TO: HOLDERS OF THE FIRE EXTINGUISHER COMPONENT MAINTENANCE MANUAL 26-22-06, DATED AUG 13/12.

REVISION NO. 1, DATED SEP 26/12

HIGHLIGHTS

THIS PUBLICATION HAS BEEN REPRINTED IN ITS ENTIRETY. REPLACE ALL PREVIOUSLY ISSUED COPIES OF THE COMPONENT MAINTENANCE MANUAL.

The highlights of the revision are outlined below. The pages have been revised and maintain the format of ATA 100 and the AECMA Simplified English guidelines.

CHAPTER/SECTION & PAGE NO.	DESCRIPTION OF CHANGE	EFFECTIVITY
Pages 2, 1005	Re-identified terminal pin connections.	All models

FIRE EXTINGUISHER, SINGLE OUTLET

110-CUBIC INCH (1.803 LITER)

P/N M57333-012

COMPONENT MAINTENANCE MANUAL

WITH

ILLUSTRATED PARTS LIST

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PMA PARTS NOTICE

MASS Systems, AMETEK Ameron, LLC, will provide full warranty on all fire extinguishers provided the component parts used in the repair and overhaul process have formal after market FAA-PMA authority for use on the fire extinguisher application.

RECORD OF REVISIONS

REV. NO.	ISSUE DATE	DATE FILED	BY	REV. NO.	ISSUE DATE	DATE FILED	BY
0	Aug 13/12	Aug 13/12	EK				
1	Sep 26/12	Sep 26/12	EK				

RECORD OF TEMPORARY REVISIONS

REVISION NO.	PAGE NUMBER	ISSUE DATE	BY	DATE REMOVED	BY

SERVICE BULLETIN LIST

SERVICE BULLETIN	ISSUE DATE	DATE FILED	BY

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INTRODUCTION

SCOPE

This Component Maintenance Manual covers the maintenance and overhaul procedures for fire extinguisher P/N M57333-012.

MANUFACTURING ENTITY & PRODUCT SUPPORT

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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.

ABBREVIATIONS AND UNIT SYMBOLS

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

Amp.	Amperes	Min	Minimum
Assy.	Assembly	mm	Millimeter (1 mm = 0.0394-inch)
ATA	Air Transport Association	m^3/hr	Cubic meter per hour
CAA	Civil Aviation Authority	N.C.	Normally Closed
CAGE	Commercial and Government Entity	N·m	Newton·meter (1 N·m = 8.3 inch-pound)
cfh	Cubic feet per hour	N.O.	Normally Open
CFR	Code of Federal Regulations	No.	Number
cm	Centimeter (1 cm = 0.394-inch)	OD	Outside Diameter
DOT	Department of Transportation	Psig	Pounds per square inch–gauge
FAA	Federal Aviation Administration	Rev.	Revision
GN_2	Nitrogen Gas	RJA	Regional Jet Association
ID	Inside Diameter	rpm	Revolutions per minute
IPL	Illustrated Parts List	SB	Service Bulletin
JAA	Joint Aviation Authorities	scc/sec	Standard cubic-centimeter per second
Kg	Kilogram (1 kg = 2.205-pounds)	SCD	Source Control Drawing
kPag	Kilo Pascal-gauge (1 kPag = 0.15-psig)	TCPS	Temperature Compensated Pressure Switch
mA	Milliamperes	Temp	Temperature
Max	Maximum	VDC	Voltage-Direct Current

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 EXTINGUISHERS ARE PRESSURIZED VESSELS WITH PYROTECHNIC ACTUATED CARTRIDGES. EXTREME CAUTION MUST BE EXERCISED IN THE HANDLING OF THESE FIRE EXTINGUISHERS. 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. Class 1.4s Actuating Cartridge
C. Fill Fitting, Safety Relief
D. Discharge Outlet

CONTAINER WELDMENT

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

CLASS 1.4s ACTUATING CARTRIDGE

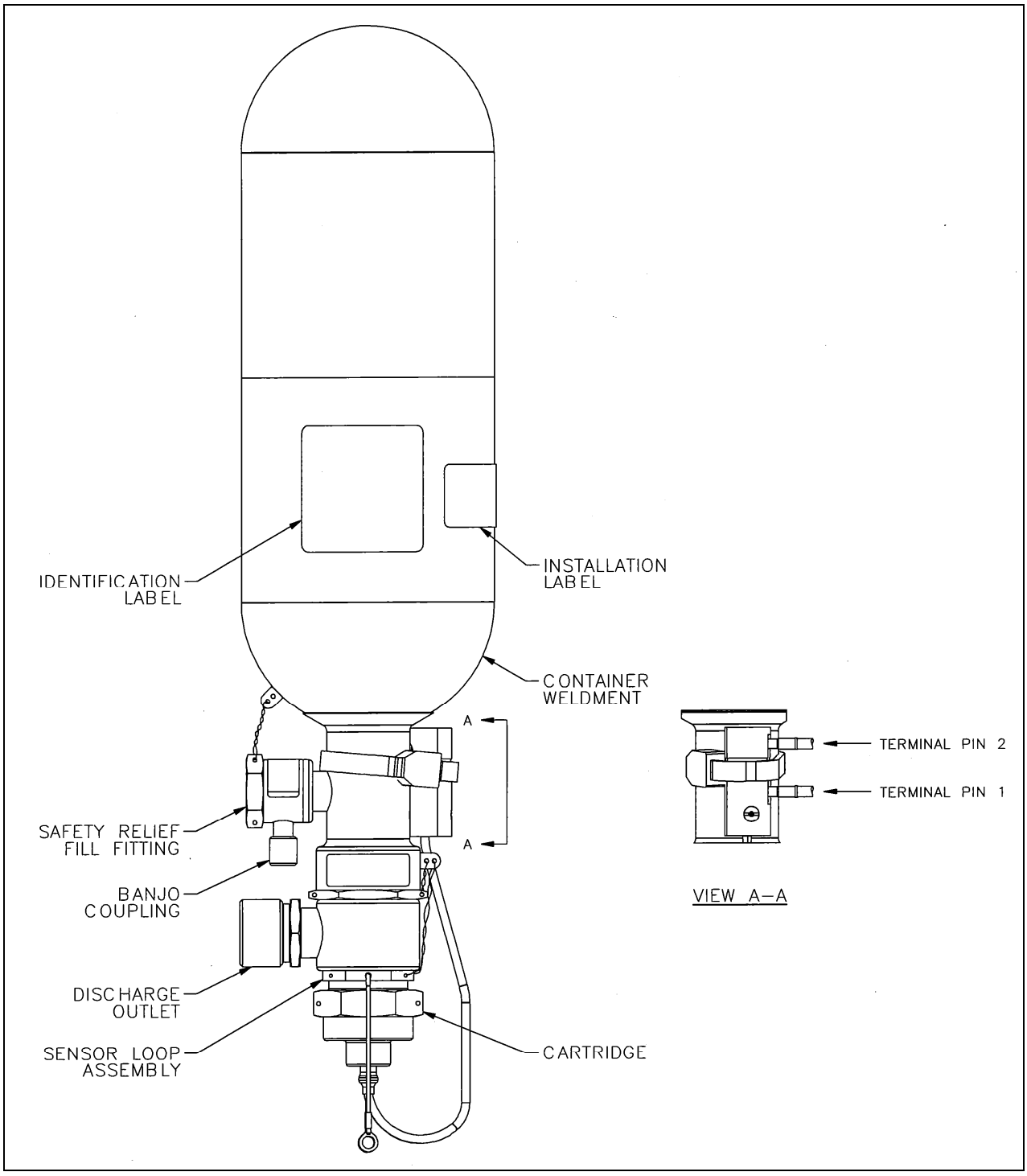
The cartridge after electrical activation produces a shock wave that fractures the sensor releasing the pressurized extinguishing agent. The pyrotechnic cartridge must be shunted during transportation and storage for safe handling.

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.

DISCHARGE OUTLET

The discharge outlet connects to the aircraft distribution network.



Primary Components
Figure 1

TECHNICAL PROPERTIES

Table 1

PROPERTY	SPECIFICATION
Description	
Part Number	M57333-012
Nomenclature	Fire Extinguisher. Single Outlet
Complies With	MIL-C-22284 and DOT-SP 10440-825
Functional Properties	
Internal Volume	110-cubic inches (1.803 liter)
Extinguishing Agent	Bromochlorodifluoromethane (CF_2ClBr) Halon 1211
Pressurizing Gas	Nitrogen (N_2)
Pressure Data At 70°F (21°C)	
Charge Pressure	360 + 10 - 0 psig (2482 to 2551 kPag)
Hydrostatic Test Pressure *	1650 psig (11376 kPag)
Burst Pressure	3000 psig (20684 kPag) minimum
Leakage Rate	1.0×10^{-4} scc/second maximum
Safety Relief pressure	1200 to 1600 psig (8274 to 11032 kPag)
Ambient Temperature Range	-65°F to +212°F (-54°C to +100°C)
Weight Data	
Empty Fire Extinguisher **	3.72 pounds (1,69 kg) maximum
Extinguishing Agent (full charge)	4.08 ± 0.07 pounds (1.85 ± 0,03 kg)
Nitrogen Charge	0.15 pound (0,75 kg)
Charged Fire Extinguisher **	7.95 pounds (3.61 kg) maximum
Allowable weight deviation – actual weight versus weight marked on identification plate	Minus 0.10 pound (0,05 kg)
Cartridge	0.23 pound (0,10 kg)
Charged Fire Extinguisher with Cartridge	8.18 pound (3,71 kg) nominal

* The fire extinguisher hydrostatic test interval is every 5 years. If 5 years have not elapsed, hydrostatic test can be waived Per CFR Title 49, section 180.205.

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

PROPERTY	SPECIFICATION
Cartridge Data, Single Bridgewire	
Voltage	16 to 30 VDC
Current Rating – All-Fire	3.5 Amps minimum for 50 milliseconds
No-Fire	1.0 Amps or 1.0 watt for 5 minutes
Test Current	50 milliamps maximum continuous
Bridgewire Resistance	0.9 to 1.4 Ohm
Electrical Connector	N/A
Maximum Life (from manufacture date)	10 years Total (Service and Storage)
Classification	1.4s, UN0323
Torque	90 to 100 inch-pounds (10,2 to 11,3 N·m)
Lockwire Size	0.025 inch (0,64 mm)
Banjo Coupling Data	
Port Thread Size	MS33514G4 (0.4375-20 UNJF-3A)
Rotatable 180 Degrees	Charged fire extinguisher
Discharge Outlet Data	
Port Thread Size	MS33514E12 (1.0625-12 UNJF-3A)
Rotatable 360 Degrees	Charged fire extinguisher
Lockwire Size	0.025 inch (0,64 mm)
Housing Mount Data	
Torque	10 to 15 foot-pounds (13,6 to 20,3 N·m)
Lockwire Size	0.025 inch (0,64 mm)
Housing Assembly Sensor Data	
Continuity Test	Continuity between the two terminal rings
Torque	150 to 170 inch-pounds (16,9 to 19,2 N·m)
Lockwire Size	0.025 inch (0,64 mm)
Safety Relief Fill Fitting Data	
Torque	15 to 20 foot-pounds (20,3 to 27,1 N·m)
Lockwire Size	0.025 inch (0,64 mm)
Safety Relief Fill Valve Data	
Torque	70 to 80 inch-pounds (7,9 to 9,0 N·m)
Sealing Screw Data	
Torque	50 to 60 inch-pounds (5,7 to 6,8 N·m)

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 weldment.

3. **HYDROSTATIC TESTING:** Periodic hydrostatic testing of the container weldment is required to comply with the U.S. Department of Transportation requirement section 180.205, contained in the Code of Federal Regulations Title 49. This required retest period for the AMETEK Ameron, LLC / MASS Systems, container weldment (design specification 4DS) is 5 years.

4. **WEIGHT CHECK PERIODS**

   Weight checks for this fire extinguisher may be performed at anytime in accordance with the aircraft maintenance manual.

CLASS 1.4s ACTUATING CARTRIDGE

1. The total life (storage and service) of the AMETEK Ameron, LLC / MASS Systems cartridge is ten-years.

2. Cartridge bridgewire checks may be performed at anytime in accordance with the aircraft maintenance manual.

SHIPMENT OF CHARGED FIRE EXTINGUISHERS

For any charged fire extinguisher being shipped the following rules must be complied with:

1. Cartridge must be shunted by attaching a conductive wire between the two posts of the terminal block.

2. Fire extinguishers 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 and Table 705.

3. The shipping container and the shipping document must be identified in accordance with DOT requirements and the UN1044 number must appear on the shipping container and the shipping document. The AMETEK Ameron, LLC / MASS Systems exemption number is stamped or engraved on the boss of the container weldment.

SHIPMENT OF CLASS 1.4s EXPLOSIVE CARTRIDGE

1. All cartridges must be shunted with a conductive wire between the two posts of the terminal block.

2. 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 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.

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	AMETEK Ameron, LLC / MASS Systems (0FRR4)
Ground Strap and Circuit Tester	WT 25	Walter G. Legge, Co. (84832)
Hydrostatic Test Setup	---	Retest facility DOT approved
Leak Detector, Halogen	HLD 5000	Inficon, Inc. (56507)
Leak Detection Solution	MIL-PRF-25567	Commercially available
Multimeter	8808A	Fluke Corp (89536)
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
Anti-Recoil Caps • Fill Port (Banjo) • Discharge Boss	 SU03400-4 SU03400-12	AMETEK Ameron, LLC / MASS Systems (0FRR4)
Safety Chamber, Cartridge	91035-1	AMETEK Ameron, LLC / MASS Systems (0FRR4)
Tape, Foam Backed, 1 inch (25,4 mm) square, 1.4 inch (6,35 mm) thick	---	The 3M Company (04963)

Test Equipment and Materials
Table 101 (con't)

NOMENCLATURE	PART OR SPECIFICATION NUMBER	SOURCE (CAGE)*
Thermometer/Thermocouple	54-2	Fluke Corp (89536)
Weighing Scale, 0 to 100 pounds (0 to 45 kg), ± 0.01 pound (0,005 kg)	3000E (Electronic)	Pennsylvania Scale Co. (03964)

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

LEAK TEST (METHOD-A)

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), outlet valve, 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 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 1.0 $x10^{-4}$ standard cubic centimeter per second.

6. Hold the leak detector probe and slowly move probe over the component joints. Replace leaking components if leakage exceeds the requirement, with exception of the note below.

   REQUIREMENT: 1.0 $x10^{-4}$ standard cubic centimeter per second

   NOTE: If leakage is found around the safety relief fill fitting (70) and banjo coupling (85) area a second leakage method is required: LEAK TEST (METHOD-B).

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

LEAK TEST (METHOD-B)

This additional leak test will be the final determination on whether the leakage requirement has been met for the specific location of the safety relief fill fitting (70) and banjo coupling (85) area of the fire extinguisher. This alternative leak test accounts for a possible false reading (erroneously showing leakage failure) during Method-A leak test due to Halon surface contamination within the banjo coupling area.

1. Place a cap over the banjo coupling (85) fitting.

2. If necessary, remove the torque decal (60) and unthread the sealing screw (65) from the safety relief fill fitting (70).

3. Level the open port of safety relief fill fitting (70) and fill exposed cavity with leak detection solution per MIL-PRF-25567 (Table 101).

4. Allow initial bubbles in leak detection solution to clear.

5. When solution has cleared, start a timer or stop watch to time any occurrence of a bubble that develops and breaks the top surface of leak detection solution.

6. If no bubble forms and release from the leak detection solution within 7 minutes then unit has passed this final leak test (one 0.079 in. OD bubble every 7 minutes is equivalent to 1.0×10^{-5} scc/sec which is less than 1.0×10^{-4} scc/sec leakage requirement).

7. If a bubble does form within 7 minutes, re-verify again to check if bubble rate is repeatable.

8. If bubble forms within 7 minutes the following torque adjustments can be made:

    a) If bubble originates from the center stem, re-torque the safety relief fill valve (95) clockwise to tighten until bubbles stop or at least decrease to a rate no more than 1 bubble in 7 minutes.
    b) If bubble originates from any of the 4 side holes, re-torque the safety relief fill fitting (70) clockwise to tighten until bubbles stop or at least decrease to a rate no more than 1 bubble in 7 minutes.
    c) After torque adjustments fail to decrease bubble rate to maximum rate of 1 bubble per 7 minutes than the fire bottle has failed leak check.

9. Replace any removed components, the sealing screw (65) and torque decal (60).

ACTUATING 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.

2. Wrap the ground strap around your wrist and connect the ground strap to the circuit tester. Test the ground circuit.

3. Verify the shunt device is installed on the cartridge.

   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 CARTRIDGE (EXCEPT WHEN SPECIFIED IN THE PROCEDURE). INADVERTENT DETONATION OF A CARTRIDGE MAY CAUSE INJURY.

4. Thread the cartridge, with the shunt device installed, into the cartridge safety chamber.

   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 INADVERTENT DETONATION OF THE CARTRIDGE MAY CAUSE INJURY.

5. Setup the digital multimeter in accordance with the manufacturer's instruction.

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 1001).

REQUIREMENT: Bridgewire resistance must be between 0.9 and 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 for suggested detonation procedure.

   B. After satisfactory completion of test, disconnect the multimeter and reinstall the shunt device on the cartridge.

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 can be reused or must be replaced.

HYDROSTATIC TESTING: Periodic hydrostatic testing of the container weldment is required to comply with the U.S. Department of Transportation requirement section 180.205, contained in the Code of Federal Regulations Title 49. The required retest period for the AMETEK Ameron, LLC / MASS Systems, container weldment (design specification 4DS) is 5-years.

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.

4. Disassemble the container weldment (135). Refer to the Disassembly section.

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 burettes to reference level.

9. Pressurize the container weldment (135) to the required hydrostatic test pressure of 1650 psig (11376 kPag) and maintain at this pressure for at least 30 seconds and sufficiently longer to ensure complete expansion.

10. After stabilization read the water level in the burette. This reading is the total expansion of the container weldment (135).

11. Depressurize the container weldment (135) and record water level in burette. This reading is the permanent expansion of the container weldment (135).

12. Calculate and record the permanent volumetric expansion as percentage of total expansion.

    Permanent volumetric expansion in cubic centimeters
    Percent (%) = X 100
    Total volumetric expansion in cubic centimeters

REQUIREMENT:	The permanent volumetric expansion must <u>not</u> 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 (135) if the container weldment 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).

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

16. Place the container weldment (135) in an oven or dryer heated at 212°F to 250°F (100°C to 121°C) 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.

DISASSEMBLY

GENERAL

Perform the Testing and Fault Isolation or the Check 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	AMETEK Ameron, LLC / MASS Systems (0FRR4)
Discharge Tool • Fill Tool • Fill Fitting	 51630-3 M13028	 AMETEK Ameron, LLC / MASS Systems (0FRR4)
Ground Strap and Circuit Tester	WT 25	Walter G. Legge, Co. (84832)
Anti-Recoil Caps • Fill Port (Banjo) • Discharge Boss	 SU03400-4 SU03400-12	AMETEK Ameron, LLC / MASS Systems (0FRR4)
Safety Bag, Black, Heat Sealable, Electrostatic (for cartridge)	---	Commercially available

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

IDENTIFICATION AND CAUTION 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 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 to install a new caution label (130).

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 ASSEMBLY (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 (70) facing up.

4. Remove the torque decal (60) and unthread the sealing screw (65) from the safety relief fill fitting (70).

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. Use appropriate o-ring on either side of fill fitting tool (M13028, Table 301) and insert into open port of safety relief fill fitting (70) – shorter side of fill fitting threads inside port.

6. Verify fill tool (Table 301) is in the disengaged position, allen-shaft of fill tool pulled out of the adapter body, and thread fill tool onto fill fitting (M13028, Table 301).

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 360 to 370 psig at ambient temperature (2,48 to 2,55 MN/m^2).

9. Carefully engage the fill tool (Table 301) by pushing the handle of allen-shaft into the safety relief fill fitting (70) and turning handle slowly until allen-shaft slips into hex broach of safety relief fill valve (95).

10. Turn handle of fill tool (Table 301) counter-clock-wise to open the fill valve (95) and discharge the extinguishing agent to zero pressure.

11. 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 VALVE, SAFETY RELIEF

Remove the safety relief fill valve (95) from the fill fitting boss on the container weldment (135). Remove and discard the washer seal (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).

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	AMETEK Ameron, LLC / MASS Systems (0FFR4)
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 A FILL FITTING RUPTURE 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.

CONTAINER WELDMENT

1. Clean the interior of the container weldment (135) as follows:

    a) Pour a small amount of detergent solution (Table 401) 1/4-to 1/2-cup into the container weldment (135).
    b) Shake the container weldment (135) in a circular motion, and drain into a disposal container.

2. Repeat step 1 using isopropyl alcohol (Table 401) until no further debris or contaminants 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).

3. Use a light probe; inspect the interior of the container weldment.

4. Glass bead hone the exterior of the container weldment, if necessary.

5. If necessary, glass bead hone the exterior of the container weldment (135) (wet or dry glass bead) as follows:
    a) 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).
    b) Remove the plugs and duct tape after glass bead hone.

6. 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.

7. Place the container weldment (135) in an oven or dryer heated at 212°F to 250°F (100°C to 121°C) for one hour or until completely dry and all traces of moisture are removed.

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	AMETEK Ameron, LLC / MASS Systems (0FFR4)
Ground Strap and Circuit Tester	WT 25	Walter G. Legge Co. (84832)
Light Probe	---	Commercially available
Power Supply, 28 VDC	---	Commercially available
Anti-Recoil Caps • Fill Port (Banjo) • Discharge Boss	 SU03400-4 SU03400-12	AMETEK Ameron, LLC / MASS Systems (0FRR4)
Safety Chamber, Cartridge	91035-1	AMETEK Ameron, LLC / MASS Systems (0FFR4)
Weighing Scale, 0 to 100 pounds (0 to 45 kg) ± 0.01 pound (0,005 kg)	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 the Technical Properties Table 1 for the charge weight.

2. Place a cradle 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 anti-recoil caps from the discharge outlet (25) and the banjo coupling (85).

4. Weigh the fire extinguisher. Record the weight to nearest 0.01pound (0,005 kg).

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.

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

6. Reinstall the anti-recoil 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 Repair section for recommended detonation procedure.

3. Inspect the cartridge (5) electrical connector pins for security and corrosion. If the terminal block posts are loose or corroded, reinstall the shunt device, if required, and dispose of the cartridge (5). Refer to the Repair section for recommended detonation procedure.

4. Verify the bridgewire check has been successfully completed. 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.

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	AMETEK Ameron, LLC MASS Systems (0FFR4)
Ground Strap and Circuit Tester	WT 25	Walter G. Legge Co. (84832)
Power Supply, 28-VDC	---	Commercially available
Anti-Recoil Caps • Fill Port (Banjo) • Discharge Boss	 SU03400-4 SU03400-12	AMETEK Ameron, LLC / MASS Systems (0FRR4)
Safety Chamber, Cartridge	91035-1	AMETEK Ameron, LLC MASS Systems (0FFR4)

* 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 or Test requirements or are damaged beyond minor repair.

WELD REPAIRS

1. Repairs that require welding, except those covered in the Assembly section of this manual, are not permitted unless authorized in writing by AMETEK Ameron LLC / MASS Systems.

2. After AMETEK Ameron LLC / MASS Systems 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.

CARTRIDGE DISPOSAL

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. THE CARTRIDGE MUST BE DETONATED IN A SAFETY FIXTURE THAT PROTECTS PERSONNEL FROM SERIOUS INJURY.

1. Make sure the shunt device is installed on the cartridge for safe handling.

2. Obtain cartridge safety cap from:
   AMETEK Ameron, LLC / AGPS
   4750 Littlejohn Street
   Baldwin Park, California 91706, U.S.A
   (626) 856-0101

3. Wrap the ground strap around your wrist and connect the ground strap to the circuit tester. 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.

4. Inspect the cartridge safety cap for steel wool, if applicable, and make sure relief holes are covered with the steel wool (refer to Figure 601 and Table 601).

NOTE: If steel wool is not present, return the safety cap.

5. Thread the cartridge safety cap onto the cartridge.

6. Remove cartridge shunt at the terminal block.

7. Check cartridge bridgewire at the terminal block.

8. Firmly secure cartridge with cartridge safety cap on a vice to prevent cartridge projection during firing. Cartridge with cartridge safety cap should be secured on vice vertically and from opposite end of vent holes.

NOTE: Ensure that cartridge safety cap relief holes are not blocked by vice!

9. Refer to IPL for cartridge firing pins which are at the terminal block and connect cartridge to the power supply.

NOTE: Use of battery as power supply is not recommended.

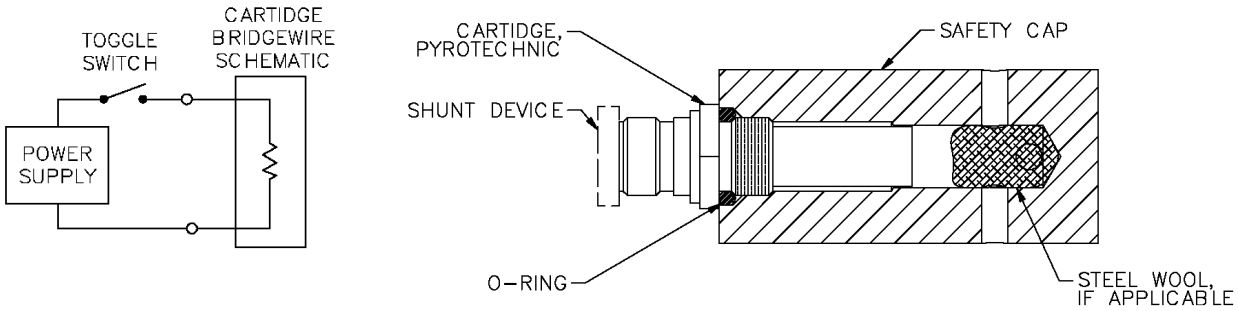
10. It is highly recommended that earplugs be worn.

11. Stand back ten feet (3 meters) minimum behind a shielding wall and apply 28-VDC and 3.5 Amperes MINIMUM at the terminal block to detonate the cartridge.

12. Confirm cartridge was fired by checking continuity at the terminal block. Bridgewire pins should give an “open” reading.

13. Discard cartridge and safety cap in accordance with approved procedure.

NOTE: Cartridge safety caps are good for a one-time detonation only.



Cartridge Disposal Setup
Figure 601

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
Charge Tool • Fill Tool • Fill Fitting	 51630-3 M13028	AMETEK Ameron, LLC MASS Systems (0FFR4)|
Cradle	91033-60	AMETEK Ameron, LLC MASS Systems (0FFR4)|
Extinguishing Agent	Bromochlorodifluoro-methane (CF_2ClBr) Halon 1211	Commercially available
Ground Strap and Circuit Tester	WT 25	Walter G.Legge Co. (84832)
Leak Detector, Halogen	HLD 5000	Inficon, Inc. (56507)
Leak Detection Solution	MIL-PRF-25567	Commercially available
Lubricant (O-ring)	DC 55	Dow Corning Co. (71984)
Lubricant (Thread)	SAF-T-EZE(C)	SAF-T-LOK Chemical Corp. (4Z400)
Nitrogen Gas (GN_2)	2000-psig (13790 kPag)	Commercially available
Anti-Recoil Caps • Fill Port (Banjo) • Discharge Boss	 SU03400-4 SU03400-12	AMETEK Ameron, LLC / MASS Systems (0FRR4)
Recharge Stand	91026-1	AMETEK Ameron, LLC MASS Systems (0FFR4)|
Safety Wire	MS20995C25	Commercially available

Assembly Tools and Materials
Table 701 (con't)

NOMENCLATURE	PART OR SPECIFICATION NUMBER	SOURCE (CAGE)*
Tape, Foam Backed, 1 inch (25,4 mm) square, 1/4 inch (6,35 mm) thick	---	The 3M Company (04963)
Thermometer/Thermocouple	54-2	Fluke Corp (89536)
Weighing Scale, 0 to 100 pounds (0 to 45 kg) ± 0.01 pound (0,005 kg)	3000E (Electronic)	Pennsylvania Scale Co. (03964)

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

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. Apply lubricant (Table 701) on o-ring (90). Apply lubricant (Table 701) on the fill boss of the container weldment (135). Install the o-ring (90) on the fill boss of the container weldment (135).

2. Using an appropriate o-ring insertion tool, 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. Apply lubricant (Table 701) on washer seal (100) and install on the safety relief fill valve (95). Thread the safety relief fill valve (95) into the safety relief fill fitting (70) leaving about 0.125 in. gap opening between the safety relief fill fitting (70) and safety relief fill valve (95) for charging the fire extinguisher.

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. After fire extinguisher recharging, thread the sealing screw (65) into the safety relief fill fitting (70). Torque sealing screw (65) 50 to 60 inch-pounds (5,6 to 6,8 N·m) (Table 801).

7. Install torque decal (60) over sealing screw (65).

IDENTIFICATION AND INSTRUCTION PLATES

1. If required, install the inspection and installation labels (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).

2. After Fire extinguisher recharge is complete attach new tags or plates showing recharged agent weight and total weights.

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. Use appropriate o-ring on either side of fill fitting tool (M13028, Table 701) and insert into open port of safety relief fill fitting (70) – shorter side of fill fitting threads inside port.

4. Verify fill tool (Table 301) is in the disengaged position, allen-shaft of fill tool pulled out of the adapter body, and thread fill tool onto fill fitting (M13028, Table 701).

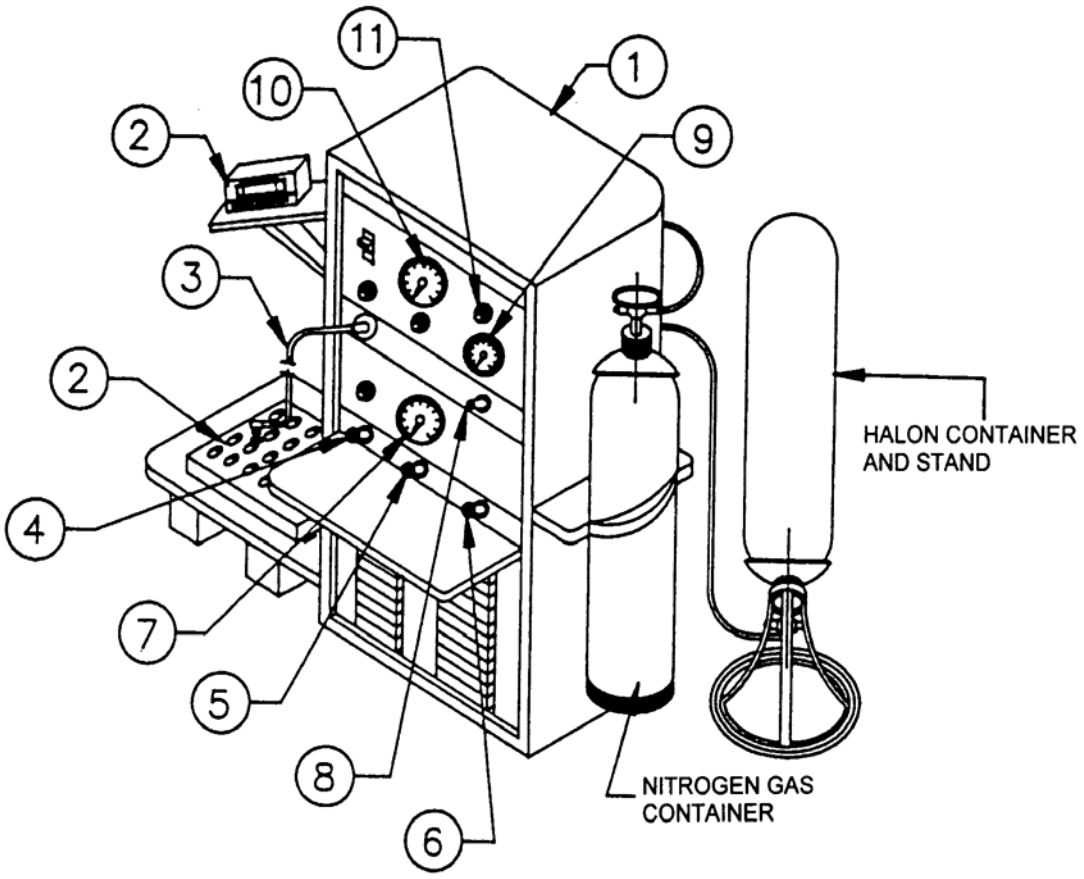
5. Install the fire extinguisher on the electronic scale (Table 701) with the cradle (Table 701) and attach the flexible hose from the recharge stand (Table 701) to the shut off valve on the charging fixture. Zero the tare reading on the electronic scale.

6. Adjust the air pressure valve to the pump inlet 50 to 60 psig (345 to 414 kPag).

7. 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 4.01 to 4.15 pounds (1,82 to 1,88 kg) extinguishing agent weight plus approximately 0.1 pound (0,05 kg) to allow for extinguishing agent trapped in the flexible hose.

8. Shut off the charging valve of the recharge stand (Table 701). Vent the flexible hose and disconnect.

9. Weigh the fire extinguisher and enter weight on the fill chart. Verify the extinguishing agent weight, Line 4 on the fill chart.



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

Recharge Setup
Figure 701

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(s) [Y] [N] With Outlet(s) [Y] [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 – Charged Fire Extinguisher Line 3 minus Line 2	_____	Pounds (kgs)
5.	Nitrogen Gas Charge Pressure Reference Table 704	_____ _____	Psig (kPag) °F (C°)
6.	Final Charged Weight of Fire Extinguisher	_____	Pounds (kgs)

10. 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.

11. Open the valve on the Nitrogen gas cylinder (Table 701) and set the regulator to 850 psig maximum (5861 kPag).

12. Open the Nitrogen gas valve to read at least 360 to 370 psig (2482 to 2551 kPag) 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 or Table 704 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, hold the fire extinguisher with the pressure gauge (if applicable) facing away from all personnel.

13. Open and close the Nitrogen gas valve until the charge pressure gauge reads the required charge pressure after the fire extinguisher has been agitated.

14. Carefully engage the fill tool (Table 701) by pushing the handle of allen-shaft into the safety relief fill fitting (70) and turning handle slowly until allen-shaft slips into hex broach of safety relief fill valve (95).

15. Turn handle of fill tool (Table 301) clock-wise to close the fill valve (95). Torque safety relief fill valve (95) 70 to 80 inch-pounds (7,9 to 9,0 N·m) (Table 801).

16. Perform bubble leak check per Leak Test (METHOD-B) in Testing and Fault Isolation section.

17. Complete Assembly per Safety Relief Components in Assembly (including Storage) section.

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

19. 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 RECHARGE LEAK CHECK

Using the leak detector (Table 701), set the sensitivity to 1.0×10^{-4} standard cubic centimeter per second and using the probe, leak check the outlet manifold valve body and components.

REQUIREMENT: 1.0×10^{-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.

The Nitrogen gas charge pressure for the actual temperature of the fire extinguisher is listed in Table 703 and Table 704.

Nitrogen Gas Charge Pressure
Table 703

TEMP	PRESSURE - PSIG	
°F	MIN	MAX
60	348	358
61	349	359
62	350	360
63	351	361
64	352	362
65	354	364
66	355	365
67	356	366
68	357	367
69	359	369
70	360	370
71	361	371
72	363	373
73	364	374
74	365	375
75	367	377
76	368	378
77	369	379
78	371	381
79	372	382

TEMP	PRESSURE - PSIG	
°F	MIN	MAX
80	373	383
81	375	385
82	376	386
83	377	387
84	379	389
85	380	390
86	382	392
87	383	393
88	385	395
89	386	396
90	388	398
91	390	400
92	391	401
93	393	403
94	394	404
95	396	406
96	398	408
97	399	409
98	401	411
99	402	412
100	404	414

Nitrogen Gas Charge Pressure (Metric)
Table 704

TEMP	PRESSURE - KPAG	
°C	MIN	MAX
15.6	2399	2468
16.1	2406	2475
16.7	2413	2482
17.2	2420	2489
17.8	2427	2496
18.3	2441	2510
18.9	2448	2517
19.4	2455	2523
20.0	2461	2530
20.6	2475	2544
21.1	2482	2551
21.7	2489	2558
22.2	2503	2572
22.8	2510	2579
23.3	2517	2586
23.9	2530	2599
24.4	2537	2606
25.0	2544	2613
25.6	2558	2627
26.1	2565	2634

TEMP	PRESSURE - KPAG	
°C	MIN	MAX
26.7	2572	2641
27.2	2586	2654
27.8	2592	2661
28.3	2599	2668
28.9	2613	2682
29.4	2620	2689
30.0	2634	2703
30.6	2641	2710
31.1	2654	2723
31.7	2661	2730
32.2	2675	2744
32.8	2689	2758
33.3	2696	2765
33.9	2710	2779
34.4	2717	2785
35.0	2730	2799
35.6	2744	2813
36.1	2751	2820
36.7	2765	2834
37.2	2772	2841
37.8	2785	2854

STORAGE INSTRUCTIONS

The recommended storage materials are given in Table 705. Equivalent items may be used.

Storage Materials
Table 705

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

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

FIRE EXTINGUISHER

1. Install the ati-recoil caps on all threaded ports, the electrical connectors, 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-SP 10440
   f. Fire extinguisher
   g. UN1044
   h. Class 2.2
   i. Bromotrifluoromethane
   j. Net weight of extinguishing agent

4. The storage temperature is +40ºF to +100ºF (+4ºC to +38ºC).

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 705).
3. Seal and identify the special cardboard carton. Mark the part number, Service Date, expiration date, and the pyrotechnic classification UN0323, 1.4s on the special cardboard carton.
4. The storage temperature is +40ºF to +100ºF (+4ºC to +38ºC).

FITS AND CLEARANCES

TORQUE LIMITS

Torque limits for the fire extinguishers are listed in Table 801.

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)
Safety Relief Fill Valve (95)	70 to 80 inch-pounds (7,9 to 9,0 N·m)

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	AMETEK Ameron, LLC d/b/a MASS Systems (0FRR4)
Detergent Solution	---	Commercially available
Discharge/Charge Tool • Fill Tool • Fill Fitting	 51630-3 M13028	 AMETEK Ameron, LLC d/b/a MASS Systems (0FRR4)
Extinguishing Agent	Bromochlorodifluoro-methane (CF_2ClBr) Halon 1211	Commercially available
Ground Strap and Circuit Tester	WT 25	Walter G. Legge, Co. (84832)
Hydrostatic Test Cap	TL02002-1	AMETEK Ameron, LLC d/b/a MASS Systems (0FRR4)
Hydrostatic Test Setup	---	DOT approved hydrostatic test facility
Leak Detector, Halogen	HLD 5000	Inficon, Inc. (56507)
Leak Detection Solution	MIL-PRF-25567	Commercially available
Lubricant (O-ring)	DC 55	Dow Corning Co. (71984)
Lubricant (Thread)	SAF-T-EZE(C)	SAF-T-LOK Chemical Corp. (4Z400)

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

NOMENCLATURE	PART OR SPECIFICATION NUMBER	SOURCE (CAGE)*
Multimeter	8808A	Fluke Corp. (0GVY8)
Nitrogen Gas (GN_2)	2000 psig (13790 kPag)	Commercially available
Oven or Heater, 250°F (121°C)	---	Commercially available
Power Supply, 28 VDC	---	Commercially available
Anti-Recoil Caps • Fill Port (Banjo) • Discharge Boss	 SU03400-4 SU03400-12	AMETEK Ameron, LLC d/b/a MASS Systems (0FRR4)
Recharge Stand	91026-1	AMETEK Ameron, LLC d/b/a MASS Systems (0FRR4)
Safety Bag, Black, Heat Sealable, Electrostatic (for cartridge)	---	Commercially available
Safety Chamber, Cartridge	91035-1	AMETEK Ameron, LLC d/b/a MASS Systems (0FRR4)
Safety Wire	0.025-inch (0,64 mm)	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	54-2	Fluke Corp (89536)
Weighing Scale, 0 to 100 pounds (0 to 45 kg), ± 0.01 pound (0,005 kg)	3000E (Electronic)	Pennsylvania Scale Co. (03964)

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

ILLUSTRATED PARTS LIST

INTRODUCTION

1. Purpose

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

2. Manufacturer Name and Address

CAGE CODE	NAME AND ADDRESS	TELEPHONE FAX
0FRR4	AMETEK Ameron, LLC d/b/a MASS Systems 4750 Littlejohn Street Baldwin Park, California 91706-2285 U.S.A.	626-337-4640 FAX 626-337-1641
03964	Pennsylvania Scale Company 1042 New Holland Ave. Lancaster, Pennsylvania 17601-5606 U.S.A.	800-233-0473 FAX 800-768-6350
03990	Ingersoll-Rand Company ARO Fluid Products 1 ARO Center P. O. Box 151 Bryan, Ohio 43506-1100 U.S.A.	202-256-1789 419-633-1674
04963	The 3M Company Adhesives Coatings and Sealers Division 3M Center St. Paul, Minnesota 55144-1000 U.S.A.	651-733-1110 FAX 888-427-0511
4Z400	SAF-T-LOK Chemical Corp. 300 Eisenhower Lane North Lombard, Illinois 60148-5405 U.S.A.	630-495-2001 FAX 630-495-8813
56242	ARCO – Atlantic Richfield Company 4 Centerpointe Dr. La Palma, California 90623-1028 U.S.A.	310-549-6204 FAX 213-486-2476
56507	Inficon, Inc. 2 Technology Place East Syracuse, New York 13057-9707 U.S.A.	949-261-2956 FAX 949-261-2959

CAGE CODE	NAME AND ADDRESS	TELEPHONE FAX
71984	Dow Corning Corporation 2200 West Salzburg Road Midland, Michigan 48640-8531 U.S.A.	800-248-2481 FAX 989-496-6731
84832	Walter G. Legge Company, Inc. 444 Central Avenue Peekskill, New York 10566-2033 U.S.A.	914-737-5004 FAX 914-737-2636
89536	Fluke Corporation 6920 Seaway Boulevard Everett, Washington 98203-5829 U.S.A.	800-903-5853 FAX 425-446-5716
99017	Caplugs LLC 2150 Elmwood Ave Buffalo, New York 14207-7198 U.S.A.	716-876-9855 FAX 716-874-1680

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.

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 AMETEK Ameron, LLC d/b/a MASS Systems), part number (if longer then 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 t o 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

TERM	ABBREVIATION	DEFINITION
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.

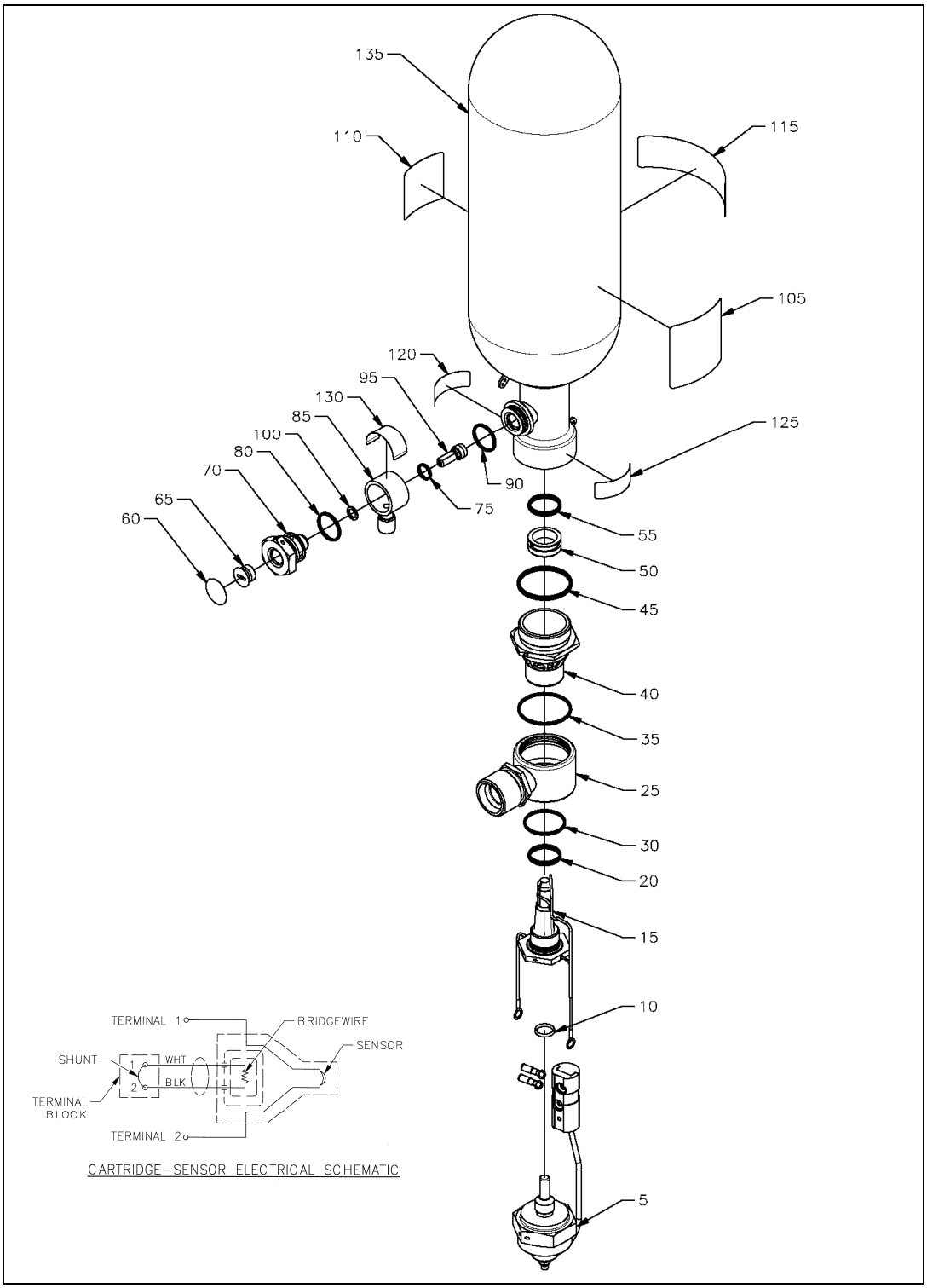
EFF CODE Column

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.

ILLUSTRATED PARTS LIST



Fire Extinguisher Exploded View
IPL Figure 1001

ILLUSTRATED PARTS LIST

Fire Extinguisher P/N M57333-012
IPL Table 1002

FIG. ITEM NO.	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1 2 3 4 5 6 7	EFF	UNITS PER ASSY
1 –1	M57333-012		FIRE EXTINGUISHER, 110-CUBIC INCH		RF
5	CT02300-1		. CARTRIDGE		1
10	NAS1611-013		. . O-RING (SCD SU01250-13) (NHA ITEM 5)		1
-12	24626-1		. . TAG, CAUTION		1
15	FX00325-1		. HOUSING ASSEMBLY, SENSOR		1
20	NAS1611-115		. O-RING (SCD SU01250-115)		1
25	FX00330-1		. OUTLET, DISCHARGE		1
30	NAS1611-022		. O-RING (SCD SU01250-22)		1
35	NAS1611-027		. O-RING (SCD SU01250-27)		1
40	FX00317-2		. MOUNT, HOUSING		1
45	NAS1611-125		. O-RING (SCD SU01250-125)		1
50	FX00332-1		. PLUG, CLOSURE		1
55	AS568A-115		. O-RING (SCD SU01256-115)		1
60	FX00321-1		. DECAL, TORQUE		1
65	FX00313-2		. SCREW, SEALING		1
70	FX00306-2		. FILL FITTING, SAFETY RELIEF		1
75	AS568A-012		. O-RING (SCD SU01256-12)		1
80	NAS1611-016		. O-RING (SCD SU01250-16)		1
85	FX00315-2		. COUPLING, BANJO		1
90	NAS1611-016		. O-RING (SCD SU01250-16)		1
95	FX00310-2		. FILL VALVE, SAFETY RELIEF		1
100	FX00328-1		. SEAL		1
105	FX00318-1		. LABEL, IDENTIFICATION		1
110	FX00322-1		. PLATE, INSPECTION		1
115	FX00319-1		. LABEL, INSTALLATION		1
120	FX00324-1		. LABEL, CAUTION		1
125	FX00326-1		. LABEL, CARTRIDGE REMOVAL		1
130	FX00324-1		. LABEL, CAUTION		1
135	FX00305-2		. WELDMENT, CONTAINER		1
-140	SU04000-1		. CABLE TIE		1

- Item not illustrated