

### Servo Transfer Feeds

One of the most challenging applications in the metal forming industry is the Servo Transfer Feed (STF®). The STF® controls the automation used for transferring parts from station to station in a forming press.

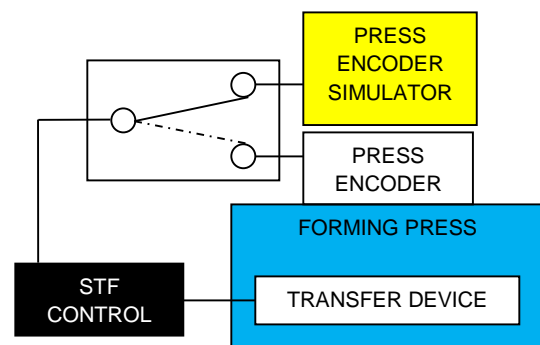
The transfer feed must be synchronized to the press position to avoid colliding with the ram of the press. Traditionally, this synchronization was accomplished through a mechanical link to the main drive shaft. The movement of the press transmitted the power to move the transfer feed via gears, cams, and shafts. While this configuration provided very tight synchronization, it was not designed for maximum production or quick part change over.

In today's press manufacturing processes, it is advantageous to be able to change the index, lift, and clamp distances of the feed quickly to accommodate optimum production rates and improve part handling. Since this is quite cumbersome in a mechanical press, many customers have switched to servo transfer feeds, which provide the flexibility necessary for efficient operation and smooth part handling.

Since a servo transfer feed is electronically synchronized to the press, an additional benefit is being able to switch the automation from being synchronized to the press position to a simulated press position. This feature is called an "electronic" clutch.

There are many times in the press cycle when it is beneficial to electronically clutch the transfer feed between following the press and following a simulated press position.

### The Electronic Clutch Advantage



The following examples demonstrate some of the uses of this feature:

**Case 1: Avoiding Press Forming Disturbances**  
When the press contacts the material, the ram experiences variations in velocity. These variations are transmitted to the transfer on mechanical systems or less sophisticated servo feeds without the benefit of an electronic clutch causing oscillations in the transfer mechanics. This results in excessive drive train wear.

Using a Unico® STF® with an electronic clutch, the transfer feed follows the press up to the point of part contact, switches over to the press simulator during forming, and then clutches back to the press encoder as the dies disengage the parts. Since the simulator provides a smoother signal for the automation to follow, it avoids the oscillations caused by the press speed variation and results in less mechanical wear.



Electronic Clutch

STF®  
System Feature  
by Unico®

## Electronic Clutch

### Case 2: Top Stop with Return to Home

One of the most frequent causes of dropped parts is top stopping the press. This abrupt stop causes the transfer feed to jerk with enough force to shake the parts free of the tooling.

With the STF® electronic clutch feature the press signals the automation that a top stop is about to take place. When the press passes the top stop angle, the automation again clutches out and switches over to the press simulator. The simulator continues to move to a "home" position and the parts are smoothly dropped off in the dies for the next press cycle.

### Case 3: Smooth Start

Just as in stopping, the press does not start out very smoothly. If the parts were left on the rails, they would start with a jerk and the rails themselves would shudder into motion.

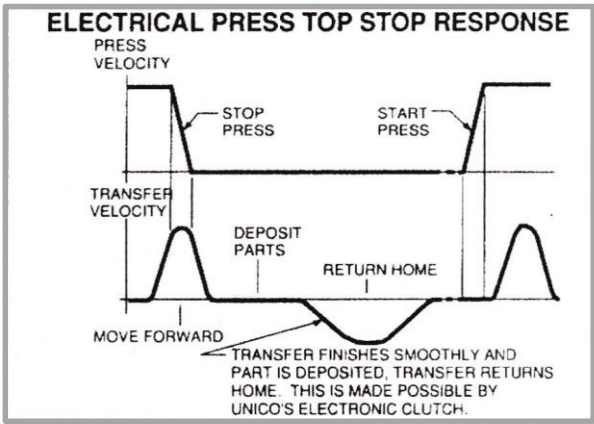
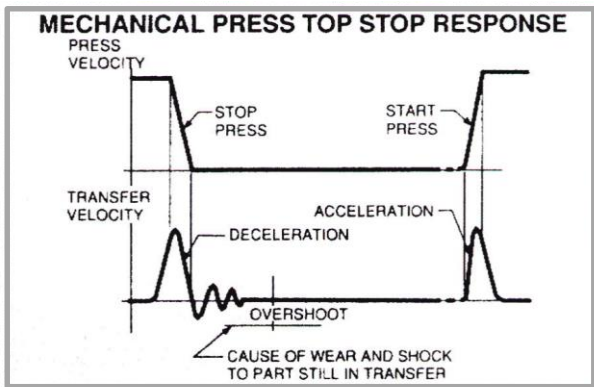
With the STF® electronic clutch feature, the transfer feed quietly remains at its home position, with the parts in the dies, waiting for the press to come down and form them. When the press passes through the bottom of its stroke, the automation is clutched in and the transfer begins to follow the press moving the parts to the next die station.

### Case 4: Simplifying Mechanical Adjustments

Often it is desirable to run the transfer feed while the press is stopped. Mechanical feeds require a mechanical clutch and auxiliary drive motor to accomplish this. With the Unico® STF® the automation can be run on path with the press simulator at any speed to perform die checkout, adjust tooling, and perform maintenance.

### Case 5: Die Change

During die change operations, it is necessary to move the transfer feed through various positions to accommodate changing the tooling and disconnecting the feed rails. Once again, using an electronic clutching scheme and the press simulator, the Unico® STF® accomplishes this task very easily.



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