

# INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS FOR THE FAIRCHILD MODEL 90 LOW PRESSURE AND MODEL 91 HIGH PRESSURE SELECTING RELAYS

## GENERAL INFORMATION

The Model 90 Low Pressure Selecting relay selects and transmits the lower of two pressures.

The Model 91 High Pressure Selecting relay selects and transmits the higher of two pressures.

### Specifications Model 90 and 91

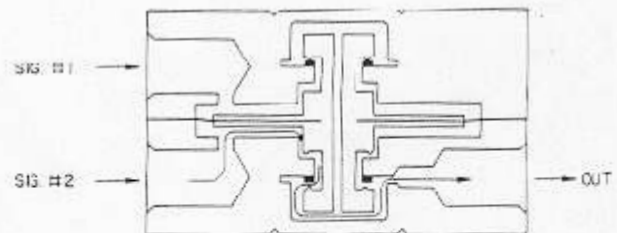
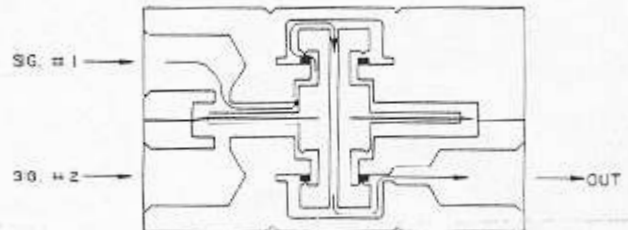
	Model 90 less than	Model 91 less than
Switching Band		
psig	0.1	0.1
[BAR]	.007	.007
(kPa)	0.7	0.7

	Model 90	Model 91
Max. Signal Pressure		
psig	200	200
[BAR]	14.0	14.0
(kPa)	1400	1400
Max. Signal Differential		
psig	100	100
[BAR]	7.0	7.0
(kPa)	700	700
Temperature Range .....	-40°F to +200°F (-40°C to +93.3°C)	

## PRINCIPLES OF OPERATION

The Model 90 Low Pressure relay uses a diaphragm assembly to perform selection of low pressure. For signal pressures as shown (Signal 1 less than Signal 2), the differential pressure sensed by the diaphragm causes the diaphragm assembly to move upward, opening a path for the lower pressure signal through valve A and the hollow center to the output port. Valve B is forced shut against its seal, preventing high pressure from reaching the output port.

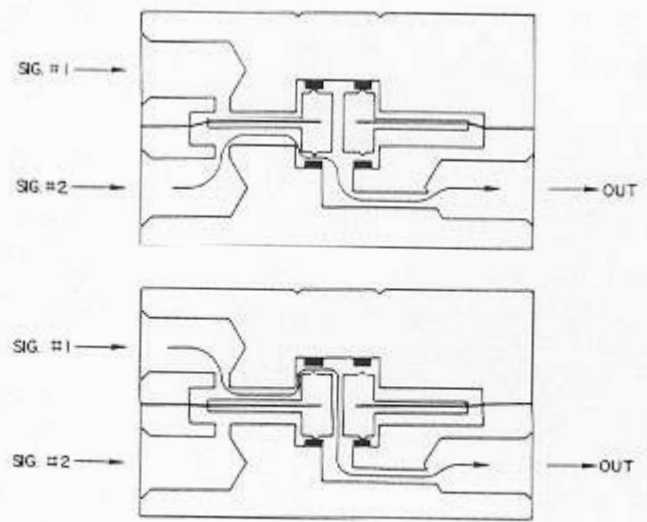
When the low pressure signal becomes greater than the high pressure signal, the diaphragm assembly moves downward, closing off valve A and opening a path past valve B to the output port.



Model 90

The Model 91 High Pressure Selector uses a diaphragm assembly to perform selection of high pressure. For signal pressures as shown (Signal 2 greater than Signal 1), the differential pressure sensed by the diaphragm causes the diaphragm assembly to move upward, opening Valve B and allowing signal to pass to the outlet port.

When the high pressure signal falls below the low pressure signal, the diaphragm moves downward, sealing off the path to the outlet port for the lower pressure signal. The higher pressure signal is transmitted through Valve A and the hollow center to the outlet port.



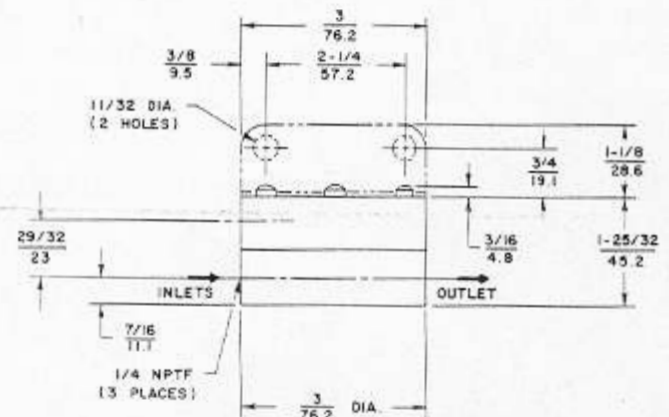
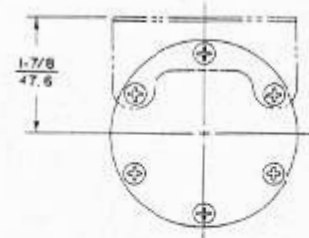
**Model 91**

**INSTALLATION**

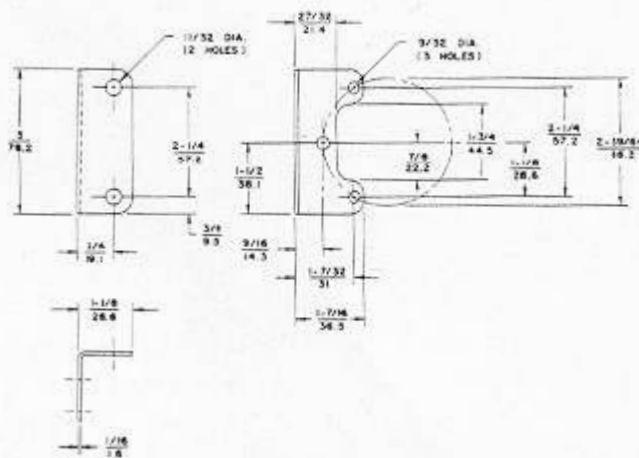
Clean all pipe lines to remove dirt and scale before installation is made. Apply minimum amount of pipe compound to the male threads of air line only. Start with third thread back and work away from end of line to avoid possibility of getting compound into the relay. Install relay in air line; body is fitted with 1/4" NPT for inlet and outlet connections. Relay can be mounted in any position without affecting its operation. Inlet and outlet connections are labelled and should be tightened securely. Avoid undersized fittings that will limit flow through the relay and cause pressure drop downstream. The use of a filter to remove dirt and entrained liquid in the air line ahead of the relay is required for correct performance.

**NOTICE**

The presence of certain diester oils in air lines may hasten deterioration of the elastomers and thus decrease the useful life of this unit.



**MODELS 90 & 91  
PRESSURE SELECTOR RELAYS**



**Mounting Bracket EB-09921**

## SERVICE KIT INSTALLATION

### Model 90

1. Check parts in the Service Kit EA-12539 against parts marked with an asterisk in the exploded view and the table.
2. Mark Housing (5) and Housing (7) so that they can be reassembled properly.
3. Use a spanner wrench to remove Cap (1) from Housing (5) and Housing (7).
4. Remove six Screws (4) attaching Upper Housing (5) to Lower Housing (7).
5. Remove Clamp Nut (2) from well in Upper Housing (5) and Housing (7) and set aside.
6. Separate Diaphragm Assembly (6) from Housing (5) and Housing (7) and discard.
7. Remove Seal (3) from Housing (5) and Housing (7) discard, and replace with Seals from the service kit.
8. Retrieve Diaphragm Assembly (6) from service kit and place on Housing (7), making sure that six holes in Diaphragm Assembly (6) are aligned with six holes in Housing (7).
9. Use Clamp Nut (2), removed in step 5 to secure Diaphragm Assembly (6) to Housing (7) and Housing (5). Ridge in the Clamp Nut should face down toward the seal in the well of Housing (7) and Housing (5).
10. Tighten both Clamp Nuts (2) until they are flush with the seals in Housing (7) and (5).

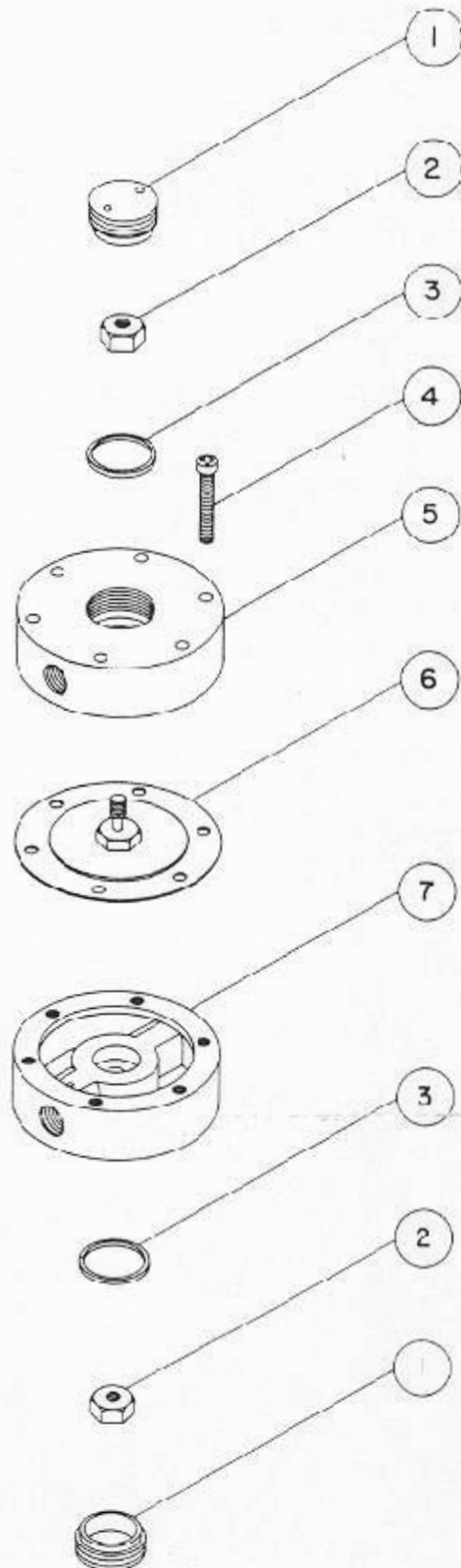
#### CAUTION:

Do not overtighten or the Diaphragm Assembly (6) will be distorted in one direction.

11. Fasten Housings (7) and (5) together using six Screws (4).
12. Install the relay in the line and check operation per the instructions in the IOM. If the unit operates properly, apply Loctite Hydraulic sealant to the top of both Clamp Nuts (2) and the threaded portion of the center stem of Diaphragm Assembly (6). If the unit does not operate properly, loosen both Clamp Nuts (2) and repeat step 10 through 12 until proper operation is obtained.
13. Using a spanner wrench, tighten both Caps (1) to Housings (5) and (7).

Index.	Part No.	Description
1	EB-10263	Cap
2	EB-11790	Clamp Nut
*3	EB-11791	Seal
4	EB-1032-20	Screw
5	EB-12184	Housing
*6	EB-11796	Diaphragm Assembly
7	EB-12133	Housing & Seal Assembly

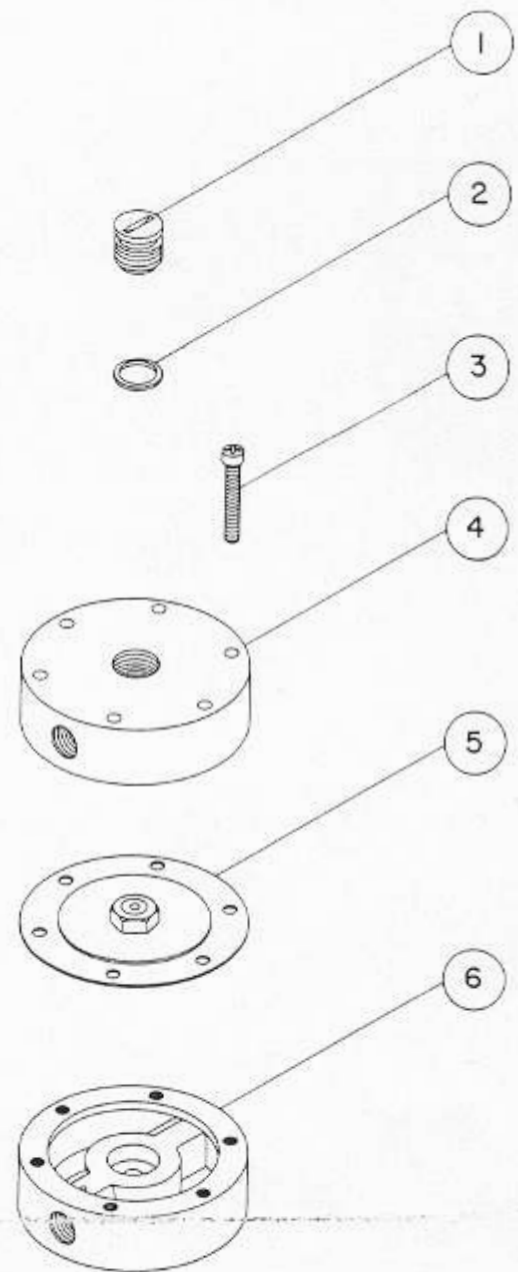
EA-12539 Service Kit Components



Model 90 Exploded View

**Model 91**

1. Check parts in the Service Kit EA-12538 against parts marked with an asterisk in the exploded view and the table.
2. Mark Housing (4) and Housing (6) so that they can be reassembled properly.
3. Remove six Screws (3) attaching Housing (4) to Housing (6) and set aside.
4. Lift out Diaphragm Assembly (4) and discard.
5. Unscrew Cap (1) from Housing (4). Remove O Ring (2) and discard. Obtain O Ring (2) from kit and place in the groove in Cap (1). Replace Cap (1) in Housing (4).
6. Obtain Diaphragm Assembly (5) from service kit and place on top of Housing (6) so that the end of the brass tube is facing up. Align six holes in Diaphragm Assembly (5) with holes in Housing (6).
7. Place Housing (4), flat surface facing up, on top of Diaphragm Assembly (5), making sure that the holes in Housing are aligned with the holes in Diaphragm Assembly. Use reference marks made in step 2 to orient the Housing (4) properly.
8. Using six Screws (3) to fasten Housings (4) and (6).
9. Place the relay back in service using the installation instructions in the IOM.



Index.	Part No.	Description
1	EB-12186	Seat & Seal Assembly
*2	EB-130-014-1-70	O Ring
3	EB-1032-20	Screw
4	EB-11786-1	Upper Housing
*5	EB-11797	Diaphragm Assembly
6	EB-12185-1	Housing & Seal Assembly

\*EA-12538 Service Kit Components

**Model 91 Exploded View**

## ADJUSTMENT

No field adjustments are required.

## OPERATION

There are no operating controls on the Model 90 and Model 91 relays.

## MAINTENANCE

The Diaphragm and O Ring can be replaced by removing the six screws in the upper housing.  
See Service Kit Installation instructions.

## TROUBLESHOOTING

Problem	Check
No selection	Seals Diaphragm Assembly off Center
No switching	Seat and Seal Assembly Threaded in too far
Switching Differential Excessive	O Ring defective

## LEGAL NOTICE:

The information set forth in the foregoing Installation, Operation and Maintenance Instructions shall not be modified or amended in any respect without prior written consent of Fairchild Industrial Products Company. In addition, the information set forth herein shall be furnished with each product sold incorporating Fairchild's unit as a component thereof.



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