



Western Berks Fire Department Training Bulletin

SCOTT Revolve Air Operation

Training Bulletin #:	001-12	Issued By:	Fire Commissioner Jeff Weidner
Issued:	04/27/12	Version:	1.0

Purpose Statement

This training bulletin has been developed to provide the member or employee of the department with a general overview of how to operate the SCOTT Revolve Air System installed in Rescue 18. This training bulletin should **NOT** be used as a substitute for hands-on use of the system in a controlled environment. All personnel are encouraged to use this document for the initial familiarization and periodic refresher if needed. Personnel should practice using the system during non-emergency conditions to ensure they understand the proper operation of the equipment.

Scope Statement

This training bulletin applies to all members and employees of the Western Berks Fire Department.

Cascade Storage System Theory of Operation

The principle of a cascade air storage system is to make the most efficient use of air stored in multiple storage cylinders to fill breathing air cylinders. This is achieved by always drawing air first from the storage cylinder with the lowest pressure and then switching to the storage cylinder with the next highest pressure until the breathing air cylinder has reached the target fill pressure. Based on a four cylinder storage system, if the first storage cylinder has less pressure than the target pressure for the breathing air cylinder, the breathing air cylinder will be filled until its pressure equals that of the first storage cylinder. The first storage cylinder is then closed and the next higher pressure storage cylinder is opened to add air to the breathing air cylinder. If the pressure in the second storage cylinder is still below the target pressure, the second storage cylinder is closed and the third storage cylinder is opened. If necessary, the fourth storage cylinder is used to finally reach the target pressure in the breathing air cylinder. When the fourth storage cylinder drops below the target pressure, no more breathing air cylinders can be filled to the target pressure until the storage system is refilled by the compressor.

With a manual cascade system (such as the SCOTT Revolve Air System on R18), the operator must continually monitor the air pressure in each of the storage cylinders while manually opening and closing each storage cylinder to fill breathing air cylinder.

SCOTT Revolve Air Equipment Overview

The SCOTT Revolve Air System is a six bank, 6000 psi system equipped to fill two breathing air cylinders of the same pressure simultaneously. In addition, a high pressure and low pressure system is installed in the compartment over the driver's side rear wheel to control air tools (low pressure blue hose) and for long line operations (high pressure black hose).

SCOTT Revolve Air Operation

The following table provides an overview of the operation of the Revolve Air system

SCOTT RevolveAir Operation

Prior to filling all air cylinders, ensure the following conditions are met:

- The Hydrostatic test date is current;
- Visually inspect the cylinder and valve assembly for physical damage such as dents or gouges in metal or in composite wrapping;
- Check the pressure rating of the selected breathing air cylinder; and
- Information on the cylinder is properly documented on the log sheet.

1. With the charging chamber door locked, open the appropriate bank and Fill Control Valve 1/8 to 1/2 turn counter-clockwise.
2. **SLOWLY** turn the Variable Pressure Fill Regulator knob clockwise until the Breathing Air Cylinder Gauge shows the target maximum fill pressure for the breathing air cylinder(s).

3. Remove one of the adapter caps and attach a cylinder to the charge adapter. Turn counter-clockwise to tighten. Hand-tighten the connector.



4. To charge two cylinders, remove the plug from the other charge adapter and mount the second cylinder. Hand-tighten the charge adapter.

5. Open the breathing air cylinder valves located on the top of the mounted cylinders.



6. Open the charging chamber door lock by operating the handle on the right side of the chamber so that the yellow lock bars are **NOT** showing.

7. Rotate the chamber door 180 degrees until it clicks into position.



8. Close and lock the charging chamber door handle. The door is locked when the yellow lock bars are visible around the door frame.

9. Adjust the fill rate as follows:
 - a. Slowly turn the Fill Control Valve counter-clockwise to increase the rate at which the cylinders are filled.
 - b. Watch the pressure reading on the Breathing Air Cylinder Gauge. When the cylinder pressure equals the pressure in the appropriate bank, close the bank and open the next bank to fill the cylinder to the appropriate level. Continue this process until the cylinder is full.
 - c. If the fill rate is too high, turn the Fill Control Valve fully clockwise to decrease the flow, then slowly turn the Fill Control Valve counter-clockwise to adjust to the proper rate.
 - d. Once fill pressure and fill rate are set for charging cylinders of the same pressure rating, minor readjustment may be necessary as the storage and compressor pressures will vary during multiple breathing air cylinder refills.



10. While the breathing air cylinders are being filled inside the chamber, mount the second set of cylinders on the rigid adapters on the outside of the charge chamber. **Be sure to hand-tighten the bleed valve and to open the breathing air cylinder valve(s).**

11. When the Breathing Air Cylinder Pressure Gauge reaches the pre-set charge pressure, open the chamber lock by operating the handle so that the yellow lock bars are **NOT** showing. This will automatically stop the cylinder charging process.

12. Remove the charged breathing air cylinders as follows:
 - a. Move the chamber lock handle to the unlock position and rotate the chamber door 180 degrees until it clicks into position.
 - b. Close the cylinder valves on the mounted breathing air cylinders.
 - c. Slowly open the bleed valve just enough to vent the air lines to the cylinders. Vent until all air flow stops. If the air does not stop venting, verify that the cylinder valves are closed.
 - d. Hold the cylinders in place and turn the charge adapter clockwise to remove the cylinder.
 - e. Replace the charge adapter plugs.

13. Once all cylinders have been filled, close the Fill Control Valve and decrease the pressure regulator until the gauge reads 0.

Long Line and Air Tools

The driver's side compartment above the rear wheel contains two regulators for the long lines. Note that one controls the low pressure (blue hose) and the other controls the high pressure (black hose).



To utilize these systems, simply open the control valve and adjust the regulator to the desired position. At the conclusion, be sure to close the control valve and decrease the regulator to 0 psi.

