

Technical Service Note 01-07c

04/15/14 – Updated 17/841/2 troubleshooting to include nuisance occurrence.

SUBJECT: Predictive Cruise Control (PCC) – Module Lockup

PRODUCTS: Cascadia units with DBCs 149-037 or 149-041 (Cruise w / Predictive Cruise)

PROBLEM / SYMPTOMS: Beyond routing and wiring concerns, the PCC system as previously implemented suffers from two timing / reporting issues. One stems from the long boot-up time of the PCC module as compared to the CPC (a.k.a. the 6N4C timer issue), and the other stems from the potential of some PCC modules to lock-up (a.k.a. the NAND flash issue). The timer concern is considered to primarily affect EPA10 units (OBD13 already had a longer timer) and most can be resolved by simply refreshing the CPC software (even if an update is not available). The module lock-up software solution is currently being validated, so the PDC stock is not clean yet. However, lock-up is anticipated to only be present in approximately 8% of PCC modules (based on testing), so (ahead of a campaign), here are instructions on how to reactivate a system, verify proper operation, and drive service actions.

COMMONLY RELATED FAULT CODES:

(SA/SPN/FMI)

0/524287/9

0/524287/19

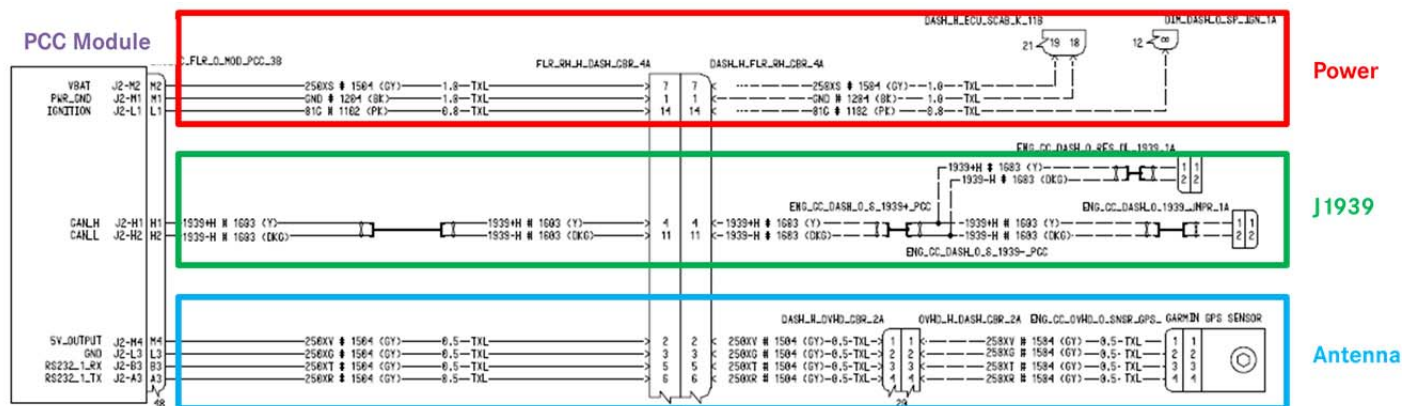
17/639/2

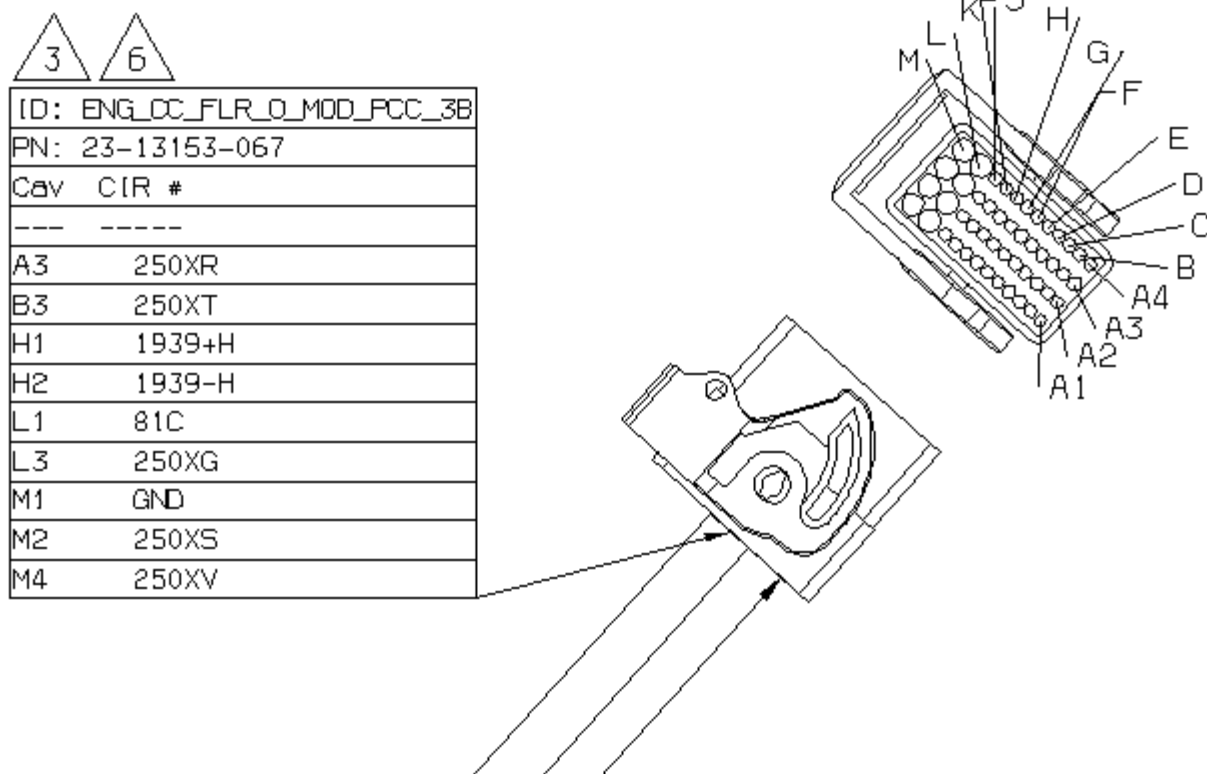
17/841/2

17/841/13

PRODUCTION ACTION: The DBCs associated with this feature have been temporarily turned off. Special “pre-wire” codes have been put in place to allow customers to order units with all the necessary parts installed, but PCC has been turned off until a complete solution is available.

Complete System Schematic
(G06-77762-000)





FIELD ACTION: Deactivating PCC

- 1) Remove F18 from the SAM Cab.
- 2) Use DDRS to access the service routine which disables / enables the CPC parameters associated with PCC. It is located under Actions-> Predictive Cruise Control Diagnostic. Select "disabled" and the system should now be completely inactive and should not result in PCC related fault coding.
- 3) Alternately, the following parameters in the CPC could be turned off manually to achieve the same effect:

EPA10 (CPC02T) - **CC Mode Selection** (VCD_PGR015_Cruise_Control) - Set to **Value 0** (Normal Cruise) or Value 1 (Soft Cruise)

OBD13 (CPC04T) - **PCC Enable** (VCD_PGR054_Predictive_Cruise_Control) - Set to **Value 0** (Disabled)

FIELD ACTION: Reactivating PCC and testing system integrity

- 1) Verify F18 (p/n 23-12537-015, blue, 15A) is installed in the SAM Cab.
- 2) Access the PCC module and disconnect the harness.

- 3) Using a DMM, test for 60 ohms (plus or minus 6 ohms) resistance on J1939 circuit between pins H1 and H2 of the PCC harness connector (see connector diagram below).
Troubleshoot J1939 according to WSM G03.02, if needed, and read Service Solution 3920 in ServicePro, if there is any trouble locating the terminating resistors.
- 4) Turn the Ignition Switch to ON.
- 5) Test the PCC harness connector for Ground at pin M1, IGN power at pin L1, and BAT voltage at pin M2. Troubleshoot those circuits, if needed.
- 6) Turn the Ignition Switch to OFF and reconnect the PCC module harness.
- 7) Turn the Ignition Switch to ON.
- 8) Connect to the unit using DDRS.
- 9) Write down any active or historic fault codes, then clear all fault codes.
- 10) Refresh the CPC software, even if it says it is not needed (**this step is essential on EPA10 units to resolve 0/524287/19 fault codes**). If the CPC software version is changed by this step, also update the MCM and ACM to the latest software versions (to help maintain software compatibility).
- 11) Once all the software has been updated, using DDRS, run the Actions – Predictive Cruise Control Diagnostic routine and set to “enabled” (to verify correct parameterization and activation of PCC).
- 12) Test drive the unit.
- 13) Check for PCC related fault codes and troubleshoot new PCC fault codes as described below.

FAULT CODE TROUBLESHOOTING: SA 0 is the CPC, SA 17 is the PCC module.

0/524287/9 – PCC Message Not Received. Results in a CEL. Service shops should pursue this code first, before an FMI 19 (below). The CPC was expecting communication from the PCC module, but no message was received. It necessarily means that the CPC has been parameterized to look for it, so it should drive a wiring check of the red and green areas from the system schematic above according to steps 3 through 5 (check the PCC J1939 and power supply). If no wiring problems exist, and there are no other indications of J1939 problems, perform a hard reset of the PCC module (unplug and plug back in). If the module recovers (begins communicating again), remove it and mark it as a module likely suffering from NAND flash lock-up, and replace using new PCC modules until you find one that does not lock-up. If the module does not recover at all, obviously, you still replace it. The point is that you should

be able to chase the wiring for this code until you get to the module, then replace until you get a reliable one.

0/524287/19 – PCC Erratic Data Error. No CEL. The CPC was expecting a communication but did not get it on time or only received part of it. It is usually a nuisance code resulting from the CPC booting up / recovering faster than the PCC. OBD13 CPC has a longer timer, so is not anticipated to see this as much. EPA10 can refresh or update the CPC software and get a new longer timer (from 6N4C). Originally this was thought to just result from “short cycling” the IGN key (not waiting for gauge sweep), but it also results from turning the key from ON to OFF, then to ACC to use some accessory.

17/639/2 – CPC Timeout. The PCC module generates this code if it is expecting communication from the CPC but does not receive it. Verify the CPC is parameterized for PCC using DDRS. Troubleshoot any CPC related J1939 codes or indications of the CPC dropping out.

17/841/2 – No GPS Data. The PCC module generates this code if it does not receive data from the antenna every two minutes. This may occur during normal operation as an historic nuisance code resulting from extended time spent under an overpass, inside a tunnel, or while inside a building (things blocking access to the satellite). Otherwise, as an active code or a high count historic code, pursue as a wiring problem or bad GPS antenna / “sensor”. Check the blue wiring from the system schematic above. For clarification, the circuits are as follows:

250XV = PCC Sensor +5V (where the antenna gets its power from)

250XG = PCC Sensor GND (where the antenna gets its ground from)

250XT = PCC Sensor Transmit (where the antenna sends its information "outbound / transmit" to the PCC module)

250XR = PCC Sensor Receive (where the antenna receives information "inbound / receive" from the PCC module)

If you have 5 VDC at the antenna, and the transmit and receive wires are good, replace the antenna / sensor. If 5 VDC is not present, chase it back to the PCC module and, if it is not putting out, replace the PCC module.

17/841/13 – Incorrect GPS Firmware. Should only affect OBD13 and later. The PCC checked the firmware / software of the GPS “sensor” / antenna and determined it was not correct. Replace the antenna.

PARTS AVAILABILITY: N/A

WARRANTY: Normal warranty applies, if the condition exists. Related fault codes should be cited under Comments.

FSPR: 22660

IMPORTANT: TSNs may contain sensitive information; do not forward directly to customers, dealers or suppliers. Upon the discretion of the recipient, select information may be copied and sent (under separate cover) to those excluded above.

- This information is NOT authorization for warranty.
- Refer to: <http://cpdxpapp18/depts/ServiceEngineering/default.aspx> for previous TSNs