



MASS Systems

A Unit of AMERON GLOBAL, INC.

FIRE EXTINGUISHER

52 CUBIC INCH

P/N M57331-009

COMPONENT MAINTENANCE MANUAL

WITH

ILLUSTRATED PARTS LIST

26-22-05 PAGE T-1
DEC 1/04



**MASS SYSTEMS
A UNIT OF AMERON GLOBAL, INC.
COMPONENT MAINTENANCE MANUAL
P/N M57331-009**

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INTRODUCTION

SCOPE

This Component Maintenance Manual covers the maintenance and overhaul procedures for fire extinguisher P/N M57331-009.

MANUFACTURING ENTITY & PRODUCT SUPPORT

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CAGE Code: 0FRR4

In addition to our factory Product Support, Overhaul and Recharge stations are available worldwide.

USE MANUAL FOR SPECIFIC FUNCTIONS

This manual covers the following topics: Description and Operation, Testing and Fault Isolation, Disassembly, Cleaning, Check, Assembly and Storage, Special Tools, Fixtures, and Equipment. For the Technical Properties and the Illustrated Parts List refer to the Supplement for the specific part number.

Recommended tools and materials are listed in each section and in the Special Tools, Fixtures, and Equipment section. Equivalent items may be used.

REVISION SERVICE

Revised pages will be issued when necessary throughout the service life of the fire extinguisher. The revised part of the page will be identified with a change bar or capital **R** in the left margin.



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ABBREVIATIONS AND UNIT SYMBOLS

Abbreviations and unit symbols used in this manual are defined below.

Assy.	Assembly	Min	Minimum
ATA	Air Transport Association	Mm	Millimeter (1 mm = 0.0394-inch)
CAA	Civil Aviation Authority	M ³ /hr	Cubic meter per hour
CAGE	Commercial and Government Entity	N.C.	Normally Closed
Cfh	Cubic feet per hour	N·m	Newton-meter (1 N·m = 8.85 inch-pound)
CFR	Code of Federal Regulations	N.O.	Normally Open
Cm	Centimeter (1 cm = 0.394-inch)	No.	Number
DOT	Department of Transportation	OD	Outside Diameter
FAA	Federal Aviation Administration	Psig	Pounds per square inch-gauge
GN ₂	Nitrogen Gas	Rev.	Revision
ID	Inside Diameter	RJA	Regional Jet Association
IPL	Illustrated Parts List	Rpm	Revolutions per minute
JAA	Joint Aviation Authorities	SB	Service Bulletin
Kg	Kilogram (1 kg = 2.205-pounds)	TCPS	Temperature Compensated Pressure Switch
kPag	Kilo Pascal-gauge (1 kPag = 0.15-psig)	Temp	Temperature
MA	Milliampere	VDC	Voltage-Direct Current
Max	Maximum		



DESCRIPTION AND OPERATION

PURPOSE

The fire extinguisher is used to protect the Engine compartment. The fire extinguisher stores extinguishing agent under pressure. When electrically activated from the cockpit, the fire extinguisher very rapidly discharges extinguishing agent into the affected fire zone. The fire extinguisher is refurbishable with replacement of appropriate parts.

WARNING: THE FIRE EXTINGUISHER IS A PRESSURIZED VESSEL WITH A PYROTECHNIC ACTUATED CARTRIDGE. EXTREME CAUTION MUST BE EXERCISED IN THE HANDLING OF THE FIRE EXTINGUISHER. SEVERE PERSONNEL INJURIES MAY RESULT IF NOT HANDLED PROPERLY.

DESCRIPTION AND BREAKDOWN OF PRIMARY COMPONENTS

The fire extinguisher is cylindrical in shape and has the following components. See Figure 1.

- A. Container Weldment
- B. Actuating Cartridge
- C. Fill Fitting, Safety Relief
- D. Discharge Outlet
- E. Extinguishing Agent Halon 1211 (Bromochlorodifluoromethane)
- F. Nitrogen Gas

CONTAINER WELDMENT

The container weldment is made from an advanced stainless steel alloy.

ACTUATING CARTRIDGE

The cartridge after electrical activation produces a shock wave that fractures the sensor releasing the pressurized extinguishing agent. The pyrotechnic cartridge must be shunted during transportation and storage for safe handling.

DISCHARGE OUTLET

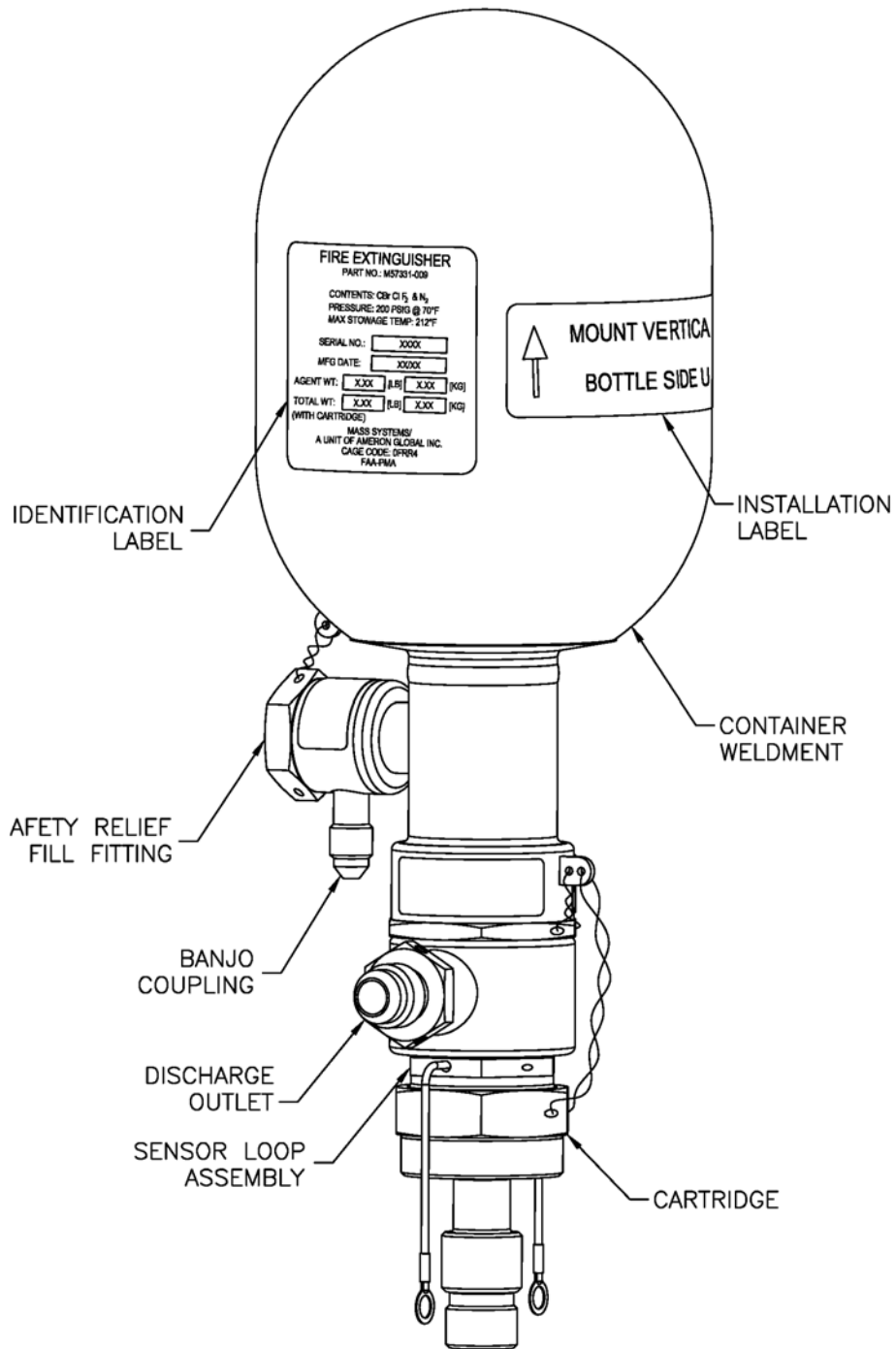
The discharge outlet connects to the aircraft distribution network.

SAFETY RELIEF FILL FITTING AND BANJO COUPLING

The safety relief fill fitting and banjo coupling are used to charge the fire extinguisher with the extinguishing agent and the Nitrogen gas.



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Primary Components
Figure 1



TECHNICAL PROPERTIES

Table 1

PROPERTY	SPECIFICATION
Description Part Number Nomenclature Complies With	M57331-009 Fire Extinguisher, Single Outlet MIL-C-22284 and DOT-E-10440-825
Functional Properties Internal Volume Extinguishing Agent Pressuring Gas	52-cubic inches (0,85 liter) Bromochlorodifluoromethane (Halon 1211) Nitrogen (N ₂)
Pressure Data At 70°F (21°C) Charge Pressure Hydrostatic Test Pressure * Burst Pressure Safety Relief Pressure	200- to 225-psig (1,38 to 1,55 MN/m ²) 1650-psig (11,38 MN/m ²) 3000-psig (20,7 MN/m ²) minimum 1400- to 1600-psig (9,65 to 11,00 MN/m ²)
Ambient Temperature Range	-65°F to +212°F (-54°C to +100°C)
Weight Data Empty Fire Extinguisher ** Extinguishing Agent (full charge) Nitrogen Charge Charged Fire Extinguisher **	2.50-pounds (1,13 kg) nominal 1.87- to 2.01-pounds (0,85 to 0,91 kg) 0.05-pound (0,02 kg) 4.49-pounds (2,04 kg) nominal
Cartridge Charged Fire Extinguisher with Cartridge	0.23-pound (0,10 kg) 4.72-pound (2,14 kg) nominal
Weight Check Interval Allowable weight deviation – actual weight versus weight marked on identification plate	Once a year is recommended Minus 0.10-pound (0,05 kg)

* The fire extinguisher hydrostatic test interval is every 5-years. If 5-years have not elapsed, hydrostatic test can be waived.

** Weight check does **not** include the cartridge (Item 5).



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PROPERTY	SPECIFICATION
Cartridge Data, Single Bridgewire Voltage Current Rating – All Fire No Fire Test Current Bridgewire Resistance Electrical Connector, 2 Pin Maximum Life – Service and Storage Classification Torque Lockwire Size	16- to 30-VDC 3.5-amperes maximum for 10-milli-seconds max. 1.0-ampere, 1.0-Watt minimum for five-minutes maximum 30 milli-ampere maximum 0.9- to 1.4-Ohm MS3106-10SL-4S 10-years 1.4s, UN0323 90 to 100 inch-pounds (10,2 to 11,3 N·m) 0.025-inch (0,64 mm)
Banjo Coupling Data Port Thread Size Rotatable 180 Degrees	MS33656G3 (0.375-24 UNJF-3A) Charged fire extinguisher
Discharge Outlet Data Port Thread Size Lockwire Size	MS33656E6 (9/16-18 UNJF-3A) 0.025-inch (0,64 mm)
Housing Mount Data Torque Lockwire Size	10 to 15 foot-pounds (13,6 to 20,3 N·m) 0.025-inch (0,64 mm)
Housing Assembly Sensor Data Torque Lockwire Size	150 to 170 inch-pounds (16,9 to 19,2 N·m) 0.025-inch (0,64 mm)
Safety Relief Fill Fitting Data Torque Lockwire Size	15 to 20 foot-pounds (20,3 to 27,1 N·m) 0.025-inch (0,64 mm)



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GENERAL MAINTENANCE AND SERVICE LIFE DATA

CONTAINER WELDMENT

1. The container weldment is constructed of stainless steel alloys. The container weldment cannot be heat-treated. All of the strength is obtained from cold work during forming. No rework of the container weldment by grinding and/or rewelding is authorized, as this will severely impact the strength of the container weldment.
2. Replacement of the bosses is not permitted as the container weldment material is already weakened during fabrication of the container weldment.
3. **HYDROSTATIC TESTING:** Periodic hydrostatic testing of the container weldment is required to comply with the U.S. Department of Transportation requirement section 173.34, contained in the Code of Federal Regulations Title 49. The recommended retest period for the MASS Systems, A Unit of Ameron Global, Inc. container weldment (design specification 4DS) is five-years. References: FAA Order 8000.40C/D, CAA, JAA regulations, ATA and RJA Exemptions.

RECOMMENDED WEIGHT CHECK PERIODS

MASS Systems, A Unit of Ameron Global, Inc. recommends yearly weight checks or the requirements by the applicable FAA, CAA, JAA agency.

ACTUATING CARTRIDGE, 1.4s CLASS

1. The total life (storage and service) of all MASS Systems, A Unit of Ameron Global, Inc. cartridge is ten-years.
2. The cartridge must be checked for bridgewire continuity in accordance with aircraft system requirements once every month.
3. The cartridge must be checked for bridgewire resistance value once every year.

SHIPMENT OF CHARGED FIRE EXTINGUISHERS

1. The cartridge must be shunted.
2. The fire extinguisher must be packed properly in a suitable shipping container. The shipping container, markings, labels, and shipping document must comply with the requirements of the Department of Transportation, refer to the Storage Instructions (Section 7.0) and Table 704.
3. The shipping container and the shipping documents must be identified in accordance with DOT requirements and the UN1044 number must appear on the shipping container and the shipping document. This MASS Systems, A Unit of Ameron Global, Inc. exemption number is stamped or engraved on the boss of the container weldment.



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SHIPMENT OF EXPLOSIVE CARTRIDGE

1. All cartridges must be shunted.
2. The cartridges must be packed in a special cardboard carton complying with DOT requirements and identified as Hazardous Material.
3. The shipping container, markings, labels, and shipping documents must be in complete compliance with DOT requirements, refer to the Storage Instructions (Section 7.0) and Table 704.
4. The explosive charge in each unit is approximately 0.25-gram and must be identified on the shipper's documentation.
5. The cartridge classification is UN0323 and the pyrotechnic class is 1.4s.



1.0 TESTING AND FAULT ISOLATION

TEST EQUIPMENT AND MATERIALS

Recommended test equipment and materials are listed in Table 101. Equivalent items may be used.

Test Equipment and Materials
Table 101

Nomenclature	Part or Specification Number	Source (CAGE)*
Cradle	91033-60	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)
Ground Strap and Circuit Tester	WT 25	Walter G. Legge, Co. (84832)
Hydrostatic Cap Plug	TL02002-1	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)
Hydrostatic Test Setup	---	Retest facility DOT approved
Leak Detector, Halogen	HLD 3000	Leybold Inficon, Inc. (56507)
Multimeter, Digital	630	Triplett Corp. (60741)
Nitrogen Gas (GN ₂) or Dry Air	2000-psig (13790 kPag)	Commercially available
Oven or Heater	250°F (121°C)	Commercially available
Power Supply	28-VDC	Commercially available
Protective Caps		Commercially available
Cartridge	CEC-10	
Fill Port	RC-6	
Discharge Boss	RC-9	
Safety Chamber, Cartridge	91035-1	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)
Tape, Foam Backed, 1-inch (25,4 mm) square, 0.25-inch (6,35 mm) thick	---	The 3M Company (04963)
Thermocouple and Readout	Iron Constantan	Commercially available
Weighing Scale, 0- to 100-pounds (0 to 45 kg), ± 0.01-pound (0,005 kg) Full Scale	3000E (Electronic)	Pennsylvania Scale Co. (03964)

* Refer to the IPL, paragraph 2, for the address.



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LEAK TEST

1. Place the fire extinguisher in the cradle (Table 101) on a level, solid surface. Orient the fire extinguisher for access to the safety relief fill fitting (70), discharge outlet (25), and cartridge (5).

WARNING: THE CARTRIDGE IS A CLASS 1.4s EXPLOSIVE DEVICE, FOR SAFE HANDLING, PERSONNEL MUST BE GROUNDED AND A SHUNT DEVICE MUST BE INSTALLED ON EACH CARTRIDGE (EXCEPT WHEN SPECIFIED IN THE PROCEDURE). INADVERTENT DETONATION OF A CARTRIDGE MAY CAUSE INJURY.

2. Wrap the ground strap around your wrist and connect the ground strap to the circuit tester (Table 101). Test the ground circuit.
3. Verify the shunt device protective cap (Table 101) is installed on the cartridge (5).
4. Using a cotton swab, clean contaminants from the components, as applicable.
5. Set the sensitivity scale on the leak detector (Table 101) to 1×10^{-4} standard cubic centimeter per second.
6. Hold the leak detector probe and slowly move probe over the component joints. Replace the leaking components, as applicable, if leakage exceeds the requirement.

REQUIREMENT: 1×10^{-4} standard cubic centimeter per second

7. After completion of the leak test, reinstall the protective caps (refer to the Assembly Section 7.0).

CARTRIDGE TEST

WARNING: THE CARTRIDGE MUST BE TESTED IN A SAFETY FIXTURE THAT PROVIDES PROTECTION FOR PERSONNEL. THE CARTRIDGE SAFETY CHAMBER IS DESIGNED FOR THIS PURPOSE.

1. Ground the cartridge safety chamber (Table 101).
2. Wrap the ground strap around your wrist and connect the ground strap to the circuit tester (Table 101). Test the ground circuit.
3. Verify the shunt device is installed on the cartridge (5).

WARNING: THE CARTRIDGE IS A CLASS 1.4s EXPLOSIVE DEVICE, FOR SAFE HANDLING, PERSONNEL MUST BE GROUNDED AND A SHUNT DEVICE MUST BE INSTALLED ON EACH CARTRIDGE (EXCEPT WHEN SPECIFIED IN THE PROCEDURE). INADVERTENT DETONATION OF A CARTRIDGE MAY CAUSE INJURY.

4. Thread the cartridge (5), with the shunt device protective cap (Table 101) installed, into the cartridge safety chamber.



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CAUTION: TEST DEVICES THAT PASS MORE THAN 30-MILLIAMPERES CURRENT CAN DAMAGE THE CARTRIDGE, REDUCING THE LIFE AND RELIABILITY OF THE CARTRIDGE. HIGHER CURRENT TEST DEVICES CAN CAUSE INADVERTANT DETONATION OF THE CARTRIDGE MAY CAUSE INJURY.

5. Setup the digital multimeter (Table 101) in accordance with the manufacturer's instruction. Select the low current display range.
6. Remove the shunt device protective cap (Table 101) from the cartridge (5).
7. Measure the bridgewire resistance by connecting the multimeter leads to the required connector pins (see IPL Figure 1).

REQUIREMENT: Bridgewire resistance must be between 0.9 to 1.4 ohms

- A. If the cartridge (5) fails, reinstall the shunt device on the cartridge (5) and dispose of the cartridge (5) in accordance with an approved procedure for disposal of explosive devices. Refer to the Repair Section 6.0 for suggested detonation procedure.
 - B. After satisfactory completion of test, disconnect the multimeter and reinstall the shunt device on the cartridge (5).
8. Remove the cartridge (5) from the cartridge safety chamber.

HYDROSTATIC PRESSURE TESTING

Hydrostatic testing of the container weldment (135) in an approved facility is required to comply with the Department of Transportation (DOT) regulations and specifications. The approved method of testing is by water jacket volumetric expansion, which uses an internal water pressure (proof pressure) to determine total volumetric expansion. The pressure is then removed and the permanent volumetric expansion of the container weldment (135) is determined. The percent of total expansion that is permanent is then calculated to determine if the container weldment (135) can be reused or must be replaced.

Five-years is the recommended retest period for all MASS Systems, A Unit of Ameron Global, Inc. container weldments (design specification 4DS), complying with U.S. Department of Transportation requirement section 173.34, contained in Code of Federal Regulations Title 49.

HYDROSTATIC TEST PROCEDURE

1. Use DOT approved hydrostatic test equipment (Table 101) or a DOT approved outside facility.
2. Verify the hydrostatic test water jacket calibration dates.
3. Prepare the container weldment (135) for hydrostatic test, as follows:

NOTE: The identification and instruction plates (105, 110, and 115) and cartridge removal and caution labels (120 and 125) may remain installed on the container weldment (135) during hydrostatic testing. All other component parts must be removed.



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4. Disassemble the container weldment (135). Refer to the Disassembly Section 3.0.
5. Place the container weldment (135) in the cradle (Table 101) with the outlet boss up. Completely fill the container weldment (135) with water. Install a test fitting into the fill fitting boss and the hydrostatic cap plug (Table 101) in outlet boss.
6. Place the filled container weldment (135) into the water jacket of the hydrostatic test equipment and connect to the pressure source through the test fitting in the fill fitting boss.
7. Close the lid to the water jacket and pressurize to seal the lid to the water jacket.
8. Adjust manometer to reference level.
9. Pressurize the container weldment (135) to the required hydrostatic test pressure of 1650 psig (11,38 MN/m²) and maintain at this pressure for a minimum of three minutes.
10. After stabilization read the water level in the manometer. This reading is the total expansion of the container weldment (135).
11. Depressurize the container weldment (135) and record water level in manometer. This reading is the permanent expansion of the container weldment (135).
12. Calculate and record the permanent volumetric expansion as percentage of total expansion.

$$\frac{\text{Permanent volumetric expansion in cubic centimeters}}{\text{Total volumetric expansion in cubic centimeters}} \times 100 = \text{Percent (\%)}$$

REQUIREMENT: The permanent volumetric expansion must not exceed 10 percent of the total volumetric expansion.

13. Retest if the container weldment (135) decreases in size. Repeat the test once if system error is suspected. Replace the container weldment if the container weldment (135) fails.
14. Remove the container weldment (135) from the water jacket.
15. Remove the test fitting, then drain the water from the container weldment (135).

CAUTION: IT IS EXTREMELY IMPORTANT TO COMPLETELY DRY THE CONTAINER WELDMENT, ANY WATER LEFT INSIDE DEGRADES THE PERFORMANCE OF THE CONTAINER WELDMENT.

16. Insert a vacuum line in the container weldment (135), place the container weldment (135) in an oven or dryer heated (Table 101) at 225°F to 250°F (107°C to 121°C), while pulling a vacuum, for one hour or until completely dry and all traces of moisture are removed.
17. Inspect the container weldment (135) for any signs of damage.
18. Impression stamp the test date on the container weldment (135) outlet boss.



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3.0 DISASSEMBLY

GENERAL

Perform the Testing and Fault Isolation Section 1.0 or the Check Section 5.0 procedures, as applicable, to determine probable cause of malfunction. Then use the appropriate procedure listed below to remove the component part. Before proceeding with any removal or disassembly, personnel must familiarize themselves with the various components, their locations, and terminology.

DISASSEMBLY TOOLS AND MATERIALS

Recommended disassembly tools and materials are listed in Table 301. Equivalent items may be used.

**Disassembly Tools and Materials
Table 301**

Nomenclature	Part or Specification Number	Source (CAGE)*
Cradle	91033-60	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)
Discharge Tool	TL02000-1 and TL02000-2	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)
Ground Strap and Circuit Tester	WT 25	Walter G. Legge, Co. (84832)
Protective Caps		Commercially available
Cartridge	CEC-10	
Fill Port	RC-6	
Discharge Boss	RC-9	
Safety Bag, Black, Heat Sealable, Electrostatic (for cartridge)	---	Commercially available

* Refer to the IPL, paragraph 2, for the address.

IDENTIFICATION AND INSTRUCTION PLATES

The identification and instruction plates (105, 110, and 115) and cartridge removal and caution labels (120 and 125) are bonded to the container weldment (135). Refer to the Assembly Section 7.0 to install new identification and instruction plates (105, 110, or 115) and cartridge removal and caution labels (120 and 125).

The caution label (130) is bonded to the banjo housing (85), refer to the Assembly Section 7.0 to install a new caution label (130).



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CARTRIDGE

WARNING: THE CARTRIDGE IS AN EXPLOSIVE DEVICE. FOR SAFE HANDLING, PERSONNEL MUST BE GROUNDED AND A SHUNT DEVICE MUST BE INSTALLED ON THE CARTRIDGE PRIOR TO REMOVAL. INADVERTENT DETONATION OF A CARTRIDGE MAY CAUSE INJURY. THE SHUNT DEVICE GROUNDS THE CARTRIDGE TO PREVENT INADVERTENT FIRING FROM A STATIC CHARGE.

1. Wrap the ground strap around your wrist and connect the ground strap to the circuit tester (Table 301). Test the ground circuit.
2. Install a shunt device protective cap (Table 301) on the cartridge (5).

WARNING: BEFORE REMOVING CARTRIDGE FROM A PRESSURIZED CONTAINER, HOLD HEX OF SENSOR HOUSING ASSY (15) SECURELY TO PREVENT HOUSING FROM UNSCREWING. FAILURE TO FOLLOW PROCEDURE CAN CAUSE INADVERTENT DISCHARGE AND SERIOUS PERSONAL INJURY.

3. Cut the safety wire and unthread the cartridge (5) from the sensor housing assembly (15). Remove and discard the o-ring (10) from the cartridge (5).
4. Place the cartridge (5) in an electrostatic safety bag (Table 301).

WARNING: DO NOT DISASSEMBLE THE FIRE EXTINGUISHER FURTHER UNTIL THE EXTINGUISHING AGENT HAS BEEN DISCHARGED OR SEVERE INJURY TO PERSONNEL CAN OCCUR.

DISCHARGE PROCEDURE

NOTE: Use this procedure to discharge the extinguishing agent before removing the safety relief fill fitting (70), safety relief fill valve (95), sensor housing assembly (15), discharge outlet (25), and banjo coupling (85).

WARNING: CONCENTRATED EXTINGUISHING AGENT CAN CAUSE LUNG IRRITATION AND NARCOSIS. DISCHARGE EXTINGUISHING AGENT IN A WELL-VENTILATED AREA.

1. Remove the cartridge (5) as previously described above.
2. Secure the cradle (Table 301) to work surface.
3. Place the fire extinguisher in the cradle, with the discharge outlet (25) facing forward and the safety relief fill fitting (75) facing up.
4. Remove the torque decal (60) and unthread the sealing screw (65) from the safety relief fill fitting (75).



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WARNING: HALON 1211 IS A KNOWN OZONE DEPLETING AGENT. THE AGENT MUST NOT BE DISCHARGED INTO THE ATMOSPHERE, TRANSFER THE AGENT INTO ANOTHER CONTAINER AND RECYCLE OR SEND TO THE CLOSEST RECYCLING CENTER.

5. Verify discharge tool (Table 301) is in the disengaged position, piston part of discharge tool is threaded out so the nut at the end of the piston is against the adapter body.
6. In this disengaged position, attach the discharge tool (Table 301) to the safety relief fill fitting (75).
7. Connect the fire extinguisher to a recovery unit by discharge hose to the port of the banjo coupling (85).
8. Apply Nitrogen gas through the discharge hose at 190- to 200-psig at ambient temperature (1,31 to 1,38 MN/m²).
9. Carefully engage the discharge tool by threading the piston into the safety relief fill fitting (75) until it stops, the piston will push the fill valve (95) and discharge the extinguishing agent to zero pressure.
10. Disconnect the fire extinguisher from the recovery unit and disconnect the discharge tool.

SENSOR HOUSING ASSEMBLY

1. Discharge the extinguishing agent.
2. Unthread the sensor housing assembly (15) from the housing mount (40) inside the discharge outlet (25). Remove and discard the o-ring (20) from the sensor housing assembly (15).

DISCHARGE OUTLET

1. Remove the discharge outlet (25) from the housing mount (40). Remove and discard the o-rings (30 and 35) from inside the discharge outlet (25).
2. Unscrew the housing mount (40) from the outlet boss on the container weldment (135). Remove and discard the o-ring (45) from the housing mount (40).

CLOSURE PLUG

Remove the closure plug (50) from the outlet boss on the container weldment (135). Remove and discard the o-ring (55) from the closure plug (50).

FILL FITTING, SAFETY RELIEF

1. Remove the torque decal (60), then unthread the sealing screw (65) from the safety relief fill fitting (70).



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2. Remove the safety relief fill fitting (70) and the banjo coupling (85) from the fill fitting boss on the container weldment (135). Remove and discard the o-rings (75 and 80) from the safety relief fill fitting (70).

FILL VALVE, SAFETY RELIEF

Remove the safety relief fill valve (95) from the fill fitting boss on the container weldment (135). Remove and discard the o-ring (100) from the safety relief fill valve (95) and the o-ring (90) from the fill fitting boss on the container weldment (135).

IDENTIFICATION AND INSTRUCTION PLATES

The identification and instruction plates (105, 110, and 115) and cartridge removal and caution labels (120 and 125) may remain installed on the container weldment (135). The caution label (130) may remain installed on the banjo housing (85).



4.0 CLEANING

CLEANING MATERIALS

Recommended cleaning materials are listed in Table 401. Equivalent items may be used.

Cleaning Materials
Table 401

Nomenclature	Part or Specification Number	Source (CAGE)*
Alcohol, Isopropyl	Federal Specification TT-I-735	Commercially available
Cloth, Lint-Free	---	Commercially available
Cradle	91033-60	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)
Detergent Solution	---	Commercially available
Light Probe	---	Commercially available
Oven or Heater	250°F (121°C)	Commercially available
Tape, Duct	---	Commercially available

* Refer to the IPL, paragraph 2, for the address.

METAL PARTS

WARNING: IMPROPER HANDLING OF A CHARGED FIRE EXTINGUISHER CAN CAUSE INJURY. DO NOT APPLY PRESSURE TO OR INSERT ANYTHING INTO THE FILL VALVE OR OUTLET VALVE.

WARNING: USE CLEANING SOLVENT IN A WELL-VENTILATED AREA. AVOID PROLONGED INHALATION OF FUMES. KEEP THE CLEANING SOLVENT AWAY FROM OPEN FLAMES.

CAUTION: ANY SCRATCHES OR DENTS ON THE SURFACE OF AN OUTLET DISC WILL CHANGE ITS CALIBRATION, MAKING IT UNUSABLE.

1. Clean all metal parts by wiping parts with a lint-free cloth (Table 401) moistened with a detergent solution (Table 401).
2. Dry the parts thoroughly using a clean, lint-free cloth.



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CONTAINER WELDMENT

1. Clean the interior of the container weldment (135) as follows:
2. Pour a small amount of detergent solution (Table 401) 1/4-to 1/2-cup into the container weldment (135).
3. Shake the container weldment (135) in a circular motion, and drain into a disposal container.
4. Repeat steps 1 and 2 using isopropyl alcohol (Table 401) until no further metal chips or filings are evident in the drained alcohol. Use the light probe (Table 401); inspect the interior of the container weldment (135) and cartridge removal label (125) and caution label (120).
5. Glass bead hone the exterior of the container weldment (135), if necessary.
6. Plug and protect all boss threads. Cover the identification plate and instruction plates (105, 110, and 115) and cartridge removal label (125) and caution label (120) with duct tape (Table 401).
7. Glass bead hone the exterior of the container weldment (135) (wet or dry glass bead), except the threads on the fill fitting boss and in the outlet boss.
8. Remove the plugs, the duct tape, and thoroughly clean the container weldment (135).

CAUTION: IT IS EXTREMELY IMPORTANT TO COMPLETELY DRY THE CONTAINER WELDMENT, ANY WATER LEFT INSIDE DEGRADES PERFORMANCE OF THE CONTAINER WELDMENT.

9. Insert a vacuum line in the container weldment (135), place the container weldment (135) in an oven or dryer (Table 401) heated at 225°F to 250°F (107°C to 121°C), while pulling a vacuum, for one hour or until completely dry and all traces of moisture are removed.



5.0 CHECK

CHECK TOOLS AND EQUIPMENT

Recommended check tools and equipment are listed in Table 501. Equivalent items may be used.

Check Tools and Equipment
Table 501

Nomenclature	Part or Specification Number	Source (CAGE)*
Cradle	91033-60	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)
Ground Strap and Circuit Tester	WT 25	Walter G. Legge Co. (84832)
Light Probe	---	Commercially available
Power Supply	28-VDC	Commercially available
Protective Caps		Commercially available
Cartridge	CEC-10	
Fill Port	RC-6	
Discharge Boss	RC-9	
Safety Chamber, Cartridge	91035-1	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)
Weighing Scale, 0- to 100-pounds (0 to 45 kg) ± 0.01-pound (0,005 kg) Full Scale	3000E (Electronic)	Pennsylvania Scale Co. (03964)

* Refer to the IPL, paragraph 2, for the address.

FIRE EXTINGUISHER WEIGHT CHECK

1. Weigh the fire extinguisher; refer to Technical Properties Table 1 for the charge weight.
2. Place the cradle (Table 501) on the weighing scale (Table 501) and adjust the weighing scale to zero.

WARNING: THE CARTRIDGE IS AN EXPLOSIVE DEVICE. FOR SAFE HANDLING, PERSONNEL MUST BE GROUNDED AND A SHUNT DEVICE MUST BE INSTALLED ON EACH CARTRIDGE. INADVERTENT DETONATION OF A CARTRIDGE MAY CAUSE INJURY.

3. Place the fire extinguisher in the cradle. Remove the protective caps from the discharge outlet (25) and the banjo coupling (85).
4. Weigh the fire extinguisher. Record the weight to nearest 0.01-pound (0,005 kg).



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5. Compare the current weight of the fire extinguisher to the last weight etched on the identification plate. If the fire extinguisher is more than 0.10-pound (0,05 kg) below last marked weight, test the fire extinguisher for leakage per Testing and Fault Isolation Section 1.0.

REQUIREMENT: Maximum weight loss allowed is minus 0.10 pound (0,05 kg)

6. Reinstall the protective caps.

CONTAINER WELDMENT

1. Inspect the container weldment (135) for scratches or dents that could reduce its strength as a pressure vessel. Dents deeper than 1/16-inch per inch (1,59 mm per mm) of average dent diameter, or scratches deeper than 0.005-inch (0,13 mm) or longer than 2-inches (50,8 mm) shall be cause for rejection.
2. Inspect all welded joints for fine cracks, or other irregularities.

SAFETY RELIEF COMPONENTS

Under a strong light, and preferably under magnification, inspect the safety relief fill fitting (70), safety relief fill valve (95), banjo coupling (85), and sealing screw (65) for cracks, corrosion, crossed threads, chafing, or scoring.

DISCHARGE OUTLET COMPONENTS

Under a strong light, and preferably under magnification, inspect the discharge outlet (25), housing mount (40), and closure plug (50) for cracks, corrosion, crossed threads, chafing, or scoring.

SENSOR HOUSING ASSEMBLY

Under a strong light, and preferably under magnification, inspect the sensor housing assembly (15) for cracks, corrosion, crossed threads, chafing, or scoring. Verify electrical continuity of the sensor.

CARTRIDGE

WARNING: THE CARTRIDGES ARE EXPLOSIVE DEVICES. FOR SAFE HANDLING, PERSONNEL MUST BE GROUNDED AND A SHUNT DEVICE MUST BE INSTALLED ON EACH CARTRIDGE (EXCEPT WHEN SPECIFIED IN PROCEDURE). INADVERTENT DETONATION OF A CARTRIDGE MAY CAUSE INJURY.

1. Wrap a ground strap around your wrist and connect the ground strap to the circuit tester (Table 501). Test the ground circuit.
2. Check the service date (month/year) etched on a wrench flat of the cartridge (5). Dispose of the cartridge (5) if the total life exceeds ten-years, in accordance with approved procedures for disposal of explosive devices. Refer to the recommended detonation procedure for disposal in the Repair Section 6.0.



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3. Remove the shunt device protective cap (Table 501), if required, to inspect the cartridge (5) electrical connector pins for security and corrosion. If the connector pins are loose or corroded, reinstall the shunt device, if required, and dispose of the cartridge (5). Refer to the recommended detonation procedure for disposal in the Repair Section 6.0.
4. Verify the bridgewire check has been successfully completed (see IPL Figure 1 for bridgewire schematic). If the bridgewire check has not been performed, remove the cartridge (5) from the outlet valve and refer to the Testing and Fault Isolation Section 1.0 and Table 1.

REQUIREMENT: Bridgewire resistance must be between 0.9- to 1.4-Ohm



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6.0 REPAIR

GENERAL

The repair instructions are limited. Refer to the Disassembly and Assembly sections to replace component parts.

REPAIR TOOLS AND MATERIALS

Recommended repair tools and materials are listed in Table 601. Equivalent items can be used.

Repair Tools and Materials
Table 601

Nomenclature	Part or Specification Number	Source (CAGE)*
Cradle	91033-60	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)
Ground Strap and Circuit Tester	WT 25	Walter G. Legge, Co. (84832)
Power Supply, 28-VDC	---	Commercially available
Protective Caps		Commercially available
Cartridge	CEC-10	
Fill Port	RC-6	
Discharge Boss	RC-9	
Safety Chamber, Cartridge	91035-1	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)

* Refer to the IPL, paragraph 2, for the address.

WARNING: DO NOT ATTEMPT ANY REPAIRS TO THE CONTAINER WELDMENT UNTIL THE EXTINGUISHING AGENT HAS BEEN DISCHARGED.

Replace all the component parts that fail to meet the Check Section 5.0 or Test and Fault Isolation Section 1.0 requirements or are damaged beyond minor repair.

WELD REPAIRS

1. Repairs that require welding, except those covered in the Assembly Section 7.0 of this manual, are not permitted unless authorized in writing by MASS Systems, A Unit of Ameron Global, Inc.
2. After MASS Systems, A Unit of Ameron Global, Inc. authorization, the welding repairs must be made in accordance with the latest FAA directives and under the supervision of a certified FAA mechanic with an airframe rating. If any doubt exists regarding penetration of the weld, inspect the welded component parts in accordance with MIL-STD-453.



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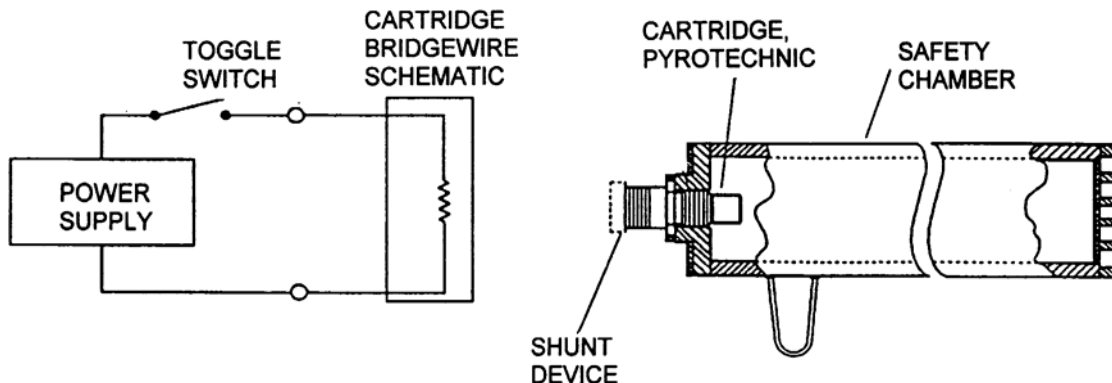
CARTRIDGE DISPOSAL

WARNING: THE CARTRIDGE MUST BE DETONATED IN A SAFETY FIXTURE THAT PROTECTS PERSONNEL FROM SERIOUS INJURY. THE CARTRIDGE SAFETY CHAMBER IS DESIGNED FOR THIS PURPOSE.

1. Ground the cartridge safety chamber (Table 601).
2. Wrap the ground strap around your wrist and connect the ground strap to the circuit tester (Table 601). Test the ground circuit.

WARNING: THE CARTRIDGE IS AN EXPLOSIVE DEVICE. FOR SAFE HANDLING, PERSONNEL MUST BE GROUNDED AND A SHUNT DEVICE MUST BE INSTALLED ON THE CARTRIDGE. INADVERTENT DETONATION OF A CARTRIDGE MAY CAUSE INJURY.

3. Make sure the shunt device protective cap (Table 601) and the o-ring are installed on the cartridge (5).
4. Thread the cartridge (5) into the cartridge safety chamber. See Figure 601.
5. Remove the shunt device protective cap and connect the power supply (Table 601) to applicable connector pins (see IPL Figure 1). Stand back five-feet (1,5 meters) minimum and apply 28-VDC, 3.5-AMPERES MAXIMUM to detonate the cartridge (5).
6. Remove the detonated cartridge (5) from the cartridge safety chamber and discard in accordance with approved procedure.



Cartridge Disposal Setup
Figure 601



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7.0 ASSEMBLY (INCLUDING STORAGE)

ASSEMBLY TOOLS AND MATERIALS

The recommended assembly tools and materials are listed in Table 701. Equivalent items may be used.

Assembly Tools and Materials
Table 701

Nomenclature	Part or Specification Number	Source (CAGE)*
Alcohol, Isopropyl	Federal Specification TT-I-735	Commercially available
Cradle	91033-60	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)
Extinguishing Agent	Halon 1211	Commercially available
Ground Strap and Circuit Tester	WT 25	Walter G.Legge Co. (84832)
Leak Detector, Halogen	HLD 3000	Leybold Inficaon, Inc. (56507)
Lubricant (Thread)	Anti-seize	Dow Corning Co. (71984)
Lubricant (O-ring)	DC 55	Dow Corning Co. (71984)
Nitrogen Gas (GN ₂)	2000-psig (13790 kPag)	Commercially available
Protective Caps Cartridge Fill Port Discharge Boss	CEC-10 RC-6 RC-9	Commercially available
Recharge Stand	91026-1	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)
Safety Wire	MS20995C25	Commercially available
Tape, Foam Backed, 1-inch (25,4 mm) square, 1/ 4-inch (6,35 mm) thick	---	The 3M Company (04963)
Thermocouple and Readout	Iron Constantan	Commercially available
Weighing Scale, 0- to 100- pounds (0 to 45 kg) ± 0.01- pound (0,005 kg) Full Scale	3000E (Electronic)	Pennsylvania Scale Co. (03964)

* Refer to the IPL, paragraph 2, for the address.



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DISCHARGE OUTLET COMPONENTS

1. Install the o-ring (55) on the closure plug (50). Apply lubricant (Table 701) on the o-ring (55). Install the closure plug (50) into the outlet boss of the container weldment (135).
2. Install the o-ring (45) on the housing mount (40) outlet. Apply lubricant (Table 701) on the o-ring (45). Thread the housing mount (40) into the discharge boss of the container weldment (135), and torque 10 to 15 foot-pounds (13,6 to 20,5 N·m) (Table 801).
3. Install the o-rings (30 and 35) in the discharge outlet (25). Apply lubricant (Table 701) on the o-rings (30 and 35). Install the discharge outlet (25) on the housing mount (40).
4. Install the o-ring (20) on the sensor housing assembly (15). Apply lubricant (Table 701) on the o-ring (20) and anti-seize lubricant (Table 701) to threads. Thread the sensor housing assembly (15) into the housing mount (40). Torque the sensor housing assembly (15) 150 to 170 inch-pounds (16,9 to 19,2 N·m) (Table 801).
5. Wrap the ground strap around your wrist and connect the ground strap to the circuit tester (Table 301). Test the ground circuit.
6. Install the o-ring (10) on the cartridge (5). Apply lubricant (Table 701) on the o-ring (10). Thread the cartridge (5) into the sensor housing assembly (15). Torque the cartridge (5) 90 to 100 inch-pounds (10,2 to 11,3 N·m) (Table 801).

SAFETY RELIEF COMPONENTS

1. Install the o-ring (90) on the fill boss of the container weldment (135). Apply lubricant (Table 701) on o-ring (90).
2. Install the o-rings (75 and 80) on the safety relief fill fitting (70). Apply lubricant (Table 701) on the o-rings (75 and 80).
3. Install the banjo coupling (85) over the safety relief fill fitting (70).
4. Install the o-ring (100) on the safety relief fill valve (95). Apply lubricant (Table 701) on the o-ring (100). Insert the safety relief fill valve (95) into the safety relief fill fitting (70).
5. Install the pre-assembled components of the safety relief fill fitting (70), refer to paragraph 1 through 4, into the fill boss of the container weldment (135). Torque the safety relief fill fitting (70) 15 to 20 foot-pounds (20,3 to 27,1 N·m) (Table 801)
6. Apply lubricant (Table 701) on the sealing screw (65) o-ring. Thread the sealing screw (65) into the safety relief fill fitting (70). Torque the safety screw (65) 50 to 60 inch-pounds (5,6 to 6,8 N·m) (Table 801).



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IDENTIFICATION AND INSTRUCTION PLATES

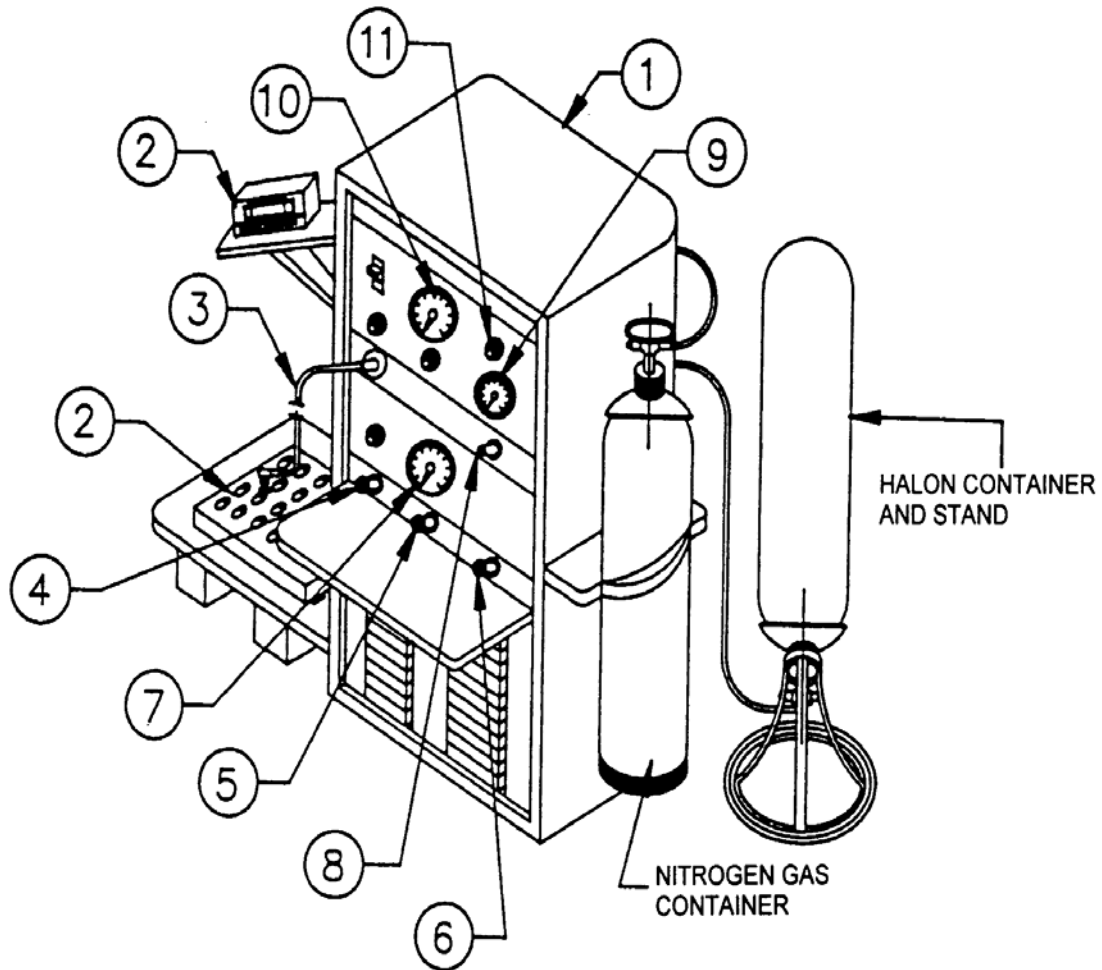
If required, install the identification and instruction plates (105, 110, and 115) and cartridge removal and caution labels (120 and 125) on the container weldment (135). If required, install the caution label (130) on to the banjo housing ((85).

FIRE EXTINGUISHER RECHARGE See Figure 701

1. Weigh the fire extinguisher; enter weight on a copy of the fill chart Table 702.
 2. Attach a flexible hose to the port of the banjo coupling (85) of the fire extinguisher. Attach the thermocouple (Table 701) with foam backed tape (Table 701) to the fire extinguisher next to a discharge boss.
 3. Install the fire extinguisher on the electronic scale (Table 701) with the cradle (Table 701) and attach the flexible hose from the recharge stand (Table 701) to the shut off valve on the charging fixture. Zero the tare reading on the electronic scale.
 4. Adjust the air pressure valve to the pump inlet 50- to 60-psig (345 to 414 kPag).
 5. Open the recharge stand charging valve and the pump will start introducing extinguishing agent (Table 701) into the fire extinguisher. Open the shut off valve on the charging fixture and pump 1.87- to 2.01-pounds (0,86 to 0,92 kg) extinguishing agent weight plus approximately 0.1-pound (0,05 kg) to allow for extinguishing agent trapped in the flexible hose.
 6. Shut off the charging valve of the recharge stand (Table 701). Vent the flexible hose and disconnect.
 7. Weigh the fire extinguisher and enter weight on the fill chart. Verify the extinguishing agent weight, Line 4 on the fill chart.
 8. Reconnect the flexible hose to the port of the banjo coupling (85) and replace the fire extinguisher onto the cradle. The cradle need not be on the scale for the Nitrogen gas charge.
 9. Open the valve on the Nitrogen gas cylinder (Table 701) and set the regulator to 850-psig maximum (5861 kPag).
 10. Open the Nitrogen gas valve to read at least 200- to 225-psig (1,38 to 1,55 MN/m²) on the charge pressure gauge. Open the valve on the charging fixture. Re-open the Nitrogen gas valve to charge the fire extinguisher to the required charge pressure of Nitrogen gas, refer to Table 703 for the metric equivalent.
- NOTE:** The Nitrogen gas is soluble in the extinguishing agent and the charge pressure will drop. The fire extinguisher must be agitated to ensure complete solubility.
11. Open and close the Nitrogen gas valve until the charge pressure gauge reads the required charge pressure after the fire extinguisher has been agitated.



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- | | | | |
|---|---------------------------|----|---------------------------------|
| 1 | RECHARGE STAND | 7 | CHARGE PRESSURE GAUGE |
| 2 | ELECTRONIC WEIGHT SCALE | 8 | AIR PRESSURE FOR PUMP |
| 3 | FLEX LINE TO FILL FIXTURE | 9 | AIR PRESSURE GAUGE FOR PUMP |
| 4 | HALON CHARGING VALVE | 10 | NITROGEN GAS PRESSURE GAUGE |
| 5 | NITROGEN GAS VALVE | 11 | NITROGEN GAS PRESSURE REGULATOR |
| 6 | VENT VALVE | | |

Recharge Setup
Figure 701



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Fill Chart Record
Table 702

Part Number _____	Serial Number _____
Date of Refill _____	Press Switch S/N _____
Certified By _____	Hydrostatic Test Date _____

1. Weight – Empty Fire Extinguisher With Cartridge <input type="checkbox"/> Y <input type="checkbox"/> N	_____	Pounds (kgs)
2. Weight – Empty Fire Extinguisher With Charging Fixture Attached	_____	Pounds (kgs)
3. Weight – Charged Fire Extinguisher With Charging Fixture Attached	_____	Pounds (kgs)
4. Weight of Halon Line 3 minus Line 2	_____	Pounds (kgs)
5. Nitrogen Gas Charge Pressure Reference Table 703	_____	Psig (kPag) _____ °F (°C)
6. Final Charged Weight of Fire Extinguisher With Cartridge <input type="checkbox"/> Y <input type="checkbox"/> N	_____	Pounds (kgs)

12. Remove the flexible hose from the port of the banjo fitting (85).

13. Weigh the charged fire extinguisher. Enter the weight on the fill chart. The final charged weight should not be entered on the identification plate until the fire extinguisher is leak checked.

FIRE EXTINGUISHER LEAK CHECK

1. Using the leak detector (Table 701), set the sensitivity to 1×10^{-4} standard cubic centimeter per second and using the probe, leak check the outlet manifold valve body and components.

REQUIREMENT: 1×10^{-4} standard cubic centimeter per second

NOTE: After charging, use an air hose to blow out all areas of the fire extinguisher because the extinguishing agent tends to accumulate in certain areas of the fill valve immediately after charging.



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Nitrogen Gas Charge Pressure
Table 703

TEMP °F	200 to 225-PSIG at 70°F		TEMP °C	1,38 to 1,55 MN/m ² at 21°C	
	Min.	Max.		Min.	Max.
60	190	215	15,6	1,31	1,48
61	191	216	16,1	1,32	1,49
62	192	217	16,6	1,32	1,50
63	193	218	17,2	1,33	1,50
64	194	219	17,8	1,34	1,51
65	195	220	18,3	1,34	1,52
66	196	221	18,9	1,35	1,52
67	197	222	19,4	1,36	1,53
68	198	223	20,0	1,37	1,54
69	199	224	20,6	1,37	1,54
70	200	225	21,1	1,38	1,55
71	201	226	21,7	1,39	1,56
72	202	227	22,2	1,39	1,57
73	203	228	22,8	1,40	1,57
74	204	229	23,3	1,41	1,58
75	205	230	23,9	1,41	1,59
76	206	231	24,4	1,42	1,59
77	207	232	25,0	1,43	1,60
78	208	233	25,6	1,43	1,61
79	209	234	26,1	1,44	1,61
80	210	235	26,7	1,45	1,62

STORAGE INSTRUCTIONS

The recommended storage materials are given in Table 704. Equivalent items may be used.

Storage Materials
Table 704

Nomenclature	Part or Specification Number	Source (CAGE)*
Cardboard Carton (for fire extinguisher)	Suitably sized	Commercially available
Packing Material	---	Commercially available
Plastic Bag (for fire extinguisher)	Suitably sized	Commercially available
Safety Bag, Black, Heat Sealable, Electrostatic (for cartridge)	---	Commercially available
Special Cardboard Carton (for cartridge)	Suitably sized	Commercially available



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The following instructions apply to the fire extinguishers and cartridges not to be placed in service.

FIRE EXTINGUISHER

1. Install the protective caps on all threaded ports and the shunt device on the cartridge.
2. Place the fire extinguisher in a suitable sized storage container. Seal the storage container.
3. Mark the storage container.
 - a. Part number
 - b. Serial number
 - c. Last hydrostatic test date
 - d. Overhaul date
 - e. DOT-E 10440
 - f. Fire extinguisher
 - g. UN1044
 - h. Class 2.2
 - i. Bromochlorodifluoromethane
 - j. Net weight of extinguishing agent
4. The storage temperature is +40°F to +100°F (+4°C to +38°C).

CARTRIDGE

WARNING: THE CARTRIDGE IS AN EXPLOSIVE DEVICE. FOR SAFE HANDLING, PERSONNEL MUST BE GROUNDED AND A SHUNT DEVICE MUST BE INSTALLED ON EACH CARTRIDGE. INADVERTENT DETONATION OF A CARTRIDGE MAY CAUSE INJURY.

1. Install a shunt device on the cartridge (5).
2. Place the cartridge (5) in an electrostatic safety bag, then into a special cardboard carton (Table 704).
3. Seal and identify the special cardboard carton. Mark the part number, Service Date, expiration date, and pyrotechnic classification UN0323, 1.4s on the special cardboard carton.
4. The storage temperature is +40°F to +100°F (+4°C to +38°C).



8.0 FITS AND CLEARANCES

TORQUE LIMITS

Torque limits for the fire extinguishers are listed in Table 801. Refer to the Supplement Technical Properties.

Torque Limits
Table 801

Nomenclature	Torque Range
Cartridge (5)	90 to 100 inch-pounds (10,2 to 11,3 N·m)
Sensor Housing Assembly (15)	150 to 170 inch-pounds (16,9 to 19,2 N·m)
Housing Mount (40)	10 to 15 inch-pounds (13,6 to 20,3 N·m)
Sealing Screw (65)	50 to 60 inch-pounds (5,6 to 6,8 N·m)
Safety Relief Fill Fitting (70)	15 to 20 foot-pounds (20,3 to 27,1 N·m)



9.0 SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

Special tools, fixtures, and test equipment required for maintenance of the fire extinguishers are listed in Table 901. Equivalent items may be used.

Special Tools, Fixtures, and Equipment
Table 901

Nomenclature	Part or Specification Number	Source (CAGE)*
Alcohol, Isopropyl	Federal Specification TT-I-735	Commercially available
Cloth, Lint-Free	---	Commercially available
Cradle	91033-60	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)
Detergent Solution	---	Commercially available
Discharge Tool	TL020000-1 and TL020000-2	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)
Extinguishing Agent	Halon 1211	Commercially available
Ground Strap and Circuit Tester	WT 25	Walter G. Legge, Co. (84832)
Hydrostatic Cap Plug	TL02002-1	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)
Hydrostatic Test Setup	---	DOT approved hydrostatic test facility
Leak Detector, Halogen	HLD 3000	Leybold Inficon, Inc. (56507)
Light Probe	---	Commercially available
Lubricant (Thread)	Anti-seize	Dow Corning Co. (71984)
Lubricant (O-ring)	DC 55	Dow Corning Co. (71984)
Multimeter, Digital	630	Triplett Corp. (60741)
Nitrogen Gas (GN ₂)	2000-psig (13790 kPag)	Commercially available



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Special Tools, Fixtures, and Equipment
Table 901 (con't)

Nomenclature	Part or Specification Number	Source (CAGE)*
Oven or Heater	250°F (121°C)	Commercially available
Power Supply	28-VDC	Commercially available
Protective Caps		Commercially available
Cartridge	CEC-10	
Fill Port	RC-6	
Discharge Boss	RC-9	
Recharge Stand	91026-1	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)
Safety Bag, Black, Heat Sealable, Electrostatic (for cartridge)	---	Commercially available
Safety Chamber, Cartridge	91035-1	MASS Systems, A Unit of Ameron Global, Inc. (0FRR4)
Safety Wire	0.025-inch (0,64 mm)	Commercially available
Tape, Duct	---	Commercially available
Tape, Foam Backed, 1-inch (25,4 mm) square, 0.25-inch (6,35 mm) thick	---	The 3M Company (04963)
Thermocouple and Readout	Iron Constantan	Commercially available
Weighing Scale, 0- to 100-pounds (0 to 45 kg), ± 0.01-pound (0,005 kg) Full Scale	3000E (Electronic)	Pennsylvania Scale Co. (03964)

* Refer to IPL, paragraph 2, for the address.



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10.0 ILLUSTRATED PARTS LIST

INTRODUCTION

1. Purpose

This IPL illustrates and lists the spare parts with attaching hardware.

2. Manufacturer Name and Address

<u>Cage Code</u>	<u>Name and Address</u>	<u>Telephone</u> <u>TeleFAX</u>
0FRR4	MASS Systems A Unit of Ameron Global, Inc. 4601 Littlejohn Street Baldwin Park, CA 91706-2285 U.S.A.	626-337-4640 FAX 626-337-1641 service@mass-sytems.com
03964	Pennsylvania Scale Company 21 Graybill Road Leola, Pennsylvania 17540-1910 U.S.A.	717-656-2653 FAX 717-656-3216
03990	Ingersoll-Rand Company ARO Fluid Products One ARO Center P. O. Box 151 Bryan, Ohio 43506 U.S.A.	419-633-1212 419-633-1239
04963	The 3M Company Adhesives Coatings and Sealers Division 3M Center St. Paul, Minnesota 55144-1000 U.S.A.	612-737-4114 FAX 612-737-4380
56242	ARCO – Atlantic Richfield Company Products Division 515 South Flower Street Los Angeles, California 90071-2201 U.S.A.	213-486-3511 FAX 213-486-2476
56507	Leybold Inficon, Inc. Two Technology Place East Syracuse, New York 13057-9714 U.S.A.	315-434-1129 FAX 315-437-3803
60741	Triplett Corporation One Triplett Drive Bluffton, Ohio 45817-1055 U.S.A.	419-358-5015 FAX 419-358-7956



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71984	Dow Corning Corporation 2200 West Salzburg Road P. O. Box 997 Midland, Michigan 48640 U.S.A.	800-248-2481 FAX 517-496-4586
84832	Walter G. Legge Company, Inc. 444 Central Avenue P. O. Box 591 Peekskill, New York 10566 U.S.A.	800-285-9204 FAX 800-332-2636

EXPLANATION OF PARTS LIST COLUMN

The Detail Parts List is arranged in general sequence of disassembly. The parts are illustrated in an exploded-view illustration and listed in the related parts list.

FIG. ITEM Column

1. The first number at the top of each FIG. Item column is the figure number of the corresponding illustration. The number given opposite each part number is the item number assigned to the part in the illustration.
2. A dash (-) in front of an item means the part is not illustrated.
3. Alpha-variants A through Z (except I and O) are assigned to item numbers, when necessary to identify:
 - Added parts
 - Alternate parts
 - Service bulletin modified parts

PART NUMBER column

This column contains the manufacturer's part number for each part, as modified to meet the requirements of ATA 200/2000. These modifications can include:

1. Removal of blank spaces and special characters, with the possible exception of dashes. Dashes are permitted only between numeric characters.
2. Insertion of a reference part number compatible with ATA 200 if the manufacturer's part number exceeds 15 characters. In these cases, the manufacturer's part number is listed in the NOMENCLATURE column.



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NOMENCLATURE Column

1. This column contains descriptive nomenclature for each part, the manufacturer's CAGE code (if the part is not manufactured or modified by MASS Systems, Inc.), part number (if longer than 15 digits), service bulletins affecting the part, and obsolete part numbers.
2. The indenture system used in the NOMENCLATURE column indicates the relationship of one part to another, as follows:

```

1 2 3
End Item or Major Assembly
ATTACHING PARTS
Attaching Parts for End Item or Major Assembly
* * *
. Detail Parts for End Item or Major Assembly
. Subassemblies
ATTACHING PARTS
Attaching Parts of Subassemblies
* * *
. . Detail parts for Subassemblies

```

3. Assemblies, subassemblies, and detail parts subject to modification, deletion, addition, or replacement by an issued Service Bulletin are annotated to indicate both pre- and post-Service Bulletin configurations. The term (PRE SB XXXX) in designates the original configuration, and the term (POST SB XXXX) identifies assemblies and parts after the modification has been completed.
4. The terms listed below are used when applicable to indicate the interchangeability of parts.

<u>Term</u>	<u>Abbreviation</u>	<u>Definition</u>
Optional	OPT	The listed part is optional to and interchangeable with other parts with the same item number variant group or other item numbers if designated.
Superseded By	SUSPD BY	The part is replaced by and is not interchangeable with the item number shown in the notation.
Supersedes	SUPSDS	The part replaces and is not interchangeable with the item number shown in the notation.
Replaced By	REPLD BY	The part is replaced by and interchangeable with the item number shown in the notation.
Replaces	REPLS	The part replaces and is interchangeable with the item number shown in the notation.



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EFF CODE Column

This column contains letter codes (A, B, etc.) to indicate the alternate models or configurations of the end item to which the listed parts apply. Where this column has been left blank, the listed parts apply to all models or configurations included in the parts list.

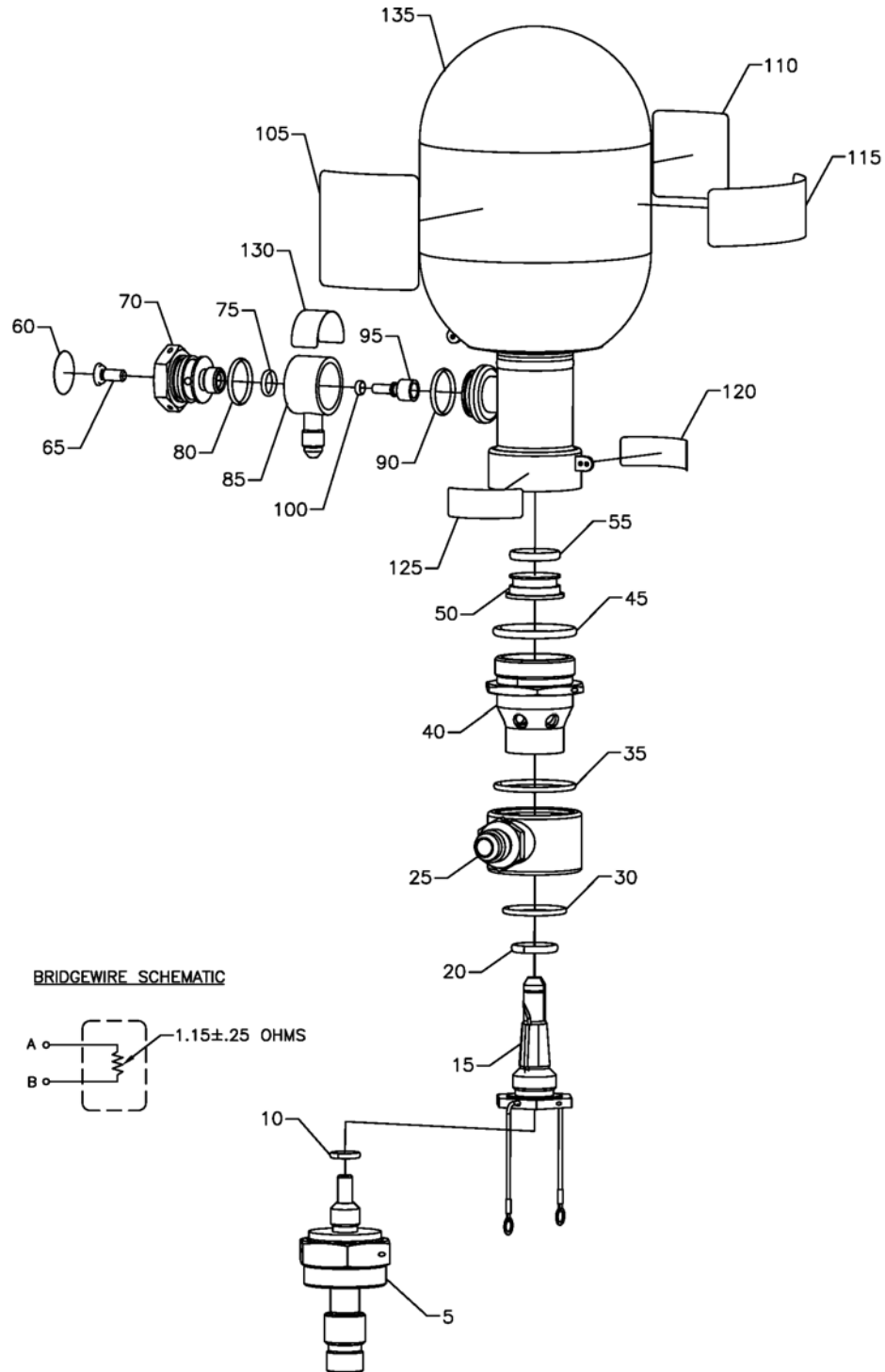
UNITS PER ASSY Column

The quantity shown in this column represents the units required for one NHA or, when referring to attaching parts, the quantity to attach one such item. The abbreviation RF (reference) indicates that the end item or assembly is shown completely assembled on the illustration referenced in the NOMENCLATURE column.



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ILLUSTRATED PARTS LIST



IPL FIGURE 1. FIRE EXTINGUISHER EXPLODED VIEW



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ILLUSTRATED PARTS LIST

FIG. ITEM NO.	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE							EFF	UNITS PER ASSY
			1	2	3	4	5	6	7		
1-1	M57331-009		FIRE EXTINGUISHER, 52-CUBIC INCH								RF
5	CT00500-1		. CARTRIDGE								1
10	SU01250-13		. . O-RING (NHA ITEM 5)								1
15	FX00325-1		. HOUSING ASSEMBLY, SENSOR								1
20	SU01250-115		. O-RING								1
25	FX00320-1		. OUTLET, DISCHARGE								1
30	SU01250-22		. O-RING								1
35	SU01250-27		. O-RING								1
40	FX00317-1		. MOUNT, HOUSING								1
45	SU01250-125		. O-RING								1
50	M13038		. PLUG, CLOSURE								1
55	SU01256-115		. O-RING								1
60	FX00321-1		. DECAL, TORQUE								1
65	FX00313-1		. SCREW, SEALING								1
70	FX00306-1		. FILL FITTING, SAFETY RELIEF								1
75	SU01256-12		. O-RING								1
80	SU01250-16		. O-RING								1
85	FX00315-1		. COUPLING, BANJO								1
90	SU01250-16		. O-RING								1
95	FX00310-1		. FILL VALVE, SAFETY RELIEF								1
100	SU01256-7		. O-RING								1
105	FX00318-1		. LABEL, IDENTIFICATION								1
110	FX00322-1		. PLATE, INSPECTION								1
115	FX00319-1		. PLATE, INSTALLATION								1
120	FX00324-1		. LABEL, CAUTION								1
125	FX00325-1		. LABEL, CARTRIDGE REMOVAL								1
130	FX00324-1		. LABEL, CAUTION								1
135	FX00305-1		. WELDMENT, CONTAINER								1

- Item not illustrated