

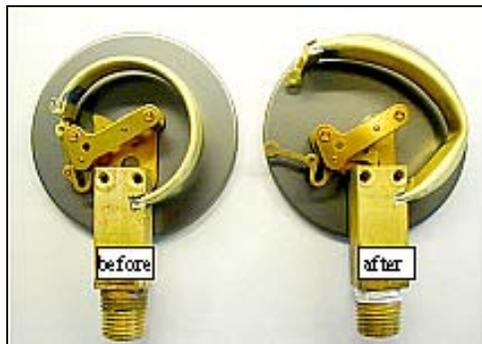
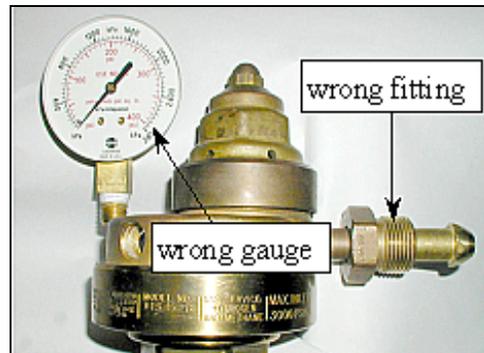
# ES&H UPDATE

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## What's Wrong With... Pressure Regulator Modification?

The trap was sprung but, fortunately, nobody was hurt. Some Fermilab employee unwittingly set a booby trap by changing components on this gas regulator. Modifying two-stage regulators for use on compressed gas cylinders is unsafe and violates Fermilab safety rules. This regulator's 3000 PSI pressure gauge was replaced with a 400 PSI gauge. Also, the regulator's fitting was changed to allow a regulator manufactured for hydrogen and methane gas to be used on a nitrogen bottle. The improperly rated gauge was destroyed when an unsuspecting co-worker tried to use the regulator. The gauge **pictured below** on the right shows how the internal mechanism deformed after being attached to a 2200 PSI gas bottle.



*Hisss...POP! Doinggg...*

The fitting on a regulator is meant to ensure that it is being used safely. The regulator manufacturer installs a fitting style on the regulator to match the style on the gas bottle with which it is designed to be used. Never replace the stem from one regulator with another to *make it work* on the bottle you are using. By changing fittings, a person risks using the regulator at a pressure or with a gas it isn't designed for. Higher pressures and incompatible gases can present explosion risks. Even a less dramatic failure such as a gas leak can be dangerous; gases themselves may be toxic or create an oxygen deficiency hazard by displacing breathable air.

When selecting a two-stage regulator, make sure it is the right type and doesn't appear to be damaged or tampered with. Do not attempt to repair or modify such regulators. Chapter 5031.3 of Fermilab's ES&H Manual specifically addresses gas regulator safety. *No regulator is to be dismantled or altered in any fashion without specific approval of the ES&H Section Head.*

Remember, gas under pressure is a form of stored energy. Accidental release of this energy can have serious consequences to people and property. Be mindful when working with pressurized components and systems. Don't use what you find in a drawer or on a

shelf without considering whether it is appropriate for the job. The Fermilab stockroom carries appropriate pressure system components such as regulators and fittings that are commonly used on site.

When working with pressure systems, it is a good idea to keep the following safety points in mind:

- Pressure systems must be treated with respect, similar to that shown for electrical systems.
- Fermilab employees and users who work with cylinders and cylinder regulators should have cylinder training (FN000213). If you haven't had this training, or are uncomfortable with use of pressurized systems, ask your supervisor to review your Individual Training Needs Assessment (ITNA) with you.
- Keep training handouts and refer to them when questions arise.
- Use the Fermilab ES&H web page for safety information and rules.
- Address unanswered questions with your supervisor or Senior Safety Officer.



Regulator left pressurized after use

This message should be distributed to all employees via delivery of un-addressed copies to Fermilab mail stations. Suggestions for ES&H message topics should be directed to Mary Logue at [grace@fnal.gov](mailto:grace@fnal.gov) or X6329.