Roadster Issue Articles

Article #22638 - "Check left/right back turn signal bulb" alert, with improper output from switchpack

Description

"Check left/right back turn signal bulb" alert, with improper output from switchpack.

Steps to Test

- Check fuse 7.
- Measure the voltage at the turn signal switch connector (Left FHC9 - pin 49AL)(Right FHC9 - pin 49AR).
- Bridge the appropriate terminals to bypass the turn signal switch.

Steps to Fix

- Replace the fuse if damaged.
- If the voltage does not equal 12V, check/repair the wiring/connectors.
- If the signal operates while bypassing the turn signal switch, replace the switch (Part#2000253). Otherwise, check/repair the wiring/connectors.

Possible Effects

- Article #21635 SWP 536 Check left back turn signal bulb
- Article #21637 SWP 538 Check right back turn signal bulb

Possible Causes

Unknown.

Article #22637 - "Check left/right back turn signal bulb" alert, with proper output from switchpack

Description

"Check left/right rear signal bulb" with proper output at rear taillight connector (RHC13)

Steps to Test

Measure the output at the rear taillight harness connector (RHC13).

Steps to Fix

If there is proper output, Replace the rear taillight lens assembly (Left-Part# 2003445, right-Part# 2003446). Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #21635 SWP 536 Check left back turn signal bulb
- Article #21637 SWP 538 Check right back turn signal bulb

Possible Causes

- Article #22639 Improper output at rear taillight harness connector (RHC13)

Article #22640 - "Check left/right front turn signal bulb" alert, with improper output from switchpack

Description

"Check left/right front turn signal bulb" alert, with improper output from switchpack.

Steps to Test

- Check fuse 7.
- Measure the voltage at the turn signal switch connector (Left FHC9 - pin 49AL)(Right FHC9 - pin 49AR).
- Bridge the appropriate terminals to bypass the turn signal switch.

Steps to Fix

- Replace the fuse if damaged.
- If the voltage does not equal 12V, check/repair the wiring/connectors.
- If the signal operates while bypassing the turn signal switch, replace the switch (Part# 2000253). Otherwise, check/repair the wiring/connectors.

Possible Effects

- Article #21636 SWP 537 Check left front turn signal bulb
- Article #21638 SWP 539 Check right front turn signal bulb

Possible Causes

Unknown.

Article #22641 - "Check left/right front turn signal bulb" alert, with proper output from switchpack

Description

"Check left/right front turn signal bulb" alert, with proper output from switchpack.

Steps to Test

Measure voltage output at front head light connector, (FHC71 - Front left) (FHC91 - Front right)

Measure the voltage output at the bulb socket.

Steps to Fix

If there is proper output, replace the bulb (Part# 2005036). Otherwise, check and repair the wiring/connectors. Pursue possible causes to investigate further.

Possible Effects

- Article #21638 SWP 539 Check right front turn signal bulb

Possible Causes

- Article #22642 Improper output at front headlight light connector, (FHC71 - Front left) (FHC91 - Front right)

Article #32596 - 1.5 PEM fan harness damage

Description

Damage to the electrical harness or fuse supplying the PEM fan is causing DFC pole fan alerts.

Steps to Test

1. Component activate the PEM fan using MTS and check for fan operation.
2. Measure voltage at RHC 9 pins 1 & 2 (+ / -).
3. Check the PEM fan fuse.
4. Inspect the fan harness. Check for corrosion, shorts to power/ground, etc between RHC 9 (PEM fan) and RHC 12 (PEM logic).

Steps to Fix

Replace fuse or repair harness. If confirmed to be a problem internal to the PEM (not serviceable) then replace the PEM.

Possible Effects

- Article #21966 DFC 1207 DFC: Pole Fan Failed
- Article #21967 DFC 1208 DFC: Pole Fan OverCurrent
- Article #21968 DFC 1209 DFC: Pole Fan 12V OverVoltage
- Article #21969 DFC 1210 DFC: Pole Fan 12V UnderVoltage
- Article #21971 DFC 1212 DFC: Pole Fan UnderCurrent
- Article #21974 DFC 1215 DFC: Pole Fan Power Failed

Possible Causes

Unknown.

Article #34807 - 1.5 to 3.0 Upgrade VMS firmware flash fails

Description

The Vehicle Management System (VMS) fails to update using the Roadster Firmware Update tool, despite following SI-16-16-003 procedure.

Steps to Test

Steps to Fix

Launch DSD Auto Update. Scan for packages. Because the other vehicle components have already updated successfully, DSD Auto should now suggest the package you attempted to update to using Roadster Firmware Update tool.

Download firmware using DSD Auto Update.

Possible Effects

- Article #32525 Firmware job issue

Possible Causes

Unknown.

Article #30740 - 1.5 Vehicles - TPMS Trigger failure

Description

1.5 Roadster TPMS systems incorporate a trigger in each wheel arch to prompt a data request from the TPMS sensor located in the wheel.

Steps to Test

1. Swap triggers and determine if problem switches to location swapped.
2. Check connections for short/open circuit between suspect trigger and TPMS Electronic Control Unit (ECU).

Steps to Fix

1. If no problems are found with the trigger, diagnose the TPMS antennae.
2. If a problem is found with the trigger circuit, repair the harness.
3. If a problem is found with the trigger, replace the unit.

Possible Effects

- Article #21607 TPMS 409 TPMS: Hardware error

Possible Causes

Unknown.

Article #22600 - 12V HVAC Assembly failure

Description

Fault 1447 and 1470 often appear in conjunction. These fault codes indicate a failed or disconnected cabin outlet air temp. sensor. After testing for a failed sensor, the measurements indicate a short, open loop, or a value that would appear to be incorrect.

Steps to Test

Inspect the wiring connections between 12V HVAC controller and the HVAC assembly, particularly FHC50 and FHC81, for damaged pins, corrosion, shorts, or otherwise faulty or damaged wiring.

Steps to Fix

If no damage is found on the wiring or connectors, replace the 12V HVAC Assembly.

Possible Effects

- Article #21990 HVAC 1407 HVAC: Outlet OverTemp
- Article #22024 HVAC 1447 HVAC: Outlet OverTemp
- Article #22045 HVAC 1470 HVAC: Temp Sensor Fault

Possible Causes

Unknown.

Article #22601 - 12V HVAC Controller Failure

Description

12V HVAC controller failure relating to wiring to the coolant pump or HVAC assembly.

Fault 1447 and 1470 often appear in conjunction. These fault codes indicate a failed or disconnected cabin outlet air temp. sensor. After testing for a failed sensor, the measurements do not indicate a short, open loop, or a value that would appear to be incorrect.

Steps to Test

Inspect the wiring connections between 12V HVAC controller and the HVAC assembly, particularly FHC50 and FHC81, for damaged pins, corrosion, shorts, or otherwise faulty or damaged wiring.

Visually inspect the wiring and connections between the 12V HVAC controller and the coolant pump.

Steps to Fix

If no damage is found on the wiring or connectors, replace the 12V HVAC controller

(Part# Pre 2010MY 6001069, 2010MY plus 6004061), and retest. If the fault is still active, escalate your session for assistance.

Possible Effects

- Article #21983 HVAC 1400 HVAC: Coolant Pump UnderCurrent
- Article #21990 HVAC 1407 HVAC: Outlet OverTemp
- Article #22019 HVAC 1440 HVAC: Coolant Pump UnderCurrent
- Article #22024 HVAC 1447 HVAC: Outlet OverTemp
- Article #22045 HVAC 1470 HVAC: Temp Sensor Fault

Possible Causes

Unknown.

Article #22628 - 12V not registering when measuring from PEM

Description

12V is not registering when measuring from the Power Electronics Module (PEM).

Steps to Test

1. Measure for 12V at the PEM with a breakout box.
2. If 12V is not registering at the breakout box, then this is your issue.

Steps to Fix

- If the 12V is registering on the breakout box, replace the PEM according to the generation of Roadster. Please reference the following Service Manual procedure: POWER ELECTRONICS MODULE (PEM) - ROADSTER 1.5 - Correction code 39010702
- If the 12V is not registering, diagnose and repair/replace the 12V. To access the 12V you will need to:
  - (1) Remove the RF wheel arch liner. Reference the following Service Manual procedure: WHEEL ARCH LINER - LOWER - FRONT - LH - Correction code 12011302
  - (2) Remove the Condenser - Exit Duct - Hood - Rear. Reference the following Service Manual procedure: CONDENSER - EXIT DUCT - HOOD - REAR - Correction code 10050402

Possible Effects

- Article #21537 VMS 56 PEM: No data fault
- Article #22225 SHFT 3004 SHFT: Warning Lost Comms DMC
- Article #23281 "Communication Problem Service Required" 1900 VMS-VDS communication fault

Possible Causes

Unknown.

Article #22343 - 400V HVAC Controller Isolation

Description

When performing an isolation resistance test of the rear motor and cable assembly at the 400V HVAC Controller, the isolation resistance measurements may differ by more than 100K Ohms.

Steps to Test

- Test the isolation resistance and record the measurements with the contactors closed. Disconnect the HVAC 400V controller and install the 400V controller simulator (TPN 6005456).

- Measure the isolation resistance with the contactors closed.
- Compare the initial measurements with those taken with the simulator installed.

Steps to Fix

- If the isolation resistance test measurements differ from the original values by MORE than 100K Ohms, pursue possible causes to investigate further.
- If the isolation resistance test measurements differ from the original values by LESS than 100K Ohms, escalate your session for assistance.

Possible Effects

- Article #21520 VMS 19 Isolation resistance warning
- Article #21593 BSM 286 BSM: Isolation fault while contactors closed
- Article #21645 BSM 603 BSM: Isolation resistance fault; power limiting in effect

Possible Causes

- Article #22344 PTC Heater Isolation

Article #23004 - AC unit does not engage after a load is connected to the APS

Description

Air-Conditioning (AC) unit does not engage after a load is connected to the Auxiliary Power Supply (APS).

Steps to Test

- Place a load on the APS output line, determine if the APS voltage drops below 13V (output pin #1) or 12V (output pin #2) with the addition of the load. Use the procedure found in SB-12-92-008 in Service Documents to load test the APS.
- Determine if the AC unit engages after several minutes of the load being attached to the APS.
-

With load attached to APS, use an infrared thermometer to measure APS coolant temperature at both input and output orifices. Record temperatures of each orifice.

Steps to Fix

- If the AC unit does not engage after several minutes, troubleshoot the Heating, Ventilation, Air-Conditioning (HVAC) system.
- If the APS is determined to be cooling when the input and output temperatures are measured, escalate your session for assistance. Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #23003 Auxiliary Power Supply (APS) fault relating to poor current output

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Possible Causes

- Article #22604 Improper coolant mixture

Article #22616 - Aftermarket accessories can cause interference with the CAN-bus

Description

Aftermarket accessories can cause interference with the CAN-bus.

Steps to Test

Disconnect or remove any aftermarket accessories and retest.

Steps to Fix

Advise customer that aftermarket accessories can cause interference. Refer customer to the Owner's Manual for additional information.

Possible Effects

- Article #21999 HVAC 1416 HVAC: Load Shed Timeout
- Article #22078 VMS 1550 VMS: Not receiving BSM version number
- Article #22079 VMS 1551 VMS: Not receiving CSB version number
- Article #22080 VMS 1552 VMS: Not receiving BMB version number
- Article #22081 VMS 1553 VMS: Not receiving SWP version number
- Article #22082 VMS 1554 VMS: Not receiving VDS version number
- Article #22083 VMS 1555 VMS: Not receiving DMC version number
- Article #22084 VMS 1556 VMS: Not receiving PM version number
- Article #22085 VMS 1557 VMS: Not receiving DFC version number
- Article #22086 VMS 1558 VMS: Not receiving TCM version number
- Article #22087 VMS 1559 VMS: Not receiving HVAC version number
- Article #22088 VMS 1560 VMS: Not receiving IP version number
- Article #22089 VMS 1561 VMS: Not receiving CPLD version number

Possible Causes

Unknown.

Article #27490 - Alpine head unit replacement

Description

Alpine double din head unit is faulty

Steps to Test

1. Operate head unit and test peripheral features (Bluetooth, Navigation, Satelite Radio, HD Radio, etc).
2. Check if head unit is turning on when vehicle is off (can be viewed through logs of the Auxilliary Power System (APS) on Radio)

Steps to Fix

If any feature does not operate as intended or is confirmed to cause the APS to turn on when vehicle is off, replace head unit with updated version INE-W957HD.

Possible Effects

- Article #21512 VMS 6 VMS: APS Failure

Possible Causes

- Article #32750 New radio head unit has different wiring

Article #22615 - APS voltage drops below 13V (output pin #1) or 12V (output pin #2) with the addition of a load

Description

Auxiliary Power Supply (APS) voltage drops below 13V (output pin #1) or 12V (output pin #2) with the addition of a load.

Steps to Test

1. Place a load on the APS output line, and check for the APS voltage to drop below 13V (output pin #1) or 12V (output pin #2) with the addition of the load,

as per SB-12-92-008 in Service Documents.

- Record voltage drop.

Steps to Fix

If the APS voltage drops below the expected voltage at pins 1 and 2, replace the APS (Part# 2005576). Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #22059 SWP 1522 SWP: BPS Active

Possible Causes

- Article #22614 No delay in AC engagement with applied load

Article #23003 - Auxiliary Power Supply (APS) fault relating to poor current output

Description

Auxiliary Power Supply (APS) fault relating to poor current output.

Steps to Test

-

With the key in the "on" position, determine if the current reads less than 5.5A at the APS main.

-

With the key in the "acc" position, determine if the current reads less than 5A at the APS main.

-

Place a load on the APS output line, determine if the APS voltage drops below 13V (output pin #1) or 12V (output pin #2) with the addition of the load. Use the procedure found in SB-12-92-008 in the Service Documents to load test the APS.

Steps to Fix

- If the current is not at the appropriate value with either key position, escalate your session for assistance.
- If the voltage drops below 13V (output pin #1) or 12V (output pin #2) with the addition of the load, replace the APS (Part# 2005576). Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #22256 Symptom Based Diagnostics 999003 BPS Active

Possible Causes

- Article #23004 AC unit does not engage after a load is connected to the APS

Article #22626 - Battery pack voltage over 250V and no battery undervoltage fault on the BSM

Description

The battery pack voltage is over 250V and there is no battery undervoltage fault on the BSM.

Steps to Test

- Plug car in and charge to 100% in standard mode.
- Issue command to ignore BSM undervoltage fault and recheck charge.

Steps to Fix

If issuing a command to ignore the BSM undervoltage fault does not resolve the fault, perform a recovery charge.

Possible Effects

- Article #21519 BMB 16 BMB: Sheet alarm

Possible Causes

Unknown.

Article #32535 - Blown line fuse

Description

One or both of the large ceramic line fuses have blown in the PEM, or have been damaged from being over torqued.

Steps to Test

Inhibit vehicle APS, disconnect HV power and ensure no charge cable is connected to the vehicle.

Use a DMM to confirm that there is no voltage present on the line fuses, measure from all four posts to chassis to confirm there is no voltage present.

remove the fuse and check continuity

Steps to Fix

See MEM-10-005 for 1.5 PEMs, see MEM-10-002 for 2.x PEMs

Possible Effects

- Article #21708 DMC 920 DMC HW: Line OverCurrent fault
- Article #21713 DMC 925 DMC HW: Common Mode Sense fault
- Article #21722 DMC 934 DMC FW: Line OverCurrent Peak fault
- Article #21724 DMC 936 DMC FW: Line OverVoltage Peak fault
- Article #21751 DMC 963 DMC FW: Line Current Not Equal Request fault
- Article #21869 DMC 1081 DMC FW: Line OverFrequency warning
- Article #32524 Unable to charge

Possible Causes

Unknown.

Article #22624 - BMB high temperature on a single sheet

Description

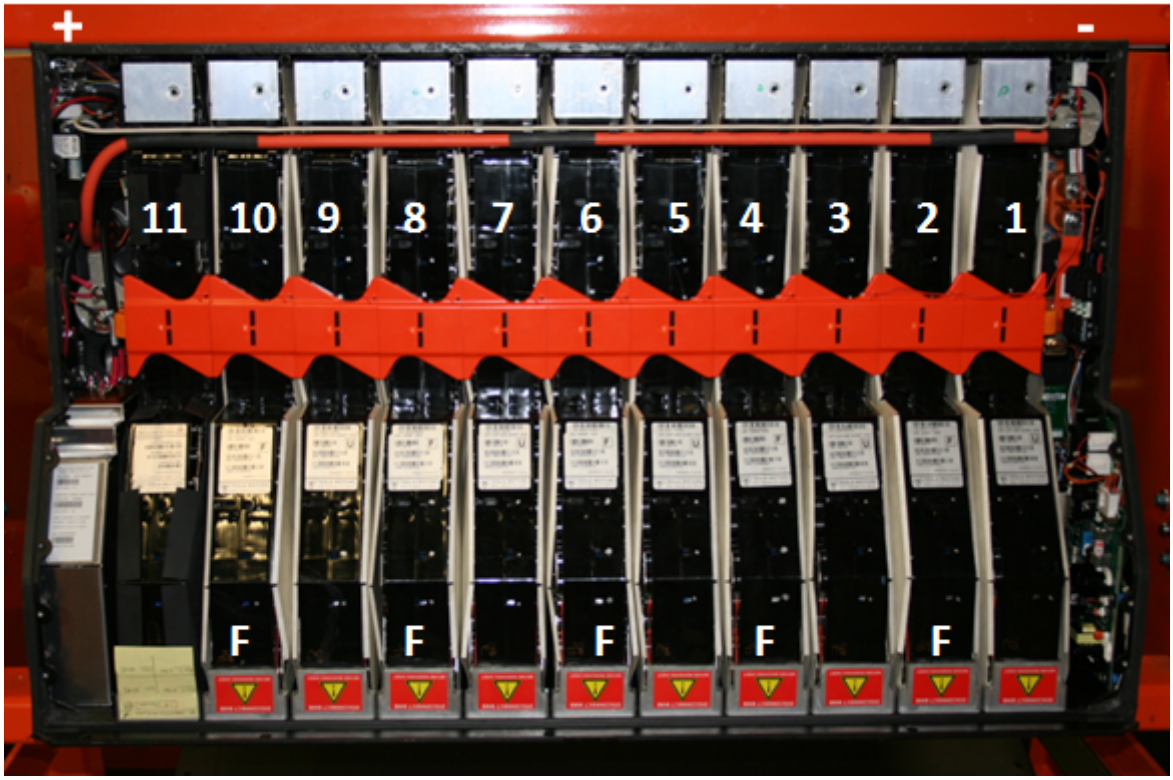
BMB high temperature on a single sheet.

Steps to Test

1. Retrieve the log files by connecting either the MTS-2 or Linux-based Engineering Tool.
2. Check for an over temperature fault.
3. Look for one sheet that reads a higher temperature than the others.

Steps to Fix

If it is determined that there is a single sheet with a higher temperature than the others, replace the BMB.
If the fault is not resolved, escalate your session for assistance.



Possible Effects

- Article #22625 Sheet alarm caused by a voltage over hardware or firmware limit

Possible Causes

Unknown.

Article #22620 - BMB not properly seated

Description

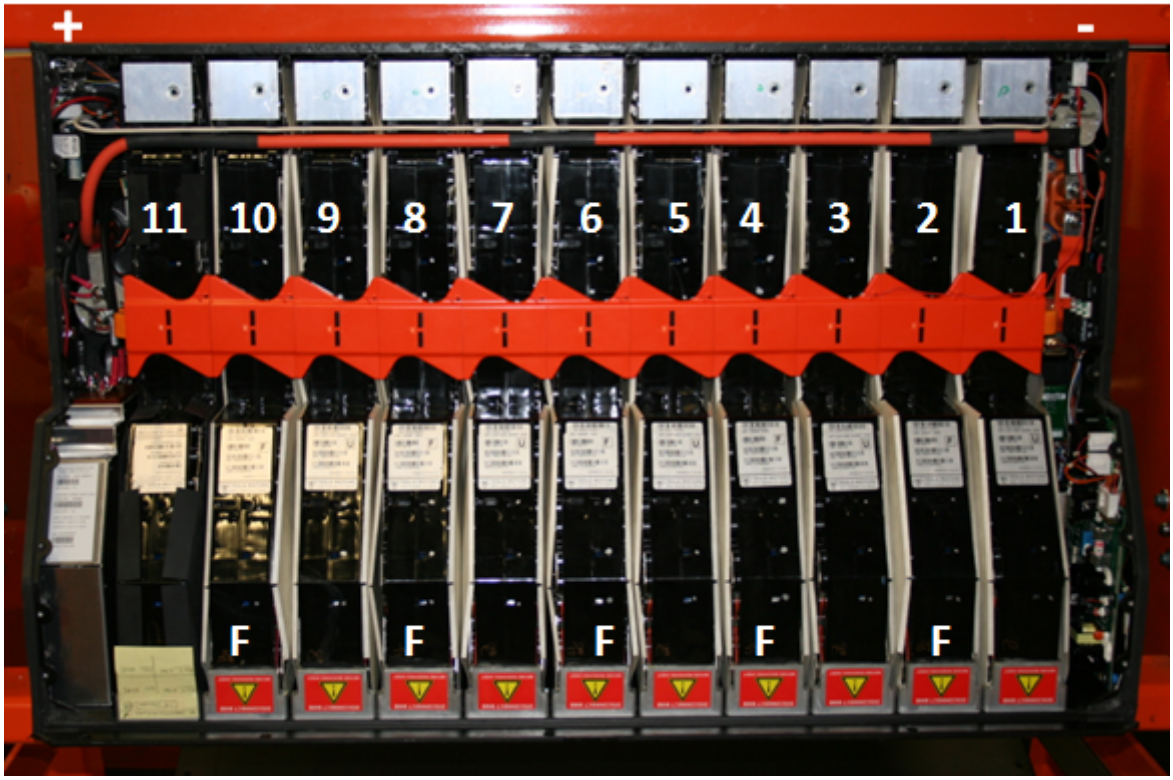
The Battery Monitor Board (BMB) is not properly seated.

Steps to Test

1. Obtain the log files using the MTS-2/Engineering Tool.
2. Using the log files, determine which sheet the fault is originating from.
3. Open the BMB access panel, and visually inspect the BMB to determine if it is properly seated.

Steps to Fix

If the BMB is properly seated, and the logs show that any of the brick voltages are greater than 4.18V, escalate your session for assistance. If the BMB is not properly seated, replace the BMB. If replacing the BMB does not resolve the fault, escalate your session for assistance.



Possible Effects

- Article #22621 Brick Failure-Adjacent high and low voltages
- Article #31869 "Charging completed" at low SOC

Possible Causes

Unknown.

Article #22623 - BMB temperature fault

Description

BMB temperature fault.

Steps to Test

1. Retrieve the log files by connecting either the MTS-2 or Linux-based Engineering Tool.
2. Check for an over temperature fault.
3. Override the low voltage sheet alarm on the Battery Monitor Boards (BMB) showing the alarm, and clear the sheet alarm on the Battery Monitor System (BMS).
4. Ensure communication with all of the BMB's.
5. Remove the BMB cover and check for flashing LEDs.

Steps to Fix

If there is a temperature fault, and the BMB LEDs are flashing, complete a recovery charge as per SB-13-92-002 in Service Documents. If the LEDs are not flashing, escalate your session for assistance.

Possible Effects

- Article #21510 VMS 4 Critical Sheet OverTemp fault
- Article #22625 Sheet alarm caused by a voltage over hardware or firmware limit

Possible Causes

- Article #28704 Insufficient Coolant Flow

Article #34798 - BMB wiring harness damaged

Description

There is damage, corrosion, bent or splayed pins, in the the 12V harness or daisy chain that enables the BMBs, BSM, and VMS to communicate with each other.

Steps to Test

Inspect CAN-bus connector RHC20 pins 5 & 6. Inspect associated CAN wiring from BSM to VMS for damage, grounding, and poor pin connections

Steps to Fix

Repair or replace harness as necessary. If the damage is internal to the battery daisy chain and is not repairable without further disassembly, a reman battery pack may be required.

Possible Effects

- Article #21531 VMS 50 BMB: No data fault
- Article #21651 VMS 609 ESS: BSM/CSB/BMB no data fault; power limited
- Article #21683 VMS 885 BMB No Data fault/Cannot start

Possible Causes

Unknown.

Article #22326 - Bootp message fault

Description

A bootp message is thrown when a module powers up unexpectedly.

Steps to Test

Check for unexpected loss of power to the module. The CAN ID for the bootp will identify the module. See the list of CAN ID's in the triggered fault.

Steps to Fix

If the issue is not related to a Bootp message, escalate your session for assistance.

Possible Effects

- Article #21507 VMS 1 ESS Bootp or Custom Alert
- Article #21508 VMS 2 PEM Bootp or Critical Sheet UnderTemp fault

Possible Causes

Unknown.

Article #22621 - Brick Failure-Adjacent high and low voltages

Description

Brick Failure-Adjacent high and low voltages.

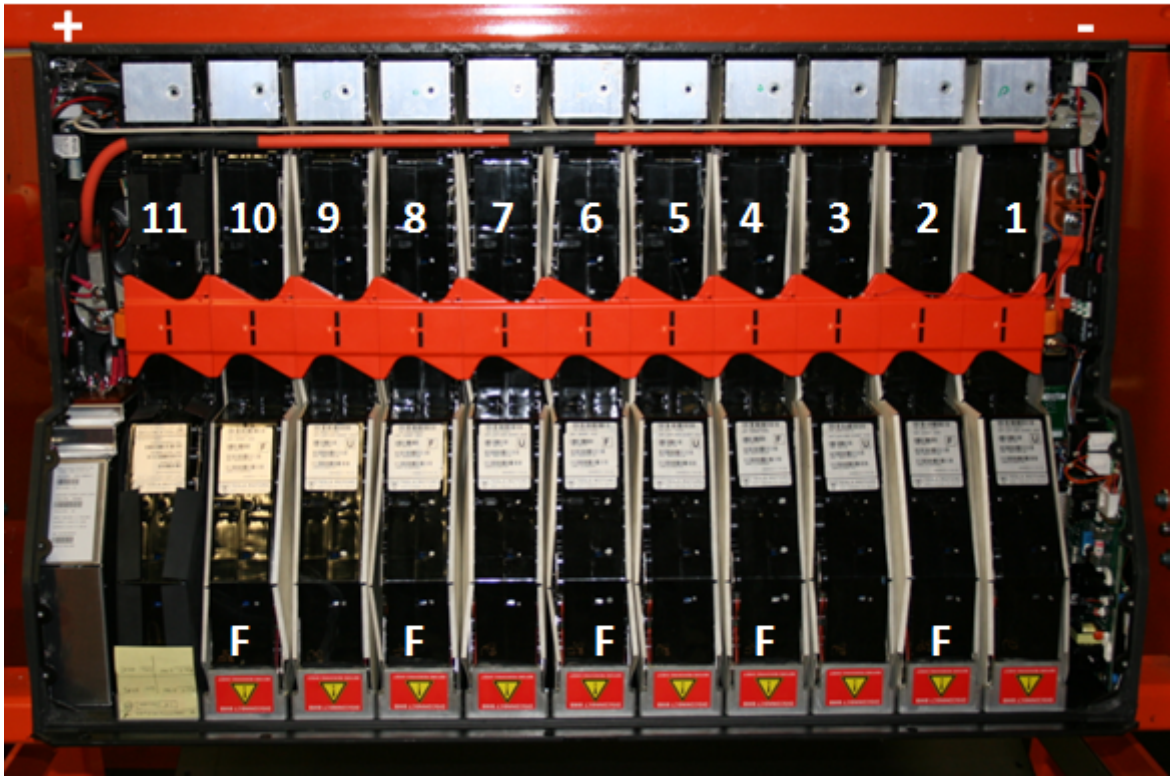
Steps to Test

1. Obtain the log files using the MTS-2/Engineering Tool.
2. Read the sheet number and brick number overvoltage from the log. (Sheet number brick (1-11) / Thermistor number (1-9))
3. Read the voltage from MTS-2/Linux-based Engineering Tool to verify brick failures for both a high and low voltage adjacent to each other.

Steps to Fix

If there are adjacent high and low voltages, replace the BMB, and verify that the fault has been resolved. If the fault

does not clear, escalate your session for assistance. Otherwise, pursue possible causes to investigate further.



Possible Effects

- Article #21519 BMB 16 BMB: Sheet alarm

Possible Causes

- Article #22620 BMB not properly seated

Article #22291 - CAN communication problem with compressor.

Description

CAN communication problem with compressor.

Steps to Test

If no damage or corrosion is visible, use Picoscope tool to record a trace of CAN traffic on bus 4. Alter key states while operating the compressor.

Steps to Fix

Escalate your session for assistance. Include recorded CAN traces in session comments.

Possible Effects

- Article #22033 HVAC 1458 HVAC: Compressor 7D Timeout

Possible Causes

- Article #22032 HVAC 1457 HVAC: Compressor 410 Timeout

Article #22930 - Charge cable fault

Description

An issue with the charging cable is causing charging faults.

Steps to Test

Connect the charging cable to the Roadster charge port and attempt to charge. Note any faults that appear on the Vehicle Display System (VDS) and process those faults using the appropriate procedures. Attempt to charge with "known good" charging equipment and watch for resulting faults. If the charge port faults (Red LED), the charge port door must be closed and re-opened to reset charging.

Test for charging faults with both a 240V adapter and a 120V adapter.

Steps to Fix

Replace defective charging equipment (Roadster Parts Manual-50.02).

Possible Effects

- Article #21743 DMC 955 DMC FW: Line Sync Loss fault
- Article #21872 DMC 1084 DMC FW: HCS Faulted warning
- Article #32524 Unable to charge

Possible Causes

Unknown.

Article #23095 - Charge door panel bond (SVC-08-10-006)

Description

Charge door panel re-bonding instructions.

Due to an incorrect bonding process from the supplier, it is possible the painted charge door may separate from the mounting plate. A new bonding process and material has been developed to ensure the charge door will pass a 30lb. pull test. This bond strength will surpass any requirements in the field. If the charge door panel has disengaged and has been damaged, replace the entire charge door with the new complete part and have it painted to match. Be sure to follow the steps exactly to ensure a quality bond.

Steps to Test

INTRODUCTION

Correct surface preparation is paramount in order to obtain optimum adhesion results. In general, the adhesive bond will provide maximum performance only when the substrate surface has been correctly prepared.

PRODUCT CLASSIFICATION

ISOPROPYL ALCOHOL

Degreasing and cleaning agent used for the removal of contamination from the substrate surface.

BETAWIPE VP 04604

Activator and cleaning agent used to promote adhesion to the aluminum substrate surface.

BETAPRIME 5404

Adhesion promoter used to maximize the performance of the bonding between the cleaned and/or activated surface and the adhesive compound.

BETASEAL 1701

One component moisture curing adhesive, providing high strength, permanently elastic bonds between various substrates.

CLEANING, ACTIVATION AND PRIMING INSTRUCTIONS FOR PRODUCTS

CLEANING:

SUBSTRATE

- Various

PRODUCT

- Isopropyl alcohol

CONTAINER

- Commercially available product

APPLICATION

- The application is a wipe on/wipe off type.
- Using a fiber-free cloth, lightly soak the cloth with
- Isopropyl alcohol
- Thoroughly clean the surface of the substrate and discard the fiber-free cloth after use.
- Thoroughly wipe off the cleaned surface of the substrate using a clean fiber-free cloth and discard after use.

QUALITY ASPECTS

- If the substrate is very soiled wipe off the surface with a clean fiber-free cloth prior to cleaning substrate. Discard fiber-free cloth after use.

ACTIVATION:

SUBSTRATE

- Aluminium

PRODUCT

- DOW BETAWIPE VP 04604

CONTAINER

- Supplied in aluminum container with a yellow colored cap.

APPLICATION

- The application is a wipe on/wipe off type.
- Pour the BETAWIPE VP 04604 into the applicator bottle, push in applicator head and fit the felt pad.
- Wet the felt pad by inverting the applicator bottle and gently squeezing the sides.
- Locate the felt pad onto the surface of the glass and apply a continuous film of BETAWIPE VP 04604.
- Minimal pressure onto the glass surface is all that is required to wet the surface.
- Immediately wipe off the activated/cleaned surface using a clean fiber free cloth and discard after use.

QUALITY ASPECTS

- Always replace the inner cap and outer caps onto the aluminum containers immediately after pouring the BETAWIPE VP 04604 into the applicator bottle. If the lid is left off for long periods of time the material will become milky in color.
- The milky color indicates that the moisture within the air has reacted with material. When this happens the material should be discarded.
- Only pour into the applicator bottle the amount of material required for the application.
- Never pour back used material from the applicator bottle into the aluminum container. Any material left should be discarded.
- When using a felt pad it should be changed at regular intervals due to surface contamination which may be picked up from the glass surface. When the substrate is very dirty wipe off the surface with a clean fiber free cloth prior to application/activating/cleaning the substrate. Discard the fiber free cloth after use.

PRIMING:

SUBSTRATE

- ABS and aluminum

PRODUCT

- DOW BETAPRIME 5404

CONTAINER

- Supplied in aluminum containers with red colored cap.
- Inner cap has a ring pull for ease of removal.

SHAKING INSTRUCTIONS

- There are two steel balls inside the aluminum containers; their presence being to assist with the dispersion of the solid content of the material into suspension. If the steel balls are not free inside the container, then the lid of the container should be tapped sharply on a bench or similar to free.
- The aluminum containers must always be thoroughly shaken for 60 seconds minimum prior to use in order that the contents are thoroughly mixed. This enables the solid particles to pass through the felt pad, resulting in correct obscuration on the surface of the substrate.

APPLICATION INSTRUCTIONS

- The application of BETAPRIME 5404 can be applied using a felt pad or swab applicator.

PRIMER APPLICATOR AND FELT PAD

- Immerse applicator into BETAPRIME 5404 and remove excess material when withdrawing.
- Locate the applicator onto the already cleaned surface of the substrate and apply a continuous film of primer.

DRYING TIME

- Minimum after application 15 minutes.

QUALITY OF APPLICATION

- The appearance of the primer area should be "deep black" in color with no streaks or voids.
- To achieve this quality the method of application is a smooth continuous uni-directional movement on the substrate and not short backward and forward movements. This latter method of application results in inconsistent film build.
- It is possible to re-work any poor areas after 5 minutes (tack time). This is achieved by re-application of BETAPRIME 5404 in the same direction as initially applied.
- The felt pad/primer applicator should always be held square to the surface substrate to ensure that the full width of the primer makes contact. Failure to do this will result in insufficient primer width at application.
- When using the felt pad/primer applicator for applying the primer, after a period of time the moisture in the air will react with the surface and will start to harden off. The felt pad/primer applicator must be discarded and replaced with a fresh one, otherwise the quality of the application will deteriorate.

QUALITY ASPECTS

- Always replace the inner cap and outer caps onto the aluminum containers after pouring the BETAPRIME 5404 into the applicator bottle. If the lids are left off for long periods of time, the material will increase in viscosity and lose reactivity.
- For stoppages the felt pad should be removed and discarded and a fresh one fitted into the applicator head, but not wetted out with the primer until ready for use.

ADHESIVE INSTRUCTIONS

PRODUCT

- DOW BETASEAL 1701

CONTAINER SIZE

- Supplied in 300 ml aluminum cartridge.

APPLICATION

- Remove cartridge end ensuring no damage to reinforcement sleeve.
- Pierce neck of cartridge and screw on applicator nozzle.
- Extrude a smooth, even and continuous bead of BETASEAL 1701 to the previously prepared surface of the substrate.
- Ensure that any joints are correctly made.

ASSEMBLY

- After extrusion of the adhesive the substrates to be bonded should be assembled immediately.

QUALITY ASPECTS

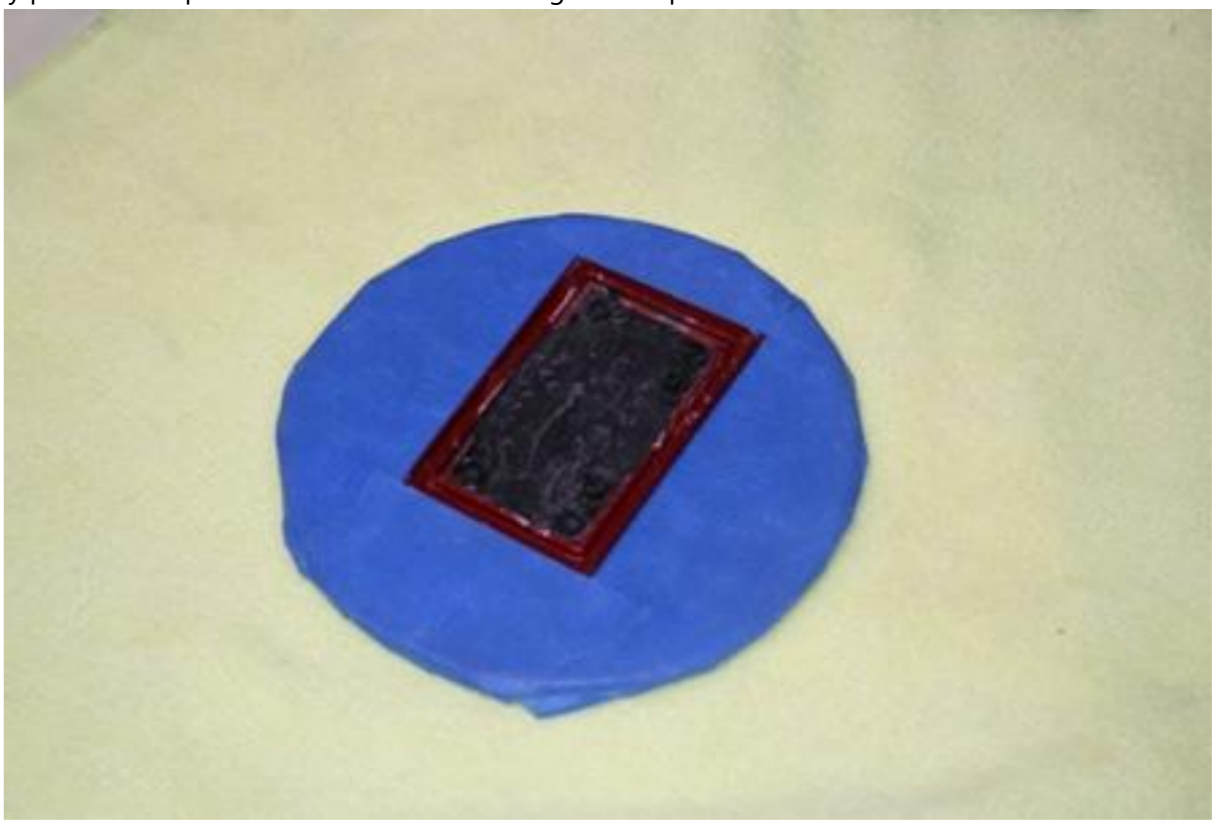
- After extrusion, the open time that the adhesive may be left is 5 minutes maximum, at 23Â°C and 50% relative humidity.

- If the adhesive has to be touched for any reason, ensure that the operator's fingers are wet. Contact will not be made with the adhesive.

Steps to Fix

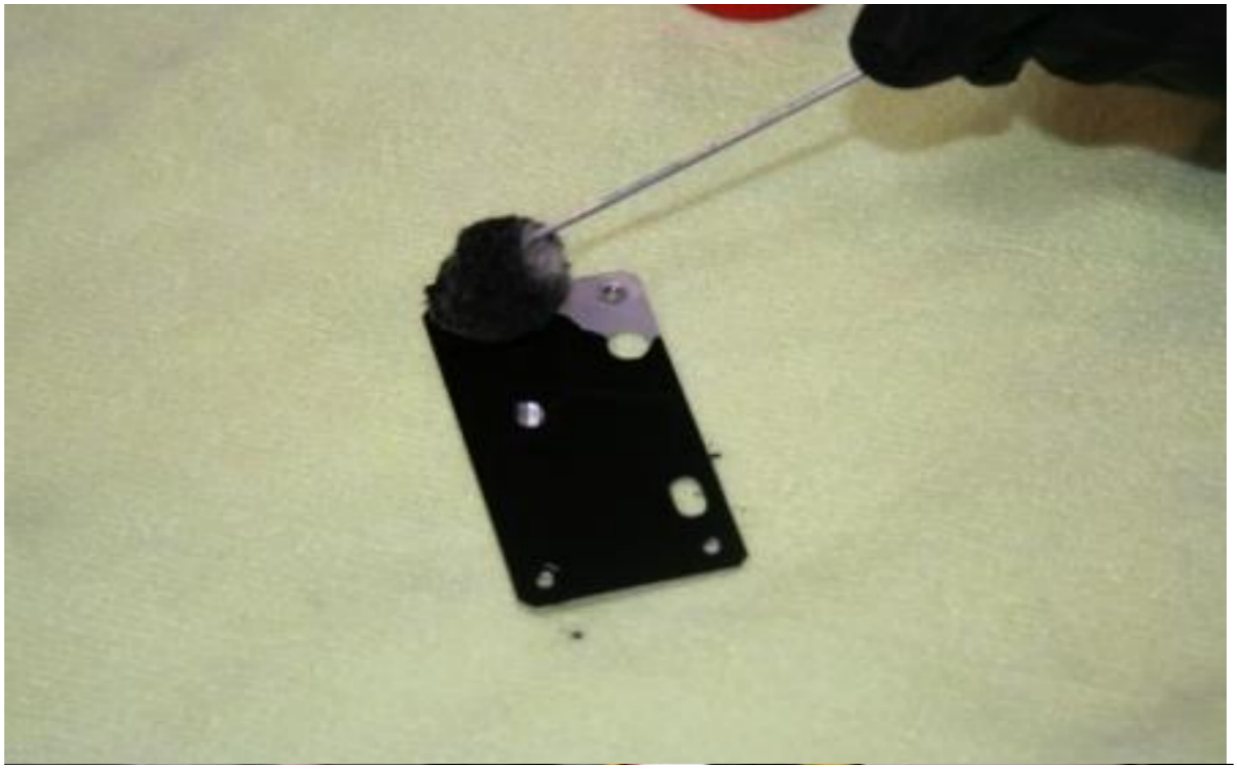
1. If door has broken off remove 4 screws holding mounting plate to charge door hinge. (picture shown with charge door attached)

2. Apply protective tape to the door to avoid damage to the painted finishes.

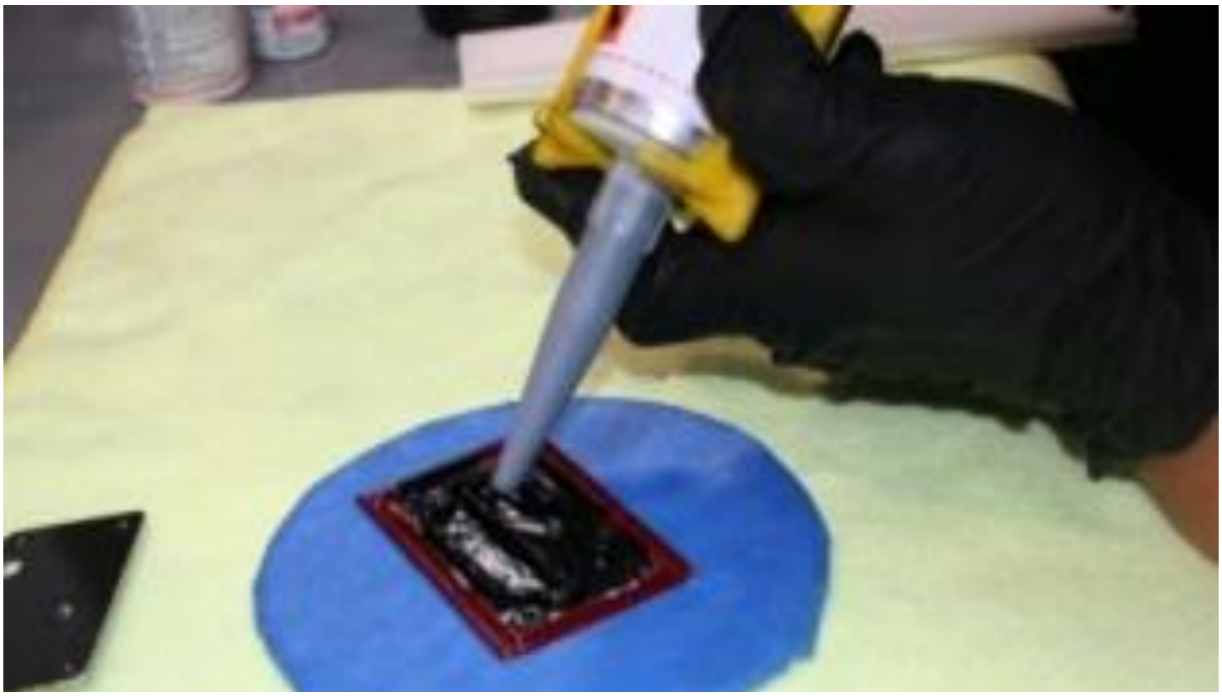


3. If the plate is still attached, pry the plate with a suitable prying tool.

4. Using a scraper or small electric grinder remove the glue that is still attached to the charge door. Remove all glue down to the ABS substrate. Use care not to remove the substrate.
5. Blow off all remaining material from charge port door with compressed air. Apply the cleaner/degreaser (isopropyl alcohol) to both the new bonding plate and the charge door. DO NOT USE THE OLD MOUNTING PLATE. Use part # 02-002452-00 for new Bonding Plate. DO NOT SCUFF OR PREP THE ALUMINUM BONDING SURFACE OF NEW PLATE.
6. Apply Betawipe VP04604 to the new bonding plate ONLY. Wipe off residual with a clean lint free cloth.



7. Apply Betaprime 5404 to both substrates and allow for drying time of 15 minutes.
8. Cut the very tip of the applicator nozzle to allow for a thin extrusion of sealer. Using a caulking gun apply the extrusion of sealer to the door. The extrusion should be no more than 1-2 mm in thickness.



9. Apply a sparing amount of Betaseal 1701 to the charge door only. It is important to avoid applying so much that the sealer will push into the molded bosses (yellow arrows).
10. Apply the sealer in a cross pattern as shown in red.

11. Allow sealer to cure 24 hours before installing.
12. After sealer is cured, re-install charge port door and recheck operation. use Loctite 380 (Part # 01- 004320-00).on the charge door fasteners. Note: Fasteners should be renewed. (Part #01-002976- 00) Fastener torque spec = 0.5 Nm

Note: If the charge door has been damaged during failure, replace charge door with part # 06-000338-00. Make sure to mask off the mounting plate before painting.

Use the quick reference chart below for application drying time and product use.

Substrate	Abrasion	Clean	Activate	Primer	Adhesive
Aluminum	No	Isopropyl Alcohol	Yes: Betawipe VP04604 wipe on/wipe off	Yes: Betaprime 5404 15 mins drying	Betaseal 1701
ABS	No	Isopropyl Alcohol	No	Yes: Betaprime 5404 15 mins drying	Betaseal 1701

Possible Effects

- Article #23102 Charge port door has visual defect (cosmetic damage, misaligned, or missing parts)

Possible Causes

Unknown.

Article #33014 - Clock Will Not Set

Description

The clock will not set. It is also possible that the clock is stuck on the date Jan 3, 1970.

Steps to Test

The clock on the VDS screen is set by the GPS. The GPS is also used for altimeter and heading functions. Check to see if these other features do not work.

Steps to Fix

Move the vehicle to an area with a clear view of the sky, this may restore GPS signal and update, clock, heading and altimeter settings.

Possible Effects

- Article #21534 VMS 53 GPS: No data fault,54329 Date in VDS and carlogs are incorrect,54682 Date and Time display is not correct yet heading and altitude displays are accurate

Possible Causes

Unknown.

Article #28641 - Clunk sound from loose or damaged transmission mount or drive coupler

Description

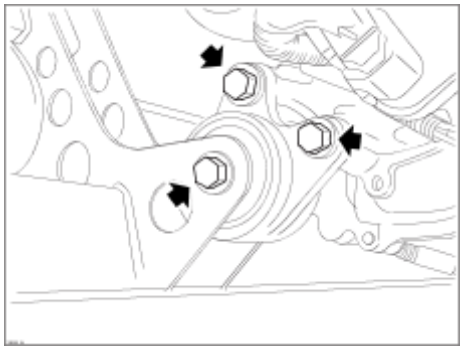
Customer reports a clunk sound when shifting from reverse to drive. May also be present when torque shifts from drive to regen.

Steps to Test

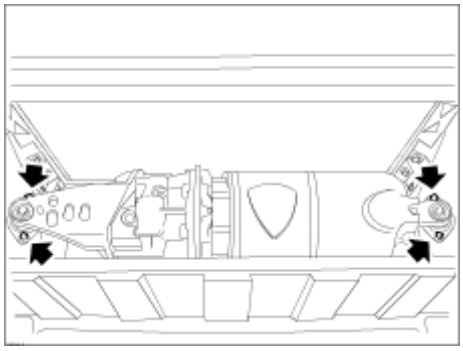
1. Attempt to duplicate concern by driving the vehicle at low speed and shifting from drive to reverse or on off throttle application.
2. The noise may be caused by a loose or damaged transmission mount or in some cases a damaged or loose drive coupler between the motor and transmission.
3. If the noise is present, then this is likely your issue.

Steps to Fix

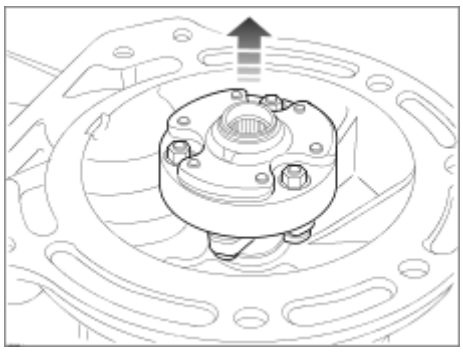
- Inspect condition of rubber transmission to subframe mount. If mount is intact and in good condition, check torque of bolts securing the mount to the transmission as well as the bolt securing the mount to subframe.



- If this does not resolve the concern, proceed to inspect drive unit to subframe mounts (may require removal of the PEM) Inspect both condition of the each mount as well as the torque to drive unit and suframe bolts.



- If concern persists the noise may be caused by a loose drive coupler between the motor and transmission. Removal of the PEM and drive motor assembly will be required to inspect this component. You will also need to separate the motor from the transmission assembly (special tools are required) See the Service Manual procedure: DRIVE COUPLER - MOTOR TO TRANSMISSION - ROADSTER 1.5 - Correction code 47030402



Possible Effects

- Article #28640 Noise while driving

Possible Causes

Unknown.

Article #22925 - Condenser Fan blockage

Description

Condenser Fan is blocked by debris or dirt buildup.

Steps to Test

Visually inspect the condenser for blockage caused by debris or dirt buildup.

Steps to Fix

If blockage is found, clean the condenser fins or remove debris to increase efficiency. Reevaluate.

Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #22896 Poor Air Flow Over Condenser

Possible Causes

- Article #22926 Coolant system over-charged

Article #22927 - Condenser fan fuse #12 or connections faulty

Description

Condenser fan Fuse

#12

or connections are faulty.

Steps to Test

Inspect fan fuse #12. Also investigate fan circuit and connections to each fan. Inspect front ground post connections for corrosion, poor connections, or damage.

Steps to Fix

If damage is found, replace as needed. Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #22931 Faulty 400V Controller related to fuse #12

Possible Causes

- Article #22849 Faulty Condenser Fan
- Article #22928 Faulty Fan Control Module in Roadster 1.5

Article #21505 - Contactors are closed unexpectedly

Description

If contactors are closed unexpectedly when the key is out and the vehicle is not charging, this indicates a problem with the high voltage (HV) system. "Contactors Closed While Not Expected" is displayed in the debug text.

Steps to Test

- Verify that the key in the off position.
- Try cycling the key twice to see if the alert clears.

If the alert does not clear, then this is your issue.

Steps to Fix

Escalate your session for assistance.

Possible Effects

- Article #21515 VMS 9 Contactors Closed While not Expected

Possible Causes

Unknown.

Article #22842 - Coolant Level Low

Description

Coolant is below the proper level.

Steps to Test

Check if the coolant was properly vacuum filled.

Steps to Fix

- Top off coolant level.
- Drain and vacuum refill system as per SB-12-18-013, in Service Documents.

Possible Effects

- Article #21569 BSM 262 BSM: Immersion fault
- Article #21983 HVAC 1400 HVAC: Coolant Pump UnderCurrent
- Article #22015 HVAC 1432 HVAC: Pump Current Out Of Range
- Article #22017 HVAC 1434 HVAC: Coolant Heater Failed
- Article #22049 HVAC 1474 HVAC: Coolant Heater Fault
- Article #28704 Insufficient Coolant Flow
- Article #29851 Customer notices green liquid under, dripping, leaking from their vehicle

Possible Causes

- Article #28004 Roadster battery coolant leak from porous sheet tubes
- Article #31861 Coolant pump leak

Article #22602 - Coolant Pump failure

Description

Coolant Pump failure.

Steps to Test

Use the MTS-2 tool to activate the coolant pump(s). Using a DVOM, measure the pump current draw.

- If the measurement is greater than 4.6A, drain and vacuum refill the cooling system as per SB-12-18-013 in Service Documents.
- If the measurement is less than 1.4A, proceed to measure the pump voltage.

Steps to Fix

Measurements of less than 1.4A, and equal to or greater than 12V, likely indicate a failed or failing pump. Replace the coolant pump

(Part# 2004503).

Possible Effects

- Article #21983 HVAC 1400 HVAC: Coolant Pump UnderCurrent
- Article #22008 HVAC 1425 HVAC: Low current pump failure
- Article #22009 HVAC 1426 HVAC: High current pump failure
- Article #22015 HVAC 1432 HVAC: Pump Current Out Of Range
- Article #22019 HVAC 1440 HVAC: Coolant Pump UnderCurrent
- Article #22047 HVAC 1472 HVAC: Pump Current Out Of Range
- Article #28704 Insufficient Coolant Flow

Possible Causes

Unknown.

Article #31861 - Coolant pump leak

Description

There may be a leak at or near the coolant pump. High pump current may be observed due to a soft short in the connector as a result of corrosion.

Steps to Test

Visually inspect the coolant pump (1.5 vehicle shown) and connectors for a coolant leak.

Example of leak in the connector:

Steps to Fix

1. Replace coolant pump.
2. Clean connector with contact cleaner and shop air.
3. If there is excessive corrosion, repair harness as needed.

Possible Effects

- Article #22009 HVAC 1426 HVAC: High current pump failure
- Article #22842 Coolant Level Low

Possible Causes

- Article #23091 Restriction in coolant return hose to reservoir (SVC-08-46-002)

Article #22355 - Coolant pump malfunction

Description

When the vehicle coolant is not at the proper level, there are no leaks in the system, and vacuum refilling does not repair the problem, the issue is related to the coolant pump.

Steps to Test

Use the MTS-2 tool to activate the coolant pump and inspect the connections to be sure of proper seal.

Steps to Fix

- Troubleshoot coolant pump and 12V controller connections.
- If the connections are secure, replace the coolant pump (Part# 2004503).

Possible Effects

Unknown.

Possible Causes

- Article #22845 Wiring Problem between 12V HVAC Controller and Coolant Pump

Article #22926 - Coolant system over-charged

Description

Coolant system over-charged.

Steps to Test

Determine if the system has been over-charged by visual examination.

Steps to Fix

If the vehicle coolant system was over-charged, evacuate and refill using SB-12-18-013 in Service Documents. Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #22925 Condenser Fan blockage

Possible Causes

- Article #22897 Faulty Solenoid

Article #22290 - Damage or corrosion at the CAN high/low connection to the compressor.

Description

Damage or corrosion at FHC1-R3 or FHC1-P3.

Steps to Test

Steps to Fix

Repair or replace as necessary. Retest to verify connectivity.

Possible Effects

- Article #22033 HVAC 1458 HVAC: Compressor 7D Timeout

Possible Causes

- Article #22032 HVAC 1457 HVAC: Compressor 410 Timeout

Article #22289 - Damage or corrosion at the compressor.

Description

Damage or corrosion at FHC130-2 or FHC130-3.

Steps to Test

Steps to Fix

Repair or replace, as needed. Retest to verify connectivity.

Possible Effects

- Article #22033 HVAC 1458 HVAC: Compressor 7D Timeout

Possible Causes

- Article #22032 HVAC 1457 HVAC: Compressor 410 Timeout

Article #22824 - Damaged Harness FHC49 to 12V HVAC Controller

Description

Damaged Harness FHC49 to 12V HVAC Controller.

Steps to Test

Inspect harness connection FHC49 to the 12V HVAC controller.

Steps to Fix

- Replace the harness.
- Escalate your session for assistance if this doesn't resolve the problem.

Possible Effects

- Article #21986 HVAC 1403 HVAC: Coolant UnderTemp
- Article #22022 HVAC 1443 HVAC: Coolant UnderTemp

Possible Causes

Unknown.

Article #22950 - Damaged wiring between Switchpack and window motor

Description

Damaged wiring between Switchpack and window motor

Steps to Test

Check wiring from the switchpack to the window switch.

Steps to Fix

Replace wiring if damaged

(Driver-2004670, Passenger-2004667).

Possible Effects

- Article #21633 SWP 534 Left window motor issue
- Article #21634 SWP 535 Right window motor issue

Possible Causes

Unknown.

Article #22968 - Damaged wiring between VDS and VMS

Description

Damaged wiring between the Vehicle Display System (VDS) and the Vehicle Monitor System (VMS).

Steps to Test

Inspect CAN-BUS connections and wiring between the VDS and VMS. Check the connections; FHC33 pins A7 and B7, FHC47 pins 12 and 20. Also inspect CAN-BUS splice; 1-H and 1-L, for pinched wires, damaged pins, or poor connections.

Steps to Fix

If the fault is not resolved, pursue possible causes to investigate further.

Possible Effects

- Article #22135 VDS 2003 No response to request to start charging
- Article #22136 VDS 2004 Request to start charging rejected
- Article #22137 VDS 2005 No response to request to stop charging
- Article #22138 VDS 2006 Request to stop charging rejected
- Article #22139 VDS 2007 No response to request to change user current limit
- Article #22140 VDS 2008 Request to change user current limit rejected
- Article #22141 VDS 2009 No response to request to uninhibit APS power
- Article #22142 VDS 2010 Request to uninhibit APS power rejected
- Article #22143 VDS 2011 No response to request to inhibit APS power
- Article #22144 VDS 2012 Request to inhibit APS power rejected
- Article #22145 VDS 2013 No response to request to change charge timing
- Article #22146 VDS 2014 Request to change charge timing rejected
- Article #22147 VDS 2015 No response to request to change charge time
- Article #22148 VDS 2016 Request to change charge time rejected
- Article #22149 VDS 2017 No response to request to change charge mode
- Article #22150 VDS 2018 Request to change charge mode rejected
- Article #22151 VDS 2019 No response to request to restore default charge mode
- Article #22152 VDS 2020 Request to restore default charge mode rejected
- Article #22153 VDS 2021 No response to request to restore default charging time
- Article #22154 VDS 2022 Request to restore default charging time rejected
- Article #22155 VDS 2023 No response to request to restore default charge timing
- Article #22156 VDS 2024 Request to restore default charge timing rejected
- Article #22157 VDS 2025 No response to request to restore default current limit

- Article #22158 VDS 2026 Request to restore default current limit rejected
- Article #22159 VDS 2027 No response to request to restore default cost/kWh
- Article #22160 VDS 2028 Request to restore default cost/kWh rejected
- Article #22161 VDS 2029 No response to request to save charge mode
- Article #22162 VDS 2030 Request to save charge mode rejected
- Article #22163 VDS 2031 No response to request to save charging time
- Article #22164 VDS 2032 Request to save charging time rejected
- Article #22165 VDS 2033 No response to request to save charge timing
- Article #22166 VDS 2034 Request to save charge timing rejected
- Article #22167 VDS 2035 No response to request to save current limit
- Article #22168 VDS 2036 Request to save current limit rejected
- Article #22169 VDS 2037 No response to request to save cost/kWh
- Article #22170 VDS 2038 Request to save cost/kWh rejected
- Article #22171 VDS 2039 No response to request to enter valet mode
- Article #22172 VDS 2040 No response to request to exit valet mode
- Article #22173 VDS 2041 No response to request to enter pin locked mode
- Article #22174 VDS 2042 No response to request to exit pin locked mode
- Article #22175 VDS 2047 No response to request to change PIN code
- Article #22176 VDS 2048 Request to change PIN code rejected
- Article #22178 VDS 2051 Request to change transmission lock state rejected
- Article #22179 VDS 2061 No response to request to change data logging
- Article #22180 VDS 2062 Request to change data logging rejected
- Article #22181 VDS 2065 No response to request to unmount USB drive
- Article #22182 VDS 2066 Request to unmount USB drive rejected
- Article #22183 VDS 2070 No response to request to get keyfob function
- Article #22184 VDS 2071 Request to get keyfob function rejected
- Article #22185 VDS 2072 No response to request to set keyfob function
- Article #22186 VDS 2073 Request to set keyfob function rejected
- Article #22187 VDS 2074 No response to request to get keyfob-activated homelink ID
- Article #22188 VDS 2075 Request to get keyfob-activated homelink ID rejected
- Article #22189 VDS 2076 No response to request to set keyfob-activated homelink ID
- Article #22190 VDS 2077 Request to set keyfob-activated homelink ID rejected
- Article #22191 VDS 2078 No response to request to enter Tow Mode
- Article #22192 VDS 2079 Request to enter Tow Mode rejected
- Article #22193 VDS 2080 No response to request to exit Tow Mode
- Article #22194 VDS 2081 Request to exit Tow Mode rejected
- Article #22195 VDS 2086 No response to request to reset PEM Limits table
- Article #22196 VDS 2087 Request to reset PEM Limits table rejected
- Article #22197 VDS 2088 Request to set TPMS limits rejected
- Article #22198 VDS 2089 No response to request to set TPMS limits
- Article #22199 VDS 2090 No response to request to reset SOC parameters
- Article #22200 VDS 2091 Request to reset SOC parameters rejected
- Article #22201 VDS 2092 No response to request to reset IP needles

- Article #22202 VDS 2093 Request to reset IP needles rejected
- Article #22203 VDS 2094 No response to request to change verbose logging
- Article #22204 VDS 2095 Request to change verbose logging rejected
- Article #22205 VDS 2096 No response to PIN submission
- Article #22206 VDS 2098 No response to request to update next service info
- Article #22207 VDS 2099 Request to update next service info rejected

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Possible Causes

Unknown.

Article #22630 - Damaged/Loose ground at TPMS

Description

Damaged/Loose ground at Tire Pressure Monitor System (TPMS).

Steps to Test

Cycle the ignition key off/on.

Steps to Fix

If the fault does not clear, replace harness as needed.

Possible Effects

- Article #22631 Possible damage to fuse 7

Possible Causes

Unknown.

Article #23209 - PEM Malfunction

Description

The diagnostic trouble codes (DTCs) on the vehicle or in the logs are indicating the Power Electronics Module (PEM) is malfunctioning.

Steps to Test

1. Confirm one or more of the following DTCs are present on the vehicle or in the logs:
    - DMC 905 DMC HW: PhaseA Low Side Desat Fault
    - DMC 1055 DMCFW: PhaseA OverCurrent warning. Torque limited
    - DMC 1056 DMCFW: PhaseB OverCurrent warning. Torque limited
    - DMC 1057 DMCFW: PhaseC OverCurrent warning. Torque limited
    - DMC 1065 DMC FW: Line UnderVoltage warning
    - DMC 1102 DMC FW: Pole Current Error warning
2. Determine if the vehicle is in Charge Mode.
3. Perform visual assessment to PEM / phase cables.
4. Perform a motor / cable Isolation Test.
5. Use HIPOT Test Sheet form (link downloads a .pdf) to track results for clear reference.

Steps to Fix

1. Proceed to Article #32597 to determine if the PEM as requiring replacement.
2. Escalate the session for further assistance to gain approval for PEM replacement
    - Battery 1.5 TPN: 6003440
    - Battery 2.X TPN: 6005203
    - Battery 3.X TPN: 1071439-00-A

Possible Effects

- Article #21843 DMC 1055 DMCFW: PhaseA OverCurrent warning. Torque limited.
- Article #21844 DMC 1056 DMCFW: PhaseB OverCurrent warning. Torque limited.
- Article #21845 DMC 1057 DMCFW: PhaseC OverCurrent warning. Torque limited
- Article #21853 DMC 1065 DMC FW: Line UnderVoltage warning
- Article #21890 DMC 1102 DMC FW: Pole Current Error warning

Possible Causes

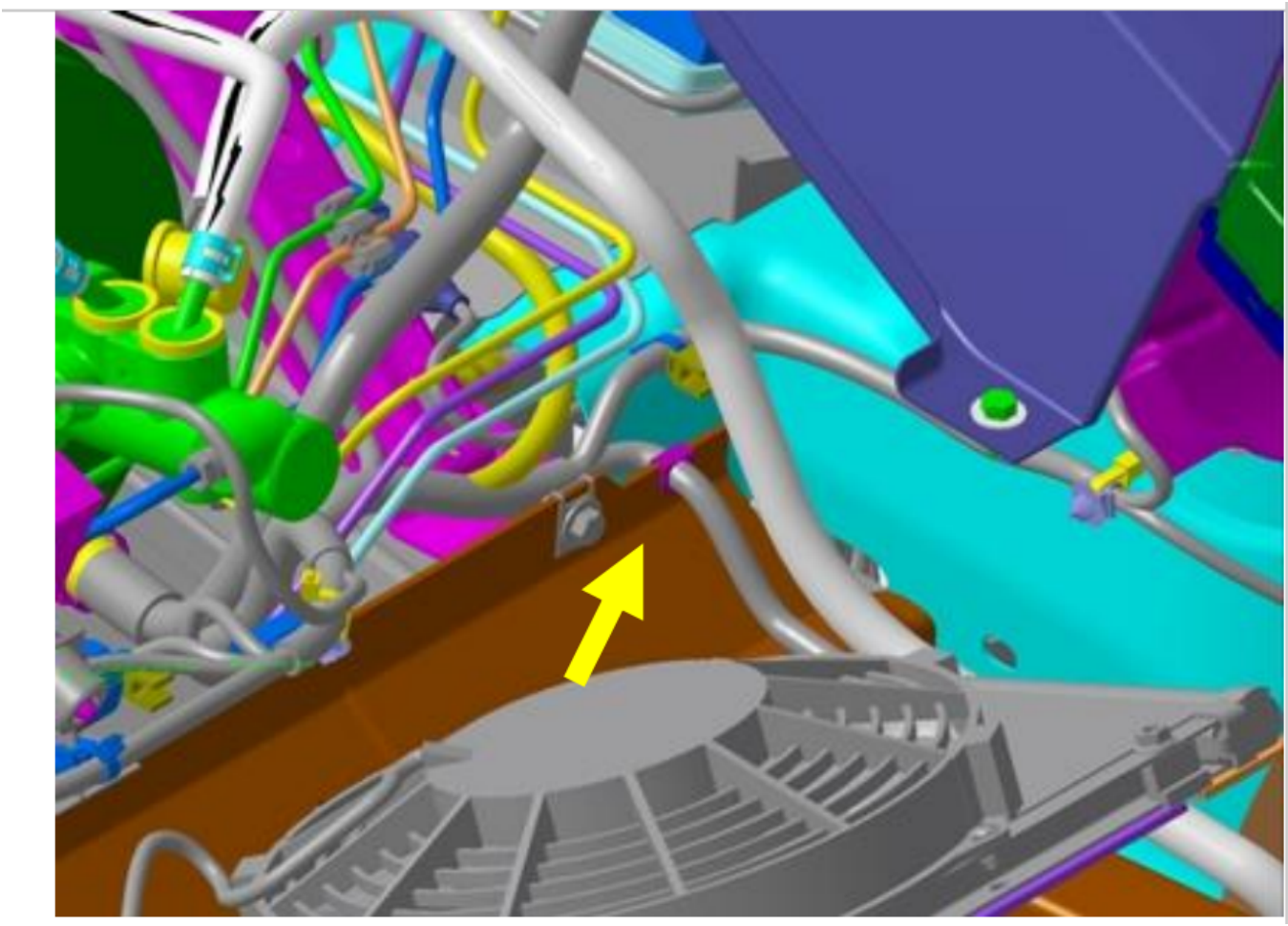
- Article #32597 PEM Service Assessment [2.x]

Article #23092 - Dislodged bulkhead grommet (SVC-08-17-005)

Description

Dislodged bulkhead grommet.

Part of the front harness that runs through the bulkhead structure of the car is secured by a "U" shaped grommet. This grommet is designed to stop the wiring harness from chafing against the impact structure. See picture below that illustrates the position of the grommet.



Steps to Test

1. Check to make sure that the grommet has not become dislodged from its mounting point in the carbon impact structure. Shown below is an example of a correctly placed grommet.
2. If the grommet is not correctly placed, then this is your issue.

Not pictured: The grommet can be viewed by opening the hood and viewing underneath the rear condenser exit duct.

Steps to Fix

Two solutions exist to re-install the grommet. If grommet is visibly dislodged from the top, remove Condenser-Exit Duct-Hood-Rear. Refer to the Service Manual procedure: Condenser - Exit Duct - Hood - Front

- FRT No: 10050302 Re-position the grommet correctly and re-install all parts.
  If the grommet is missing when viewed from the top, it has slid down the harness under the front bulkhead. It is necessary to remove Wheel Arch Liner-Upper-Front, reach under the front bulkhead and push the grommet into place. Refer to the Service Manual procedure: Wheel Arch Liner - Upper - Front - LH
- FRT No: 12010902

Possible Effects

- Article #39902 Servicing articles

Possible Causes

Unknown.

Article #22287 - Encoder cable damaged

Description

Encoder cable is damaged, shorted, or connectors are corroded.

Steps to Test

Remove motor monitoring encoder cable connector SHC5 from the PEM. Using a digital multimeter, measure the resistance between pins 4 and 13 (temp sensor 1) and pins 3 and 12 (temp sensor 2). Are the two measurements nearly identical and between 1 and 1.5k ohms at room temperature?

Check for short/continuity of encoder cable by disconnecting connector at motor encoder and PEM. Check cable for visible damage.

Steps to Fix

Replace the motor encoder cable (Part# 6005225).

Possible Effects

- Article #21857 DMC 1069 DMCFW: Motor Sensor1 OverTemp warning. Torque limited.
- Article #21858 DMC 1070 DMCFW: Motor Sensor2 OverTemp warning. Torque limited.

Possible Causes

Unknown.

Article #30732 - ESS requires cooling

Description

The Roadster battery requires cooling at 40Â°C, but if the temperature takes a long time to come down, then the Energy Storage System (ESS) solenoid may stay open longer than the 6 minute threshold, potentially suspending the cabin HVAC, as ESS cooling has higher priority.

Steps to Test

1. Check the ambient air temperature and indications that vehicle is being driven hard (quick acceleration, high top speeds, ask customer).
2. Look at the logs to determine ess_max_temp and hvac_coolant_temp to see if the battery requires cooling (near or above 40Â°C) and if the coolant temperature lowers.
3. Confirm battery temperatures return to normal levels when no heat generating loads are present, such as driving, charging, or very high ambient temperatures.

Steps to Fix

When not paired with other ESS or HVAC temperature alerts, the system is operating as expected and no fix is necessary.

Note: In future, it may be recommended to the customer that parking the Roadster in the shade and not driving the car is a way to reduce the need for battery cooling.

Possible Effects

- Article #21998 HVAC 1415 HVAC: Thermostat Stuck Open

Possible Causes

- Article #44368 HVAC failure

Article #22800 - Failed ABS Release

Description

Failed ABS Release.

Steps to Test

Disconnect the ABS module and see if the fault remains.

Steps to Fix

- If the fault is not present, replace the ABS module (Part# 2002518).
- If the fault is present, proceed to "Faulty Switchpack" (Article 22617).

Possible Effects

- Article #21999 HVAC 1416 HVAC: Load Shed Timeout
- Article #26290 TC / ABS telltale is lit

Possible Causes

- Article #22617 Faulty Switchpack

Article #22827 - Failed PEM ground fuse/internal fuse

Description

Failed Power Electronics Module (PEM) ground fuse/internal fuse.

There are four ground fuses in the PEM which may have failed, two can be tested externally.

Steps to Test

To test the external fuses, using a DMM:

1. Remove the PEM logic connector (RHC 12) and probe pin 21.
2. Remove the motor monitoring encoder cable (SHC 5) and probe pin 13 of the PEM. Record the measured value.
3. Repeat this procedure measuring between pin 21 of RHC 12 (PEM side) and pin 12 of SHC 5 (PEM side). Record this value.
4. The two recorded values should be very low. Determine if the recorded values differ by more than 30 ohms.

Steps to Fix

- If the recorded values differ by more than 30 ohms, the ground fuse has failed.
- If the values do not differ by more than 30 ohms, the internal fuses are most likely the cause of failure.
- In either case, the PEM will need to be replaced (1.5-Part# 6003440, 2.0&2.5-Part# 6005203).

Possible Effects

- Article #21776 DMC 988 DMC FW: MotorTemp Sensors differ fault
- Article #21904 DMC 1116 DMC FW: Motor Temp Sensors Differ warning
- Article #22955 Power output reduced due to Thermal limiting
- Article #23008 Vehicle turns on but can't drive - 1.5 Roadsters

Possible Causes

Unknown.

Article #30014 - Fan configuration incorrect

Description

2.x Roadsters have an available upgrade to a dual fan assembly, which replaces individual power electronics module (PEM) or Motor fans.

Part of the instructions in Service Bulletin SVC-11-40-014 is to set the fan configuration after upgrade.

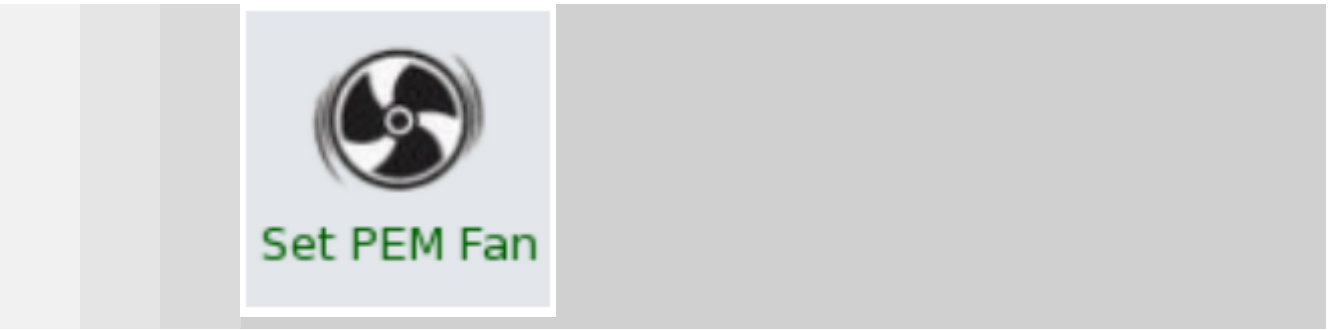
Note: Failure to set fan configuration can result in PEM and Motor fan alerts.

Steps to Test

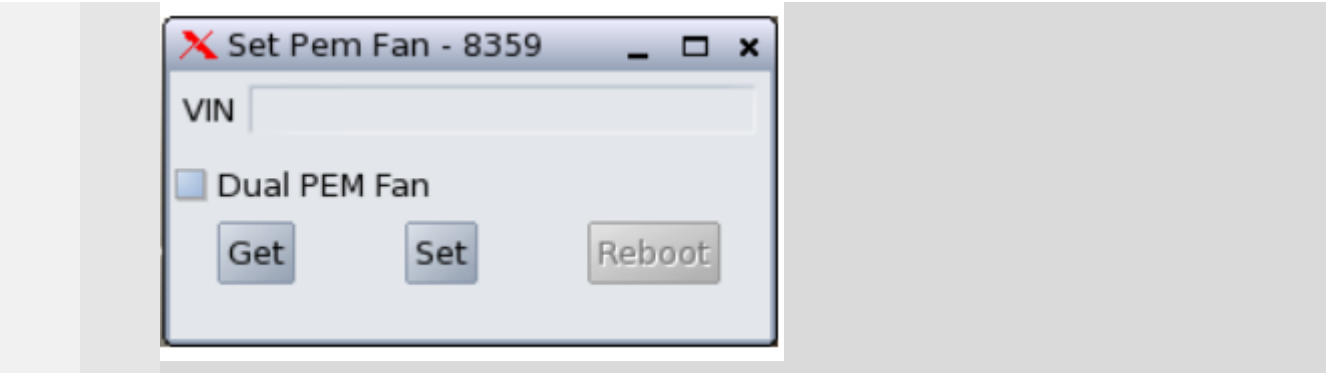
If dual fan retrofit was performed and there are no ventilation problems observed or recorded in logs (abnormal pole temperatures), the configuration may need to be reset.

Steps to Fix

1. Boot into linux puppy version 4.5.2 or newer.
2. Connect to CAN 4 / Diagnostic bus.
3. Open Diagnostic tools -> Set PEM fan.



4. Click "Get" icon to obtain VIN. 5. Select "Dual Fan" check box. 6. Click "Set."



7. Click "Reboot" to reboot VMS, you will be notified via the tool when it completes.

Possible Effects

- Article #21932 DMC 1144 DMC PEM Fan Problem
- Article #21934 DMC 1146 DMC Motor Fan Problem

Possible Causes

Unknown.

Article #22931 - Faulty 400V Controller related to fuse #12

Description

There are symptoms describing a faulty 400V controller related to fuse #12.

Steps to Test

- Inspect fan fuse #12.
- Investigate fan circuit and connections to each fan.
- Inspect front ground post connections.
- Using MTS-2 tool actuate condenser fans and back probe fan connector bodies.
    - The fans should be receiving approximately 12V.

Steps to Fix

1. If the fuse, fan circuit, connections, and condenser fan all seem to be functioning properly while testing, the problem is most likely related to the 400V Controller.
2. Replace the 400V Controller (1.5-Part# 6001479, 2.0&2.5-Part# 1014547-02-A), according to Service Bulletin SB-12-18-001.

Possible Effects

- Article #21996 HVAC 1413 HVAC: High Pressure
- Article #22029 HVAC 1453 HVAC: High Pressure

Possible Causes

- Article #22927 Condenser fan fuse #12 or connections faulty

Article #22345 - Faulty 400V HVAC Controller (Isolation resistance test)

Description

When performing an isolation resistance test of the rear motor and cable assembly with the Positive Temperature Coefficient (PTC) heater disconnected, the isolation resistance measurements may differ by more than 100K Ohms.

Steps to Test

- Test the isolation resistance and record the measurements with the contactors closed.
- Disconnect the Positive Temperature Coefficient (PTC) heater cable from the 400V controller.
- On 2.0/2.5 models a jumper wire must be used to loop connector pins 2 and 3, prior to testing.
- Measure the isolation resistance and record the measurements with the contactors closed.
- Compare the results with the initial measurements (before PTC heater was removed).

Steps to Fix

- If the final results do not differ by more than 100K Ohms, replace the 400V HVAC controller (1.5-Part# 6001479, 2.0&2.5-Part# 1014547-02-A), as per SB12-18-001 in Service Documents. Retest isolation resistance.
- If the fault is not resolved after the isolation resistance retest, pursue possible causes to investigate further.

Possible Effects

- Article #21520 VMS 19 Isolation resistance warning
- Article #21590 BSM 283 BSM: Isolation fault
- Article #21593 BSM 286 BSM: Isolation fault while contactors closed
- Article #21645 BSM 603 BSM: Isolation resistance fault; power limiting in effect
- Article #44344 ESS Internal Isolation-Failure

Possible Causes

- Article #22344 PTC Heater Isolation
- Article #22346 Faulty A/C Compressor

Article #22786 - Faulty 400V HVAC Controller-400V HVAC controller simulator (TPN 6005456)

Description

Faulty 400V HVAC Controller-400V HVAC controller simulator (TPN 6005456).

Steps to Test

Install 400V Heating, Ventilation, Air-Conditioning (HVAC) controller simulator (TPN 6005456).

Attempt to start the vehicle.

Steps to Fix

If the vehicle starts while running the 400V HVAC controller simulator, replace the 400V controller. Pursue possible causes to investigate further.

Possible Effects

- Article #21583 BSM 276 BSM: V_ess too low at end of precharge
- Article #22012 HVAC 1429 HVAC: No HV Controller Clock Detected

Possible Causes

- Article #22316 Power Electronics Module (PEM) access door micro switch not functioning properly
- Article #23036 Poor HVIL Loop connections

Article #31914 - Faulty 5V Reference from PEC board

Description

The DMC 1119 DMC FW: 5V Power alert has been recorded in logs. Vehicle may have shut down due to bad encoder values from the motor encoder.

The PEC board in the PEM regulates 12V APS down to 5V for the encoder.

Steps to Test

Inspect motor encoder for damage, corrosion, debris, or misalignment.

Steps to Fix

1. Escalate the session for further assistance for log review.
2. Replace PEM after receiving approval.

Possible Effects

- Article #21797 DMC 1009 DMC FW: Encoder Hardware
- Article #21907 DMC 1119 DMC FW: 5V Power

Possible Causes

Unknown.

Article #22346 - Faulty A/C Compressor

Description

When performing an isolation resistance test of the rear motor and cable assembly at the 400V HVAC Controller, the isolation resistance measurements may differ by more than 100K Ohms. This fault can be related to a faulty A/C compressor.

Steps to Test

Test the isolation resistance and record the measurements with the contactors closed. Disconnect the Positive Temperature Coefficient (PTC) heater cable from the 400V controller. On 2.0/2.5 models a jumper wire must be used to loop connector pins 2 and 3, prior to testing. Measure the isolation resistance and record the measurements with the contactors closed. Compare the results with the initial measurements (before PTC heater was removed).

Steps to Fix

If the isolation fault is not remedied, replace the A/C compressor (2.0&2.5-Part# 2005205).

Possible Effects

- Article #21520 VMS 19 Isolation resistance warning
- Article #21593 BSM 286 BSM: Isolation fault while contactors closed
- Article #21645 BSM 603 BSM: Isolation resistance fault; power limiting in effect
- Article #22344 PTC Heater Isolation
- Article #22345 Faulty 400V HVAC Controller (Isolation resistance test)

Possible Causes

Unknown.

Article #23023 - Faulty Anti-lock Braking System (ABS) module

Description

Faulty Anti-lock Braking System (ABS) module.

Steps to Test

- Inspect switchpack and Anti-lock Braking System (ABS) module connections and wiring by performing the following tests:
    - With FHC86 and FHC19 connected measure voltage at :

  FHC86-1 (should be approx 13.3-13.5v) FHC86-32 (should be approx 13.3-13.5v)

- With FHC86 and FHC19 disconnected, measure resistance between:

FHC86-1 to FHC19-1 (ideal appox 0.5 ohm) FHC86-32 to FHC19-2 (ideal approx 0.5 ohm) FHC86-1 to front ground post (should be open circuit) FHC86-32 to front ground post (should be open) FHC19-1 to front ground post (should be open) FHC19-2 to front ground post (should be open) FHC86-1 to all other pins in FHC86 (all should be open circuit except to FHC86-32, which should be approx 0.5ohms) FHC86-32 to all other pins in FHC86 (all should be open circuit except to FHC86-1, which should be approx 0.5ohms)

- If there are no wiring issues, disconnect the ABS module.

Steps to Fix

- If the wiring is found to be faulty or loose, restore/replace.
- If disconnecting the ABS module resolves the fault, replace (Part# 2002518).
- Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #21562 TCM 107 TCM: CAN error
- Article #21886 DMC 1098 DMC: Lost ABS Comms (and TC) warning
- Article #21915 DMC 1127 DMC FW: CAN Overrun
- Article #22123 PM 1669 PM: CAN Error warning
- Article #22132 VDS 1906 To exit Tow Mode, APS power is required

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Possible Causes

- Article #23024 Faulty Switchpack related to Fuse 23

Article #22945 - Faulty Auxiliary Battery

Description

Faulty Auxiliary Battery

Steps to Test

Remove the auxiliary battery fuse, and determine if there is an open circuit. Determine if the fuse is the correct amperage. Test the voltage at FHC123-2 to determine if it is 13.8V.

Steps to Fix

lock and unlock the vehicle to load test the 12V battery and see if the voltage drops below 10.5V If the voltage at FHC123-1 is less than 10.5V, replace the auxiliary battery (Part# 2005576).
be aware: in some cases the battery voltage is >12V without load, indicating nothing is wrong with the battery but at load test, battery voltage will drop below threshold. Otherwise, escalate your session for assistance.

Possible Effects

- Article #21616 SWP 428 SWP: Aux Battery Supply Low

Possible Causes

Unknown.

Article #22963 - Faulty Brake Light Switch

Description

Faulty Brake Light Switch.

Steps to Test

DVOM the brake light switch to determine if it is functioning properly.

Steps to Fix

If it is determined that there is a problem with the brake switch or wiring harness, replace as needed.

Possible Effects

- Article #21883 DMC 1095 DMC FW: Press brake before shifting warning

Possible Causes

Unknown.

Article #23037 - Faulty Cabin Fan

Description

Faulty Cabin Fan.

Steps to Test

- Use the MTS-2 to activate fan to 100% and test how it operates in this order:
  - Check to see if the fan turns freely with no grinding.
  - Check to see if the contacts corroded.
  - Check to see if the ducts are free of restrictions and fins are undamaged.
  - Check to see that the fan is clean, clear debris out of the air passages.
  - Check to see that the wiring isn't reversed.

Steps to Fix

After testing the possible causes listed above, replace the fan if no solutions are found. If the contacts are not corroded, escalate your session for assistance.

Possible Effects

- Article #21993 HVAC 1410 HVAC: Blower UnderCurrent

Possible Causes

Unknown.

Article #22833 - Faulty CAN connections

Description

Faulty CAN connections.

Steps to Test

Inspect the CAN connections to the shifter board for damage, corrosion, pushed back pins, etc.

Steps to Fix

If damage is found on the harness, replace the harness. Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #21919 DMC 1131 DMC FW: Lost Comms With Shifter

Possible Causes

- Article #22830 Faulty shifter board front-to-mid harness
- Article #22831 Faulty shifter board mid-to-rear harness
- Article #22832 Faulty shifter board center console harness

Article #22849 - Faulty Condenser Fan

Description

The fan does not operate to 100% efficiency.

Steps to Test

-

Use the MTS-2 to activate fan to 100% and test how it operates in this order:

- Check to see if the fan turns freely with no grinding.
- Check to see if the contacts corroded.
- Check to see if the ducts are free of restrictions and fins are undamaged.
-

Check to see that the fan is clean, clear debris out of the air passages.

- Check to see that the wiring isn't reversed.

Steps to Fix

After testing the possible causes listed above, replace the fan if no solutions are found. If the contacts are not corroded, escalate your session for assistance.

Possible Effects

- Article #21959 DFC 1200 DFC: Heatsink OverTemp
- Article #21996 HVAC 1413 HVAC: High Pressure
- Article #22029 HVAC 1453 HVAC: High Pressure
- Article #22896 Poor Air Flow Over Condenser
- Article #22927 Condenser fan fuse #12 or connections faulty

Possible Causes

Unknown.

Article #22885 - Faulty coolant pump less than 3amps

Description

Faulty coolant pump less than 3A.

Steps to Test

Using an Inductive Ammeter Probe, check for a current at the pump.

Steps to Fix

If the current at the pump is less than 3A, replace the pump (Part# 2004503). Otherwise, escalate your session for assistance.

Possible Effects

- Article #21983 HVAC 1400 HVAC: Coolant Pump UnderCurrent
- Article #22019 HVAC 1440 HVAC: Coolant Pump UnderCurrent

Possible Causes

Unknown.

Article #22984 - Faulty Drive Shift button

Description

Faulty Drive Shift button.

Steps to Test

Determine if the vehicle is running the latest firmware.

Steps to Fix

If the vehicle is not running the latest firmware, update the firmware and recheck for fault. If the vehicle is running the latest firmware, or the fault was not resolved with updated firmware, replace the Drive Shift button.

Possible Effects

- Article #22232 SHFT 3011 SHFT: Warning DRIVE Switch Problem

Possible Causes

Unknown.

Article #22993 - Faulty Drive Shift button-Drive Shift button not changing color

Description

Faulty Drive Shift button-Drive Shift button not changing color.

Steps to Test

- Determine if the vehicle will transition through gear selection.
- Watch for the Drive button to change color while shifting through gear selection.
- If the Drive button changes color, inspect the Drive button wiring for poor connections.

Steps to Fix

If the Drive button does not change color, replace the Drive Shift button. If wiring has poor connections, repair as needed. Otherwise, escalate your session for assistance.

Possible Effects

- Article #22238 SHFT 3017 SHFT: Drive LED

Possible Causes

Unknown.

Article #22928 - Faulty Fan Control Module in Roadster 1.5

Description

There are symptoms describing a faulty fan control module.

Steps to Test

- Inspect fan fuse #12.
- Investigate fan circuit and connections to each fan.
- Inspect front ground post connections.
- Using MTS-2 tool actuate condenser fans and back probe fan connector bodies.
    - The fans should be receiving approximately 12V.

Steps to Fix

Replace fan control module (Part# 2000973).

Possible Effects

- Article #21996 HVAC 1413 HVAC: High Pressure
- Article #22029 HVAC 1453 HVAC: High Pressure
- Article #22927 Condenser fan fuse #12 or connections faulty

Possible Causes

Unknown.

Article #22799 - Faulty FHC Connection

Description

Front Harness Connector (FHC) Connection.

Steps to Test

- Check for loose connections or shorted wiring between the switchpack, HVAC 12V controller, and HVAC coolant pump. Probe and wiggle test FHC 20 pins 5 and 17 as well as FHC 50 pin T1.
- Inspect switchpack and ABS module connections and wiring by performing the following tests:
    - With FHC86 and FHC19 connected measure voltage at:
        - FHC86-1 (should be approx 13.3-13.5v)
        - FHC86-32 (should be approx 13.3-13.5v)
    - With FHC86 and FHC19 disconnected, measure resistance between:
        - FHC86-1 to FHC19-1 (ideal appox 0.5 ohm)
        - FHC86-32 to FHC19-2 (ideal approx 0.5 ohm)
        - FHC86-1 to front ground post (should be open circuit)
        - FHC86-32 to front ground post (should be open)
        - FHC19-1 to front ground post (should be open)
        - FHC19-2 to front ground post (should be open)

FHC86-1 to all other pins in FHC86 (all should be open circuit except to FHC86-32, which should be approx 0.5ohms) FHC86-32 to all other pins in FHC86 (all should be open circuit except to FHC86-1, which should be approx 0.5ohms)

Steps to Fix

Reseat connectors as needed. If there are signs of water ingress or corrosion, replace the connectors.

Possible Effects

- Article #21999 HVAC 1416 HVAC: Load Shed Timeout

Possible Causes

Unknown.

Article #22962 - Faulty Gear Selector

Description

Faulty Gear Selector.

Steps to Test

Test the shifting functionality with a known good gear selector.

Steps to Fix

If it is determined that there is a problem with the gear selector, replace as needed.

Possible Effects

- Article #21883 DMC 1095 DMC FW: Press brake before shifting warning

Possible Causes

Unknown.

Article #22986 - Faulty gear selector circuit board

Description

Faulty gear selector circuit board.

Steps to Test

Inspect the Park/Reverse/Neutral/Drive/Traction Control (depending on which the fault refers to) button wiring for poor connections.

Steps to Fix

If poor connections are found, repair as needed. If connections are found to be okay, replace the gear selector circuit board.

Possible Effects

- Article #22987 Faulty Park Shift button relating to Fault 3019
- Article #22989 Faulty Reverse Shift button relating to Fault 3020
- Article #22991 Faulty Neutral Shift button relating to Fault 3021
- Article #22997 Faulty Traction Control Shift button relating to Fault 3023

Possible Causes

Unknown.

Article #22995 - Faulty gear selector circuit board relating to TSB-10-47-006

Description

Faulty gear selector circuit board relating to TSB-10-47-006.

Steps to Test

Inspect the Park button wiring for poor connections.

Determine if Drive button modifications have been performed as per TSB-10-47-006 in Service Documents.

Steps to Fix

- If the Drive button modifications have been performed, replace the gear selector circuit board

(Part# 6004192).

- If the modifications have not been performed, perform the modifications and look for the 3022 fault.
- If the fault remains, replace the gear selector circuit board (Part# 6004192).

Possible Effects

- Article #22994 Faulty Park Shift button relating to Fault 3022

Possible Causes

Unknown.

Article #22791 - Faulty HID headlamps

Description

Disconnect high intensity discharge (HID) headlamps.

Steps to Test

Eliminate a variable in the equation by disconnecting the head lamps.

Steps to Fix

If fault is still present after disconnecting the HID Headlamp, investigate other causes of the load shed timeout fault, or escalate your session for assistance.

Possible Effects

- Article #21999 HVAC 1416 HVAC: Load Shed Timeout

Possible Causes

Unknown.

Article #23031 - Faulty Motor fan

Description

Faulty Motor fan. The fan does not operate to 100% efficiency.

Steps to Test

- Use the MTS-2 Tool to activate the fan to 100%.
  - Determine if the fan is turning freely, or if it is grinding on the shaft.
  - Look for corrosion on the contacts.

Steps to Fix

If the fan is grinding or there is corrosion on the contacts, replace the Motor fan. If the fan is turning freely and the contacts are not corroded, escalate your session for assistance.

Possible Effects

- Article #21934 DMC 1146 DMC Motor Fan Problem
- Article #21965 DFC 1206 DFC: Motor Fan Failed
- Article #21975 DFC 1216 DFC: Motor Fan OverCurrent
- Article #21976 DFC 1217 DFC: Motor Fan 12V OverVoltage
- Article #21977 DFC 1218 DFC: Motor Fan 12V UnderVoltage
- Article #21978 DFC 1219 DFC: Motor Fan Control OverTemp
- Article #21979 DFC 1220 DFC: Motor Fan UnderCurrent

Possible Causes

Unknown.

Article #22785 - Faulty motor-Passed Motor/Cable Isolation Test

Description

Passed Motor/Cable Isolation Test. If Traction control (TC) is disabled when performing a Motor/Cable Isolation Test, this is expected behavior; keep TC engaged to avoid occurrence of fault.

Steps to Test

Perform a Motor / Cable isolation test. Determine if the traction control was disabled. A loud noise or clunk could be heard, if the motor has higher miles. Determine if the motor is has high miles.

Steps to Fix

If a loud noise/clunk is not heard, escalate your session for assistance. If the motor has high miles, replace it and reset the PEM Limits table in the VDS diagnostics screen. If the issue is not resolved with the motor replacement, escalate

the session for assistance.

Possible Effects

- Article #21689 DMC 901 DMC HW: PhaseA OverCurrent Fault
- Article #21690 DMC 902 DMC HW: PhaseB OverCurrent Fault
- Article #21691 DMC 903 DMC HW: PhaseC OverCurrent Fault
- Article #21843 DMC 1055 DMCFW: PhaseA OverCurrent warning. Torque limited.
- Article #21844 DMC 1056 DMCFW: PhaseB OverCurrent warning. Torque limited.
- Article #21845 DMC 1057 DMCFW: PhaseC OverCurrent warning. Torque limited

Possible Causes

Unknown.

Article #22983 - Faulty Neutral Shift button

Description

Faulty Neutral Shift button.

Steps to Test

Determine if the vehicle is running the latest firmware.

Steps to Fix

If the vehicle is not running the latest firmware, update the firmware and recheck for fault. If the vehicle is running the latest firmware, or the fault was not resolved with updated firmware, replace the Neutral Shift button.

Possible Effects

- Article #22231 SHFT 3010 SHFT: Warning NEUTRAL Switch Problem

Possible Causes

Unknown.

Article #22991 - Faulty Neutral Shift button relating to Fault 3021

Description

Faulty Neutral Shift button relating to Fault 3021.

Steps to Test

- Determine if the vehicle will transition through gear selection.
- Check for fault code 3021.

Steps to Fix

If fault code 3021 is present, replace the Neutral button. Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #22237 SHFT 3016 SHFT: Neutral LED
- Article #22242 SHFT 3021 SHFT: NEUTRAL Switch Stuck Down

Possible Causes

- Article #22986 Faulty gear selector circuit board

Article #22992 - Faulty Neutral Shift button-Neutral Shift button not changing color

Description

Faulty Neutral Shift button-Neutral Shift button not changing color.

Steps to Test

1. Determine if the vehicle will transition through gear selection.
2. Watch for the Neutral button to change color while shifting through gear selection.
3. If the Neutral button changes color, inspect the Neutral button wiring for poor connections.

Steps to Fix

If the Neutral button does not change color, replace the Neutral Shift button. If wiring has poor connections, repair as needed. Otherwise, escalate your session for assistance.

Possible Effects

- Article #22237 SHFT 3016 SHFT: Neutral LED

Possible Causes

Unknown.

Article #22981 - Faulty Park Shift button

Description

Faulty Park Shift button.

Steps to Test

Determine if the vehicle is running the latest firmware.

Steps to Fix

- If the vehicle is not running the latest firmware, update the firmware and recheck for fault.
- If the vehicle is running the latest firmware, or the fault was not resolved with updated firmware, replace the Park Shift button (Part# 6003345).

Possible Effects

- Article #22229 SHFT 3008 SHFT: Warning PARK Switch Problem

Possible Causes

Unknown.

Article #22987 - Faulty Park Shift button relating to Fault 3019

Description

Faulty Park Shift button relating to Fault 3019.

Steps to Test

1. Determine if the vehicle will transition through gear selection.
2. Check for fault code 3019.

Steps to Fix

If fault code 3019 is present, replace the Park button (Part# 6003345). Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #22235 SHFT 3014 SHFT: Park LED
- Article #22240 SHFT 3019 SHFT: PARK Switch Stuck Down

Possible Causes

- Article #22986 Faulty gear selector circuit board

Article #22994 - Faulty Park Shift button relating to Fault 3022

Description

Faulty Park Shift button relating to Fault 3022.

Steps to Test

- Determine if the vehicle will transition through gear selection.
- Check for fault code 3022.

Steps to Fix

If fault code 3022 is present, replace the Drive button (Part# 6004223). Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #22238 SHFT 3017 SHFT: Drive LED
- Article #22243 SHFT 3022 SHFT: DRIVE Switch Stuck Down

Possible Causes

- Article #22995 Faulty gear selector circuit board relating to TSB-10-47-006

Article #22988 - Faulty Park Shift button-Park Shift button not changing color

Description

Faulty Park Shift button-Park Shift button not changing color.

Steps to Test

1. Determine if the vehicle will transition through gear selection.
2. Watch for the Park button to change color while shifting through gear selection.
3. If the Park button changes color, inspect the Park button wiring for poor connections.

Steps to Fix

If the Park button does not change color, replace the Park Shift button (Part# 6003345). If wiring has poor connections, repair as needed. Otherwise, escalate your session for assistance.

Possible Effects

- Article #22235 SHFT 3014 SHFT: Park LED

Possible Causes

Unknown.

Article #23026 - Faulty Power Electronics Module (PEM) fan

Description

Faulty Power Electronics Module (PEM) fan. The fan does not operate to 100% efficiency.

Steps to Test

1. Use the MTS-2 Tool to activate the fan to 100%.
2. Determine if the fan is turning freely, or if it is grinding on the shaft.
3. Look for corrosion on the contacts.

Steps to Fix

- If the fan is grinding or there is corrosion on the contacts, replace the PEM fan.
- If the fan is turning freely and the contacts are not corroded, escalate your session for further assistance.

Possible Effects

- Article #21932 DMC 1144 DMC PEM Fan Problem
- Article #21934 DMC 1146 DMC Motor Fan Problem
- Article #21966 DFC 1207 DFC: Pole Fan Failed
- Article #21967 DFC 1208 DFC: Pole Fan OverCurrent
- Article #21968 DFC 1209 DFC: Pole Fan 12V OverVoltage
- Article #21969 DFC 1210 DFC: Pole Fan 12V UnderVoltage
- Article #21970 DFC 1211 DFC: Pole Fan Control OverTemp
- Article #21971 DFC 1212 DFC: Pole Fan UnderCurrent

Possible Causes

Unknown.

Article #22982 - Faulty Reverse Shift button

Description

Faulty Reverse Shift button.

Steps to Test

Determine if the vehicle is running the latest firmware.

Steps to Fix

If the vehicle is not running the latest firmware, update the firmware and recheck for fault. If the vehicle is running the latest firmware, or the fault was not resolved with updated firmware, replace the Reverse Shift button.

Possible Effects

- Article #22230 SHFT 3009 SHFT: Warning REVERSE Switch Problem

Possible Causes

Unknown.

Article #22989 - Faulty Reverse Shift button relating to Fault 3020

Description

Faulty Reverse Shift button relating to Fault 3020.

Steps to Test

- Determine if the vehicle will transition through gear selection.
- Check for fault code 3020.

Steps to Fix

If fault code 3020 is present, replace the Reverse button. Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #22236 SHFT 3015 SHFT: Reverse LED
- Article #22241 SHFT 3020 SHFT: REVERSE Switch Stuck Down

Possible Causes

- Article #22986 Faulty gear selector circuit board

Article #22990 - Faulty Reverse Shift button-Reverse Shift button not changing color

Description

Faulty Reverse Shift button-Reverse Shift button not changing color.

Steps to Test

- Determine if the vehicle will transition through gear selection.
- Watch for the Reverse button to change color while shifting through gear selection.
- If the Reverse button changes color, inspect the Reverse button wiring for poor connections.

Steps to Fix

If the Reverse button does not change color, replace the Reverse Shift button. If wiring has poor connections, repair as needed. Otherwise, escalate your session for assistance.

Possible Effects

- Article #22236 SHFT 3015 SHFT: Reverse LED

Possible Causes

Unknown.

Article #22826 - Faulty SHC5 connector

Description

Faulty SHC5 connector.

Steps to Test

Inspect SHC5 connector and wire condition to determine if the pin connections are free of damage and seated properly. See the wiring diagram for complete details.

Steps to Fix

If damaged, replace the harness. If seated improperly, re-seat. If the issue is not resolved, escalate your session for assistance.

Possible Effects

- Article #21776 DMC 988 DMC FW: MotorTemp Sensors differ fault
- Article #21904 DMC 1116 DMC FW: Motor Temp Sensors Differ warning
- Article #22955 Power output reduced due to Thermal limiting

Possible Causes

Unknown.

Article #22832 - Faulty shifter board center console harness

Description

Faulty shifter board center console harness.

Steps to Test

Inspect the center console harness connections for damage, loose connections, corrosion, etc.

Steps to Fix

If there is no damage to the harness, replace the shifter board. If damage is found on the harness, replace the harness. If the issue is still unresolved, escalate your session for assistance.

Possible Effects

- Article #21791 DMC 1003 DMC FW: Lost Comms With Shifter
- Article #21919 DMC 1131 DMC FW: Lost Comms With Shifter
- Article #22833 Faulty CAN connections

Possible Causes

Unknown.

Article #22830 - Faulty shifter board front-to-mid harness

Description

Faulty shifter board front-to-mid harness.

Steps to Test

Inspect the front-to-mid harness connections for damage, loose connections, corrosion, etc.

Steps to Fix

If there is no damage to the harness, replace the shifter board. If damage is found on the harness, replace the harness. If the issue is still unresolved, escalate your session for assistance.

Possible Effects

- Article #21791 DMC 1003 DMC FW: Lost Comms With Shifter
- Article #21919 DMC 1131 DMC FW: Lost Comms With Shifter
- Article #22833 Faulty CAN connections

Possible Causes

Unknown.

Article #22831 - Faulty shifter board mid-to-rear harness

Description

Faulty shifter board mid-to-rear harness.

Steps to Test

Inspect the mid-to-rear harness connections for damage, loose connections, corrosion, etc.

Steps to Fix

If there is no damage to the harness, replace the shifter board. If damage is found on the harness, replace the harness. If the issue is still unresolved, escalate your session for assistance.

Possible Effects

- Article #21791 DMC 1003 DMC FW: Lost Comms With Shifter
- Article #21919 DMC 1131 DMC FW: Lost Comms With Shifter
- Article #22833 Faulty CAN connections

Possible Causes

Unknown.

Article #22897 - Faulty Solenoid

Description

Faulty Solenoid not opening and closing when activated.

Steps to Test

Place the vehicle in Heating, Ventilation, Air-Conditioning (HVAC) service mode. Determine if the solenoids open and close when commanded.

To place the vehicle into service mode:

1.5 Roadster:

1. Simultaneously hold down both the heating and air conditioning buttons on the center console.
2. Turn the starter key to ACC position whilst holding the buttons down.
3. The LEDs within the buttons should now be illuminated.
4. Continue to hold both buttons down until the LEDs extinguish (5 seconds approx).
5. Release the buttons within 10 seconds and the system will enter service mode.

2.0 & 2.5 Roadster

1. Turn the starter key to the OFF position.
2. Simultaneously press and hold both the air conditioning and air recirculation buttons on the HVAC control panel.
3. Turn the starter key to ACC position whilst pressing the buttons.
4. The LED in the heater button should illuminate after approximately 5 to 10 seconds.

NOTE: When in service mode, all normal HVAC system operation is disabled apart from operation of the battery coolant pump.

Steps to Fix

If the solenoids do not open and close when commanded, replace the solenoid (Part# 2000861 or 6001846). Otherwise, escalate your session for assistance.

Possible Effects

- Article #21996 HVAC 1413 HVAC: High Pressure
- Article #21998 HVAC 1415 HVAC: Thermostat Stuck Open
- Article #22029 HVAC 1453 HVAC: High Pressure
- Article #22926 Coolant system over-charged

- Article #44368 HVAC failure

Possible Causes

Unknown.

Article #22617 - Faulty Switchpack

Description

Faulty Switchpack

Steps to Test

- Inhibit the Auxiliary Power Supply (APS) and disconnect the Battery cable to Power Electronics Module (PEM) connection.
- Use a multi-meter to probe pin D of the Battery cable.
- Connect the other multi-meter lead to chassis ground.
- Use the Battery System Monitor User Interface (BSMUI) to activate the APS (BSMUI must be connected to the Battery logic connector).
- Inhibit the APS by selecting the box next to "APS Main" in the Battery Safety Monitor (BSM) State tab of BSMUI and select **UPGRADE**.
- Watch for a "blip" to be recorded on the multi-meter.

Note: If the battery is equipped with a "Delta" APS (easily identified by only 2 APS coolant tubes, instead of 4) a load must be placed in parallel with the multi-meter probes, in order to record a voltage "blip".

Steps to Fix

- If a "blip" is reported on the multi-meter, replace the switchpack (1.5-Part# 6003276, 2.0&2.5-Part# 6002894).
- If the issue is not resolved after replacing the switchpack, escalate your session for assistance.

Possible Effects

- Article #21615 SWP 420 SWP: APS off, but no pulse from BPS
- Article #21882 DMC 1094 DMC FW: Invalid Shift Request warning
- Article #21999 HVAC 1416 HVAC: Load Shed Timeout
- Article #22081 VMS 1553 VMS: Not receiving SWP version number
- Article #22114 PM 1660 PM: Invalid Shift Request warning
- Article #22800 Failed ABS Release

Possible Causes

Unknown.

Article #23024 - Faulty Switchpack related to Fuse 23

Description

Faulty Switchpack related to Fuse 23.

Steps to Test

- Inspect switchpack and Anti-lock Braking System (ABS) module connections and wiring by performing the following tests:
    - With FHC86 and FHC19 connected measure voltage at :

  FHC86-1 (should be approx 13.3-13.5v) FHC86-32 (should be approx 13.3-13.5v)

- With FHC86 and FHC19 disconnected, measure resistance between:

FHC86-1 to FHC19-1 (ideal appox 0.5 ohm) FHC86-32 to FHC19-2 (ideal approx 0.5 ohm) FHC86-1 to front ground post (should be open circuit) FHC86-32 to front ground post (should be open) FHC19-1 to front ground post (should be open) FHC19-2 to front ground post (should be open) FHC86-1 to all other pins in FHC86 (all should be open circuit except to FHC86-32, which should be approx 0.5ohms) FHC86-32 to all other pins in FHC86 (all should be open circuit except to FHC86-1, which should be approx 0.5ohms)

- If there are no wiring issues, disconnect the ABS module.

Steps to Fix

If the fault is unresolved after disconnecting the ABS module, replace the switchpack (1.5-Part# 6003276, 2.0&2.5-Part# 6002894). If replacing the switchpack does not resolve the fault, escalate your session for assistance.

Possible Effects

- Article #21999 HVAC 1416 HVAC: Load Shed Timeout
- Article #23023 Faulty Anti-lock Braking System (ABS) module

Possible Causes

Unknown.

Article #22949 - Faulty switchpack related to the window motor

Description

Faulty switchpack related to the window motor.

Steps to Test

Check the output of the switchpack at the window motor.

Steps to Fix

Replace the switchpack if the output of the switchpack is not registering properly

(1.5-Part# 6003276, 2.0&2.5-Part# 6002894), otherwise, replace the window motor.

Possible Effects

- Article #21633 SWP 534 Left window motor issue
- Article #21634 SWP 535 Right window motor issue

Possible Causes

Unknown.

Article #22985 - Faulty Traction Control button

Description

Faulty Traction Control button.

Steps to Test

Determine if the vehicle is running the latest firmware.

Steps to Fix

If the vehicle is not running the latest firmware, update the firmware and recheck for fault. If the vehicle is running the latest firmware, or the fault was not resolved with updated firmware, replace the Traction Control button.

Possible Effects

- Article #22233 SHFT 3012 SHFT: Warning TC Switch Problem

Possible Causes

Unknown.

Article #22997 - Faulty Traction Control Shift button relating to Fault 3023

Description

Faulty Traction Control Shift button relating to Fault 3023.

Steps to Test

- Determine if the vehicle will transition through gear selection.
- Check for fault code 3023.

Steps to Fix

If fault code 3023 is present, replace the Traction Control button. Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #22244 SHFT 3023 SHFT: TC Switch Stuck Down

Possible Causes

- Article #22986 Faulty gear selector circuit board

Article #22969 - Faulty VDS related to VDS fault

Description

Faulty VDS related to VDS fault.

Steps to Test

Inspect CAN-BUS connections and wiring between the Vehicle Display System (VDS) and Vehicle Monitor System (VMS). Check the connections; FHC33 pins A7 and B7, FHC47 pins 12 and 20. Also inspect CAN-BUS splice; 1-H and 1-L, for pinched wires, damaged pins, or poor connections.

Steps to Fix

If the wiring is determined to be okay, replace the VDS (Part# 6000520). If the new VDS does not resolve the issue, pursue possible causes to investigate further.

Possible Effects

Unknown.

Possible Causes

- Article #22970 Faulty VMS relating to a VDS fault

Article #22970 - Faulty VMS relating to a VDS fault

Description

Faulty Vehicle Monitor System (VMS) relating to a Vehicle Display System (VDS) fault.

Steps to Test

Using SI-12-17-002, replace the Vehicle Monitor System (VMS). Be sure to "clone" the old VMS prior to replacement. Determine if this restores normal operation.

Steps to Fix

If the fault is not resolved, escalate your session for assistance.

Possible Effects

- Article #22969 Faulty VDS related to VDS fault

Possible Causes

Unknown.

Article #22948 - Faulty window motor

Description

Faulty window motor.

Steps to Test

Check the voltage at the window motor while activating the switch.

Steps to Fix

Replace the window motor if the voltage at the window motor is registering.

Possible Effects

- Article #21633 SWP 534 Left window motor issue
- Article #21634 SWP 535 Right window motor issue

Possible Causes

Unknown.

Article #22947 - Faulty window switch: no continuity

Description

Faulty window switch: no continuity.

Steps to Test

Check the window switch continuity.

Steps to Fix

Replace the switch if there is no continuity at the window switch (Part# 2002097).

Possible Effects

- Article #21633 SWP 534 Left window motor issue
- Article #21634 SWP 535 Right window motor issue

Possible Causes

Unknown.

Article #22798 - FHC Harness

Description

Front Harness Connector (FHC) Harness.

Steps to Test

Check wiring harness for faults or defects.

Steps to Fix

Replace wiring harness as needed.

Possible Effects

- Article #21999 HVAC 1416 HVAC: Load Shed Timeout

Possible Causes

Unknown.

Article #22322 - Front Tire Pressure Monitoring System (TPMS) Antenna is not functioning properly

Description

Front TPMS Antenna is not functioning properly.

Steps to Test

Disconnect the front antenna and reconnect. Check the connector for a missing weather plug, corrosion, missing or loose terminals.

Steps to Fix

- Make all necessary corrections to antenna connector. Refer to TSB 10-34-011 at https://service.teslamotors.com/ .

If weather plug is missing, fill the hole with a small dab of RTV silicone.

- Test drive the vehicle for 5 minutes and wait an additional 15 minutes after the test drive before checking for correction.
- Replace the front antenna.

It is possible that both the front and rear antennae could be an issue. Refer to Issue 22321.

Possible Effects

- Article #21607 TPMS 409 TPMS: Hardware error

Possible Causes

Unknown.

Article #28357 - Fuse for vacuum pump is blown

Description

The fuse for the Roadster vacuum assist pump is blown.

Steps to Test

Check wiring for a short to ground around the vacuum pump assembly in the left front wheel arch area. There is a sharp bracket around the pump and the wiring can chafe. See photo below:

Steps to Fix

1. Repair the wiring and add foam tape or cloth tape to any sharp edges around the wiring.
2. Also wrap the wiring in electrical tape.

3. Install a wire loom around the wiring for added protection:

Possible Effects

- Article #31080 Brake Assistance has poor performance

Possible Causes

Unknown.

Article #28642 - Gear box damage

Description

If the customer complains of a grinding noise while driving and all other drive train variables have been eliminated, the noise may be explained by excessive gear box wear.

Steps to Test

1. Drain gear box following the Service Manual Procedure: Transmission Fluid - Check - FRT 47030100
2. Check gear oil for shavings or signs of internal gear wear. If heavy accumulations of debris are noted in the oil, gear box replacement may be necessary.

Steps to Fix

1. Remove the gear box following the Service Manual procedure: Transmission Assembly - Replace - FRT 47030302.
2. Once the gearbox and motor are separated, spin each by hand while listening for evidence of grinding or noise. Also feel for binding or catching as the assemblies rotate.
3. Replace gearbox as necessary.

Possible Effects

- Article #28623 Grinding noise while driving

Possible Causes

Unknown.

Article #22317 - High Voltage Interlock Loop (HVIL) is damaged

Description

High Voltage Interlock Loop (HVIL) is damaged.

Steps to Test

Check HVIL for damage or loose connection.

Steps to Fix

Replace HVIL. If the issue is unresolved, escalate your session for assistance.

Possible Effects

- Article #21571 BSM 264 BSM: PEM cable fault
- Article #21712 DMC 924 DMC HW: ESS Cable Interlock fault

Possible Causes

Unknown.

Article #22603 - HVAC 12V Controller failure

Description

HVAC 12V Controller failure.

Steps to Test

Use the MTS-2 tool to activate the coolant pump(s). Using a DVOM, measure the pump current draw. If the measurement is less than 1.4A, proceed to measure the pump voltage to determine if the voltage is below 12V.

-

Measurements of less than 1.4A and 12V likely indicate either the power supply (12V controller) has failed or the circuit has become resistive.

-

Re-inspect wiring from 12V controller to coolant pump(s).

Steps to Fix

- If damaged, replace wiring harness.
- Replace the 12V controller as needed (1.5-Part# 6001069, 2.0&2.5-Part# 6004061).

Possible Effects

- Article #21993 HVAC 1410 HVAC: Blower UnderCurrent
- Article #21998 HVAC 1415 HVAC: Thermostat Stuck Open
- Article #22015 HVAC 1432 HVAC: Pump Current Out Of Range
- Article #22047 HVAC 1472 HVAC: Pump Current Out Of Range

Possible Causes

Unknown.

Article #23453 - HVAC selector knob cracked/broken

Description

The selector knobs in the Roadster center console for blower fan speed, blend door, and duct position selector seem to be prone to breaking due to weak plastic construction.

Steps to Test

Verify that the HVAC selector knob is cracked / broken.

Steps to Fix

Replace with a new selector knob from Parts.

If the part is unavailable, you could fill the hollow void in the knob with a plastic epoxy such as JB Weld plastic weld quick cure epoxy. This should add a lot of rigidity to the knob and increase it life span. However, if it does break again/differently, the entire HVAC control console.

Possible Effects

- Article #38337 Dashboard / Instrument panel trim articles

Possible Causes

Unknown.

Article #22604 - Improper coolant mixture

Description

Improper coolant mixture.

Steps to Test

Using a refractometer, measure the coolant mixture to verify that it is the specified 50/50 mixture.

Steps to Fix

Replace the coolant with the correct mixture, as per SB-12-18-013, in Service Documents. Retest.

Possible Effects

- Article #21669 CSB 729 Undertemp event during charge or regen
- Article #22015 HVAC 1432 HVAC: Pump Current Out Of Range
- Article #22017 HVAC 1434 HVAC: Coolant Heater Failed
- Article #22047 HVAC 1472 HVAC: Pump Current Out Of Range
- Article #22049 HVAC 1474 HVAC: Coolant Heater Fault
- Article #23004 AC unit does not engage after a load is connected to the APS
- Article #28704 Insufficient Coolant Flow

Possible Causes

Unknown.

Article #22613 - Improper cooling of the APS

Description

With an applied load, the Auxiliary Power Supply (APS) is not cooling properly.

Steps to Test

- Place a load on the APS output line, and watch for the APS voltage to drop below 13V (output pin #1) or 12V (output pin #2) with the addition of the load.
    - To apply load, turn on the car and run as many 12V accessories as possible (headlights, radio, cabin blower, heated seats, etc.) for 15 to 20 minutes.
- Use an infrared thermometer to measure the APS coolant temperature at both input and output orifices, and determine if the APS is cooling.
- Record the temperatures of each orifice.

Steps to Fix

If it is determined that the APS is not cooling, pursue possible causes to investigate further.

Possible Effects

- Article #21521 VMS 21 APS OverTemp fault
- Article #21642 BSM 600 APS: Cooling issue; power limiting in effect
- Article #22614 No delay in AC engagement with applied load

Possible Causes

- Article #28704 Insufficient Coolant Flow

Article #22642 - Improper output at front headlight light connector, (FHC71 - Front left) (FHC91 - Front right)

Description

Improper output at front headlight light connector, (FHC71 - Front left) (FHC91 - Front right).

Steps to Test

Check output voltage at switchpack (FHC22).

Steps to Fix

If the switchpack connector has the proper output, check/repair the wiring/connectors. Otherwise, replace the switchpack (1.5-Part# 6003276, 2.0&2.5-Part# 6002894).

Possible Effects

- Article #22641 "Check left/right front turn signal bulb" alert, with proper output from switchpack

Possible Causes

Unknown.

Article #22639 - Improper output at rear taillight harness connector (RHC13)

Description

Improper output at the rear taillight harness connector (RHC13).

Steps to Test

Check the output at the switchpack connector (RH - FHC21 pin14)(LH - FHC22 pin2).

Steps to Fix

If the switchpack connector has the proper output, check/repair the wiring/connectors. Otherwise, replace the switchpack (1.5-Part# 6003276, 2.0&2.5-Part# 6002894).

Possible Effects

- Article #22637 "Check left/right back turn signal bulb" alert, with proper output from switchpack

Possible Causes

Unknown.

Article #22375 - Inadequate operating voltage on 400V HVAC simulator attached directly to battery pack

Description

Inadequate operating voltage on a 400V Heating, Ventilation, Air-Conditioning (HVAC) simulator attached directly to a battery pack.

There may be a blown fuse internal to the pack.

Steps to Test

An open circuit equates to a blown fuse. To test for this open fuse, using a digital multi-meter, test the continuity of the HVAC wiring internal to the Battery pack.

- For 1.5 models check the continuity of pin B in connector J1 (ESS PEM Connector) with pin A in connector J2 (ESS HVAC connector).
- For 2.0 models check the continuity of PEM Cable B+ with pin A in connector J2 (ESS HVAC connector).

A diagram illustrating this procedure can be found here:
http://iwiki.teslamotors.com/twiki/bin/view/Main/DeterminingStateOfHVACFuseInternalToESS

Steps to Fix

If there is a blown fuse in the battery pack, remove the battery pack for Reman. Otherwise, escalate your session for assistance.

Possible Effects

- Article #22369 Red LED on 400V HVAC controller fails to illuminate while investigating HVAC: Compressor UnderVoltage
- Article #44368 HVAC failure

Possible Causes

Unknown.

Article #32731 - Kinked coolant lines

Description

Kinked coolant lines constricting battery coolant flow, resulting in insufficient cooling or heating of the ESS and associated alerts.

Steps to Test

Check for kinked coolant lines.

Steps to Fix

Reroute and replace as necessary.

Possible Effects

- Article #22017 HVAC 1434 HVAC: Coolant Heater Failed
- Article #22049 HVAC 1474 HVAC: Coolant Heater Fault
- Article #28704 Insufficient Coolant Flow

Possible Causes

Unknown.

Article #23022 - Loose connections or shorted wiring between the switchpack, HVAC 12V controller, and HVAC coolant pump

Description

Loose connections or shorted wiring between the switchpack, HVAC 12V controller, and HVAC coolant pump

Steps to Test

Check for loose connections or shorted wiring between the switchpack, HVAC 12V controller, and HVAC coolant pump. Probe and wiggle test FHC 20 pins 5 and 17 as well as FHC 50 pin T1.

Steps to Fix

If wiring problem is found, repair/replace as needed. Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #23021 Poor connection/blown Fuse 23

Possible Causes

Unknown.

Article #22374 - Loose or damaged wiring between battery pack and 400V HVAC controller

Description

Loose or damaged wiring between battery pack and 400V

Heating, Ventilation, Air-Conditioning (HVAC) controller. Adequate operating voltage on a 400V HVAC simulator attached directly to a battery pack.

Steps to Test

-

Inspect the high voltage HVAC cables and connections from the battery pack to the 400V HVAC controller for poor connections or damaged wiring.

Steps to Fix

- If the cables and connections from the battery pack to the 400 V HVAC controller are damaged or loose, repair/tighten the cables.
- Escalate your session for assistance.

Possible Effects

- Article #22316 Power Electronics Module (PEM) access door micro switch not functioning properly
- Article #22369 Red LED on 400V HVAC controller fails to illuminate while investigating HVAC: Compressor UnderVoltage
- Article #23036 Poor HVIL Loop connections
- Article #44368 HVAC failure

Possible Causes

- Article #23183 Poor connection to / malfunction of compressor due to bent pins on the compressor connector of HVAC 400V Controller (SVC-08-18-012)

Article #22296 - Maintenance Service Interval has been reset, but alert has not cleared

Description

A maintenance service message is being displayed despite the fact that both the service and an interval reset have been performed.

Steps to Test

Look at service records for historical data. Verify that the service and interval reset have been performed.

Steps to Fix

Escalate your session for assistance.

Possible Effects

- Article #21509 VMS 3 Maintenance Service Required

Possible Causes

Unknown.

Article #22295 - Maintenance Service Required has not been reset

Description

Message displayed when interval is not reset after a service is performed.

Steps to Test

Look at service records for historical data and verify that interval was not reset.

Steps to Fix

Reset interval.

Possible Effects

- Article #21509 VMS 3 Maintenance Service Required

Possible Causes

Unknown.

Article #22801 - Malfunctioning Coolant Temp Sensor

Description

A Coolant UnderTemp fault occurring in conjunction with a Coolant OverTemp fault, indicates a malfunctioning coolant temperature sensor.

Steps to Test

- Inspect coolant temperature sensor connections.
- Inspect the coolant temperature sensor (located on the bottom of the heat exchanger) for loose or damaged connections.
- Ensure that the sensor is secured to the heat exchanger and free from debris blockage.
- Measure the resistance of the sensor and ensure it is very low or infinite.

Steps to Fix

If connections are secure, replace the coolant temperature sensor (Part# 6003198) and test the connections again. Escalate your session for assistance if no solutions are found during secondary testing.

Possible Effects

- Article #21985 HVAC 1402 HVAC: Coolant OverTemp
- Article #21986 HVAC 1403 HVAC: Coolant UnderTemp
- Article #21998 HVAC 1415 HVAC: Thermostat Stuck Open
- Article #22021 HVAC 1442 HVAC: Coolant OverTemp
- Article #22022 HVAC 1443 HVAC: Coolant UnderTemp

Possible Causes

Unknown.

Article #23033 - Motor fan wiring reversed

Description

Motor fan wiring reversed.

Steps to Test

Using a digital multi-meter, with actuator set for 100% check for 12 volts and ground at the motor terminals. If the values are correct, check for reversed wiring.

Steps to Fix

If the wiring is reversed, properly reconnect. If the values are incorrect, and the wiring was not reversed, escalate your session for assistance.

Possible Effects

- Article #21934 DMC 1146 DMC Motor Fan Problem
- Article #21977 DFC 1218 DFC: Motor Fan 12V UnderVoltage
- Article #21978 DFC 1219 DFC: Motor Fan Control OverTemp
- Article #21979 DFC 1220 DFC: Motor Fan UnderCurrent

Possible Causes

Unknown.

Article #22793 - Motor overtemp fault relating to the motor encoder connection to the PEM

Description

Motor overtemp fault relating to the motor encoder connection to the Power Electronics Module (PEM).

Steps to Test

Remove the motor and check the RTD temperature sensor connections on the motor encoder board.

Steps to Fix

If the connections are secure, the temperature sensor is faulty, replace the motor (1.5 Part# 6002584, 2.0&2.5 Part# 6003145). If the connections are loose, replace the motor encoder (Part# 6005225).

Possible Effects

- Article #22794 Resistance between pins 4 and 13 (temp. sensor 1) and pins 3 and 12 (temp. sensor 2) not within range
- Article #22955 Power output reduced due to Thermal limiting

Possible Causes

Unknown.

Article #22365 - No communication between MTS-2 and SRS ECU

Description

No communication between MTS-2 and SRS ECU

Steps to Test

Disconnect the SRS ECU connector and check for power at pin 35, and ground at pin 7.

Steps to Fix

Pursue possible causes to investigate further.

Possible Effects

- Article #21529 SRS 32 SRS: Airbag must be serviced. Contact Tesla Service Center

Possible Causes

- Article #22364 SRS ECU connector power at pin 35, and ground at pin 7 voltage is less than 12V
- Article #22366 SRS ECU connector power at pin 35, and ground at pin 7 voltage is greater than 12V

Article #22614 - No delay in AC engagement with applied load

Description

There is no delay in AC engagement with an applied load.

Steps to Test

1. Place a load on the Auxiliary Power Supply (APS) output line, as per SB-12-92-008 in Service Documents.
2. Record the voltage drop.
3. Determine how long it takes for the AC to engage.

Steps to Fix

If it is determined that the AC does not have a delay in engagement, troubleshoot the HVAC system.

Otherwise, pursue possible causes for further investigation.

Possible Effects

- Article #22615 APS voltage drops below 13V (output pin #1) or 12V (output pin #2) with the addition of a load

Possible Causes

- Article #22613 Improper cooling of the APS

Article #23032 - Obstructed Motor fan

Description

Obstructed Motor fan.

Steps to Test

Use the MTS-2 Tool to activate the fan to 100%

- Check for any obstructions that may be present in the fan.

Steps to Fix

Clean debris out of the air passages.

Possible Effects

- Article #21934 DMC 1146 DMC Motor Fan Problem
- Article #21965 DFC 1206 DFC: Motor Fan Failed
- Article #21975 DFC 1216 DFC: Motor Fan OverCurrent
- Article #21976 DFC 1217 DFC: Motor Fan 12V OverVoltage
- Article #21977 DFC 1218 DFC: Motor Fan 12V UnderVoltage
- Article #21978 DFC 1219 DFC: Motor Fan Control OverTemp
- Article #21979 DFC 1220 DFC: Motor Fan UnderCurrent

Possible Causes

Unknown.

Article #34806 - PEC board bootloader incorrect

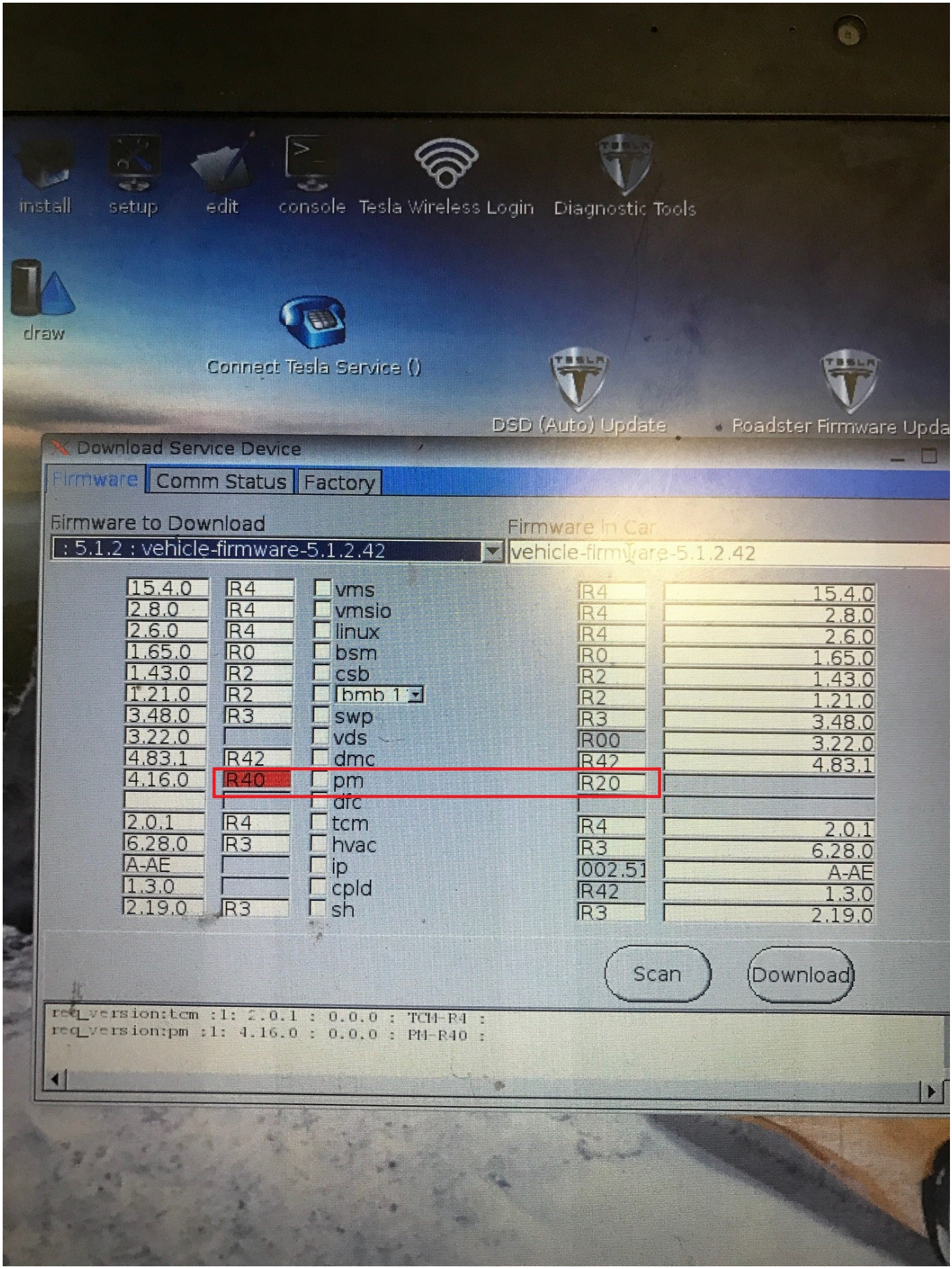
Description

The Power Electronics Controller (PEC) board in a 2.x PEM houses the Digital Motor Controller (DMC) and Pedal Monitor (PM) micro controllers.

In order to be able to receive application firmware, the bootloader version must support the intended application firmware. If it does not, firmware will not flash to the component. If using DSD Auto Update, a package may not be available. If using Roadster Firmware Update tool, it will fail to update the DMC or PM.

Steps to Test

1. Open the Roadster Firmware Update tool.
2. Navigate to the Factory Tab.
3. Click STOP VMS.
4. Navigate to the Firmware Tab.
5. Click SCAN.
6. Select the firmware package you intend to download to the vehicle from the drop down in the upper left.
7. compare the second column of the intended package to the first column of the vehicle firmware. In the example below, the firmware package requires R40, while the installed component is R20. If you cannot communicate with the PM, both columns on the vehicle package would be blank.


install
setup
edit
console
Tesla Wireless Login
Diagnostic Tools
draw
Connect Tesla Service ()
DSD (Auto) Update
Roadster Firmware Upda
Download Service Device
Firmware
Comm Status
Factory
Firmware to Download
: 5.1.2 : vehicle-firmware-5.1.2.42
Firmware in Car
vehicle-firmware-5.1.2.42
15.4.0 R4 vms R4 15.4.0
2.8.0 R4 vmsio R4 2.8.0
2.6.0 R4 linux R4 2.6.0
1.65.0 R0 bsm R0 1.65.0
1.43.0 R2 csb R2 1.43.0
1.21.0 R2 bmb 1 R2 1.21.0
3.48.0 R3 swp R3 3.48.0
3.22.0 vds R00 3.22.0
4.83.1 R42 dmc R42 4.83.1
4.16.0 R40 pm R20
dfc
2.0.1 R4 tcm R4 2.0.1
6.28.0 R3 hvac R3 6.28.0
A-AE ip 002.51 A-AE
1.3.0 cpld R42 1.3.0
2.19.0 R3 sh R3 2.19.0
Scan
Download
req_version:tcm :1: 2.0.1 : 0.0.0 : TCM-R4 :
req_version:pm :1: 4.16.0 : 0.0.0 : PM-R40 :

Steps to Fix

Bootloader updates cannot be done in Service. MRB the component so that it can be updated in remanufacturing and re used. Order a new PEC board.

Possible Effects

- Article #22069 VMS 1541 VMS: DMC firmware version doesn't match car-wide release
- Article #22070 VMS 1542 VMS: PM firmware version doesn't match car-wide release

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Possible Causes

Unknown.

Article #41495 - PEM 3.0 installed in a non-3.0 vehicle

Description

A power electronics module (PEM) designed for the Roadster 3.0 has been incorrectly installed on a non-3.0 Roadster. This can cause the firmware update procedure to fail.

Note: PEM 3.0 cannot be used on non-3.0 Roadsters.

Steps to Test

Confirm a 3.0 PEM was installed on a non-3.0 Roadster.

Steps to Fix

1. Check part manual and source proper PEM.
2. Replace the PEM or the HV battery so that they match.

Possible Effects

- Article #23547 Roadster firmware update procedure

Possible Causes

Unknown.

Article #22629 - PEM CAN status is unavailable

Description

The Power Electronics Module (PEM) CAN status is unavailable.

Steps to Test

Using the MTS-2/Linux-based Engineering Tool, check the Power Electronics Module (PEM) CAN status.

(Information about the MTS-2 tool can be found in article 22957)

Steps to Fix

- If the PEM CAN status is unavailable, reboot the Vehicle Monitor System (VMS).
- If the VMS reboot does not resolve the fault, cycle the Auxiliary Power Supply (APS).

Escalate your session for assistance, if the APS does not resolve the fault.

Possible Effects

- Article #21537 VMS 56 PEM: No data fault

Possible Causes

Unknown.

Article #37569 - PEM fan fuses blown roadster 2.X

Description

The Roadster power electronics module (PEM) fans and motor fans are driven by the PEM. The PEM also houses two mini fuses on the fan driver circuits. If the PEM or motor fans are blocked or become worn, it is possible for these fuses to blow.

NOTE: This occurs on cars with a single motor dual fan upgrade installed. The fan may still operate if only one of the two fuses is blown, but a fault will be present.

Steps to Test

1. Complete the vehicle electrical isolation according to Service Manual procedure: VEHICLE ELECTRICAL ISOLATION PROCEDURE - Correction code: 16010002
2. Remove PEM service access lid.
3. Inspect two yellow mini fuses pictured below: 

Steps to Fix

1. Replace fuses as necessary. If one is blown, replace both.
2. Reinstall the PEM access lid.
3. Reinstall the service disconnect.
4. Un-inhibit the APS.
5. Test that faults have cleared and that PEM fan is active.
6. Check to confirm operation by charging the vehicle on a 240V, 40A or higher source. The fan should activate within several minutes of charging.

Possible Effects

- Article #21932 DMC 1144 DMC PEM Fan Problem

- Article #21934 DMC 1146 DMC Motor Fan Problem

Possible Causes

Unknown.

Article #38963 - PEM internal isolation

Description

The power electronics module (PEM) has low internal isolation.

Steps to Test

1. Rule out isolation loss in the HVAC circuit by connecting the HVAC simulator (RST 193) directly to the Energy Storage System (ESS). (Note that the Energy Storage System is now known as the High Voltage Battery.)
2. Rule out motor and cables by performing a HIPOT test - see MEM-11-004 (and/or remove motor cables from the PEM).
3. Remove the battery heater connector from the PEM.
4. If possible, charge the ESS with a recovery charger and check isolation with the Battery Safety Monitor User Interface (BSMUI) on puppy tools.
5. If isolation is good, the PEM (Power Electronics Module) is the only component left to cause isolation loss and this is your issue.

Steps to Fix

Replace the PEM following the appropriate Service Manual procedure for your vehicle:

- Roadster 1.5: POWER ELECTRONICS MODULE (PEM) - ROADSTER 1.5 - Correction code 39010702
- Roadster 2.x: POWER ELECTRONICS MODULE (PEM) - ROADSTER 2.X - Correction code 39010802

Possible Effects

- Article #21593 BSM 286 BSM: Isolation fault while contactors closed

Possible Causes

- Article #44209 Blown Sheet-Fuse

Article #22896 - Poor Air Flow Over Condenser

Description

Fault likely caused by poor air flow over the condenser.

Steps to Test

Determine if the vehicle is charged in an area with poor air flow or under a cover.

Steps to Fix

If the vehicle has been charged under a cover, remove the vehicle cover and reevaluate. Otherwise, escalate your session for assistance.

Possible Effects

- Article #21996 HVAC 1413 HVAC: High Pressure
- Article #22029 HVAC 1453 HVAC: High Pressure

Possible Causes

- Article #22849 Faulty Condenser Fan
- Article #22925 Condenser Fan blockage

Article #23035 - Poor connection between 12V HVAC and 400V HVAC controllers

Description

Poor connection between 12V HVAC and 400V HVAC controllers.

Problem may be intermittent.

Steps to Test

Inspect the connection between the 12V Heating, Ventilation, Air-Conditioning (HVAC) and the 400V HVAC controllers.

Steps to Fix

If there are any connection issues between the 12V HVAC and 400V HVAC controllers, restore/replace as needed. Otherwise, escalate your session for assistance.

Possible Effects

- Article #22787 PTC heater and A/C compressor do not function-Faulty 12V HVAC Controller
- Article #44368 HVAC failure

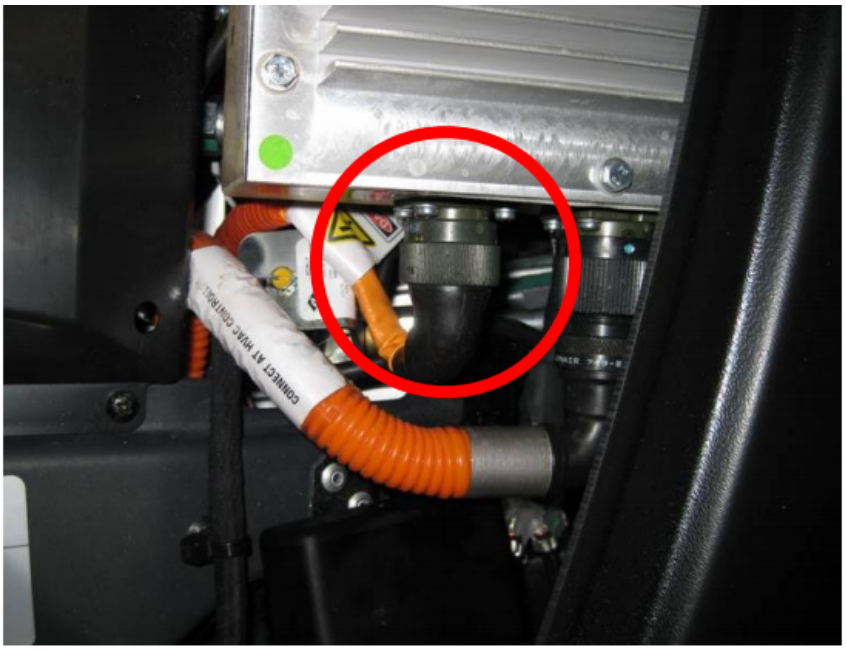
Possible Causes

Unknown.

Article #23183 - Poor connection to / malfunction of compressor due to bent pins on the compressor connector of HVAC 400V Controller (SVC-08-18-012)

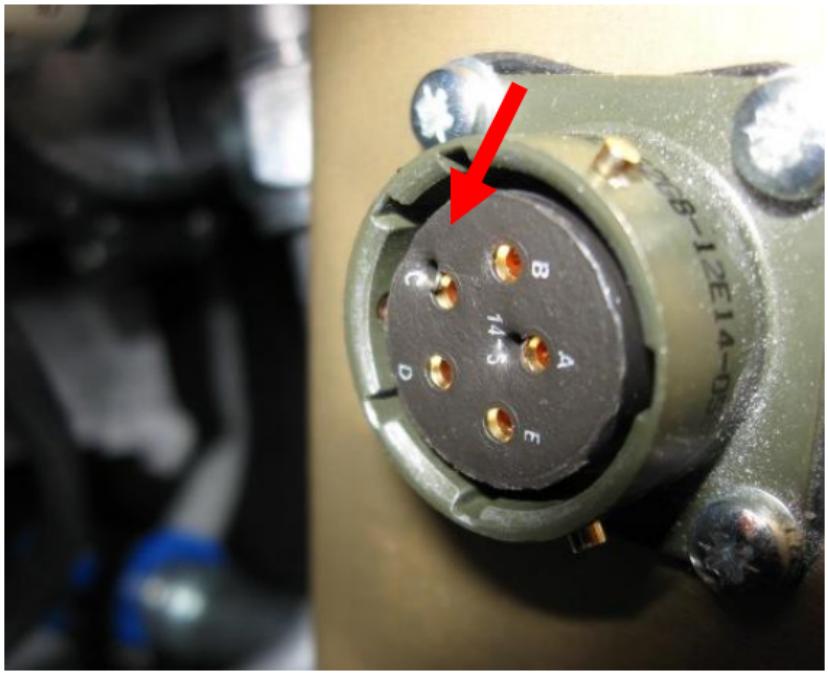
Description

Some vehicles were assembled with misaligned pins on the compressor connector of the 400V Heating, Ventilation, Air-Conditioning (HVAC) controller. When assembly was completed, the pins would bend and cause a poor connection to and possible malfunction of the compressor.



When the misaligned pins are forced onto the control unit, a mark is left in the 400V HVAC controller's connector.

Most commonly, pin C has misalignment problems, but others are susceptible as well.



Steps to Test

1. Open the hood.
2. Disconnect the compressor connector,
3. Inspect for bent pins.
4. If any bent pins are discovered, this is the issue.

Steps to Fix

1. Carefully straighten the pins using non-marring needle nose pliers.
2. Once the pins are straightened, re-install the connector.

3. Check the pin connection once again before the vehicle is released.

Possible Effects

- Article #22374 Loose or damaged wiring between battery pack and 400V HVAC controller

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Possible Causes

Unknown.

Article #23036 - Poor HVIL Loop connections

Description

Poor High Voltage Interlock (HVIL) Loop connections.

Steps to Test

Inspect the HVIL loop connections for damage or loose connections.

Steps to Fix

If there are damaged/loose connections, restore/replace connections. Pursue possible causes to investigate further.

Possible Effects

- Article #22786 Faulty 400V HVAC Controller-400V HVAC controller simulator (TPN 6005456)
- Article #22787 PTC heater and A/C compressor do not function-Faulty 12V HVAC Controller

Possible Causes

- Article #22374 Loose or damaged wiring between battery pack and 400V HVAC controller
- Article #23021 Poor connection/blown Fuse 23

Article #22631 - Possible damage to fuse 7

Description

Possible damage to fuse 7.

Steps to Test

Replace fuse 7 and check for a cleared fault. Visually inspect the wiring.

Steps to Fix

Replace harness as needed. Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #22632 TPMS CAN status

Possible Causes

- Article #22630 Damaged/Loose ground at TPMS

Article #22316 - Power Electronics Module (PEM) access door micro switch not functioning properly

Description

Power Electronics Module (PEM) access door micro switch not functioning properly.

Steps to Test

Verify that the Power Electronics Module (PEM) door is fully closed.

Steps to Fix

Repair or replace PEM micro switch and fully seat PEM access door.

pursue possible causes to investigate further.

Possible Effects

- Article #21571 BSM 264 BSM: PEM cable fault
- Article #21712 DMC 924 DMC HW: ESS Cable Interlock fault
- Article #22786 Faulty 400V HVAC Controller-400V HVAC controller simulator (TPN 6005456)
- Article #22787 PTC heater and A/C compressor do not function-Faulty 12V HVAC Controller

Possible Causes

- Article #22374 Loose or damaged wiring between battery pack and 400V HVAC controller
- Article #23021 Poor connection/blown Fuse 23

Article #22821 - Problem with contactor while charging

Description

Problem with contactor while charging.

Steps to Test

Using the MTS-2/Linux-based Engineering Tool, actuate the Battery Safety Module (BSM) contactors. Determine if the contactors open and close when activated / deactivated.

Steps to Fix

If the contactors do not function properly, it may be a contactor problem. Escalate your session for assistance.

Possible Effects

- Article #22819 Problem with tripped GFI, home wiring, or circuit breaker while charging

Possible Causes

Unknown.

Article #22816 - Problem with front to mid (FHC 45 to MHC1) wiring harness

Description

Problem with front to mid (FHC 45 to MHC1) wiring harness.

Steps to Test

Inspect connections between front to mid (FHC 45 to MHC1) wiring harness, looking for poor connections, damaged pins, or wire chaffing.

Steps to Fix

If poor connections, damaged pins, or wire chaffing are found, replace the harness.

Possible Effects

- Article #21707 DMC 919 DMC HW: Pedal Monitor Fault
- Article #21760 DMC 972 DMC FW: Accelerator Ratio Error fault
- Article #21835 DMC 1047 DMC HW: Pedal Monitor warning

Possible Causes

Unknown.

Article #22817 - Problem with mid to rear (MHC1 to RHC1) wiring harness

Description

Problem with mid to rear (MHC1 to RHC1) wiring harness.

Steps to Test

Inspect connections between

mid to rear (MHC1 to RHC 1)

wiring harness, looking for poor connections, damaged pins, or wire chaffing.

Steps to Fix

If poor connections, damaged pins, or wire chaffing are found, replace the harness.

Possible Effects

- Article #21707 DMC 919 DMC HW: Pedal Monitor Fault
- Article #21760 DMC 972 DMC FW: Accelerator Ratio Error fault
- Article #21835 DMC 1047 DMC HW: Pedal Monitor warning

Possible Causes

Unknown.

Article #22818 - Problem with PEM logic connector

Description

Problem with Power Electronics Module (PEM) logic connector.

Steps to Test

Inspect the PEM logic connector (RHC 12), looking for poor connections, damaged pins, or wire chaffing.

Steps to Fix

If poor connections, damaged pins, or wire chaffing are found, replace the harness (Part# 1017075-00-A). Otherwise, escalate your session for assistance.

Possible Effects

- Article #21707 DMC 919 DMC HW: Pedal Monitor Fault
- Article #21760 DMC 972 DMC FW: Accelerator Ratio Error fault
- Article #21835 DMC 1047 DMC HW: Pedal Monitor warning

Possible Causes

Unknown.

Article #22820 - Problem with PEM while charging

Description

Problem with Power Electronics Module (PEM) while charging.

Steps to Test

Using the MTS-2/Linux-based Engineering Tool, actuate the Battery Safety Module (BSM) contactors. Determine if the contactors open and close when activated / deactivated.

Steps to Fix

If the contactors function properly, there may be a problem with the PEM. Escalate your session for assistance.

Possible Effects

- Article #22819 Problem with tripped GFI, home wiring, or circuit breaker while charging

Possible Causes

Unknown.

Article #22819 - Problem with tripped GFI, home wiring, or circuit breaker while charging

Description

Problem with tripped GFI, home wiring, or circuit breaker while charging.

Steps to Test

Review vehicle logs for a line voltage drop away when the fault is set.

Steps to Fix

If there is a line voltage drop, check the charger for a tripped GFI. Also inspect the home wiring and circuit breaker.

Possible Effects

- Article #21769 DMC 981 DMC FW: Bad State Transition fault
- Article #21897 DMC 1109 DMC FW: Bad State Transition warning

Possible Causes

- Article #22820 Problem with PEM while charging
- Article #22821 Problem with contactor while charging

Article #22787 - PTC heater and A/C compressor do not function-Faulty 12V HVAC Controller

Description

Positive Temperature Coefficient (PTC) heater and Air-conditioning (A/C) compressor do not function-Faulty 12V HVAC Controller.

Steps to Test

- Check fuses 23 and 27.
- Check wiring from the battery (ESS) to the 12V Heating, Ventilation, Air-Conditioning (HVAC) controller.

Steps to Fix

- If fuses 23 and 27 along with the wiring from the ESS to the 12V HVAC controller are damaged, replace fuses/wiring as needed (Harness part# 2002780).
-

If fuses 23 and 27 along with the wiring from the ESS to the 12V HVAC controller are

not damaged/loose, replace the 12V HVAC controller

(Part# 6004061)

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- If the issue is not resolved, pursue possible causes to investigate further.

Possible Effects

- Article #22012 HVAC 1429 HVAC: No HV Controller Clock Detected

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Possible Causes

- Article #22316 Power Electronics Module (PEM) access door micro switch not functioning properly
- Article #23035 Poor connection between 12V HVAC and 400V HVAC controllers
- Article #23036 Poor HVIL Loop connections

Article #22344 - PTC Heater Isolation

Description

When performing an isolation resistance test of the rear motor and cable assembly with the

Positive Temperature Coefficient (PTC) heater disconnected, the isolation resistance measurements may differ by more than 100K Ohms.

Steps to Test

- Test the isolation resistance and record the measurements with the contactors closed.
- Disconnect the PTC heater cable from the 400V controller. On 2.0/2.5 models a jumper wire must be used to loop connector pins 2 and 3, prior to testing.
- Measure the isolation resistance and record the measurements with the contactors closed.
- Compare the results with the initial measurements (before PTC heater was removed).

Steps to Fix

- If the final test measurements differ by more than 100K Ohms, replace the PTC heater.
- Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #21520 VMS 19 Isolation resistance warning
- Article #21593 BSM 286 BSM: Isolation fault while contactors closed
- Article #22343 400V HVAC Controller Isolation
- Article #22345 Faulty 400V HVAC Controller (Isolation resistance test)
- Article #44344 ESS Internal Isolation-Failure

Possible Causes

- Article #22346 Faulty A/C Compressor

Article #22998 - Range decrease after Battery Bleed Test

Description

Range decrease after Battery Bleed Test.

Steps to Test

1. Charge vehicle in standard mode.
2. Once charge has completed, allow vehicle to sit idle at full charge for a 12 hour period (vehicle may be allowed to remain plugged into charger during the idle period). During this time the battery pack should improve pack balance and as a result increase vehicle range. The pack may require several cycles of charge and idle periods in order to restore range.

Steps to Fix

If the range of the vehicle does not increase after allowing the pack to balance, determine the Computed Amp-hour Capacity (CAC) of the battery. Escalate your session for assistance.

Possible Effects

- Article #22254 Low Battery Capacity / Range

Possible Causes

Unknown.

Article #22321 - Rear Tire Pressure Monitoring System (TPMS) Antenna is not functioning properly

Description

Rear TPMS Antenna is not functioning properly.

Steps to Test

Disconnect the rear antenna and reconnect. Check the connector for a missing weather plug, corrosion, missing or loose terminals.

Steps to Fix

- Make all necessary corrections to antenna connector. Refer to TSB 10-34-011 at https://service.teslamotors.com/ .

If weather plug is missing, fill the hole with a small dab of RTV silicone.

- Test drive the vehicle for 5 minutes and wait an additional 15 minutes after the test drive before checking for correction.

- Replace the rear antenna.

It is possible that both the front and rear antennae could be an issue. Refer to Issue 22322.

Possible Effects

- Article #21607 TPMS 409 TPMS: Hardware error

Possible Causes

Unknown.

Article #22369 - Red LED on 400V HVAC controller fails to illuminate while investigating HVAC: Compressor UnderVoltage

Description

Red LED on 400V Heating, Ventilation, Air-Conditioning (HVAC) controller fails to illuminate while investigating HVAC: Compressor UnderVoltage.

Steps to Test

Install the 400V HVAC simulator; TPN 6005456, directly to the Battery pack.

With the contactors closed, check for an adequate operating voltage (greater than 300V).

Steps to Fix

Pursue possible causes to investigate further.

Possible Effects

- Article #22036 HVAC 1461 HVAC: Compressor UnderVoltage

Possible Causes

- Article #22374 Loose or damaged wiring between battery pack and 400V HVAC controller
- Article #22375 Inadequate operating voltage on 400V HVAC simulator attached directly to battery pack

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Article #22368 - Red LED on 400V HVAC controller illuminates while investigating HVAC: Compressor UnderVoltage

Description

Red LED on 400V Heating, Ventilation, Air-Conditioning (HVAC) controller illuminates while investigating HVAC: Compressor UnderVoltage.

Steps to Test

Install the 400V HVAC controller simulator; TPN 6005456.

With the contactors closed, check for an adequate operating voltage (greater than 300V).

Steps to Fix

If there is adequate operating voltage, replace the 400V HVAC controller, as per SB-12-18-001 in Service Documents.

Possible Effects

- Article #22036 HVAC 1461 HVAC: Compressor UnderVoltage

Possible Causes

Unknown.

Article #22794 - Resistance between pins 4 and 13 (temp. sensor 1) and pins 3 and 12 (temp. sensor 2) not within range

Description

Resistance between pins 4 and 13 (temp. sensor 1) and pins 3 and 12 (temp. sensor 2)

are not identical or between 1 and 1.5k ohms at room temperature.

Steps to Test

Check for short/continuity of the encoder cable by disconnecting the connector at the motor encoder and the Power Electronics Module (PEM).

Steps to Fix

If damage is found, replace the cable

(Part# 6005225). Otherwise, pursue possible causes to investigate further.

Possible Effects

- Article #21729 DMC 941 DMC FW: Motor Sensor1 OverTemp fault
- Article #22792 Motor fan ducting and operation articles

Possible Causes

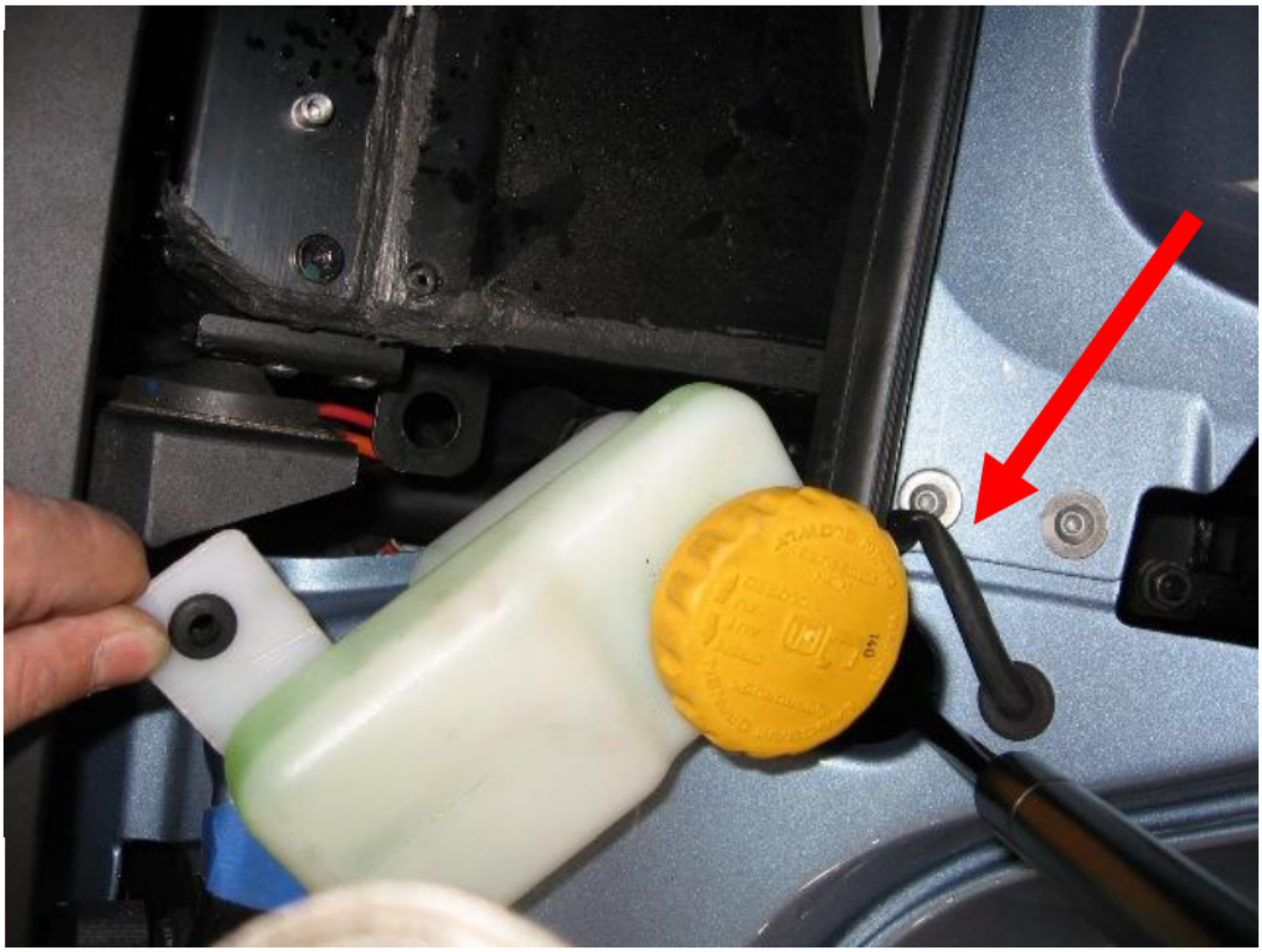
- Article #22793 Motor overtemp fault relating to the motor encoder connection to the PEM

Article #23091 - Restriction in coolant return hose to reservoir (SVC-08-46-002)

Description

Restriction in coolant return hose to reservoir. Coolant leakage can be caused by a kinked coolant return hose at the reservoir.

Bypass hose may be pinched when shifting expansion tank to remove and install the Power Electronics Module (PEM). The pinched hose may cause a coolant leak.



The coolant return line to the reservoir should be inspected for potential restriction due to improper installation. This can happen during battery (ESS) removal when shifting coolant reservoir to the side.

Steps to Test

Make sure the hose is not pinched during re-installation. Failure to do so may result in a restriction. The non-preformed EPDM material may kink after replacing the coolant reservoir into its original position. If this happens the hose can be shortened by 10mm by removing the clamp and hose, removing the material with cutters. Always replace the clamp with a new part after re-installation.

Steps to Fix

Possible Effects

- Article #31861 Coolant pump leak

Possible Causes

Unknown.

Article #22625 - Sheet alarm caused by a voltage over hardware or firmware limit

Description

Sheet alarm caused by a voltage over hardware or firmware limit.

Steps to Test

1. Retrieve the log files by connecting either the MTS-2 or Linux-based Engineering Tool.
2. Check for an over temperature fault.
3. Look for one sheet that reads a higher temperature than the others.

Steps to Fix

If there is not a temperature fault, and it is determined that there is not a single sheet that has a higher temperature, check the cooling system.

Pursue possible causes to investigate further.

Possible Effects

- Article #21519 BMB 16 BMB: Sheet alarm

Possible Causes

- Article #22623 BMB temperature fault
- Article #22624 BMB high temperature on a single sheet

Article #22327 - Sheet Undertemp

Description

The ambient air temperature where the vehicle is operated could have reached -19C or -2F.

Steps to Test

Review the vehicle logs for "ESS min temp" and min "temp id" while vehicle is in drive, idle, and charge modes for temperatures that fall below -19C or -2F.
NOTE: Battery the heater only operates when charging on an HPC 240.

Steps to Fix

If the ambient air temperatures fell below -19C or -2F, perform a battery bleed test, as per SB-12-16-002 in Service Documents. Escalate your session for assistance.

Possible Effects

- Article #21508 VMS 2 PEM Bootp or Critical Sheet UnderTemp fault

Possible Causes

- Article #44443 ESS TVSH-Failure

Article #22366 - SRS ECU connector power at pin 35, and ground at pin 7 voltage is greater than 12V

Description

Supplemental Restraint System (SRS) ECU connector power at pin 35, and ground at pin 7 voltage is greater than 12V.

Steps to Test

Check the wiring for a short to ground/open between the SRS controller Pin 40, and Vehicle Management System (VMS) J2-Pin 7.

Steps to Fix

If the wiring is kinked, loose, or damaged, repair the wiring. If the wiring is okay, troubleshoot the VMS.

Possible Effects

- Article #21529 SRS 32 SRS: Airbag must be serviced. Contact Tesla Service Center
- Article #22365 No communication between MTS-2 and SRS ECU

Possible Causes

Unknown.

Article #22364 - SRS ECU connector power at pin 35, and ground at pin 7 voltage is less than 12V

Description

SRS ECU connector power at pin 35, and ground at pin 7 voltage is less than 12V.

Steps to Test

Troubleshoot the switchpack. Determine if power is available between SRS ECU pin 35 and switchpack pin 4. Check the ground.

Steps to Fix

If power is unavailable, troubleshoot the power. If power is available, but the ground is unavailable, troubleshoot the ground. If power is available, and the ground is available, replace the SRS ECU.

Possible Effects

- Article #21529 SRS 32 SRS: Airbag must be serviced. Contact Tesla Service Center
- Article #22365 No communication between MTS-2 and SRS ECU

Possible Causes

Unknown.

Article #26290 - TC / ABS telltale is lit

Description

Traction Control (TC) / Anti-lock brake (ABS) telltale is lit. This includes when the telltale is lit intermittently or constantly.

Steps to Test

Perform test drive and confirm improper illumination of TC Telltale.

Steps to Fix

Check for correct tire sizes. If winter tires are installed, check PTS-10-34-005 https://service.teslamotors.com/protected-doc/ServiceBulletins/Internal/PTS/PTS-10-34-005_Winter_Tir... If correct tires are installed push during test drive the "new tires" button in touch screen. If fault is still present, use MTS-2 for diagnosing on ABS failure. See Article #22957 for more information.

Possible Effects

Unknown.

Possible Causes

- Article #22800 Failed ABS Release

Article #22300 - Temperature Voltage Sense Harness (TVSH) to BMB poor or loose connection

Description

Triggered by a loose or poor Temperature Voltage Sense Harness (TVSH) to Battery Monitor Board (BMB) connection. The BMB interprets a loose connection as an open circuit or low voltage.

Steps to Test

Review vehicle logs to determine which sheet is causing the fault, then inspect the BMB on that sheet for proper fitment, and for damaged TVSH terminals.

Steps to Fix

Ensure proper fitment and/or repair any damaged TVSH terminals.

Possible Effects

- Article #31869 "Charging completed" at low SOC

Possible Causes

Unknown.

Article #22632 - TPMS CAN status

Description

When the ignition is turned on after a fault, the Tire Pressure Monitor System (TPMS) CAN status is determined.

Steps to Test

Turn the ignition on and check the TPMS CAN status. Reboot the Vehicle Monitor System (VMS)

Steps to Fix

If the TPMS CAN status is okay, but the VMS reboot does not resolve the fault, escalate your session for assistance. If the TPMS CAN is determined to be in error, pursue possible causes to investigate further.

Possible Effects

- Article #21539 VMS 58 TPMS: No data fault
- Article #21607 TPMS 409 TPMS: Hardware error

Possible Causes

- Article #22631 Possible damage to fuse 7
- Article #30739 TPMS controller failure

Article #30739 - TPMS controller failure

Description

The Tire Pressure Monitoring System (TPMS) controller is not responding.

Steps to Test

1. Check fuse 7.
2. Measure voltage at TPMS Electronic Control Unit (ECU) connector FHC7, pin 2 (+) / pin 1 (-). Troubleshoot +/- failure.
3. Check for water ingress at controller.
4. Verify that all other potential causes for TPMS communication issues are eliminated.

Steps to Fix

Replace the ECU.

Possible Effects

- Article #22632 TPMS CAN status

Possible Causes

Unknown.

Article #22323 - TPMS Sensor Faulty

Description

Tire Pressure Monitoring System (TPMS)-One specific wheel is missing a signal consistently. Sensor may be faulty or low battery

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Steps to Test

Determine which TPMS sensor is consistently missing a signal by looking on the vehicle's touchscreen. Pull logs and check data_text(diag_tpms) for sensor PSI reports & status message displayed shortly after the TPMS 409 alert.

[1.5 Roadsters] To narrow it down to a bad sensor, you can swap wheels L & R to confirm the issue follows the tire and is not related to a trigger

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Steps to Fix

Reprogram all four sensors.
Test drive the vehicle for 5 minutes and wait an additional 15 minutes after the test drive before checking for correction.

If the warning is still present, replace wheel sensor. Check for expiration, the date code on the replacement sensors should be no less than two years old.
Test drive the vehicle for 5 minutes and wait an additional 15 minutes after the test drive before checking for correction.

If the warning is still present, escalate your session for assistance.

Possible Effects

- Article #21607 TPMS 409 TPMS: Hardware error

Possible Causes

- Article #40443 OBD 2 Cable pinned incorrectly or open circuit

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Article #26182 - Upon reboot, boot to USB Hard Drive is not available

Description

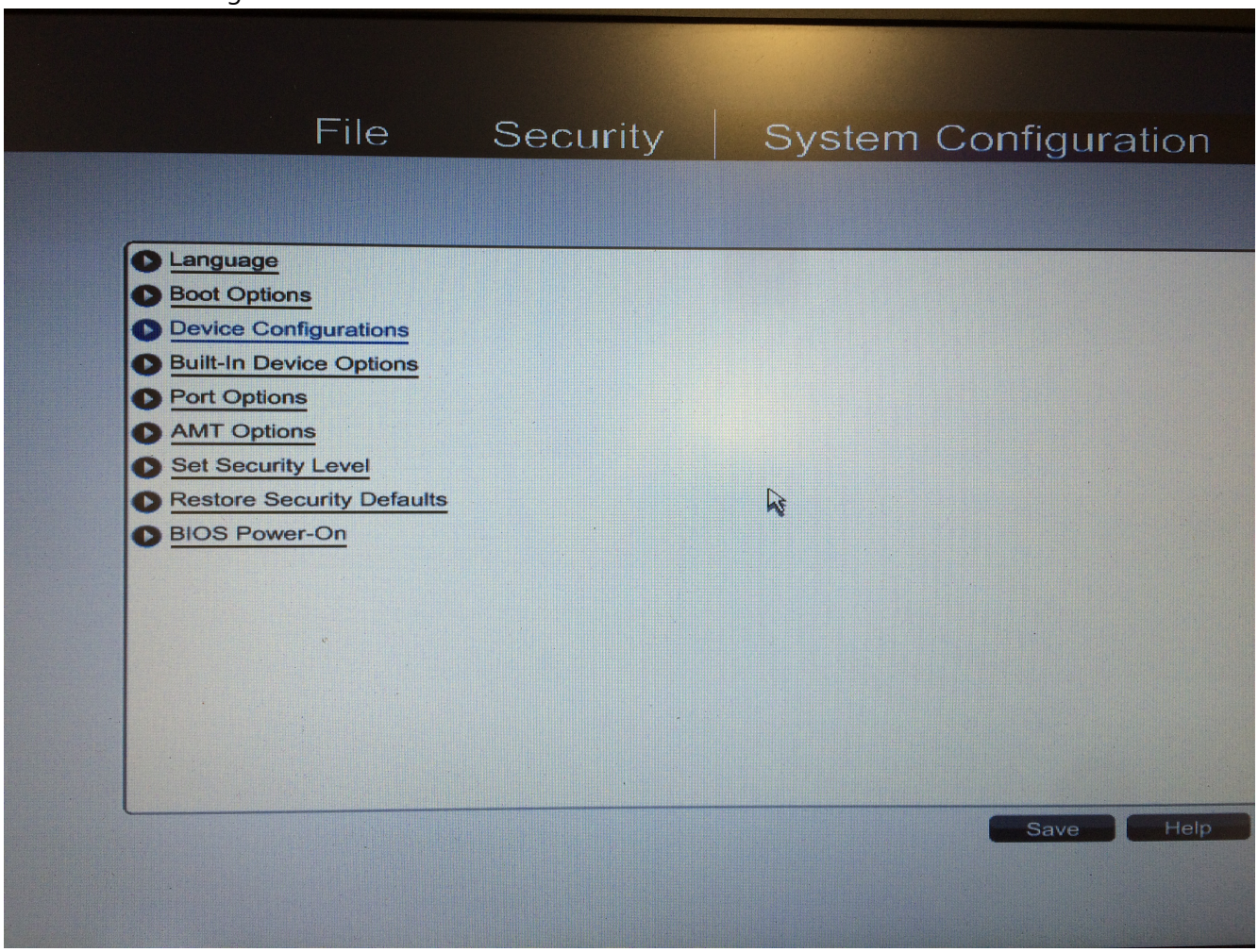
When booting from a USB hard drive to perform a Roadster firmware update, if this option is not available, it is possible that a setting in the bios may need to be changed.

Steps to Test

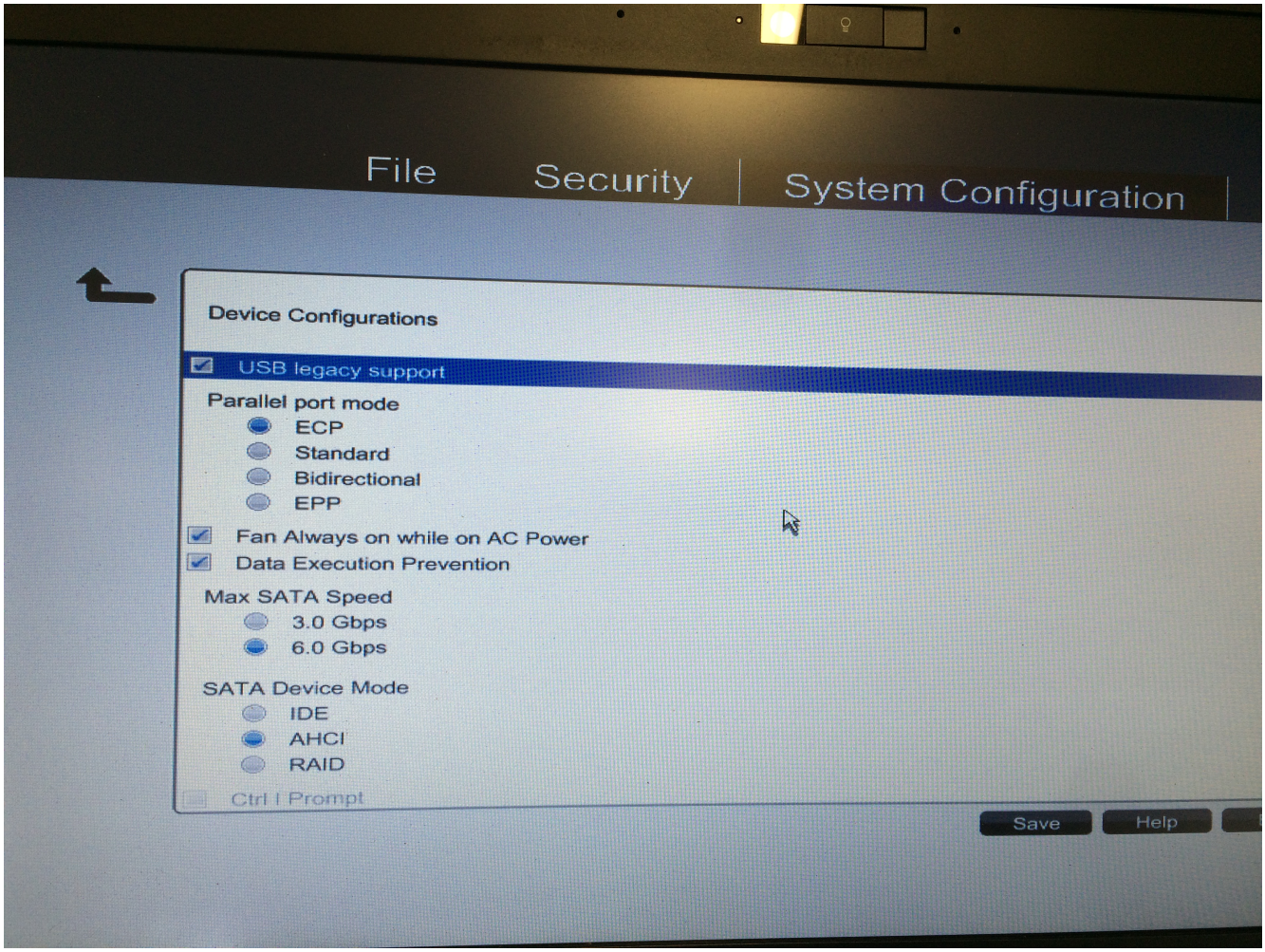
After selecting F9, USB Hard Drive is not a choice. Reseat the USB hard drive.

Steps to Fix

1. Go to Bios Set Up (usually F10) in the prior menu.
2. Select Device Configurations:



3. Select the checkbox for **USB Legacy Support**:



4. Exit and reboot the device again.
    - Boot from USB Hard Drive now appears as an option under Boot Device Options.

Possible Effects

- Article #23547 Roadster firmware update procedure

Possible Causes

Unknown.

Article #23194 - Water Ingress Containment at door hinge area (TSB-09-10-001)

Description

Leak Point around Door Hinge.

There is potential for water to ingress into the forward sill cavity of the body side panel. Water strikes this area as run off from the windshield and passes over the top of the body side panel and onto the door hinge area. Small points of ingress between the door hinge and the body side potentially exist.

This area houses electronics and connectors that can be damaged by moisture.

Note: It is important to perform TSB-09-10-003 in conjunction with this repair if necessary. Verify vehicle history before proceeding with these repairs. Perform this repair to both sides of the vehicle when the vehicle is in the workshop.

Steps to Test

1. Determine if the area has been affected by water ingress.
2. If moisture is detected, verify function of stereo components (i.e. BluetoothÂ® module, satellite radio antenna, iPod adapter).
3. Check for moisture inside the forward sill cavity by removing the left-hand dash trim Please reference the following Service Manual procedure: TRIM - DASH - LH - Correction code 15180902
4. If moisture is present, then this is your issue. Please proceed to the "Steps to Fix" section.

Steps to Fix

- Verify the area; including mounting foam for components, is fully dried.
- Use a fan or heated blower to remove moisture.
- Replace all electronic components affected by moisture; make sure electrical connectors are clean and free of corrosion.
- Pay special attention to door harness connectors.
- Repeat necessary actions in right forward sill cavity area as well.

1.

Raise the front of the vehicle safely on jack stands or a lift.

•

Remove both wheel arch liners. Refer to the Service Manual procedure: WHEEL ARCH LINER - UPPER - FRONT - LH

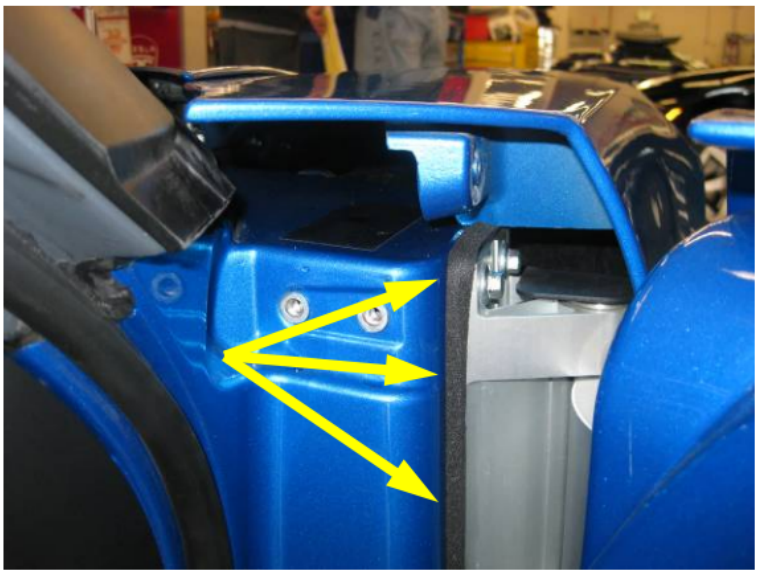
- Correction code 12010902 WHEEL ARCH LINER - LOWER - FRONT - LH
- Correction code 12011302
- Open the door and remove the three (3) bolts securing the upper fender bracket on the left side.

•

Clean the area around the door hinge with a paint safe cleaner or alcohol, remove all dirt and contamination.

•

Apply door hinge gasket (part no. pending) around the door hinge. Use care to wrap the foam seal tightly around the door hinge, use heat gun in ambient temps below 60Â° F to and apply light heat to assure good adhesion.



Service Tip: Apply glass cleaner to area around the door hinge before installing the gasket. This will allow the gasket to move around and not stick until it is positioned properly. Once it has been placed properly, use the heat gun to dry and promote adhesion.

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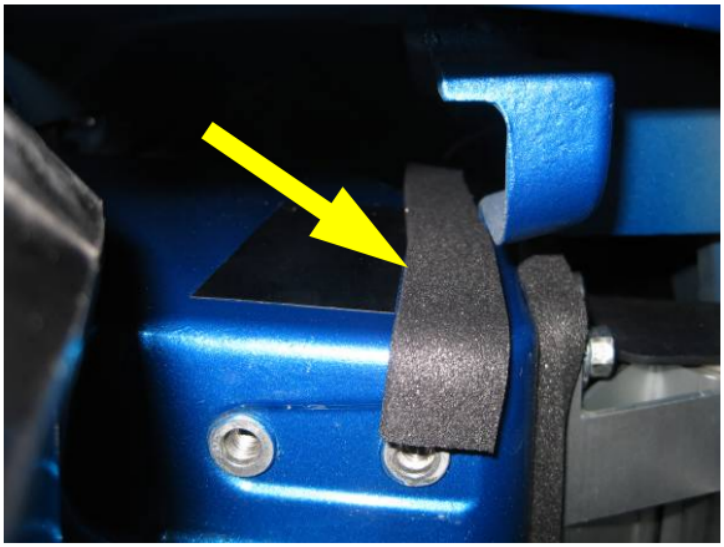
Apply a strip of EPDM or urethane foam tape (Approx 8mm thick, cut to 20mm wide X 160mm long) to the top of the panel above the door hinge.



Note: Do not cover the holes for the fender bracket.

-

Using a drill with a 23/64th regular drill bit, drill out the two scrivet holes in the body side panel with the drill on the reverse setting.

Important: Make sure to use the drill in reverse only (counter-clockwise), drilling into the carbon clockwise will pull on the carbon and cause damage to the body side panel. **Caution:** Make sure to wear a dust mask and clean the area of dust, avoid breathing or exposure to carbon panel dust.

- Clean area free of dirt and oils. Apply a thin bead of sealer (urethane or black RTV silicone) the area across the body side panel and CLSR panel as shown below.

- Install the 6mm aluminum riv-nut to the installation tool and apply a thin bead of black RTV silicone to the edge of the flange as shown. Bottom the riv-nut on the tool's anvil.

-

Install the riv-nut, only tighten snugly, do not over-tighten. The riv-nut only needs to be set in the panel.
Important: Over-tightening the riv-nut may damage the carbon panel.

- Follow steps 3-10 on the right side.
-

When installing arch liners use new black oxide coated M6 x 16mm hex bolts and M6 x 18mm fender washers. Discard old scrivets.

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Install wheel-arch liners and check door alignment.

Possible Effects

- Article #42464 Water ingress at doors

Possible Causes

Unknown.

Article #22845 - Wiring Problem between 12V HVAC Controller and Coolant Pump

Description

Wiring problem between 12V HVAC controller and coolant pump.

Steps to Test

- Using diagnostic tool to measure voltage signal at the coolant pump, cycle pump on/off.
- Visually inspect the associated wiring and connections.

Steps to Fix

If a voltage reading is not showing while testing with the diagnostic tool, the problem most likely relates to the wiring between the 12V battery and the coolant pump. Replace or repair wiring as needed.

Possible Effects

- Article #21983 HVAC 1400 HVAC: Coolant Pump UnderCurrent
- Article #22008 HVAC 1425 HVAC: Low current pump failure
- Article #22019 HVAC 1440 HVAC: Coolant Pump UnderCurrent
- Article #22355 Coolant pump malfunction

Possible Causes

Unknown.

Article #39453 - Wrong PEC board installed during 3.0 upgrade

Description

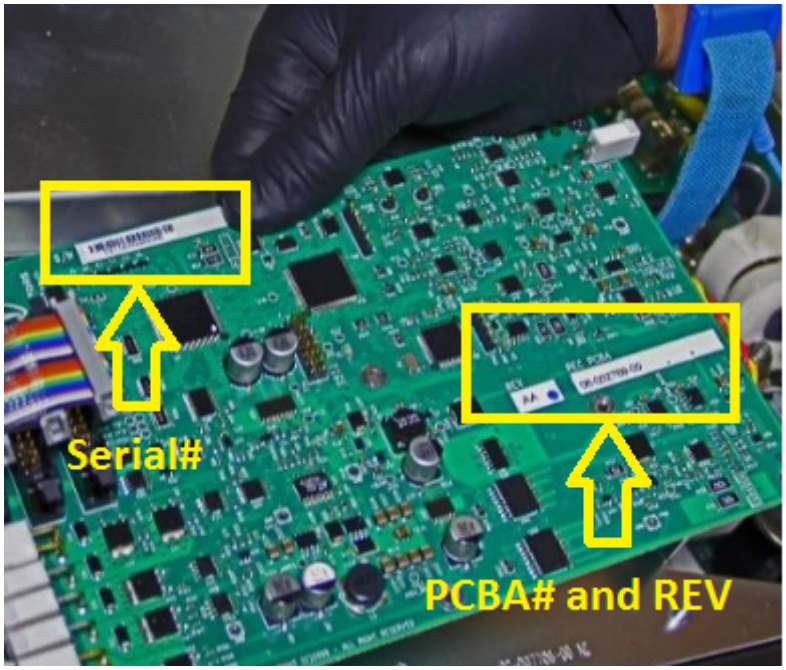
If an incompatible PEC-board was sent and installed, the firmware update on a Roadster that has been upgraded to 3.0 is not going through.

If the firmware does not go through, the DSD AutoUpdate may not be able to flash 3.0 firmware onto the PEC Board.

Steps to Test

1. Check ASY-Number or PCBA-Number on PEC Board.
    - This number may be covered by a label stating the 3.0 PEC-board PN 1071438-00-A
2. Verify the numbers match the 3.0 Requirements below:
    - **PEM 2.0 PEC PCBA Base = DO NOT USE FOR 3.0** ASY: 06-002583-00 PCBA: 09-000232-00 Rev AA
    - **PEM 2.01 PEC PCBA Sport = OK TO USE FOR 3.0** ASY: 06-002769-00 PCBA: 09-000232-00 Rev AB

Location of the serial number and the RCBA rev number on the PEC board:



Steps to Fix

1. If an incompatible PEC-board was sent and installed, please order a new PEC-board (PN 1071438-00-A) from Fremont and return the incompatible board through MRB.
    - All 3.0 PEC-Boards distributed as of September 2017 should match the Hardware requirements.

2. If the right PEC-board version is installed but the issue persists, mark this article as "Not an issue", return to Article 40051 ,and escalate the session for further assistance.

Possible Effects

- Article #40051 DSD AutoUpdate fails after 3.0/Nextgen upgrade

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Possible Causes

Unknown.
