

Low Pressure – Fuel Leak From Clamps



Updated:
05/21/2021

BACKGROUND

- Engines reported leaking from low pressure fuel lines in fuel filter assembly.
- Leaks reported on L9 engines.
- OEMs reporting leaks from hose: Gillig, Spartan Motors, and Tiffin.
- Onsite mechanics reported leaks coming from clamp around quick connect fitting.
- Sort failure rate table in bottom right corner.

FAULT CODE/FAIL MODE

- Class 5 Fuel leak reported from low pressure hoses.

ROOT CAUSE

- Class 5 leak detected at the customer locations.
- OEM found steady leak coming from the area of the clamps on low pressure hoses.
- Intermittent failure across shipped engines.
- Part numbers impacted: 5563641, 5563642, and 5563643 supplied by Imperial.
- Adding torque to the clamps resolved the leak.

Completed

- Current Step 3 actions completed at RMEP include:
 - Lineset hold initiated to sort product at RMEP.
 - Onsite mechanics requested to tighten clamps using Oetiker tool.
 - Inspection hold and screening initiated to test parts prior to assembly.
 - Pressurized (90psi) testing for leak detection. ESNF 74783822
- Step 6 actions/investigations:
 - Reviewing supplier process controls.
 - Evaluating modification of clamp from the supplier assembly.

NEXT STEPS

- Step 6 implementation discussions with supplier.
- Review overall design of the hose for opportunities for improvement.



| Part No. | Tested | Rejects | Reject Rate% |
|----------|--------|---------|--------------|
| 5563641 | 2244 | 213 | 9.49 |
| 5563642 | 584 | 39 | 6.67 |
| 5563643 | 339 | 3 | 0.88 |
| Totals | 3167 | 255 | 8.05 |

From: [REDACTED]
To: [REDACTED]
Date: Monday, June 07, 2021 8:49:08 AM
Attachments: [image003.png](#)

Thank you,

[REDACTED]
Product Safety Specialist
EJU Product Safety

Cummins Inc.
500 Jackson Street, Mail
Columbus, IN 47201 USA
[REDACTED]

From: [REDACTED]
Sent: Friday, June 04, 2021 3:57 PM
To: [REDACTED]
Cc: [REDACTED]
Subject: FW: Leaking fuel lines

FYI example of communication between [REDACTED] and CMI on fuel line leaks

[REDACTED]
Customer Quality Assurance Manager
Cummins Inc.
Rocky Mount Engine Plant
9377 N US Highway 301
[REDACTED]

From: [REDACTED]
Sent: Friday, June 4, 2021 2:10 PM
To: [REDACTED]
Subject: FW: Leaking fuel lines

Hi [REDACTED],

This is one email that I have with Gillig Bus. The QA guy is [REDACTED].

From: [REDACTED]
Sent: Thursday, May 20, 2021 9:03 AM
To: [REDACTED]
Subject: RE: Leaking fuel lines

Thanks [REDACTED],

I will get these into RMEP's MNC system!

From: [REDACTED]
Sent: Thursday, May 20, 2021 9:01 AM
To: [REDACTED]
Subject: FW: Leaking fuel lines
Importance: High

FYI, another complaint came through this morning from Gillig.
Found out from [REDACTED] these leaks were on the following ESNs:
74780638
74780686
74781910
74781835

Thanks [REDACTED] for helping with the clean point date, let me know so we can check if current preventative action is robust or not.

Best,
[REDACTED]
Sr. OEM Customer Quality Engineer
Customer Integration – Bus
Cummins Inc.
[REDACTED]
[REDACTED]

From: [REDACTED]
Sent: Thursday, May 20, 2021 8:33 AM
To: [REDACTED]
Subject: RE: Leaking fuel lines
Importance: High

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Good morning [REDACTED],

We are continuing to see fuel lines leaking at start up, yesterday we had 3 buses in a row that leaked. Currently Cummins rep is doing a fix as fail online but we need to get ahead of this, can you please push to have all fuel lines either replaced or the crimps checked on all of our Cummins engines in stock before getting installed.

Do you have serial numbers for the clean point of the engines coming out of your plant that have been tested before shipping?

What is the status of your hose suppliers investigation/analysis of the leaking hoses that have been returned?

[REDACTED] | Supplier Quality

[REDACTED]



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From: [REDACTED]
Sent: Friday, May 07, 2021 8:19 AM
To: [REDACTED]
Subject: RE: Leaking fuel lines

Hello [REDACTED]

The returned parts were received at supplier's end this week. They are going to do testing to calculate exact mass flow leak rate. This testing and analysis will help with identifying the root cause. The crimping tool is advised as a tightening measure to fix the leak at Gillig, this is a temporary action for now.

I can also comment that while the investigation is ongoing at our supplier, we are working to set up a leak test system at our warehouse as well as supplier's manufacturing facility. I am working to get more answers, will continue to keep you updated.

Best,

[REDACTED]
Sr. OEM Customer Quality Engineer
Customer Integration – Bus
Cummins Inc.

[REDACTED]

From: [REDACTED]
Sent: Thursday, May 6, 2021 12:23 PM
To: [REDACTED]
Cc: [REDACTED]
Subject: RE: Leaking fuel lines

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Good morning [REDACTED],

Do you have an updates to report on this issue? Talking with [REDACTED] today he commented that the last few leaks he was able to fix using the crimping tool that was provided to him to re-crimp the hose bands. Does the issue trace back to a crimping problem that the hose supplier was having? Has the root cause been found on their end?

Thank you

[REDACTED] | Supplier Quality

[REDACTED]



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From: [REDACTED]
Sent: Friday, April 23, 2021 6:02 AM
To: [REDACTED]
Subject: RE: Leaking fuel lines

Good morning [REDACTED],

At Cummins we use a 7 step product problem solving process to resolve identify, define and resolve issues. Step 3 is what we consider a temporary fix to an issue until a permanent solution is identified and implemented. The step 3 in this case is ensuring Gillig does not receive further hoses with a leak defect.

Hope that helps on clarity, let me know if you have any questions.

Thanks,

[REDACTED]
Sr. OEM Customer Quality Engineer
Customer Integration – Bus
Cummins Inc.

[REDACTED]

From: [REDACTED]
Sent: Friday, April 23, 2021 4:17 AM
To: [REDACTED]
Subject: RE: Leaking fuel lines

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Good morning [REDACTED]

What is "STEP 3"?

[REDACTED]

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From: [REDACTED]
Sent: Thursday, April 22, 2021 3:36 PM
To: [REDACTED]
Cc: [REDACTED]
Subject: RE: Leaking fuel lines

Hello [REDACTED]

We currently have a STEP 3 at the plant leak testing the fuel hoses to the maximum shop air pressure. There is also a dock closure in place at RMEP for this part to ensure defective ones are screened.

Our Supplier Quality is working with the supplier to get a Step 3 implemented from their end. Will keep you posted on findings.

Thanks,
[REDACTED]
Sr. OEM Customer Quality Engineer
Customer Integration – Bus
Cummins Inc.

[REDACTED]

From: [REDACTED]
Sent: Wednesday, April 21, 2021 1:01 PM
To: [REDACTED]
Subject: RE: Leaking fuel lines

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Good afternoon [REDACTED]

Do you have any updates from your supplier on the leaking fuel lines?

[REDACTED]

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From: [REDACTED]
Sent: Friday, April 16, 2021 7:09 AM
To: [REDACTED]
Subject: RE: Leaking fuel lines

Hello [REDACTED]

I have been in touch with [REDACTED] about this issue. The hoses that the leak was observed on have been sent back to RMEP for analysis. We are currently in the process of reviewing these for root cause investigation with the supplier. I will keep you posted as soon as we have our findings and corresponding next steps.

Thanks,
[REDACTED]
Sr. OEM Customer Quality Engineer
Customer Integration – Bus
Cummins Inc.

[REDACTED]

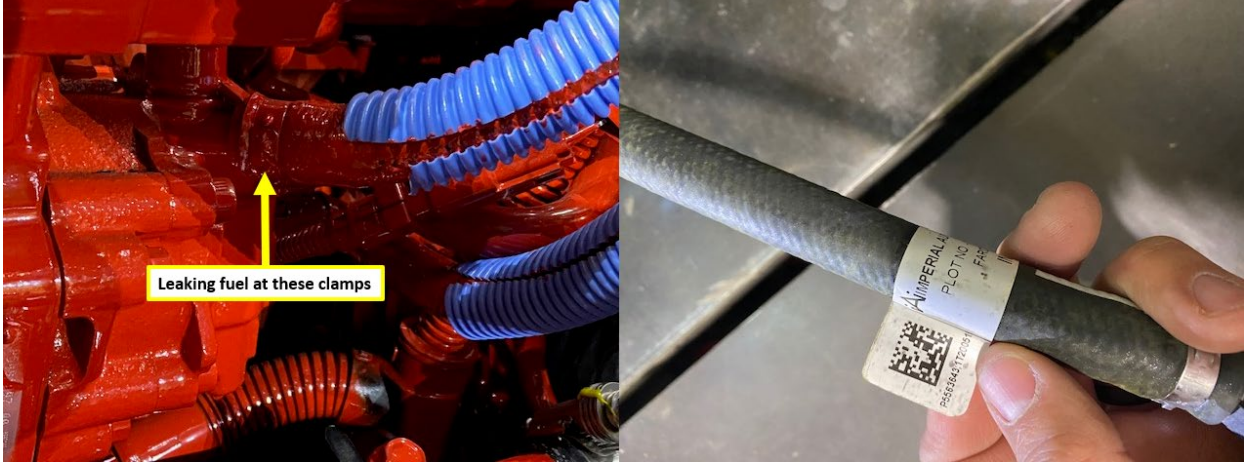
From: [REDACTED]
Sent: Friday, April 16, 2021 10:01 AM

To: [REDACTED]
[REDACTED]
Subject: Leaking fuel lines

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Good morning [REDACTED]

I am [REDACTED] part of Gillig quality team, I got your contact info from [REDACTED]. We are currently having issues with fuel lines leaking fuel at the clamps, [REDACTED] is replacing another 2 hoses today. Have you started a failure analysis or found a root cause of this issue yet? Please let me know what has been found.



[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

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