KENWORTH
A PACCAR COMPANY

Technical Information Bulletin

32-014

Section

Starter, Battery - 32

Subject

Battery Management System Incorrectly Reporting Battery Condition

Release Date

10/12/2020

Condition

The Battery Management System (BMS) may report the incorrect battery condition which can result in dead batteries and the no-idle system to be non-functional. Additional symptoms may include:

- The engine may not start if the BMS reports starting (main) battery condition incorrectly which allows the batteries to draw below the desired amount (if showing max).
- If reporting a state of charge at zero, then auxiliary batteries will not charge, allowing batteries to draw and the Kenworth Idle Management System (KIMS) will not function as designed.

Chassis Affected

Model Year 2017-2021 T270, T370, T440/470, T680, T800, T880, W900, and W990 vehicles built from 01/04/2016 through 08/15/2019 equipped with the KIMS/Engine Auto Start/Stop option.

Action

Fix-As-Fail

If a customer comes into your dealership and demonstrates the condition above, follow the attached troubleshooting guidelines and the attached procedure to troubleshoot and possibly replace the BMS module. Use the procedure below.

Warranty

Through Standard Warranty or any applicable active Extended Warranty, Kenworth will pay for parts at dealer net plus applicable mark-up and labor:

- 1.0 hours labor to troubleshoot and R&R the BMS module. File a long form claim and reference bulletin 32-014.

Take-Off Parts Disposition: Destroy take-off parts 30 days after claim is paid

CLAIM CODING			
Failure Location:	032-001-001	Work Accomplished:	21
Failure Type:	185	Responsibility Code:	01/06
SRT Code:	**001-366** 0.50 hours labor KIMS (Kenworth) SmartAir (Peterbilt) : diagnostic time external unit - includes All system parts not in internal unit / includes Condenser, User Interface, BMS, Battery separator, fuses, can bus communication, checking system pressure, checking louver temp, etc. **001-372** 0.50 hours labor KIMS (Kenworth) SmartAir (Peterbilt) : battery management system (BMS) R & R	Claim Type:	N/E

Parts

Parts are available from PACCAR Parts.
WebECAT must be used to determine the BMS system for a specific chassis. The list below provides all potential BMS part numbers.

Quantity	Part Number	Description
1	1000278739BSM	BMS, NITE
1	1000364629BSM	BMS, NITE

1	1000776694BSM	BMS, NITE
1	1001060203BSM	BMS, Aux MONITOR-BATTERY START SYSTEM
1	1001178614BSM	MONITOR-NITE BATTERY
1	1001393612BSM	BATT MONITOR-NORTHSTAR
1	1001473894BSM	MONITOR-BATTERY SYSTEM, PACCAR ONLY
1	1001577434BSM	MONITOR-BATTERY SYSTEM
1	1001789046	BATT MNTR, NRTHSTR AUX
1	1001917820	MONITOR -BATTERY NORTHSTAR STARTING

Procedure

Please follow your dealership's safety procedures and precautions to ensure the vehicle can be safely repaired and maintained.

1. Remove the battery box cover to gain access to the BMS.
2. Troubleshoot the BMS. Use the attached Additional BMS Troubleshooting Guide and the Kenworth Idle Management System Service Manual (SM001-300).
3. Replace the Battery Management System if required. Use WebECAT to determine which part(s) are required.

See the images below to locate the BMS module, circled in green, within the different battery configurations.

Figure 1 3x1 Battery Configuration (click the image to open a larger version in a new window

Image is from sheet 4 of N97-6134

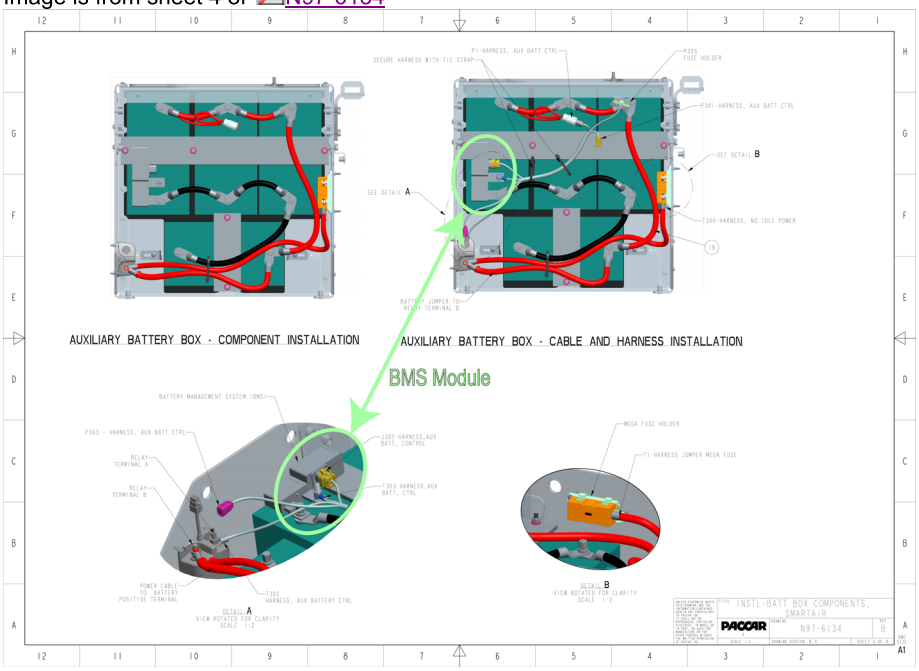

Figure 2 2x2 Battery Configuration (click the image to open a larger version in a new window)

Image is from sheet 3 of N97-6135

Attachments

Additional BMS Troubleshooting Guidelines

Authored by: OF

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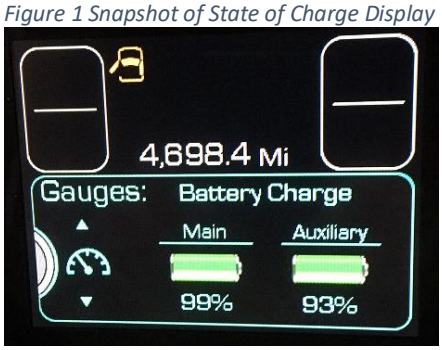
Additional BMS-100 Troubleshooting Guidelines

Description of Operation

- It is important that the Battery Management System (BMS) is not tied to a Low Voltage Disconnect (LVD). We do not want the battery management system to shut off at any time. If it does, it cannot calculate State of Charge (SOC) and will not report any messages to the truck.
- The BMS does not start the truck. It reports messages regarding battery status to the truck, but it does not start the truck.
- The BMS does not shut off any loads or systems other than the Terra Power relay. It engages that relay to charge the auxiliary batteries when the alternator is on and/or when the starting batteries are at a high SOC. It disengages the relay to separate the auxiliary batteries from the starting batteries when the starting batteries get to a medium SOC. This allows the auxiliary batteries to go to a low state of charge without pulling the starting batteries to a low SOC.
- All charging current that goes into the starting batteries must go through the starting battery BMS, otherwise the SOC calculations can be wrong.
- All loads that pull from the starting batteries must go through the starting battery BMS, otherwise the SOC calculations can be wrong.
- All charging current that goes into the auxiliary batteries must go through the auxiliary battery BMS, otherwise the SOC calculations can be wrong.
- All loads that pull from the auxiliary batteries must go through the auxiliary battery BMS, otherwise the SOC calculations can be wrong.
- There is a different part number for the starting battery BMS than there is for the auxiliary battery BMS. It is important to put the correct BMS on the correct set of batteries. Otherwise, messages will not be sent to the truck correctly.
- There is a graphic on each BMS that shows where each pin should be wired to on the truck. That graphic also helps identify whether the BMS is for the auxiliary or starting batteries.
- Below is a snapshot of the state of charge display on PACCAR trucks that include an Auto Start feature. Both state of charge percentages typically show at least 40%. If not, then either the vehicle has been sitting for a long time or there could be a problem with the vehicle.

Figure 1 Snapshot of State of Charge Display



Troubleshooting Procedure

1. If the main battery state of charge is low:
    a. Check the voltage of the main batteries. If the voltage is below 11.5 volts, then there may be a problem with the batteries or charging system.
    b. If the voltage is above 12 volts when the truck is not running, then disconnect the main (starting) battery BMS-100 for 1 minute and re-connect it. Reference Peterbilt SmartAir Diagnostics Guide Manual Page 21 (PM820010) or Kenworth Idle Management System (KIMS) Page 21 (SM001-300). If the main battery state of charge does not change, then disconnect the BMS-100 once again and check for the proper voltage at the wiring harness connector, using the wiring diagram on the BMS-100 as a guide to determine which pins to check.
    c. If the wiring harness and batteries look OK, then there may be an issue with the BMS-100.
2. If you suspect a problem with the auxiliary battery management system, follow the instructions below to go into SERVICE MODE to check the starting battery voltage, auxiliary voltage, and the current flowing into or out of the batteries. Instructions are shown below. If any of the values look incorrect, take note of the questionable readings.
    a. To enter SERVICE MODE, press the **ON/OFF** and **ENTER** buttons simultaneously.
    b. Press the **ENTER** button to proceed through the available service screens. The service screens are:
        - SV = Starting batteries Voltage
        - AV = Auxiliary batteries Voltage
        - AA = Unit amperage draw
    c. Press the **ENTER** button after viewing a service screen to return to the fault code screen.

Figure 2 Enter Service Mode

3. Turn on the engine.
4. After the starting battery voltage is at or above 13.5 volts for at least 10 seconds, the BMS-100 should trigger the high current relay between the starting batteries and auxiliary batteries to engage. This will allow the auxiliary batteries to charge. At this point, the starting battery voltage and auxiliary battery voltage should become almost equal as the auxiliary batteries start to get charged. There should also be an indication that current is flowing into the batteries. This will be seen in the 'AA' service screen.
5. Turn off the engine and start the no-idle air conditioner.
6. After the starting battery voltage is below 12.5 volts for at least 10 seconds, the BMS-100 should trigger the high current relay between the starting batteries and auxiliary batteries to disengage. This will allow the auxiliary batteries to run down to empty without pulling energy from the starting batteries. At this point, the starting battery voltage and auxiliary battery voltage should be different from one another.
7. If there were any erroneous readings, then check all connections to be sure that that they are clean and not broken, loose, or weak.
8. If all connections look solid and clean but the readings are still not correct, unplug the BMS-100 to check for the proper voltage at each of the connections in the wiring harness. The wiring diagram on the BMS-100 will indicate the wiring that is expected at the wiring harness.
9. If the voltage readings at each pin of the wiring harness are correct, then plug in the BMS-100 and check the values at the controller again using the SERVICE MODE instructions. If any of the voltages are close to zero or 29

volts, then the BMS-100 is likely defective. If all the values in the Service Screens look correct, then the problem is unlikely to be the BMS-100.

Service Bulletin

32-014

Section

32 - Cranking

Description

Battery Management system (BMS) may report incorrect battery condition in certain Model 567 and 579 vehicles built between January 1, 2017 and June 14, 2018 with SmartAir/Engine Auto Start/Stop option.

Release Date

10/13/2020

Introduction

Peterbilt has identified that certain model of 567 and 579 vehicles built between January 1, 2017 and June 14, 2018 with engine auto start/stop may have an issue with the battery management system (BMS) performing as designed. The BMS may report an incorrect state of charge (SOC) for the starting batteries which can lead to dead batteries and the no-idle system to be non-functional.
The truck may not start if the Battery Management System (BMS) reports starting battery condition incorrectly which allows batteries to draw below the desired amount (if showing max).
If reporting state of charge at zero, then auxiliary batteries will not charge, allowing batteries to draw and SmartAir system will not function as designed.

Resolution

Fix-as-Fail

If a customer comes into your dealership and demonstrates the condition noted above, troubleshoot and replace the battery management system (BMS) module if found to be faulty. Follow the attached troubleshooting guidelines and the attached procedure to replace the BMS module.

Warranty

Through Standard Warranty, Peterbilt will pay for parts at dealer net plus applicable mark-up and labor:

1. 0 hours labor for diagnostic time to troubleshoot and R&R the BMS. File a long form claim and referece “32-014”.
File and additional claim for extraordinary circumstances, referencing 32-014. A long form for standard labor must be filled first.

For Field...	Enter...
Failure Location	032-001-001
Failure Type	185
Claim Type	N
Campaign Number	32-014
Labor	**001-366 - 0.50 hours labor** KIMS (Kenworth) SmartAir (Peterbilt) : diagnostic time external unit - includes All system parts not in internal unit / includes Condenser, User Interface, BMS, Battery separator, fuses, can bus communication, checking system pressure, checking louver temp, etc. **001-372 - 0.50 hours labor**

	KIMS (Kenworth) SmartAir (Peterbilt) : battery management system (BMS) R & R

Parts

Parts are available from PACCAR Parts or through DSP.
Review WebECAT for the correct part to order.

Quantity	Old Part Number	New Part number	Description
1	1000278739BSM	1000776664BSM	BMS, NITE
1	1000364629BSM	1000776664BSM	BMS, NITE
1	1000776694BSM	1000776664BSM	BMS, NITE
1	1001060203BSM	1001060203BSM	BMS, Aux MONITOR-BATTERY START SYSTEM
1	1001178614BSM	1001178614BSM	MONITOR-NITE BATTERY
1	1001393612BSM	1001393612BSM	BATT MONITOR-NORTHSTAR
1	1001473894BSM	1001473894BSM	MONITOR-BATTERY SYSTEM, PACCAR ONLY
1	1001577434BSM	1001577434BSM	MONITOR-BATTERY SYSTEM
1	1001789046	Q21-6160-1031	BATT MNTR, NRTHSTR AUX
1	1001917820	1001917820BSM	MONITOR -BATTERY NORTHSTAR STARTING

Procedure

Please follow your dealership's safety procedures and precautions to ensure the vehicle can be safely repaired and maintained.

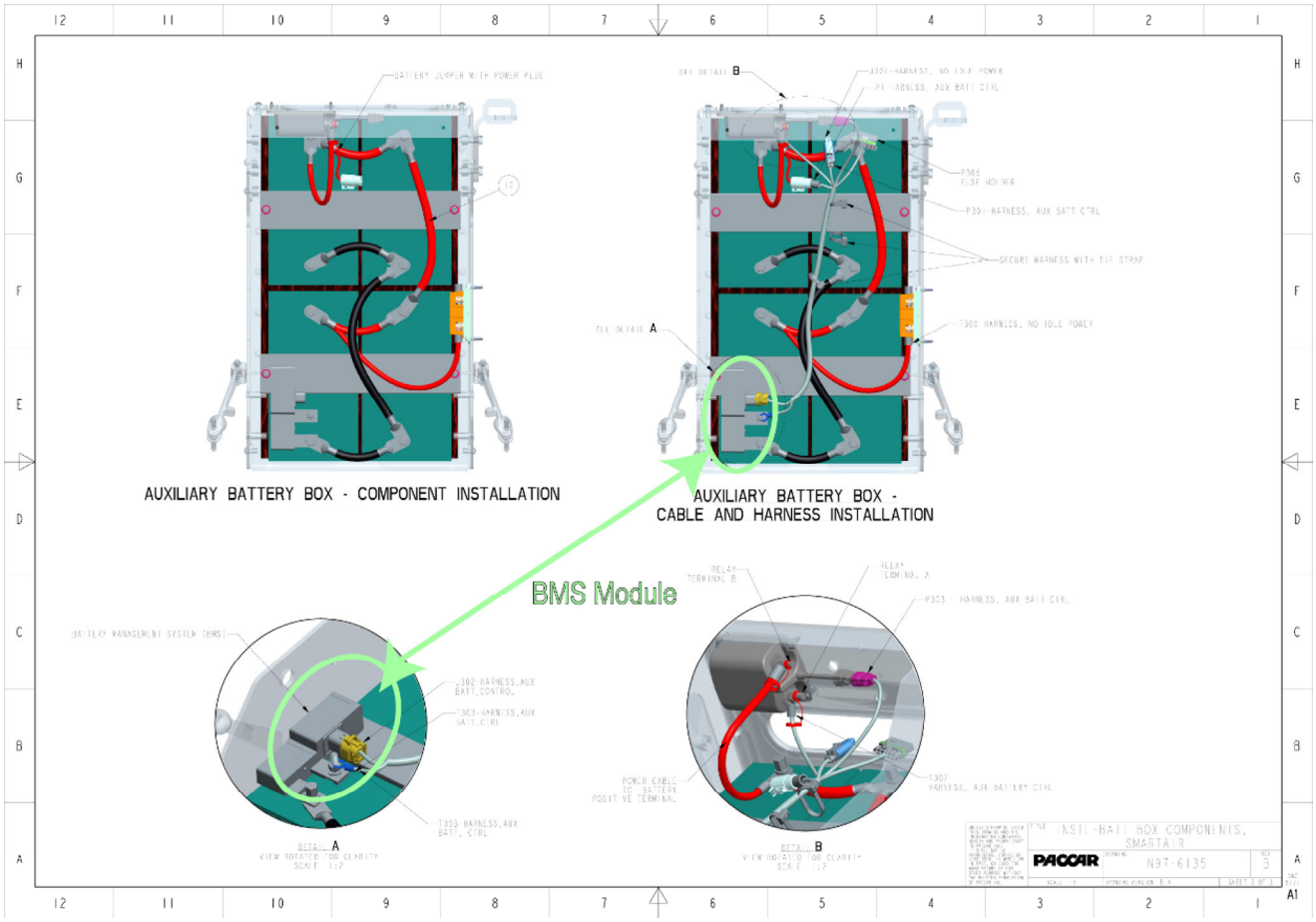
1. Remove the battery box cover to gain access to the Battery Management System.
2. Troubleshoot the Battery Management System. See additional guidelines here.
3. Replace the Battery Management System if required.
4. Use WebECAT to determine which part(s) are required.
5. See the images below to locate the BMS module, circled with green, within the different battery configurations.

Figure 1 3x1 Battery Configuration

Select the image below to open in a new window.

Figure 2 2x2 Battery Configuration

Select the image below to open in a new window.



Attachments

Additional BMS Troubleshooting Guidelines

Authored by: DKH

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