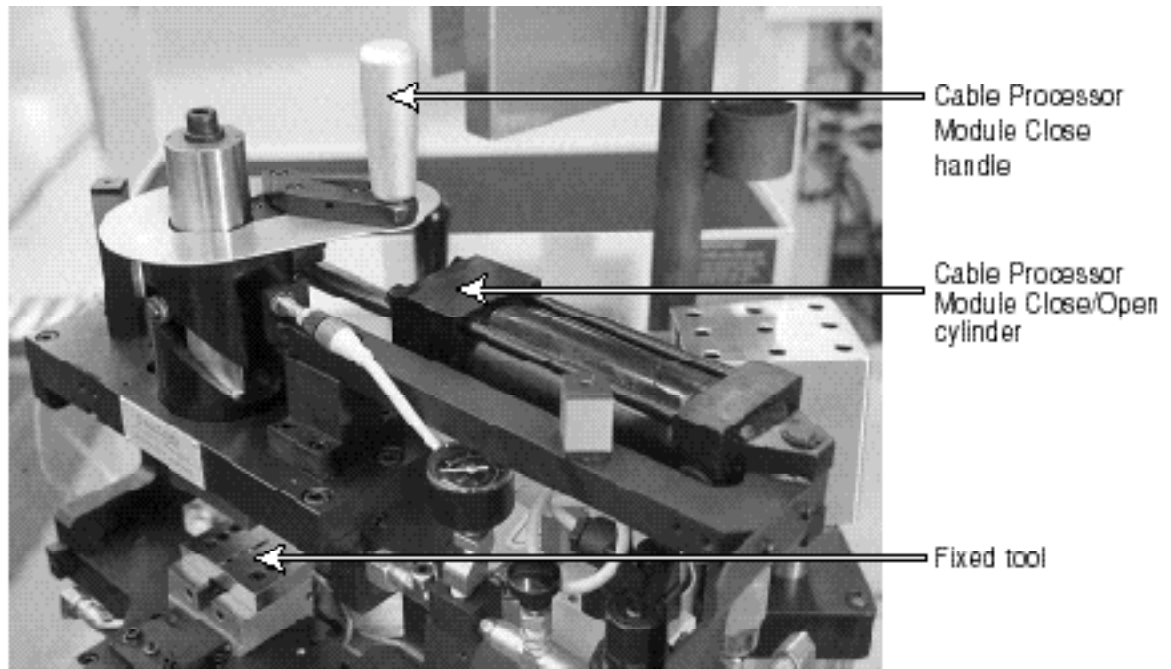

SECTION G2: CABLE PROCESSOR MODULE MAINTENANCE



Cable Processor Module overview



WARNING!

When tipping the Cable Processor Module back, (after removing the toggle arm pin), use extreme caution not to drop the Cable Processor Module. Support the Cable Processor Module until it reaches the stops. The Cable Processor Module linkage and counterbalance mechanism could be damaged, and the Cable Processor Module could break off from the machine if it is dropped onto the stops.



CAUTION!

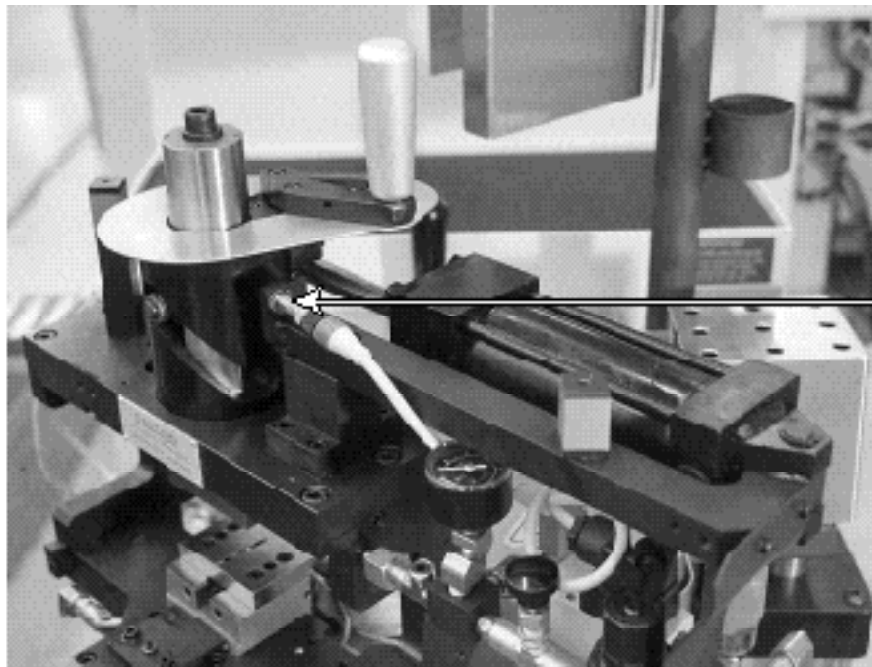
Regular inspection of all guards, protective devices, point of operation safeguarding systems and mechanically loaded components is recommended. Component devices or guarding which show signs of wear, fatigue (cracks, distortion), or damage of any type should be replaced immediately.

Cable Processor Module Closed proximity switch

The Cable Processor Module Closed proximity switch closes when the tool faces are together. If something (debris, a strand of wire or an out-of-position component) holds the tool faces apart during a cycle, the switch will not close and the cycle will stop.

The Cable Processor Module Closed proximity switch is set as follows:

1. Turn the machine control on and put the machine in setup mode.
2. Remove the large guard which covers the Cable Processor Module. Clean the tool faces to ensure nothing is between them which will hold them apart.
3. Place a piece of paper on the fixed tool, 0.1 mm (.004 inch) thick.



Cable Processor
Module Closed
proximity switch

Cable Processor Module Closed proximity switch

4. Close the tooling using the manual close handle.
5. Loosen the two screws which hold the switch actuator to the cam assembly.

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6. Display the Cable Processor Module Closed proximity switch status on the operator interface module. There is a small LED on the proximity switch itself which illuminates when the switch closes. Move the actuator away from the switch until the switch opens. Slowly slide the actuator towards the switch until the switch closes. Tighten the two retaining screws.
 7. Open the tooling and remove the paper. Fold the paper double and place it between the tool faces. Close the tooling. If the Cable Processor Module Closed switch is set correctly, the switch will not close. If the switch does close with the folded paper between the tool faces, reset the switch following the above steps.
 8. When the switch has been properly set, replace the guarding.

Note: An improperly set Cable Processor Module Closed switch can be a safety hazard. Take the time to set the switch properly. The switch should be set (or at least checked) whenever tooling is installed.

If the proximity switch must be replaced, the correct spacing between the end of the proximity switch and the switch actuator is 0.6 mm (.025 inch).

The Cable Processor Module Closed switch is designed to “over-travel” in the event the Cable Processor Module is closed with part or all of the tooling missing.

Cable-In-Place (Part-In-Place) switch

Operation of Cable-In-Place switch

The Cable-In-Place pressure switch is used to signal to the Programmable Logic Controller when a cable or component is correctly positioned in the tool.

Air is supplied to the air switch circuit as long as the control is on. The switch closes when a cable pushes up the safety pin in the movable tool and seals off the flow of air passing through the tool. The pressure in the switch circuit builds sufficiently to cause the switch to close, and an input is made to the PLC allowing an injection to take place. After an injection is made and the main slide opens, the safety pin drops down and air flows through the movable tool again. The pressure switch opens as air exits through the small hole in the front of the movable tool.

If the safety pin does not drop down after the main slide opens, the Cable-In-Place input signal to the PLC will not turn off. In this case, an alarm will be triggered and further machine operation will be inhibited until the alarm is acknowledged and the problem, (the reason why the safety pin did not drop), is repaired.

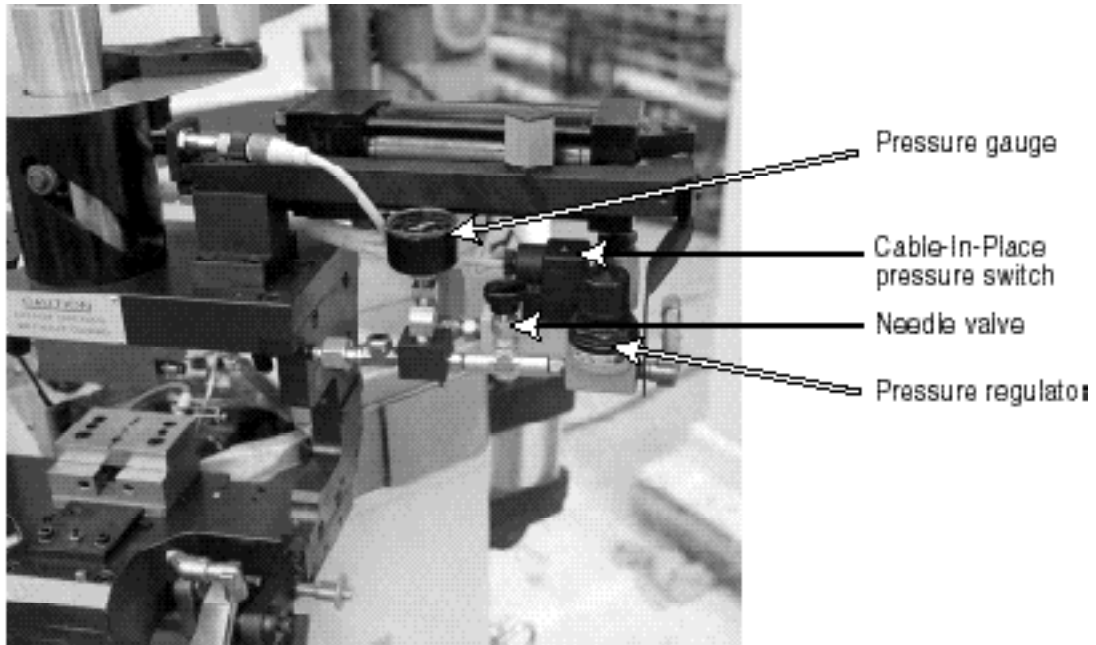
See Section G5: Troubleshooting for more details on alarms.

Adjustments to the Cable-In-Place switch

Air pressure switch: The pressure switch circuit consists of an air regulator, a needle valve, an adjustable pressure switch and a pressure gauge.

To set the Cable-In-Place switch:

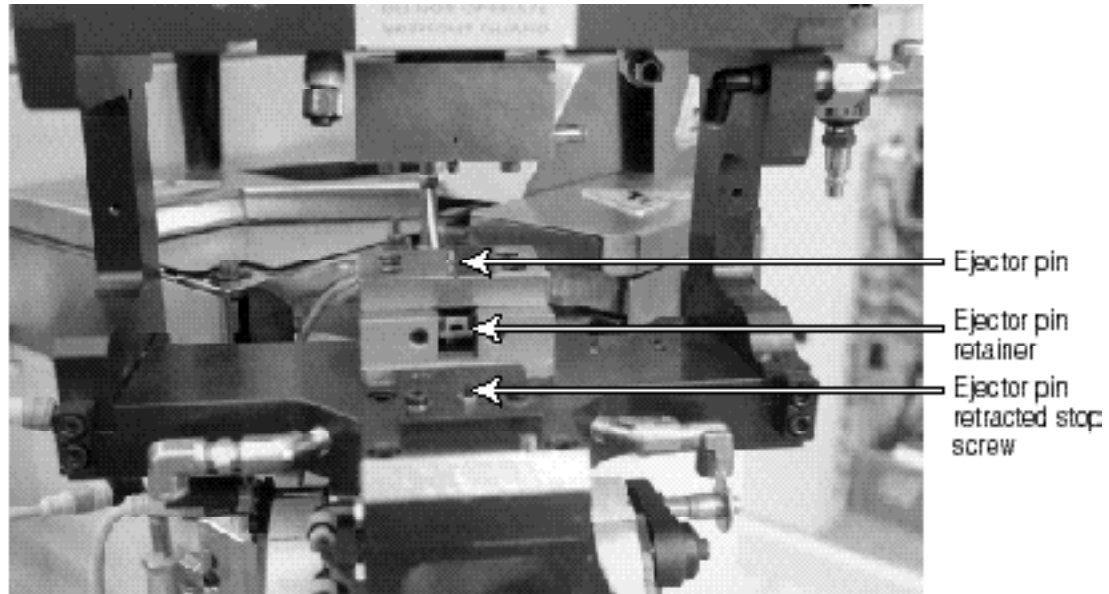
1. Place a cable, or component, in the channel in the fixed tool.
2. With the machine in set-up mode and the control on, close the tooling.
3. Open the needle valve wide open and adjust the pressure regulator to 1.4 bar (20 psig.)
4. Open the tooling and remove the cable or component. Turn the needle valve in, (clockwise), until the pressure at the gauge is approximately 0.3 bar (4 psig).
5. Place the cable, or component, back in the tool and close the tooling.
6. Display the Cable-In-Place switch status on the operator interface module.
7. The pressure switch can now be adjusted. Turn the adjusting screw on the end of the pressure switch clockwise, if the switch is already made, until the switch opens.



Cable-In-Place switch

8. Turn the screw slowly counter-clockwise until the switch closes.
9. Open and close the tooling while holding the cable or component. The Cable-In-Place switch should close and open consistently. If the switch is “sluggish” or closes and opens slowly, open the needle valve slightly to speed up the action.

Ejector system



Operation of the ejector system

The ejector system consists of a built-in pneumatic cylinder (built into the Cable Processor Module frame), a lever, an ejector shaft, an ejector pin retainer and a number of ejector pins.

When activated, the cylinder moves the lever which moves the ejector shaft. One end of the ejector shaft houses the ejector pin retainer. To eject the part, the piston end of the lever moves down, moving the shaft end of the lever up. In the “at rest position”, the ejector system has the piston up and the ejector shaft down.

Adjustments to the ejector system

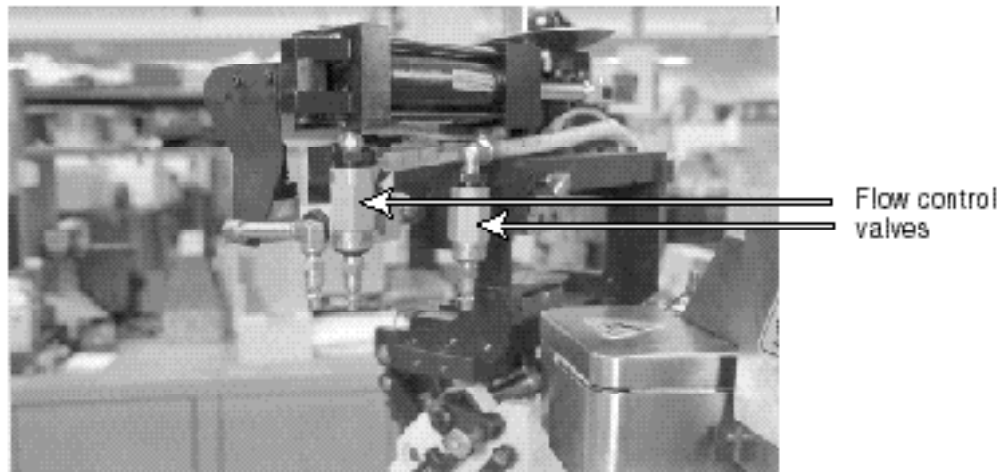
Setting the ejector pin position in the cavity

In the retracted position, the ejector cylinder is held against an adjustable stop by pneumatic pressure. The stop is a set screw fitted with a lock nut. Several assemblies should be produced, and the ejector pin position checked before an adjustment is made. If the set screw is turned down, (clockwise), the ejector pins will be raised. If the adjusting screw is turned up, (counter-clockwise) the ejector pins will be lowered.

Flow control valve adjustments

Most of the pneumatic circuits have flow control valves provided to allow for regulation of cylinder speed. The flow controls are installed so that the exhaust air is being controlled.

All of the flow control valves are factory set so that all cylinders move quickly with no slamming at the end of their stroke.

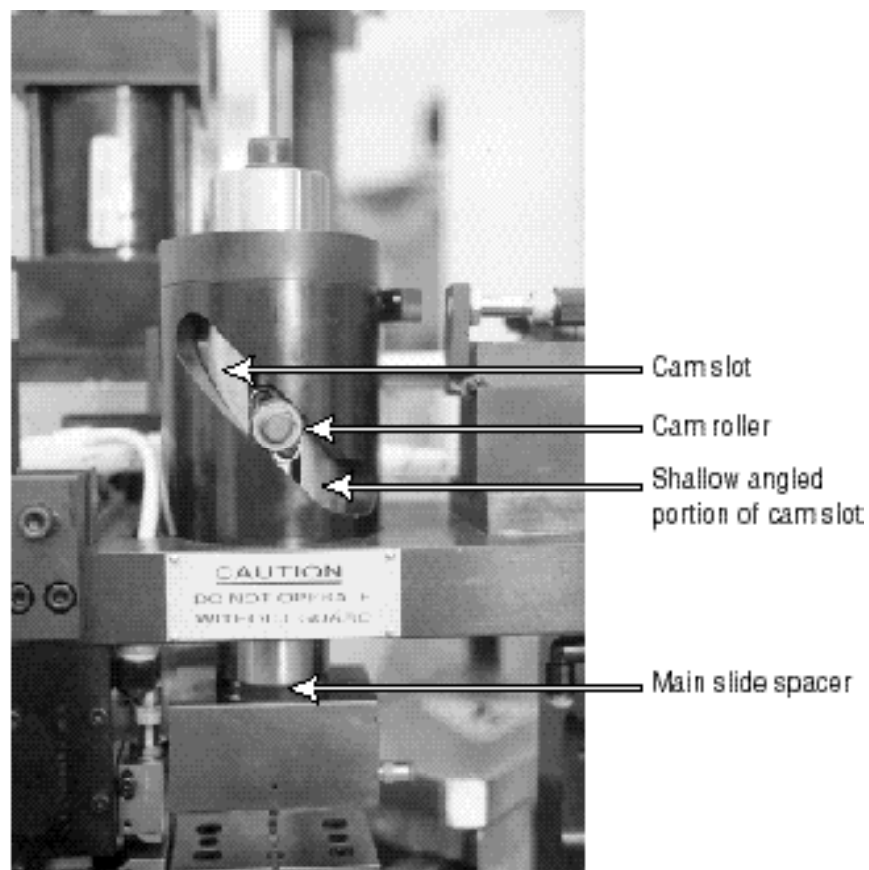


Flow control valves

Note: The flow control valves should not be adjusted in an attempt to increase cycle rate as damage to pneumatic and mechanical components could result.

Cam slot/cam roller alignment

During the close and lock motion of the Cable Processor Module, a cam roller travels in a cam slot in the Cable Processor Module housing. The Cable Processor Module is locked when the roller has just started into the shallow angled portion of the cam slot.



The shut height of the tooling determines how far along the locking portion of the cam slot the roller will travel. The shut height of the Cable Processor Module is factory set at 51 mm (2.0 inches). This is accomplished by grinding the spacer on the end of the main slide to give the correct distance between the end of the spacer and the surface of the fixed tool holder when the roller is in the correct position in the locking portion of the cam slot.

Note: If the shut height of the tooling is too large, it is possible that the roller will never engage the locking portion of the cam slot.

If the pin does not travel far enough into the shallow angled portion of the cam slot (tool shut height too large), the tool faces may be free to separate during injection, causing flash or allowing the escape of molten alloy from the cavity.

Note: The Cable Processor Module Closed switch must be closed for an injection to take place. If debris or a wire strand holds the tool faces sufficiently far apart so the roller does not engage the locking portion of the cam slot, an injection should not take place as the switch will not close. Therefore, the situation described above only refers to a tool set with an excessive shut height and the Cable Processor Module Closed switch set to this tooling.

If the tool shut height was too small, it is possible for the roller to “bottom out” in the cam slot before tooling is actually closed. Again, the Cable Processor Module Closed switch would have to be set to this incorrect tool installation for an injection to take place.

Shut height adjustment

The shut height is the linear dimension on the Cable Processor Module between the fixed tool holder and the movable tool mounting surface when the Cable Processor Module is in the locked position (when the roller is in the correct lock position in the cam slot). The shut height is factory set at 51 mm (2.0 inches).

Changing adjusting spacer

If required, the thickness of the adjusting spacer on the end of the main slide can be altered to ensure that the roller and cam slot are in the proper relationship when the Cable Processor Module is closed and locked to the specified shut height.

Non-Fishertech replacement parts

Placing a shim behind the main slide spacer may be necessary if a replacement tool is manufactured by someone other than Fishertech, and the shut height is too small. The Cable Processor Module should be periodically checked to ensure that the shut height is properly adjusted.

Cable Processor Module removal and installation



WARNING!

When the Cable Processor Module must be tipped back, (after removing the toggle arm pin), use extreme caution not to drop the Cable Processor Module. Support the Cable Processor Module until it reaches the stops. The Cable Processor Module linkage and counterbalance mechanism could be damaged, and the Cable Processor Module could break off from the machine if it is dropped onto the stops.

Cable Processor Modules (and other operating heads) are easily removed from the machine, allowing a basic machine to produce assemblies using different operating heads, as well as allowing the Cable Processor Module to be removed from the machine for maintenance.

The following steps outline the procedure recommended by Fishertech for removing and installing the Cable Processor Module:

Removal of the Cable Processor Module

1. Disconnect the electrical connectors and pneumatic lines between the machine and the Cable Processor Module.
2. Disconnect the coolant lines between the machine, the Cable Processor Module and tool.
3. Remove the moving mechanism lever pin to allow the toggle arm to rotate back slightly.
4. Remove the hinge pin securing the Cable Processor Module to the moving mechanism toggle arm, being careful not to allow the module to fall forward and damage the nozzle. The alignment pin can be used to assist in the removal of the hinge pin.
5. Remove one retaining ring from the pin holding the rear link of the Cable Processor Module to the moving mechanism. While securing the Cable Processor Module, carefully push the rear link pin out using the alignment pin.
6. Remove the socket-head cap screws which secure the Cable Processor Module counterbalance mechanism to the moving mechanism.

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7. Carefully remove the Cable Processor Module from the moving mechanism.

Installation of the Cable Processor Module

1. Place the Cable Processor Module on the moving mechanism, positioning the rear link in the moving mechanism recess. Insert the rear link pin through the moving mechanism and the Cable Processor Module rear link. Install the retaining ring on the rear link pin.
2. Carefully guide the Cable Processor Module forward so the front bushings in the module housing slide between the bushings in the toggle arm. Install the hinge pin, using the alignment pin to align the bushings while installing the hinge pin.
3. Install the socket-head cap screws to secure the Cable Processor Module counterbalance mechanism to the moving mechanism.
4. Push the Cable Processor Module slightly forward such that the moving mechanism lever pin can be installed.
5. Connect the pneumatic lines and electrical connectors between the machine and the Cable Processor Module.
6. Connect the coolant lines between the machine, the Cable Processor Module and tool.