Due to the potential problem presented by the “quarter turn” style caps on Stihl Chainsaws, the decision was made to issue this RLS.

NARRATIVE

A cooperator was assigned to the west side of this prescribed fire to assist in firing and holding operations. Several U.S. Forest Service employees were also working on this side of the fire.

After firing operations had gone through the area, the cooperator was holding the piece of line by himself. He noticed that there was a snag that had ignited, estimated to be about 50 feet tall, with fire toward the top.

To prevent any spot fires from igniting across the north side of the line, the cooperator called a nearby Type 7 Engine to come and suppress the tree. The engine operator attempted to pull a hose line from the Type 7 to the snag, but there was not enough length of hose to reach the snag to adequately suppress it.

After the cooperator and engine operator discussed the situation, it was determined that the cooperator, a properly Red Carded B (2) Sawyer, felt comfortable falling the tree into the black to prevent any spot fires. Earlier in the year, the cooperator had signed the Unit’s Job Hazard Analysis (JHA) for chainsaw work.

Trouble with the Chainsaw Cap

The Type 7 was outfitted with a Stihl 390 chainsaw. The cooperator took the saw from the engine and inspected the bar oil and fuel by removing each cap. When the cooperator tried to put the fuel cap back on, he ran into an issue that is common with the Stihl “quarter turn” caps. Initially, when he tried to turn and lock the cap back into place, it wouldn’t line up into the correct locking position.

When the cooperator removed the cap and inspected it, he didn’t see any issue or damage to either the chainsaw or the cap, and attempted to reset it. He twisted the cap enough that he felt if it were turned anymore he would damage the equipment.

After about five minutes of attempting to force the cap into position, the locking mechanism pushed down, and the cooperator assumed that he had locked the cap into the correct position.
As the cooperator lifted up on the chaps, fuel on his boot and under the chap’s left leg reignited. The two firefighters worked quickly to extinguish the flames.

The tree that the cooperator was cutting down was located approximately 110 feet from the truck. The cooperator climbed the small embankment and headed directly toward the tree to cut it. The engine operator stayed near the Type 7 where he could view both the tree and the cooperator—outside the danger area of the tree falling operation.

The area around the tree was already cleared out. There was plenty of room for egress away from the direction of fall. This meant that the cooperator only had to start the saw for the actual felling cuts. At this point, he didn’t notice any issue with the saw.

Falling Piece of Bark with Embers Ignites the Sawyer’s Chaps
After starting the saw and cutting for approximately 10-20 seconds, the engine operator spotted a piece of ignited bark with embers falling toward the cooperator. The engine operator called out—but wasn’t heard. At the same time, the engine operator noticed a “large flare up” and the saw stopped.

The cooperator was focused on his face cut when the ignited bark lit his chaps on fire. The cooperator immediately stopped, dropped, and rolled. The engine operator ran to him. By the time he got there, the cooperator had removed the top of his chaps, undone the buckles on the right leg, and was working on the left. The flames appeared to be extinguished.

But as the cooperator lifted up on the chaps, fuel on his boot and under the chap’s left leg reignited. The two firefighters worked quickly to extinguish the last of the flames.

They Agree to Wait to Inform about this Incident Until the Prescribed Fire’s AAR
Both individuals started to walk back toward the truck to examine the cooperator for injuries. On the way, they found the chainsaw’s fuel cap about 50 feet from the truck inside the burn. It appeared that the fuel cap had fallen off when the cooperator was initially taking the saw to the snag.

At the vehicle, the engine operator and cooperator discussed the incident. The cooperator was uninjured. The only damage to any equipment was some melting on the inside of the chaps. The outside of the chaps, the cooperator’s boots, and his Nomex all appeared to be undamaged.
The two firefighters agreed that they should bring it up during the prescribed fire’s AAR as a “Near Miss”. At that time, they didn’t think that the incident needed to be shared with either the Firing Boss or the Burn Boss.

They decided to examine the saw and reset the fuel cap. Next, they continued to fall the tree without any other issue.

This incident occurred at 1130. At 1530, during the AAR, the cooperator brought the incident up with the entire group. The Burn Boss called attention to the issue and gathered more information. That evening, the Burn Boss discussed the incident with the District Ranger. Due to the potential problem presented by the “quarter turn” style caps on Stihl Chainsaws, the decision was made to issue this RLS.

**LESSONS**

*Both positive and negative lessons were observed during the course of this incident.*

1. **The Proper Inspection and Training of Stihl ¼ Turn Fuel Caps.**

   These ¼ turn fuel caps have a “false position” when installing them onto the fuel tanks.

   If the inner ring is out of position when attempting to click the cap closed, it will not turn into the proper position—although the fuel cap will fold down and give the impression that the cap is properly closed.

   The direct indication of the cap not being properly seated is that the “tooth” does not fit into the cut groove on the tank lip. Even though it will lock, if a sawyer does not inspect the cap to ensure that tooth and groove are properly lined up, the cap will leak, and potentially fall off.

   It was found that if the cap is in this “false position” and sit into the fuel tank, it can be turned counter clock wise until the sawyer hears a “pop.” This indicates the inner ring has been reset into the proper position. The sawyer will now be able to turn the cap clockwise into the proper locking position.

   This issue was identified in an equipment review conducted by the Missoula Technology and Development Center (MTDC) after a 2014 injury. The recommendation was to include this inspection and issue into S-212. Furthermore, on this Forest, future JHAs will indicate this issue and the ¼ Stihl cap inspection criteria.

   [Click here to see the MTDC equipment evaluation associated with the 2014 Rock Ridge Burn Injury.](#)

2. **Reporting Incident Up Through the Chain of Command**

   The initial incident happened at approximately 1130 on the fireline. Neither the cooperator nor the engine operator reported the event until 1530 at the prescribed fire’s AAR. Therefore, no one else in the chain of command was aware of this incident until four hours after it had happened.

   The individuals involved believed the incident was important enough to bring up at the AAR. But, at the time of the event, they didn’t think it was serious enough to immediately report it.

   This event mirrors several recent U.S. Forest Service incidents in which employees do not want to halt work or burden others after an incident—making the assumption that it will be OK to report it at the end of shift, or the next convenient time they see their supervisor.
Employees, cooperators, or others working with the U.S. Forest Service are required to report an incident immediately to their supervisor at the time of the incident. Employees and others should not have to “guess” what incidents should or should not be reported. The information should run through the chain of command to properly report any and all incidents.

Although there is a perceived “gray line” for which incidents to report, employees should feel confident that they can report any incident without reprisal.

The importance of upward reporting is a reflection of our learning culture. Although the cooperator in this case was not injured, there was some equipment damage and a Near Miss. In some cases, immediate reporting has saved someone else from injury or accident.

This incident could happen on any Stihl saws using the ¼ turn caps, which many of our employees are exposed to. By reporting the incident, we can prevent others from potential injury, and continue to learn from all of our incidents.

3. Proper Training and Qualification

This incident was largely mitigated by the proper use of all PPE, as well as by following proper falling procedures. The cooperator was wearing all of his appropriate PPE, including leather 8-inch tall boots, Nomex pants, and saw chaps.

The majority of the fuel fell onto the chaps and flashed up on the outside without injuring the cooperator’s legs underneath.

Although there was accumulated fuel between the chaps and his boots, by wearing the appropriate and required boots, the cooperator was able to extinguish the flames before the boot was damaged—and, even more significantly, before he was injured.

Additionally, previous to the incident, the local Unit had ensured that the cooperator was fully qualified as a sawyer and firefighter.

Because of the review of the JHA and proper saw procedures, the cooperator maintained a well-controlled safety circle. Had another employee been inside the area, they could have been exposed or injured by the flash of the fuel.

By keeping the engine operator in a safe area as a spotter, provided a rapid response immediately after the event. Although the cooperator was not injured, there was a potential for receiving significant burns. Had he been by himself, this could have resulted in serious negative outcomes.

This RLS was submitted by:
The Forest Safety Officer

Do you have a Rapid Lesson to share?
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