



**Countries:** CANADA, UNITED STATES **Document ID:** IK0800504  
**Availability:** ISIS, Bus ISIS, IsSIR **Revision:** 3  
**Major System:** ELECTRICAL SYSTEM **Created:** 10/27/2014  
**Current Language:** English **Last Modified:** 8/3/2020  
**Other Languages:** NONE **Author:** Charles Schroeder  
**Viewed:** 4626

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Coding Information

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**Title:** Repair Procedures for Vehicles Struck by Lightning

**Applies To:** All Models

## CHANGE LOG

Please refer to the change log text box below for recent changes to this article:

08/03/2020 - Added Endurant Transmission Mechatronic Transmission Module (MTM) based on dealer feedback.  
 08/16/2016 - Updated Warranty Information to define lightning strikes are not warrantable.  
 07/21/2015 - Added Step 9 to Repair Procedures to include LED headlight assemblies.  
 10/28/2014 - Initial Article Release.

## DESCRIPTION

When units are damaged by extreme high voltage, the most common complaint is a crank no start, or the engine will start, but is in a de-rated state of operation, "Limp Mode".

- Initial diagnostics will show that all or most of the modules (ECM, ABS, EGC, BC, etc...) are not communicating on the J1939 or not showing up on any 1939 sniffer.
- Data link voltage checks at the 9 pin diagnostic connector will also show the voltage way out of specification.
- Refer to [IK0800080](#) for J1939 diagnostics.
- To verify this condition, it is also acceptable to swap a few of the modules with known good ones to see if those modules start to communicate.
  - This will ensure there is no wiring or component issue and high voltage damage to the modules and sensors is the root cause.
- If you are unsure on what direction is needed based of your initial diagnostics, create a case file for assistance.

## SYMPTOM(s)

**Diagnostic Trouble Code(s) & Dashboard Indicator Light(s):**

DTC/Light	Description
N/A	Not Applicable

**Customer Observations or Concerns:**

Engine Cranks, but will Not Start  
 Poor Engine Performance

## SPECIAL TOOL(s) / SOFTWARE

Tool Description	Tool Number	Comments	Instructions
Fluke DVOM Universal	ZTSE4357		

## SERVICE PART(s) INFORMATION

Parts required will vary for each repair.

## DIAGNOSTIC STEP(s)

Step	Action	Decision
#1	<b>DIAGNOSTIC:</b> <ul style="list-style-type: none"> <li>Turn the key to the ignition position (KOEO)</li> <li>Measure the voltage at the 9-Pin Diagnostic Connector for the data link</li> <li>Record the voltage on terminal C to Ground</li> <li>Record the voltage on terminal D to Ground</li> </ul> <p><b>Is the voltage in specification and remain steady?</b></p> <ul style="list-style-type: none"> <li>The sum of the voltage on C and D should be approx 5 Vdc</li> <li>Example: 2.6 Vdc on C, 2.4 Vdc on D</li> <li>The voltage on terminal C should be slightly higher than terminal D</li> </ul>	<b>Yes:</b> <ul style="list-style-type: none"> <li>If the voltages are in specification, attempt to identify any communicating modules using a J1939 sniffer such as INTUNE.</li> <li>Refer to <a href="#">IK0800080 - J1939 Data Link Troubleshooting</a> for further assistance.</li> </ul>
		<b>No:</b> <ul style="list-style-type: none"> <li>Voltage is excessively out of specification, or voltage is constantly fluctuating.</li> <li>Continue to Step 2.</li> </ul>

Step	Action	Decision
#2	<b>DIAGNOSTIC:</b> <ul style="list-style-type: none"> <li>Extreme High Voltage damage suspected:                             <ul style="list-style-type: none"> <li>Install a known working module</li> <li>Check to see if the module is now showing on a data link sniffer</li> <li><b>NOTE:</b> The module may not re-establish communications, but should show on a data link sniffer</li> </ul> </li> </ul> <p><b>Is the test module showing up on a data link sniffer?</b></p>	<b>Yes:</b> <ul style="list-style-type: none"> <li>Continue to Repair Steps.</li> </ul>
		<b>No:</b> <ul style="list-style-type: none"> <li>Unplug various other modules, re-checking for the test module showing on a data link sniffer each time.</li> <li>If unable to get the test module to show on the sniffer use <a href="#">IK0800080 - J1939 Data Link Troubleshooting</a> for further assistance.</li> </ul>

## REPAIR STEP(s)

### REMOVAL PROCEDURE:

The following items will need to be replaced in most cases.

- All Modules on the Public J1939
  - This includes but is not limited to:

ECM	EGC	Telematics Module
ACM	TCM	Telematics Multi-bus Adapter
ABS ECU	Body Controller	Collision Avoidance Radar
Electronic Gauge Cluster	Electronic Shift Console	Collision Avoidance DIU
Endurant Transmission Mechatronic Transmission Module (MTM)		

- All Engine 5v sensors
  - This includes but is not limited to:

ITV / ETV	EOP	Turbo Actuator (Cummins only)
EBP	IMP / MAP	

FRP	APP	
FDP	EGR Valve	

### 3. All Aftertreatment 5v sensors and Smart sensors

- This includes but is not limited to:

DPFDP Sensor	Temperature Sensor Module	
NH <sub>3</sub> Ammonia Sensor	NH <sub>3</sub> Sensor Module	
NO <sub>x</sub> Sensor	NO <sub>x</sub> Sensor Module	
DEF Head (Tank Level and Temperature)		

### 4. All Body 5v sensors

- This includes but is not limited to:

A/C Pressure Transducer		
Primary/Secondary Air Pressure		
Application Air Pressure		
Axle Load		

### 5. Radio

- Front and Sleeper

### 6. HVAC Components

- Bunk HVAC System Controller
- ESPAR Control Module (If equipped)

### 7. Remote Power Modules (RPM)

### 8. J1939 Terminating Resistors (2)

### 9. LED Headlight Module Assemblies

## INSTALLATION PROCEDURE:

1. Install all new components as outlined above.
  - Program all new modules as needed
2. Test all cab features to verify proper operation.
  - All switches need to be tested
  - Headlights, Mirror heaters, Window switches, door locks, etc...
  - Radio operation and radio reception (AM / FM / SAT)
  - CB Radio operation and reception
  - HVAC operation, cab and sleeper, including No-Idle system if equipped
  - Driver Information Display (DID)/(VID)
  - GPS
  - Telematics System

## **WARRANTY INFORMATION**

**NOTE:**

Lightning strikes are not warrantable. No claims should be filed.

## **OTHER RESOURCES**

- [Master Service Information Site](#)

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