SAFETY BULLETIN
ISSUE # 04-2023

Opportunities to Improve Testing of Positive Air Shutoff Systems

POSITIVE AIR SHUTOFF SYSTEMS

Diesel-powered vehicles or equipment that may be in contact with gaseous hydrocarbons are required to have positive air shutoff systems. Inspectors from the Alberta Energy Regulator (AER) report that these systems are often not tested regularly, increasing the risk of serious incidents.

What they are:

- Safety mechanisms in diesel engines that swiftly terminate airflow when the engine draws in a flammable hydrocarbon vapour.
- Part of a broader strategy for engine protection and overall vehicle safety.

What they are NOT:

- A substitute for routine engine maintenance.
- Devices to prevent the engine from being a source of ignition.
- An anti-theft device or solution for all engine-related hazards.

Did You Know?

Positive air shutoff systems should be activated automatically or manually in the event of an engine runaway and remain on until they are automatically or manually reset.

Image credit: Diesel Power Products

TESTING GUIDELINES

Testing must be performed regularly on this safety critical device to ensure the shutoff valve functions as designed and avoid the potential for serious incidents or engine damage.

- **Testing requirements and frequency** vary depending on specific regulations or standards.
  - AER's Site Directive 37 states that **positive air shutoff systems should be tested weekly** as part of the regular functional testing of diesel engines.
  - The Canadian Energy Regulator advises conducting "inspections, testing and maintenance pursuant to the schedule outlined in procedures or according to manufacturer's specifications."
- **Operational reviews** of positive air shutoff systems, including administrative actions, should be conducted frequently to ensure workers understand hazards when operating a diesel engine in locations with potential hydrocarbon vapours.

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Ensure Optimal Functioning

- Refer to the original equipment manufacturers (OEM) recommendations for instructions on installation, testing and inspection. If these conflict with regulations, consult the OEM and regulatory authorities.
- Ensure positive air shutoff systems comply with applicable regulations and standards.
- Install a redundant positive air shutoff system where necessary.
- Perform regular maintenance, including sensor checks and cleaning, and verifying wire connections.
- Conduct regular testing. Only perform testing in open, well-ventilated areas when the engine is functioning properly, and when the OEM testing recommendations can be followed.
- Ensure operators and maintenance personnel understand how positive air shutoff systems function and identifying and responding to system alerts.

RESOURCES

- Standards and regulatory requirements:
  - Canadian Standards Association (CSA) B621-14; CSA B622-12; CSA B376-09
  - Alberta Energy Regulator (AER) Directive 37 – 230: Air Shut-Offs/Diesel and Gasoline Engine Spacing
  - Canadian Energy Regulator Directive on Positive Air Shutoff Devices
  - Industry Recommended Practice 20: Wellsite Design Spacing Recommendations
  - CMVSS 121 - Air Brake Systems
- Energy Safety Canada Positive Air Shutoff Bulletin – Issue #04-2018
- Chemical Safety Board Investigation Report: Vapour Cloud Deflagration and Fire
- Transportation of Dangerous Goods Notification of CSA Standards updates
- Blog - What is a Positive Air Shutoff System? | AMOT