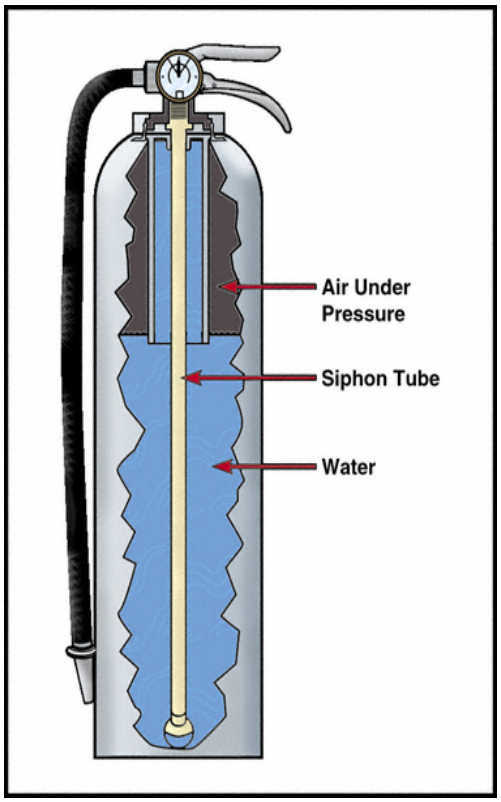
TOPIC #1: Fire Extinguishers

Engine, Ladder and Heavy Rescue Companies carry a complete set of fire extinguishers. A complete set includes each of the following: Water Can, CO2 and Dry Chemical

1. Water Can – Pressurized Water Extinguisher

CFD water extinguishers are 2-1/2 gallon pressurized water cans. Water cans are used to control Class "A" incipient fires.



Physical Characteristics

Total Weight – approximately 30 pounds
Water Capacity - 2-1/2 gallons
Pressure - 100 pounds
Discharge Time - approximately 50 seconds
Reach - 40 to 50 feet
Freezing Temp - 32 degrees F

Operation

a. Maintain the extinguisher in an upright position
b. Pull the ring pin
c. Grasp the hose near the nozzle with one hand and squeeze the discharge lever with your free hand
d. Direct the stream at the base of the fire or with your finger over the nozzle, direct the spray at the fire

Note: The extinguisher is easily carried in one hand and can also be affixed with a strap to allow it to be carried over the shoulder. If used during actual fire situations, use caution not to abandon pressurized water extinguishers as they can become over pressurized due to heat from the fire and explode (see figure 1)

Types of Fire

a. Useful on Class "A" fires and in some cases on Class "B" fires

   Note: If it is used on a Class "B" fire; place a finger of the nozzle tip to produce a fine spray. Direct application or plunging of the pressurized stream into the Class "B" fire can cause fire spread or injury.

b. Do not use on electrical fires
c. Use on the following fires
   i. Small mattress or chair fires
   ii. To control small fires in walls or ceiling spaces while waiting for a hose line
   iii. Reduce a fire in an apartment or room in order to close the door and limit fire spread while waiting on a hose line
   iv. Extinguish multiple incipient level fires
   v. Clean cuts and eyes when exposed to chemicals or other dangerous substances

Inspection

a. Inspect daily for signs of visual corrosion to the pressure vessel
b. Make sure pin is in place
c. Ensure it is pressurized to 100 psi
d. Protect from freezing during extreme temperatures

Recharging

a. Invert the extinguisher and squeeze handle to remove pressure
b. Remove the head assembly
c. Wash all parts with water, rinse the hose and nozzle
d. Fill extinguisher with water to the inside mark (there should be a white sleeve fitted on the inside of the extinguisher to use as the fill mark)
e. Replace and hand tighten the head assembly
f. Fill with air via a "Schrader" valve to 100 psi
g. Shake the extinguisher and re-check the gauge and if necessary, add more air.

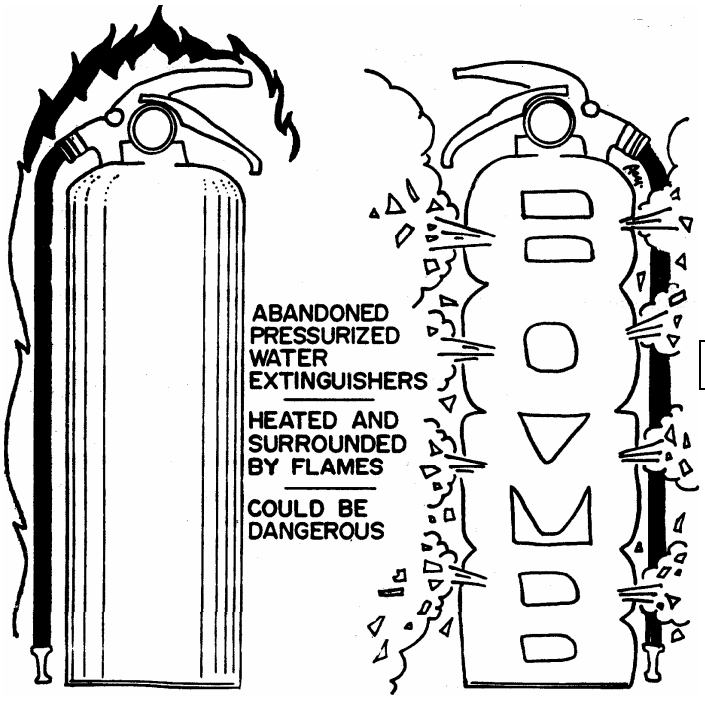


Figure 1

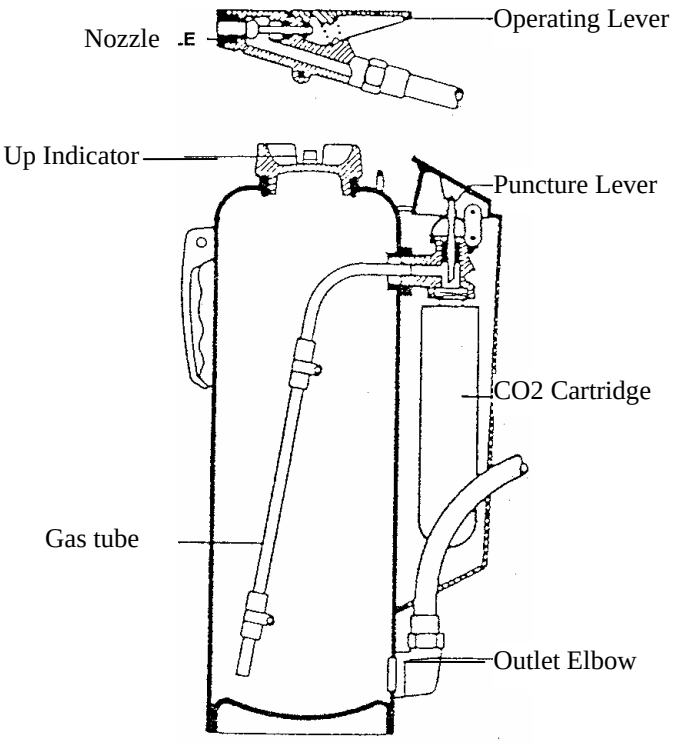
2. Dry Chemical – Purple K Extinguisher

Dry Chemical extinguishers are filled with Purple K dry chemical. Purple K is a Potassium Bicarbonate base dry chemical.

Description and Physical Characteristics

1. Cylinder of heavy gauge steel welded construction having an internal corrosion resistant coating.
2. Nozzle - High velocity, self-closing discharge nozzle, swivels 360 degrees. Self closing feature helps prevent moisture from entering unit when it is not in operation.
3. Pressure Indicator - located on some fill caps, pops up to indicate that the cartridge has been used.
4. Fill cap, carry handle, nozzle valve body, and actuator body are of durable forged aluminum.

EXTINGUISHER COMPONENTS

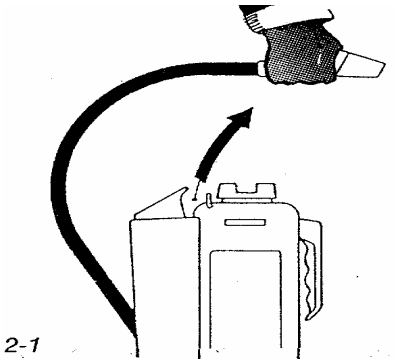


PHYSICAL CHARACTERISTICS

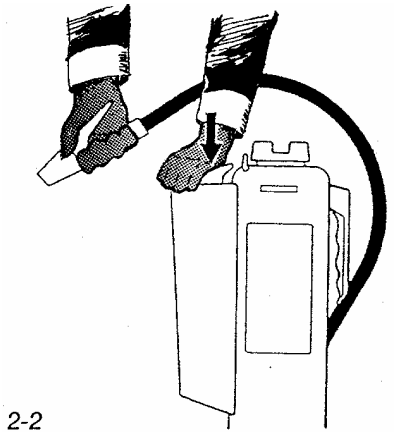
Total Weight – Approximately 50 pounds
Purple K Capacity - 30 pounds
Pressure - 100 pounds
Discharge Time - approximately 11 seconds
Coverage Area - Approximately 30 square feet
Temp Restrictions - Between minus 40 degrees and up to 120 degrees F

TYPES OF FIRE Primary for Class "B" and "C" Fires. Limited Class "A" Fire Application

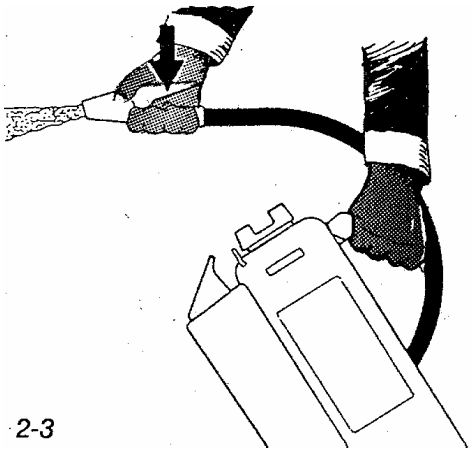
OPERATION



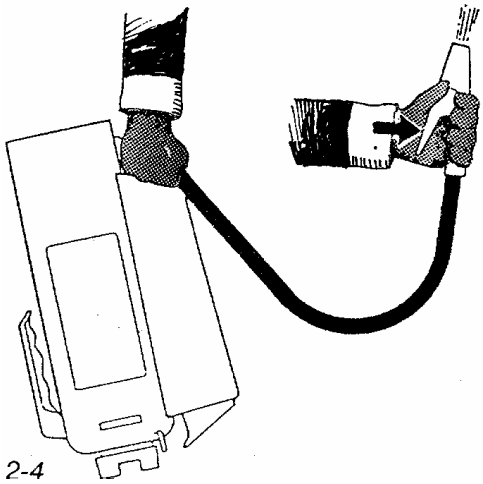
Remove ring pin and hose *(fig. 2-1)*



Push down on puncture lever. When the puncture lever is depressed, the CO2 cartridge is punctured. CO2 pressurizes the dry chemical chamber and forces the agent through the hose and up to the nozzle. Discharge is controlled by squeezing the nozzle operating lever.*(fig 2-2)*



Squeeze nozzle operating lever. Direct stream at base of flames using a side to side motion. In order to achieve even distribution, and to obtain best results the nozzle should be held with the members strongest hand. Hold the extinguisher upright. The extinguisher will not function properly if it is held in a horizontal or inverted position while being used.*(fig. 2-3)*



After using: Invert extinguisher by grasping base of hose at the metal elbow, and squeeze nozzle to release all pressure.*(fig. 2-4)*

INSPECTION

The extinguishers are to be checked at the beginning of each tour and thoroughly examined every month and shall undergo in-depth service once every six months.

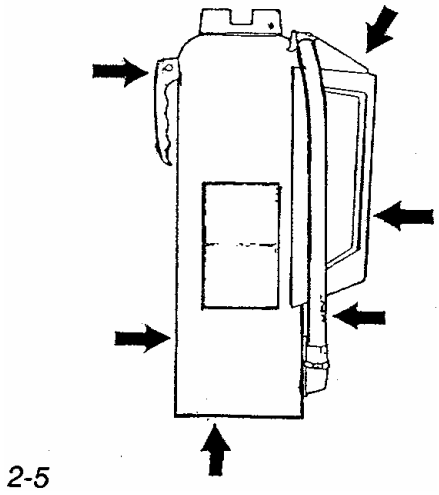
2.4.1 Inspection at the beginning of each tour is to include:

A. Insuring the extinguisher is in its designated place and is accessible for immediate use.

B. Examining the extinguisher shell, cartridge guard, cartridge receiver and all other external parts for evidence of physical damage, corrosion or other impairments.

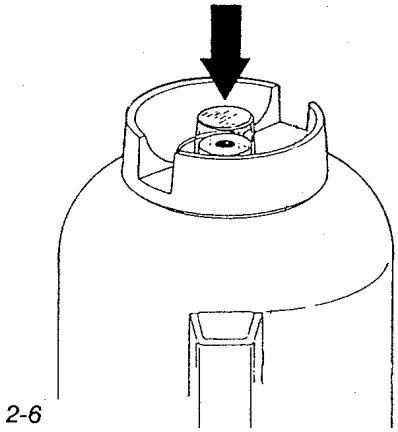
C. If equipped, check red pressure indicator stem. If it has popped up a complete maintenance check as outlined in the following sections must be conducted.

MONTHLY INSPECTION



2-5

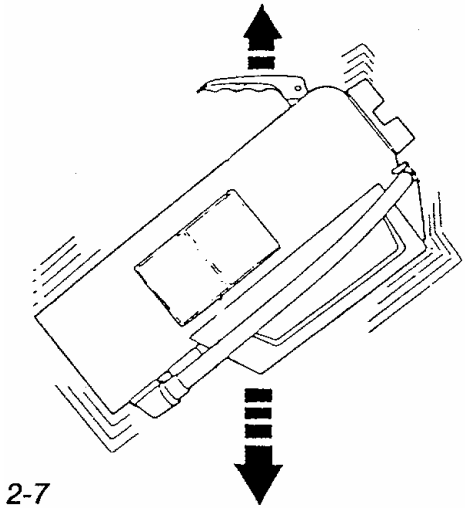
Examine the extinguisher shell, cartridge guard, cartridge receiver and all other external parts for evidence of physical damage, corrosion or other impairments.*(fig. 2-5)*



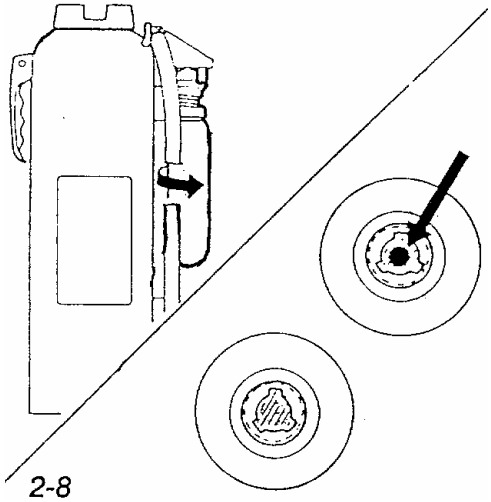
2-6

IF the extinguisher has a red stem indicator which pops up in the center of the fill cap and remains up after the pressure has been relieved. Check the red indicator stem. If it is up, a complete maintenance check is in order. *(fig. 2-6)* ***NOTE: THIS IS NOT ON ALL EXTINGUISHERS***

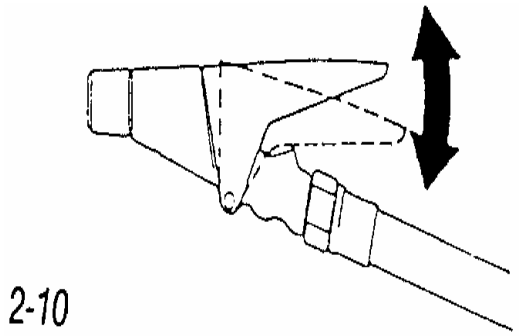
CAUTION: To insure that there is no pressure in the cylinder invert extinguisher, direct nozzle to a safe area and squeeze the lever. Any residue pressure would be released. This must be performed prior to the removal of fill cap or cartridge.



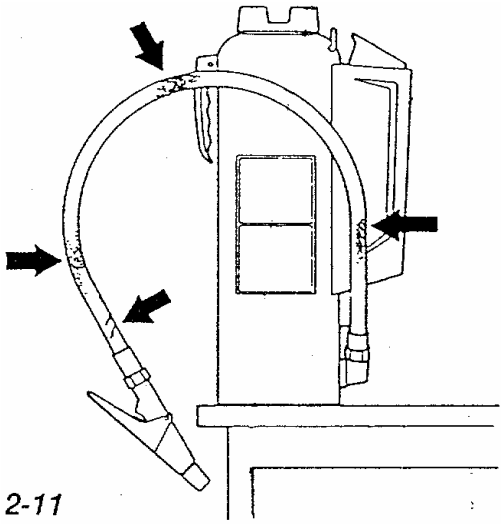
Heft (lifted up and down slightly) the extinguisher to determine if it is filled. If in doubt after hefting, remove the fill cap to make absolutely certain the shell is filled to rated capacity (Purple K is supposed to be 3" from the cap threads).*(fig 2-7)*



Unscrew the cartridge (cartridge has left-hand thread) and examine seal to see that it has not been punctured. A spent or used cartridge is readily identifiable from a full cartridge by the large hole made by the puncture pin upon operation of the extinguisher.*(fig. 2-8)*

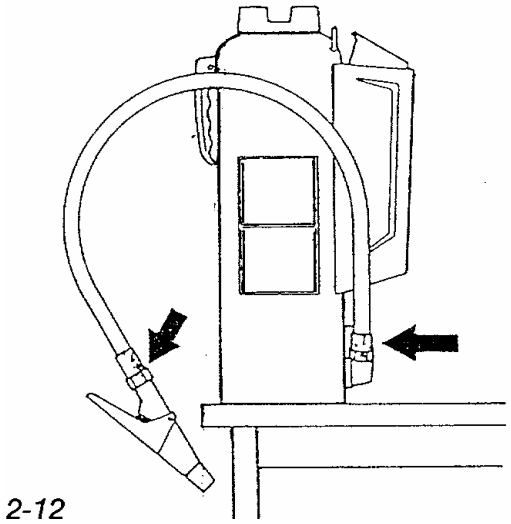


Check nozzle tip for obstructions. Operate the nozzle handle to check for free movement. If the handle is binding or immovable, replace the nozzle or clean deposits from the internal passages and parts with a small, stiff bristle brush.*(fig. 2-10)*



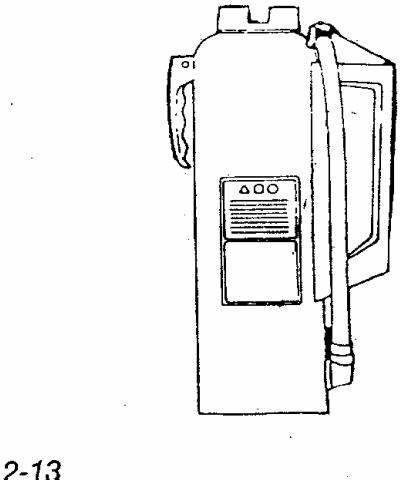
2-11

Examine the hose for cuts, severe weather checking, abrasion or deformed exterior. Dependent upon the severity of the disorder, the hose could rupture upon pressurization of the extinguisher for use on a fire.*(fig. 2-11)*



2-12

Check the hose couplings for tightness, corrosion or cracks. A loose connection of coupling to shell outlet or nozzle could contribute to a significant change in discharge characteristics upon use. A corroded or cracked coupling could separate under pressure.
(fig. 2-12)

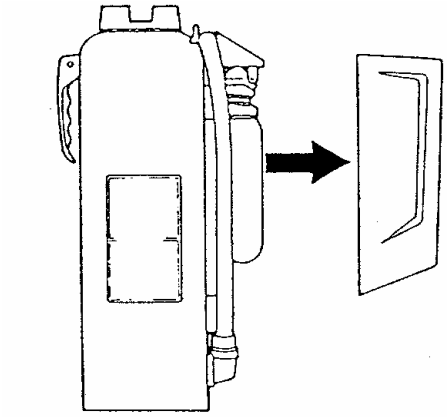


2-13

Place extinguisher back in its designated place, assuring that it is accessible for immediate use.*(fig. 2-13)*

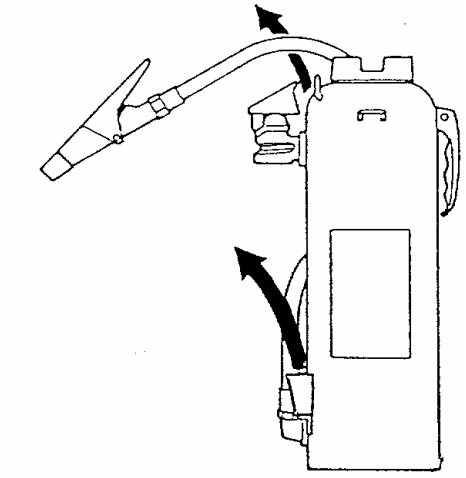
6-MONTH INSPECTION

After 6 months of non-use, the extinguisher should be serviced. (Defects to Central Stores)



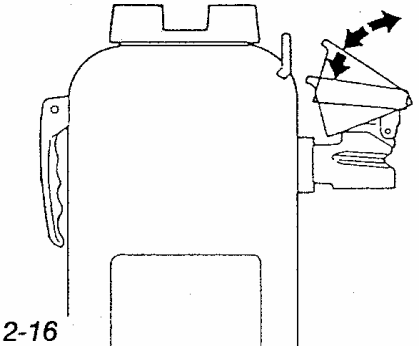
2-14

Remove the cartridge guard to effect examination of the gas pressure cartridge. Then, before setting the guard off to one side, check the integral inside components for mechanical damage or evidence of corrosion.*(fig. 2-14)*



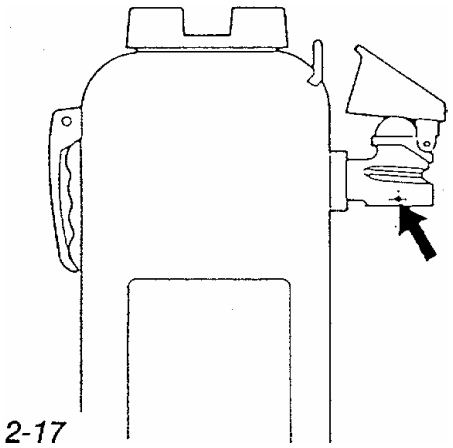
2-15

Remove cartridge and before installing new cartridge, remove nozzle from its holder and lift hose out from behind and under the puncture lever.*(fig. 2-15)*

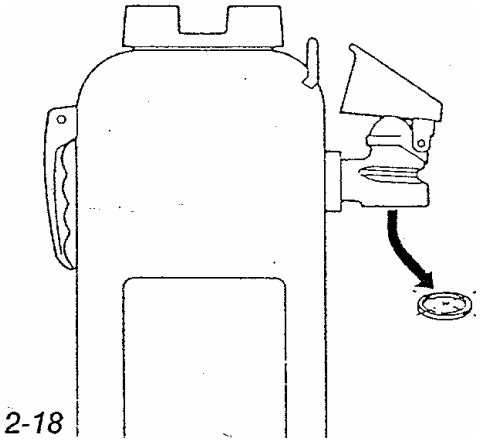


2-16

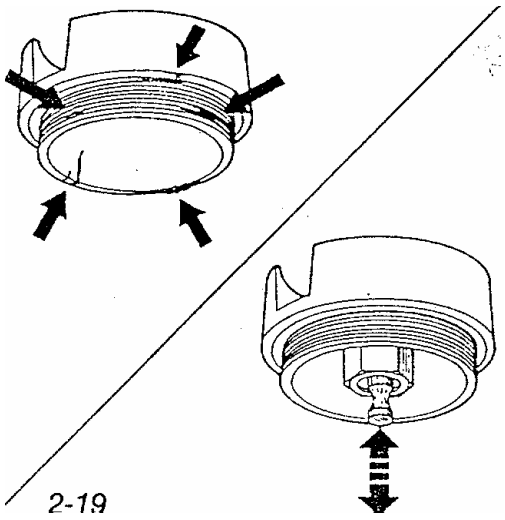
Operate the puncture lever to make sure the lever works freely - a bent or dull puncture pin may hang up and not puncture the cartridge seal disc cleanly.*(fig. 2-16)*



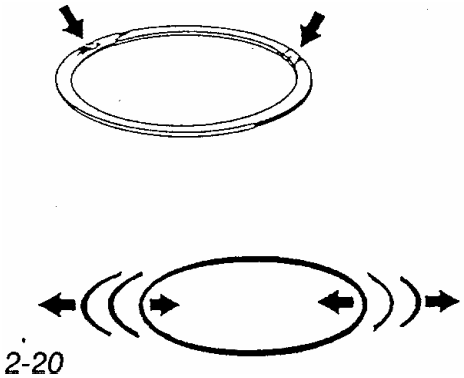
Check the pressure relief vent in the cartridge receiver for obstruction. This relief vent is a small hole in the receiver collar. This vent provides an audible signal and a safe vent if a cartridge is unscrewed while there is a still pressure inside. A stiff wire or bristle brush may be used for cleaning.*(fig. 2-17)*



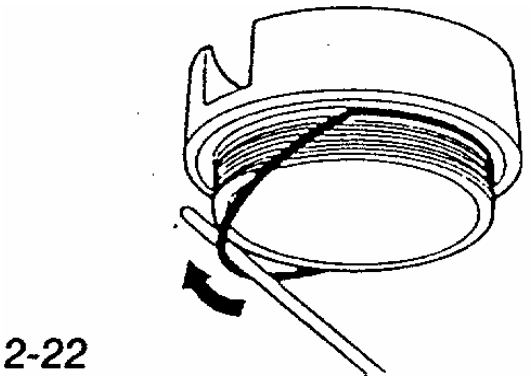
Remove and examine gasket in the cartridge receiver. Replace if brittle, compression set, cracked, cut or missing. (acquire new from central stores) *fig 2-18)*



Next examine the fill cap for abrasions, cracks or corrosion and the fill cap threads for nicks, burrs, cross-threading, rough or feathered edges. If the extinguisher is equipped, grasp the indicator stem and gently move the stem up and down to check for free movement. If the stem will not move, the mechanism may be damaged and the cap must be replaced.
(fig. 2-19)

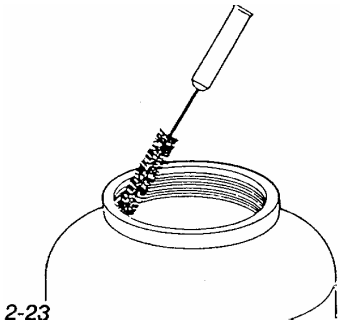


Examine the fill cap gasket and quad ring for cuts, checks, deformities and wear and then stretch them to determine elasticity. Do not rely on a visual determination of condition.*(fig. 2-20)*

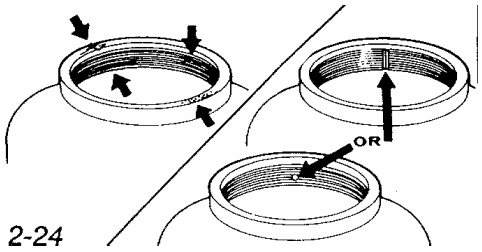


Return the gaskets to fill cap, taking care not to twist the quad ring as you return it to its recess in the cap. A twist will negate the design function of the ring.*(fig. 2-22)*

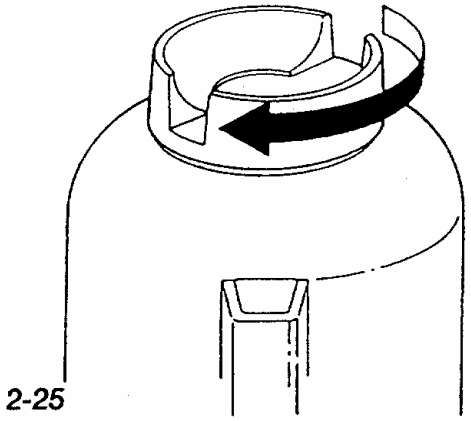
At this time dump the contents of the extinguisher out into a cylinder and then refill the cylinder with 30 pounds of Purple K product. (Refer to refilling procedures to judge how much product and how to refill the extinguisher)



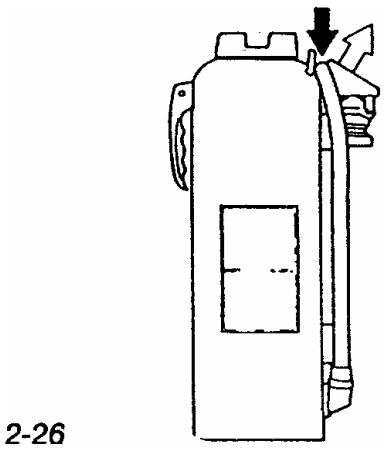
Do not return the fill cap to the extinguisher shell at this time. Instead, use a stiff bristle brush to clean the threads or top collar gasket seating surface of a shell free from dry chemical or foreign deposits.*(fig. 2-23)*



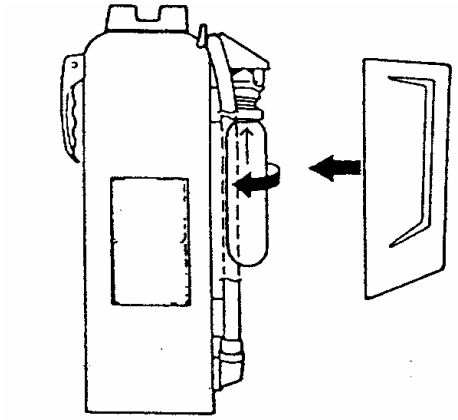
Note: The pressure relief vent may be a small hole or a set of grooves in the collar. One of these pressure relief vents must be present in each extinguisher.*(fig. 2-24)*



Secure the fill cap to the dry chemical shell opening by hand tightening only. Over tightening using a bar or similar leverage may result in mechanical injury to the fill cap; especially to the threads.*(fig. 2-25)*



Lift the puncture lever, place the hose behind lever and secure the nozzle in holder. With the puncture lever fully up and the hose in place to prevent the lever from being depressed, safe installation of the cartridge is assured. If the extinguisher is equipped with a pin it must be inserted in the activation lever.*(fig. 2-26)*



2-27

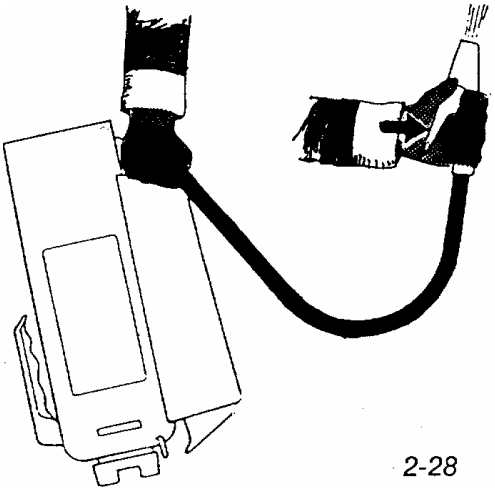
Place the new cartridge in the receiver (hand tight to assure proper use of the cartridge receiver gasket is sufficient) and carefully engage the cartridge guard to align the guide fork with the recess in the cartridge receiver body.*(fig. 2-27)*

If the extinguisher is secured by any type of bracket or hung by a support, that bracket or support and the extinguisher's hanging ring must be maintained. Bracket inspection and maintenance should be performed whenever the extinguisher is inspected monthly (more often if conditions indicate the need).

Examine each vehicle unit mount for any looseness between extinguisher and bracket.

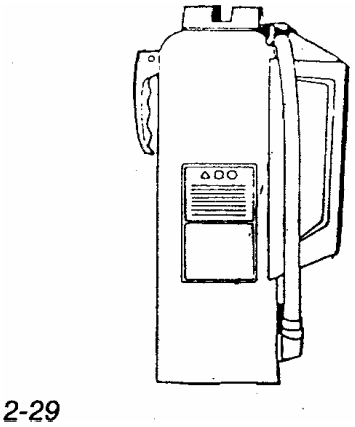
RECHARGING

Purple K extinguishers shall be recharged after use, and as indicated by an inspection. Recharging is the replacement or replenishment of the extinguishing agent. It also includes the replacement of the CO2 cartridge. When performing the recharging, use only those materials specified in this section. The use of other recharging materials may impair the efficiency, cause malfunction, or result in rupture of the extinguisher that could cause injury to the operator.



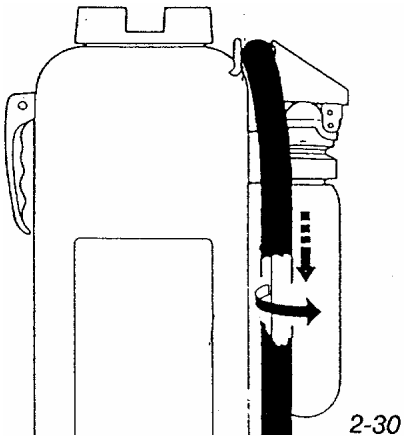
2-28

Invert the extinguisher and open the nozzle to clear dry chemical from the hose and to relieve all pressure remaining in the shell.
(fig. 2-28)



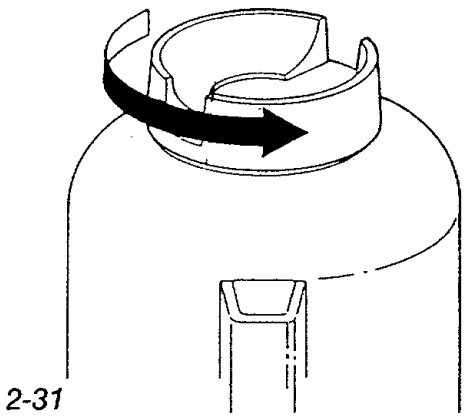
2-29

Return the extinguisher to the upright position, place the hose in its normal position and insert the nozzle in the holder.*(fig. 2-29)*



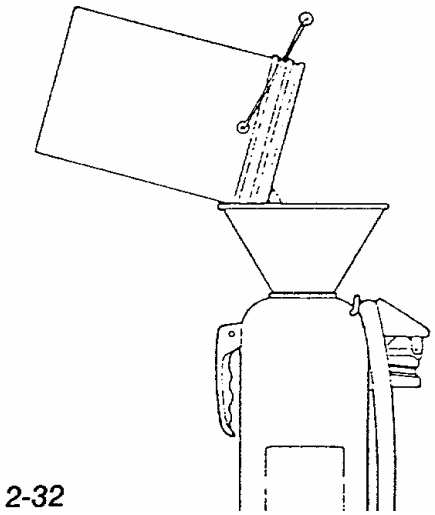
2-30

Remove the cartridge guard and spent cartridge (cartridge has a left-hand thread). *(fig. 2-30)*

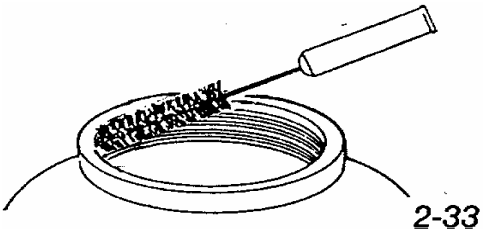


2-31

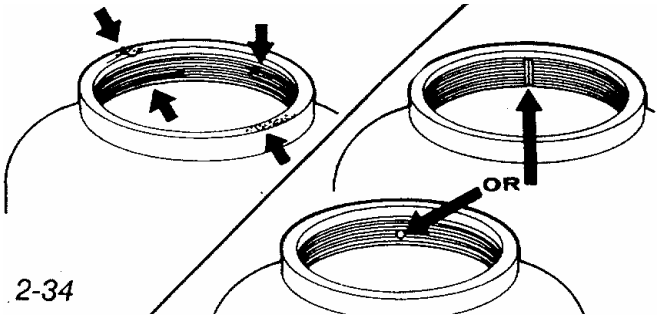
Remove the fill cap slowly and deliberately. If there is any residual pressure in the shell, it will be relieved through the pressure relief vent hose in the top collar while 3 1/2 threads are still engaged. Pause after one complete turn and listen. Do not unscrew fill cap any further until all sound of escaping pressure if any, have ceased.*(fig. 2-31)*



Place a funnel in the fill opening and charge the extinguisher to the rated capacity with Purple K dry chemical (30 pounds about 1" from cap threads). Keep dry chemical storage pail sealed when not in use to prevent absorption of moisture into dry chemical. Throw out caked powder. Do not substitute or mix different types of dry chemicals.
(fig. 2-32)

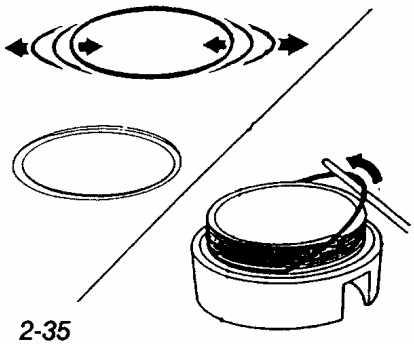


Clean the fill opening threads and the gasket seating surface on the shell. Pressure vents are cut in the threads, be sure they are clean and unobstructed.*(fig. 2-33)*

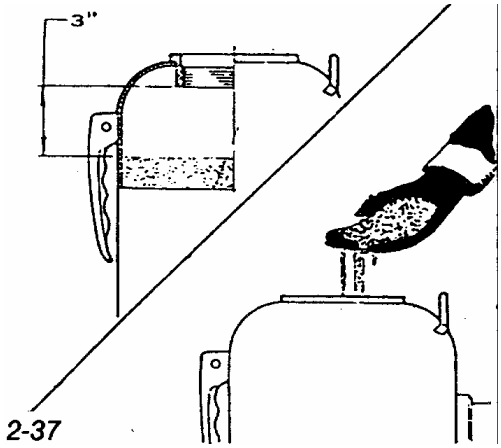


Note: The pressure relief vent may be a small hole or a set of grooves in the collar. One of these pressure relief vents must be present in each extinguisher.*(fig. 2-34)*

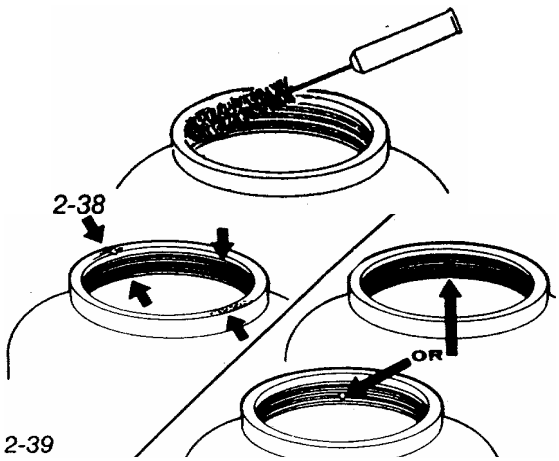
DO NOT REPLACE FILL CAP AT THIS TIME.



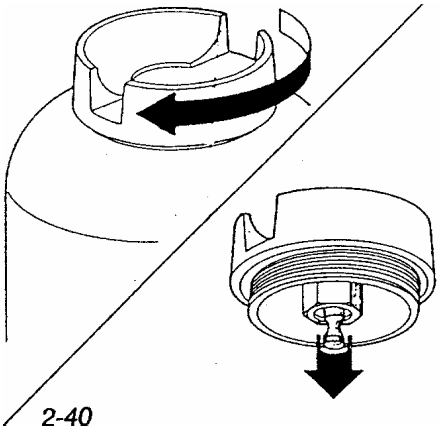
Remove the gaskets from the fill cap and examine them for elasticity - do not rely on a visual determination of condition. *(fig. 2-35)*



Once the Purple K has settled (this may require you to replace the cap and heft the extinguisher, check it after your next run or let it sit for 24 hours to settle, make certain the tank is filled to rated capacity (approximately 3 inches from the bottom of fill opening) with free-flowing (no lumps) Purple K.*(fig. 2-37)*

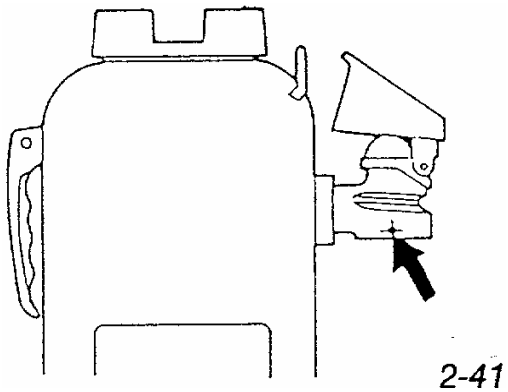


Clean the threads and gasket seating surface on the cap with a stiff bristle brush before returning the gaskets to the cap. Pressure vents are cut in the threads, be sure they are clean and unobstructed.*(fig. 2-38,2-39)*

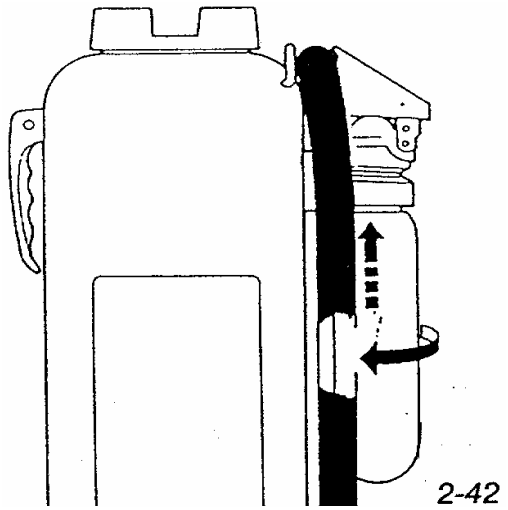


Return the fill cap to the shell. Hand tight is sufficient when the gaskets are resilient, clean and freshly lubricated.*(fig. 2-40)*

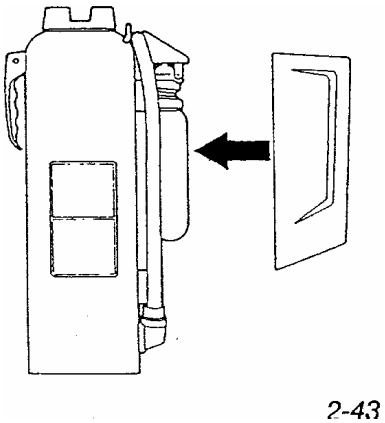
NOTE: The fill cap is an indicator model, first pull the red indicator stem down to reset the indicator.



Inspect the cartridge receiver to verify that the pressure relief vent (indicated in the figure) is clear.*(fig. 2-41)*

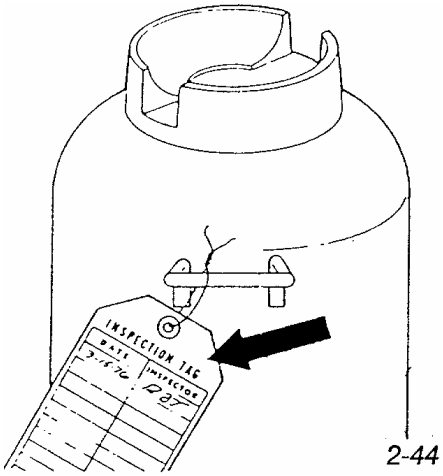


Lift the puncture lever, place the hose behind lever and secure the nozzle in holder. With the puncture lever fully up and the hose in place to prevent the lever from being depressed, safe installation of the cartridge is assured. If the extinguisher is equipped with a safety pin it must be installed in the activation lever. Then screw the full cartridge into the receiver, hand tighten. *(fig. 2-42)*



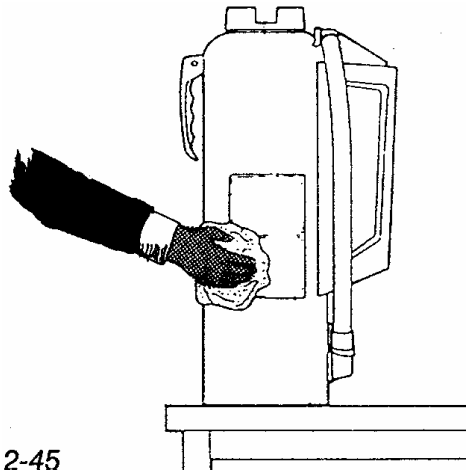
2-43

Replace the cartridge guard, making sure the guide fork inside the guard is fitted into the recessed groove in the cartridge receiver body.*(fig. 2-43)*



2-44

Record the date of recharge in the company diary. *(fig. 2-44)*



2-45

Remove all dry chemical and foreign deposits from the shell and other components - a clean extinguisher is a very visual indication of a properly services extinguisher, even to the eye of a casual observer.*(fig. 2-45)*

CHECKING FOR CAKING OF PURPLE K – DRY CHEMICAL

Check the dry chemical agent when replenishing or recharging the extinguisher.

If inspection reveals caked dry chemical agent, discard and refill with fresh extinguishing agent.

The term caked, as applied to dry chemical, describes a condition. It is best identified as dry chemical containing hard lumps. These lumps will render a dry chemical extinguisher inoperative. The condition usually follows the absorption and later the evaporation of an unusual amount of moisture. It is often confused with packing - a condition produced by normal settling, by vibration or by impact.

There is no known case on which there is evidence that an extinguisher was made inoperative as a result of packing. A simple procedure to determine which condition exists is the Underwriters Laboratories four inch drop to a clean hard surface test. If the lumps do not break up into individual participles, caking is present.

MIXING OF DRY CHEMICAL AGENTS

Do not mix different types of dry chemicals. Use only the type issued by the CFD.

STORAGE AND COMPANY SUPPLY

The dry chemical must be stored in a dry area to prevent caking of the agent.

The company should keep 50 pounds of dry chemical and 1 spare CO2 cartridges in quarters for servicing and re-filling. Spent CO2 cartridges shall be sent to Central Stores.

REPAIRS AND RECORDS

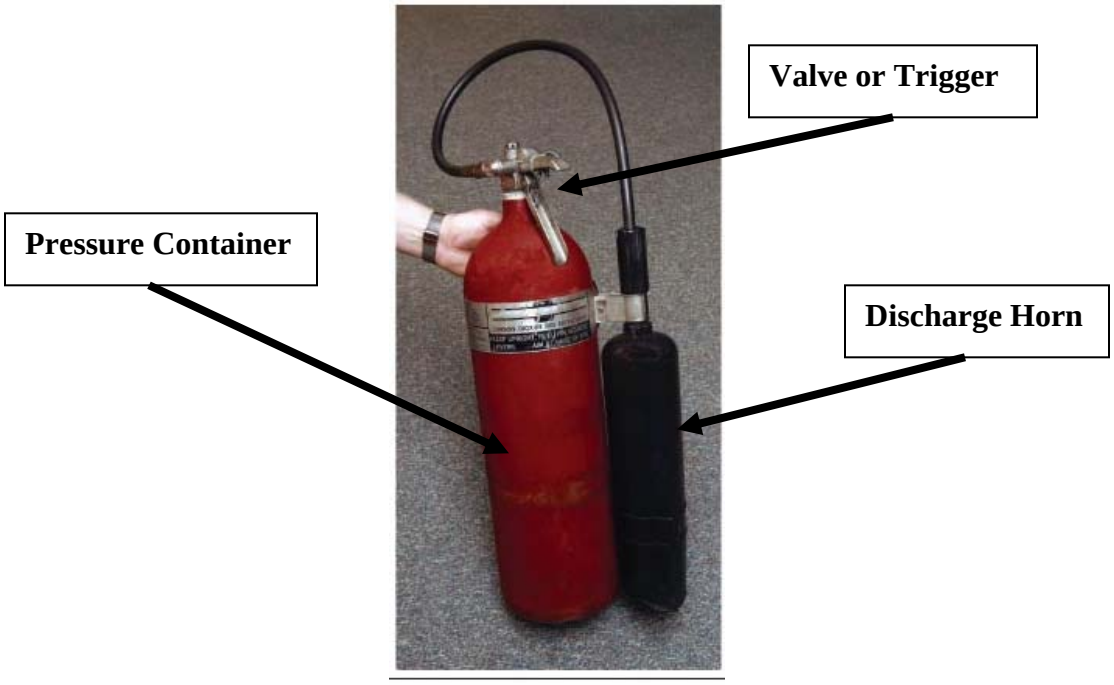
Each monthly inspection, recharging and 6-month maintenance examination of the extinguisher is to be recorded in the company diary

Any time an extinguisher malfunctions, shows evidence of corrosion, or mechanical damage, it shall be removed from service and forwarded to Central Stores for replacement

3. Carbon Dioxide (CO^2) Extinguisher

Physical Characteristics

Total Weight – Approximately 40 pounds
CO2 Capacity - 15 pounds
Pressure - Liquid CO2 at 800 to 900 psi
Discharge Time - Approximately 12 to 15 seconds
Reach - 3 to 8 feet
Freezing Temp - Not Applicable



Operation

a. Maintain the extinguisher in an upright position
b. Pull the ring pin
c. Grasp the hose near the nozzle with one hand and squeeze the discharge lever with your free hand
d. Direct the discharge at the base of the fire
e. To stop discharging, release the handle

Types of Fire

a. Use on Class "B" and Class "C" fires.
b. Can be used electrical or electrical equipment fires

Inspection

a. Inspect daily for signs of visual corrosion or damage
b. Make sure pin is in place
c. The only way to ensure it is fully charged is to weigh it. Weighing should be done after recharge and every 30 days thereafter.
d. If it has lost 10% or more of its rated capacity, it needs refilled or recharged.

Recharging

a. Send the extinguisher to Central Stores for recharging. This is not field serviceable or rechargeable by Fire Companies.