



Hot Work Safety: The Case of the Cracked Fuel Tank

OSHA says that exposure to lead occurs in at least 120 different occupations. Overexposure to lead can result in serious illness and death. And according to a recent CDC study, occupational exposures are on the rise.

Use this case study of a real welding accident to train your welders to prevent similar accidents.

The employee was an experienced welder who had worked a year and a half for this employer. He was assigned by his supervisor to weld a 1 1/2-inch-long crack in an empty diesel fuel tank. The fuel tank had been removed that morning from a diesel truck.

The welder did not personally inspect the tank for diesel fuel or fumes before beginning his work. At 7:30 a.m., the welder began to weld with an arc welder unit. The tank exploded at the seam line away from the welder. The welder suffered serious fractures of his jaw, right wrist, and left hand, along with other injuries. The welder was hospitalized for 4 days.

Question for Trainees

Here are some key questions trainers might ask trainees about this case:

- Why do you think the tank exploded?
- Is it important to inspect fuel tanks before welding?
- Is it important to always clean a tank of fuel and fumes before welding it? Why?
- If the welder started work at 7:30 a.m. and the tank had been removed that morning, the tank probably hadn't been out of the truck for much more than an hour. Is that enough time for diesel fuel and fumes to dissipate?
- Who should ensure the tank has been cleaned?
- Do you think "assumptions" or "miscommunication" between supervisor and employee might have contributed to this accident?

Why This Accident Happened

The primary cause of the accident was that the fuel tank was not cleaned before the welder struck an arc on the tank. Although the tank was empty, it still contained diesel vapors at a high enough concentration to cause an explosion.

This may have been a rush job, because the fuel tank was removed that morning, and by 7:30 a.m., the welder was beginning to weld on it. This did not allow enough time to properly clear the tank of diesel liquids and diesel-saturated air. Maybe the welder felt the need to get the job done right away and decided to cut a safety corner by not cleaning the tank.

The supervisor who assigned the job of welding the diesel tank may not have communicated the fact that the tank needed to be cleaned first. He may have assumed that the welder would know to clean the tank first. He may have assumed that whoever removed the tank from the truck had cleaned the tank. Unclear communication and unfounded assumptions are at the root of many serious accidents.

The welder may have assumed that the tank was cleaned first. However, a quick inspection of the tank would have revealed that it was not cleaned when it still smelled like diesel fuel.

Although the accident investigation does not specify, the welder may not have known that the tank should have been cleaned first. Even though he is an experienced welder, he may have never welded a fuel tank before. He may not have been trained properly on the dangers of welding fuel tanks or on how to properly clean and flush out a fuel tank.



5 MINUTE SAFETY
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Preventing These Accidents

Train welders to follow proper procedures for jobs that might have special risks. For example:

- **Clean and flush fuel tanks to remove all residual fuel liquids.** Remember, flushing the tank with a solvent will only replace the fuel with a combustible solvent that also has very flammable vapors. Clean the tank with a water-based solution. Remember to manage the fuel-contaminated cleaning solution appropriately. Do not put it down the sink.
- **Open up the tank and allow it to “breathe”** for a while in order to remove the fuel-saturated air that is contained in the tank. To expedite this process, a fan can be used to help flush the fuel-saturated air out of the tank. Be sure to wear the appropriate protective equipment, such as a respirator, if one is required.
- **Inspect the work and the work area before starting any job.** This welder could have avoided the accident if he had done a quick inspection of the tank. He would have discovered that the tank smelled like diesel. In addition to the job, inspect the work area for any combustible or flammable objects. If necessary, complete a Hot Work Permit before starting to weld.
- **Make sure you are properly trained on the requirements of the job.** Learn about the hazards of the job, and follow all company safe work practices.
- **Never make any assumptions about the work you have been assigned.** Communication is critical for making the workplace safe. If you have any questions, ask your supervisor.