



## ZF4HP22 & ZF4HP22-EH RWD Applications Clutch "E" Drum Saver® Clutch Pack

### ALTO PART #053758

#### Alto # 053758 POWERPACK® CONTENTS:

- (4) 053706-225 (.089" / 2.25mm) Thick Core Clutch "F" Friction Plates
- (4) 053705 (.059" / 1.50mm) Steel Plates
- (1) 053707 (.083" / 2.10mm) Standard Steel Plate

### DURABILITY AND PERFORMANCE BENEFITS

The thicker steel core of the enclosed clutch "F" friction plates allows the reuse of a worn splined clutch "E" drum. The kit offers the same extended durability to avoid a potential comeback or rework even when a NEW clutch "E" drum is installed. It is excellent insurance for your quality rebuild.

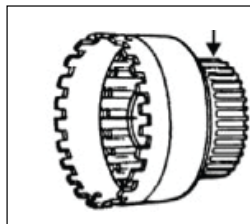
### INSTALLATION INSTRUCTIONS

Install the friction and steel plates in the conventional manner. Install the top backing plate and snap ring. Air check the clutch pack several times to seat all the components. Check the clutch clearance with a feeler gauge between the bottom of the backing plate and the top friction plate. Recommended clutch pack clearance is .025" - .030". If it becomes necessary to reduce the clearance, remove one of the .059" (1.50mm) steel plates and install the .083" (2.10mm) steel plate included.

**TECHNICAL NOTE:** ZF and some aftermarket service manual refer to clutch "E" as clutch unit #11 and clutch "F" as clutch unit #12.

### WHAT ARE THE REASONS FOR INSTALLING THIS CLUTCH KIT?

When a ZF4 series transmission shifts into 4<sup>th</sup> gear, clutch pack element "F" applies, which then allows the rear planetary section to lift and rotate. During the time that the elements are applied, vibratory resonance from the TCC tends to rock clutch drum "E" back and forth slightly but with considerable force. With diesel equipped vehicles, the engine pulses tend to aggravate the condition even more. As the friction plate teeth on clutch "F" rock back and forth with this motion, the teeth begin a peening effect on the splines of the clutch "E" drum. The steel cores of the enclosed friction plates are .060" thick versus the .035" of the original thickness steel cores. The additional .025" of material is almost double the amount of total tooth contact area. The additional .025" thickness also spreads the energy of the apply over more surface area. The illustration below shows the area to check for clutch drum "E" spline wear.



CLUTCH DRUM "E" ASSEMBLY

Check the entire drum spline contact area as indicated by the arrow. Always check BOTH sides of the splines since they are generally peened on both sides. If the peening marks do not exceed approximately .025" in depth, use a file and carefully round off any raised burrs that the peening has created.

NOTE: Clutch pack "F" can have a three OR four friction plate setup. See the page two in order to identify the drum differences.

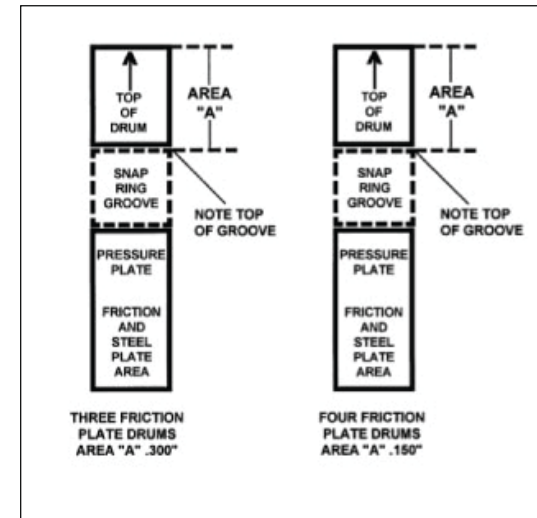
*Shift . . . Your Thinking*



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### CLUTCH "F" DRUM FRICTION PLATE USAGE

Using a vernier caliper, measure area "A" as shown below. You will be measuring between the very TOP of the drum to the upper high point area of the snap ring groove. The dimensional difference of .150" is easily distinguished. The recommended clutch clearance is .025" - .030" for clutch "F" and .025" - .035" for clutch "E". These tighter clearances result in a shorter and cleaner 3-4 up shift and 4-3 part throttle or forced down shift. The tighter clearances also encourage the apply and release rates to occur more at the beginning stages of friction element overlap and will tend to increase quickly so that the peak torque load of the two elements occurs in the MIDDLE of the shift. This will help avoid a tail end bang or cut loose and also significantly reduce accelerated wear on the splines of the clutch "E" drum.



*Shift . . . Your Thinking*