Self Contained Breathing Apparatus

Part 3
Objectives

• Identify the procedure for changing a low / empty SCBA cylinder
• Identify the procedures for cleaning and sanitizing an SCBA
• Identify the components and purpose of an SCBA fill system
• Identify the operating principles of an SCBA refilling system
Changing Cylinder While Worn

Remove the regulator from the face piece

Turn off the cylinder valve on the used cylinder
Changing Cylinder While Worn

Open the purge valve to bleed off the pressure from the high-pressure supply line

Disconnect the high-pressure supply hose
Changing Cylinder While Worn

Release the SCBA cylinder from the backpack assembly and set aside

Slide the full SCBA cylinder into the backpack
Changing Cylinder While Worn

Check for the pressure and satisfactory condition of the “O” ring

Lock the SCBA cylinder into place
Changing Cylinder While Worn

Connect the high-pressure hose to the SCBA cylinder

Open cylinder valve and notify the firefighter that the SCBA cylinder change is complete
Changing Cylinder While Not Worn

Place the SCBA on the floor or a bench

Turn off the cylinder valve
Changing Cylinder While Not Worn

Open the purge valve to bleed off the pressure

Disconnect the high-pressure supply hose
Changing Cylinder While Not Worn

Release the cylinder from the backpack

Slide a full cylinder into the backpack, align outlet and lock cylinder in place
Changing Cylinder While Not Worn

Check that the “O” ring is present and in good shape

Connect the high-pressure hose to the air cylinder
Changing Cylinder While Not Worn

Open the cylinder valve, check gauge reading and compare gauge readings
Cleaning and Sanitizing

- Inspect the SCBA for any damage that may have occurred before cleaning
- Remove the face piece from the regulator
- On some models, the regulator also can be removed from the harness
- Detach the SCBA cylinder from the harness
- Rinse all parts of the SCBA with clean water
  (Water from a garden hose can be used for this step)
- Using a stiff brush, along with soap and water solution, scrub the SCBA cylinder and harness.
- Rinse and set these pieces aside to dry
Cleaning and Sanitizing

• In a bucket, make a mixture of mild soap and water
• Submerge the SCBA face piece into the solution
• Clean the regulator with the solution, following the manufacturer’s instructions
• Completely rinse the face piece and regulator with clean water
• Set aside and let dry
• Reassemble and inspect the entire SCBA before placing back in service

• Only use cleaning products approved by the SCBA manufacturer
Components and Purpose of an SCBA Fill System

- Compressor
- Filter
- Cascade (storage) system
- Charging (fill) station
Components and Purpose of an SCBA Fill System

• Compressor
  – Takes ambient air and compresses it in stages
  – Usually electric driven but portable units can be run from internal combustion engine
  – Air is cooled after each stage
Components and Purpose of an SCBA Fill System

- Filter
  - Consists of
    - Dryer
    - Air sweetener
    - Carbon monoxide converter
  - Removes
    - Oil
    - Water
    - Odors
    - Other gases and contaminants
Components and Purpose of an SCBA Fill System

• Cascade (storage) system
  – Used for storage of compressed air
  – Three or more cylinders
  – Cylinders should be opened one at a time during filling operations
Components and Purpose of an SCBA Fill System

• Charging (fill) station
  – Used to protect operator should cylinder rupture
  – May or may not contain water depending on the type of cylinder being refilled
  – Contains fragmentation deflector
  – May contain other control valves
Operating Principles of an SCBA Refilling System

• Always check the hydrostatic test date for compliance with standards and inspect cylinder for damage such as deep nicks, cuts, gouges or discoloration from heat

• Steel & aluminum cylinders should be tested every 5 years and have an indefinite service life
• Fiberglass & Kevlar wrapped cylinders should be tested every 3 years and have a service life of 15 years
• Carbon fiber wrapped cylinders should be tested every 5 years and have a service life of 15 years
Operating Principles of an SCBA Refilling System - Cascade

• Place the SCBA cylinder in a fragment proof charging station
• Connect the charging hose to the cylinder
  – If the charging hose has a bleed valve, make sure that the bleed valve is closed
• Open the SCBA cylinder valve
• Open the valve at the charging hose
• Close charging station door and engage locking mechanism
Operating Principles of an SCBA Refilling System - Cascade

- Open the valve of the cascade cylinder that has the least pressure, but that has more pressure than the SCBA cylinder.
- Open the fill station manifold valve.
- When the pressures of the SCBA and the cascade cylinder equalize, close the cascade cylinder valve.
- If the SCBA cylinder is not yet fully charged, repeat above steps using the cascade cylinder with the next highest pressure.
- Continue repeating the above until the SCBA cylinder is fully charged.
Operating Principles of an SCBA Refilling System - Cascade

- Close the cascade system valve
- Close the fill station manifold valve
- Disengage locking mechanism and open fill station door
- Close cylinder valve
- Close charging hose valve and bleed excess pressure
- Disconnect charging hose from cylinder
- Remove cylinder and return it to proper storage
Operating Principles of an SCBA Refilling System - Compressor

- Same steps as before except for not using a cascade
Q & A