



FACE Fatal Facts



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Radiator Hose on Truck Ruptures Killing Worker

Background

A 52 year-old equipment operator died from complications after being burned by hot coolant sprayed from a burst radiator hose on his loader dozer. In October of 2003, the loader operator went to inspect his engine after a fire had been extinguished in his engine compartment. After lifting the engine cover, the 2-1/4 inch radiator hose burst, spraying his body with hot coolant. He was airlifted to a burn unit with second degree burns on 25 percent of his body. He died ten days later.

It was later found that the truck was equipped with a hose designed for marine fuel, not radiator coolant. A hose distributor may have recommended this hose to the company. It is not known whether the hose burst because it was the wrong type, it was old, or it was damaged by the fire.

Hazard

The Society of Automotive Engineers (SAE) establishes performance requirements for hoses (and other parts) for specific uses. Radiator or coolant system hoses must meet the requirements of the SAE J20 standard for Coolant System Hoses. Using the wrong type of hose may increase the likelihood of a hose rupturing. Hoses have differences in burst strength, temperature resistance, and chemical compatibility.

Recommendations*

- Use parts approved by the manufacturer of your equipment or vehicle.
- Use hose with the appropriate SAE rating. Only hoses with an SAE rating of J20 should be used in a coolant system. There are other designations that will tell you more about the hose's construction and specific uses (wire reinforcement, heater hose, etc.) and applicability for temperature and pressure extremes and resistance to electrochemical degradation.

Inspect and maintain coolant system hoses.

- Look for kinks and ensure that hoses don't touch hot or moving parts or sharp edges.
- Oil may damage hoses; look for swollen, soft, or sticky sections of hose.
- Check clamp connections for leakage. Tighten clamps and replace as needed.
- Physically check coolant hoses by conducting the following squeeze test.
 - 1) Make sure the engine is cool.
 - 2) Use your thumb and fingers to check for weakness, not the whole hand.
 - 3) Squeeze near the connectors. A critical form of hose degradation occurs within two inches of the ends of the hose.
 - 4) Check for differences in the feel between the middle and ends of the hose.
 - 5) If the ends feel soft, the hose should be replaced immediately.
- Hoses showing signs of wear or more than four years old should be replaced immediately. More frequent hose replacements should be made for fleet vehicles with much stop and go driving, which can cause high engine temperatures.
- Conduct a cooling system pressure test annually or more frequently depending on manufacturer recommendations and working conditions.

Resources:

- Equipment or vehicle dealer or manufacturer.
- Equipment or vehicle users' manual.
- Technical support personnel for the hose manufacturer.
- "Trouble Shooting Cooling System Hoses," Gates Corp,
http://www.gates.com/brochure.cfm?brochure=1023&location_id=541
- "Give a Good Squeeze to Detect a Bad Hose," Gates Corp,
http://www.gates.com/brochure.cfm?brochure=1022&location_id=541
- SAE Standard, "Coolant System Hoses," SAE J20, January 2002, Society of Automotive Engineering.

*Many of the recommendations have been adapted from the two Gates Corporation fact sheets listed in the resources section.



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