Heavy Equipment Investigation #3

ENGINEERING REPORT

PREPARED FOR:	**TRANSPORT COMPANY #1 MISSISSIPPI**
ATTENTION:	**MS. TONYA STALLS**

INSURED:	TRANSPORT COMPANY #1
DATE OF LOSS:	MARCH 2004
INSPECTION LOCATION:	WRECKER FACILITY #1 GEORGIA
POLICY NUMBER:	N/A
CLAIM NUMBER:	<omitted>
IC1 FILE NUMBER:	**<omitted>**

Introduction

On March 2004, a 2000 Tractor owned by the insured, Transport Company #1 caught fire while the tractor was parked and not operating. The tractor was reportedly parked in a grassy area adjacent to the driveway leading to the Transport Company #1 driver's residence, which was located in Georgia. The driver, Mr. Daniel Downing, was reportedly in the residence at the time of the fire.

On March 2004, Ms. Tonya Stalls of Transport Company #1 contacted the author of this report, Scott A. Jones, P.E., Certified Vehicle Fire Investigator (C.V.F.I.) and Mechanical Engineer of Investigation Company #1 (IC1), (812) 944-9988, to conduct an origin and cause investigation of the subject fire. The observations and conclusions from the investigation are included in this report.

Background

The author did not interview the driver, Mr. Downing, or gain access to his property for inspection. Ms. Stalls delivered .jpg photographs of the loss site to the author for reference. (*Author's note: the .jpg photographs will be maintained in the IC1 Master File for this project*.) The loss scene reportedly appeared as shown in ***Figure 1***.

Figure 1 - View Looking Across Reported Loss Scene

Per the responding fire department report, County Fire-Rescue Incident Report (Appendix A), dated March 2004, Mr. Downing was reportedly burning waste in the open container as shown in the foreground in ***Figure 1***. The "Possible Origin" of the subject fire was listed as "grass fire out of control".

Fire Hazard Index

On April 2004, the author contacted the Georgia Forestry Commission to learn the Fire Hazard Index for the region on the day of loss, March 2004. Per Mr. Chen Cho of the Georgia Forestry Commission, the Fire Hazard Index for Georgia, which was the closest reporting station to the loss site, was "4". The reporting system spanned from 1 to 5A where 5 A represented the highest hazard. On the day of the loss, the fire hazard was listed as "Very High".

Observations

On April 2004, the author traveled to Wrecker Facility #1 in Georgia. Per Mr. Larry Folapyle, driver for Wrecker Facility #1, he utilized a semi-trailer and wench to drag the tractor remnants onto the trailer and transport the same to Wrecker Facility #1.

The tractor was situated in a closed, locked storage yard just south of the Wrecker Facility #1 administrative building. A front view of the tractor is shown in *Photograph 2*. The driver's side appeared as shown in *Photograph 3*. The driver's side diesel fuel tank appeared partially melted, empty, and inverted on top of the cab remnants (*Photograph 4*).

The aluminum passenger's side steer wheel was not damaged by heat, and the wheel bearing was intact as shown in *Photographs 5 and 11*. The top front portion of the aluminum passenger's side diesel fuel saddle tank was melted by heat from the fire, and the tank was approximately ½ full of diesel fuel (*Photograph 6*). Charred and melted debris that had fallen from the tractor was heaped on the cab/sleeper remnants as shown in *Photograph 7*. A large section of the thin aluminum cab enclosure was still in place along the lower edge of the passenger's side cab.

The aluminum tandem passenger's side drive wheels were undamaged from the heat of the fire (*Photographs 8, 9, and 10*). All aluminum drive wheel mounts had melted from the heat of the fire and both drive axles were displaced from their respective installed positions.

The aluminum driver's side wheel nearly melted from the brake drum as shown in *Photograph 12*. The heat from the fire extensively damaged the tandem aluminum front

drive wheels as shown in *Photograph 13*. A small portion of the driver's side rear axle outer drive wheel had melted as shown in *Photograph 14*.

The author inspected the small gauge power conductors that were lying across the cab and engine compartment (*Photographs 15 through 19*). There were no conductor-to-conductor shorting indications discovered, but a large number of electrical conductors in the cab region were parted from the heat of the fire (*Photograph 17*). The conductors leading to the driver's side parking, turn and headlamps were intact and showed no indications of conductor-to-conductor or conductor-to-ground shorting (*Photograph 18*).

The engine alternator, which was situated on the passenger's side of the Detroit Diesel Series 60 engine was partially melted. The alternator output (i.e., B+) stranded copper conductor along with the stranded ground conductor were connected to the alternator. The conductors showed no indications of conductor-to-conductor or conductor-to-ground shorting (*Photograph 20*).

The alternator B+ and ground conductors showed no indications of conductor-to-conductor or conductor-to-ground shorting along their respective spans to the engine starter solenoid (*Photograph 21*). The large gauge battery conductors at the starter solenoid (*Photograph 22*) showed no indications of conductor-to-conductor or conductor-to-ground shorting.

Large portions of the aluminum intake manifold were melted from the engine as shown in *Photographs 23 and 24*. The passenger's side of the engine received relatively less heat flux as shown through the relatively intact aluminum air conditioning compressor and alternator cases (reference *Photograph 20*).

The aluminum-finned air conditioning condenser mounted at the front of the aluminum-cored turbocharger air intercooler experienced a large heat flux along its lower periphery and driver's side edge. ***Figure 1***, which was created from *Photograph 25*, shows the effects of the directional heat flux emanating from below and to the driver's side of the condenser.

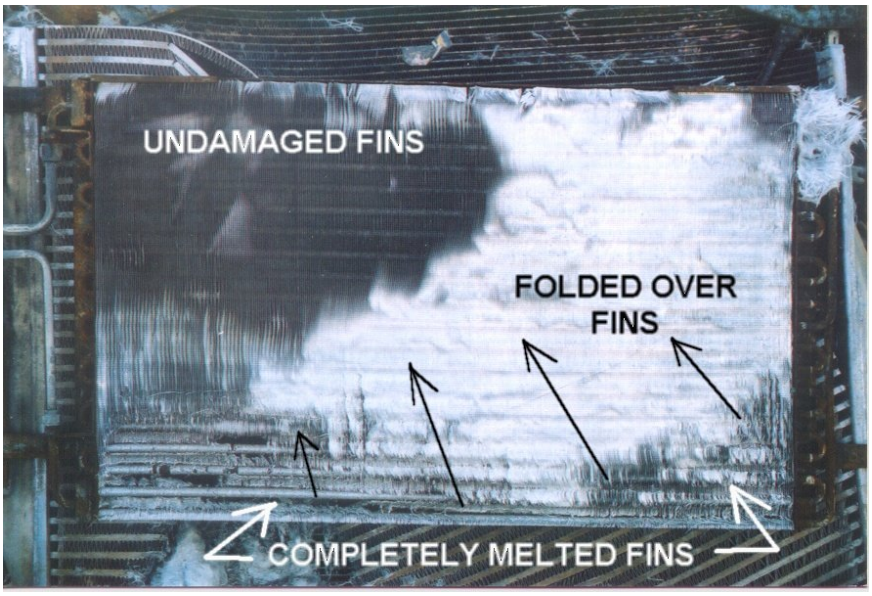

Figure 2 - Directional Heat Flux Directed Toward Air Conditioning Condenser

The aluminum turbocharger intercooler outlet plenum, which was positioned on the driver's side of the engine compartment, received substantially greater heat input than the inlet plenum, which was positioned on the passenger's side. As shown in *Photograph 27*, the inlet plenum was nearly intact, and the outlet plenum was nearly melted from the intercooler as shown in *Photograph 26*.

Discussion/Conclusions

Examination of the tractor remnants revealed that heat-induced damage was greatest at the forward, driver's side quadrant and decreased proceeding to the rear, passenger's side quadrant.

Examination of the power conductors lying in the cab/sleeper region revealed no individual indications of conductor-to-conductor or conductor-to-ground faults. Many of the cab/sleeper conductors were terminated by melting due to the heat of the fire that existed in the region. A large section of the thin aluminum cab enclosure was still in place along the lower edge of the passenger's side cab (reference *Photograph 7*). *It is therefore not believed that the fire originated in the cab/sleeper region.*

The author examined the large gauge, normally energized conductors spanning between the alternator and the starter solenoid. There were no indications of conductor-to-conductor or conductor-to-ground faults along the length of the conductors. The author examined the visible portions of the large gauge battery conductors spanning from the

engine starter/solenoid. There were no indications of conductor-to-conductor or conductor-to-ground faults.

The author examined the small gauge conductors spanning from the engine compartment to the driver's side headlamps, turn signals, and parking lamps and discovered no indications of conductor-to-conductor or conductor-to-ground faults. *It is therefore believed that the small and large gauge conductors situated in the engine compartment of the subject tractor had no causation in the subject fire event.*

The author inspected all of the visible portions of the electrical conductors that might have been energized while the subject tractor was parked and the engine was off. *There were no indications of electrical faulting conditions that might have served as a competent ignition source for the subject fire. Therefore, the ignition source for the subject fire: 1) was not based upon the tractor and 2) consequently, was undetermined. Accordingly, the first fuel to the fire was not determined.*

Author's note:
The author was presented with the data that a grass fire existed in the region of the parked tractor. The heat and fire damage to the tractor was highly directional and consistent with damage that would be expected from a ground-level fire approaching the tractor.

The analysis and conclusions are based upon information reviewed to date, plus general engineering knowledge and experience. Information reviewed at a later date may warrant modifying or augmenting the conclusions.

We appreciate the opportunity to work with you on this evaluation. Pending further direction, this file is considered closed. Please let us know whether we can be of further assistance to you.

Sincerely,

Investigation Company #1

Scott A. Jones, P.E., C.V.F.I.
Mechanical Engineer