42–080 ABS Wheel Speed Fault Code Correction for MBSP Equipped Vehicles

TSB-42-080-FTL

Creation Date:2024-05-13
Last Revision Date:2024-10-09

Engine or Vehicle Affected:

▸New Cascadia

Description of Revisions: This bulletin replaces the version dated 08/28/2024. Added metadata for fault code.

This is an informational bulletin only. If the described condition exists, base warranty or extended warranty applies.

Described Condition

This bulletin only applies to New Cascadia vehicles that were built after September 9, 2019, and are experiencing repetitive occurrence rear axle antilock brake system (ABS) fault codes. The following instructions provide information on how to diagnose and fix the ABS codes, thereby reducing the chances of future contamination that could lead to more fault codes. They also offer supplementary and improved guidelines for diagnosis and repair.

NOTE: Confirm the ABS ECU part number is one of the following. See Table 1.

Table 1, ECU Part Numbers

400 864 815 0	400 864 821 0	400 864 825 0	400 867 178 0	400 867 183 0	400 867 130 0	400 867 113 0
400 864 816 0	400 864 822 0	400 864 826 0	400 867 179 0	400 867 184 0	400 867 131 0	400 867 114 0
400 864 817 0	400 864 823 0	400 864 827 0	400 867 180 0	400 867 185 0	400 867 132 0	400 867 115 0
400 864 818 0	400 864 824 0	400 864 828 0	400 867 181 0	400 867 186 0	400 867 133 0	400 867 116 0
400 867 119 0	400 867 128 0	400 867 135 0	400 864 836 0	400 864 841 0	400 867 101 0	400 864 801 0
400 867 120 0	400 867 129 0	400 867 136 0	400 864 867 0	400 864 842 0	400 867 102 0	400 864 802 0

400 867 121 0	400 867 125 0	400 867 137 0	400 864 838 0	400 864 843 0	400 867 103 0	400 864 803 0
400 867 122 0	400 867 126 0	400 867 138 0	400 864 839 0	400 864 844 0	400 867 104 0	400 864 804 0

Table 1, ECU Part Numbers

NOTE: Ensure that the **ABS software** is updated to the latest version. To update the software version, go to https://www.zf.com/products/en/cv/footer/downloads/downloads.html#accordeon_1_664701_0 and download the file '**mBSP Flash Tool**' of **TP19072**.

Verifying the ABS Wheel Speed Fault Code

1. ☐ Park the vehicle on a level surface, place the vehicle in neutral, shut down the vehicle, and set the park brake. Chock the tires.
2. ☐ Open DiagnosticLink® and connect to the vehicle.
3. ☐ Ensure that DiagnosticLink is updated to the latest version (8.19 at time of publication) or newer.
4. ☐ Are any of the following active/inactive fault SPNs present? See Table Fault SPNs 2 active/inactive fault SPNs present?

Table 2, Fault SPNs

SPN 791	Left Forward differential
SPN 792	Right Forward differential
SPN 793	Left Rear Differential
SPN 794	Right Rear Differential

Table 2, Fault SPNs

   a. ☐ **YES** → Go to Step 5.
   b. ☐ **NO** → No action required.

> 👉 **Note:** FMI 1 and FMI 7 are also triggered due to rear drive axle ABS harness failures.

5. ☐ Are either of the following fault FMIs present? See Table 3, fault FMIs present?

Table 3, Fault FMI

FMI 1	Reflects an air gap failure
FMI 7	Reflects a tone wheel failure

Table 3, Fault FMI

   a. ☐ **YES** → Go to 'Inspection of Harness Displayed as Faulted in DiagnosticLink'.
   b. ☐ **NO** → This service bulletin doesn't apply.

Inspection of the Harness Displayed as Faulted in DiagnosticLink

6. ☐ Are the wheel speed sensor and air gap between the sensor and tone ring (0.04-inch max) warped?
   a. ☐ **YES** → Repair and replace as needed.
   b. ☐ **NO** → Go to step 7.

> 👉 **Note:** Go to https://www.zf.com/products/en/cv/home/cv.html and search 'TP2303' for troubleshooting instructions.

7. ☐ Test the resistance at wheel speed sensor (WSS). Is the resistance between 900 to 2000 ohms?
   a. ☐ **YES** → Go to step 8.
   b. ☐ **NO** → Replace the sensor.
8. ☐ Test the WSS voltage. Is the sensor voltage at least 0.2 VAC at 30 RPM?
   a. ☐ **YES** → Voltage and resistance meets the specifications, reconnect WSS. Go to step 9.
   b. ☐ **NO** → Replace the sensor. Go to step 9.
9. ☐ Test the resistance from the ABS module to the WSS.
   a. ☐ If the resistance is not within 1 ohm of the wheel speed sensor reading, go to step 10.
   b. ☐ If resistance is within 1 ohm of the wheel speed sensor reading, go to step 11.
10. ☐ Check the wire integrity from the WSS to ECU.
    a. ☐ If the resistance is not within 1 ohm of the wheel speed sensor reading, go to step 12.
    b. ☐ If the resistance is within 1 ohm of the wheel speed sensor reading, go to step 11.
11. ☐ Refer to DiagnosticLink. Are there any active air gaps, tone rings, and adjustment codes?
    a. ☐ **YES** → Check the tone rings. (Jack up the wheel and spin while inspecting the tone ring or chart with DiagnosticLink and drive. A tone ring will show up as weak compared to the rest of the wheel speeds). See Table Wheel Speed Chart Signals 4. Fix as needed. Go to step 12. The only part that needs to be replaced is the rotor due to rust jacking.
    b. ☐ **NO** → Go to step 12.
12. ☐ Does this only happen in damp or wet weather conditions?
    a. ☐ **YES** → Go to step 14a.

b. ☐ **NO** → Go to step 13.

13. ☐ During the test drive, monitor the wheel speeds using DiagnosticLink and ensure that the ABS module and all J1939 connections are active. Do the wheel speeds appear erratic, spike up, or show readings when the vehicle is stationary? It is recommended to refer to the chart instead of the ABS tab/panel. See Table Wheel Speed Chart Signals 4 and Fig. 1 for the charting selections in DiagnosticLink.

Table 4, Wheel Speed Chart Signals

Device/Module	Signal Name
ABS	Wheelspeed Wheel 1
ABS	Wheelspeed Wheel 2
ABS	Wheelspeed Wheel 3
ABS	Wheelspeed Wheel 4
ABS	Wheelspeed Wheel 5
ABS	Wheelspeed Wheel 6
ABS	Wheelspeed Wheel 7
ABS	Wheelspeed Wheel 8
J1939-11	Relative Wheelspeed; Front Axle, Left Wheel
J1939-11	Relative Wheelspeed; Front Axle, Right Wheel
J1939-11	Relative Wheelspeed; Rear Axle 1, Left Wheel
J1939-11	Relative Wheelspeed; Rear Axle 1, Right Wheel
J1939-11	Relative Wheelspeed; Rear Axle 2, Left Wheel
J1939-11	Relative Wheelspeed; Rear Axle 2, Right Wheel

Table 4, Wheel Speed Chart Signals

14. ☐ See Fig. 2 for the traces of the selected wheel speed and relative speed signals. Note the erratic signal on wheel speed 6.

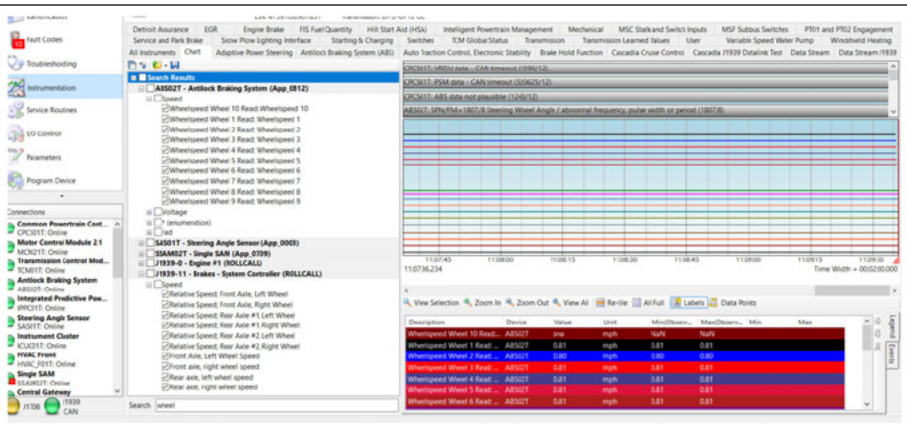


Fig. 1, DiagnosticLink Wheel Speed and Relative Speed Signals

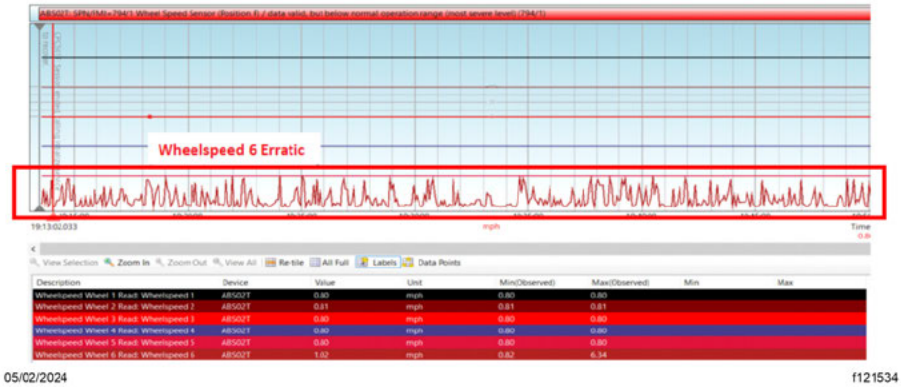


Fig. 2, DiagnosticLink Signal Traces

a. **If the readings are erratic regardless of location, or if the issue only happens in damp or wet conditions, install the individual overlays for all four rear wheel ends.** See Table WABCO Harness Part Numbers 5 for length and part number of WABCO harnesses.

Table 5, WABCO Harness Part Numbers

WABCO Part Number	Part Description	Length
WAB 449 711 050 0	23-13666-050 Cable-ABS Sensor	5 meters
WAB 449 711 060 0	23-13666-060 Cable-ABS Sensor	6 meters
WAB 449 711 065 0	Extension Cable	6.5 meters
WAB 449 711 080 0	23-13666-080 Cable-ABS Sensor	8 meters
WAB 449 711 100 0	23-13666-1000 Cable-ABS Sensor	10 meters

Table 5, WABCO Harness Part Numbers

b. All harnesses listed above in Table WABCO Harness Part Numbers 5 will require termination at the bulkhead connector BHB. See Fig. 3 and Fig. 4 for bulkhead connector BHB location.

Fig. 3, WABCO ABS Harness

Fig. 4, Bulkhead Connector BHB Location

c. The lengths of the WSS overlay harness required will vary based on the wheelbase of the vehicle. See 'Determine Vehicle Wheelbase' below.

d. All the harnesses listed in Table WABCO Harness Part Numbers 5 will require trimming to length and termination at the 76–pin bulkhead connector BHB. See Fig. 3 for image of a typical WABCO ABS Harness and Fig. 4 for bulkhead connector BHB location.

e. Choose the closest available harness length in order to minimize harness waste when trimming to length.

f. Installation of the terminal part number 23-13211-410 (Qty: 8 Nos.) requires crimping tool SPX J-38125-6 (non-ratcheting) or SPX J-38125-7 (ratcheting).

☛ Note:

g. Carefully mark all eight circuits in the four harnesses to be replaced. Remove and replace only one circuit at a time. Use separate colored tape at each end of the overlay harness in order to correctly identify and avoid mispinning the connector. See Fig. 5.

Fig. 5, Multicolored Tape

h. During the harness replacement, ensure that the 76-pin bulkhead connector BHB is free from moisture or corrosion. If moisture is detected, clean the connector using compressed air and dielectric spray. If corrosion is found, note that repairs for additional circuits fall outside the scope of this service bulletin.

i. Install the overlay harness within the left frame hand rail and secure as needed. After trimming the overlay harness to length, strip insulation, then crimp on new terminal at BHB connector. For all harnesses, only one terminal part number 23-13211-410 is needed, and it remains consistent across all. Keep the original wire twist of the overlay harness as close as possible to the respective terminal location of the bulkhead connector BHB.

j. Verify that the terminals are installed into the correct cavity of the 76-pin bulkhead connector BHB. See Fig. 6.

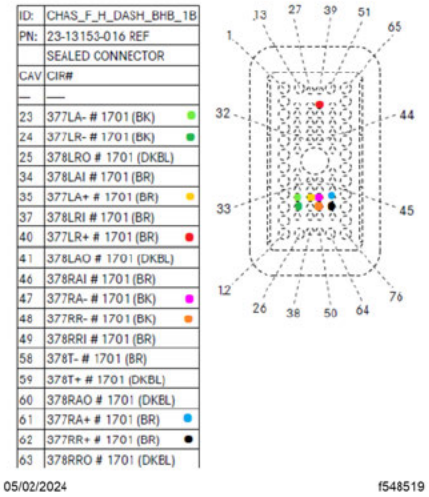


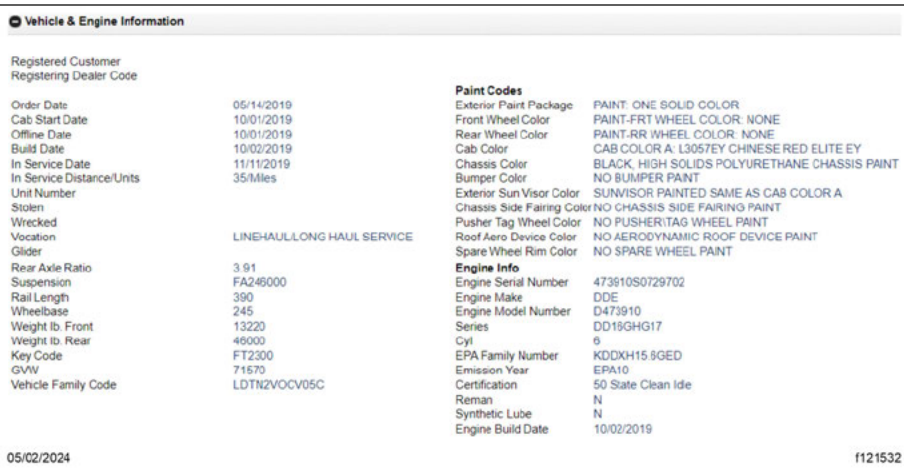
Fig. 6, BulkHead Connector BHB

Determine Vehicle Wheelbase

15. Log on to DTNA Portal.

16. Enter the vehicle VIN or serial number in the search bar of the box titled 'Vehicle Info,' and select 'Go to Vehicle Info.'

17. Find the vehicle wheelbase, once the results have loaded, and determine the replacement harness length. See Fig. 7.



Vehicle & Engine Information

Registered Customer			
Registering Dealer Code			
		Paint Codes	
Order Date	05/14/2019	Exterior Paint Package	PAINT: ONE SOLID COLOR
Cab Start Date	10/01/2019	Front Wheel Color	PAINT-FRT WHEEL COLOR: NONE
Offline Date	10/01/2019	Rear Wheel Color	PAINT-RR WHEEL COLOR: NONE
Build Date	10/02/2019	Cab Color	CAB COLOR A: L3057EY CHINESE RED ELITE EY
In Service Date	11/11/2019	Chassis Color	BLACK, HIGH SOLIDS POLYURETHANE CHASSIS PAINT
In Service Distance/Units	35/Miles	Bumper Color	NO BUMPER PAINT
Unit Number		Exterior Sun Visor Color	SUNVISOR PAINTED SAME AS CAB COLOR A
Stolen		Chassis Side Fairing Color	NO CHASSIS SIDE FAIRING PAINT
Wrecked		Pusher Tag Wheel Color	NO PUSHER\TAG WHEEL PAINT
Vocation	LINEHAUL/LONG HAUL SERVICE	Roof Aero Device Color	NO AERODYNAMIC ROOF DEVICE PAINT
Glider		Spare Wheel Rim Color	NO SPARE WHEEL PAINT
Rear Axle Ratio	3.91	**Engine Info**	
Suspension	FA246000	Engine Serial Number	473910S0729702
Rail Length	390	Engine Make	DDE
Wheelbase	245	Engine Model Number	D473910
Weight lb. Front	13220	Series	DD15GHG17
Weight lb. Rear	46000	Cyl	6
Key Code	FT2300	EPA Family Number	KDDXH15.9GED
GVW	71570	Emission Year	EPA10
Vehicle Family Code	LDTN2VOCV05C	Certification	50 State Clean Idle
		Reman	N
		Synthetic Lube	N
		Engine Build Date	10/02/2019

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Fig. 7, Vehicle Wheelbase

Frequently Asked Questions

- Will NEXIQ USB Link 3 work for the WABCO YRR+ software download?

  → No, only NEXIQ USB Link 2 is acceptable in the WABCO program.

- Upon completion of repair, what might trigger an FMI 05?

  → FMI 05 indicates an interruption of the wheel speed sensor, indicating an error in the pinning of the connector during the repair. Refer to the SPN in the code for the wheel speed sensor location.

- Are there instructions for removing the pins in the bulkhead connector?

  → See addendum 1 below.

Addendum 1

- Carefully pull the red retention plate out of the connector with pliers on the four red tabs, working around the mounting stud. See Fig. 8.

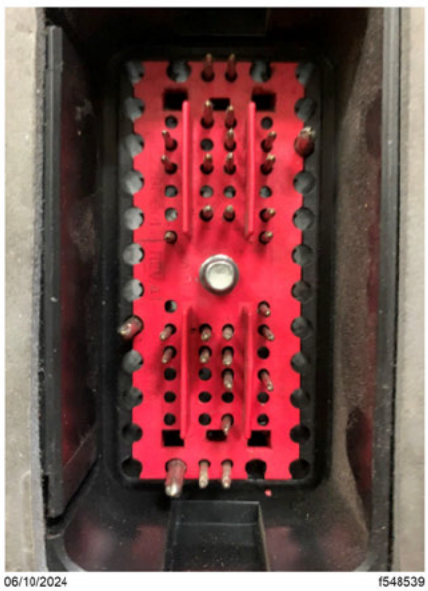

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Fig. 8, Red Retention Plate

- To extract the terminal, move the tang down and away from the terminal with a small screwdriver or terminal tool while gently pulling on the terminal outer end. See Fig. 9.

Fig. 9, Extracting the Terminal

Validation of Repair

Upon completion of replacement of all four rear ABS harnesses, clear all codes in DiagnosticLink and verify all wheel speed values remain consistent both while the vehicle is idle and while driven in the dealership lot.

Warranty

This is an informational bulletin only. If the described condition exists, base warranty or extended warranty applies.

Note:

F16
F26
F35
F36
TROUBLESHOOT
ABS02T
SPN791/FMI1
SPN791/FMI2
SPN792/FMI1
SPN792/FMI2
SPN793/FMI1
SPN793/FMI2
SPN794/FMI1
SPN794/FMI2

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