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Maintenance Manual

4-Inch Pressure Control Valve

F370 Series

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Meggitt Fuelling Products
 Maintenance Manual
 4-Inch Pressure Control Valve – F370 Series

LIST OF EFFECTIVE PAGES

On a revised page, the portion of text or illustrations affected by the change is indicated by a vertical line in the outer margin of the page. When a revision is issued, the entire document is reissued with the current revision number and date shown on all pages. For major revisions, the basic number is incremented. For minor revisions, the number following the decimal is incremented. Dates of issue for original and subsequent revisions are as follows:

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INTRODUCTION

1. General

This manual provides component maintenance shop instructions for the 4-Inch Pressure Control Valve.

2. Revision Service

This manual will be revised as necessary to show the current information.

3. Weights and Measurements

Weights and measurements in this manual are expressed in both English (U.S. customary) and Metric (SI) units.

DESCRIPTION AND OPERATION

1. Description

The 4-Inch Pressure Control Valve (valve) provides three operating modes for the control of fluid flow in a pressure control system.

2. Operation

A. Pressure Control – In this mode the valve operates on the basis of a fuel or air reference pressure. An air pressure source or a regulated fuel pressure source must be provided to effect control. This reference pressure is normally somewhat higher than the desired control pressure. The difference between the reference and control pressures is termed "bias".

B. Deadman Control – In deadman mode, the release of the reference pressure to the servo causes the valve to automatically close.

C. Aircraft Valve Response – In this mode, a downstream pressure increase caused by closure of the aircraft valve causes the F370 to close, thus preventing excessive surge build-up. This feature is available on all except the F370J variation.

D. Principles of Operation – Refer to Figure 1.

3. Leading Particulars (Refer to Table 1)

4. Leading Particulars (Refer to Table 1)

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Table 1. Leading Particulars	
Service Automotive and Aviation Fuels	
Mainstream Pressure	
Inlet Pressure up to 200 psi	
Outlet Pressure controllable from 15 to 75 psi	
Bias Pressure 25 psi (except Mod A, which is 16 psi)	
Pressure Drop 3.5 psi at 600 gpm	
Table 1. Leading Particulars (continued)	
Operating Times	
Opening adjustable from 10 to 50 seconds;	initially set to 25 seconds
Closing Closes when reference pressure is	released (deadman) in 0.8 second minimum or when aircraft valve closes (surge control) in 0.75 second from start of aircraft valve closure
Closing Time (Mod J) The surge control is ineffective and	the closing time is adjustable from 1.0 to 15 seconds; initially set to 2.5 seconds

4. Model Variations

The basic 4-inch Pressure Control Valve has an aluminum alloy body, flange and piston. It operates on an air pressure set 25 psi bias. Each variation (modification) is identified by a Mod letter, or combination of letters. Refer to Table 2 for the available valve variations. Refer to the **ILLUSTRATED PARTS LIST** section for additional details.

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Table 2. Model Variations

MOD LETTERS	DESCRIPTION
(Basic)	4-inch, 150 pound ASA flanges, air set, 25 psi bias, aluminum body
A	Changes pressure bias to 16 psi
B	Changes body to ductile iron
C	Changes inlet to Victaulic (for basic and Mods A, D, E and J only)
D	Changes outlet to Victaulic (for basic and Mods A, C, E and J only)
E	Modified for use with F540 flow control (for basic and Mods A, B, C, D and J only) (F540 not included)
J	Adds closing time adjustment (for basic and Mods A, B, C, D and E only) (Note: When adjustable closing time is added, surge control is eliminated.)

FAULT ISOLATION

1. General

Refer to Table 3 for fault isolation information. Locate suspected faulty component and take appropriate remedial action.

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Table 3. Fault Isolation		
FAULT	POSSIBLE CAUSE	CORRECTIVE ACTION
Valve will not open	Check air pressure supply to servo	Open the hydrant coupler.
	Opening time adjustment screw too far in	Back the screw out 1/8 to 1/4-turn and recheck operation.
	Servo valve sticking	Actuate the deadman control several times and recheck operation.
	Bias pressure adjustment screw too far in	Back the screw out 1-turn and recheck operation.
Valve operation is unstable	Air trapped in fuel sense line	Completely bleed trapped air from the servo valve and the fuel sense line (refer to ADJUSTMENTS AND BLEEDING).
	Opening time is too fast	Adjust the opening time screw all the way in and then back it out 1/8-turn. If necessary, adjust the screw 1/8-turn further out, and repeat until operation stabilizes.
	Servo valve or main piston sticking	Actuate the deadman control several times and recheck operation.
	Reference pressure is too high	Adjust the bias pressure (refer to ADJUSTMENTS AND BLEEDING).
	Sense line restricted	Make sure that the sense line is 3/8-inch inside diameter.
	Sense line (hose) too soft	Make sure that the hose is sufficiently strong to prevent expansion and contraction.
Table 3. Fault Isolation (continued)		
FAULT	POSSIBLE CAUSE	CORRECTIVE ACTION
Valve will not fully close	Servo valve or main piston sticking	Actuate the deadman control several times and recheck operation.
	Closing time adjustment screw too far in	Back the screw out 1/8 to 1/4-turn and recheck operation.

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ADJUSTMENTS AND BLEEDING

1. Setup

A. Apply air reference (or regulated fuel reference) pressure to the AIR port. For all variations but the "A" modification, the reference pressure should be 25 psi higher than the desired control pressure. On the "A" modification, reference pressure should be 16 psi higher than the desired control pressure.

B. Refer to Figure 2 for the adjustment screw locations.

2. Bleeding

A. Two screws are provided on the servo assembly for line bleeding purposes.

B. The screw nearest the outlet is used for bleeding air from the fuel lines. Loosen the screw approximately two turns, until the leakage shows no evidence of air. Then, tighten the screw.

C. The screw nearest the valve inlet is used for bleeding fluid from the air lines. Loosen the screw approximately two turns, until the leakage shows no evidence of fuel. Then, tighten the screw.

3. Opening Time

A. The valve is factory set for an opening time of 22 to 32 seconds, with a 110 psi inlet pressure. To adjust set this setting, remove the screw and washer located on the side of the servo assembly opposite the AIR and FUEL ports, nearest to the mating surfaces of the servo assembly and main valve body.

NOTE: There will be minor leakage when the screw is removed.

B. Using a hex key, adjust the opening time as required. (Turning the adjustment screw clockwise increases the opening time. Turning the adjustment screw counterclockwise increases the opening time.) Turn the screw approximately 1/16-turn each time and recheck the operation. After the final adjustment, replace screw and washer.

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4. Bias Pressure Adjustment

Apply air pressure and inlet pressure and establish a flow rate. Remove the screw and washer from the servo assembly end cap, nearest the valve outlet. Using a hex key, adjust the closing time as required. (Turning the adjustment screw clockwise increases the closing time. Turning the adjustment screw counterclockwise increase the closing time). After the final adjustment, replace screw and washer.

ILLUSTRATED PARTS LIST

1. General

This section lists, describes, and illustrates all detail parts required for maintenance support of the 4-Inch Pressure Control Valve.

2. Scope of Information

A. The parts list is arranged in the general order of disassembly. The listing is indented to show the relationship between each part and its next higher assembly. Item numbers used in the parts list are keyed to the corresponding numbers of the accompanying illustration.

B. MODIFICATION CODE

The modification code (see Table 1) indicates the parts usage with respect to the end item. When the MODIFICATION CODE column is blank, the part usage is applicable to all versions unless otherwise specified in the DESCRIPTION column.

C. Abbreviations

ASSY	Assembly.
FIG.	Figure.
IPL	Illustrated Parts List.
MOD	Modification.

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FIG. ITEM	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	MOD CODES	UNITS
				PER ASSY REF
	F370	VALVE, 4-INCH PRESSURE CONTROL		REF
1	–	· BODY AND PISTON ASSEMBLY Flanged (See manual M300 for details)		1
2	4631050C	· SERVO ASSEMBLY, 25 psi bias, aluminum Alloy (See manual 4631050 for details)		1
	4631050AC	· SERVO ASSEMBLY, 16 psi bias, aluminum Alloy (See manual 4631050 for details)	A	1
	4631050	· SERVO ASSEMBLY, 25 psi bias, Ductliron (See manual 4631050 for details)	B	1
	4631050A	· SERVO ASSEMBLY, 16 psi bias, Ductliron (See manual 4631050 for details)	AB	1
	4631050D	· SERVO ASSEMBLY, 25 psi bias, for use with F540-1 flow control (See manual 4631050 for details)	E	1
3	4631050P	· SERVO ASSEMBLY, 25 psi bias and adjustable closing time) (See manual 4631050 for details)	J	1
4	CNAS1351-3-12P	· SCREW, MACHINE		4
5	CMS35338-43	· WASHER, LOCK		4

PARTS KITS AVAILABLE

KIT PART NUMBER	DESCRIPTION	ITEMS IN KIT
2702278-1	Seal Kit for Body and Piston Assembly	Refer to Manual M300 for details
2KITF4631050-101	Seal Kit for Servo Assembly	Refer to Manual 4631050 for details
2702278-4	Complete Seal Kit for F376	Contains all parts provided in the 2702278-1 and 2KITF4631050-101 kits

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