

Mobile Equipment Pre-Heater Failure Issues

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To help TPA members avoid accidents resulting in injury or damage to property, the Timber Bulletin, in association with Lumbermen's Underwriting Alliance, will publish details of actual incidents and what can be done to avoid such occurrences in the future. By sharing this information, TPA and LUA hope to make our industry as safe as possible.

Background:

During the cold winter months the use of pre-heater units that mount on trucks and other mobile equipment is becoming very popular. These pre-heater units are self contained, and fired by diesel fuel. Problems have been seen in the field with the discharge of flames and fuel from the exhaust of these units. The excess use of these pre-heaters this past winter has warranted this discussion about proper installation and the extra time needed for necessary maintenance.

This review involves four different situations where pre-heater units failed and belched flame from the exhaust:

The first involved a delimber unit with a timer system. The operator had set the timer for the pre-heater to start approximately twenty minutes before start-up time. The next morning, another operator was on-site starting other equipment about the time the involved mobile equipment should have been pre-heating. No problem was noticed due to the darkness and location of the involved mobile equipment until the operator arrived. Immediately, a light was noticed coming from the bottom side of this delimber unit, but unfortunately it was too late to control the fire, leading to a total loss.

The next situation also involved a delimber unit, but in this situation the operator arrived at the site as this unit was belching smoke from the exhaust. As this pre-heater unit fired, flames and fuel discharged from the exhaust. The fire was extinguished with a hand-held fire extinguisher. The pre-heater unit was subsequently removed from the piece of mobile equipment.

In another situation, a cut-to-length harvester was equipped with this same type of pre-heater. The heater unit misfired while the operator was on-site, and a small flame flash discharged from the exhaust. The machine's housekeeping was very good, and fortunately no problem occurred. The pre-heater was reviewed, repaired, and the fuel regulator was replaced. No extended problems or damage occurred after the repair of this misfire.

The last situation involved another delimber unit where the pre-heater unit failed to start. During the repair process, a start test was completed, and this pre-heater unit flashed fire out the exhaust. That was the last straw for the owner, and this unit was dismantled. An electric frost plug heater was installed on the engine as an alternative.

Operator:

The involved operators and owners were trained in proper operation of the equipment, specifically including the use

of these pre-heater units.

Accident and/or Injury:

These recent pre-heater problems noted above do have a direct cost involving mobile equipment loss and down time of equipment. No serious injuries were noted; however, these high-stress times (fire) warrant the need for pre-planning for an emergency situation.

Unsafe Act and/or Condition:

It is very difficult to pin down the basic problem in the above situations; however, here are some factors that may have contributed to these failures:

- Improper installation
- Little or no maintenance
- Not following safe operating procedures in use of these pre-heaters
- Failure to clean – or position of – equipment before use of these pre-heaters
- No emergency plan to respond

Lessons from Losses



Example of discharging into the engine compartment – not recommended.



Example of discharging outside the engine and hydraulic compartments – recommended.

to fire situation

The most logical cause of this property loss and these near misses may be little or no maintenance and poor operating procedures. Proper operator training and maintenance will benefit all involved and add to the profitability of a logging operation.

Preventative Measures:

1. Follow proper installation procedures of these pre-heater units. Always utilize the installation manual when installing by yourself or having a mechanic install. In addition, the following should be considered:
 - Locate in a clean safe area
 - Position so maintenance can be easily completed
 - Be sure the exhaust is routed to outside the engine and hydraulic compartments away from the equipment
 - Discourage splices of fuel and electrical supply
2. Complete regular maintenance and upkeep of these pre-heater units before use. Also, during the year, more frequent maintenance may be needed due to use. Examples of these activities include the following:
 - Review the igniter for cleaning
 - Review the air intake/filter
 - Review the fuel regulator
 - Review the heater enclosure
3. Follow safe operating procedures during the use of these pre-heaters. Always utilize the installation and operator manuals before use. Depending on the situation, the following should be considered:
 - Position the mobile equipment so the discharge exhaust is downhill, so that if fuel is leaked it will run away from the equipment
 - Position the mobile equipment so the discharge exhaust falls to the ground and away from the equipment
 - Clean around the discharge exhaust and the surrounding area, including the pre-heater



Example of discharging outside the engine and hydraulic compartments – recommended.

- Inspect the pre-heater
 - Test system
4. Review and train all operators in emergency response. Being prepared in a panic situation (fire or personal injury) can and will help reduce the seriousness of an emergency. Weekly tool box safety meetings work well in reviewing all equipment, danger areas, proper shut-down procedures, etc. Cross-training all employees is very beneficial.