

Proper Operation of Pressure Regulators Yields Long-Term Service



by Frank Scornavacca

Thousands of pressure regulators are sent to the repair shop or the scrap heap because users do not follow basic operating instructions.

Pressure regulators are the workhorses of virtually every gas application. They reduce the cylinder or source pressure to a safe working level. Although simple to operate and maintain, every year, hundreds, perhaps even thousands, of pressure regulators are sent to the repair shop, or worse, the scrap heap, because users do not follow the basic instructions for the operation.

This is a great equation for the regulator suppliers, but not for the users. Provided below are the simple procedures for installing and operating a pressure regulator (Figure 1.).

The Proper Installation and Operation of a Pressure Regulator.

Before installing a regulator, make sure that it is the right regulator for your application. The following are the questions that you should ask yourself:

1. Is it a two-stage or single-stage design?
2. Is it made of the proper materials of construction?
3. Is it rated for the correct delivery pressure range?
4. Is the inlet pressure rating sufficient?



Figure 1. Typical installation of a regulator on a cylinder.

5. Does it have sufficient flow capacity for my application?
6. Does it have the correct regulator-to-cylinder connection commonly known as a CGA connection? [The CGA (Compressed Gas Association) has assigned different connections to each gas to minimize the accidental, inappropriate gas to a system to avoid reactions.]
7. Does it have an outlet valve to control the flow?

If you cannot answer all of these questions, or do not know the correct requirements for your application, do not install the regulator. Call your gas or equipment supplier for assistance.

Be sure to consult your supplier be-

fore attempting to switch regulator gas services. Many gases can react with each other and explode. In some cases, you may be introducing undesired impurities into your system. For example, an oxygen regulator should never be used for anything but oxygen.

The Proper Attachment of a Pressure Regulator to a Cylinder.

Once you are certain that you have selected the correct pressure regulator, make sure that it is installed correctly.

1. Never use Teflon tape or any other thread sealant on CGA cylinder connections. While some of these connections require a gasket, no sealant is necessary to achieve a gas tight connection.
2. Inspect the regulator inlet and the cylinder valve outlet to ensure that they are free of dirt, grease, or other foreign matter.
3. Prior to attaching the regulator, make sure that the cylinder is properly secured to prevent it from falling (see Figure 2).
4. Tighten the cylinder connection using a proper wrench and a gasket if one is



Figure 2. Prior to attaching the regulator, make sure that the cylinder is properly secured to prevent it from falling.

required (see Figure 3). Remember, some CGA connections have a left-hand thread (these connections have a notch on the hex of the nut).



Figure 3. Proper regulator tightening wrench.

The Proper Operation of a Pressure Regulator.

Now that the regulator has been properly installed on the cylinder, let's review the proper way to put the regulator into operation.

1. After attachment and prior to opening the cylinder valve, turn the adjusting knob counter clockwise until there is no resistance. This closes the regulator.
2. Make sure that the outlet valve is closed.
3. Open the cylinder valve slowly to bleed the pressure into the regulator inlet. Constant slamming of the regulator, with full cylinder pressure, by quickly opening the valve, will shorten the working lifetime of the regulator. Now open the cylinder valve fully, but leave the hand wheel loose as an indicator that it is open.
4. Adjust the delivery pressure to the desired value by turning the adjusting

knob clockwise.

5. Now open the outlet valve and adjust it to achieve the required flow rate.
6. Remember, *regulators reduce and control pressure, but valves control flow.*

The Proper Shutdown Procedure.

The proper shutdown procedure is just as important to extending regulator lifetime as the startup procedures.

1. Turn the cylinder valve clockwise to close the valve and shut off the gas source.
2. Allow the pressure to drain from the regulator until both gauges read "zero."
3. Turn the pressure adjusting knob counterclockwise until it turns freely. This assures that the regulator is shut off.
4. It is not necessary to remove the regulator from the cylinder unless the cylinder is to be moved or replaced with a full one.
5. Never attempt to remove the regulator if there is pressure indicated on either gauge.
6. Never move a cylinder with a regulator attached.

Special NOTE: *If the regulator is in corrosive gas service, it is a must that you purge the regulator with dry nitrogen before disconnecting it. A purge assembly can be installed on the inlet to facilitate this operation.*

Summary

Treated properly a pressure regulator can provide many years of satisfactory service. It only takes a few minutes to add years to the life of your regulator.

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