

4 Isolation Valves

One of the first things to do when approaching a boiler for operation, aside from proving the glass, is to check the position of the valves. Regardless of how the engine was left, the valves have a curious way of changing position, especially in a museum setting with many inquisitive hands.

4.1 Purpose

Isolation valves are shut-off valves placed in the boiler's plumbing so that a fitting, line, or accessory can be taken out of service without dropping boiler pressure or draining the system. Their job is to let the operator isolate a component for proving, cleaning, repair, or replacement while the rest of the boiler remains fully pressurized and in water. Any line that must occasionally be serviced—steam, water, or blowdown—will have an isolation valve at its boiler end.

4.2 Valve Type

Regardless of type, an isolation valve must:

- withstand full boiler pressure
- withstand steam temperature
- seal positively when closed
- be fully open in normal operation
- be located as close to the boiler shell as practical

If a valve cannot meet those requirements, it is not suitable for isolation duty on a boiler.

4.3 Location

An isolation valve is always installed as close to the boiler shell as practical, so that closing it leaves only a short length of pipe or a single fitting exposed. On a traction engine this includes the steam and water isolation valves for the gauge glass, the turret isolation valve feeding the accessory manifold, the injector steam and water isolation valves, the blower isolation valve, and the blowdown valve at the lowest point of the boiler. Each one sits at the point where a branch line leaves the boiler, marking the boundary between "boiler proper" and "serviceable plumbing."

4.4 Position under operation:

During normal steaming, all isolation valves that serve operating equipment must be fully open so that each device sees true boiler pressure and unrestricted flow. A gauge glass with either isolation valve shut will lie; an injector with its steam or water valve partly closed will not pick up; a blower or turret line with its isolation valve shut will appear dead. Isolation valves are therefore open in service, and closed only when isolating a component for maintenance, proving, or safety.

4.5 Location

In order to check the the isolation valves, one has to know where they are, and whether they should be open or closed. The best way to find the isolation valves is to consider each plumbing section in turn. As a general rule, if there is a fixture connected to the steam or water space, there should also be an isolation valve at the closest point to the boiler.

injectors

- at the feedwater entry
- at the steam supply

main steam line

- at the dome

water column

- on the steam side
- on the water side

whistle

gauge

blower

- on some engines, the blower is fed from the injector steam supply and is isolated when the injector is isolated