Aerospace
Defense
Energy

Energy products

User Information and Maintenance Manual

Eliminator Valves

F354EL, F354EM, F355EL and F355EM Bypass Valves

F368V, F372V Hydrant Valves

F375V, F375W, F377V, F377W In-Line Valves

[FPV-1]

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SAFETY SUMMARY

GENERAL

The following are general safety precautions. These are recommended precautions that personnel should understand and apply during many phases of maintenance.

WEAR PROTECTIVE CLOTHING

Wear protective clothing (safety glasses, gloves, apron, etc.) approved for the materials and tools being used.

USE APPROVED SAFETY EQUIPMENT

Ensure that firefighting equipment is readily available and in working order.

FUEL PRECAUTIONS

Personnel operating pressurized fuel systems must recognize the hazardous character of the system. Periodically check the condition of the pressurized systems and maintain them in safe working order.

The fuel system must be depressurized prior to removing or disassembling any components.

Periodically check all safety devices, including pressure relief valves and pressure gages to make sure the system is operating within proper limits. Protect all pressurized lines from damage or puncture. Do not operate the system if leaks are detected.

ELECTRICAL SYSTEM PRECAUTIONS

Prior to performing electrical system repairs, make sure that the electrical power source is disconnected prior to removing or disassembling any electrical components. This will protect personnel from the possible electric shock hazard, as well as protecting the equipment from possible damage.

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SECTION I
INTRODUCTION

1-1. PURPOSE OF MANUAL.

1-2. This technical manual contains general information and instructions for operation and maintenance of various Eliminator Valve components manufactured by Meggitt Fuelling Products. The components include Bypass Valves, Hydrant Valves, and Hydrant Valves, which are designed specifically for use in aircraft fueling systems.

1-3. The individual components may be arranged in many ways, depending on the overall system design.

1-4. SCOPE OF MANUAL.

1-5. This manual is intended to provide information in sufficient detail to permit proper setup, adjustment, operation, and maintenance of the fueling system valves.

1-6. This technical manual is divided into eight sections:

Section I – Introduction – Describes the purpose and scope of this manual.

Section II – Description and Principles of Operation – Contains basic system descriptions and explanations of their operation.

Section III – Function and Adjustment – Bypass Valve – Provides a functional description and adjustment procedures for the bypass valve.

Section IV – Function and Adjustment – Hydrant Valve – Provides a functional description and adjustment procedures for the hydrant valve.

Section V – Function and Adjustment – In-Line Valve – Provides a functional description and adjustment procedures for the in-line valve.

Section VI – Typical Initial Setup Procedure – Spring Set Fueler System – Outlines the basic spring set fueler system setup and adjustment procedures.

Section VII – Typical Initial Setup Procedure – Spring Set Hydrant System – Outlines the basic spring set hydrant system setup and adjustment procedures.

Section VIII – Maintenance Procedures – Contains maintenance procedures and replacement parts information for various fuel system components.

1-7. SYMBOLS AND ABBREVIATIONS.

1-8. Symbols and abbreviations used in this technical manual are as follows:

% percent

A/C Aircraft

P/N Part Number

psi Pounds per square inch

SECTION II
DESCRIPTION AND PRINCIPLES OF OPERATION

2-1. BASIC SYSTEM DESCRIPTION.

2-2. The purpose of the fueling systems, both fueler and hydrant, is to load a measured amount of clean fuel into an aircraft at a controlled pressure. A primary consideration is protection of the aircraft. To this end a filter/separator or monitor maintains the fuel quality, a flow meter registers the amount, and 'primary' and 'secondary' pressure controls safeguard the aircraft structure. The secondary control pressure is set 5 to 7 psi above the primary control pressure to make the transition automatic, in case of a failure. Flow is manually started and stopped by operating a deadman handle. Fuel pressure at the aircraft nozzle is simulated by a venturi compensator, which produces the 'sense' pressure.

2-3. Refer to Figures 2-1 and 2-2 for simplified fueler and hydrant service schematic diagrams.

2-4. NORMAL 'AIR-SET' SYSTEMS.

2-5. In a normal 'air-set' system the primary and secondary control pressures are adjusted by regulated air pressure. Flow is started and stopped by application or removal of air pressure by operating the deadman handle. In the control valve servos, control is effected by balancing 'air' and 'fuel sense' pressures across a piston. Any leakage at the piston seals allows air into the sense line or fuel into the air line. Air in the fuel sense line causes control instability. Fuel in the air line allows fuel to spray from the deadman handle and causes malfunctioning of the air regulators.

2-6. ELIMINATOR 'NO FUEL/AIR INTERFACE'

SYSTEMS.

2-7. In an eliminator system all fuel-to-control-air interfaces are eliminated. Primary and secondary controls are effected by balancing 'spring' and 'fuel sense' pressures across a piston, except for the F239 coupler/regulator, which has an atmospheric air gap. Flow is started and stopped by application or removal of air or electric power by operating the deadman handle. This power actuates pilot valves on the servos of the control valves. Any air or fuel leakage at the piston seals is to atmosphere, eliminating the stability and fuel spray hazards.

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SECTION III
FUNCTION AND ADJUSTMENT BYPASS VALVE
F354EL, F354EM, F355EL AND F355EM

-1. DESCRIPTION.

3-2. The Bypass Valve (see Figure 3-1) is a normally open spring set remote pressure bypass regulator with pilot operated open/control features. The servo and pilot valves are mounted onto the manifold on the main valve. The valve has a variable pressure control setting and a variable pump pressure limit control setting.

3-3. OPERATION.

3-4. The downstream control pressure sense point is connected to the FUEL port of the servo by a 3/8-inch (minimum) line. The sense line should be as short as possible, with a minimum of bends, to allow the pressure signal to be freely transferred to the servo for maximum pressure control stability.

3-5. The valve is maintained in the open position by a 3-way pilot valve (connecting downstream pressure into the main piston cavity). When the pilot valve is energized, the downstream bleed is shut off, allowing the servo to control.

3-6. To protect the pump, there is an adjustable relief pilot that bleeds the main piston chamber to downstream.

3-7. As long as the sense pressure is low, the control poppet remains closed, allowing less fuel to bleed downstream than enters through the fixed upstream orifice, causing the piston to close.

3-8. As the sense pressure approaches the control pressure, the control poppet opens, balancing the flows in and out of the main piston cavity. The piston position is thereby controlled to maintain the preset control pressure.

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BYPASS VALVE OPERATING CHARACTERISTICS
Inlet Pressure (maximum operating) 200 psi
Control Pressure Range (adjustable) 30 to 80 psi (Factory setting: 50 psi)
Pump Relief Pressure Range (adjustable) 1 to 125 psi
Pressure Drop F354 (at 600 gpm flow) 9.0 psi F355 (at 1000 gpm flow) 10.0 psi

3-9. ADJUSTMENTS AND BLEEDING.

3-10. The following paragraphs provide information on adjusting the valve. Refer to the illustrated parts list for Servo (2691786) for the item number references, and proceed as follows:

3-11. CONTROL PRESSURE. Using a 3/32" hex key, adjust the setscrew (Item 41).
a. The factory setting for the control pressure is 50 psi (adjustable from 30 to 80 psi).
b. Turn the setscrew clockwise to increase the control pressure.
c. Turn the setscrew counterclockwise to decrease the control pressure.

3-12. PUMP RELIEF PRESSURE. Manual Adjustment.
a. The factory setting for the pump relief pressure is 80 psi (adjustable from 0 to 125 psi).
b. Lift the locking ring toward the cap and turn it clockwise to increase the pump relief - pressure.
c. Lift the locking ring toward the cap and turn it counterclockwise to decrease the pump relief pressure.
d. Push the locking ring away from the cap to lock it.

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4-1. DESCRIPTION.

4-2. The Hydrant Valve (see Figure 4-1) is a normally closed spring set remote pressure regulator with surge control and pilot operated open/close features. The servo and pilot valves are mounted onto the manifold on the main valve. The valve has an adjustable opening time and variable pressure control settings.

4-3. OPERATION.

4-4. The downstream pressure sense point is connected to the FUEL port of the servo by a 3/8-inch dry-break quick disconnect. (The port marked AIR is not used on this type of valve [leave open].)

4-5. The actuation air for the pilot valve is connected to the manifold by a ¼-inch dry-break quick disconnect with bleed.

4-6. The valve is maintained in the closed position by a 5-way pilot valve (connecting upstream pressure into the main piston cavity). When the pilot valve is energized, the main piston cavity bleeds downstream through the servo, allowing the valve to open.

4-7. If an excess flow servo is installed, the actuation air is supplied from the excess flow pilot air port (the 1/4-inch dry-break quick disconnect then connects directly to the excess flow servo.)

4-8. As long as the sense pressure is low, the control poppet remains open, allowing more fuel to bleed downstream than enters through the fixed upstream orifice, allowing the piston to open.

4-9. As the sense pressure approaches the control pressure, the control poppet closes, balancing the flows in and out of the main piston cavity. The piston position is thereby controlled to maintain the preset control pressure.

4-10. Should there be a sudden increase in downstream sense pressure, the fast closing poppet will open, allowing upstream pressure to flow rapidly into the main piston cavity. This will close the valve rapidly, preventing over-pressurization of the system downstream of the valve.

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HYDRANT VALVE OPERATING CHARACTERISTICS
Inlet Pressure (maximum operating) 200 psi
Outlet Pressure Range (adjustable) 30 to 80 psi (Factory setting: 45 psi)
Opening Time (adjustable) 10 to 50 seconds (Factory setting: approximately 15 seconds)
Deadman Closure Rate (dependent on system piping configuration) 5% of flow (maximum)
Surge Control Closing Time 0.3 second
Pressure Drop F368 with F250 (at 1000 gpm flow) 13.7 psi F372 with F211 (at 600 gpm flow) 16.5 psi

4-11. ADJUSTMENTS AND BLEEDING.

4-12. The following paragraphs provide information on adjusting the valve. Refer to the illustrated parts list for Servo (4631050CGR or 4631050GR) for the item number references, and proceed as follows:

4-13. OPENING TIME. Using a 1/8" hex key, adjust the setscrew (Item 47).

a. Turn the setscrew clockwise for a slower valve opening time.
b. Turn the setscrew counterclockwise for a faster valve opening time.

4-14. CLOSING TIME. There is no adjustment for the valve closing time.

4-15. CONTROL PRESSURE. Using a 3/32" hex key, adjust the setscrew (Item 26).

a. The factory setting for the control pressure is 45 psi (adjustable from 30 to 80 psi).

NOTE: The control pressure adjustments are in the opposite directions to the other adjustments.

b. Turn the setscrew clockwise to decrease the control pressure.
c. Turn the setscrew counterclockwise to increase the control pressure.

4-16. SURGE PRESSURE. Using a 3/32" hex key, adjust the setscrew (Item 26A).

a. The factory setting for the surge pressure is 57 psi (adjustable from 30 to 80 psi).
b. Turn the setscrew clockwise to increase the surge pressure.
c. Turn the setscrew counterclockwise to decrease the surge pressure.

4-17. FUEL LINE BLEEDING. Two button-head cap screws (Item 44) at the top and bottom of the servo are provided for bleeding purposes. The screw nearest the top of the servo is for bleeding air from the fuel lines.

4-18. Loosen the screw approximately two turns until the fuel line leakage shows no evidence of air. Then, re-tighten the screw.

NOTE: The screw on the opposite side of the valve is not used on this valve.

The bleed screws are designed to release only small amounts of air from the servo and system. Larger amounts of air in the tubing or piping should be removed by disconnecting the tubing or piping connections.

4-19. EXCESS FLOW. (Optional) (See T.M. M576.)

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SECTION V
FUNCTION AND ADJUSTMENT IN-LINE VALVE
F375V, F375W, F377V AND F377W

5-1. DESCRIPTION.

5-2. The In-Line Valve (see Figure 5-1) is a normally closed spring set remote pressure regulator with surge control and pilot operated open/close features. The servo and pilot valves are mounted onto the manifold on the main valve. The valve has an adjustable opening time and variable pressure control settings.

5-3. OPERATION.

5-4. The downstream pressure sense point is connected to the FUEL port of the servo by a 3/8-inch (minimum) line. (The port marked AIR is not used on this type of valve [leave open].) The sense line should be as short as possible, with a minimum of bends, to allow the pressure signal to be freely transferred to the servo for maximum pressure control stability.

5-5. The valve is maintained in the closed position by a 5-way pilot valve (connecting upstream pressure into the main piston cavity). When the pilot valve is energized, the main piston cavity bleeds downstream through the servo, allowing the valve to open.

5-6. As long as the sense pressure is low, the control poppet remains open, allowing more fuel to bleed downstream than enters through the fixed upstream orifice, allowing the piston to open.

5-7. As the sense pressure approaches the control pressure, the control poppet closes, balancing the flows in and out of the main piston cavity. The piston position is thereby controlled to maintain the preset control pressure.

5-8. Should there be a sudden increase in downstream sense pressure, the fast closing poppet will open, allowing upstream pressure to flow rapidly into the main piston cavity. This will close the valve rapidly, preventing over-pressurization of the system downstream of the valve.

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IN-LINE VALVE OPERATING CHARACTERISTICS
Inlet Pressure (maximum operating) 200 psi
Outlet Pressure Range (adjustable) 30 to 80 psi (Factory setting: 50 psi)
Opening Time (adjustable) 10 to 50 seconds (Factory setting: approximately 15 seconds)
Deadman Closure Rate (dependent on system piping configuration) 5% of flow (maximum)
Surge Control Closing Time 0.3 second
Pressure Drop F375 (at 600 gpm flow) 9.0 psi F377 (at 1000 gpm flow) 10.0 psi

5-9. ADJUSTMENTS AND BLEEDING.

5-10. The following paragraphs provide information on adjusting the valve. Refer to the illustrated parts list for Servo (4631050CGR or 4631050GR) for the item number references, and proceed as follows:

5-11. OPENING TIME. Using a 1/8" hex key, adjust the setscrew (Item 47).
a. Turn the setscrew clockwise for a slower valve opening time.
b. Turn the setscrew counterclockwise for a faster valve opening time.

5-12. CLOSING TIME. There is no adjustment for the valve closing time. The closing time should be approximately 4 seconds.

5-13. CONTROL PRESSURE. Using a 3/32" hex key, adjust the setscrew (Item 26).
a. The factory setting for the control pressure is 50 psi (adjustable from 30 to 80 psi).

NOTE: The control pressure adjustments are in the opposite directions to the other adjustments.

b. Turn the setscrew clockwise to decrease the control pressure.
c. Turn the setscrew counterclockwise to increase the control pressure.

5-14. SURGE PRESSURE. Using a 3/32" hex key, adjust the setscrew (Item 26A).
a. The factory setting for the surge pressure is 57 psi (adjustable from 30 to 80 psi).
b. Turn the setscrew clockwise to increase the surge pressure.

c. Turn the setscrew counterclockwise to decrease the surge pressure.

5-15. FUEL LINE BLEEDING. Two button-head cap screws (Item 44) on the servo are provided for bleeding purposes. The screw on the servo nearest to the pilot valve is for bleeding air from the fuel lines.

5-16. Loosen the screw approximately two turns until the fuel line leakage shows no evidence of air. Then, retighten the screw.

NOTE: The screw on the opposite side of the valve is not used on this valve.

The bleed screws are designed to release only small amounts of air from the servo and system. Larger amounts of air in the tubing or piping should be removed by disconnecting the tubing or piping connections.

SECTION VI
TYPICAL INITIAL SETUP PROCEDURE
SPRING SET FUELER SYSTEM

6-1. GENERAL.

NOTE: This procedure is typical only. Variations in system design, additional interlocks, etc. and personal preference may require procedural changes.

6-2. This procedure covers both air and electrical piloted systems.

6-3. This procedure assumes the following:

a. HECV's, if installed, are locked in the open position.
b. Pump by-pass control (F354 or F355) is primary. In-line control (F375 or F377) is secondary.
c. The fueler system is configured as shown in Figure 6-1.
d. Figure 6-2 shows an eliminator in-line servo valve assembly. Figure 6-3 shows a servo valve and manifold assembly.

6-4. **INITIAL START-UP CONDITIONS.**

a. Aircraft fueling nozzle(s) closed.
b. Pressure gage installed on one fueling nozzle.
c. Pressure gage (temporary) in pump outlet line.
d. 3-way 'setup valve' in sense line open to atmosphere.
e. Venturi compensation needle valve fully open.
f. Venturi flow control needle valve (if used) fully open.
g. Primary (bypass) valve servo pressure control setting is not critical.
h. Primary (bypass) valve pressure relief valve should be 2 or 3 turns from maximum.
i. Secondary (in-line) valve servo pressure control set to maximum.
j. Secondary (in-line) valve servo surge control set to minimum.
k. Secondary (in-line) valve servo opening speed control set open 3/4 turn.

6-5. SETTING THE PUMP MAXIMUM RELIEF PRESSURE.

a. Make sure that the aircraft fueling nozzle(s) are closed.
b. Make sure that a pressure gauge is installed at the pump outlet.
c. Make sure that the 3-way 'set-up valve' in the sense line is open to atmosphere.
d. Actuate the deadman handle and set the engine rpm to normal speed.
e. Adjust the 'Eliminator modified' relief valve to the maximum desired pump pressure.

6-6. SETTING THE SURGE PRESSURE.

a. Open the aircraft fueling nozzle(s).
b. Make sure that the 3-way 'set-up valve' in the sense line is open to atmosphere.
c. Actuate the deadman handle.
d. Using a valve downstream of the nozzle(s), adjust and maintain the flow rate to 60 to 70% of the rated flow.
e. Set the secondary 'surge pressure' as indicated by the 'nozzle pressure gage' to the desired value on the in-line valve (suggested setting: 55 psi).

6-7. SETTING THE SECONDARY CONTROL PRESSURE.

a. Open the aircraft fueling nozzle(s).
b. Make sure that the 3-way 'set-up valve' in the sense line is open to atmosphere.
c. Actuate the deadman handle.
d. Using a valve downstream of the nozzle(s), adjust and maintain the flow rate to 60 to 70% of the rated flow,
e. Set the secondary 'control pressure' as indicated by the 'nozzle pressure gage' to the desired value on the in-line valve (suggested setting: 50 psi).

6-8. SETTING THE PRIMARY PRESSURE.

a. Open the aircraft fueling nozzle(s).
b. Close the 3-way 'set-up valve' (sense line connected to venturi).
c. Actuate the deadman handle.
d. Set and maintain a flow rate to 60 to 70% of rated flow, using a valve downstream of the nozzle(s).
e. Using a valve downstream of the nozzle(s), adjust and maintain the flow rate to 60 to 70% of the rated flow.
f. Set the primary 'control pressure' as indicated by the 'nozzle pressure gage' to the desired value on the in-line valve (suggested setting: 40 psi).

6-9. OPENING SPEED SETTING.

a. Open the aircraft fueling nozzle(s).
b. Make sure the 3-way 'set-up valve' is closed (sense line connected to venturi).
c. Actuate the deadman handle.
d. Set and maintain a flow rate to 60 to 70% of rated flow, using a valve downstream of the nozzle(s).
e. Release the deadman handle.
f. Actuate the deadman handle.
g. Measure time required to reach 90% of the set flow rate.

h. Release the deadman handle.
i. Adjust the 'opening speed screw' to obtain the desired opening time (suggested setting: 22 ± 5 seconds).

6-10. SETTING THE VENTURI COMPENSATION.

a. Install a pressure gauge on the aircraft nozzle.
b. Open the aircraft fueling nozzle(s).
c. Actuate the deadman handle.
d. Set and maintain a flow rate to 60% to 70% of rated flow, using a valve downstream of the nozzle(s).
e. Adjust the 'venturi compensation needle valve' so that the indicated pressures on the 'nozzle pressure gage' (on the fueling panel) and the 'pressure gage on the nozzle' are the same within 2 psi.

6-11. FLOW CONTROL SETTING. (If Used)

a. Open the aircraft fueling nozzle(s).
b. Actuate the deadman handle.
c. Set the flow rate to 110 to 115% of rated flow, using a valve downstream of the nozzle(s).

CAUTION: DO NOT EXCEED THE CAPACITY OF THE FLOWMETER OR THE FILTER.

d. Adjust the 'venturi flow control needle valve' to decrease the flow to 'maximum flow' rate.

6-12. FINAL LOCK-UP AND SEAL.

a. Reinstall and tighten the 3 cap screws in the secondary (in-line) valve servo (surge pressure adjustment, control pressure adjustment, and opening speed adjustment).
b. Reinstall and tighten the cap screw in the primary (bypass) valve servo (control pressure adjustment.
c. Make sure that the primary (bypass) relief valve adjustment cap is locked.
d. Safety wire the 3-way 'set-up valve' in the closed position.
e. Lock and seal the venturi compensation needle valve (refer to paragraph 6-10e).
f. Lock and seal the venturi flow control needle valve (if used) (refer to paragraph 6-11d).
g. Remove the pressure gage from the aircraft fueling nozzle and plug the hole.
h. Remove the temporary pressure gage from the pump outlet line and plug the hole.

SECTION VII
TYPICAL INITIAL SETUP PROCEDURE
SPRING SET HYDRANT SYSTEM

7-1. GENERAL.

NOTE: This procedure is typical only. Variations in system design, additional interlocks, etc. and personal preference may require procedural changes.

7-2. This procedure covers air piloted systems.

7-3. This procedure assumes the following:

a. HECV's, if installed, are locked in the open position.
b. Hydrant valve (F368 or F372) is primary. In-line valve (F375 or F377) is secondary.
c. The hydrant system is configured as shown in Figure 7-1.
d. Figure 6-2 shows an eliminator in-line servo valve assembly. Figure 6-3 shows a servo valve and manifold assembly.

7-4. **INITIAL START-UP CONDITIONS.**

a. Aircraft fueling nozzle(s) closed.
b. Pressure gage installed on one fueling nozzle.
c. Pressure gage (temporary) in pump vehicle inlet line.
d. 3-way 'setup valve' in sense line open to atmosphere.
e. Venturi compensation needle valve fully open.
f. Venturi flow control needle valve (if used) fully open.
g. Primary hydrant valve servo pressure control set to maximum.
h. Primary hydrant valve servo surge pressure control setting is not critical.
i. Secondary (in-line) valve servo pressure control set to maximum.
j. Secondary (in-line) valve servo surge pressure control set to maximum.
k. Secondary (in-line) valve servo opening speed control set open 3/4 turn.

7-5. SETTING THE PRIMARY HYDRANT SURGE PRESSURE.

a. Open the aircraft fueling nozzle(s).
b. Make sure that the 3-way 'set-up valve' in the sense line is open to atmosphere.
c. Close the 3-way 'set-up valve' (sense line connected to venturi).
d. Actuate the deadman handle.

e. Using a valve downstream of the nozzle(s), adjust and maintain the flow rate to 60 to 70% of the rated flow.
f. Set the primary 'surge pressure' as indicated by the 'nozzle pressure gage' to the desired value on the hydrant valve (suggested setting: 55 psi).

7-6. SETTING THE SECONDARY IN-LINE SURGE PRESSURE.

a. Open the aircraft fueling nozzle(s).
b. Make sure that the 3-way 'set-up valve' in the sense line is open to atmosphere.
c. Actuate the deadman handle.
d. Using a valve downstream of the nozzle(s), adjust and maintain the flow rate to 60 to 70% of the rated flow.
e. Set the secondary 'surge pressure' as indicated by the 'nozzle pressure gage' to the desired value on the in-line valve (suggested setting: 60 psi).

7-7. SETTING THE SECONDARY IN-LINE CONTROL PRESSURE.

a. Open the aircraft fueling nozzle(s).
b. Make sure that the 3-way 'set-up valve' in the sense line is open to atmosphere.
c. Actuate the deadman handle.
d. Using a valve downstream of the nozzle(s), adjust and maintain the flow rate to 60 to 70% of the rated flow,
e. Set the secondary 'control pressure' as indicated by the 'nozzle pressure gage' to the desired value on the in-line valve (suggested setting: 50 psi).

7-8. SETTING THE PRIMARY HYDRANT PRESSURE.

a. Open the aircraft fueling nozzle(s).
b. Close the 3-way 'set-up valve' (sense line connected to venturi).
c. Actuate the deadman handle.
d. Using a valve downstream of the nozzle(s), adjust and maintain the flow rate to 60 to 70% of the rated flow.
e. Set the primary 'control pressure' as indicated by the 'nozzle pressure gage' to the desired value on the bypass valve (suggested setting: 40 psi).

7-9. SETTING THE PRIMARY HYDRANT OPENING SPEED.

a. Open the aircraft fueling nozzle(s).
b. Make sure the 3-way 'set-up valve' is closed (sense line connected to venturi).
c. Actuate the deadman handle.
d. Using a valve downstream of the nozzle(s), adjust and maintain the flow rate to 60 to 70% of the rated flow.
e. Release the deadman handle.

f. Adjust the ‘opening speed screw’ on the secondary in-line valve to 1½ turns open.
g. Actuate the deadman handle.
h. Measure time required to reach 90% of the set flow rate.
i. Release the deadman handle.
j. Adjust the 'opening speed screw' to obtain the desired opening time (suggested setting: 22 ± 5 seconds).

7-10. SETTING THE SECONDARY IN-LINE OPENING SPEED.

a. Open the aircraft fueling nozzle(s).
b. Make sure the 3-way 'set-up valve' is closed (sense line connected to venturi).
c. Actuate the deadman handle.
d. Using a valve downstream of the nozzle(s), adjust and maintain the flow rate to 60 to 70% of the rated flow.
e. Release the deadman handle.
f. Adjust the ‘opening speed screw’ on the secondary in-line valve to ¼ turn open.
g. Actuate the deadman handle.
h. Make sure that the ‘hydrant hose’ remains soft until maximum flow is reached.
i. Adjust the 'opening speed screw' until the hose remains soft during opening.

7-11. SETTING THE VENTURI COMPENSATION.

a. Install a pressure gauge on the aircraft nozzle.
b. Open the aircraft fueling nozzle(s).
c. Actuate the deadman handle.
d. Using a valve downstream of the nozzle(s), adjust and maintain the flow rate to 60 to 70% of the rated flow
e. Adjust the 'venturi compensation needle valve' so that the indicated pressures on the 'nozzle pressure gage' (on the fueling panel) and the 'pressure gage on the nozzle' are the same ±2 psi.

7-12. FLOW CONTROL SETTING. (If Used)

a. Open the aircraft fueling nozzle(s).
b. Actuate the deadman handle.
c. Set the flow rate to 110 to 115% of rated flow, using a valve downstream of the nozzle(s).

CAUTION: DO NOT EXCEED THE CAPACITY OF THE FLOWMETER OR THE FILTER.

d. Adjust the 'venturi flow control needle valve' to decrease the flow to 'maximum flow' rate.

7-13. FINAL LOCK-UP AND SEAL.

a. Reinstall and tighten the 3 cap screws in the primary hydrant valve servo (surge pressure adjustment, control pressure adjustment, and opening speed adjustment).
b. Reinstall and tighten the cap screw in the secondary (in-line) valve servo (control pressure adjustment.
c. Safety wire the 3-way 'set-up valve' in the closed position.
d. Lock and seal the venturi compensation needle valve (refer to paragraph 7-11e).
e. Lock and seal the venturi flow control needle valve (if used) (refer to paragraph 7-12d).
f. Remove the pressure gage from the aircraft fueling nozzle and plug the hole.
g. Remove the temporary pressure gage from the pump outlet line and plug the hole.

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SECTION VIII
MAINTENANCE PROCEDURES
SUBSECTION A
SERVO ASSEMBLY (FOR ELIMINATOR VALVES)
PART NUMBERS 4631050GR AND 4631050CGR

NOTE: The body of the 4631050GR and 4631050CGR Servo Assembly is machined differently from the bodies of the 'air set' valves. Therefore, a servo assembly from an F370 or F376 cannot be field converted.

8-1. DISASSEMBLY. Refer to Figure 8-1 and proceed as follows:

a. Remove the three packings (15 and 42) and the screen (16).
b. Remove the three screws (17) and the washers (18).
c. Remove the two screws (44) and the washers (45).
d. Back out the two setscrews (26A) until the springs are unloaded.
e. Remove the retainer (20), the cap (27), the retainer (36) and the spring (29).
f. Remove the screw (1) and the washers (2 and 3) and the poppet (4).

NOTE: It may be necessary to grip the head of the rod (31) to prevent rotation.

g. Remove the rod assembly (items 30, 31, 32 and 33) from body.
h. Remove the retainer (30) from the rod (31). Remove the piston (33) and the packing (32) from the rod.
i. Remove the retaining ring (12) from the body (48). Then remove the retainer (13) and the packing (14) from the body.
j. Remove the retaining ring (20), the cap (35), retainer (36) and the spring (37).
k. Remove the poppet (38) and the spring (39) from the body (48).
l. Remove the retaining ring (12), the retainer (40) and the packing (41) from the body (48).
m. Remove the needle screw (47).
n. Remove the four packings (5 and 9) from the top of the body (48). Remove the packing (5) and the seal (6) from the bottom of the body.
o. Drive out the pin (60) and then remove the seal plug (61), the packing (62) and the ball (63).

8-2. CLEANING. Clean all of the disassembled parts, paying particular attention to:

a Removing all contamination from the packing grooves.

b. Long drilled ports.

c Make sure that the control orifice under the screen (16, Figure 8-1) and the orifice in the diagonal drilled port between the two bores in the top of the body (48) are both clear.

8-3. INSPECTION. Inspect the cleaned parts as follows:

a. Check all packing grooves and seats for the packings (5, 9, 14, 15, 41, 42, Figure 8-1) for corrosion or damage (10 places).

b. Check the seating areas for the control poppet (38) and the needle screw (47) for corrosion, contamination or damage.

c. Check the poppet (4) for scoring, and check its sealing area for cracking or damage.

d. Check the piston (33) and the sealing areas of the rod (31) for scoring or other damage.

e. Check the poppet (38) for scoring and indentation to the outside diameter and the needle end.

8-4. REASSEMBLY. Refer to Figure 8-1 and reassemble all of the parts in the reverse order of disassembly, and as follows:

a. Replace all damaged or unserviceable parts.

b. Replace **ALL** of the packings with new packings.

c. Lightly lubricate **ALL** of the packings and all of the moving parts with petrolatum (Vaseline).

d. When installing the seal (6) and the packing (5), first install the packing in the groove. Then, carefully fold the seal (6) between finger and thumb, and fit it into the groove, covering the packing.

e. When installing the screw (1) it must only be tightened to a point where a clearance gap of 0.001 to 0.004 inch remains. (Tighten it down and back off ¼-turn).

f. When installing the needle (47), tighten it until it seats, and then back it out ½- turn. This will be a good ‘initial’ setting.

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4631050GR AND 4631050CGR SERVO ASSEMBLIES (FOR ELIMINATOR VALVES)				
ITEM	PART NUMBER	DESCRIPTION	QUANTITY GR	QUANTITY CGR
1	–	SCREW, Button Head, socket, #6-32 x ½-inch long,	1	1
2	CAN960C8	WASHER, Flat	1	1
3	2706580-103	WASHER, Nylon	1	1
4	2632685	POPPET ASSEMBLY	1	1
5	2661058BD122	PACKING	3	3
6	4631061-1022	SEAL	1	1
9	2661058A123	PACKING	2	2
12	CMS16625-4050	RING, Retaining	2	2
13	2662637	RETAINER	1	1
14	2661058BD010	PACKING	1	1
15	2661058A011	PACKING	2	2
16	2632889	SCREEN	1	1
17	CMS35308-301	SCREW	3	3
18	2706580-109	WASHER, Nylon	3	3
20	CMS16625-4118	RING, Retaining	2	2
26	–	SETSCREW, #10-32 x 1.18 inches long	1	1
26 A	–	SETSCREW, #10-32 x 1.18 inches long	1	1
27	2692094-2	CAP (steel)	1	–
27	2692094-1	CAP (aluminum)	–	1
29	2721715	SPRING	1	1
30	5133-21	RING, Retaining	1	1
31	2692181	ROD	1	1
32	2661058A006	PACKING	1	1
33	2692182	PISTON	1	1
35	2692094-2	CAP (steel)	1	–
35	2692094-1	CAP (aluminum)	–	1
36	2692178	RETAINER	2	2

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4631050GR AND 4631050CGR SERVO ASSEMBLIES (FOR ELIMINATOR VALVES)				
ITEM	PART NUMBER	DESCRIPTION	QUANTITY GR	QUANTITY CGR
37	2721716	SPRING	1	1
38	2692095	POPPET	1	1
39	2692177	SPRING	1	1
40	2662636	RETAINER	1	1
41	2661058BD009	PACKING	1	1
42	2661058A130	PACKING	1	1
44	CAN515C8-4	SCREW	2	2
45	2706580-105	WASHER, Nylon	2	2
46	CAN932-3S	PLUG	1	1
47	2671228	SCREW, Needle	1	1
48	2871019-102	BODY (aluminum)	1	–
48	2871019-101	BODY (cres)	–	1
60	27065810-02006	PIN	1	1
61	931020-101	PLUG, Seal	1	1
62	2661058A006	PACKING	1	1
63	2706786-4812	BALL	1	1

SUBSECTION B
SERVO ASSEMBLY (FOR ELIMINATOR VALVES)
PART NUMBERS 2691786H AND 2691786J

8-5. DISASSEMBLY. Refer to Figure 8-2 and proceed as follows:

a. Remove the packings (25) and the orifice (26).
b. Remove the hex cap screw (28) and the washer (30). If installed, remove and discard the setscrew (32).
c. Remove the hex cap screw (42) and the washer (43).
d. Back out the screw (41) until the spring is unloaded.
e. Remove the retainer (2), the cap (40), the retainer (45) and the spring (44).
f. Remove the retainer (10) from the poppet (18). Remove piston (7).
g. Remove the two packings (22) from the body (36).
h. Remove the retainer (12), and then pull the poppet (18) together with the guide (13) from the body (36).
i. Remove the retainer (10) from the poppet (18). Separate the guide from the poppet and remove the three packings (15 and 19).
j. Remove the seat (20) and the packing (21) from the body (36). Remove the packing from the seat.

8-6. CLEANING. Clean all of the disassembled parts, paying particular attention to:

a Removing all contamination from the packing grooves.
b Long drilled ports.

8-7. INSPECTION. Inspect the cleaned parts as follows:

a. Check all of the packing grooves for packings (22, 25, 19 and 15, Figure 8-2) and the seating face of the body (36) for corrosion or damage (8 places).
b. Check all of the sealing areas for packings (15, 19 and 21) in the body (36) and the guide (13) for corrosion, contamination or damage.
c. Check the inside and outside diameters of the piston (7) for scoring or other damage.
d. Check the poppet (18) for scoring and indentation to the outside diameter and the needle end.

8-8. REASSEMBLY. Refer to Figure 8-2 and reassemble all of the parts in the reverse order of disassembly, and as follows:

a. Replace all damaged or unserviceable parts.
b. Replace **ALL** of the packings with new packings.
c. Lightly lubricate **ALL** of the packings and all of the moving parts with petrolatum (Vaseline).
d. Do **NOT** install the setscrew (32).

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2691786H AND 2691786J SERVO ASSEMBLIES (FOR ELIMINATOR VALVES)				
ITEM	PART NUMBER	DESCRIPTION	QUANTITY H	QUANTITY J
2	N500-125	RING, Retaining	1	1
7	2691779-1	PISTON	1	1
10	X5133-31	RING, Retaining	2	2
12	5000-102H	RING, Retaining	1	1
13	2691777-1	GUIDE	1	1
15	2661058A015	PACKING	1	1
18	2691783	POPPET	1	1
19	2661058BD008	PACKING	2	2
20	2691776-1	SEAT	1	1
21	2661058A014	PACKING	1	1
22	2661058BD218	PACKING	2	2
25	2661058A013	PACKING	2	2
26	2691787-1	ORIFICE (0.093-inch) (4-Inch Valve)	1	–
26	2691787-7	ORIFICE (0.062-inch) (3-Inch Valve)	–	1
28	2701361	BOLT	1	1
30	2706580-115	WASHER, Nylon	1	1
32	–	–	–	–
36	2691728-1-1	BODY	1	1
40	2881012-101	CAP	1	1
41	–	SETSCREW, #10-32 x 1.18-inch long	1	1
42	2706580-109	WASHER, Nylon	1	1
43	CMS35308-301	SCREW, Hex head	1	1
44	2721715	SPRING	1	1
45	2692178	RETAINER	1	1

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SUBSECTION C
PILOT VALVE
PART NUMBERS
970000 – AIR ACTUATED 5-WAY PILOT VALVE
970001 – SOLENOID ACTUATED 5-WAY PILOT VALVE
52451-1000 – AIR ACTUATED 3-WAY PILOT VALVE

NOTE: Maintenance is limited to cleaning and replacement of the packings. If further maintenance is required, the pilot valve must be replaced.

8-9. DISASSEMBLY. Refer to Figure 8-3 and proceed as follows:

a. Remove the screws (12, 10 or 11).
b. Remove the cap (G), the spring (K) and the packing (8).
c. Remove the actuator assembly (A or C) and the spacer (E).
d. Push the spool (J), the spacers (H) and the packings (1) out of the body (F).
e. Do **NOT** remove the pistons (B or D) from the actuator assemblies unless they are leaking or are contaminated.

8-10. CLEANING. Clean all of the disassembled parts, paying particular attention to removing all contamination from the packing grooves.

8-11. INSPECTION. Inspect the cleaned parts as follows:

a. Check all of the spools and the bore of body for corrosion or damage.
b. Check the spool packings (1) for damage or swelling.
c. If the pistons (B or D) have been removed, check the piston seals (2 or 3) for damage.
d. If the pistons (B or D) have been removed, check the piston bores for damage or corrosion.

8-12. REASSEMBLY. Refer to Figure 8-3 and reassemble all of the parts in the reverse order of disassembly, and as follows:
NOTE: The packings (1, 4, 5, 6, 7, 8 and 9) and the seals (2 and 3) are the only replaceable parts. If any other parts are defective, replace the pilot valve.

a. Replace **ALL** of the packings which have been remove during disassembly with new packings.
b. If the pistons have been removed from the actuators, great care is necessary not to fold the lip of the seal. If lip is folded leakage will occur and the pilot valve will fail to actuate or release.

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970000, 970001 AND 52451-1000 PILOT VALVES					
ITEM	PART NUMBER	DESCRIPTION	QUANTITY		
			970000	970001	52451-10000
1	2661058BD110	PACKING	6	6	4
2	850400500-4257	SEAL	–	1	1
3	850400625-4257	SEAL	1	–	–
4	2661058A006	PACKING	1	–	–
5	2661058A006	PACKING	3	3	2
6	2661058A006	PACKING	3	3	2
7	2661058A006	PACKING	2	2	–
8	2661058A016	PACKING	1	1	–
9	2661058A011	PACKING	5	5	–
10	–	SCREW	–	4	–
11	–	SCREW	2	–	2
12	–	SCREW	2	2	4
13	46F2-2	ADAPTER	–	1	–
A	–	SOLENOID ASSEMBLY	–	1	–
B	–	PISTON	–	1	–
C	–	CYLINDER	1	–	1
D	–	PISTON	1	–	1
E	–	SPACER	1	1	1
F	–	BODY	1	1	1
G	–	CAP	1	1	1
H	–	SPACER	5	5	3
J	–	SPOOL	1	1	1
K	–	SPRING	1	1	1

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SUBSECTION D
BODY ASSEMBLY (3-INCH VALVE)
PART NUMBERS F354 AND F375

8-13. DISASSEMBLY. Refer to Figure 8-4 and proceed as follows:
a. Remove the four screws securing the servo and the manifold, and remove the servo and the manifold as an assembly.
b. On the bypass valve, P/N F354, remove the adapter (17) and the three packings (16, 18 and 19).
c. If installed, remove the Victaulic cover (11) and the packing (12).
d. Remove the two screws (9) and remove the guide (8) with the two packings (7).
e. Lift out the spring (6) and the piston (3).
f. Remove the seal (5) and the packing (4) from inside of the body (1 or 2).
8-14. CLEANING. Clean all of the disassembled parts, paying particular attention to:
a. Removing all contamination from the packing grooves.
b. The main piston seat in the body (1 or 2, Figure 8-4).
c. The servo piston seat in the side port of the body (1 or 2).
d. The servo mounting face on the side of the body (1 or 2).

8-15. INSPECTION. Inspect the cleaned parts as follows:
a. Check all of the sealing diameters and surfaces in the side port of the body (1 or 2, Figure 8-4) for corrosion or damage.
b. In the body (1 or 2), check the main piston seat inside diameter, the seat face and the blend radius for corrosion or damage. Also check the bore for scoring or other damage.
c. Check the packing grooves inside the body (1 or 2), the guide (8) and the adapter (17), if installed.
d. Check the piston (3) for scoring on the nose and the outside polished diameter. Check the condition of the bonded seal.

8-16. REASSEMBLY. Refer to Figure 8-4 and reassemble all of the parts in the reverse order of disassembly, and as follows:
a. Replace all damaged or unserviceable parts.
b. Replace **ALL** of the packings with new packings.
c. Lightly lubricate **ALL** of the packings and all of the moving parts with petrolatum (Vaseline).

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F354 AND F375 BODY ASSEMBLIES (3-INCH VALVE)				
ITEM	PART NUMBER	DESCRIPTION	QUANTITY F354	QUANTITY F375
1	2691972-1	BODY (flanged)	1	1
2	2691972-19	BODY (Victaulic)	–	–
3	2691976-1	PISTON ASSEMBLY	1	1
4	2661058BD239	PACKING	1	1
5	4631062-239	SEAL	1	1
6	2691980	SPRING	1	1
7	2661058A152	PACKING	2	2
8	2691977-1	GUIDE	1	1
9	CAN26C1032-6	SCREW	2	2
10	CAN932-3	PLUG	2	2
11	2691979-1	COVER (Victaulic)	–	–
12	2661058A238	PACKING	–	–
13	CAN10-22A	BOLT	–	–
14	CAN315-10R	NUT	–	–
15	CAN935-1016	WASHER	–	–
16	2661058A214	PACKING	1	–
17	2691726-1	ADAPTER	1	–
18	2661058A130	PACKING	1	–
19	2661058A222	PACKING	1	–

SUBSECTION E
BODY ASSEMBLY (4-INCH VALVE)
PART NUMBERS F355 AND F377

8-17. DISASSEMBLY. Refer to Figure 8-5 and proceed as follows:

a. Remove the four screws securing the servo and the manifold, and remove the servo and the manifold as an assembly.

b. On the bypass valve, P/N F355, remove the adapter (17) and the three packings (16, 18 and 19).

c. Remove the cover (3 or 4) and the two packings (8 and 9).

d. Lift out the spring (10) and the piston (11).

e. Remove the seal (12) and the packing (13) from inside of the body (1 or 2).

8-18. CLEANING. Clean all of the disassembled parts, paying particular attention to:

a. Removing all contamination from the packing grooves.

b. The main piston seat in the body (1 or 2, Figure 8-5).

c. The servo piston seat in the side port of the body (1 or 2).

d. The servo mounting face on the side of the body (1 or 2).

8-19. INSPECTION. Inspect the cleaned parts as follows:

a. Check all of the sealing diameters and surfaces in the side port of the body (1 or 2, Figure 8-5) for corrosion or damage.

b. In the body (1 or 2), check the main piston seat inside diameter, the seat face and the blend radius for corrosion or damage. Also check the bore for scoring or other damage.

c. Check the packing grooves inside the body (1 or 2), the cover (3 or 4) and the adapter (17), if installed.

d. Check the piston (11) for scoring on the nose and the outside polished diameter. Check the condition of the bonded seal.

8-20. REASSEMBLY. Refer to Figure 8-5 and reassemble all of the parts in the reverse order of disassembly, and as follows:

a. Replace all damaged or unserviceable parts.

b. Replace **ALL** of the packings with new packings.

c. Lightly lubricate **ALL** of the packings and all of the moving parts with petrolatum (Vaseline).

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F355 AND F377 BODY ASSEMBLIES (4-INCH VALVE)

ITEM	PART NUMBER	DESCRIPTION	QUANTITY	
			F355	F377
1	2672169-1	BODY (Flanged inlet) (Aluminum alloy)	1	1
	2672169-2	BODY (Flanged inlet) (Ductliron) (Mod B)	1	1
2	2672161-2	BODY (Victaulic inlet) (Aluminum alloy) (Mod C)	–	–
	2672161-1	BODY (Victaulic inlet) (Ductliron) (Mod BC)	–	–
3	2672306-1	FITTING, OUTLET (Flanged) (Aluminum alloy)	1	1
	2672306-2	FITTING, OUTLET (Flanged) (Ductliron) (Mod B)	1	1
4	2672163-1	FITTING, OUTLET (Victaulic) (Aluminum alloy) (Mod D)	–	–
	2672163-2	FITTING, OUTLET (Victaulic) (Ductliron) (Mod BD)	–	–
5	3/8-24X1-1/2	BOLT, MACHINE	8	8
6	CAN960-616	WASHER, FLAT	8	8
7	2691179-1	PLATE, IDENTIFICATION	1	1
8	2661058A263	PACKING	1	1
9	2661058A245	PACKING	1	1
10	2672165	SPRING	1	1
11	2632643-2	PISTON, VALVE	1	1
12	4631062-247	SEAL	1	1
13	2661058BD248	PACKING	1	1
14	CAN932-3	PLUG	3	3
15	2661058A222	PACKING	1	–
16	2661058A214	PACKING	1	–
17	2691726-1	ADAPTER	1	–
18	2661058A130	PACKING	1	–

SUBSECTION F
HYDRANT VALVE ASSEMBLY (4-INCH)
PART NUMBERS F368 AND F372

8-21. DISASSEMBLY – PART NUMBER F368. Refer to Figures 8-6 and 8-9, and proceed as follows:

a. Remove the two external tubes (10, Figure 8-9, Sheet 2 or 3) and the adapter assembly (14 or 15).
b. Remove the four screws (11, Figure 8-9, Sheet 1) securing the control servo (2) and the manifold (1). Remove the servo and the manifold as an assembly.
c. Remove the excess flow servo (P/N F576), or remove the plug (items 31, 32 and 33 [not illustrated]).
d. Remove the bolts (13, Figure 8-6), the washers (14), the identification plate (15) and the dust cover (2).
e. Remove the adapter (16) and the packing (17).
f. Remove the poppet assembly (items 6, 7, 8, 9 and 10) and the spring (11).
g. Disassemble the poppet assembly (items 6, 7, 8, 9 and 10).
h. Remove the guide (24) and the packing (18). Lift out the spring (21) and the piston (22).
i. Remove the (19) seal and the packing (20) from inside of the body (1).

8-22. DISASSEMBLY – PART NUMBER F372. Refer to Figures 8-7 and 8-9, and proceed as follows:

a. Remove the two external tubes (10, Figure 8-9, Sheet 2 or 3) and the adapter assembly (14 or 15).
b. Remove the four screws (11, Figure 8-9, Sheet 1) securing the control servo (2) and the manifold (1). Remove the servo and the manifold as an assembly.
c. Remove excess flow servo (P/N F576), or remove plug (items 31, 32 and 33 [not illustrated]).
d. Remove the nine screws (3), the selector ring (4), if installed, the flange (5) and the packing (12).
e. Remove the poppet assembly (items 6, 7, 8, 9 and 10) and the spring (11).
f. Disassemble the poppet assembly (items 6, 7, 8, 9 and 10).
g. Remove the bolts (13, Figure 8-6), the washers (14), the identification plate (15) and the dust cover (2).
h. Remove adapter (16) and the packings (17 and 18). Lift out spring (21) and the piston (22).
i. Remove the seal (19) and the packing (20) from inside the body (1).

8-23. CLEANING. Clean all of the disassembled parts, paying particular attention to:

a. Removing all contamination from the packing grooves.
b. The main piston seat in the body (1 or 2, Figure 8-6 or 8-7).
c. The servo piston seat in the side port of the body (1 or 2, Figure 8-6 or 8-7).
d. The servo mounting face on the side of the body (1 or 2, Figure 8-6 or 8-7).

8-24. INSPECTION. Inspect the cleaned parts as follows:

a. Check all of the sealing diameters and surfaces in the side port of the body (1 or 2, Figure 8-6 or 8-7) for corrosion or damage.
b. In the body (1 or 2, Figure 8-6 or 8-7), check the main piston seat inside diameter, the seat face and the blend radius for corrosion or damage. Also check the bore for scoring or other damage.
c. Check the packing grooves inside the body (1 or 2, Figure 8-6 or 8-7).
d. Check the piston (22, Figure 8-6 or 8-7) for scoring on the nose and the outside polished diameter. Check the condition of the bonded seal.
e. Check the condition of the bonded seal in the poppet (6, Figure 8-6 or 8-7).
f. (P/N F368 only.) Check the poppet and coupler seal faces in the (16, Figure 8-6) for wear or corrosion.
g. (P/N F372 only.) Check the poppet and coupler seal faces in the flange (5, Figure 8-7) or the adapter (16) for wear or corrosion.
h. (P/N F372 only.) Check the three lugs on the flange (5, Figure 8-7) for wear.

8-25. REASSEMBLY. Refer to Figures 8-6, 8-7 and 8-9, and reassemble all of the parts in the reverse order of disassembly, and as follows:

a. Replace all damaged or unserviceable parts.
b. Replace **ALL** of the packings with new packings.
c. Lightly lubricate **ALL** of the packings and all of the moving parts with petrolatum (Vaseline).

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F368 AND F372 HYDRANT VALVES				
ITEM	PART NUMBER	DESCRIPTION	QUANTITY F368 (Figure 8-6)	QUANTITY F372 (Figure 8-7)
1	2672169-3	BODY	1	1
2	2681255	COVER, DUST	1	–
	2682050	COVER, DUST	–	1
3	2681245	SCREW	–	9
4	2681246-1	RING, SELECTOR	–	1
5	1427-595185-2	FLANGE	–	1
6	2682052-1	POPPET	–	1
	2681242-2	POPPET	1	–
7	2681965	GASKET	1	1
8	2681261-3	PLUNGER	–	1
	2681261-1	PLUNGER	1	–
9	2-1349-46	SPRING	1	1
10	2681260	SHAFT	1	1
11	2691265	SPRING	–	1
	2681220	SPRING	1	–
12	2661058A043	PACKING	–	1
13	CMS90727-64	BOLT	8	5
14	CAN960C616	WASHER	8	5
15	2691179-1	PLATE, IDENTIFICATION	1	1
16	2681241-2	ADAPTER	–	1
	2681172-2	FLANGE	1	–
17	2661058A263	PACKING	1	1
18	2661058A245	PACKING	1	1
19	4631062-247	SEAL	1	1
20	2661058BD248	PACKING	1	1
21	2661925	SPRING	1	1

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F368 AND F372 HYDRANT VALVES				
ITEM	PART NUMBER	DESCRIPTION	QUANTITY F368 (Figure 8-6)	QUANTITY F372 (Figure 8-7)
22	2632643-2	PISTON ASSEMBLY	1	1
23	CAN932-3S	PLUG	1	1
24	2681213-1	GUIDE	1	–
25	CMS171555	PIN	1	–
27	CMS90727-71	BOLT	3	–
28	2681249-3	SPACER	3	–
31	2681975-2	PLUG (without F576 Excess Flow Servo)	1	1
32	2661058A029	PACKING (without F576 Excess Flow Servo)	1	1
33	CNAS1352C4-10	SCREW (without F576 Excess Flow Servo)	4	4

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SUBSECTION G
MANIFOLD ASSEMBLIES

F354 AND F355 SERVO VALVE AND MANIFOLD ASSEMBLIES				
ITEM	PART NUMBER	DESCRIPTION	QUANTITY F354	QUANTITY F355
1	971024-101 971024-102 971024-103 971024-104	MANIFOLD ASSEMBLY (12 VDC) MANIFOLD ASSEMBLY (120 VAC) MANIFOLD ASSEMBLY (24 VDC) MANIFOLD ASSEMBLY (air actuated)	1	1
1A	2706142-101	VALVE, RELIEF	1	1
1B	2706170-101 2706170-102 2706170-103 52451-1000	VALVE, SOLENOID (12 VDC) VALVE, SOLENOID (120 VAC) VALVE, SOLENOID (24 VDC) VALVE, AIR PILOT	1	1
1C	CAN932-3	PLUG, ¼" NP	1	1
1D	971023-101	MANIFOLD	1	1
1E	6-4CBZA	FITTING, ELBOW	4	1
1F	2706133-108	NIPPLE	2	4
1G	2706015-5	TUBE, 3/8" (aluminum)	2	2
2	2691786H	SERVO, BYPASS, 4"	-	2
	2691786J	SERVO, BYPASS, 3"	1	1
3	2661058A011	PACKING	2	-
4	2661058A130	PACKING	1	2
5	CMS16998-32	SCREW	2	1
6	91252A059	SCREW	1	2
7	91252A060	SCREW	1	1

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F368 AND F372 HYDRANT VALVE ASSEMBLIES					
ITEM	PART NUMBER	DESCRIPTION	QUANTITY		
			F375/7	F368/F372 w/F576	F368/F372 wo/ F576
1	961005-101	MANIFOLD (aluminum)	1	–	–
	961005-102	MANIFOLD (cres)	–	1	1
2	4631050CGR	SERVO, Binocular (aluminum)	–	–	–
	4631050GR	SERVO, Binocular (cres)	–	1	1
3	970000-101	VALVE, PILOT (air actuated)	1	1	1
4	970001-101	VALVE, PILOT (12 VDC)	–	–	–
5	2661058A011	PACKING	2	2	2
6	2661058A130	PACKING	1	1	1
7	2661058A214	PACKING	1	1	1
8	6-2CBZ-A	FITTING, ELBOW	1	–	–
	4-2CBZ-SS	FITTING, ELBOW	–	1	1
9	6-2FBZA	FITTING, STRAIGHT	1	–	–
10	2706015-5	TUBE, 3/8" (aluminum)	1	–	–
	2706015-3	TUBE, 1/4" (cres)	–	3	3
11	CMS16998-35	SCREW (manifold/servo)	4	4	4
12	CMS16998-33	SCREW (pilot valve)	4	4	4
14	970002-101	ADAPTER ASSEMBLY (with excess flow)	–	1	–
15	970002-102	ADAPTER ASSEMBLY (without excess flow)	–	–	1
17	4-2FBZ-SS	FITTING, STRAIGHT	–	1	2
18	4-4FBZ-SS	FITTING, STRAIGHT	–	1	1