



Technical Support Document

Valving of SCUBA (Air) Cylinders

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Catalina Cylinders recommends that anyone valving SCUBA (air) cylinders should be aware of the hazards associated with high pressure compressed air and be trained in safe practices of valving SCUBA cylinders. Catalina Cylinders has compiled the list of items below that should be included in all safe practices for the valving SCUBA (air) cylinders. For valving SCUBA cylinders to be used in oxygen enriched air service reference Catalina Cylinders technical support document, Oxygen Compatibility of SCUBA Cylinders and consult recognized authorities in oxygen enriched air.

Valve Removal

1. Verify the cylinder is free of charge and not under pressure before attempting to remove the valve.
2. Only discharge the remaining charge of a cylinder in a well ventilated area.
3. Position the cylinder with outlet port of the valve facing away from all personnel and/or equipment.
4. Slightly ("crack") open the handwheel of the valve discharging or releasing the residual charge. Leave the handwheel of the valve open throughout the valve removal process.
5. Fitting a wrench snugly to the valve body, use force turning the wrench counter clockwise to loosen the valve.
6. If the valve cannot be loosened, stop, remove the wrench and apply a small amount of penetrating release agent at the junction of the valve and cylinder and allow time, 5 - 15 minutes, for the release agent to penetrate the junction.

7. Again attempt to loosen the valve. It may take some time to work the valve free from the cylinder. If a valve is really stuck and a release agent is used, you may have to stop periodically in the removal process and reapply the release agent and allow time for the newly applied release agent to work.

8. When a release agent is used, always clean completely the cylinder and valve of the entire release agent.

Valve Insertion

1. Verify that the cylinder was manufactured for SCUBA (air) service.

2. Verify the valve is a SCUBA valve (typically a k-type valve).

3. Verify that the safety device is the correct safety device, is rated at the test pressure of the cylinder, and has not been actuated or altered (tampered with).
 - Never tamper with the safety device. If the safety device appears to be tampered with, do not use the valve.

 - Never replace the safety device of a valve on a cylinder that is charged.

 - If a safety device has been actuated and the cylinder has vented, then the cylinder may have been overfilled or exposed to high heat.

4. Inspect the inlet threads and outlet port of the valve and the threads and o-ring gland of the cylinder for damage. If either the valve or cylinder has damage to the threads or the o-ring gland area, do not insert the valve into the cylinder.

5. Inspect the cylinder threads and the cylinder internally verifying that the cylinder is free of all contaminants (i.e. release agents that may have been used to remove the valve, moisture, soils, corrosion, etc.). Do not proceed if you feel the cylinder may be contaminated. Reference Catalina Cylinders Technical Support Document, [Cylinder Cleaning](#), for common methods of cleaning a cylinder.
6. Catalina Cylinders recommends the insertion of a new buna-N o-ring, with a hardness of 90 shore, every time the valve of a cylinder is removed and re-installed. Verify that the new o-ring is free of all damage. Following are the buna-N o-ring sizes for the different inlet thread sizes:

Thread Designation	Buna-N O-ring Size
.750 - 16 UNF	210
¾ - 14 NGS (NPSM)	214

7. Catalina Cylinders has found it easiest to place the o-ring on the valve and then insert the valve into the cylinder tightening the valve hand tight. Placing the o-ring in the o-ring gland of the cylinder and then inserting the valve is known to have damaged the o-ring in some instances.
8. Apply a small amount of lubricant, Dow Corning Compound 111, to the end of the valve and the leading 2 to 3 threads of the valve. A small amount of lubricant has been found helpful to reduce galvanic corrosion in the threads of the cylinder.
9. Hand tightening of the valve should seat the valve completely on the cylinder (i.e. no gap between the valve and the cylinder). If there is still a gap between the valve and the bottom of the cylinder lightly tap the valve handle with a rawhide or rubber mallet to seat the valve completely. The valve should only rotate 45° (1/8 of a turn) from the point of hand tightening to fully seated. If you decide to seat the valve using a torque wrench, following are recommended torque values by Catalina Cylinders and the CGA:

Thread Designation	Catalina Cylinders Recommended Torque	Catalina Cylinders Maximum Torque
.750 - 16 UNF	40 lbf-ft	50 lbf-ft
¾ - 14 NGS (NPSM)	40 lbf-ft	50 lbf-ft

10. Close the valve with no more than 1 lbf-ft torque.