SS 1033055 Cummins Fault Code 4277 - DEF Exhaust Fluid Quality Unavailable

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Applicable Vehicles

M2 with Cummins ISL with 2016 OBD (possibly others as well)

Symptom

Cummins fault code 4277 (SPN 3364 FMI 10)

Solution

Cummins defines the fault and lists possible causes as follows:

Aftertreatment Diesel Exhaust Fluid Quality - Abnormal Rate of Change. The Urea Quality Sensor has been unable to generate a concentration value for a period of time

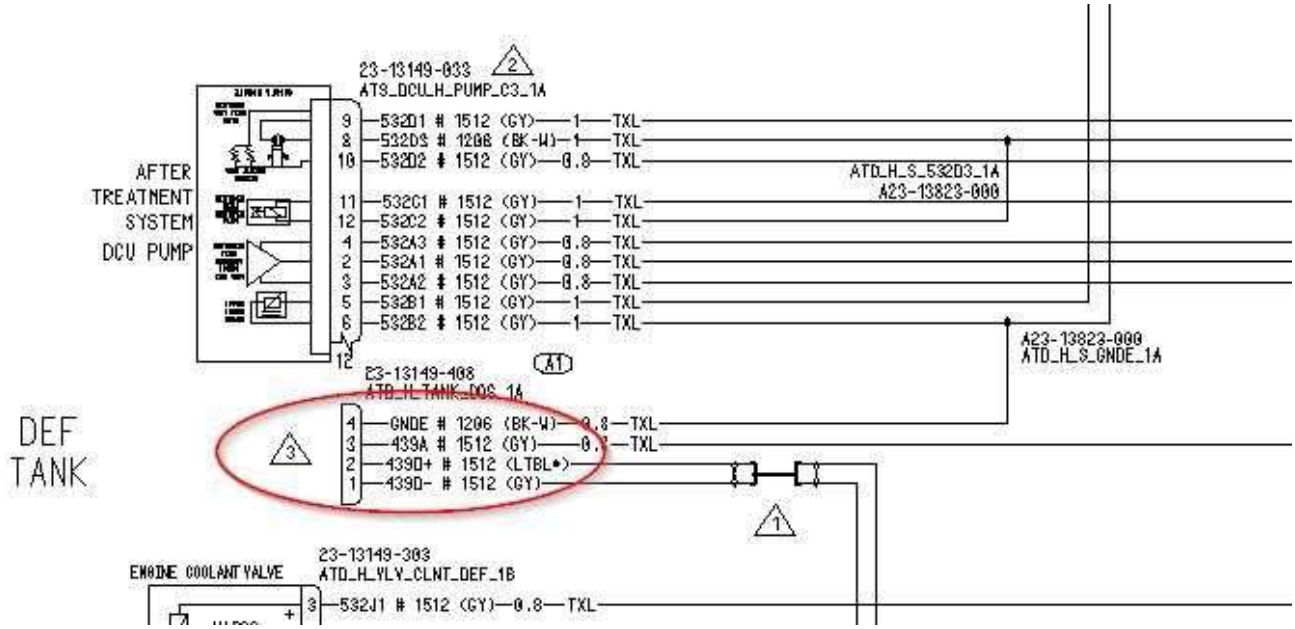
Possible causes of this fault code include:

-Low aftertreatment diesel exhaust fluid level in the diesel exhaust fluid tank
-Shorted or open J1939 data link wiring
-Malfunctioning Aftertreatment DEF Quality Sensor

The following is intended to supplement published Cummins troubleshooting:

For wiring diagrams related to the DEF Quality Sensor (DQS), see modules 28F and 43V.

Referring to the diagram below, the circled connector connects to the DEF Quality Sensor (DQS):



First, verify there is DEF in the tank. Assuming that is the case, proceed as follows:

At the DQS 4-pin connector shown above, verify the following:

- Check for ignition power and ground on pins 3 and 4. Use a test light with an incandescent bulb (something that draws some load) to verify.
- Check for 60 ohms across pins 1 and 2

NOTE: The datalink on pins 1 and 2 is a Cummins proprietary datalink (Cummins refers to it as J1939). It is not part of the vehicle's J1939 datalink.

If the above checks at the 4-pin DQS connector reveal a problem, further troubleshoot the wiring as necessary. If the above checks indicate no wiring issues, replace the DQS.

Labels :

Business Class M2 **Freightliner** **Powertrain & Driveline**

cummins

Add tags

4 Kudos

Comments

Keith_Govenlock 07-24-2017 11:27 AM

Seeing this fault in 1 fleet 4 times in the last 2 weeks. All header failures. Vin#s JE5125, JE5126, JE5127, and JE5128. Units have come in with inactive codes, after updating ECM calibration and performing parked regens, after unit idles for 5 minutes the fault becomes active.

Keith_Govenlock 07-24-2017 11:28 AM

FC 4739 and 1715 also show up.

Keith_Govenlock 10-25-2017 09:45 AM

Unit JE5126 had DEF header replaced in July. Unit is back again with Intermittent F/C 4277. Is anybody else seeing failures of the quality sensor?

1 Kudo

Chaz_Trimble 10-26-2017 08:34 PM

Had our first of these a few weeks ago. Makes the repair more difficult when there have been repeat failures. Hands are pretty much tied. The three sensors being data linked from the same unit means if one sensor is faulting by itself the header is likely failed. Still check ignition, ground, and data link. I feel ya on this one Keith.

1 Kudo

Ernesto_Luzania 10-29-2017 10:28 AM

We've also experienced troubleshooting this sensor multiple times on the same unit. It feel wrong somehow to replace again, but after verifying calibrations, DEF quantity and quality, the only thing left was to Voltage drop B+ and ground. We also back-probe J1939 to check communication traffic, and lastly disconnect and check for proper resistance. The spec we used was 60 ohms (+/- 6 ohms). When all this checks out, we've replaced again. Its been noted in our fleet that a few of these DEF units seem defective.

Keith_Govenlock 10-30-2017 04:13 AM

Yes it does seem wrong that we have repeat failures only months apart and it is component related. 3 sensors and only 1 faulting makes it highly unlikely that a wiring issue is to blame when they are multiplexed. So is it a tolerance issue in Cummins programming? How often does the quality sensor report and when? To me it would make sense that it only reports after system warm up for 1 time after engine start. Quality is not likely to change between that time and engine shutdown. Could possibly avoid some of these codes. In the case of our particular unit, codes were inactive at time unit was brought to our shop. Customer stated unit was in full derate, but when I went to unit, no lights on and functioning normal. All checks come up normal. So clear codes and release unit. Have not seen truck back yet.

1 Kudo

Ryan_Seibert 10-30-2018 07:40 AM

We also perform the troubleshooting like shown, since no other troubleshoot can be found. The truck has come back but the warranty group chargeback the claim as no problem found. We need better troubleshooting between Freightliner and dealers.

Robert_Cadell_J 10-30-2018 10:33 AM

Ryan, give me a vin (last 6) and a Engine serial if you can a copy of what you guys did.

Rob "Doc" Cadell

Diagnostic Technician

TransChicago Truck Group BFWD

Shorewood,IL

815-600-8301 Shop 803-917-5397 Cell

Ryan_Seibert 10-30-2018 10:37 AM

Here you go.

Thanks,

Ryan

Robert_Cadell_J 10-30-2018 10:52 AM

I got nothing bud no attachment

Ryan_Seibert 10-30-2018 10:59 AM

Try this

Thanks,

Ryan

Robert_Cadell_J 10-30-2018 11:03 AM

Nope again, not a last 6 of vin is fine

Ryan_Seibert 10-30-2018 11:12 AM

The attachment must be getting removed. Vin# HY0857

Thanks,

Ryan

Robert_Cadell_J 10-30-2018 11:42 AM

I found the T.S from Cummins and it isn't worded well, I cant attach it theres no where to attach it to this, 439A is ignition, the 439D- and D= are data bus and grnd is grnd, check the databus side like you would a truck both ohms and voltages, I'd load test the ignition to about 10 amps give or take verify ground.

Ryan_Seibert 10-30-2018 11:45 AM

Will do

Thanks,

Ryan

Robert_Cadell_J 10-30-2018 11:49 AM

It's just my 2 cents it's a repeat issue check the wiring

Rob "Doc" Cadell

Diagnostic Technician

TransChicago Truck Group BFWD

Shorewood IL 60404

803 917 5397 cell

Keep digging you'll find the answer

Robert_Cadell_J 10-30-2018 11:52 AM

Put a head light on the ignition ground out to your ground with in the 4 pin, if it holds I'd say your good on that side

Rob "Doc" Cadell

Diagnostic Technician

TransChicago Truck Group BFWD

Shorewood IL 60404

803 917 5397 cell

Keep digging you'll find the answer

Ryan_Seibert 10-30-2018 11:54 AM

The truck didn't come back, warranty chargeback for no problem found.

Thanks,

Ryan

Chaz_Trimble 10-30-2018 08:53 PM

Check out Cummins J1939 isolation tool part # 5299465. Great way to test and or help resolve intermittent issues such as the DQS. Connects Cummins components to the Cummins diagnostic port on the engine harness bypassing the OEM Cummins private data link. Power and ground comes from the cigarette lighter. This way if the unit faults you know it's the component causing the issue. Has adapters for VGT, Nox sensors, ect.

2 Kudos

Robert_Cadell_J 10-31-2018 04:45 AM

So could we add something like this to check our databus? test.justin.johnso strip47 D70TASI Deactivated user D70ERBL

2 Kudos

Robert_Cadell_J 10-31-2018 04:50 AM

Or at least look into it ?

Rob "Doc" Cadell

Diagnostic Technician

TransChicago Truck Group BFWD

Shorewood,IL

815-600-8301 Shop 803-917-5397 Cell

1 Kudo

Chaz_Trimble 10-31-2018 04:54 AM

We think a lot alike Doc, I say absolutely. It's a great way to quickly identify/narrow down an intermittent wiring issue. Would like to have some things added that it in that could make it even better.

Robert_Cadell_J 10-31-2018 05:21 AM

Well talk soon, theres alot to be added or looked into, I'll post this on our list

Rob "Doc" Cadell

Diagnostic Technician

TransChicago Truck Group BFWD

Shorewood IL 60404

803 917 5397 cell

Keep digging you'll find the answer

Chaz_Trimble 10-31-2018 05:23 AM

Nice

Scott_Trippel 10-31-2018 06:22 AM

Have you used it Rob?

Do you have a instance where it was use ful?

I think it would be useful to a cummins didstributer where they have no access to an OEM wiring schem.

Robert_Cadell_J 10-31-2018 06:28 AM

I haven't unfortunately theres so many cool tools like this I'd love to try and use its frustrating

Rob "Doc" Cadell

Diagnostic Technician

TransChicago Truck Group BFWD

Shorewood IL 60404

803 917 5397 cell

Keep digging you'll find the answer

Chaz_Trimble 11-01-2018 06:10 PM

I used it specifically for diagnosing the DQS. Unit had multiple faults for the DQS but after reviewing the ECM image it showed the quality sensor faulting separately from the other sensors in the header. The sensors all have their data sent over the Cummins J1939 together. They share power supply, ground, and J1939 connections. So if only one

of the sensors faults, that sensor is failing. The sensors are not serviced. Didn't want to go through the revolving door scenario I had read about on here. Customer had already installed 3 DQS's on the truck in a year themselves. All circuits and terminals passed all tests. People were sceptical and did not want to replace the header again. Used tool and had customer take it for a day. Unit threw a fault for the quality sensor only. Replaced DQS and unit hasn't had a problem since. Good tool for a situation like this but most issues can be resolved with normal diagnostics.

Kyle_Siebert 11-01-2018 06:48 PM

Is this sensor just sensitive to static electricity? Oils on the fingers in certain areas? Another example of us not understanding how the system works to figure out why it's failing.

How does a DEF quality sensor work? proprietary information...

Can't really fix it is understandable. But knowing how it works could help figure out why it keeps failing.

Its just a magic box.

1 Kudo

Ryan_Seibert 11-01-2018 07:00 PM

Agree.

Sent from my iPhone

Thanks,

Ryan Seibert