

CALLBACK

From NASA's Aviation Safety Reporting System



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A Day in the Life of a Maintainer



Whether supporting commercial, military, or General Aviation (GA), Maintainers in the aviation industry are some of our most unsung heroes. They work diligently and strive to keep the nation's aircraft airworthy and mission capable. Aviation Maintainers are indispensable and a great tribute to the safest form of transportation in modern history.

ASRS does, however, receive reports suggesting Maintainers are vulnerable to similar types of threats that plague aircrew. Distraction, fatigue, confusion, inexperience, lack of teamwork, communication, or procedural discipline, documentation errors, and understaffing are but a few. Others do exist, and in today's environment, Maintainers face special challenges in preserving the many aircraft that have become temporarily grounded.

This month, *CALLBACK* shares reports that describe situations that a Maintainer or pilot could face daily. Rife with lessons and wisdom, the narratives afford insight into the Maintainer's world and provide an appreciation that...

"...when you see mighty jet aircraft as they mark their way through the air, the grease-stained man with a wrench in his hand is the man who put them there." - *Anonymous*¹

The Eleventh Hour

Shortly after the completion of a 100-hour inspection, this C172 pilot assumed that the aircraft was airworthy. Engine trouble and subsequent discoveries proved otherwise.

■ *I was flying to see a friend and lost power at 9,500 feet. I had intermittent power, but not enough to maintain altitude. I ran through my checklist with no luck and requested priority handling. [ATC]...gave me vectors to ZZZ.... I kept fiddling with the fuel and leaning combinations but had time to take down a phone number for ATC, so I could call after landing. Then I switched to the UNICOM.... I checked the weather and made the airport with about 3,000 feet of altitude to spare. [I made a] spiral descent to downwind and landed without incident. There was a policeman waiting when we landed, and Mechanics [were] on duty.*

I had eleven hours on the plane since a 100-hour inspection. The ignition harness had been replaced during that inspection. At the same time, a new electronic starter was installed. It was apparent to the Mechanic at ZZZ that the

spark plugs had not been removed, cleaned, or replaced. One had ceased firing and was visibly oval shaped from wear. Another had corroded through the ceramic liner and was not firing properly.... All twelve had not been cleaned. There was visible rust on the exterior of two of the other ten. I'm not a Mechanic, but I read the 100-hour [inspection] checklist that mandates a close look at any rusty parts. If the spark plugs were not removed, they didn't do a compression test. The Cessna 100-hour [inspection] checklist calls for a compression test and an inspection of all engine systems.

According to the [Mechanic at ZZZ,] the ignition switch was replaced with a new ACS A-510-2K and matching door locks, and...an Annual Inspection, described under Title 14 CFR 43, Appendix D, was performed.... [The aircraft] was determined to be in an airworthy condition at this time.

Out With the Old, in With the New

A procedure skirted and an assumption unverified produced a threat unnoticed to this Maintenance Technician. Serious consequences thoroughly reiterated the old lessons.

■ *Last week, I was informed that the oil drum [containing unused oil] was running low. After asking Stores personnel more than once over the span of a couple of days to bring new barrels over from our remote storage facility, I went out...near our loading docks to find a barrel [containing unused oil] that we could use.... New barrels [of unused oil] are often stored alongside waste barrels before they are moved.... We found a barrel that appeared to be unused, and we brought it into the hangar. I was informed that a [servicing unit] was filled with waste oil, but that the Mechanics who identified it thought that [the only item]... serviced [by that servicing unit] was an Integrated Drive Generator (IDG), which was [then] flushed and ops-checked good. The [servicing unit] was then put out of service, and the barrel, [which we had brought in], removed.*

ZZZ identified an aircraft that was serviced with waste oil.... The source of this waste oil may have been me moving the barrel from outside, and...several aircraft may have been serviced with waste oil. The Crew Chiefs then worked with Maintenance Control to identify all affected aircraft.

I failed to follow procedures, as I did not verify the barrel to see if it had a serviceable Part/Material Inspection (PMI)

tag. Stores could have eliminated this issue by acting upon requests when they are made or by not storing waste and new oil next to each other. I also should have verified the PMI tag and issued it to the floor when moving the barrel.

Safety, Integrity, and the Bottom-Line

Once in a long while, professionalism suffers when judgment and integrity fade and the bottom-line clouds the clear vision of safety. Kudos to this Aviation Maintenance Technician.

■ During troubleshooting of the [B777] D5L passenger entry door, the flight lock was not releasing, allowing the door to be opened and closed. The outbound Captain approached me and the assigned Mechanic, and asked several times for me, the certifying engineer, to make a false logbook entry stating that the door operated normally, and that he would endorse the fact that he witnessed the correct operation. Each time I refused to acknowledge his request. The driver for his request was...the number of passengers that would need to be offloaded due to an inoperative door.

[When] it was deemed that the door would have to be deferred as inoperative, I was in the flight deck reviewing the [maintenance procedure].... The Captain approached me again and said, "You know, you're killing my company by doing this. If you won't do what I had asked, maybe we can find another company that will do it for us." My response was, "That's not up to me. That's up to the company."

After that, there wasn't any further dialog regarding the serviceable condition of the door.

We All Should Have...

When this Maintenance Technician helped move a CRJ700, the reduced manpower, relaxed procedural discipline, and lack of a clear plan all produced an undesirable result.

■ I was trying to be helpful by staying on overtime to help the dayshift wing-walk the aircraft into the hangar because they didn't have enough people.

The plane arrived back from the gate to the hangar. We hooked up the towbar to the tug to start moving the aircraft inside. Person 2 and I were the only wing-walkers, and Person 3 was on the tug. Person 3 didn't have a tail-walker but started [pulling] the plane inside the hangar, nose in.... Person 3...angled the plane to me so he cleared Person 2's side, because the hangar doors were not opened all the way. After Person 3 cleared the wingtip on Person 2's side, he cut the wheel so the wingtip on my side would clear.... When he cut the wheel, he could no longer see me, and if I went in his line of sight, I would no longer be able to see if the wingtip

cleared.... Person 2 was walking to my side so he could tell how much clearance we had.... That's when I crossed my arms and said, "Cut it, stop," because the wingtip was going to hit the hangar door.... Person 3 kept moving with the tug and hit the hangar door with the right-hand wingtip.... Person 2 even saw me cross my arms and...didn't say anything to the tug driver.

The tug driver should have had a tail-walker before tugging the aircraft, and the hangar doors should have been more open, but Person 3 said it was enough room.... Person 2 should have told the tug driver that I had my arms crossed.

Nuts and Bolts of Maintenance

A B767 engine had been repaired. Training was being accomplished during the engine run test, and an apparent oversight resulted in significant damage to the engine.

■ [We three] Mechanics removed and replaced three fan blades and three opposites for weight purposes. Other blades underwent Non-Destructive Testing (NDT) for damage. After the blade replacement, I was asked to train for engine run qualification. [Two of us] were being trained. We did an engine run for vibration per the Airplane Maintenance Manual (AMM), test number six.... [Ground Operations] pushed us into location, and they were out front with communications with us and Tower.

The vibrations for the fan were out of limits high: We couldn't go above 76 percent. We then returned to the gate, and [the Trainer] called Maintenance Control. [The Trainer] said that they instructed him to have [the team of three] remove the spinner and run the engine again.

We pushed back for more engine run training.... The Trainer was in the First Observer's seat.... Another Mechanic was in the doorway. Ground Operations was in front of the aircraft in a car, and all were in communications with Tower. We ran both engines up, and the vibrations were lower than before and closer to within limits. We taxied back to the gate and shut down. When we got out, the Mechanics on the ground informed us that, when we started to go to full power, they heard a noise. Neither Ground Operations nor Tower...informed us of this. We then looked at the engine and noticed the damage to the blades and cowling. We called Maintenance Control and informed them.

The barrel nuts for holding the spinner on came out of their respective mounts and flew into the blades and engine [inlet] acoustic [liner], creating the damage.

1. "Remembering the Forgotten Mechanic" - Anonymous

ASRS Alerts Issued in March 2020	
Subject of Alert	No. of Alerts
Aircraft or Aircraft Equipment	2
Airport Facility or Procedure	5
Maintenance Procedure	1
TOTAL	8

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 A Monthly Safety
 Newsletter from
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 Aviation Safety
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 P.O. Box 189
 Moffett Field, CA
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<https://asrs.arc.nasa.gov>

March 2020 Report Intake	
Air Carrier/Air Taxi Pilots	4,580
General Aviation Pilots	1,144
Flight Attendants	623
Controllers	364
Military/Other	255
Mechanics	204
Dispatchers	152
TOTAL	7,322