FORD

Service Manual

FORD
NEW HOLLAND

Tractors
FW-20, FW-30, FW-40, FW-60

Reprinted

40003040

Contents

Steiger Clutch, Operation and Maintenance

General:

The major cause of clutch failures could be summarized with two words: "EXCESSIVE HEAT." Excessive heat is not the amount of heat a clutch can normally absorb and dissipate, but the amount of heat a clutch is "FORCED" to absorb and attempt to dissipate.

Most clutches are designed to absorb and throw off more heat than encountered in normal clutch operation without damage or breakdown of the friction surfaces. Clutch installations are engineered to last many thousands of hours under normal operating temperatures and if properly used and maintained they will give satisfactory service.

However, if a clutch is "slipped" excessively or asked to do the job of a fluid coupling, high heat quickly develops to destroy the clutch. Temperatures generated between the flywheel, driven discs and pressure plates can be high enough to cause the metal to flow and the friction facing material to char and burn.

Heat or wear is practically non-existent when a clutch is Fully Engaged but during the moment of engagement, when the clutch is picking up the load, it generates considerable heat. An improperly adjusted or slipping clutch will rapidly generate sufficient heat to destroy itself.

Proper training of drivers, as well as mechanics, is essential for long and satisfactory clutch life. The tractor operator should be taught how to operate the tractor properly, not left to experiment for himself. Starting in the right gear, clutch malfunctions and "when to write up a clutch for readjustment" are the more critical points to cover in operator training programs.

The maintenance personnel should not be left out of the picture. Mechanics attending operator training programs have a chance to see what operator errors can do to clutch life and be in a better position to spot and analyze failures during their clutch maintenance and rebuild programs.

Clutches are designed and recommended for specific vehicle applications and loads. These limitations should not be exceeded. Excessive or extreme overloading is not only injurious to the clutch, but to the entire vehicle power train as well if the total gear reduction in the power train is not sufficient to handle excessive overloads.

"Riding" the clutch pedal is very destructive to the clutch, since a partial clutch engagement permits slippage and excessive heat.

"Riding" the clutch pedal will also put a constant thrust load on the release bearing, which can thin out the lubricant. Release bearing failures can be attributed to this type of operation.

Holding the vehicle on an incline with a slipping clutch is asking the clutch to do the job normally expected of a fluid coupling. A slipping clutch accumulates heat faster than it can be dissipated, resulting in early failures.

Description:

Operators and mechanics should be aware of the fact that the Steiger Angle-Spring Clutches have provisions for an internal clutch adjustment. This permits the clutch "itself" to be readjusted while it is in the tractor. Operators and mechanics should be advised that, unlike competitive clutches, YOU DO NOT ADJUST THE EXTERNAL LINKAGE ON A STEIGER ANGLE-SPRING CLUTCH TO COMPENSATE FOR WEAR. LINKAGE SHOULD ONLY BE RESET TO PROVIDE FOR PROPER FREE-PEDAL AFTER THE INTERNAL CLUTCH ADJUSTMENT HAS BEEN MADE.

On all models Series I and II tractors, including the Series III Wildcat, the clutch is activated by means of direct mechanical linkage.

On all model Series III tractors equipped with a 1010 transmission, with the exception of the Series III Wildcat, the clutch is activated hydraulically by means of a clutch master cylinder and slave cylinder arrangement.

Steiger Angle-Spring Clutches utilize twin 6-button "ceremetallic facing" driven discs and are of the adjustable, pull-type design for heavy duty service, utilizing centrally located pressure springs entirely isolated from the heat of the pressure plate.

Operation and Maintenance

In the 14 inch (35.56 cm) two-plate models, the intermediate plate separating the driven discs is mounted inside a "cup-type" flywheel and carried on drive pins mounted in the flywheel itself. The 14 inch (35.56 cm) clutch will have a 1.75 inch (4.445 cm) -10 spline transmission input drive gear.

The 15.50 inch (39.37 cm) two-plate clutch requires a "flat-type" flywheel. The intermediate plate separating the driven disc is mounted and carried on drive pins inside the clutch cover assembly. The 15.50 inch (39.37 cm) clutch will require a 2.00 inch (5.08 cm) -10 spline transmission input drive gear.

In all models, the pressure plate is driven by four drive lugs, which mate with four drive slots in the clutch cover itself. The pressure plate also carries four return springs to retract the pressure plate when the clutch is disengaged.

The clutch release bearing rotates continuously since the inner race of the bearing is pressed on the release sleeve. However, the clutch release bearing only carries a thrust load when the clutch is released.

The clutches are ventilated to circulate cooling air through the clutch whenever the engine is running.

The clutch design is such that maintenance is readily accomplished without special tools other than a hand arbor press, which should be available for easier clutch disassembly and assembly.

Internal clutch adjustment is simple and quickly maintained by turning the threaded adjusting ring, which is accessible through the inspection plates located on the clutch housing.

A clutch brake is installed to the heavy-duty pull-type clutch as an aid to gear shifting when the vehicle is stationary. The clutch brake is located between the release bearing housing and transmission bearing cap. The steel washer has a tang on the I.D. to engage the transmission main drive gear. When the clutch pedal is fully depressed, the disc is squeezed between the release bearing housing assembly and transmission bearing cap to stop the rotation of the main drive gear and clutch discs.

Constant clutch capacity is maintained regardless of facing wear. There is no direct contact between pressure springs and pressure plate; therefore, springs will not take a set and lose pressure due to heat. The threaded internal adjusting ring permits a quick internal adjustment to restore the springs to their original height and pressure.

Clutch balance is maintained even though parts are interchanged or replaced in the field. All major parts are balanced individually at the factory.

NOTE: *Later production clutch assemblies have "knife-edge" design release levers in the adjusting ring. This design can be readily evidenced by the absence of the release lever pins and clips used on the former design.*

The newer design "knife-edge" lever and ring will be directly interchangeable with the earlier design as a complete ring assembly.

Refer to Parts Identification Section for specific identification of designs.

14.00" CLUTCH PARTS IDENTIFICATION

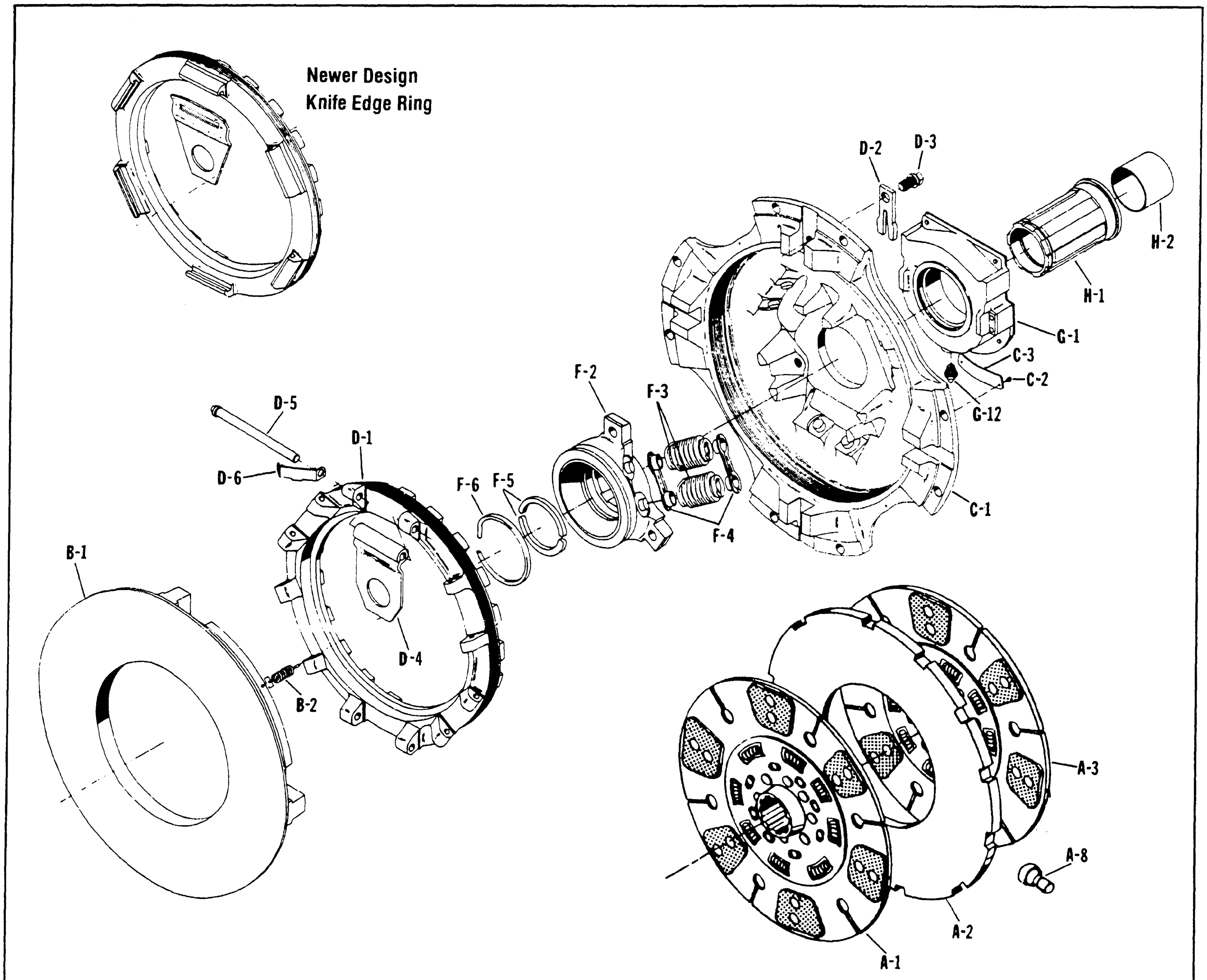

Figure 1:

A-1	DISC, driven front	D-4	LEVER
A-2	PLATE, intermediate	D-5	PIN, pivot
A-3	DISC, driven rear	D-6	CLIP, spring
A-8	DRIVE PIN	F-2	RETAINER, release sleeve
B-1	PLATE, pressure	F-3	SPRING, pressure
B-2	SPRING, return	F-4	PIVOT, spring
C-1	RING, flywheel	F-5	RING, release sleeve
C-2	PIN, name plate	F-6	RING, snap
C-3	PLATE, name	G-1	BEARING & COVER, Sub-Assembly
D-1	RING, adjusting	G-12	NIPPLE, Zerk
D-2	LOCK, adjusting ring	H-1	RELEASE SLEEVE, Sub-Assembly
D-3	BOLT & lock washer assembly	H-2	BUSHING, Release Sleeve