

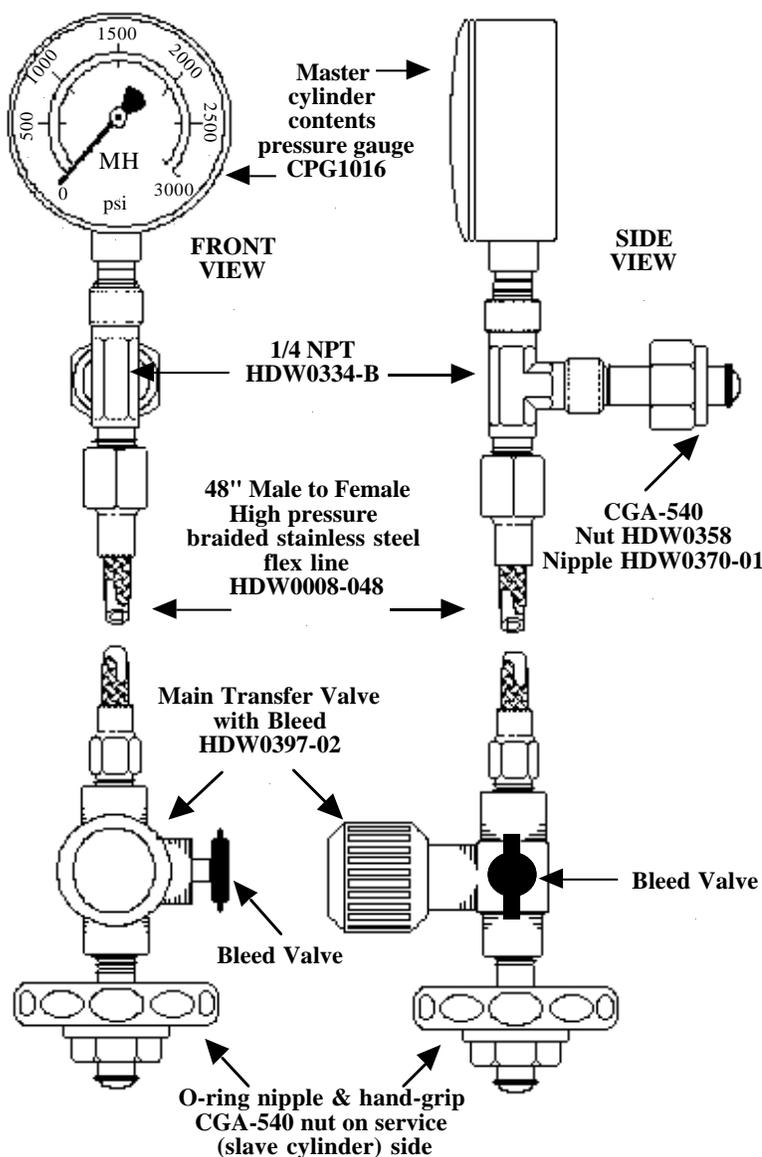
Instruction & Safety Manual

Step by step cylinder transfilling instructions for the TR-95b

SEE REVERSE SIDE FOR SAFETY PRECAUTIONS

The intended purpose of this device is to allow the transfilling (transfer) of compressed oxygen from one cylinder to another.

TR-95b



**SPARE
#011
O-Ring**

DO NOT attempt to unscrew the O-ring nipple ends while the line is under pressure This will damage the O-rings.

1. Make sure that the cylinder fittings are of the proper CGA type and are in good shape and completely free of oil, grease and dirt. You must make sure that the hydro-test date has not expired on the cylinder you are about to refill. This includes checking for correct DOT type rating for refilling for proper pressure.
2. If the cylinder is completely empty, had the valve been left open or is in question, check to make sure it has not been internally contaminated with any combustible materials such as oils, fluids or gases. If you can not assure the cylinder is safe... **DON'T FILL IT!**
3. The TR-95 will make a proper air-tight seal to chrome plated valve heads during transfilling. Securely mount the end with the gauge of the TR-95 to the master cylinder (the cylinder you will be filling from). Connect the hand-grip nut side to the cylinder you wish to refill.
4. Once the TR-95 is securely connected to both cylinders, make sure that the bleed valve and the main transfer valves are both in the full hand-tight shut (clock-wise) position.
5. **SLOWLY** open the valve (counter clock-wise) on the master cylinder to allow oxygen to charge the empty line of the TR-95. Next, **SLOWLY** open the main transfer valve (counter clock-wise) on the TR-95 then **SLOWLY** open the valve on the cylinder to be filled, to start transfilling. You should hear the oxygen transfer. Fill the cylinder at about 50-75 liters/min. For cylinders over 300 liters, you may want to fill them in segments, pausing for about a minute between transfers. This will help keep the cylinder cool and help you detect any problems such as leakage.
6. Once the slave cylinder is filled, shut off its valve (clock-wise) and then the transfer valve. Then **SLOWLY** open the bleed valve on the TR-95 to bleed the small amount of gas from the CGA-540 fitting and not the entire line. The hand-grip nut should then be easily removed by hand. Attempting to unscrew any of the "O" ring fittings while under pressure will cause damage to the "O" rings.

Hazards of high pressure oxygen and Transfilling

Transfilling of gaseous oxygen from one cylinder to another involves hazards associated with the handling of oxygen under pressure. A hazardous condition does exist if high pressure oxygen equipment becomes contaminated with hydrocarbons such as oil, grease or other combustible materials which may include oil from a persons hands or contaminated tools.

A cylinder will heat as it is filled from a high pressure source. The more rapidly the cylinder is filled, the higher the temperature rise in the cylinder resulting from the heat of compression of the gas. Excessive temperature may result in the ignition of any combustible materials that may be present in the system. Refill the cylinder at a flow rate that reduces heating of the cylinder. Use only equipment designed for refilling and transfilling.

Although oxygen itself is nonflammable, materials which burn in air will burn much more vigorously and at higher temperatures in an oxygen enriched atmosphere. If ignited, some combustible materials such as oil will burn in oxygen with explosive violence. Many other materials which do not burn in air will burn vigorously in oxygen-enriched atmospheres. Ignition temperatures are reduced in oxygen-enriched atmospheres. Compressed oxygen presents a hazard in the form of stored energy.

Open the cylinder valve slowly. The rapid release of high pressure oxygen through orifices, control valves, etc. in the presence of foreign particles can cause friction or impact resulting in temperatures which may be sufficient to ignite combustible materials present in the system.

Cleaning the adapter, service line and valve of oil and greases

If any part of the system should become contaminated or you suspect so, you can clean it by hot water and detergent. Do not use the system if it has become contaminated with oil or grease. If the contamination is mild, a liquid form of automatic dishwasher detergent or the cleaning product "Formula 409" has shown to work best for this purpose. This type of detergent is able to cut and remove almost all types of oils or greases and will rinse off without any detectable residue.

To test for contamination take a clean cotton swab "Q-Tip" and wipe the suspected area with it. Next place the tip of the cotton swab into the surface of a plane of CLEAN water while you are observing a clear reflection of light that shows the waters surface. You should not detect any oil what so ever bleed from the cotton tip fanning out over the waters surface. This is an accepted method for oil contamination detection. An oil clean surface will pass this test without any doubt.

If the service line should become contaminated internally by oil or grease it can be cleaned by soaking the entire line in a vat of hot water and a liquid form of automatic dishwasher detergent. Rinse the line in hot water and inspect. If contaminates are still present repeat soaking. Dry the line by hanging it vertically in a hot air or direct sunlight environment. However, if the contamination is more so or severe you may have to perform the cleaning process several times or use a solvent such as "111 trichloroethane".