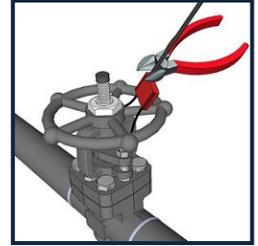


CAR SEAL PROGRAM

What is CSO & CSC?

"CS" stand for Carseal while "O" and "C" are stands for Open and Close respectively.

Car seal is a device used for locking valves in the OPEN or CLOSED positions. CSO stands for Car seal open which means; the valve should remain OPEN during normal operation. CSC stand for Car seal CLOSE which means the valve should remain CLOSE during normal operation. CSO/CSC should be defined considering the hazards and operability issues. Same is marked in the Process & Instrumentation Diagrams (P & IDs) for ease in operation and identification. **In some industries CSO/CSC are also designated as NO/NC which has the same meaning (NO means Normally Open and NC means Normally Closed).**



APPLICABILITY

A common installation of a car seal is on an isolation valve under a Process Safety Valve (PSV) or Pressure Relief Valve (PRV) that must be inspected frequently without shutting down the entire process each inspection.

It is important to note that in the aforementioned installation, redundant Process Safety Valves (PSVs) or specific protocols are in place to ensure safety in the event of an over pressure situation while the isolation valve is in use.

Car seals may also be used for valves that periodically or in special instances are open or closed but must not remain open or closed during normal operations. These valves are noted on Piping and Instrumentation Diagrams (P&IDs) as Car Seal Open (CSO) for a valve that must remain open, and Car Seal Closed (CSC) for valve that must remain closed.

PROCEDURE

A procedure or Car Seal Program contains the following:

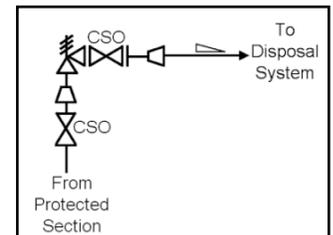
- A list of safety critical valves
- Their safe position (Could be either open or closed)
- A description of their location (e.g. serial numbers), and
- Some type of seal that will prevent the valve from being deviated from its safe position.

This seal can be a plastic tie wrap, chain, or some type of metal banding. Some facilities even using color coding for their seals (e.g. green is for open and red is for closed valves). The physical seal should have suitable mechanical strength to prevent unauthorized valve operation.



FUNCTIONS OF CSC/CSO:

In a process plant, some of block valves shall be put in a fix position for specific reason. For example, a drain valve is Carseal Closed (CSC) to avoid loss of inventory in the event of inadvertently opening of this valve. This CSC valves can assist operator easily identify those valves position can only be altered with specific permission via stringent control procedure. Similarly, pressure relief valve inlet and outlet isolation valves are Car Sealed Open (CSO) to avoid operator inadvertently close.



EXAMPLES OF SEALS USED FOR CSO/CSC PURPOSE:

Nowadays, most (if not all) valve manufactures will have hole cut in valve handles and tabs on the valve bodies. Some valve manufactures will treat this as additional feature by providing a "add-on" adapter with in-built hole. These holes can be lined up and cable seal, plastic / metal strips, etc. Following are some images for different seal type.



Heavy Duty Bolt Lock Can only be cut by special cutting tools



Cable Seal



Plastic Seal

Bringing to you the "Act-Now" solutions of process safety...

An Initiative by:

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