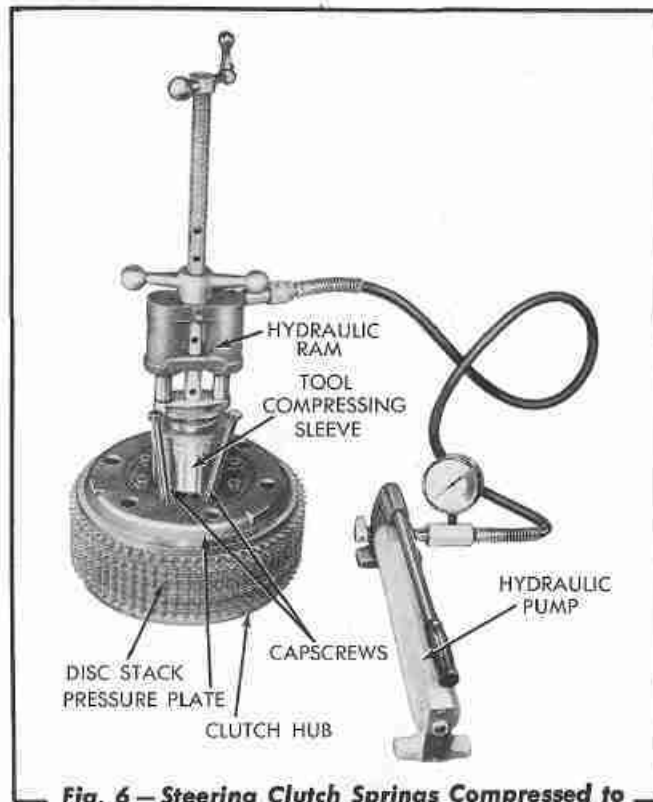


Fig. 6 — Steering Clutch Springs Compressed to Remove Capscrews

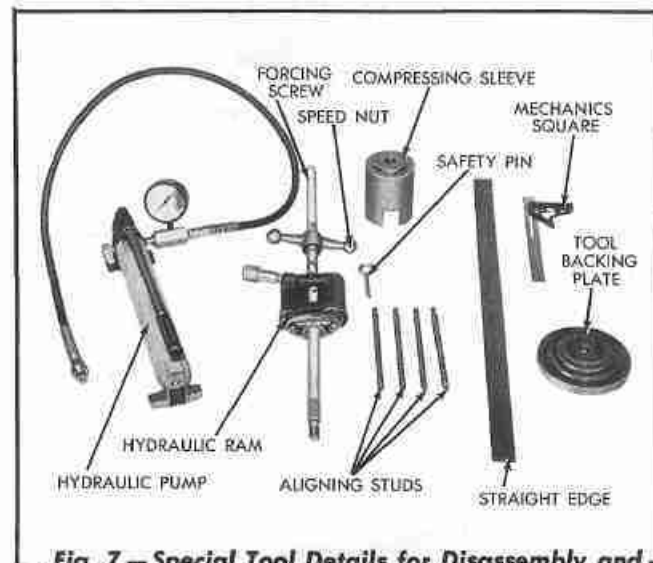


Fig. 7 — Special Tool Details for Disassembly and Assembly of Steering Clutch

tion, new discs must be installed.

3. Pressure Springs

Each pressure spring of the steering clutch when new exerts a pressure of 275 to 305 pounds when compressed to 3-11/16". If a pressure spring does not check reasonably close to this tolerance, it is an indication that the spring has lost its tension and a new spring must be installed.

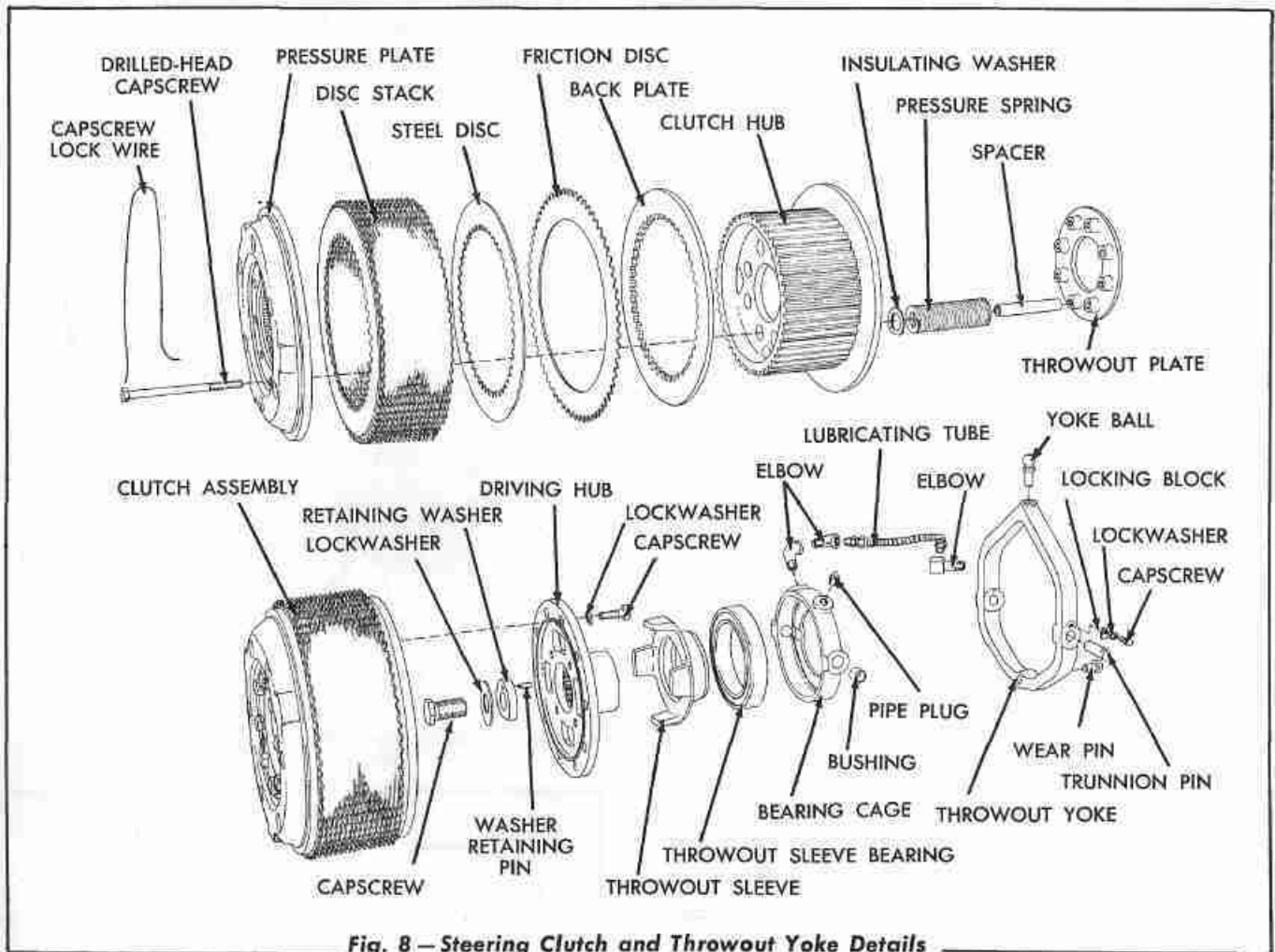


Fig. 8 — Steering Clutch and Throwout Yoke Details

4. Clutch Hub

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

G. Assembly of Steering Clutch

Refer to Figs. 8 and 9 showing the steering clutch components in their relative position.

1. Lubricate the teeth of the steering clutch hub and the outer diameter of the steering clutch throwout plate sparingly with a graphite base lubricant.
2. Place the special tool backing plate (shown in Figs. 7 and 10) on a work bench and place the clutch throwout plate, with the pressure spring boss side up, in position on the tool backing plate.
3. Place one pressure spring over each pressure spring boss of the throwout plate and insert

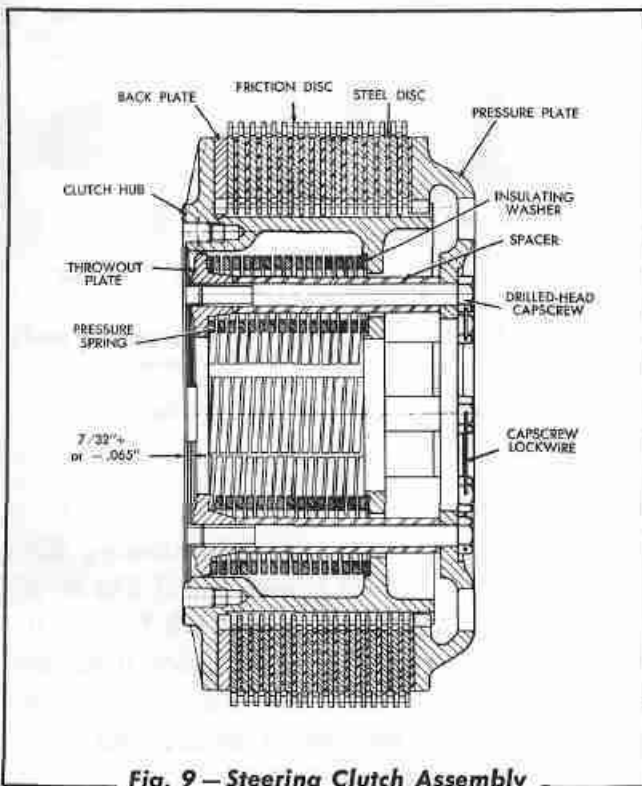


Fig. 9 — Steering Clutch Assembly

a throwout plate spacer into each spring.

- Place an insulating washer on the top of each pressure spring.
- Install the clutch hub in position over the pressure springs and the insulating washers.
- Insert four (4) aligning studs (shown in Figs. 7 and 11) through four (4) of the throwout plate spacers and screw the studs into the throwout plate.
- Place the brake drum down over the clutch hub, with the throwout plate side of the brake drum down. Place $\frac{1}{2}$ " blocks under brake drum to hold it up off of work bench. This will position the brake drum so that all of the clutch discs can be aligned when they are installed on the clutch hub.
- Install the back plate in position on clutch hub.
- Stack the clutch discs (17 each — Friction and Steel) alternately on the clutch hub, beginning with a friction disc next to the back plate. Check the stack height of the discs as shown in Fig. 10; the top disc should be $\frac{9}{16}$ " + or - $\frac{1}{16}$ " below the top of the steering clutch hub.

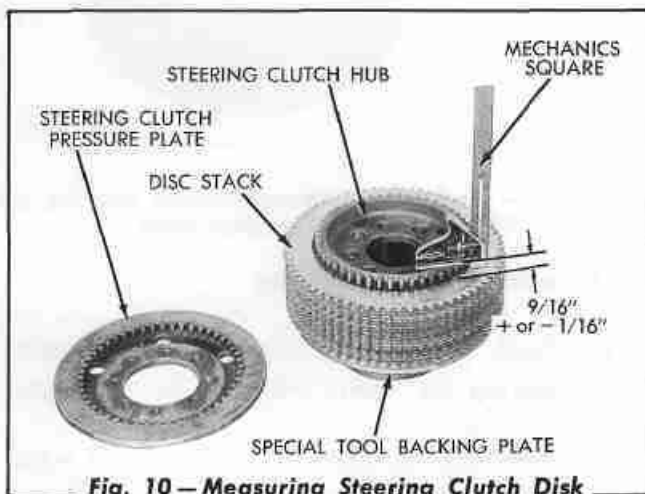


Fig. 10 — Measuring Steering Clutch Disk Stack Height

- Place the clutch pressure plate in position, making certain the punch marks are aligned, and place the tool compressing sleeve through the center of the pressure plate and down on the clutch hub as shown in Fig. 11.

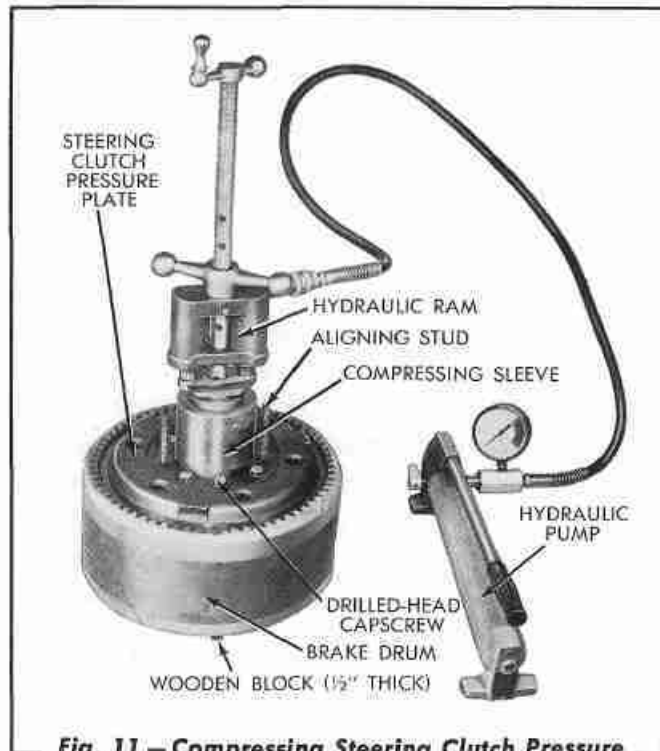


Fig. 11 — Compressing Steering Clutch Pressure Springs to Install Capscrews

- Insert the tool forcing screw through the tool compressing sleeve and down through the clutch pressure plate and turn the screw into the tool backing plate.
- Install the hydraulic ram as shown in Fig. 11 and compress the clutch pressure springs. Insert four (4) drilled-head cap screws and tighten the cap screws securely.
- Remove the aligning studs and install the remaining four (4) drilled-head cap screws. Tighten all eight (8) cap screws securely.
- Release the pressure from hydraulic ram and remove the special tools. Remove the brake drum from the clutch.
- Measure the distance between the face of the clutch hub and the flat face of the throwout plate as shown in Fig. 12. This measurement should be $\frac{7}{32}$ " + or - $.065$ ". In case the distance is not within this specification, add a steel disc to correct; placing the added steel disc next to the pressure plate.