



Event Type: Multiple Bulldozer Fires

Dates: August 2021 thru March 2022

Location: Ouachita National Forest
Arkansas

Expect the Unexpected. Stop, Inspect, and Act!

Report Summary

Between August 2021 and March 2022, the Ouachita National Forest had three separate bulldozer fire incidents involving three different operators. Two of these incidents occurred during prescribed burns and one happened during road maintenance.

The Regional Risk Manager assembled a team to assist the Ouachita National Forest in reviewing these three incidents, finding any similarities, and developing any lessons learned. After evaluating the bulldozer fires' elements, the team determined that the Ouachita National Forest has solid and capable primary operators within their Heavy Equipment Program.

Bulldozer operations were completed within policy and training regarding their tasks. During the prescribed fire and road operations, operators acted reasonably and professionally during all phases of these functions. In addition, helpful lessons learned from participants and the team have been shared in this report.

First Incident

Pleasant Hill Ranger District – August 6, 2021

After completing a road opening and maintenance operation on a 2006 John Deere 450J bulldozer, the operator noticed slight changes in the temperature gauge while tracking back. *"It was nothing alarming, but it was not normal. I thought I had busted a hose. I opened the compartment door and saw flames!"* The quick-thinking operator immediately extinguished the fire with the onboard extinguisher.

The operator, for good measure, used an additional water source to ensure the blaze was extinguished. The operator spoke with a John Deere representative who agreed that a possible cause of the fire was a fuel leak. The operator could not pinpoint what the spark cause could have been, or when during the operation the fire had started.

Second Incident

Jessieville Ranger District – March 4, 2022

The Wildcat Prescribed Fire burned 2,002 acres. A primary operator of a 2016 D5K2 bulldozer was holding line after prepping four miles of prepared snags.

As the operator was winding down the day's work at 1500, the dozer panel flashed two caution lights the operator had never seen before. As he continued to track for approximately 50 yards, he saw a small trail of smoke on the left side of the engine compartment door.

The operator stopped, pulled the door open, and saw two-foot flames. Even though he had not seen flying embers or an "ember storm" anytime during the day, the operator thinks a "perfect" series of events allowed an ember to get into the engine compartment and ignite the plastic radiator

"I wanted to save the machine, so I radioed for the UTV pumper. I threw out my shelter and iPad and grabbed the fire extinguisher!"

Dozer Operator

reservoir. The operator extinguished the fire within two minutes with the extinguisher on the bulldozer. The operator tracked out two miles to load the bulldozer onto the transport.

Third Incident

Poteau-Cold Springs Ranger District – March 21, 2022

A few weeks later, the Square Rock Prescribed Fire burned 1,800 acres. The operator was prepositioned on the fireline during the operation using a 2009 John Deere 450J dozer when he received notification of some burning snags.

The operator was pushing over the third snag when the machine died. The operator then saw white smoke coming out of the engine compartment. After grabbing the fire extinguisher, he opened the access door to the engine compartment and noticed the air filter burning.

“I removed the air filters to stop the fire. The air filters were the only thing I could see actively burning. I did not discharge the fire extinguisher for fear of the chemical powder further damaging the engine air intake system.”

After removing the air filters, the operator could not see any visible fire. After a few restart attempts, the operator moved the dozer away from the burning snag to a safer location on the fireline.

“I was able to survey the damage. I found none except the two burned air filters. Once the dozer started, it ran fine with no misses and had full power.”

Next, the bulldozer started making a light squeal sound like a fan belt squealing when the operator saw smoke coming out of the engine compartment. Assuming the embers had ignited in the belly pan, the operator soaked it in water and kept moving. The smoke was visible again while the engine started running rough. The bulldozer was inoperable.

The operator later discovered that the heat was so intense, when the filter pieces began burning, they were getting sucked into the motor compartment, broke every fin off the turbo intake, and flew into the engine.



One of the burning air filters that the operator removed from the dozer.

Lessons and Suggestions

While these three bulldozer fire incidents had different causes, they all have a common theme: Quick thinking and knowing the machine’s subtle hints that something is wrong can save valuable time when an operator needs to act.

1. Not everyone has the expertise to know what issues and maintenance need to be completed on a dozer. Dedicating a portion of the RT-130 Wildland Fire Safety Training Annual Refresher to dozer maintenance would educate a non-heavy equipment person on known issues to be an “extra set of eyes” during operations. For example, a person having this basic knowledge would be able to notify the operator of fluid leaks, debris in the front of the equipment, smoke from the machine, or other potential hazards.
2. Minimize the possibility of an ember storm by training operators to push a snag to the edge from an angle to prevent limbs and embers from showering directly on top of the dozer.

3. Operators must immediately check the air filter when safe with any “ember storm” or indication that embers may have been “sucked into” the air filter. Identifying damage to an air filter would reduce accumulated damage to the equipment.
4. Operators need to pay attention to minor changes in gauges on the equipment. These minor changes may indicate that something more extensive is happening to the equipment. Significant damage can be avoided by simply checking the equipment during these indications.



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