



First Time Operation – System Checkout

I. Filling the Cylinder for the First Time

High Pressure Cylinders are shipped empty. Included with each Air Storage Module is an adaptor fitting that will allow the tank to be safely filled to 3300 psig at any facility that is equipped to fill standard scuba tanks.

Alternatively, Cylinders can be filled remotely provided standard safety procedures for filling high pressure cylinders are adhered to.

Compressed Air Supercharging tanks are available in two sizes: 125 scf capacity (aluminum cylinders) and 158 scf (composite wrapped aluminum cylinders). Ratioing your tanks volume to a standard scuba tank (80 scf) and multiplying this times what your local dive shop charges for a normal scuba fill is a good general guideline for what a fill should cost.

II. Electrical System Checkout

With the system completely **depressurized/empty** the operation of the system including data recording and analysis functions should be checked. To do so:

1. If the system has been pressurized, close the Cylinder Valve and bleed all air from the system using the Schrader Valve located in the Mechanical Regulator's outlet fitting.
2. Turn arming switch to "on" position.
3. Activate system by moving throttle to WOT. In Double Redundant Systems the Transbrake/Clutch switch should be in their fault positions (normally closed).
4. When WOT is reached two things should occur: 1) There should be an audible "click" emanating from the Lock-off valve due to pilot operation and 2) The EPR butterfly valve should be driven fully open and the EPR should emit a high frequency "hum".
5. Toggle the engine to WOT and back to idle several times to verify proper electrical system operation.
6. Return arming switch to off position
7. Download data logger using BCU Editor program..
8. Review system performance using BCU Analysis program. EPR should open fully within 100 ms after **Motor Delay** period has expired.



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III. Hose Seal Integrity (External Leaks)

1. Slowly open Cylinder Valve 1 to 1-1/2 turns. This will open the pilot seat. As the pilot begins to open you will hear an audible “rush” as the system becomes pressurized. After approximately 3 seconds, shut the valve.
2. Examine all hoses and fittings for leakage.
 - 3a. If leakage in high pressure AN fittings (hose ends) is noted, check fitting torque; 70 ft-lb maximum.
 - 3b. If leakage in medium pressure hose connections is noted, retorque fittings; 35 ft-lb maximum.

Note: If the fittings still leak after retorquing, chances are that the copper AN seals were not properly seated when installed or were damaged. De-pressurize the system using Schrader valve located in Regulator outlet port. Reset/replace Seals as necessary.

IV. Basic Operational Tips

Pressurizing the System

The Compressed Air Supercharging Bottle Valve used in your system is a unique two stage design. The first 1-1/2 turns open a .060-in orifice pilot valve that allows the inlet of the Mechanical Regulator to equalize with the contents of the High Pressure Cylinder. Once equalized the Bottle Hand Wheel can easily be opened an additional 5 to 5-1/2 turns to maximize flow area and minimize pressure drop. When operating note the following operational characteristics.

1. Turn the Bottle Valve Handle 1-1/2 turns CCW.
2. Wait three seconds. During this period the Mechanical Regulator may make a small “thunk” noise as the internal piston shuts once downstream pressure has reached 100 – 120 psig.
3. Turn Bottle hand wheel additional 5 to 5-1/2 turns until wheel stops.
4. The system should now be ready for operation, once the arming switch is toggled “on”.

Note: In systems with two Cylinders once the first Cylinder’s Valve has been opened and downstream pressure is equalized, the 2nd cylinder should open easily and there will be no “obvious” Pilot Valve movement as pressure is already equalized on both sides of the valve. . This does not impact the total number of turns required to open the valve fully.



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IV. Basic Operational Tips Cont'd

De-Pressurizing the System

1. Shut the bottle valve by turning it full clockwise until wheel stops. You will find it handy to count revolutions as you shut the valve; It is possible to confuse shutting the valve fully with merely coming up against the engagement of the pilot valve shuttle.
2. Remove the cap from the Schrader valve located on the outlet port of the Mechanical Regulator
3. Bleed system pressure by pressing axial on the core of the Schrader Valve.
4. Replace cap when system is empty.

System Cleanliness

Whenever the Compressed Air Supercharging System is not in usage, shut the Bottle Valve fully. The Mechanical Regulator features a special conical chlorofluorocarbon internal seal and hardened burnished seat that is verified to be “Bubble Tight” before leaving the factory.

Contaminants can significantly degrade this seal, resulting in a slow internal leak. If this occurs outlet pressure will eventually reach 140 – 145 psig whereby the downstream PRD will vent to prevent overpressurization. If this phenomena happens, the contents will be emptied over a period of time.

Cylinder Valve Operation

Do not overtorque Bottle Valve Handle when opening or closing. Merely turning the handle up to its stop is adequate to ensure that it is fully open or fully closed. In extreme cases overtightening the handle open can result in a stuck pilot valve, requiring disassembly of the valve to free the mechanism.

Cylinder Pressure Monitoring

Usage of a gauge or pressure transducer to monitor the high pressure side of a system is paramount in obtaining proper performance. CAS recommends and uses exclusively Autometer P/N 4396 in conjunction with the remote high pressure sensor and power source available from CAS under P/N SENS-4000.

The medium pressure side of the system (Mechanical Regulator to EPR) is not usually monitored. However, monitoring pressure at the outlet of the Safety is a great way to get immediate feedback as to how your system is operating and can be valuable should any troubleshooting every be required.