

# FET ACCEPT STATION

## THEORY OF OPERATION

The accept station removes accepted squibs. The gripper jaws are V-shaped and grab both the exposed pin and the Ampenol squib on the overmold. The accept station vertical slide and gripper are mounted on a power linear slide cylinder that moves to the accept bin. This arrangement allows a six (6) inch movement to clear the upper top plate of the conveyor and deliver accepted squibs to the passed bin.

After Final Electrical Test, the AUTOFET software logs the test data and sends the PLC an accept code. The PLC then energizes the appropriate accept station valves (SOL812, SOL813, SOL814A, and SOL814B) to enable the station to move parts to the accept bin. The valves, located on the accept station mounting plate, will have an LED indicator illuminated when the PLC has energized the valve. Due to the fast cycle rate of the machine, the accept station requires two valves (SOL814A and SOL814B) plumbed in parallel to provide the large air flow for the traverse power slide.

The PLC has inputs from hall and inductive solid state sensors to verify completion of the given output. The accept station has inputs: HS303, HS304, HS305, HS306, HS307, and HS308 for this feedback.

## SEQUENCE OF OPERATION

After the Final Electrical Test station has performed all electrical tests, the results are stored and logged. If an accept code is given to the PLC, the accept station will remove the squib and place it into the accept bin. As the conveyor is indexed and the part comes to rest at the accept station the PLC actuates valve SO813 sending the gripper down. When the lower cylinder sensor (HS306) is activated the PLC turns on valve SO812 to close the gripper. When the gripper closed sensor (HS304) is made the PLC deactivates valve SO813, raising the gripper. Upon reaching and activating the vertical cylinder sensor (SO305) the PLC will activate valves SO814A and SOL814B, providing the traverse motion for the accept bin. When the traverse at drop off sensor (HS308) has been made the PLC deactivates valve SO812 opening the gripper. After a short time, the PLC will deactivate the traverse valves SO814A and SOL814B and the accept gripper assembly will return to the home position.

When the accept gripper assembly reaches the home sensor (HS307), the gripper up sensor (HS305) and gripper open sensor (HS303), the accept station is ready for the next cycle. If there is a significant delay in reaching a commanded position an error message will occur. When all the sensors are made and the conveyor has indexed under the Accept Station with a passed squib, the cycle will start again.

## MECHANICAL ADJUSTMENTS

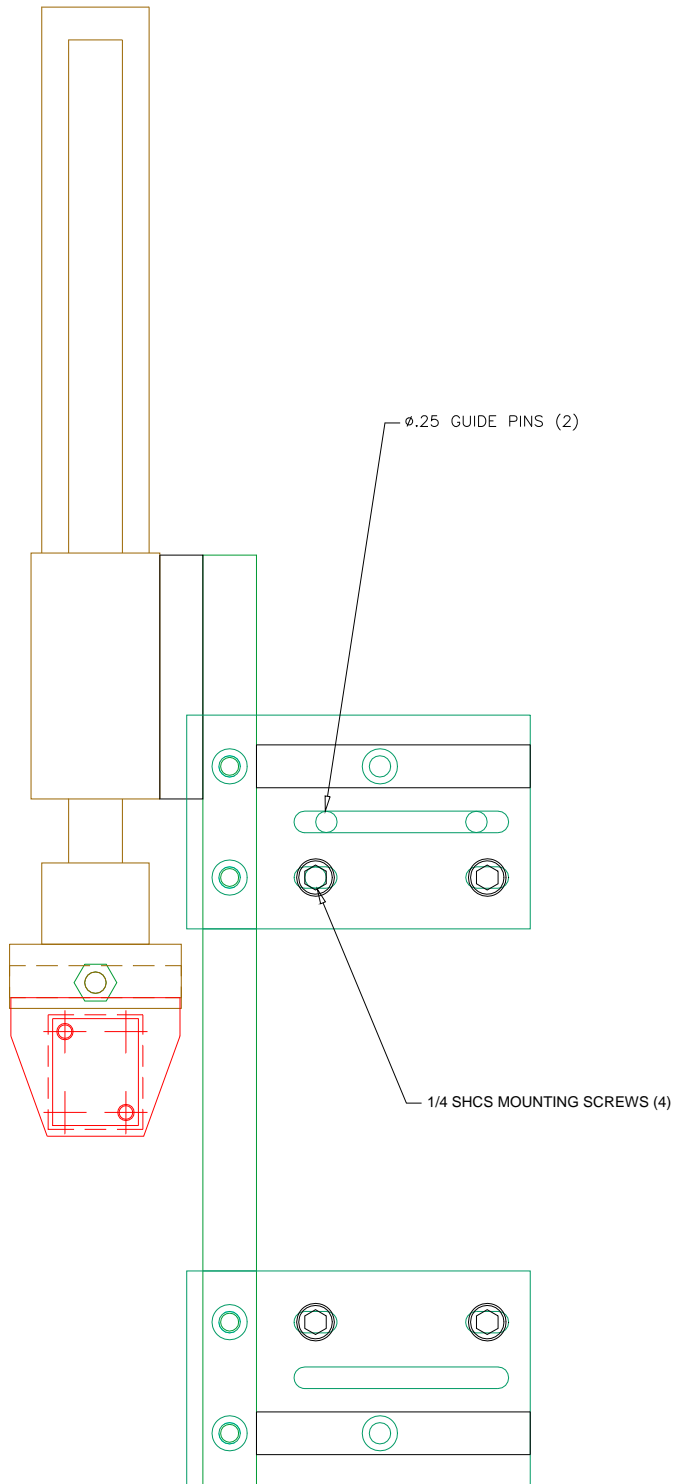
The accept station is fully adjustable in all three axes (X, Y, and Z). Once adjusted the station should require no adjustments during production usage. The X-axis adjustment is factory set and should not need to be changed when replacing mechanical wear components. When replacing any of the cylinders the adjustment procedure must be performed as part of the replacement procedure. Due to manufacturing differences, when replacing the vertical guided cylinder, gripper, or the gripper jaws the Z-axis adjustment procedure may need to be carried out.

## X AXIS ADJUSTMENT

The X-axis adjustment should never have to be changed during normal production usage. The entire accept station is adjustable in the direction of the conveyor travel. There are two (2) guide pins in the conveyor top plate that keeps a linear track for the station (common to Load and Reject stations as well). There are two (2) ¼ socket head cap screws in each of the feet of the station. These bolts are loosened and then adjustment can be made. Once in the proper position, the four (4) bolts are tightened and the process is complete.

### PROCEDURE

1. PLACE THE MACHINE IN TO MAINTENANCE MODE AND SELECT THE ACCEPT STATION ON THE CONTROL BOX.
2. JOG THE ACCEPT STATION GRIPPER ASSEMBLY TO THE HOME NEST POSITION.
3. LOOSEN THE FOUR (4) ¼ SHCS, DO NOT REMOVE ONLY RELIEVE TENSION, IN THE TWO (2) MOUNTING FEET.
4. PLACE THE GRIPPER ASSEMBLY IN THE HOME POSITION, AND ALIGN TO THE INSULATOR NEST.
5. TIGHTEN THE FOUR (4) ¼ SHCS.
6. RECHECK THE ALIGNMENT TO THE INSULATOR NEST POSITION.



**Figure 1 X-AXIS ADJUSTMENT LOCATIONS**

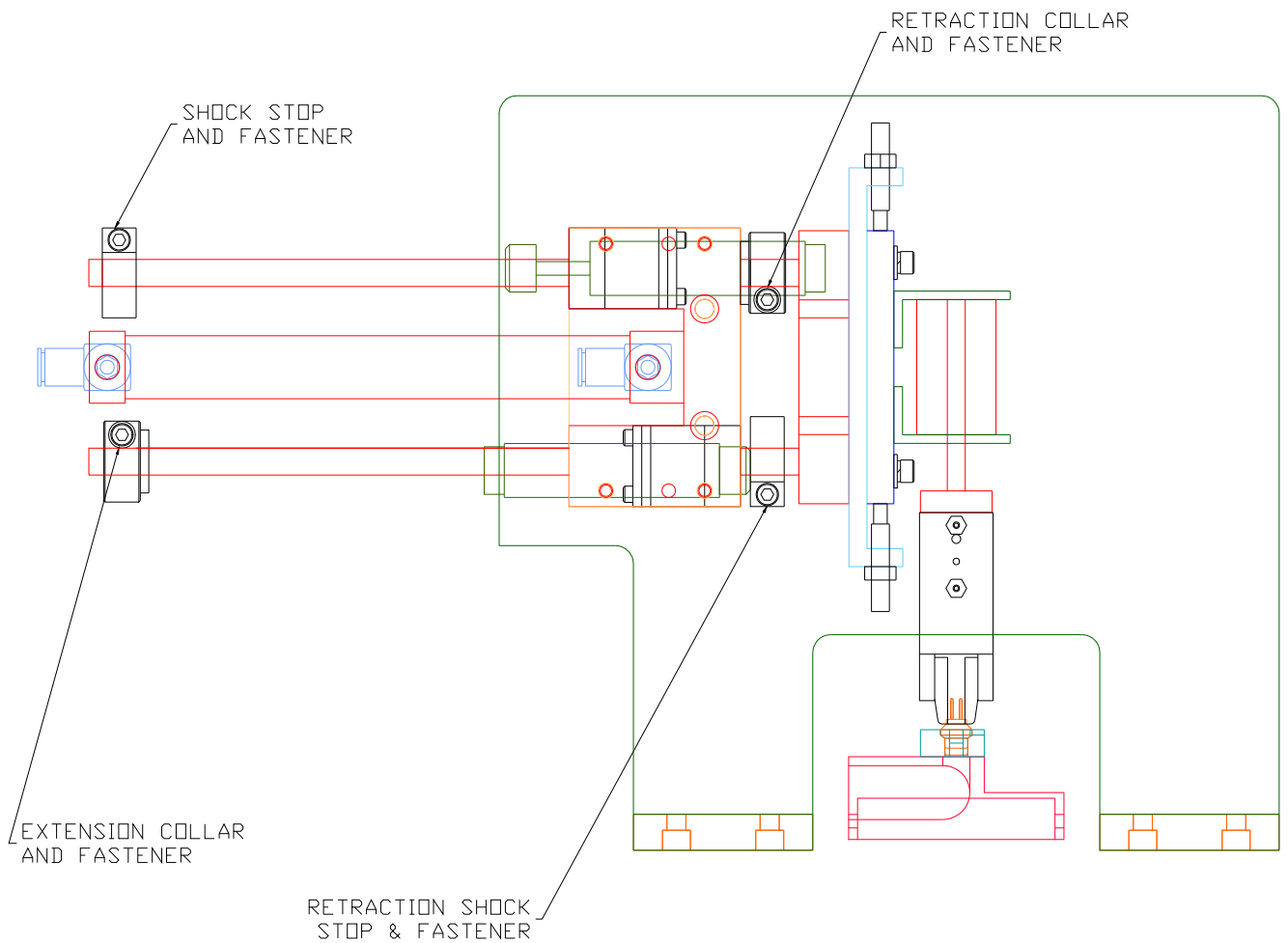
## Y AXIS ADJUSTMENT

Two adjustments may be made in the direction for travel of the gripper head. The first and most important is the squib pick up/home position. This adjustment is made using the retraction hard stop collar located on the front of the power slide shaft. Use the Load Station as a guide to proper adjustment position.

The second adjustment is the Accept Bin drop off position. This adjustment is made using the extension hard stop collar located on the rear of the power slide shaft.

## NEST POSITION ALIGNMENT PROCEDURE

1. PLACE THE MACHINE INTO MAINTENANCE MODE AND SELECT THE ACCEPT STATION ON THE CONTROL BOX.
2. JOG THE ACCEPT STATION GRIPPER ASSEMBLY TO THE NEST INSERTION POSITION.
3. DETERMINE THE DIRECTION OF THE ADJUSTMENT.
4. REMOVE AIR TO THE ACCEPT TRAVERSE CYLINDER.
5. TO MOVE THE GRIPPER INSERTION POINT TOWARD THE REAR OF THE MACHINE, LOOSEN THE EXTENSION COLLAR FASTENER AND MOVE THE STOP COLLAR THE APPROPRIATE AMOUNT TOWARD THE FRONT OF THE MACHINE.
6. TO MOVE THE GRIPPER PICK UP POINT TOWARD THE FRONT OF THE MACHINE, LOOSEN THE EXTENSION COLLAR FASTENER AND MOVE THE STOP COLLAR THE APPROPRIATE AMOUNT TOWARD THE REAR OF THE MACHINE.
7. DEPENDING UPON THE AMOUNT OF ADJUSTMENT, THE EXTENSION SHOCK MAY NEED TO BE ADJUSTED (SEE SHOCK ADJUSTMENT AND REPLACEMENT SECTION).
8. TURN AIR BACK ON TO THE ACCEPT TRAVERSE CYLINDER.
9. CHECK THAT ALIGNMENT IS IN THE CORRECT LOCATION BY JOGGING THE GRIPPER AND LOWERING FOR INSERTION AT THE NEST POSITION.
10. IF ALIGNMENT IS CORRECT, PLACE MACHINE BACK INTO RUN MODE AND RESTART THE LOT TO CONTINUE OPERATION.



**Figure 2 Y-AXIS ADJUSTMENT LOCATIONS**

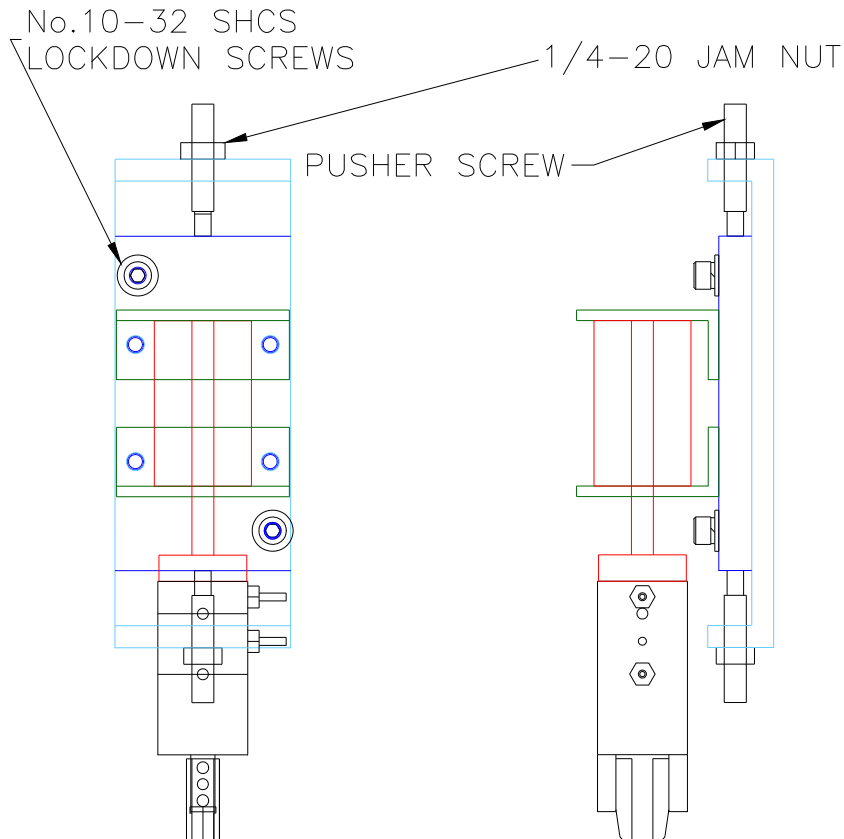
### Z AXIS ADJUSTMENT

The gripper assembly (vertical cylinder, gripper, V jaws, and associated sensors) is identical to the Reject Station Assembly. It has a total travel adjustment of ½ inch in the Y-axis. The Y-axis adjustment is performed by using the swivel set screws at the top and bottom of the mounting plate. The two (2) number 10-32 socket head cap screws (SHCS) need to be loosened so that the vertical cylinder mounting plate can be moved. Once the plate is free, use the top and bottom swivel screws to move in the appropriate direction. Once in the proper location, tighten down the

### PROCEDURE

1. PLACE THE MACHINE IN TO MAINTENANCE MODE AND SELECT THE ACCEPT STATION ON THE CONTROL BOX.
2. PLACE A SQUIB INTO THE INSULATOR NEST.
3. SEND THE GRIPPER DOWN

4. DETERMINE WHAT DIRECTION (UP OR DOWN) THE GRIPPER MUST BE ADJUSTED TO.
5. LOOSEN THE TWO (2) NUMBER 10-32 SHCS, ONLY RELIEVE THE FRICTION TENSION, HOLD DOWN SCREWS ON THE CYLINDER MOUNTING BLOCK.
6. LOOSEN THE TWO 1/4-20 JAM NUTS ON EACH OF THE PUSHER SCREWS.
7. ROTATE THE TWO PUSHER SCREWS IN OPPOSITE DIRECTIONS TO GIVE THE PROPER DIRECTION OF MOVEMENT.
8. TIGHTEN THE JAM NUTS ON THE PUSHER SWIVEL SCREWS
9. TIGHTEN THE TWO (2) NUMBER 10-32 SHCS.
10. CHECK THAT ALIGNMENT IS CORRECT.



**FIGURE 3 Z-AXIS ADJUSTMENT LOCATIONS**

### SHOCK ADJUSTMENT AND REPLACEMENT

Because of the high cycle rates of the machine, the load and accept stations are fitted with shock absorbers for the extend and retract motions (traverse). These shocks (22599) take out the kinetic energy of the slides and convert it to heat. The use of shock absorbers allows the machine to accelerate and decelerate in the least amount of time. Thus, the machine can run as fast as possible.

During normal operation of the machine there should never be a need to adjust the shock absorbers. However, due to the nature of shock absorbers, they will need to be replaced. The best way to check for replacement is when there is loud noises coming out of the station. At this point place the machine in maintenance mode and check both of the shocks by pushing on them.

If either or both are extremely easy to push (i.e. very little resistance) the particular shock will have to be replaced.

When replacing shock absorbers, it is important to note that they are not to be used as a final hard stop. The stop collars are there to provide the hard stop. The shock absorbers are there only to decelerate the load.

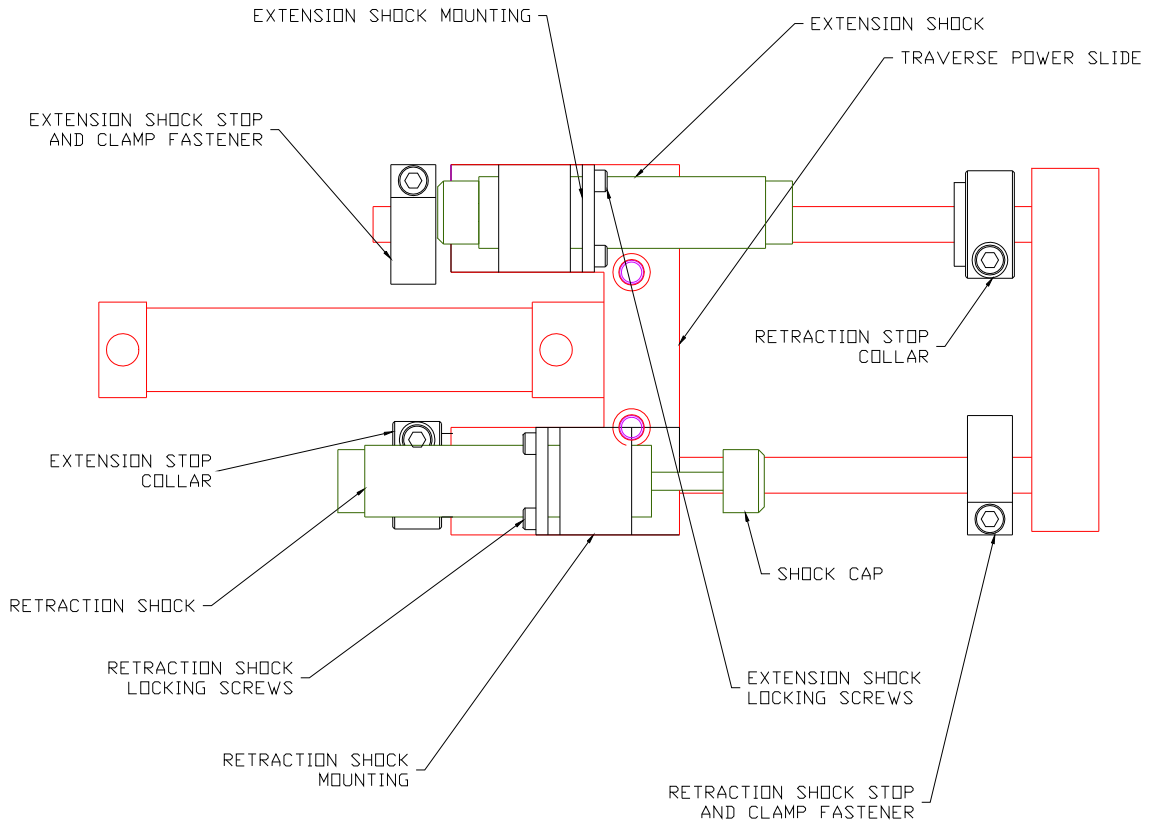
## **USING THE SHOCK ABSORBERS AS A FINAL HARD STOP WILL GREATLY REDUCE LIFE AND LEAD TO PREMATURE FAILURE OF THE UNIT.**

Do not bottom the shock out against the shock stop. When replacing the shock, make note of the distance between the cap of the shock and the main threaded body. Maintain the same distance after the new shock is installed.

The shock absorbers are mounted to a bracket. This bracket allows the shock to be adjusted in the direction of travel and then to be locked in place. To remove the old shock absorber, release the tension on the locking screws. The shock then can be unscrewed out of the bracket. Then screw in the new shock; remember to maintain some distance from the cap to the body when fully depressed by the shock stop. Once the shock absorber is in the correct position, tighten the locking screws to complete.

### **PROCEDURE**

1. PLACE THE MACHINE IN TO MAINTENANCE MODE AND SELECT THE LOAD STATION ON THE CONTROL BOX.
2. SEND THE LOAD TRAVERSE TO THE OPPOSITE POSITION OF THE SHOCK TO BE REPLACED
3. LOOSEN THE LOCKING SCREWS ON THE SHOCK MOUNTING BRACKET.
4. TAKE NOTE OF THE POSITION OF THE OLD SHOCK.
5. UNSCREW THE SHOCK, COUNTER CLOCKWISE (WHEN VIEWED FROM THE REAR OF THE SHOCK).
6. SCREW IN THE NEW SHOCK CLOCKWISE (WHEN VIEWED FROM THE REAR OF THE SHOCK).
7. SCREW THE SHOCK INTO THE MOUNTING BRACKET UNTIL THE POSITION CORRESPONDS TO THE OLD SHOCK.
8. TIGHTEN THE LOCKING SCREWS ON THE SHOCK MOUNTING BRACKET.
9. CHECK FOR OPERATIONAL PERFORMANCE BY JOGGING THE TRAVERSE SLIDE.
10. RESTART TO CONTINUE OPERATION



**Figure 4 SHOCK REPLACEMENT AND ADJUSTMENT**



## **PERIODIC MAINTENANCE**

### **DAILY**

CHECK FOR PROPER ACTUATION OF LIMIT SENSORS  
CHECK FOR SMOOTH OPERATION OF ALL PNEUMATIC CYLINDERS  
CHECK FOR SMOOTH OPERATION OF TWIN RAIL LINEAR POWER SLIDE SYSTEM

### **WEEKLY**

PERFORM ALL DAILY CHECKS  
CHECK FOR HOME AND BIN STATION ALIGNMENT  
CHECK ALL PNEUMATIC FITTING AND TUBE INTERFACES FOR AIR LEAKS

### **MONTHLY**

PERFORM ALL WEEKLY CHECKS  
CHECK AND LUBRICATE TWIN RAIL BEARINGS AND SHAFT  
CHECK FOR CYLINDER SHOCK PAD INTEGRITY  
CHECK 'V' JAW SURFACES FOR WEAR, REPLACE IF NECESSARY