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HAND PORTABLE
AIRCRAFT FIRE EXTINGUISHERS

3.75 lb. Halotron BrX Part No. 375H673
3.75 lb. Halotron BrX Part No. 375N69953

COMPONENT MAINTENANCE MANUAL
WITH
ILLUSTRATED PARTS LIST

RECORD OF REVISIONS

Keep this page in the front of the manual. When you get a revision, put the revised pages in the manual, and record the revision number, the dates, and your initials in the areas below.

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1) INSTRUCTION

- a) The CMM gives all the procedures from the manufacturer for the use, repair, and complete overhaul of the component
- b) The manual gives all the procedures necessary to let a person do tests, disassemble, clean, check and assemble a unit which has been rejected from serviceable use
- c) Only approved personnel can perform maintenance on the component.
- d) This manual contains:
 - Technical data
 - Maintenance and repair procedures
 - Illustrated Parts Lists (IPL)

2) REFERENCES IN THIS MANUAL

- a) **NFPA-10** Portable Fire Extinguishers
- b) **CGA C-1** Methods for Hydrostatic Testing of Compressed Gas Cylinders
- c) **CGA C-6** Standard for Visual Inspection of Compressed Gas Cylinders
- d) http://www.halotron.com/brx_technical_info.php

3) DESCRIPTION

- a) Part numbers 375H673 & 375N69953 are portable handheld Halotron BrX fire extinguishers, for use in aircraft occupied spaces. Part number BR325 is the bracket intended for use with these extinguishers when installed in aircraft. The brackets are not supplied with the fire extinguishers and must be ordered separately.
- b) The fire extinguishers consist of an aluminum pressure vessel, a pressure gauge, and a machined aluminum valve assembly with a chrome steel handle. The extinguishers are fitted with a discharge hose assembly or a discharge nozzle. A pull-out pin and nylon tamper seal are fitted to the valve handle to prevent the fire extinguisher from being operated accidentally.
- c) The extinguisher cylinders are filled with a liquid fire-extinguishing agent, Halotron BrX (2-bromo-3,3,3-trifluoro-1-propene [$\text{CF}_3\text{CBr} = \text{CH}_2$ (stabilized with proprietary additives)]), pressurized with nitrogen (N_2). A valve assembly is attached to the cylinder neck, and a pressure gauge is attached to the valve body and continuously monitors the pressure inside the cylinder. The valve body provides a method to connect a recharge line to the fire extinguisher as well as to discharge the extinguishing agent. The hose assembly or nozzle, as applicable, are attached to the valve body.
- d) The pressurized extinguishing agent is held inside the cylinder by the valve assembly until the lever is manually operated. When the valve is activated by removing the tamper seal and the ring pin and squeezing the lever, the valve stem assembly inside the valve is pushed down and the nitrogen forces the extinguishing agent up the siphon tube, around the stem assembly, through the valve assembly and out the hose or nozzle.

4) OPERATING INSTRUCTIONS

NOTE: The following instructions are general in nature and meant to familiarize the user with the basic operating techniques. The extinguisher nameplate must be consulted for specific procedures and starting distances.

- a) To operate, hold the extinguisher upright and pull on the ring pin (item 5) to break the nylon tamper seal (item 7). Ensure the ring pin is completely disengaged from the valve handle.
- b) Stand back a minimum of 8 feet from the fire and aim the discharge hose or nozzle at the base of the fire nearest you.
- c) Hold and keep the extinguisher upright and firmly squeeze the handles together to discharge the extinguishing agent. Spray the agent using a sweeping side to side motion aimed at the near base of the fire. Move closer as the fire is extinguished, but not so close as to scatter the burning material or liquid.
- d) After the fire is out, step back and watch for possible re-ignition.
- e) Evacuate and ventilate the area to the extent possible immediately after use. The fumes and smoke from any fire may be hazardous and can be deadly.
- f) Service the extinguisher immediately after use, regardless of the amount of extinguishing agent used.

NOTE: Whenever possible, protective clothing and breathing equipment should be used when fighting a fire.

At all times, care should be taken not to damage the operating labels installed on the extinguishers. These labels are serialized UL listed products that are not procurable as replacement parts. If the labels are damaged to the extent that they become illegible, the extinguisher must be removed from service.

5) SPECIFIED DATA

Bracket Part No.	BR375
Agent Capacity	3.75 lb (1.7 kg)
Charged Weight	6 lb (2.72 kg)
Discharged Time	9 seconds
Listings/Approvals	UL/ULC/FAA/USCG
UL/ULC Rating	5B:C
Dimensions	<div>Height 17.59 in. (446.9 mm)</div> <div>Width 6.5 in. (165.1 mm)</div> <div>Depth 3.25 in. (82.6 mm)</div>
Extinguishing Agent	2-bromo-3,3,3-trifluoro-1-propene (Halotron BrX)
Operating Pressure	100 psi (689.5 kPa)
Temperature Range	-40°F to +120°F / -40°C to +49°C
Cylinder Material	Aluminum
Cylinder Finish	Red Polyester Powder Paint
Valve Construction	Machined Anodized Aluminum

6) INSPECTION & MAINTENANCE

- a) The extinguisher maintenance schedule shall be based on the manufacturing date specified on the nameplate.
- b) The extinguisher maintenance schedule shall be based on the original manufacturing date or if applicable, the date the last 6 year or 12 year maintenance was performed (see below). If the last maintenance was correctly performed, the date of the last maintenance and the type of maintenance that was carried out should be indicated on a label affixed to the extinguisher (see below). In the event there is no label indicating the date the last maintenance was carried out and the type of maintenance that was performed, the owner of the extinguisher should conclude that the maintenance was either not performed or not properly performed.
- c) Monthly Inspection: Perform a visual inspection when the extinguisher is initially placed in service, and at monthly intervals thereafter (or more frequent if circumstances dictate) to ensure that the unit is in good operating condition and ready for use. This maintenance must be recorded, including the date of the inspection and the identity of the person performing the inspection. Inspection records shall be kept on a tag or label attached to the extinguisher, on an inspection checklist maintained on file, or by an electronic method that provides a permanent record. This inspection shall include:
 - 1. Check last service date to determine need for inspection or maintenance.
 - 2. Visually examine the cylinder for damage, dents, bulges, scratches, gouges, nicks, excessive corrosion, or evidence of repairs by soldering, welding, brazing or use of patching compounds. Cylinders that have bulges, dents, pitting or line corrosion, large amounts of general corrosion, evidence of fire damage or unauthorized repairs, or loss of wall thickness due to scratches, gouges, cuts, digs or nicks must be removed from service and forwarded to a service facility for maintenance or proper disposal.
 - 3. Examine the valve for loose or damaged components. Repair or replace missing, loose, or damaged components, as necessary.

4. Visually examine the valve assembly for cracks or other damage. Extinguishers with damaged valves must be removed from service and repaired.
5. Verify valve to ensure all seals are intact, and that the ring pin is present and properly fitted. Replace or reattach as required
6. Verify fullness by weighing or “hefting”.
7. Visually examine the pressure gauge for damage and verify that the pressure indicated is within operational limits. Replace damaged gauge or repair and recharge extinguisher, as applicable.

NOTE: Temperature variations may affect gauge readings. The gauge dial has been calibrated to reflect the tested extinguisher temperature extremes (-40 °F to +120 °F / -40 ° to +49 °C). When in doubt about a gauge reading, place the extinguisher at room temperature (70 °F /21 °C) for several hours to obtain a true reading.

8. Visually examine the hose or nozzle (as applicable) for damage or blockage. Clean or replace a blocked or damaged hose or nozzle as required.
9. Ensure the operating instruction label is intact, legible, and facing outward when the extinguisher is installed in the bracket.

d) Annual Inspection: Once a year, the extinguisher must be subject to the following maintenance/service procedure.

1. Remove the extinguisher from its bracket.
2. Clean the extinguisher to remove dirt, grease, or foreign material. Check to ensure that the nameplate is securely fastened and fully legible. Inspect the cylinder for corrosion, abrasion, dents, or weld damage. If any of these conditions are found or there is any doubt about the integrity of the cylinder,

remove the unit from service and have it hydrostatically tested to the specified test pressure, using the proof pressure method specified in CGA-6 and NFPA 10.

NOTE: When cleaning, avoid the use of solvents around the pressure gauge. They could seriously damage the plastic gauge face.

3. Weigh the extinguisher using calibrated high-resolution scales to ensure the actual weight of the extinguisher (less bracket) is not below the minimum allowable weight specified on the instruction label. After the extinguisher is weighed, record the date the unit was weighed and the actual weight on a locally approved label or tag attached to the cylinder. Underweight units must be removed from service for repair and recharge.

NOTE: The only valid minimum allowable weight is the weight that is specified on the operating label affixed to the unit at the time of manufacture. Changes in the materials used for the manufacture of this extinguisher may result in changes to the empty weight of the extinguisher, which in turn may cause changes to the minimum allowable full weight. Only the minimum allowable weight specified on the original operating label correctly reflects the minimum weight requirements for a particular extinguisher.

If the weight is determined to be outside the allowable tolerance specified on the nameplate, remove the extinguisher from service and forward to a repair facility for maintenance.

4. Visually inspect the extinguisher for damaged, missing, or incorrect parts. Only replacement parts approved by the manufacturer are approved for use on these extinguishers
5. Remove and check the ring pin (item 5) for freedom of movement, replace if bent or removal appears difficult.
6. Visually inspect the pressure gauge. Remove the extinguisher from service and send to an approved facility for maintenance if:
 - i. If the gauge is bent, damaged or the incorrect gauge (item 10);
 - ii. If the pressure is found to be low, and temperature/pressure relationship has been ruled out;

- iii. If the pressure is found to be high, and temperature/pressure relationship has been ruled out.
 - 7. Inspect the push lever for any dirt or corrosion that could impair freedom of movement. Inspect carrying handle for proper installation. If lever, handle, or rivets are damaged or distorted, they must be replaced.
 - 8. Disassemble the hose assembly (item 2) or nozzle (item 3) from the valve body by turning them counterclockwise and inspect for damage or obstruction. Inspect the hose O-ring (item 4) for damage. Replace damaged parts as required.
 - 9. Inspect the valve assembly for corrosion or damage to the hose thread connection. Extinguishers with damaged or corroded valves must be removed from service and sent for maintenance.
 - 10. Re-install the hose assembly (item 2) or nozzle (item 3) (see assembly), the ring pin (item 5) and a new tamper seal (item 7).
 - 11. Replace extinguisher in its bracket.
- e) Six Year Maintenance: Every six years, the extinguisher must be removed from service, emptied and subject to the six-year maintenance requirements specified in NFPA-10. The six-year maintenance shall be carried out in accordance with this manual and must include all items specified above for the annual inspection in addition to the following:
- 1. Expelling of the extinguishing agent into a closed recovery system and disassembly of the extinguisher (refer to Disassembly below).
 - 2. Inspection of all mechanical parts to ensure they are functional.
 - 3. Internal inspection of the cylinder for corrosion.
 - 4. Replacement of valve stem assembly (item 14) and collar O-ring (item 13)
 - 5. Recharging with correct amount and type of extinguishing agent.
 - 6. Affixing a locally approved label to the extinguisher indicating the type of maintenance that was carried out (i.e. 6 or 12 year), the date of maintenance, as well as the name and location of the repair facility that performed the maintenance.

- f) 12 Year Hydrostatic Test: Every twelve years the extinguisher must be removed from service for hydrostatic (proof pressure) testing and requalification of the cylinder. The six-year maintenance described above must also be performed at this time. The equipment and procedures used for hydrostatic testing shall be in accordance with the requirements for proof pressure testing specified in CGA Pamphlet C-1.

NOTE: Hydrostatic testing and maintenance shall only be performed by trained and appropriately authorized personnel familiar with the required procedures and safeguards, and who have suitable testing equipment, facilities, and regulatory approvals to carry out the work reliably and legitimately.

- g) Service Life: The extinguisher may remain in service indefinitely provided the required maintenance requirements are complied with and completed successfully.

7) DISASSEMBLY

- a) Empty the extinguisher in accordance with the procedure specified below.

NOTE: The Halotron BrX® clean agent is comprised of 2-bromo-3,3,3-trifluoropropene (also known as BTP, 2- BTP, or HBFO-1233xfB) with proprietary stabilizers. Without the stabilizers, small amounts of air and moisture contamination typically found in extinguishers will result in undesirable excess acidity which may cause cylinder corrosion and degradation of elastomers. Each new handling cycle of the same material may lead to additional air and moisture contamination; therefore, the number of handling operations should be limited to only what is necessary. The stabilized agent has a 12-year shelf life after it is transferred into an extinguisher. Failure to fill the extinguisher with new or re-certified material at the 12-year teardown (proscribed by NFPA 10) may lead to corrosion of the extinguisher cylinder and degradation of the elastomers.

WARNING: Before attempting to remove the valve from the extinguisher, ensure that the extinguisher is completely depressurized. Never have any part of your body over the extinguisher while removing the valve assembly.

- b) Refer to the illustrated parts list and figure (Figure 1. And Table 1) when servicing these extinguishers
- c) Complete the steps specified above for annual inspection.
- d) Remove the hose assembly (Item 2) or nozzle (Item 3) and O-ring (Item 4) from the valve and attach an appropriate recharge adaptor to the extinguisher operating valve and empty the extinguisher of all pressure and Halotron BrX (2-BTP) using an approved recovery/recharge system. Recharge adaptors and recovery/recharge systems are commercially available.
- e) When the extinguisher is completely empty of all agent and pressure, remove the valve assembly (item 1) from the cylinder by turning counterclockwise.
- f) Remove collar O-ring (Item 12) and inspect for damage. Replace if necessary. Ensure the interior of the cylinder is dry and plug or cover the cylinder opening in order prevent moisture from entering the cylinder. If moisture is detected inside the cylinder, dry well with warm air prior to covering the opening.

NOTE: Inspect the interior cylinder following CGA Visual Inspection Standard, C-6.

- g) Unscrew the downtube/retainer assembly (item 15) from the valve body by turning it counterclockwise. Inspect spring (Item 14) and downtube/retainer assembly (Item 15) for any pitting or corrosion.
- h) Remove valve stem assembly (item 13) from valve body (item 1). Make sure that the valve stem seating area is not scratched. Discard the used valve stem assembly (item 13).
- i) Do not remove the nameplate labels from the extinguisher. These are serialized ULC listed products that are not procurable as replacement parts. Only the extinguisher manufacturer is authorized to install these labels.

8) REPAIR & CLEANING

- a) Repair of the detail parts of the fire extinguisher is not permitted. Repairs are limited to replacing defective items.
- b) Thoroughly clean all parts of the disassembled valve with a soft bristle brush or soft cloth. Blow the valve out with dry nitrogen.
- c) Clean the collar O-ring seating groove in the cylinder neck. If any rust is evident, remove it by using a fine emery cloth (200 grit).
- d) Inspect all parts for damage and examine all moving mechanical parts for a free and/or unobstructed fit.
- e) Inspect the cylinder interior per CGA C-6 and current NFPA 10 guidelines.
- f) Replace all damaged or unserviceable components. Do not reuse the collar O-ring or the valve stem assembly, they must be replaced before reassembly.

TROUBLE SHOOTING GUIDE

COMPONENT	DISORDER	CORRECTIVE ACTION
Tank	Dents or abrasions	Hydrotest or discard tank.
	Rust spots, pits or corrosion	Replace tank if there is any corrosion penetration
	Threads nicked, cross-threaded, corroded or worn	If damage or worn extensively the tank must be discarded
	Leak in weld seam	Discard tank
	Burn marks	Discard tank
Extinguishing agent	Improper fill level	Fill extinguisher to rated capacity with ANSUL extinguishing agent specified
Pickup tube	Bent, cracked, broken, or obstructed	Replace, using OEM parts only
Valve	Leak through valve	Replace valve stem assembly (item 14). Check valve stem seat for scratched or FOD
	Leak at gauge (item 6) threads	Replace valve assembly (item 1)
	Damages or defective gauge (item 6)	Replace valve assembly (item 1)
	Low pressure on gauge (item 6)	Check for leaks. Weight. Repressurize. Retest
	Leak at collar o-ring	Remove valve assembly (item 1), clean collar thoroughly and install new collar O-ring (optional)
Nameplate	Unreadable	Use mild detergent to clean Nameplate. If still unreadable, replace nameplate****
	Partially detached	Inspect area under nameplate. If corroded see "Tank" section of troubleshooting guide. Reattached loose Nameplate with good grade of heatless adhesive.
	Missing	Replace with new Nameplate ****
Hose/Nozzle	Cut, cracked, or abraded	Replace (Item 2 or Item 3)
	Corroded or cracked coupling	Replace (Item 2 or Item 3)
	Internal blockage	Clear by flexing or blowing 50 psi max of air through the hose/nozzle. If still blocked, replace
	O-ring cut, brittle or missing	Replace O-ring (item 4), lubricate new O-ring with silicone grease

9) ASSEMBLY

- a) Refer to the illustrated parts list at the back of this manual when servicing these extinguishers.
- b) Ensure all parts are thoroughly clean and dry before reassembling the extinguisher.
- c) Lightly lubricate the valve stem assembly O-ring with a thin film silicon-based O-ring lubricant and install the new valve stem into the valve body. Do not lubricate the valve stem seating surface.
- d) Reassemble the spring (item 15) and downtube/retainer assembly (item 16) to the valve assembly.
- e) Wrench tight the downtube/retainer assembly (item 16) to prevent expellant gas leakage.
- f) Apply a thin film silicon-based lubricant to collar O-ring (item 13) and install into valve body (item 1) O-ring groove.
- g) Install valve assembly cylinder and hand tight firmly.

NOTE: Do not apply force to the hanger portion of the valve body when tightening.

Screw the valve until properly seated. Be careful not to rip, tear, or otherwise damage collar O-ring (item 13). Do not over torque valve assembly.

- h) Squeeze the push lever (item 8) to ensure proper working action.
- i) The extinguisher is ready to be recharged at this point, before assembling the hose assembly (item 2) or nozzle (item 3), refer to recharge instructions.

10) RECHARGE INSTRUCTIONS

- a) The recharging of these extinguishers should be performed only by qualified, experienced personnel with access to an appropriate Halotron BrX (2-BTP) recovery/recharge system. to prevent corrosion of the cylinder, ensure it is fully dry before recharging the extinguisher.
- b) Check the extinguisher label for the correct weight of Halotron BrX (2-BTP) agent and for the proper recharging pressure prior to recharging.
- c) Remove hose assembly (item 2) or nozzle (item 3), if installed.
- d) Install charging adapter (commercially available) to the hose assembly or nozzle valve body port.
- e) Place the extinguisher on a calibrated high-resolution scale of sufficient size and capacity. Tare weight the extinguisher.
- f) Connect the Halotron BrX supply tank to the extinguisher.

NOTE: The Halotron BrX supply tank must always be pressurized to approximately 100 psi with Nitrogen.

- g) Depress the operating lever and fill extinguisher with amount of agent specified by the nameplate.
Caution: Avoid liquid Halotron BrX contact with extinguisher tank. Wipe dry immediately with clean cloth.
- h) Pressurize to the extinguisher operating pressure with Nitrogen (N₂). Repeatedly rock the extinguisher to mix the Nitrogen pressuring gas until proper pressure is reached.
- i) If required, repeat steps g. and h. until required pressure is reached and stable.
- j) Vent any line pressure before removing the recharge adaptor from the extinguisher valve and remove the adaptor from the valve.
- k) After recharge is complete, apply a liquid leak detection compound onto all possible leakage points (valve outlet, around the collar seal, at the gauge and at the cylinder welds) No leakage is permitted.
- l) Dry and thoroughly clean the extinguisher using a clean cloth and clean compressed air, ensuring no leak detection compound remains on or in the valve.

- m) Reinstall the O-ring (item 4) and the hose assembly (item 2) or nozzle (item 3) firmly hand tight and tighten very slightly with a wrench. Do not over torque.
- n) Install the ring pin and chain assembly (item 5 & 6) through the holes in the handle and secure the pull pin with the visual inspection seal (item 7).
- o) Weight the extinguisher to confirm that the total weight is within the tolerances indicated in the Maintenance section on the extinguisher.
- p) Attached a label to the extinguisher indicating the type of maintenance that was carried out (i.e., 6 or 12 year), the date of maintenance, as well as the name and location of the repair facility that performed the maintenance. Refer to NFPA 10 for guidelines regarding acceptable types of labels to be used for this purpose.

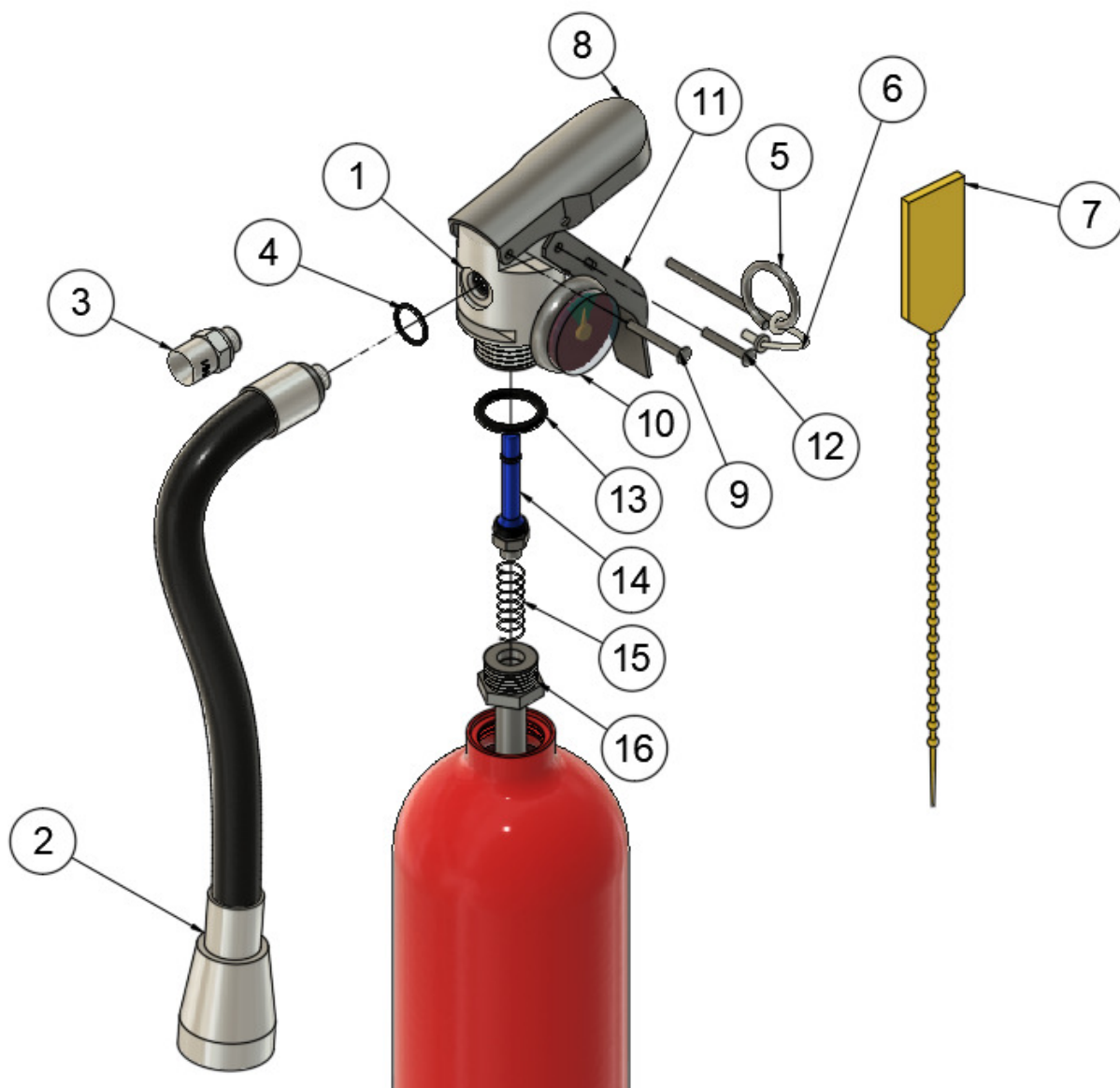


Figure 1.375H673 & 375N69953 Fire Extinguisher Assembly

FIG. ITEM	PART NUMBER	NOMENCLATURE	EFF CODE	UNITS/ ASSY
1-	375H673	FIRE EXTINGUISHER ASSEMBLY, HOSE	A	
	375N69953	FIRE EXTINGUISHER ASSEMBLY, NOZZLE	B	
1	23674	*VALVE ASSEMBLY		1
2	27189	*HOSE ASSEMBLY	A	1
3	24490	*NOZZLE	B	1
4	01532	*O-RING, NOZZLE		1
5	16268	*RING PIN		1
6	00532	*CHAIN (NYLON) FOR RING PIN		1
7	01387	*TAMPER SEAL		1
8	01057	*LEVER		1
9	01060	*RIVET ONLY FOR LEVER		1
10	14417	*GAUGE 100 PSI		1
11	04554	*HANDLE		1
12	01064	*RIVET ONLY FOR HANDLE		1
13	14268	*COLLAR O-RING		1
14	14327	*VALVE STEM ASSEMBLY		1
15	01074	*SPRING		1
16	25192	*DOWNTUBE/RETAINER ASSEMBLY		1

Table 1. Parts list

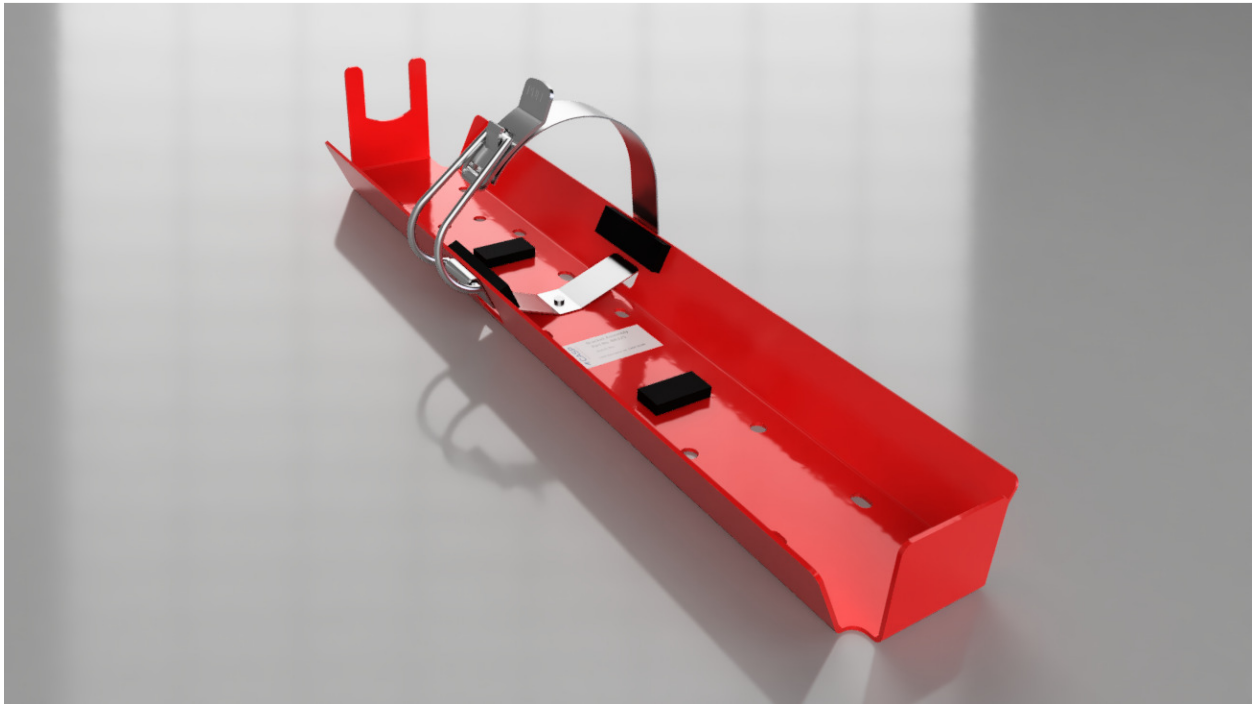


Figure 2. BR325 Bracket assembly