

2021 ACCESSORIES & EQUIPMENT

Data Communications - Diagnostic Information and Procedures (1 of 2) - Canyon, Colorado

DIAGNOSTIC INFORMATION AND PROCEDURES

CONTROL MODULE U CODE LIST

This list includes all Data Communications related U-code DTCs in alphanumeric order with descriptors for all devices. Not all DTCs listed will be applicable to all vehicles.

For symptom byte information, refer to [Symptom Byte List](#).

DTC	DTC Descriptor
U0001	High Speed CAN Bus Malfunction
U0002	High Speed CAN Bus
U0009	High Speed CAN Bus [-] Shorted to Bus [+]
U0020	Low Speed CAN Bus
U0028	MOST Bus
U0029	MOST Bus Performance
U0073	Control Module Communication Bus A Off
	Control Module Communication High Speed CAN Bus Off
U0074	Control Module Communication Bus B Off
	Control Module Communication Powertrain Expansion CAN Bus Off
U0075	Control Module Communication Object Detection CAN Bus Off
U0076	Control Module Communication Powertrain Sensor CAN Bus Off
U0077	Control Module Communication Chassis Expansion CAN Bus Off
U0078	Control Module Communication Low Speed CAN Bus Off
U007A	Control Module Communication High Voltage Energy Management CAN Bus Off
U007B	Control Module Communication High Speed Extension CAN Bus Off
U007C	Control Module Communication High Speed Extension CAN Bus 2 Off
U007D	Control Module Communication Low Speed Extension CAN Bus Off
U007E	Control Module Communication FlexRay 1A Bus Off
U007F	Control Module Communication FlexRay 1B Bus Off
U0100	Lost Communication With Engine Control Module
U0101	Lost Communication With Transmission Control Module
U0102	Lost Communication with Transfer Case Control Module
U0103	Lost Communication with Shift Lever Module
U0104	Lost Communication With Cruise Control Module
U0105	Lost Communication with Fuel Injector Control Module
U0106	Lost Communication with Glow Plug Control Module
U0109	Lost Communication with Fuel Pump Control Module (2013 and prior)
	Lost Communication with Chassis Control Module (2014 and beyond)
U010C	Lost Communication with Turbocharger Boost Control Module
U010E	Lost Communication with Reductant Sensor Module
U010F	Lost Communication with Air Conditioning Control Module
U0110	Lost Communication with Drive Motor Control Module
U0111	Lost Communication with Battery Energy Control Module
U0112	Lost Communication with Battery Energy Control Module
U0114	Lost Communication with Four Wheel Drive Clutch Control Module
U0115	Lost Communication with Engine Control Module B

DTC	DTC Descriptor
U0117	Lost Communication With Power Take-Off Control Module
U0121	Lost Communication with Electronic Brake Control Module
	Lost Communication with Brake System Control Module
U0122	Lost Communication With Vehicle Stability Control Module
U0123	Lost Communication with Yaw Rate Sensor Module
U0125	Lost Communication With Multi-Axis Acceleration Sensor Module
U0126	Lost Communication With Steering Wheel Angle Sensor Module
U0128	Lost Communication With Park Brake Control Module
U0129	Lost Communication with Brake System Control Module
U012A	Lost Communication With Chassis Control Module
U012B	Lost Communication with Chassis Control Module - Auxiliary
U0130	Lost Communication With Power Steering Control Module
U0131	Lost Communication With Power Steering Control Module
U0132	Lost Communication With Suspension Control Module
U0133	Lost Communication With Air Suspension Control Module
U0134	Lost Communication with Power Steering Control Module - Rear
U0136	Lost Communication With Differential Control Module - Rear
U0137	Lost Communication with Trailer Brake Control Module
U0139	Lost Communication With Suspension Control Module 2
U0140	Lost Communication With Body Control Module
U0146	Lost Communication with Serial Data Gateway Module
U0151	Lost Communication With Inflatable Restraint Sensing and Diagnostic Module
U0154	Lost Communication with Passenger Presence Module
U0155	Lost Communication With Instrument Cluster
U0158	Lost Communication With Head-Up Display
U0159	Lost Communication With Parking Assist Control Module
U0160	Lost Communication With Chime Alarm Control Module
U0164	Lost Communication with HVAC Control Module
U0166	Lost Communication with Auxiliary Heater Control Module
U0167	Lost Communication with Immobilizer Control Module
U0168	Lost Communication With Keyless Entry Control Module
U016B	Lost Communication with Electric A/C Compressor Control Module
U0170	Lost Communication with Passenger Presence Detection Sensor Module
U017E	Lost Communication with Seat Belt Retractor Motor Module
U0181	Lost Communication with Automatic Headlamp Leveling Control Module
U0182	Lost Communication With Lighting Control Module - Front
U0184	Lost Communication With Radio
U0186	Lost Communication With Speaker Amplifier Module
U0196	Lost Communication With Rear Audio Control Module
U0191	Lost Communication With Television
U0193	Lost Communication With Digital Radio Receiver Control Module
U0197	Lost Communication With Telephone Control Module
U0198	Lost Communication with Telematics Communication Interface Control Module
U019E	Lost Communication With Transmission Range Control Module
U01A0	Lost Communication with Hybrid/EV Battery Interface Control Module 1
U01A1	Lost Communication with Hybrid/EV Battery Interface Control Module 2
U01A2	Lost Communication with Hybrid/EV Battery Interface Control Module 3
U01A3	Lost Communication with Hybrid/EV Battery Interface Control Module 4

DTC	DTC Descriptor
U01A4	Lost Communication with Hybrid/EV Battery Interface Control Module 5
U01A5	Lost Communication with Hybrid/EV Battery Interface Control Module 6
U01A6	Lost Communication with Hybrid/EV Battery Interface Control Module 7
U01A7	Lost Communication with Hybrid/EV Battery Interface Control Module 8
U01B0	Lost Communication with Battery Monitor Module
U01B4	Lost Communication with Brake System Control Module 2
U0201	Lost Communication with Passenger Door Switch Panel Control Module
U0203	Lost Communication With Left Rear Door Switch Panel Control Module
U0204	Lost Communication With Right Rear Door Switch Panel Control Module
U0207	Lost Communication With Moveable Roof Control Module
U0208	Lost Communication with Seat Memory Control Module
U0209	Lost Communication With Front Seat Heating Control Module
U0210	Lost Communication With Rear Seat Heating Control Module
U0230	Lost Communication With Liftgate Control Module
U0231	Lost Communication with Rain Sensor Module
U0232	Lost Communication with Side Object Detection Control Module - Left
U0233	Lost Communication with Side Object Detection Control Module - Right
U0236	Lost Communication With Steering Column Lock Module
U0237	Lost Communication With Multimedia Player Interface Module
U023A	Lost Communication With Vehicle Direction Camera Control Module (<i>without UGN</i>)
	Lost Communication With Active Safety Control Module 1 (<i>with UGN</i>)
U023B	Lost Communication with Active Safety Control Module 2
U023C	Lost Communication with Night Vision Camera Control Module
U0241	Lost Communication With Left Headlamp High Beam Control Module
U0242	Lost Communication With Right Headlamp High Beam Control Module
U0248	Lost Communication with Remote Accessory Module
U0249	Lost Communication with Rear Seat Entertainment Control Module
U0250	Lost Communication with Impact Classification System Module
U0252	Lost Communication With Trailer Interface Control Module
U0253	Lost Communication with Accessory Protocol Interface Module
U0254	Lost Communication With Remote Start Module
U0255	Lost Communication With Info Display Module
U0256	Lost Communication With Infotainment Faceplate Control Module
U0257	Lost Communication With Info Display Module/Infotainment Faceplate Control Module
U0259	Lost Communication with Special Purpose Vehicle Control Module
U025B	Lost Communication with Special Purpose Vehicle Control Module "C"
U025C	Lost Communication with Special Purpose Vehicle Control Module "D"
U0264	Lost Communication With Camera Module - Rear
U0265	Lost Communication with Left Front Short Range Radar Sensor Module
U0266	Lost Communication with Night Vision Camera
U0268	Lost Communication with Right Front Short Range Radar Sensor Module
U0269	Lost Communication with Front Long Range Object Sensor
U026A	Lost Communication with Frontview Camera Module
U026B	Lost Communication with Rear Short Range Object Sensor
	Lost Communication with Left Rear Short Range Radar Sensor Module
U026C	Lost Communication with Right Rear Short Range Radar Sensor Module
U026D	Lost Communication with Rear Middle Short Range Radar Sensor Module

DTC	DTC Descriptor
U0284	Lost Communication with Active Grille Air Shutter 1 Motor Module
U0285	Lost Communication with Active Grille Air Shutter 2 Motor Module
U0293	Lost Communication with Hybrid/EV Powertrain Control Module
U0298	Lost Communication with DC/DC Converter Control Module
U029D	Lost Communication with NOx Sensor 1 Module
U029E	Lost Communication with NOx Sensor 2 Module
U02A1	Lost Communication with NOx Sensor 3 Module
U02A3	Lost Communication With Particulate Matter Sensor Module
U02A9	Lost Communication with Charge Air Cooler Coolant Pump
U0301	Software Incompatibility with Engine Control Module
U0302	Software Incompatibility with Transmission Control Module
U0305	Software Incompatibility With Cruise Control Module
U0315	Software Incompatibility with Electronic Brake Control Module
U031C	Software Incompatibility With Brake System Control Module 2
U0401	Invalid Data Received From Engine Control Module
U0402	Invalid Data Received From Transmission Control Module
U0403	Invalid Data Received From Transfer Case Control Module
U0405	Invalid Data Received From Cruise Control Module
U0411	Invalid Data Received From Drive Motor Control Module
U0412	Invalid Data Received From Battery Energy Control Module
U0414	Invalid Data Received From Four Wheel Drive Clutch Control Module
U0415	Invalid Data Received From Electronic Brake Control Module
U0416	Invalid Data Received From Vehicle Dynamics Control Module
U0417	Invalid Data Received From Park Brake Control Module
U0418	Invalid Data Received From Brake System Control Module
U0420	Invalid Data Received From Power Steering Control Module
U0421	Invalid Data Received From Suspension Control Module
U0422	Invalid Data Received From Body Control Module
U0423	Invalid Data Received From Instrument Cluster
U0424	Invalid Data Received From HVAC Control Module
U0428	Invalid Data Received From Steering Wheel Angle Sensor Module
U042B	Invalid Data Received From Chassis Control Module
U0431	Invalid Data Received From Body Control Module "A"
U0432	Invalid Data Received From Multi-axis Acceleration Sensor Module
U0435	Invalid Data Received From Power Steering Control Module - Rear
U0436	Invalid Data Received From Differential Control Module - Front
U0437	Invalid Data Received From Differential Control Module - Rear
U0438	Invalid Data Received From Trailer Brake Control Module
U0447	Invalid Data Received from Central Gateway Module
U0452	Invalid Data Received From Inflatable Restraint Sensing and Diagnostic Module
U045A	Invalid Data Received From Parking Assist Control Module "A"
U0465	Invalid Data Received From Power Take-Off Control Module
U0499	Invalid Data Received From Telematics Communication Interface Control Module
U0513	Invalid Data Received From Yaw Rate Sensor Module
U053B	Invalid Data Received From Active Safety Control Module 1
U053C	Invalid Data Received From Active Safety Control Module 2
U056B	Invalid Data Received From Frontview Camera Module
U0585	Invalid Data Received From Active Grille Air Shutter 1 Motor Module

DTC	DTC Descriptor
U0594	Invalid Data Received From Hybrid/EV Powertrain Control Module
U0601	Lost Communication with Particulate Filter Differential Pressure Sensor Circuit Bank 1
U0602	Lost Communication with Particulate Filter Differential Pressure Sensor Circuit Bank 2
U0606	Lost Communication With Throttle Position Sensor 1
U0607	Lost Communication With Throttle Position Sensor 2
U0608	Lost Communication With Throttle Position Sensor Bank 2 Sensor 1
U060F	Lost Communication with Mass Air Flow (MAF) Sensor Bank 1
U0611	Lost Communication With Intake Air Temperature Sensor 1 - Bank 1
U0612	Lost Communication With Intake Air Temperature Sensor 1 - Bank 2
U0615	Lost Communication with Engine Coolant Bypass Valve
U0617	Lost Communication With Engine Coolant Bypass Valve "C"
U0623	Lost Communication with Auxiliary Coolant Pump
U0625	Lost Communication With Fuel Rail Pressure Sensor Bank 1
U062F	Loss Communication with Low Temperature Loop Coolant Pump
U0632	Lost Communication with Engine Cooling Fan
U063E	Lost Communication with Exhaust Heat Exchanger Exhaust Bypass Valve
U063F	Lost Communication With Engine Coolant Flow Control Valve Position Sensor
U0643	Lost Communication With Turbocharger Wastegate Actuator Temperature Sensor Bank 1
U0644	Lost Communication With Turbocharger Wastegate Position Sensor
U0646	Lost Communication with Motor Electronics Coolant Pump "A"
U064F	Lost Communication With Intake Manifold Runner Control Valve Position Sensor
U0650	Lost Communication With Exhaust Pressure Control Valve "A" Sensor/Switch
U0653	Lost Communication with Exhaust Gas Recirculation 2 Position Sensor
U0656	Lost Communication with Turbocharger Boost Control Position Sensor
U0657	Lost Communication with Turbocharger/Supercharger Bypass Valve "A" Position Sensor
U0672	Lost Communication with Engine Coolant Pump
U0674	Lost Communication With Turbocharger Wastegate Position Sensor Bank 2
U0680	Lost Communication With Barometric Pressure Sensor Bank 2 Sensor 1
U0688	Lost Communication With Throttle Position Sensor Bank 2 Sensor 2
U0689	Lost Communication With Turbocharger Wastegate Actuator Temperature Sensor Bank 2
U068A	Lost Communication With Barometric Pressure Sensor 2
U101B	Lost Communication With Fuel Rail Pressure Sensor Bank 1 Sensor 2
U1032	Lost Communication with Vehicle Dynamic Sensor 1
U1033	Lost Communication with Vehicle Dynamic Sensor 2
U1067	Lost Communication with Digital Map Control Module
U1069	Lost Communication with Driver Monitoring System Control Module
U106A	Lost Communication with Multifunction Energy Storage Capacitor Control Module
U106B	Lost Communication with Multifunction Battery Isolator Control Module
U1112	Lost Communication with Left Headlamp Leveling Device
U1113	Lost Communication with Right Headlamp Leveling Device
U1114	Lost Communication with Left Headlamp Vertical Motor
U1115	Lost Communication with Right Headlamp Vertical Motor
U111A	Lost Communication with Engine Block Coolant Valve

DTC	DTC Descriptor
U111E	Lost Communication with EVAP Purge Pump
U1343	Chassis Control Module LIN Bus 1
U1345	Engine Control Module LIN Bus 1 (or Bus 21)
U1346	Engine Control Module LIN Bus 2 (or Bus 22)
U1347	Engine Control Module LIN Bus 3
U1348	Engine Control Module LIN Bus 4 (or Bus 24)
U1349	Engine Control Module LIN Bus 5
U1359	Lost Communication with Transmission Range Indicator
U135A	Lost Communication with Shift to Park Range Actuator
U135B	Lost Communication with Sunload Sensor
U135C	Lost Communication with Start-Stop Capacitor Control Module
U135D	Lost Communication with Transmission Control Module on Chassis Control Module LIN Bus 2
U135E	Lost Communication with Transmission Control Module on Engine Control Module LIN Bus 1
U1501	LIN Bus
U1502	LIN Bus
U1505	LIN Bus
U1509	LIN Bus
	A26 HVAC Controls / P17 Info Display Module Lost Communication with K33 HVAC Control Module on LIN Bus
U150E	LIN Bus
	A22 Radio Controls / P17 Info Display Module Lost Communication with A11 Radio on LIN Bus
U150F	LIN Bus
	A22 Radio Controls / P17 Info Display Module Lost Communication with K74 Human Machine Interface Control Module on LIN Bus
	K161 Vehicle Performance Data Recorder Lost Communication with K74 Human Machine Interface Control Module on LIN Bus
U1510	A11 Radio Lost Communication with A20 Radio/HVAC Control / P17 Info Display Module on LIN Bus
	K9 Body Control Module Lost Communication with B67 Ultrasonic Intrusion Sensor / B165 Content Theft Deterrent Sensor Module on LIN Bus
	K20 Engine Control Module Lost Communication with M96 Active Grille Air Shutter Actuator / M60A Active Grille Air Shutter 1 Motor Module on LIN Bus
	K33 HVAC Control Module Lost Communication with A26 HVAC Controls / A20 Radio/HVAC Controls / P17 Info Display Module on LIN Bus
	K33 HVAC Control Module Lost Communication with A34 HVAC Controls - Auxiliary on LIN Bus
	K39 Liftgate Control Module Lost Communication with K171 Hands-Free Liftgate Sensor Control Module / S45A Liftgate Control Switch - Exterior on LIN Bus
	K124B Active Safety Control Module 2 Lost Communication with P51 Lane Centering Indicators - Steering Wheel / B307 Touch Sensors - Steering Wheel on LIN Bus
	K160 Brake System Control Module Lost Communication with B80 Park Brake Switch on LIN Bus
	P16 Instrument Cluster Lost Communication with S70D Steering Wheel Controls Switch - Right Upper / S70R Steering Wheel Controls Switch - Right on LIN Bus
U1511	K20 Engine Control Module Lost Communication with M60B Active Grille Air Shutter 2 Motor Module on LIN Bus

DTC	DTC Descriptor
	K26 Headlamp Control Module / K28 Headlamp Leveling Control Module Lost Communication with E13L Headlamp - Left on LIN Bus
	K40 Seat Memory Control Module Lost Communication with K99 Steering Column Position Control Module on LIN Bus
	K183 UHF Short Range Low Energy Remote Control Access Transceiver Lost Communication with B342A UHF Low Energy Remote Control Access Sensor Transceiver 1 on LIN Bus
U1512	K26 Headlamp Control Module / K28 Headlamp Leveling Control Module Lost Communication with E13R Headlamp - Right on LIN Bus
	K124B Active Safety Control Module 2 Lost Communication with K187 Steering Column Friction Control Module on LIN Bus
	K183 UHF Short Range Low Energy Remote Control Access Transceiver Lost Communication with B342B UHF Low Energy Remote Control Access Sensor Transceiver 2 on LIN Bus
U1513	K26 Headlamp Control Module / K28 Headlamp Leveling Control Module Lost Communication with E13L Headlamp - Left on LIN Bus
	K183 UHF Short Range Low Energy Remote Control Access Transceiver Lost Communication with B342C UHF Low Energy Remote Control Access Sensor Transceiver 3 on LIN Bus
U1514	K26 Headlamp Control Module / K28 Headlamp Leveling Control Module Lost Communication with E13R Headlamp - Right on LIN Bus
	K33 HVAC Control Module Lost Communication with A34 HVAC Controls - Auxiliary on LIN Bus
	K38 Chassis Control Module / K38A Chassis Control Module - Auxiliary Lost Communication with K133 Trailer Brake Power Control Module on LIN Bus
	K183 UHF Short Range Low Energy Remote Control Access Transceiver Lost Communication with B342D UHF Low Energy Remote Control Access Sensor Transceiver 4 on LIN Bus
U1515	K9 Body Control Module Lost Communication with M75 Windshield Wiper Motor / M75L Windshield Wiper Motor Module - Left on LIN Bus
	K183 UHF Short Range Low Energy Remote Control Access Transceiver Lost Communication with B342E UHF Low Energy Remote Control Access Sensor Transceiver 5 on LIN Bus
U1516	K9 Body Control Module Lost Communication with B110 Battery Sensor Module on LIN Bus
U1517	K9 Body Control Module Lost Communication with K62 Sunroof Sunshade Motor Module on LIN Bus
U1518	P16 Instrument Cluster Lost Communication with K78 Head-Up Display Module / P29 Head-Up Display on LIN Bus
U1519	K40 Seat Memory Control Module Lost Communication with S52 Outside Rearview Mirror Switch / S146 Window/Outside Rearview Mirror Switch - Driver on LIN Bus
	K40 Seat Memory Control Module Lost Communication with K96 Mirror Control Module / K96D Mirror Control Module - Driver / K96L Mirror Control Module - Left on LIN Bus
U151A	K9 Body Control Module Lost Communication with B117 Rain Sensor / B177 Rain/Ambient Light Sensor Module / B200 Rain Sensor Module on LIN Bus
U151B	K9 Body Control Module Lost Communication with K61 Sunroof Control Module on LIN Bus
	K40 Seat Memory Control Module Lost Communication with S79P Window Switch - Passenger on LIN Bus
U151C	K33 HVAC Control Module Lost Communication with A34 HVAC Controls - Auxiliary / K33A HVAC Control Module - Auxiliary on LIN Bus

DTC	DTC Descriptor
	K38A Chassis Control Module - Auxiliary Lost Communication with S76 Trailer Brake Control Switch on LIN Bus
U151F	A11 Radio Lost Communication with A20 Radio/HVAC Controls / A22 Radio Controls / P17 Info Display Module on LIN Bus
U1520	K9 Body Control Module Lost Communication with P4 Security Siren / P25 Power Sounder Content Theft Deterrent Alarm Module on LIN Bus
	K33 HVAC Control Module Lost Communication with M6CR Air Temperature Door Actuator - Center Console Right Auxiliary on LIN Bus
	K40D Seat Memory Control Module - Driver Lost Communication with K134D Seat Bolster Memory Control Module - Driver on LIN Bus
	K40P Seat Memory Control Module - Passenger Lost Communication with K134P Seat Bolster Memory Control Module - Passenger on LIN Bus
U1521	K9 Body Control Module Lost Communication with S48E Multifunction Switch - Center Console on LIN Bus
	K26 Headlamp Control Module / K28 Headlamp Leveling Control Module Lost Communication with E13L Headlamp - Left on LIN Bus
U1522	K9 Body Control Module Lost Communication with K65 Tire Pressure Indicator Module / B178 Tire Pressure Sensor Locator Module on LIN Bus
	K26 Headlamp Control Module / K28 Headlamp Leveling Control Module Lost Communication with E13R Headlamp - Right on LIN Bus
	K33 HVAC Control Module Lost Communication with M6UR Air Temperature Door Actuator - Right Upper Auxiliary on LIN Bus
U1523	K26 Headlamp Control Module / K28 Headlamp Leveling Control Module Lost Communication with E13L Headlamp - Left on LIN Bus
U1524	K9 Body Control Module Lost Communication with K29 Seat Heating Control Module / K29F Seat Heating Control Module - Front on LIN Bus
	K26 Headlamp Control Module / K28 Headlamp Leveling Control Module Lost Communication with E13R Headlamp - Right on LIN Bus
	K33 HVAC Control Module Lost Communication with K10 Coolant Heater Control Module on LIN Bus
	K160 Brake System Control Module Lost Communication with K133 Trailer Brake Power Control Module on LIN Bus
U1525	K33 HVAC Control Module Lost Communication with K10 Coolant Heater Control Module on LIN Bus
U1526	K9 Body Control Module Lost Communication with K29R Seat Heating Control Module - Rear on LIN Bus
U1528	K33 HVAC Control Module Lost Communication with M37B Mode Door Actuator - Auxiliary on LIN Bus
	K40D Seat Memory Control Module - Driver Lost Communication with S64D Seat Adjuster Switch - Driver on LIN Bus
	K40P Seat Memory Control Module - Passenger Lost Communication with S64P Seat Adjuster Switch - Passenger on LIN Bus
U1529	K33 HVAC Control Module Lost Communication with B357 Inside Ambient Air Quality Particulate Sensor Module on LIN Bus
U152A	K33 HVAC Control Module Lost Communication with M6UL Air Temperature Door Actuator - Left Upper Auxiliary on LIN Bus
U152B	K33 HVAC Control Module Lost Communication with K32 Steering Wheel Heating Control Module on LIN Bus
U152C	K9 Body Control Module Lost Communication with K18 Compass Module on LIN Bus
	K160 Brake System Control Module Lost Communication with S76 Trailer Brake Control Switch on LIN Bus

DTC	DTC Descriptor
U152D	K9 Body Control Module Lost Communication with P2 Transmission Shift Lever Position Indicator on LIN Bus
	K33 HVAC Control Module Lost Communication with V1 Air Ionizer on LIN Bus
U1530	K9 Body Control Module Lost Communication with M35P Window Motor Module - Passenger / M74P Window Motor - Passenger on LIN Bus
U1531	K26 Headlamp Control Module / K28 Headlamp Leveling Control Module Lost Communication with E13LA Headlamp Assembly - Left on LIN Bus
U1532	K26 Headlamp Control Module / K28 Headlamp Leveling Control Module Lost Communication with E13RA Headlamp Assembly - Right on LIN Bus
U1534	K9 Body Control Module Lost Communication with M74D Window Motor - Driver on LIN Bus
U1538	K9 Body Control Module Lost Communication with S79D Window Switch - Driver / S146 Window/Outside Rearview Mirror Switch - Driver on LIN Bus
U153A	K9 Body Control Module Lost Communication with S79P Window Switch - Passenger on LIN Bus
U1540	K9 Body Control Module Lost Communication with M74RR Window Motor - Right Rear on LIN Bus
U1544	K9 Body Control Module Lost Communication with M74LR Window Motor - Left Rear on LIN Bus
U1548	K9 Body Control Module Lost Communication with S79LR Window Switch - Left Rear on LIN Bus
U1549	K9 Body Control Module Lost Communication with M45 Rear Wiper Motor on LIN Bus
U154A	K9 Body Control Module Lost Communication with S79RR Window Switch - Right Rear on LIN Bus
U154B	K9 Body Control Module Lost Communication with K49 Rear Seat Control Module on LIN Bus
U1550	K9 Body Control Module Lost Communication with S31D Seat Heating and Cooling Switch - Driver on LIN Bus
U1551	K9 Body Control Module Lost Communication with K33 HVAC Control Module on LIN Bus
U1555	K9 Body Control Module Lost Communication with S100LR Seat Heating/Venting/Cooling Switch - Left Rear on LIN Bus
U1556	K38 Chassis Control Module / K38A Chassis Control Module - Auxiliary Lost Communication with K133 Trailer Brake Power Control Module on LIN Bus
U1558	K9 Body Control Module Lost Communication with S31P Seat Heating and Cooling Switch - Passenger on LIN Bus
U1559	K9 Body Control Module Lost Communication with K183 Short Range Remote Control Transceiver on LIN Bus
U155D	K9 Body Control Module Lost Communication with S100RR Seat Heating/Venting/Cooling Switch - Right Rear on LIN Bus
U156D	K38 Chassis Control Module Lost Communication with S3 Transmission Shift Lever on LIN Bus
U15E1	A11 Radio Lost Communication with A26 HVAC Controls / P17 Info Display Module on LIN Bus
U15F0	K74 Human Machine Interface Control Module Lost Communication with P17 Info Display Module on LIN Bus
	A11 Radio Lost Communication with A20 Radio/HVAC Controls / A22 Radio Controls / P17 Info Display Module on LIN Bus
U15F1	K74 Human Machine Interface Control Module Lost Communication with K188 Human Machine Interface Control Module Bypass Module on LIN Bus

DTC	DTC Descriptor
U15F3	K74 Human Machine Interface Control Module Lost Communication with K31 Navigation Control Module on LIN Bus
U1653	Chassis Systems High Speed Communication Enable Circuit
U1725	Left Headlamp High Beam Control Module Lost Communication with Left Headlamp Low Beam Control Module
U1726	Right Headlamp High Beam Control Module Lost Communication with Right Headlamp Low Beam Control Module
U1727	Right Headlamp High Beam Control Module Lost Communication with Right Headlamp Leveling Actuator
U1728	Left Headlamp High Beam Control Module Lost Communication with Left Headlamp Leveling Actuator
U1729	Right High Beam Control Module Lost Communication with Right Headlamp Horizontal Motor
U172A	Left High Beam Control Module Lost Communication with Left Headlamp Horizontal Motor
U1793	14V Power Module Lost Communication with Hybrid/EV Powertrain Control Module on Powertrain Expansion Communication Bus
U1795	14V Power Module Powertrain Expansion Communication Bus Off
U179A	Lost Communication with Hybrid/EV Powertrain Control Module 2
U179C	Lost Communication with One or More Hybrid/EV Battery Interface Control Modules
U179D	Lost Communication with Brake System Control Module 2 on Chassis Expansion Bus
U1803	Lost Communication with Hybrid/EV Powertrain Control Module 2
U1804	Lost Communication with Inside Rearview Mirror Control Module
U1806	Battery Energy Control Module High Voltage Energy Management CAN Bus Off
U1807	Battery Charger Control Module High Voltage Energy Management CAN Bus Off
U180A	Electric A/C Compressor Control Module High Speed CAN Bus Off
U180B	Battery Energy Control Module High Speed CAN Bus Off
U180C	Battery Charger Control Module High Speed CAN Bus Off
U180D	Electronic Brake Control Module Chassis Expansion CAN Bus Off
U1811	Battery Energy Control Module Powertrain Expansion CAN Bus Off
U1814	Powertrain Wake-Up Communication Circuit
U1815	Lost Communication with Drive Motor Control Module 1 on Powertrain Expansion CAN Bus
U1816	Lost Communication with Drive Motor Control Module 2 on Powertrain Expansion CAN Bus
U1817	Lost Communication with Hybrid/EV Powertrain Control Module on Powertrain Expansion CAN Bus
U1818	Lost Communication with Engine Control Module on Powertrain Expansion Communication Bus
U1821	Lost Communication with 14V Power Module on Powertrain Expansion Communication Bus
U1826	Lost Communication with Multi-Axis Acceleration Sensor Module on Powertrain Expansion CAN Bus
U1827	Lost Communication with Steering Angle Sensor Module on Powertrain Expansion CAN Bus
U182A	Lost Communication with Battery Energy Control Module on Powertrain Expansion CAN Bus
U182B	Lost Communication with Transmission Control Module on Powertrain Expansion CAN Bus

DTC	DTC Descriptor
U182D	Lost Communication with Hybrid/EV Powertrain Control Module 2 on Powertrain Expansion Communication Bus
U182E	Drive Motor Control Module 1 Lost Communication with Hybrid/EV Powertrain Control Module 2 on Powertrain Expansion Communication Bus
U182F	Drive Motor Control Module 2 Lost Communication with Hybrid/EV Powertrain Control Module 2 on Powertrain Expansion Communication Bus
U1831	Drive Motor Control Module 1 Lost Communication with Hybrid/EV Powertrain Control Module on Powertrain Expansion CAN Bus
U1833	Lost Communication with Electronic Brake Control Module on Chassis Expansion CAN Bus
U1838	Lost Communication with Battery Charger Control Module on High Voltage Energy Management CAN Bus
U1839	Auxiliary Transmission Fluid Pump Control Module Lost Communication with Engine Control Module
U183A	Lost Communication with Telematics Communication Interface Control Module on High Speed CAN Bus
U183B	Auxiliary Transmission Fluid Pump Control Module Lost Communication with Transmission Control Module
U183C	Auxiliary Transmission Fluid Pump Control Module Lost Communication with Hybrid/EV Powertrain Control Module 2 on Powertrain Expansion Communication Bus
U183E	Lost Communication with Telematics Communication Interface Control Module on Low Speed CAN Bus
U1844	Battery Energy Control Module Lost Communication with Hybrid/EV Powertrain Control Module on Bus B
U1845	Drive Motor Control Module 1 Lost Communication with Hybrid/EV Powertrain Control Module
U1846	Drive Motor Control Module 2 Lost Communication with Hybrid/EV Powertrain Control Module
U1847	Drive Motor Control Module 1 Lost Communication with Battery Energy Control Module on Powertrain Expansion CAN Bus
U1849	Drive Motor Control Module 1 Lost Communication with Transmission Control Module
U184A	Lost Communication with Body Control Module on Low Speed CAN Bus
U184B	Lost Communication with Remote Heater and Air Conditioning Control Module on Low Speed CAN Bus
U184C	Lost Communication with Instrument Cluster on Low Speed CAN Bus
U184D	Lost Communication with Radio on Low Speed CAN Bus
U184E	Lost Communication with Inflatable Restraint Sensing and Diagnostic Module on Low Speed CAN Bus
U184F	Electric A/C Compressor Control Module Lost Communication with Engine Control Module
U1850	Drive Motor Control Module 2 Lost Communication with Transmission Control Module
U1858	Electronic Brake Control Module Lost Communication with Hybrid/EV Powertrain Control Module on Chassis Expansion CAN Bus
U185A	Lost Communication with Battery Energy Control Module on High Voltage Energy Management CAN Bus
U185B	Battery Energy Control Module Lost Communication with Hybrid/EV Powertrain Control Module 2 on High Voltage Energy Management CAN Bus
U185C	Battery Charger Control Module Lost Communication with Hybrid/EV Powertrain Control Module 2 on High Voltage Energy Management CAN Bus

DTC	DTC Descriptor
U185D	Fuel Injector Control Module Lost Communication with Engine Control Module
U185E	Fuel Injector Control Module Lost Communication with Body Control Module
U1860	Electric A/C Compressor Control Module Lost Communication with Hybrid/EV Powertrain Control Module 2
U1861	Battery Charger Control Module Lost Communication with Engine Control Module
U1862	Battery Energy Control Module Lost Communication with Central Gateway Module
U186A	Electronic Brake Control Module Lost Communication with Engine Control Module
U186B	Electronic Brake Control Module Lost Communication with Transmission Control Module
U1875	Drive Motor Control Module 1 Lost Communication with Battery Energy Control Module
U1876	Drive Motor Control Module 1 Lost Communication with Engine Control Module
U1879	Drive Motor Control Module 2 Lost Communication with Engine Control Module
U1885	Battery Energy Control Module Lost Communication with Hybrid/EV Powertrain Control Module
U1886	Battery Energy Control Module Lost Communication with Engine Control Module
U1888	Hybrid/EV Powertrain Control Module Lost Communication with Battery Energy Control Module
U18A1	Lost Communication with Coolant Temperature Control Module on High Voltage Energy Management CAN Bus
U18A2	Lost Communication with Fuel Pump Driver Control Module
U18A3	Lost Communication with Human Machine Interface Control Module
U18A4	Lost Communication with Hybrid/EV Battery DC Charging Communications Gateway Module on High Voltage Energy Management CAN Bus
U18A5	Lost Communication with Fuel Injector Control Module on Powertrain Expansion CAN Bus
U18A6	Lost Communication with Right Object Detection Control Module on Dedicated Bus 1
U18A7	Lost Communication with Power Supply Transformer on Powertrain Expansion CAN Bus
U18A9	Transmission Range Control Module Lost Communication with Chassis Control Module on Chassis Expansion CAN Bus
U18AA	Transmission Range Control Module Lost Communication with Engine Control Module
U18AB	Transmission Range Control Module Lost Communication with Chassis Control Module on High Speed CAN Bus
U18AC	Lost Communication With Transmission Range Control Module on Chassis Expansion CAN Bus
U18AD	Transmission Range Control Module Lost Communication with Electronic Brake Control Module on Chassis Expansion CAN Bus
U18AE	Lost Communication with Infotainment Control Touchpad on Dedicated Bus 1
U18AF	Lost Communications With Telematics Communications Interface Control Module on Ethernet Bus
U18B0	Lost Communications With Instrument Cluster on Ethernet Bus
U18B1	Lost Communications With Audio Amplifier on Ethernet Bus
U18B2	Lost Communication with Rear Audio Control Module on Ethernet Bus
U18B3	Lost Communications With Navigation Control Module on Ethernet Bus
U18B4	Lost Communication with Radio on Ethernet Bus

DTC	DTC Descriptor
U18B5	Lost Communication With Hybrid Powertrain Control Module on Chassis Expansion CAN Bus
U18B6	Lost Communication with Active Safety Control Module 1 on Chassis Expansion CAN Bus
U18B7	Lost Communication with Active Safety Control Module 2 on Chassis Expansion CAN Bus
U18B8	Lost Communication with Body Control Module on High Speed CAN Bus
U18B9	Primary High Speed CAN Bus Subnet Configuration List
U18BA	Lost Communication with Power Steering Control Module on High Speed CAN Bus
U18BB	Lost Communication with Power Steering Control Module on Chassis Expansion CAN Bus
U18BF	Secondary High Speed CAN Bus Subnet Configuration List
U18C0	Lost Communication with Suspension Control Module on High Speed CAN Bus
U18C1	Lost Communication with Suspension Control Module on Chassis Expansion CAN Bus
U18C2	Lost Communication with Frontview Camera Module on Flexray Bus
U18C3	Lost Communication with Video Processing Control Module on High Speed CAN Bus
U18C4	Lost Communication with Video Processing Control Module on Low Speed CAN Bus
U18C5	Lost Communication with Electronic Brake Control Module on High Speed CAN Bus
U18C6	Transmission Range Selector Control Module Lost Communication with Engine Control Module on Powertrain Sensor CAN Bus
U18C7	Transmission Range Selector Control Module Lost Communication with Engine Control Module on Powertrain Expansion CAN Bus
U18CA	Lost Communication with Active Safety Control Module 1 on Flexray Bus
U18CB	Lost Communication with Active Safety Control Module 2 on Flexray Bus
U18CC	Transmission Range Control Module Lost Communication with ECM on Powertrain Expansion Bus
U18CF	Lost Communication with Active Safety Control Module 1 on High Speed CAN Bus
U18D0	Lost Communication with Active Safety Control Module 2 on High Speed CAN Bus
U18D1	Lost Communication with Transmission Range Control Module on Powertrain Expansion CAN Bus
U18D2	Lost Communication with Transmission Range Selector Control Module on Powertrain Sensor CAN Bus
U18D3	Lost Communication with Transmission Range Selector Control Module on Powertrain Expansion CAN Bus
U18D4	Lost Communication with Fuel Level Sensor Control Module
U18D5	Central Gateway Module Lost Communication with Engine Control Module
U18D6	Central Gateway Module Lost Communication with Hybrid/EV Powertrain Control Module 1
U18D7	Central Gateway Module Lost Communication with Transmission Control Module
U18D8	Central Gateway Module Lost Communication with Fuel Pump Control Module
U18D9	Central Gateway Module Lost Communication with Chassis Control Module
U18DA	Central Gateway Module Lost Communication with Fuel Injector Control Module
U18DB	Central Gateway Module Lost Communication with Hybrid/EV Powertrain Control Module 2

DTC	DTC Descriptor
U18DC	Central Gateway Module Lost Communication with Brake System Control Module 1
U18DD	Central Gateway Module Lost Communication with Brake System Control Module 2
U18DE	Central Gateway Module Lost Communication with Glow Plug Control Module
U18DF	Central Gateway Module Lost Communication with Auxiliary Heater Control Module
U18E0	Central Gateway Module Lost Communication with Battery Energy Control Module
U18E1	Glow Plug Control Module Lost Communication with Central Gateway Module
U18E9	Lost Communication with Serial Data Gateway Module on Low Speed CAN Bus
U1900	Lost Communication With Speech to Text Interface Module
U1901	Lost Communication with Infotainment Multifunction Switch Module
U2010	Network Configuration List Not Programmed - Engine Control Module LIN Bus 1
U2011	Network Configuration List Not Programmed - Engine Control Module LIN Bus 2
U2012	Network Configuration List Not Programmed - Engine Control Module LIN Bus 3
U2013	Network Configuration List Not Programmed - Engine Control Module LIN Bus 4
U2022	Network Configuration List Not Programmed - Electronic Brake Control Module LIN Bus 1
U2023	Network Configuration List Not Programmed - Electronic Brake Control Module LIN Bus 2
U2098	MOST Communication Enable Circuit
U2099	High Speed Communication Enable Circuit
U209E	Object Detection Control Module High Speed Communication Enable Circuit 1
U209F	Object Detection Control Module High Speed Communication Enable Circuit 2
U2100	CAN Bus Communication
U2101	CAN Bus Maximum List of Control Modules
U2103	Fewer Controllers On Bus Than Programmed
U2105	Lost Communication with Engine Control Module
U2106	Lost Communication with Transmission Control Module
U2107	Lost Communication with Body Control Module
U2108	Lost Communication with Electronic Brake Control Module
U2125	Lost Communication with Telematic Unit
U2127	Lost Communication with Front HVAC Control Module
U2139	Lost Communication with Column Integration Module
U2144	Lost Communication with Distance Sensing Cruise Control Module
U216A	Lost Communication with Front Object Detection Control Module
U216B	Lost Communication with Rear Object Detection Control Module
U2176	Lost Communication with Power Take-Off Control Module
U2178	Lost Communication With Trailer Interface Control Module
U2400	Fuel Injector Control Module High Speed CAN Bus Off
U2401	Battery Energy Control Module Dedicated Bus 1 Off
U2409	Transmission Range Control Module High Speed CAN Bus Off
U240A	Transmission Range Control Module Chassis Expansion CAN Bus Off
U240B	Radio Dedicated Bus Off
U240D	Transmission Range Selector Control Module Powertrain Expansion CAN Bus Off
U240E	Transmission Range Selector Control Module Powertrain Sensor CAN Bus Off
U240F	Transmission Range Control Module Lost Communication with EBCM on High Speed CAN Bus

DTC	DTC Descriptor
U2410	Transmission Range Control Module Lost Communication with BCM on High Speed CAN Bus
U2411	Transmission Range Control Module Powertrain Expansion CAN Bus Off
U2412	Reductant Control Module Powertrain Sensor Bus Off
U2413	Central Gateway Module High Speed CAN Bus Off
U2414	Central Gateway Module High Speed Extension CAN Bus Off
U2415	Central Gateway Module Chassis Expansion CAN Bus Off
U2501	Invalid Data Received From Hybrid/EV Powertrain Control Module 2
U2502	Invalid Data Received From Electronic Brake Control Module on Chassis Expansion CAN Bus
U2503	Invalid Data Received From Object Detection Control Module
U2504	Invalid Data Received From Trailer Brake Driver Control Module
U2505	Invalid Data Received from Human Machine Interface Control Module on MOST Bus
U2506	Invalid Data Received From Dual Battery Control Module
U2507	Invalid Data Received from Instrument Cluster on MOST Bus
U2508	Invalid Data Received from Audio Amplifier on MOST Bus
U250B	Invalid Data Received from Active Safety Control Module 1 on Chassis Expansion CAN Bus
U250C	Invalid Data Received from Active Safety Control Module 2 on Chassis Expansion CAN Bus
U250D	Invalid Data Received from Transmission Control Module on Chassis Control Module LIN Bus 2
U250E	Invalid Data Received from Vehicle Dynamic Sensor 1
U250F	Invalid Data Received from Vehicle Dynamic Sensor 2
U2510	Invalid Data Received from Multifunction Energy Storage Capacitor Control Module
U2511	Invalid Data Received from Digital Map Control Module
U2512	Invalid Data Received from Video Processing Control Module
U2513	Invalid Data Received from Driver Monitoring System Control Module
U2520	Invalid Data Received from Active Safety Control Module 1 on High Speed CAN Bus
U2602	Battery Energy Control Module Lost Communication with Hybrid/EV Powertrain Control Module 2
U2603	Battery Energy Control Module Lost Communication with Hybrid/EV Battery Interface Control Module 1
U2604	Battery Energy Control Module Lost Communication with Hybrid/EV Battery Interface Control Module 2
U2605	Battery Energy Control Module Lost Communication with Hybrid/EV Battery Interface Control Module 3
U2606	Battery Energy Control Module Lost Communication with Hybrid/EV Battery Interface Control Module 4
U2608	Electric A/C Compressor Control Module Lost Communication with Hybrid/EV Powertrain Control Module
U2609	Battery Charger Control Module Lost Communication with Hybrid/EV Powertrain Control Module
U2611	Auxiliary Transmission Fluid Pump Control Module Lost Communication with Hybrid/EV Powertrain Control Module
U2612	Battery Charger Control Module Lost Communication with Hybrid/EV Powertrain Control Module 2

DTC	DTC Descriptor
U2613	Drive Motor 1 Control Module Lost Communication with Hybrid/EV Powertrain Control Module 2
U2614	Drive Motor 2 Control Module Lost Communication with Hybrid/EV Powertrain Control Module 2
U2615	Auxiliary Transmission Fluid Pump Control Module Lost Communication with Hybrid/EV Powertrain Control Module 2
U2616	Fuel Pump Driver Control Module Lost Communication with ECM
U2617	Battery Energy Control Module Lost Communication with Hybrid/EV Battery Interface Control Module 5
U2618	Battery Energy Control Module Lost Communication with Hybrid/EV Battery Interface Control Module 6
U2619	Battery Energy Control Module Lost Communication with Hybrid/EV Battery Interface Control Module 7
U2620	Battery Energy Control Module Lost Communication with Hybrid/EV Battery Interface Control Module 8
U2621	Battery Energy Control Module Lost Communication with Hybrid/EV Battery Interface Control Module 9
U2622	Battery Energy Control Module Lost Communication with Hybrid/EV Battery Interface Control Module 10
U2623	Battery Energy Control Module Lost Communication with Hybrid/EV Battery Interface Control Module 11
U2624	Battery Energy Control Module Lost Communication with Hybrid/EV Battery Interface Control Module 12
U2625	Battery Energy Control Module Lost Communication with Hybrid/EV Battery Interface Control Module 13
U2626	Reductant Control Module Lost Communication With Engine Control Module on Powertrain Sensor CAN Bus
U2627	Reductant Control Module Lost Communication with Reductant Level Sensor
U2628	Reductant Control Module Lost Communication with Reductant Concentration Sensor
U2629	Reductant Control Module Lost Communication with Reductant Tank Temperature Sensor 1
U2630	Reductant Control Module Lost Communication with Reductant Tank Temperature Sensor 2
U2631	Reductant Control Module Lost Communication with Reductant Pressure Sensor
U3000	Control Module
U3001	Control Module Improper Shutdown Performance
U3012	Control Module Improper Wake-up Performance

DTC B1000

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC B1000

Electronic Control Unit

For symptom byte information, refer to [Symptom Byte List](#) .

Circuit/System Description

The internal fault detection is handled inside the device. The symptom byte information is for engineering reference only. No external circuit diagnosis is involved.

Conditions for Running the DTC

The device runs the program to detect an internal fault when power up is commanded. The only requirements are voltage and ground. This program runs even if the voltage is out of the valid operating range.

Conditions for Setting the DTC

The device has detected an internal malfunction.

Action Taken When the DTC Sets

The device refuses all additional inputs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Diagnostic Aids

- This DTC may be stored as a history DTC without affecting the operation of the device.
- If stored only as a history DTC and not retrieved as a current DTC, do not replace the device.
- If this DTC is retrieved as both a current and history DTC, replace the device that set the DTC.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

Data Link Communications Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify DTC B1000 is not set.

- **If DTC B1000 is set**

Replace the device that sets the DTC.

- **Go to next step: If DTC B1000 is not set**

3. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC B1001

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC B1001

Option Configuration

For symptom byte information, refer to [Symptom Byte List](#) .

Circuit/System Description

Some devices must be configured with serial numbers, vehicle options, or other information. If a device was not properly configured after installation that device may set DTC B1001. The symptom byte information is for engineering reference only. No external circuit diagnosis is involved.

Conditions for Running the DTC

Battery voltage is between 9 - 16 V and data link communications operate normally.

Conditions for Setting the DTC

The device is not configured properly.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify DTC B1001 is not set.
 - **If DTC B1001 is set**
 1. Program the device that sets the DTC.
 2. Verify the DTC does not set.
 - If the DTC sets, replace the device that sets the DTC.
 - Go to next step: If the DTC does not set
 3. All OK.
 - **Go to next step: If DTC B1001 is not set**
3. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC B101D

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC B101D

Electronic Control Unit Hardware

For symptom byte information, refer to [Symptom Byte List](#) .

Circuit/System Description

The internal fault detection is handled inside the device. The symptom byte information is for engineering reference only. No external circuit diagnosis is involved.

Conditions for Running the DTC

- The device runs the program to detect an internal fault when power up is commanded. The only requirements are voltage and ground. This program runs even if the voltage is out of the valid operating range.
- The keyless entry control module will set this DTC with symptom byte 39 when the keyless entry control module antenna is activated.

Conditions for Setting the DTC

The device has detected an internal malfunction.

Action Taken When the DTC Sets

The device refuses all additional inputs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Diagnostic Aids

- This DTC may be stored as a history DTC without affecting the operation of the device.
- Do not replace a device based only on DTC B101D being set in history with the exception of the following devices:
 - K36 Inflatable Restraint Sensing and Diagnostic Module (SDM)
 - K85 Passenger Presence Module
- If DTC B101D is set as current, replace the appropriate device.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify DTC B101D is not set as current.
 - **If DTC B101D is set as current**

Replace the device that sets the DTC.
 - **Go to next step: If DTC B101D is not set as current or is set as history**
3. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC B101E

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC B101E

Electronic Control Unit Software

For symptom byte information, refer to [Symptom Byte List](#) .

Circuit/System Description

Some devices must be configured with specific software, serial numbers, vehicle options, or other information. If a device was not properly configured after installation that module may set DTC B101E. The symptom byte information is for engineering reference only. No external circuit diagnosis is involved.

Conditions for Running the DTC

Battery voltage is between 9 - 16 V and data link communications operate normally.

Conditions for Setting the DTC

The device is not configured properly.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)

- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

[Circuit/System Verification](#)

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0028 or U0029 is not set.
 - **If any of the DTCs are set**
Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Verify DTC B101E is not set.
 - **If DTC B101E is set**
 1. Program the device that sets the DTC.
 2. Verify the DTC does not set.
 - If the DTC sets, replace the device that sets the DTC.
 - Go to next step: If the DTC does not set
 - 3. All OK.
 - **Go to next step: If DTC B101E is not set**
4. All OK

[Repair Instructions](#)

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC B2B12 OR B2B13

[Diagnostic Instructions](#)

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

[DTC Descriptor](#)

DTC B2B12

Central Gateway Module Control Module Memory Failure

DTC B2B13

Central Gateway Module Control Module Internal Performance Failure

For symptom byte information, refer to [Symptom Byte List](#).

Circuit/System Description

This diagnostic applies to internal microprocessor integrity conditions within the device. The device monitors its ability to read and write to the memory. No external circuits are involved.

Conditions for Running the DTC

- The ignition is ON.
- The system voltage is greater than 9.5 V.

Conditions for Setting the DTC

The K56 Serial Data Gateway Module detects an internal malfunction.

Action Taken When the DTC Sets

DTC B2B12 and B2B13 are Type B DTCs.

Conditions for Clearing the DTC

DTC B2B12 and B2B13 are Type B DTCs.

Diagnostic Aids

If stored only as a history DTC and not retrieved as a current DTC, do not replace the device.

Reference Information

Schematic Reference

Data Communication Wiring Schematics

Connector End View Reference

[Master Electrical Component List](#), or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

Data Link Communications Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

DTC Type Reference

Powertrain Diagnostic Trouble Code (DTC) Type Definitions

Scan Tool References

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Verify that DTC B2B12 or B2B13 is not set.
 - **If any of the DTCs are set**

Replace the K56 Serial Data Gateway Module.
 - **Go to next step: If none of the DTCs are set**
3. All OK

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.

Control Module References for device replacement, programming and setup

DTC C056D

Diagnostic Instructions

- Perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.
- Review Strategy Based Diagnosis for an overview of the diagnostic approach.
- Diagnostic Procedure Instructions provides an overview of each diagnostic category.

DTC Descriptor

DTC C056D

Electronic Control Unit Hardware

For symptom byte information, refer to Symptom Byte List .

Circuit/System Description

The internal fault detection is handled inside the device. The symptom byte information is for engineering reference only. No external circuit diagnosis is involved.

Conditions for Running the DTC

The device runs the program to detect an internal fault when power up is commanded. The only requirements are voltage and ground. This program runs even if the voltage is out of the valid operating range.

Conditions for Setting the DTC

The device has detected an internal malfunction.

Action Taken When the DTC Sets

The device refuses all additional inputs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.

- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Diagnostic Aids

- This DTC may be stored as a history DTC without affecting the operation of the device.
- If stored only as a history DTC and not retrieved as a current DTC, do not replace the device.
- If this DTC is retrieved as both a current and history DTC, replace the device that set the DTC.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify DTC C056D is not set.
 - **If DTC C056D is set**

Replace the device that sets the DTC.
 - **Go to next step: If DTC C056D is not set**
3. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC C056E

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.

- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC C056E

Electronic Control Unit Software

For symptom byte information, refer to [Symptom Byte List](#) .

Circuit/System Description

Some devices must be configured with specific software, serial numbers, vehicle options, or other information. If a device was not properly configured after installation that module may set DTC C056E. The symptom byte information is for engineering reference only. No external circuit diagnosis is involved.

Conditions for Running the DTC

Battery voltage is between 9 - 16 V and data link communications operate normally.

Conditions for Setting the DTC

The device is not configured properly.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

Data Communication Wiring Schematics

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

Data Link Communications Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool References

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.

2. Verify DTC C056E is not set.

- **If DTC C056E is set**

1. Program the device that sets the DTC.

2. Verify the DTC does not set.

- If the DTC sets, replace the device that sets the DTC.
- Go to next step: If the DTC does not set

3. All OK.

- **Go to next step: If DTC C056E is not set**

3. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC P0601-P0607, P060A-P060C, P0610, P062F, P0630, P16E9-P16F3, P16F9, P16FD, P16FE, P262B, P30D6-P30DD, P3186, OR P3996

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC P0601

Control Module Read Only Memory Performance

DTC P0602

Control Module Not Programmed

DTC P0603

Control Module Long Term Memory Reset

DTC P0604

Control Module Random Access Memory Performance

DTC P0605

Control Module Programming Read Only Memory Performance

DTC P0606

Control Module Processor Performance

DTC P0607

Control Module Performance

DTC P060A

Control Module Monitoring Processor Performance

DTC P060B

Control Module Analog to Digital Converter Performance

DTC P060C

Control Module Main Processor Performance

DTC P0610

Control Module Vehicle Options Incorrect

DTC P062F

Control Module Long Term Memory Performance

DTC P0630

VIN Not Programmed or Mismatched - Engine/Powertrain Control Module

DTC P16E9

Control Module Serial Peripheral Interface Bus 2

DTC P16EA

Control Module Serial Peripheral Interface Bus 3

DTC P16EB

Control Module Serial Peripheral Interface Bus 4

DTC P16EC

Control Module Serial Peripheral Interface Bus 5

DTC P16ED

Control Module Serial Peripheral Interface Bus 6

DTC P16EE

Control Module Serial Peripheral Interface Bus 7

DTC P16EF

Control Module Serial Peripheral Interface Bus 8

DTC P16F0

Control Module Serial Peripheral Interface Bus 1

DTC P16F1

Control Module Serial Peripheral Interface (SPI) Signal Message Counter Incorrect

DTC P16F2

Control Module Transmission Direction Switch Input Circuitry Performance

DTC P16F3

Control Module Redundant Memory Performance

DTC P16FD

Control Module Wake-Up Not Detected

DTC P16FE

Control Module Unexpected Wake-Up Detected

DTC P262B

Control Module Power Off Timer Performance

DTC P30D6

Control Module Processor Serial Peripheral Interface Bus 1

DTC P30D7

Control Module Processor Serial Peripheral Interface Bus 2

DTC P30D8

Control Module Processor Serial Peripheral Interface Bus 3

DTC P30D9

Control Module Processor Serial Peripheral Interface Bus 4

DTC P30DA

Control Module Processor Serial Peripheral Interface Bus 5

DTC P30DB

Control Module Processor Serial Peripheral Interface Bus 6

DTC P30DC

Control Module Processor Serial Peripheral Interface Bus 7

DTC P30DD

Control Module Processor Serial Peripheral Interface Bus 8

DTC P3186

Control Module Security Peripheral Hardware Performance

For symptom byte information, refer to [Symptom Byte List](#) .

Circuit/System Description

This diagnostic applies to internal microprocessor integrity conditions within the control module. This diagnostic also addresses if the control module is not programmed. The control module monitors its ability to read and write to the memory. It also monitors a timing function. No external circuits are involved.

Conditions for Running the DTC

- The ignition is ON or the vehicle is in service mode.

- The system voltage is greater than 9.5 V.

Conditions for Setting the DTC

The control module detects an internal malfunction or incomplete programming.

Action Taken When the DTC Sets

- DTCs P0601 - P0607, P060A - P060C, P0610, P16E9 - P16F0, P30D6 - P30DD, and P3186 are type A DTCs.
- DTC P16FD and P262B are type B DTCs.
- DTC P062F and P16FE are type C DTCs.

Conditions for Clearing the DTC

- DTCs P0601 - P0607, P060A - P060C, P0610, P16E9 - P16F0, P30D6 - P30DD, and P3186 are type A DTCs.
- DTC P16FD and P262B are type B DTCs.
- DTC P062F and P16FE are type C DTCs.

Diagnostic Aids

If stored only as a history DTC and not retrieved as a current DTC, do not replace the control module.

Reference Information

Schematic Reference

Data Communication Wiring Schematics

Connector End View Reference

Master Electrical Component List , or Inline Harness Connector End Views - Index or Component Connector End Views - Index

Description and Operation

Data Link Communications Description and Operation

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

DTC Type Reference

Powertrain Diagnostic Trouble Code (DTC) Type Definitions

Scan Tool References

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Verify that DTC P0602, P0610, or P0630 is not set.

- **If any of the DTCs are set**

1. Perform all necessary programming and setup procedures for the control module that sets the DTC.
2. Verify the DTC does not set.
 - If the DTC sets, replace the control module that sets the DTC.
 - Go to next step: If the DTC does not set
3. All OK.

- **Go to next step: If none of the DTCs are set**

3. Verify DTC P0601, P0603, P0604, P0605, P0606, P0607, P060A, P060B, P060C, P062F, P16E9, P16EA, P16EB, P16EC, P16ED, P16EE, P16EF, P16F0, P16F1, P16F2, P16F3, P16FD, P16FE, P262B, P30D6, P30D7, P30D8, P30D9, P30DA, P30DB, P30DC, P30DD, or P3186 is not set.

- **If any of the DTCs are set**

Replace the control module that sets the DTC.

- **Go to next step: If none of the DTCs are set**

4. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for control module replacement, programming and setup

DTC U0020

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC U0020

Low Speed CAN Bus

For symptom byte information, refer to [Symptom Byte List](#) .

Circuit/System Description

Devices connected to the GMLAN serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have programmed information about what messages are needed to be exchanged on the serial data circuits. The messages are also supervised and some periodic messages are used by the receiver device as an availability indication of the transmitter device.

Conditions for Running the DTCs

- Supply voltage to the devices is in the normal operating range.
- The vehicle power mode requires serial data communication to occur.
- The DTC U2100 does not have a current status.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTCs Sets

The device uses a default value for the missing parameter.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Circuit/System Verification

Diagnosis of this DTC is accomplished via the symptom or an additional DTC. Refer to [Scan Tool Does Not Communicate with Low Speed GMLAN Device](#) , or [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

DTC U0073 OR U2100

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC U0073

Control Module Communication Bus A Off

DTC U2100

CAN Bus Communication

For symptom byte information, refer to [Symptom Byte List](#) .

Circuit/System Description

The devices connected to the high speed GMLAN serial data circuits (circuit numbers 2500 & 2501) monitor for serial data communications during normal vehicle operation. The high speed GMLAN serial data bus uses terminating resistors that are in parallel with the high speed GMLAN (+) and (-) circuits.

Conditions for Running the DTCs

- Supply voltage to the devices is in the normal operating range.
- The vehicle power mode requires serial data communications.

Conditions for Setting the DTC

The device setting the DTC has attempted to establish communications on the serial data circuits more than 3 times in 5 s.

Action Taken When the DTCs Sets

- The device suspends all message transmission.
- The device uses default values for all parameters received on the serial data circuits.
- In the transmission control module, DTC U0073 will cause the transmission to go into default gears.
- In the engine control module and transmission control module, DTC U0073 will cause the malfunction indicator lamp (MIL) to illuminate.

- If equipped with eAssist, DTC U0073 in the hybrid powertrain control module is a type B DTC and will cause the malfunction indicator lamp to illuminate and result in the engine operating in conventional engine mode and will maintain 14 V module operation.
- The device inhibits the setting of all other communication DTCs.

Conditions for Clearing the DTC

- The engine control module or transmission control module turns OFF the MIL after 4 consecutive ignition cycles that the diagnostic runs and does not fail.
- If equipped with eAssist, the hybrid powertrain control module turns off the MIL after the diagnostic runs and does not fail during subsequent ignition cycles. Normal operation will resume 5 s after subsequent ignition cycle.
- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Circuit/System Verification

1. Refer to [Data Link References](#) to determine which serial data communication system is used for a specific device.
2. This DTC may not be retrieved with a current status. Diagnosis is accomplished using the symptom. Refer to [Symptoms - Data Communications](#).

DTC U0074

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U0074 00

Control Module Communication Powertrain Expansion CAN Bus Off Malfunction

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Powertrain High Speed GMLAN Serial Data (+)	U0074	U0074	U0074	-
Powertrain High Speed GMLAN Serial Data (-)	U0074	U0074	U0074	-

Circuit/System Description

The devices connected to the powertrain high speed GMLAN serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices when the ignition switch is in any position other than OFF. The powertrain high speed GMLAN serial data bus uses terminating resistors that are in parallel with the powertrain high speed GMLAN (+) and (-) circuits.

Conditions for Running the DTC

- The system voltage is between 9 - 16 V.

- The vehicle power mode requires serial data communications.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received for more than 450 ms.

Action Taken When the DTC Sets

DTC U0074 is a type B DTC.

Conditions for Clearing the DTC

DTC U0074 is a type B DTC.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

DTC Type Reference

[Powertrain Diagnostic Trouble Code \(DTC\) Type Definitions](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Testing

NOTE:

Some devices with an internal terminating resistor have a loop in the harness that connects the internal terminating resistor to the serial data circuit. When wired this way, test these loop circuits for the appropriate failure mode short to voltage, short to ground, or open/high resistance prior to replacing the device for each of the following tests. Each device may need to be disconnected to isolate a circuit fault. Use the schematics and connector end views to identify the following:

- Powertrain high speed GMLAN devices and terminating resistors the vehicle is equipped with
- Device locations on the powertrain high speed GMLAN serial data circuits

- **Each device's ground, B+, ignition, and powertrain high speed GMLAN serial data circuit terminals**

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors with the powertrain high speed GMLAN serial data circuits at an easily accessible device that is not communicating. It may take up to 10 min for all vehicle systems to power down. Refer to [Data Link References](#) to determine which devices are on the powertrain expansion bus.
2. Ignition ON/Vehicle In Service Mode.
3. Test for less than 4.5 V between each powertrain high speed GMLAN serial data circuit at the device that was just disconnected and ground.

- **If 4.5 V or greater**

Refer to Testing the Serial Data Circuits for a Short to Voltage.

- **Go to next step: If less than 4.5 V**

4. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
5. Test for greater than 100 Ω between each powertrain high speed GMLAN serial data circuit at the device that was just disconnected and ground.

- **If 100 Ω or less**

Refer to Testing the Serial Data Circuits for a Short to Ground.

- **Go to next step: If greater than 100 Ω**

6. Test for 110 - 130 Ω between each pair of the powertrain high speed GMLAN serial data circuits at the device that was just disconnected:

- **If less than 110 Ω**

Refer to Testing the Serial Data Circuits for a Short between the Circuits.

- **If greater than 130 Ω**

Refer to Testing the Serial Data Circuits for an Open/High Resistance.

- **Go to next step: If between 110 - 130 Ω**

7. Refer to Testing the Device Circuits.

Testing the Serial Data Circuits for a Short to Voltage

1. Ignition/Vehicle OFF, disconnect the harness connectors with the powertrain high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to voltage, ignition ON/Vehicle In Service Mode.
2. Test for greater than 4.5 V between each powertrain high speed GMLAN serial data circuit at the device connector that was just disconnected and ground.

- **If each serial data circuit is 4.5 V or less**

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each of the device's ground circuit terminals and ground.

- If 10 Ω or greater, repair the open/high resistance in the circuit.

- If less than 10 Ω , replace the device that was disconnected.

- **Go to next step: If any serial data circuit is greater than 4.5 V**

3. Repeat step 1 until one of the following conditions are isolated:

- A short to voltage on the serial data circuit between two devices or splice packs, if equipped.
- A short to voltage on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short to Ground

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Disconnect the harness connectors with the powertrain high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to ground.
3. Test for greater than 100 Ω between each powertrain high speed GMLAN serial data circuit at the device connector that was just disconnected and ground.
 - **If each serial data circuit is 100 Ω or greater**
Replace the device that was disconnected.
 - **Go to next step: If any serial data circuit is less than 100 Ω**
4. Repeat step 1 until one of the following conditions are isolated:
 - A short to ground on the serial data circuit between two devices or splice packs, if equipped.
 - A short to ground on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short between the Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Connect the harness connectors at the device that was previously disconnected.
3. Disconnect the harness connectors with the powertrain high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted together.
4. Test for greater than 110 Ω between each pair of powertrain high speed GMLAN serial data circuits at the device connector that was just disconnected.
 - **If each pair of serial data circuits is 110 Ω or greater**
Replace the device that was disconnected.
 - **Go to next step: If any pair of serial data circuits is less than 110 Ω**
5. Repeat step 1 until one of the following conditions are isolated:
 - Serial data circuits shorted together between two devices or splice packs, if equipped.
 - Serial data circuits shorted together between a device and a terminating resistor.
 - A shorted terminating resistor.

Testing the Serial Data Circuits for an Open/High Resistance

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Connect the harness connectors at the device that was previously disconnected.
3. Disconnect the harness connectors with the powertrain high speed GMLAN serial data circuits at another device, in the direction of the circuit with the open/high resistance.
4. Test for less than 130 Ω between each pair of the powertrain high speed GMLAN serial data circuits at the device connector that was just disconnected.
 - **If each pair of serial data circuits is 130 Ω or less**
Replace the device that was disconnected.
 - **Go to next step: If any pair of serial data circuits is greater than 130 Ω**

5. Repeat step 1 until one of the following conditions are isolated:

- An open/high resistance on the serial data circuit between two devices or splice packs, if equipped.
- An open/high resistance on the serial data circuit between a device and a terminating resistor.
- An open/high resistance terminating resistor.

Testing the Device Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

2. Test for less than 10 Ω between each ground circuit terminal at the non communicating device that was just disconnected and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/Vehicle In Service Mode

4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the B+ circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the disconnected device.

- **Go to next step: If the test lamp illuminates**

5. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which has a fuse in the circuit, and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the disconnected device.

- **Go to next step: If the test lamp illuminates**

6. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which is controlled by a control module, and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit and all devices that share the same ignition circuit.
2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
3. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - Go to next step: If less than 2 Ω
4. Reconnect the control module that controls the ignition circuit, ignition ON/Vehicle In Service Mode.
5. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the control module that controls the ignition circuit.
 - Go to next step: If the test lamp illuminates
6. Ignition/Vehicle OFF, reconnect the first device that shares the same ignition circuit, ignition ON/Vehicle In Service Mode.
7. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the device that was just connected.
 - If the test lamp illuminates and there are more devices to connect, connect the next device and repeat step 6.7 until there are no more devices to connect.
 - **Go to next step: If the test lamp illuminates**
7. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal or the serial data communication enable circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the accessory wakeup serial data circuit or the serial data communication enable circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
9. Disconnect the harness connector at a powertrain high speed GMLAN device that is still communicating and closest to the non communicating device.
10. Test for less than 2 Ω in each powertrain high speed GMLAN serial data circuit end to end between the non communicating device and the device that was just disconnected.
 - **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.
 - **Go to next step: If less than 2 Ω**
11. Replace the non communicating device.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

Control Module References for device replacement, programming and setup

DTC U0076

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U0076 00

Control Module Communication Powertrain Sensor CAN Bus Off

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Powertrain High Speed GMLAN Serial Data (+) [or High Speed GMLAN Serial Data (+) 7]	U0076	U0076	U0076	-
Powertrain High Speed GMLAN Serial Data (-) [or High Speed GMLAN Serial Data (-) 7]	U0076	U0076	U0076	-

Circuit/System Description

The devices connected to the powertrain high speed GMLAN serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices when the ignition switch is in any position other than OFF. The powertrain high speed GMLAN serial data bus uses terminating resistors that are in parallel with the powertrain high speed GMLAN (+) and (-) circuits.

Conditions for Running the DTC

- The system voltage is between 9 - 16 V.
- The vehicle power mode requires serial data communications.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received for more than 450 ms.

Action Taken When the DTC Sets

DTC U0076 is a type B DTC.

Conditions for Clearing the DTC

DTC U0076 is a type B DTC.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

DTC Type Reference

[Powertrain Diagnostic Trouble Code \(DTC\) Type Definitions](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

[Circuit/System Testing](#)

NOTE: Some devices with an internal terminating resistor have a loop in the harness that connects the internal terminating resistor to the serial data circuit. When wired this way, test these loop circuits for the appropriate failure mode short to voltage, short to ground, or open/high resistance prior to replacing the device for each of the following tests. Each device may need to be disconnected to isolate a circuit fault. Use the schematics and connector end views to identify the following:

- Powertrain high speed GMLAN devices and terminating resistors the vehicle is equipped with
- Device locations on the powertrain high speed GMLAN serial data circuits
- Each device's ground, B+, ignition, and powertrain high speed GMLAN serial data circuit terminals

1. Ignition/Vehicle OFF, disconnect the harness connectors with the powertrain high speed GMLAN serial data circuits at an easily accessible device that is not communicating. Refer to [Data Link References](#) to determine which devices are on the powertrain expansion bus.
2. Ignition ON/Vehicle In Service Mode.
3. Test for less than 4.5 V between each powertrain high speed GMLAN serial data circuit at the device that was just disconnected and ground.

- **If 4.5 V or greater**

Refer to Testing the Serial Data Circuits for a Short to Voltage.

- **Go to next step: If less than 4.5 V**

4. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
 5. Test for greater than 100 Ω between each powertrain high speed GMLAN serial data circuit at the device that was just disconnected and ground.
- **If 100 Ω or less**

Refer to Testing the Serial Data Circuits for a Short to Ground.

- **Go to next step: If greater than 100 Ω**

6. Test for 110 - 130 Ω between each pair of the powertrain high speed GMLAN serial data circuits at the device that was just disconnected:

- **If less than 110 Ω**

Refer to Testing the Serial Data Circuits for a Short between the Circuits.

- **If greater than 130 Ω**

Refer to Testing the Serial Data Circuits for an Open/High Resistance.

- **Go to next step: If between 110 - 130 Ω**

7. Refer to Testing the Device Circuits.

Testing the Serial Data Circuits for a Short to Voltage

1. Ignition/Vehicle OFF, disconnect the harness connectors with the powertrain high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to voltage, ignition ON/Vehicle In Service Mode.

2. Test for greater than 4.5 V between each powertrain high speed GMLAN serial data circuit at the device connector that was just disconnected and ground.

- **If each serial data circuit is 4.5 V or less**

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

2. Test for less than 10 Ω between each of the device's ground circuit terminals and ground.

- If 10 Ω or greater, repair the open/high resistance in the circuit.
- If less than 10 Ω , replace the device that was disconnected.

- **Go to next step: If any serial data circuit is greater than 4.5 V**

3. Repeat step 1 until one of the following conditions are isolated:

- A short to voltage on the serial data circuit between two devices or splice packs, if equipped.
- A short to voltage on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short to Ground

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

2. Disconnect the harness connectors with the powertrain high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to ground.

3. Test for greater than 100 Ω between each powertrain high speed GMLAN serial data circuit at the device connector that was just disconnected and ground.

- **If each serial data circuit is 100 Ω or greater**

Replace the device that was disconnected.

- **Go to next step: If any serial data circuit is less than 100 Ω**

4. Repeat step 1 until one of the following conditions are isolated:

- A short to ground on the serial data circuit between two devices or splice packs, if equipped.
- A short to ground on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short between the Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Connect the harness connectors at the device that was previously disconnected.
3. Disconnect the harness connectors with the powertrain high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted together.
4. Test for greater than 110 Ω between each pair of powertrain high speed GMLAN serial data circuits at the device connector that was just disconnected.

- **If each pair of serial data circuits is 110 Ω or greater**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is less than 110 Ω**

5. Repeat step 1 until one of the following conditions are isolated:
 - Serial data circuits shorted together between two devices or splice packs, if equipped.
 - Serial data circuits shorted together between a device and a terminating resistor.
 - A shorted terminating resistor.

Testing the Serial Data Circuits for an Open/High Resistance

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Connect the harness connectors at the device that was previously disconnected.
3. Disconnect the harness connectors with the powertrain high speed GMLAN serial data circuits at another device, in the direction of the circuit with the open/high resistance.
4. Test for less than 130 Ω between each pair of the powertrain high speed GMLAN serial data circuits at the device connector that was just disconnected.

- **If each pair of serial data circuits is 130 Ω or less**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is greater than 130 Ω**

5. Repeat step 1 until one of the following conditions are isolated:
 - An open/high resistance on the serial data circuit between two devices or splice packs, if equipped.
 - An open/high resistance on the serial data circuit between a device and a terminating resistor.
 - An open/high resistance terminating resistor.

Testing the Device Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal at the non communicating device that was just disconnected and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/Vehicle In Service Mode
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
- **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.
- **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which has a fuse in the circuit, and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which is controlled by a control module, and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit and all devices that share the same ignition circuit.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - Go to next step: If less than 2 Ω
 4. Reconnect the control module that controls the ignition circuit, ignition ON/Vehicle In Service Mode.
 5. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the control module that controls the ignition circuit.
 - Go to next step: If the test lamp illuminates
 6. Ignition/Vehicle OFF, reconnect the first device that shares the same ignition circuit, ignition ON/Vehicle In Service Mode.
 7. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the device that was just connected.
 - If the test lamp illuminates and there are more devices to connect, connect the next device and repeat step 6.7 until there are no more devices to connect.
 - **Go to next step: If the test lamp illuminates**

7. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal or the serial data communication enable circuit terminal and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
2. Test for less than 2 Ω in the accessory wakeup serial data circuit or the serial data communication enable circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.

- If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
9. Disconnect the harness connector at a powertrain high speed GMLAN device that is still communicating and closest to the non communicating device.
10. Test for less than 2 Ω in each powertrain high speed GMLAN serial data circuit end to end between the non communicating device and the device that was just disconnected.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

11. Replace the non communicating device.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U0077

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)
- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

DTC Descriptor

DTC U0077

Control Module Communication Chassis Expansion CAN Bus Off

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Chassis High Speed GMLAN Serial Data (+) or High Speed GMLAN Serial Data (+) 2	U0077	U0077, U0100 - U02FF*	U0077	-
Chassis High Speed GMLAN Serial Data (-)	U0077	U0077, U0100 - U02FF*	U0077	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
or High Speed GMLAN Serial Data (-) 2				
* An open in only one chassis high speed GMLAN serial data circuit may allow degraded communication between the devices. An open between the X84 Data Link Connector (DLC) and the K56 Serial Data Gateway Module will only affect the communication with the scan tool. The devices will still communicate.				

Circuit/System Description

The devices connected to the chassis high speed GMLAN serial data circuits (circuit numbers 6105 & 6106) monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices when the S39 Ignition Switch (or S38 Ignition Mode Switch) is in any position other than OFF. The chassis high speed GMLAN serial data bus uses terminating resistors that are in parallel with the chassis high speed GMLAN (+) and (-) circuits.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

The device setting the DTC has attempted to establish communications on the chassis high speed GMLAN serial data circuits more than 3 times.

Action Taken When the DTC Sets

- The device suspends all message transmission.
- The device uses default values for all parameters received on the serial data circuits.
- The device inhibits the setting of all other communication DTCs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)

- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

[Circuit/System Verification](#)

1. Ignition ON/Vehicle In Service Mode.
2. Verify DTC U0077 is not set.

- **If the DTC is set**

Refer to [Scan Tool Does Not Communicate with Chassis High Speed GMLAN Device](#) .

- **Go to next step: If the DTC is not set**

3. All OK.

DTC U0078

[Diagnostic Instructions](#)

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

[DTC Descriptor](#)

DTC U0078

Control Module Communication Low Speed CAN Bus Off

For symptom byte information, refer to [Symptom Byte List](#) .

[Circuit/System Description](#)

The low speed GMLAN serial data bus is used to communicate information between the low speed GMLAN devices. The serial data is transmitted over a single wire to the appropriate devices.

[Conditions for Running the DTC](#)

- Supply voltage to the devices are in the normal operating range.
- The vehicle power mode requires serial data communications.

[Conditions for Setting the DTC](#)

The device setting the DTC has attempted to establish communications on the serial data circuits more than 3 times in 5 s.

[Action Taken When the DTC Sets](#)

- The device suspends all message transmission.
- The device uses default values for all parameters received on the serial data circuits.
- The device inhibits the setting of all other communication DTCs.

[Conditions for Clearing the DTC](#)

- A current DTC clears when the malfunction is no longer present.

- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify DTC U0078 is not set.

- **If DTC U0078 is set**

Refer to [Scan Tool Does Not Communicate with Low Speed GMLAN Device](#) .

- **Go to next step: If DTC U0078 is not set**

3. All OK

DTC U007B

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)
- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

DTC Descriptor

DTC U007B 00

Control Module Communication High Speed Extension CAN Bus Off

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Gateway Expansion High Speed GMLAN Serial Data (+) or High Speed GMLAN Serial Data (+) (8)	U007B	U007B	U007B	-
Gateway Expansion High Speed GMLAN Serial Data (-) or High Speed GMLAN Serial Data (-) (8)	U007B	U007B	U007B	-

Circuit/System Description

The devices connected to the gateway expansion high speed GMLAN serial data circuits (circuit numbers 3935 & 3936) monitor for serial data communications during normal vehicle operation. The K56 Serial Data Gateway Module acts as the gateway module between devices on primary high speed GMLAN bus and devices on gateway expansion high speed GMLAN bus. The gateway expansion high speed GMLAN serial data bus uses terminating resistors that are in parallel with the gateway expansion high speed GMLAN (+) and (-) circuits.

Conditions for Running the DTC

- The system voltage is between 9 - 16 V.
- The vehicle power mode requires serial data communications.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

- The device suspends all message transmission.
- The device uses default values for all parameters received on the serial data circuits.
- The device inhibits the setting of all other communication DTCs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify DTC U007B is not set.

- **If the DTC is set**

Refer to [Scan Tool Does Not Communicate with Gateway Expansion High Speed GMLAN Device](#) .

- **Go to next step: If the DTC is not set**

3. All OK.

DTC U007C

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)
- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

DTC Descriptor

DTC U007C 00

Control Module Communication High Speed Extension CAN Bus 2 Off

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Gateway Isolated High Speed GMLAN Serial Data (+) or High Speed GMLAN Serial Data (+) (9)	U007C	U007C	U007C	-
Gateway Isolated High Speed GMLAN Serial Data (-) or High Speed GMLAN Serial Data (-) (9)	U007C	U007C	U007C	-

Circuit/System Description

The devices connected to the gateway isolated high speed GMLAN serial data circuits (circuit numbers 1304 & 1305) monitor for serial data communications during normal vehicle operation. The K56 Serial Data Gateway Module acts as the gateway module between devices on primary high speed GMLAN bus and devices on gateway isolated high speed GMLAN bus. The gateway isolated high speed GMLAN serial data bus uses terminating resistors that are in parallel with the gateway isolated high speed GMLAN (+) and (-) circuits.

Conditions for Running the DTC

- The system voltage is between 9 - 16 V.
- The vehicle power mode requires serial data communications.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

- The device suspends all message transmission.
- The device uses default values for all parameters received on the serial data circuits.
- The device inhibits the setting of all other communication DTCs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)

- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

[Circuit/System Verification](#)

1. Ignition ON/Vehicle In Service Mode.
2. Verify DTC U007C is not set.

- **If the DTC is set**

Refer to [Scan Tool Does Not Communicate with Gateway Isolated High Speed GMLAN Device](#) .

- **Go to next step: If the DTC is not set**

3. All OK.

DTC U007D

[Diagnostic Instructions](#)

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)
- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

[DTC Descriptor](#)

DTC U007D 00

Control Module Communication Low Speed Extension CAN Bus Off

[Diagnostic Fault Information](#)

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Gateway Isolated Low Speed GMLAN Serial Data or Low Speed GMLAN Serial Data #2	U007D	U0100-U02FF	U007D	-

Circuit/System Description

The gateway isolated low speed GMLAN serial data bus is used to communicate information between the devices. The serial data is transmitted over a single wire (circuit number 1102) to the appropriate devices. The K56 Serial Data Gateway Module acts as the gateway module between devices on low speed GMLAN bus and devices on gateway isolated low speed GMLAN bus.

Conditions for Running the DTC

- The system voltage is between 9 - 16 V.
- The vehicle power mode requires serial data communications.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

- The device suspends all message transmission.
- The device uses default values for all parameters received on the serial data circuits.
- The device inhibits the setting of all other communication DTCs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.

2. Verify DTC U007D is not set.

- If the DTC is set

Refer to [Scan Tool Does Not Communicate with Gateway Isolated Low Speed GMLAN Device](#).

- Go to next step: If the DTC is not set

3. All OK.

DTC U0100-U02FF

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

For device DTC descriptors, refer to [Control Module U Code List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U0100 - U02FF	U0100 - U02FF	-	-
Ignition	U0100 - U02FF, U1814, U2099	U0100 - U02FF	-	-
High Speed GMLAN Serial Data (+)	U0073, 2	U0100 - U02FF	U0073, 2	-
High Speed GMLAN Serial Data (-)	U0073, 2	U0100 - U02FF	U0073, 2	-
Object High Speed GMLAN Serial Data (+)	U0075	U0100 - U02FF	U0075	-
Object High Speed GMLAN Serial Data (-)	U0075	U0100 - U02FF	U0075	-
Chassis High Speed GMLAN Serial Data (+)	U0077	U0100 - U02FF	U0077	-
Chassis High Speed GMLAN Serial Data (-)	U0077	U0100 - U02FF	U0077	-
Low Speed GMLAN Serial Data	U0078, 1	U0100 - U02FF	U0078, 1	-
Ground	-	U0100 - U02FF	-	-
1. Scan tool does not communicate with most low speed GMLAN device				
2. Scan tool does not communicate with most high speed GMLAN device				

Circuit/System Description

The serial data circuit is the means by which the devices in the vehicle communicate with each other. Once the scan tool is connected to the serial data circuit through the Data Link Connector (DLC), the scan tool can be used to monitor each device for diagnostic purposes and to check for Diagnostic Trouble Codes (DTC). Each device communicating on the serial data circuit sends a state of health message to ensure that the device is operating properly. When a device stops communicating on the serial data circuit, for example if the device loses power or ground, the state of health message it normally sends on the serial data circuit disappears. Other devices on the serial data circuit, which expect to receive that state of health message, detect its absence; those

devices in turn set a DTC associated with the loss of state of health of the non-communicating device. The DTC is unique to the device which is not communicating and one or more devices may set the same exact code. A loss of serial data communications DTC does not represent a failure of the devices that contain the stored code.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

- Specific subsystems will not function.
- DTC U0100 in the Transmission Control Module will cause the transmission to go into default gears.
- Both DTC U0100 in the Transmission Control Module and DTC U0101 in the Engine Control Module will cause the malfunction indicator lamp (MIL) to illuminate.

Conditions for Clearing the DTC

- The Engine Control Module or Transmission Control Module turns OFF the MIL after 4 consecutive ignition cycles that the diagnostic runs and does not fail.
- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Diagnostic Aids

- Sometimes, while diagnosing a specific customer concern or after a repair, you may notice a history U code present. However, there is no associated "current" or "active" status. Loss of communication U codes such as these can set for a variety of reasons. Many times, they are transparent to the vehicle operator and technician, and/or have no associated symptoms. Eventually, they will erase themselves automatically after a number of fault-free ignition cycles. This condition would most likely be attributed to one of these scenarios:
 - A device on the data communication circuit was disconnected while the communication circuit is awake.
 - Power to one or more devices was interrupted during diagnosis.
 - A low battery condition was present, so some devices stop communicating when battery voltage drops below a certain threshold.
 - Battery power was restored to the vehicle and devices on the communication circuit did not all re-initialize at the same time.
 - If a loss of communication U code appears in history for no apparent reason, it is most likely associated with one of the scenarios above. These are all temporary conditions and should never be interpreted as an intermittent fault, causing you to replace a part.
- A device may have a U code stored in history that does not require any repairs. Issues with late or corrupted messages between devices can be temporary with no apparent symptom or complaint; this does not mean the device is faulty. Do not replace a device based only on a history U code.
- Do not replace a device reporting a U code. The U code identifies which device needs to be diagnosed for a communication issue.
- Communication may be available between some devices and the scan tool with either the low or high speed GMLAN serial data system inoperative. This condition is due to those devices using multiple serial data communication systems.
- Use [Data Link References](#) to determine what serial data communications the device uses.

- Some devices may not have internal protection for specific control circuits and may open a B+ or ignition fuse. If a fuse is open and the B+ or ignition circuit is not shorted to ground, ensure none of the control circuits are shorted to ground before replacing the device.
- Some intermittent communication concerns may be caused by fretting corrosion on the serial data circuit terminals. Inspect all connectors at the device that set the communication DTC, the device that the communication DTC was set against, and any inline harness connectors between the two devices. Do not replace a device based only on fretting corrosion. Refer to bulletin 09-06-03-004 for assistance with the diagnosis and repair of this condition, if applicable.
- This diagnostic can be used for any device that is not communicating, regardless of the type of serial data circuit it is connected to, providing the vehicle is equipped with the device.
- This diagnostic procedure can be used to diagnose the common no communication DTCs: U0100, U0101, U0102, U0103, U0104, U0105, U0106, U0109, U010E, U010F, U0111, U0112, U0115, U0117, U0121, U0122, U0123, U0125, U0126, U0128, U0129, U012A, U0130, U0131, U0132, U0133, U0136, U0137, U0139, U0140, U0146, U0151, U0155, U0158, U0159, U0160, U0164, U0166, U0167, U0168, U016B, U0170, U0181, U0182, U0184, U0186, U0191, U0193, U0196, U0197, U0198, U0201, U0203, U0204, U0207, U0208, U0209, U0210, U0230, U0232, U0233, U0236, U0237, U023A, U0248, U0249, U0250, U0252, U0254, U025B, U0264, U0265, U0268, U0269, U026A, U026B, U0293, U029D, U029E, U02A3, and other DTCs within U0100 - U02FF range.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

DTC Type Reference

[Powertrain Diagnostic Trouble Code \(DTC\) Type Definitions](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, U1814, U2099, U2100, B1325, B1330, B1370, B1380, B1424, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, P0562, P06E4, or P1EB9 is not set.
 - **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

3. Determine the device that is not communicating. Refer to [Control Module U Code List](#).

4. Refer to [Data Link References](#) to determine which data communication bus the non communicating device is on.

- **If the device is on Gateway Expansion High Speed GMLAN bus**

Refer to [Scan Tool Does Not Communicate with Gateway Expansion High Speed GMLAN Device](#) to diagnose that device.

- **If the device is on Gateway Isolated High Speed GMLAN bus**

Refer to [Scan Tool Does Not Communicate with Gateway Isolated High Speed GMLAN Device](#) to diagnose that device.

- **If the device is on Gateway Isolated Low Speed GMLAN bus**

Refer to [Scan Tool Does Not Communicate with Gateway Isolated Low Speed GMLAN Device](#) to diagnose that device.

- **Go to next step: If the device is not on Gateway Expansion High Speed GMLAN bus, Gateway Isolated High Speed GMLAN bus, and Gateway Isolated Low Speed GMLAN bus**

5. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, accessory wakeup serial data, serial data communication enable, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect all the harness connectors at the device that is not communicating. It may take up to 10 min for all vehicle systems to power down.

2. Test for less than 10 Ω between each ground circuit terminal and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/Vehicle In Service Mode.

4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the B+ circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the disconnected device.

- **Go to next step: If the test lamp illuminates**

5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.

- **Go to next step: If the test lamp illuminates**

6. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which is controlled by a control module, and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit and all devices that share the same ignition circuit.
2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
3. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - Go to next step: If less than 2 Ω
4. Reconnect the control module that controls the ignition circuit, ignition ON/Vehicle In Service Mode.
5. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the control module that controls the ignition circuit.
 - Go to next step: If the test lamp illuminates
6. Ignition/Vehicle OFF, reconnect the first device that shares the same ignition circuit, ignition ON/Vehicle In Service Mode.
7. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the device that was just connected.
 - If the test lamp illuminates and there are more devices to connect, connect the next device and repeat step 6.7 until there are no more devices to connect.

- **Go to next step: If the test lamp illuminates**

7. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal or the serial data communication enable circuit terminal and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
2. Test for less than 2 Ω in the accessory wakeup serial data circuit or the serial data communication enable circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

8. Test for less than 4.5 V between each GMLAN serial data circuit terminal and ground.

- **If 4.5 V or greater between a low speed GMLAN serial data circuit and ground**

Refer to [Scan Tool Does Not Communicate with Low Speed GMLAN Device](#) to test for a short to voltage.

- **If 4.5 V or greater between a high speed GMLAN serial data circuit and ground**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to voltage.

- **If 4.5 V or greater between a chassis high speed GMLAN serial data circuit and ground**

Refer to [Scan Tool Does Not Communicate with Chassis High Speed GMLAN Device](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

9. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

10. Test for greater than 100 Ω between each GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less between a low speed GMLAN serial data circuit and ground**

Refer to [Scan Tool Does Not Communicate with Low Speed GMLAN Device](#) to test for a short to ground.

- **If 100 Ω or less between a high speed GMLAN serial data circuit and ground**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to ground.

- **If 100 Ω or less between a chassis high speed GMLAN serial data circuit and ground**

Refer to [Scan Tool Does Not Communicate with Chassis High Speed GMLAN Device](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

11. Disconnect the harness connectors at the K56 Serial Data Gateway Module.

12. Test for less than 2 Ω in each of the GMLAN serial data circuits end to end between the non communicating device and the K56 Serial Data Gateway Module.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

13. Reconnect the harness connectors at the K56 Serial Data Gateway Module.

NOTE: The following test step is only applicable to a high speed GMLAN device with 2 pairs of serial data circuits or a high speed GMLAN device with an internal terminating resistor.

14. Test for 110 - 130 Ω between each pair of high speed GMLAN serial data circuits.

- **If less than 110 Ω**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to ground or a short between the serial data circuits.

- **If greater than 130 Ω**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for an open/high resistance in the serial data circuit.

- **Go to next step: If between 110 - 130 Ω**

15. Replace the device that is not communicating.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U010C, U010E, U029D, U029E, OR U02A3

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U010E 00

Lost Communication with Reductant Sensor Module

DTC U029D 00

Lost Communication with NOX Sensor Module 1 Malfunction

DTC U029E 00

Lost Communication with NOX Sensor Module 2 Malfunction

DTC U02A3 00

Lost Communication With Particulate Matter Sensor Module

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U010E, U029D, U029E, U02A3	U010E, U029D, U029E, U02A3	-	-
Ignition	U010E, U029D, U029E, U02A3	U010E, U029D, U029E, U02A3	-	-
Powertrain High Speed GMLAN Serial Data (+) [or High Speed GMLAN Serial Data (+) 7]	U0076	U010E, U029D, U029E, U02A3	U0076	-
Powertrain High Speed GMLAN Serial Data (-) [or High Speed GMLAN Serial Data (-) 7]	U0076	U010E, U029D, U029E, U02A3	U0076	-
Ground	-	U010E, U029D, U029E, U02A3	-	-

Circuit/System Description

Devices connected to the Powertrain High Speed GMLAN serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device. A loss of serial data communications DTC does not represent a failure of the devices that contain the stored DTC.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Engine Controls Wiring Schematics](#)
- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Verify that DTC U0073, U0078, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

2. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, and serial data circuit terminals.

U010E

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect all the harness connectors at the K115 Reductant Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 4 X1 and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. Verify a test lamp illuminates between the B+ circuit terminal 1 X1 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K115 Reductant Control Module.
 - **Go to next step: If the test lamp illuminates**
5. Verify that a test lamp illuminates between each ignition circuit terminal listed below and ground.
 - Terminal 5
 - Terminal 8
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the K115 Reductant Control Module.

• **Go to next step: If the test lamp illuminates**

6. Test for less than 4.5 V between each Powertrain high speed GMLAN serial data circuit terminal and ground.

- **If 4.5 V or greater**

Refer to [DTC U0076](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

7. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

8. Test for greater than 100 Ω between each Powertrain high speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [DTC U0076](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

9. Disconnect the harness connectors at the device setting the DTC.

10. Test for less than 2 Ω in each Powertrain high speed GMLAN serial data circuit end to end between the K115 Reductant Control Module and the device setting the DTC.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit between the K115 Reductant Control Module and the device setting the DTC.

- **Go to next step: If less than 2 Ω**

11. Reconnect the harness connectors at the device setting the DTC.

12. Test for 110 - 130 Ω between each pair of Powertrain high speed GMLAN serial data circuits at the K115 Reductant Control Module.

- **If less than 110 Ω**

Refer to [DTC U0076](#) to test for a short between the serial data circuits.

- **If greater than 130 Ω**

Refer to [DTC U0076](#) to test for an open/high resistance in the serial data circuit.

- **Go to next step: If between 110 - 130 Ω**

13. Replace the K115 Reductant Control Module.

U029D

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connector at the B195A Nitrogen Oxides Sensor 1. It may take up to 10 min for all vehicle systems to power down.

2. Test for less than 10 Ω between the ground circuit terminal 6 and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.

- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/Vehicle In Service Mode.

4. Verify that a test lamp illuminates between the ignition circuit terminal 1 and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the B195A Nitrogen Oxides Sensor 1.

- **Go to next step: If the test lamp illuminates**

5. Test for less than 4.5 V between each Powertrain high speed GMLAN serial data circuit terminal and ground.

- **If 4.5 V or greater**

Refer to [DTC U0076](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

6. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

7. Test for greater than 100 Ω between each Powertrain high speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [DTC U0076](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

8. Disconnect the harness connectors at the device setting the DTC.

9. Test for less than 2 Ω in each Powertrain high speed GMLAN serial data circuit end to end between the B195A Nitrogen Oxides Sensor 1 and the device setting the DTC.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit between the B195A Nitrogen Oxides Sensor 1 and the device setting the DTC.

- **Go to next step: If less than 2 Ω**

10. Reconnect the harness connectors at the device setting the DTC.

11. Test for 110 - 130 Ω between each pair of Powertrain high speed GMLAN serial data circuits at the B195A Nitrogen Oxides Sensor 1.

- **If less than 110 Ω**

Refer to [DTC U0076](#) to test for a short between the serial data circuits.

- **If greater than 130 Ω**

Refer to [DTC U0076](#) to test for an open/high resistance in the serial data circuit.

- **Go to next step: If between 110 - 130 Ω**

12. Replace the B195A Nitrogen Oxides Sensor 1.

U029E

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connector at the B195B Nitrogen Oxides Sensor 2. It may take up to 10 min for all vehicle systems to power down.

2. Test for less than 10 Ω between the ground circuit terminal 6 and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/Vehicle In Service Mode.

4. Verify that a test lamp illuminates between the ignition circuit terminal 1 and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the B195B Nitrogen Oxides Sensor 2.

- **Go to next step: If the test lamp illuminates**

5. Test for less than 4.5 V between each Powertrain high speed GMLAN serial data circuit terminal and ground.

- **If 4.5 V or greater**

Refer to [DTC U0076](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

6. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

7. Test for greater than 100 Ω between each Powertrain high speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [DTC U0076](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

8. Disconnect the harness connectors at the device setting the DTC.

9. Test for less than 2 Ω in each Powertrain high speed GMLAN serial data circuit end to end between the B195B Nitrogen Oxides Sensor 2 and the device setting the DTC.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit between the B195B Nitrogen Oxides Sensor 2 and the device setting the DTC.

- **Go to next step: If less than 2 Ω**

10. Reconnect the harness connectors at the device setting the DTC.

11. Test for 110 - 130 Ω between each pair of Powertrain high speed GMLAN serial data circuits at the B195B Nitrogen Oxides Sensor 2.

- **If less than 110 Ω**

Refer to [DTC U0076](#) to test for a short between the serial data circuits.

- **If greater than 130 Ω**

Refer to [DTC U0076](#) to test for an open/high resistance in the serial data circuit.

- **Go to next step: If between 110 - 130 Ω**

12. Replace the B195B Nitrogen Oxides Sensor 2.

U02A3

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connector at the B136 Exhaust Particulate Matter Sensor. It may take up to 10 min for all vehicle systems to power down.

2. Test for less than 10 Ω between the ground circuit terminal 1 and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/Vehicle In Service Mode.

4. Verify that a test lamp illuminates between the ignition circuit terminal 6 and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the B136 Exhaust Particulate Matter Sensor.

- **Go to next step: If the test lamp illuminates**

5. Test for less than 4.5 V between each Powertrain high speed GMLAN serial data circuit terminal and ground.

- **If 4.5 V or greater**

Refer to [DTC U0076](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

6. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

7. Test for greater than 100 Ω between each Powertrain high speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [DTC U0076](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

8. Disconnect the harness connectors at the device setting the DTC.

9. Test for less than 2 Ω in each Powertrain high speed GMLAN serial data circuit end to end between the B136 Exhaust Particulate Matter Sensor and the device setting the DTC.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit between the B136 Exhaust Particulate Matter Sensor and the device setting the DTC.

- **Go to next step: If less than 2 Ω**

10. Reconnect the harness connectors at the device setting the DTC.

11. Test for 110 - 130 Ω between each pair of Powertrain high speed GMLAN serial data circuits at the B136 Exhaust Particulate Matter Sensor.

- **If less than 110 Ω**

Refer to [DTC U0076](#) to test for a short between the serial data circuits.

- **If greater than 130 Ω**

Refer to [DTC U0076](#) to test for an open/high resistance in the serial data circuit.

- **Go to next step: If between 110 - 130 Ω**

12. Replace the B136 Exhaust Particulate Matter Sensor.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Reductant Control Module Replacement](#) for the K115 Reductant Control Module.
- [Nitrogen Oxides Sensor Replacement - Position 1](#) for the B195A Nitrogen Oxides Sensor 1.
- [Nitrogen Oxides Sensor Replacement - Position 2](#) for the B195B Nitrogen Oxides Sensor 2.
- [Exhaust Particulate Matter Sensor Replacement](#) for the B136 Exhaust Particulate Matter Sensor.
- [Control Module References](#) for device replacement, programming and setup

DTC U0300-U0336

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

Refer to [Control Module U Code List](#).

Circuit/System Description

Some devices must be configured with specific software, serial numbers, vehicle options, or other information. If a device was not properly configured after installation that device may set the appropriate communication

DTCs. No external circuit diagnosis is involved.

Conditions for Running the DTC

Battery voltage is between 9 - 16 V and data link communications operate normally.

Conditions for Setting the DTC

The device is not configured properly.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify DTC U0300-U0336 is not set.
 - **If DTC U0300-U0336 is set**
 1. Program the device specified by the DTC descriptor.
 2. Verify the DTC does not set.
 - If the DTC sets, replace the device specified by the DTC descriptor.
 - Go to next step: If the DTC does not set
 3. All OK.
 - **Go to next step: If DTC U0300-U0336 is not set**
3. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U0400-U05FF

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

Refer to [Control Module U Code List](#).

Circuit/System Description

Some devices are constantly receiving information from other devices through serial data communication network. The invalid data code will be set when a receiving device detects a discrepancy in information it receives from another device causing its integrity to be questioned. The symptom byte listed in the DTC Descriptor is for engineering reference only. No external circuit diagnosis is involved.

Conditions for Running the DTC

Battery voltage is between 9 - 16 V and data link communications operate normally.

Conditions for Setting the DTC

The device is not configured properly.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Diagnostic Aids

This diagnostic procedure can be used to diagnose these common DTCs: U0400, U0401, U0402, U0403, U0404, U0405, U0406, U0407, U0408, U0409, U040D, U040F, U0410, U0414, U0415, U0416, U0417, U0418, U041B, U041E, U0420, U0421, U0422, U0423, U0424, U0425, U0426, U0427, U0428, U0429, U042B, U042E, U0430, U0431, U0432, U0433, U0435, U0436, U0437, U0438, U0439, U043A, U043B, U043C, U0440, U0447, U0452, U0456, U0459, U045A, U0461, U0462, U0463, U0464, U0465, U0466, U0467, U0468, U0469, U046A, U046B, U046C, U046D, U0481, U0482, U0483, U0485, U0486, U0492, U0493, U0497, U0498, U0499, U04B1, U04B5, U0507, U0508, U0513, U0514, U0515, U052A, U0532, U0533, U0534, U0536, U0537, U053B, U053C, U053D, U0546, U0549, U054B, U0551, U0555, U0558, U0563, U0564, U0565, U056B, U056E, U0585, U0586, U0588, U0594, U0595, U0596, U059B, U05A1, U05A2, and other DTCs within U0400 - U05FF range.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

[Circuit/System Verification](#)

1. Engine running for 10 s.
2. Ignition ON/Vehicle In Service Mode, engine OFF, verify DTC U0400-U05FF is not set.

- **If DTC U0400-U05FF is set along with other DTCs set or symptoms**

Diagnose all other DTCs or symptoms first. Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) , or [Symptoms - Vehicle](#) .

- **If DTC U0400-U05FF is set without other DTCs set or symptoms**

1. Program the device specified by the DTC descriptor.
2. Verify the DTC does not set.
 - If the DTC sets, replace the appropriate device.
 - Go to next step: If the DTC does not set

3. All OK.

- **Go to next step: If DTC U0400-U05FF is not set**

3. All OK

[Repair Instructions](#)

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U0600-U06FF

[Diagnostic Instructions](#)

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

[DTC Descriptor](#)

For device DTC descriptors, refer to [Control Module U Code List](#).

[Diagnostic Fault Information](#)

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U0600-U06FF	U0600-U06FF	-	-
Ignition	U0600-U06FF	U0600-U06FF	-	-
LIN Serial Data	U0600-U06FF	U0600-U06FF	U0600-U06FF	-
Ground	-	U0600-U06FF	-	-

Circuit/System Description

The Local Interconnect Network (LIN) Bus consists of a single wire with a transmission rate of 10.417 Kbit/s. The serial data is transmitted over a LIN circuit between a master control module and other LIN devices within a particular subsystem. If serial data communication is lost between any of the LIN devices on the LIN bus network, the master control module will set a no communication code against the non-communicating LIN device.

Conditions for Running the DTC

The system voltage is between 9-16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Determine the LIN device that is not communicating. Refer to [Control Module U Code List](#).
2. Ignition ON/Vehicle In Service Mode.
3. Verify that DTC B1325, B1330, B1370, B1380, B1424, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, P0562, P06E4, P24EF, P24F0, P24F1, U0028, U0029, U0073-U0078, U007A-U007F, U0100-U02FF, U1814, U2098, or U2099 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

4. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the following:

- **The master control module and the LIN devices on the same LIN serial data circuit**
- **The master control module's LIN serial data circuit terminal and the LIN device's B+, ignition, ground, and LIN serial data circuit terminals**

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at a LIN device that is not communicating. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance, replace the non-communicating LIN device.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
- **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance, replace the non-communicating LIN device.
- **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which is controlled by a control module, and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit and all devices that share the same ignition circuit.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - Go to next step: If less than 2 Ω
 4. Reconnect the control module that controls the ignition circuit.
 5. Ignition ON/Vehicle In Service Mode.
 6. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the control module that controls the ignition circuit.
 - Go to next step: If the test lamp illuminates
 7. Ignition/Vehicle OFF, reconnect the first device that shares the same ignition circuit.
 8. Ignition ON/Vehicle In Service Mode.
 9. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the device that was just connected.
 - If the test lamp illuminates and there are more devices to connect, connect the next device and repeat step 6.9 until there are no more devices to connect.
 - **Go to next step: If the test lamp illuminates**
 - 7. Ignition/Vehicle OFF, disconnect all LIN devices that share the same LIN serial data circuit.
 - 8. Ignition ON/Vehicle In Service Mode.

NOTE: For accurate voltage reading, disconnect the battery charger prior to performing the following test step.

9. Test for 3.5-12 V between the LIN serial data circuit terminal and ground.
 - **If less than 3.5 V**
 1. Ignition/Vehicle OFF, disconnect the harness connectors at the control module setting the DTC.
 2. Test for infinite resistance between the LIN serial data circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the LIN serial data circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
 - Go to next step: If less than 2 Ω
4. Replace the control module that sets the DTC.
- **If greater than 12 V**
1. Ignition/Vehicle OFF, disconnect the harness connectors at the control module setting the DTC.
 2. Ignition ON/Vehicle In Service Mode.
 3. Test for less than 1 V between the LIN serial data circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage in the circuit.
 - Go to next step: If less than 1 V
 4. Replace the control module that sets the DTC.
- **Go to next step: If between 3.5-12 V**
10. Verify how many LIN devices are connected to this LIN circuit.
- **If there is only one LIN device**
1. Ignition/Vehicle OFF, inspect both harness and component connectors for contamination, corrosion, and terminal tension.
 2. Reconnect the harness connectors at the LIN device. Verify all connectors/terminals are fully seated.
 3. Ignition ON/Vehicle In Service Mode.
 4. Verify the DTC is not set again.
 - If the DTC is set, replace the LIN device that is not communicating.
 - Go to next step: If the DTC is not set
 5. A fault is currently not present and may be an intermittent condition.
- **Go to next step: If there are two or more LIN devices**
11. Ignition/Vehicle OFF, disconnect the harness connectors at the control module setting the DTC.
12. Reconnect the harness connectors at the first LIN device.
13. Ignition ON/Vehicle In Service Mode.
14. Test for 3.5-12 V between the LIN serial data circuit terminal at the control module setting the DTC and ground.
- **If less than 3.5 V or greater than 12 V**
- Replace the LIN device that was just connected.
- **Go to next step: If between 3.5-12 V**
15. Ignition/Vehicle OFF, reconnect the harness connectors at another LIN device.
16. Ignition ON/Vehicle In Service Mode.
17. Test for 3.5-12 V between the LIN serial data circuit terminal at the control module setting the DTC and ground.
- **If less than 3.5 V or greater than 12 V**
- Replace the LIN device that was just connected.
- **Go to next step: If between 3.5-12 V**
18. Repeat steps 15-17 for the remaining LIN devices until a faulty LIN device is identified. If there is no faulty LIN device, replace the LIN device that is not communicating.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U1340-U135F

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

For device DTC descriptors, refer to [Control Module U Code List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U1340-U135F	U1340-U135F	-	-
Ignition	U1340-U135F	U1340-U135F	-	-
LIN Serial Data	U1340-U135F	U1340-U135F	U1340-U135F	-
Ground	-	U1340-U135F	-	-

Circuit/System Description

The Local Interconnect Network (LIN) Bus consists of a single wire with a transmission rate of 10.417 Kbit/s. The serial data is transmitted over a LIN circuit between a master control module and other LIN devices within a particular subsystem. If serial data communication is lost between any of the LIN devices on the LIN bus network, the master control module will set a no communication code against the non-communicating LIN device.

Conditions for Running the DTC

The system voltage is between 9-16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Diagnostic Aids

- Sometimes, while diagnosing a specific customer concern or after a repair, you may notice a history U code present. However, there is no associated "current" or "active" status. Loss of communication U codes such as these can set for a variety of reasons. Many times, they are transparent to the vehicle operator and technician, and/or have no associated symptoms. Eventually, they will erase themselves automatically after a number of fault-free ignition cycles. This condition would most likely be attributed to one of these scenarios:
 - A device on the data communication circuit was disconnected while the communication circuit is awake.
 - Power to one or more devices was interrupted during diagnosis.

- A low battery condition was present, so some devices stop communicating when battery voltage drops below a certain threshold.
- Battery power was restored to the vehicle and devices on the communication circuit did not all re-initialize at the same time.
- If a loss of communication U code appears in history for no apparent reason, it is most likely associated with one of the scenarios above. These are all temporary conditions and should never be interpreted as an intermittent fault, causing you to replace a part.
- A device may have a U code stored in history that does not require any repairs. Issues with late or corrupted messages between devices can be temporary with no apparent symptom or complaint; this does not mean the device is faulty. Do not replace a device based only on a history U code.
- Do not replace a device reporting a U code. The U code identifies which device needs to be diagnosed for a communication issue.
- Some devices may not have internal protection for specific control circuits and may open a B+ or ignition fuse. If a fuse is open and the B+ or ignition circuit is not shorted to ground, ensure none of the control circuits are shorted to ground before replacing the device.
- Some intermittent communication concerns may be caused by fretting corrosion on the serial data circuit terminals. Inspect all connectors at the device that set the communication DTC, the device that the communication DTC was set against, and any inline harness connectors between the two devices. Do not replace a device based only on fretting corrosion. Refer to bulletin 09-06-03-004 for assistance with the diagnosis and repair of this condition, if applicable.
- An open in the LIN bus serial data circuit between the splice pack and a LIN device will only affect that specific LIN device. This type of failure will set a loss of communication DTC for each LIN device affected and the other LIN devices will still communicate.
- This diagnostic procedure can be used to diagnose the common LIN DTCs: U1340, U1341, U1342, U1343, U1344, U1345, U1346, U1347, U1348, U1349, U134A, U134B, U134C, U134D, U134E, U134F, U1350, U1351, U1352, U1353, U1354, U1355, U1356, U1357, U1358, U1359, U135A, U135B, U135C, U135D, U135E, and U135F.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Determine the LIN device that is not communicating. Refer to [Control Module U Code List](#).
2. Ignition ON/Vehicle In Service Mode.
3. Verify that DTC B1325, B1330, B1370, B1380, B1424, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, P0562, P06E4, U0028, U0029, U0073-U0078, U007A-U007D, U0100-U02FF, U1814, U2098, or U2099 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).

- **Go to next step: If none of the DTCs are set**

4. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the following:

- **The master control module and the LIN devices on the same LIN serial data circuit**
- **The master control module's LIN serial data circuit terminal and the LIN device's B+, ignition, ground, and LIN serial data circuit terminals**

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at a LIN device that is not communicating. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance, replace the disconnected LIN device.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.

- If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
- If less than $2\ \Omega$, verify the fuse is OK and there is voltage at the fuse.
- **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance, replace the disconnected LIN device.
- **Go to next step: If the test lamp illuminates**
- 6. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which is controlled by a control module, and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit and all devices that share the same ignition circuit.
 2. Test for infinite resistance between the ignition circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - Go to next step: If infinite resistance
 3. Test for less than $2\ \Omega$ in the ignition circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - Go to next step: If less than $2\ \Omega$
 4. Reconnect the control module that controls the ignition circuit.
 5. Ignition ON/Vehicle In Service Mode.
 6. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the control module that controls the ignition circuit.
 - Go to next step: If the test lamp illuminates
 7. Ignition/Vehicle OFF, reconnect the first device that shares the same ignition circuit.
 8. Ignition ON/Vehicle In Service Mode.
 9. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the device that was just connected.
 - If the test lamp illuminates and there are more devices to connect, connect the next device and repeat step 6.9 until there are no more devices to connect.
 - **Go to next step: If the test lamp illuminates**
- 7. Ignition/Vehicle OFF, disconnect all LIN devices that share the same LIN serial data circuit.
- 8. Ignition ON/Vehicle In Service Mode.

NOTE: For accurate voltage reading, disconnect the battery charger prior to performing the following test step.

9. Test for 3.5-12 V between the LIN serial data circuit terminal and ground.
 - **If less than 3.5 V**
 1. Ignition/Vehicle OFF, disconnect the harness connectors at the control module setting the DTC.
 2. Test for infinite resistance between the LIN serial data circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - Go to next step: If infinite resistance
 3. Test for less than $2\ \Omega$ in the LIN serial data circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - Go to next step: If less than $2\ \Omega$

4. Replace the control module that sets the DTC.

- **If greater than 12 V**

1. Ignition/Vehicle OFF, disconnect the harness connectors at the control module setting the DTC.

2. Ignition ON/Vehicle In Service Mode.

3. Test for less than 1 V between the LIN serial data circuit terminal and ground.

- If 1 V or greater, repair the short to voltage in the circuit.
- Go to next step: If less than 1 V

4. Replace the control module that sets the DTC.

- **Go to next step: If between 3.5-12 V**

10. Verify how many LIN devices are connected to this LIN circuit.

- **If there is only one LIN device**

1. Ignition/Vehicle OFF, inspect both harness and component connectors for contamination, corrosion, and terminal tension.

2. Reconnect the harness connectors at the LIN device. Verify all connectors/terminals are fully seated.

3. Ignition ON/Vehicle In Service Mode.

4. Verify the DTC is not set again.

- If the DTC is set, replace the LIN device that is not communicating.
- Go to next step: If the DTC is not set

5. A fault is currently not present and may be an intermittent condition.

- **Go to next step: If there are two or more LIN devices**

11. Ignition/Vehicle OFF, disconnect the harness connectors at the control module setting the DTC.

12. Reconnect the harness connectors at the first LIN device.

13. Ignition ON/Vehicle In Service Mode.

14. Test for 3.5-12 V between the LIN serial data circuit terminal at the control module setting the DTC and ground.

- **If less than 3.5 V or greater than 12 V**

Replace the LIN device that was just connected.

- **Go to next step: If between 3.5-12 V**

15. Ignition/Vehicle OFF, reconnect the harness connectors at another LIN device.

16. Ignition ON/Vehicle In Service Mode.

17. Test for 3.5-12 V between the LIN serial data circuit terminal at the control module setting the DTC and ground.

- **If less than 3.5 V or greater than 12 V**

Replace the LIN device that was just connected.

- **Go to next step: If between 3.5-12 V**

18. Repeat steps 15-17 for the remaining LIN devices until a faulty LIN device is identified. If there is no faulty LIN device, replace the LIN device that is not communicating.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

Control Module References for device replacement, programming and setup

DTC U1500-U15FF

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

For device DTC descriptors, refer to [Control Module U Code List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U1500-U15BF	U1500-U15BF	-	-
Ignition	U1500-U15BF	U1500-U15BF	-	-
LIN Serial Data	U1500-U15BF	U1500-U15BF	U1500-U15BF	-
Ground	-	U1500-U15BF	-	-

Circuit/System Description

The Local Interconnect Network (LIN) Bus consists of a single wire with a transmission rate of 10.417 Kbit/s. The serial data is transmitted over a LIN circuit between a master control module and other LIN devices within a particular subsystem. If serial data communication is lost between any of the LIN devices on the LIN bus network, the master control module will set a no communication code against the non-communicating LIN device.

Conditions for Running the DTC

The system voltage is between 9-16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Diagnostic Aids

- Sometimes, while diagnosing a specific customer concern or after a repair, you may notice a history U code present. However, there is no associated "current" or "active" status. Loss of communication U codes such as these can set for a variety of reasons. Many times, they are transparent to the vehicle operator and technician, and/or have no associated symptoms. Eventually, they will erase themselves automatically after a number of fault-free ignition cycles. This condition would most likely be attributed to one of these scenarios:
 - A device on the data communication circuit was disconnected while the communication circuit is awake.
 - Power to one or more devices was interrupted during diagnosis.
 - A low battery condition was present, so some devices stop communicating when battery voltage drops below a certain threshold.

- Battery power was restored to the vehicle and devices on the communication circuit did not all re-initialize at the same time.
- If a loss of communication U code appears in history for no apparent reason, it is most likely associated with one of the scenarios above. These are all temporary conditions and should never be interpreted as an intermittent fault, causing you to replace a part.
- A device may have a U code stored in history that does not require any repairs. Issues with late or corrupted messages between devices can be temporary with no apparent symptom or complaint; this does not mean the device is faulty. Do not replace a device based only on a history U code.
- Do not replace a device reporting a U code. The U code identifies which device needs to be diagnosed for a communication issue.
- Communication will be available between the master control module and the scan tool if there is a loss of communications with any of the other LIN devices on the LIN bus network.
- Some devices may not have internal protection for specific control circuits and may open a B+ or ignition fuse. If a fuse is open and the B+ or ignition circuit is not shorted to ground, ensure none of the control circuits are shorted to ground before replacing the device.
- Some intermittent communication concerns may be caused by fretting corrosion on the serial data circuit terminals. Inspect all connectors at the device that set the communication DTC, the device that the communication DTC was set against, and any inline harness connectors between the two devices. Do not replace a device based only on fretting corrosion. Refer to bulletin 09-06-03-004 for assistance with the diagnosis and repair of this condition, if applicable.
- An open in the LIN bus serial data circuit between the splice pack and a LIN device will only affect that specific LIN device. This type of failure will set a loss of communication DTC for each LIN device affected and the other LIN devices will still communicate.
- This diagnostic procedure can be used to diagnose the common LIN DTCs: U1500, U1501, U1502, U1503, U1504, U1505, U1506, U1507, U1508, U1509, U150E, U150F, U1510, U1511, U1512, U1513, U1514, U1515, U1516, U1517, U1518, U1519, U151A, U151B, U151C, U1520, U1521, U1522, U1523, U1524, U1526, U1528, U152C, U152D, U1530, U1531, U1532, U1534, U1538, U153A, U1540, U1544, U1548, U1549, U154A, U154B, U1550, U1556, U1558, U15E1, U15E3, U15F0, and other DTCs within the U1500 - U15FF range.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Determine the LIN device that is not communicating. Refer to [Control Module U Code List](#).
2. Ignition ON/Vehicle In Service Mode.
3. Verify that DTC B1325, B1330, B1370, B1380, B1424, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, P0562, P06E4, U0028, U0029, U0073-U0078, U007A-U007D, U0100-U02FF, U1814, U2098, or U2099 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

4. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE:

- A DTC in U1501-U150F range is normally used to indicate a LIN bus off. If a DTC in U1501-U150F range is set by itself, use the LIN schematics for the device setting this DTC to identify the LIN slave device to diagnose it.
- For some vehicles, both headlamps may be connected to the same LIN circuit through a splice. Or both LIN circuits to the headlamps may be internally connected at the connector of the K26 Headlamp Control Module (or K28 Headlamp Leveling Control Module). A short in one headlamp or its LIN circuit may cause no communication to both headlamps. Ensure to diagnose both LIN circuits and headlamps prior to replacing any headlamp.
- Use the schematic to identify the following:
 - The master control module and the LIN devices on the same LIN serial data circuit
 - The master control module's LIN serial data circuit terminal and the LIN device's B+, ignition, ground, and LIN serial data circuit terminals

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at a LIN device that is not communicating. It may take up to 10 min for all vehicle systems to power down.

2. Test for less than 10 Ω between each ground circuit terminal and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/Vehicle In Service Mode.

4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance, replace the disconnected LIN device.
- **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance, replace the disconnected LIN device.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which is controlled by a control module, and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit and all devices that share the same ignition circuit.
 2. Test for infinite resistance between the ignition circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - Go to next step: If less than 2 Ω
 4. Reconnect the control module that controls the ignition circuit.
 5. Ignition ON/Vehicle In Service Mode.
 6. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the control module that controls the ignition circuit.
 - Go to next step: If the test lamp illuminates
 7. Ignition/Vehicle OFF, reconnect the first device that shares the same ignition circuit.
 8. Ignition ON/Vehicle In Service Mode.
 9. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the device that was just connected.
 - If the test lamp illuminates and there are more devices to connect, connect the next device and repeat step 6.9 until there are no more devices to connect.
 - **Go to next step: If the test lamp illuminates**
7. Ignition/Vehicle OFF, disconnect all LIN devices that share the same LIN serial data circuit.
8. Ignition ON/Vehicle In Service Mode.

NOTE: For accurate voltage reading, disconnect the battery charger prior to performing the following test step.

9. Test for 3.5-12 V between the LIN serial data circuit terminal and ground.

- **If less than 3.5 V**

1. Ignition/Vehicle OFF, disconnect the harness connectors at the control module setting the DTC.
2. Test for infinite resistance between the LIN serial data circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - Go to next step: If infinite resistance
3. Test for less than 2 Ω in the LIN serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - Go to next step: If less than 2 Ω
4. Replace the control module that sets the DTC.

- **If greater than 12 V**

1. Ignition/Vehicle OFF, disconnect the harness connectors at the control module setting the DTC.
2. Ignition ON/Vehicle In Service Mode.
3. Test for less than 1 V between the LIN serial data circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage in the circuit.
 - Go to next step: If less than 1 V
4. Replace the control module that sets the DTC.

- **Go to next step: If between 3.5-12 V**

10. Verify how many LIN devices are connected to this LIN circuit.

- **If there is only one LIN device**

1. Ignition/Vehicle OFF, inspect both harness and component connectors for contamination, corrosion, and terminal tension.
2. Reconnect the harness connectors at the LIN device. Verify all connectors/terminals are fully seated.
3. Ignition ON/Vehicle In Service Mode.
4. Verify the DTC is not set again.
 - If the DTC is set, replace the LIN device that is not communicating.
 - Go to next step: If the DTC is not set
5. A fault is currently not present and may be an intermittent condition.

- **Go to next step: If there are two or more LIN devices**

11. Ignition/Vehicle OFF, disconnect the harness connectors at the control module setting the DTC.

12. Reconnect the harness connectors at the first LIN device.

13. Ignition ON/Vehicle In Service Mode.

14. Test for 3.5-12 V between the LIN serial data circuit terminal at the control module setting the DTC and ground.

- **If less than 3.5 V or greater than 12 V**

Replace the LIN device that was just connected.

- **Go to next step: If between 3.5-12 V**

15. Ignition/Vehicle OFF, reconnect the harness connectors at another LIN device.

16. Ignition ON/Vehicle In Service Mode.

17. Test for 3.5-12 V between the LIN serial data circuit terminal at the control module setting the DTC and ground.

- **If less than 3.5 V or greater than 12 V**

Replace the LIN device that was just connected.

- **Go to next step: If between 3.5-12 V**

18. Repeat steps 15-17 for the remaining LIN devices until a faulty LIN device is identified. If there is no faulty LIN device, replace the LIN device that is not communicating.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U1814

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U1814

Powertrain Wake-Up Communication Circuit

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Accessory Wakeup Serial Data	U1814 02*	U0100-U02FF	-	-
* Vehicle may not start.				

Circuit/System Description

The body control module (BCM) activates the accessory wakeup serial data circuit, when the ignition key is in ACC, ON or START. The accessory wakeup serial data circuit wakes up the devices for serial data bus communication.

Conditions for Running the DTC

- The system voltage is between 9 - 16 V.
- The vehicle power mode master requires serial data communication to occur.

Conditions for Setting the DTC

The BCM senses a short to ground on the accessory wakeup serial data circuit.

Action Taken When the DTC Sets

- The output command is turned off while the malfunction is present.
- The devices use a default value for the missing parameters until the next ignition cycle.
- The device(s) is never signaled. Therefore, the specific subsystem(s) will not function.
- The vehicle will not start while the circuit is shorted to ground.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.

- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Testing

NOTE: Use the schematics to determine which devices are connected to the K9 Body Control Module's accessory wakeup serial data circuit terminal 22 X4. Use the connector end views to identify the accessory wakeup serial data circuit terminal for each of those devices.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K9 Body Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for greater than 100 Ω between the accessory wakeup serial data circuit terminal 22 X4 and ground.
 - **If 100 Ω or less**
 1. Disconnect the harness connectors at all devices that share the accessory wakeup serial data circuit.
 2. Test for infinite resistance between the accessory wakeup serial data circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
 3. Reconnect the first device that shares the share the accessory wakeup serial data circuit.
 4. Test for greater than 100 Ω between the accessory wakeup serial data circuit terminal and ground.
 - If 100 Ω or less, replace the device that was just connected.
 - If greater than 100 Ω and there are more devices to connect, connect the next device and repeat step 2.4 until there are no more devices to connect.
 - **Go to next step: If greater than 100 Ω**
3. Replace the K9 Body Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U1818

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U1818

Lost Communication with Engine Control Module on Powertrain Expansion Communication Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U1818	U1818	-	-
Ignition	U1818	U1818	-	-
Powertrain High Speed GMLAN Serial Data (+)	U0074*	U1818	U0074*	-
Powertrain High Speed GMLAN Serial Data (-)	U0074*	U1818	U0074*	-
Ground	-	U1818	-	-
* Other DTCs may set with this fault				

Circuit/System Description

Devices connected to the powertrain high speed GMLAN serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is at least 10 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

DTC U1818 is a type B DTC.

Conditions for Clearing the DTC

DTC U1818 is a type B DTC.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

DTC Type Reference

[Powertrain Diagnostic Trouble Code \(DTC\) Type Definitions](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, U1814, U2099, U2100, B1325, B1330, B1370, B1380, B1424, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, P0562, P06E4, or P1EB9 is not set.
 - **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K20 Engine Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/Vehicle In Service Mode.

4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the B+ circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the K20 Engine Control Module.

- **Go to next step: If the test lamp illuminates**

5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the K20 Engine Control Module.

- **Go to next step: If the test lamp illuminates**

6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.

2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

7. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the device setting the DTC. It may take up to 10 min for all vehicle systems to power down.

8. Test for less than 2 Ω in each serial data circuit end to end between the K20 Engine Control Module and the device setting the DTC.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

9. Replace the K20 Engine Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U1833

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U1833

Lost Communication with Electronic Brake Control Module on Chassis Expansion CAN Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U0121, U0129, U1833	U0121, U0129, U1833	-	-
Ignition	U0121, U0129, U1833	U0121, U0129, U1833	-	-
Accessory Wake-Up Serial Data (circuit 5985)	U1814	U0121, U0129, U1833	-	-
Serial Data Communication Enable (circuit 5986)	U2099	U0121, U0129, U1833	-	-
Chassis High Speed GMLAN Serial Data [+] (circuit 6105)	U0077*	U0077*	U0077*	-
Chassis High Speed GMLAN Serial Data [-] (circuit 6106)	U0077*	U0077*	U0077*	-
Ground	-	U0121, U0129, U1833	-	-

* Other DTCs may set with this fault.

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is at least 10 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

- A driver information center message and/or a warning indicator may be displayed.
- The DTC U1833 is a type B DTC.

Conditions for Clearing the DTC

The DTC U1833 is a type B DTC.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, U1814, U2099, U2100, B1325, B1330, B1370, B1380, B1424, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, P0562, P06E4, or P1EB9 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, accessory wake-up serial data, serial data communication enable, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K17 Electronic Brake Control Module (or K160 Brake System Control Module). It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each of the ground circuit terminals and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each of the B+ circuit terminals and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K17 Electronic Brake Control Module (or K160 Brake System Control Module).
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each of the ignition circuit terminals and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K17 Electronic Brake Control Module (or K160 Brake System Control Module).
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between the accessory wake-up serial data circuit terminal (circuit 5985) and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the accessory wake-up serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**

7. If equipped, verify a test lamp illuminates between the serial data communication enable circuit terminal (circuit 5986) and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
2. Test for less than 2 Ω in the serial data communication enable circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the device setting the DTC. It may take up to 10 min for all vehicle systems to power down.
9. Test for less than 2 Ω in each of the chassis high speed GMLAN serial data circuits end to end between the K17 Electronic Brake Control Module (or K160 Brake System Control Module) and the device setting the DTC.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

10. Replace the K17 Electronic Brake Control Module (or K160 Brake System Control Module).

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U183A

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U183A

Lost Communication with Telematics Communication Interface Control Module on High Speed CAN Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U183A	U183A	-	-
Ignition	U183A	U183A	-	-
Serial Data Communication Enable	U1814, U2099	U183A	-	-
Gateway Isolated High Speed GMLAN Serial Data (+)	U007C	U183A	U007C	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
or High Speed GMLAN Serial Data (+) (9)				
Gateway Isolated High Speed GMLAN Serial Data (-) or High Speed GMLAN Serial Data (-) (9)	U007C	U183A	U007C	-
Ground	-	U183A	-	-

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)

- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, U1814, U2099, U2100, B1325, B1330, B1370, B1380, B1424, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, P0562, P06E4, or P1EB9 is not set.

- **If any of the DTCs are set**

Refer to **Diagnostic Trouble Code (DTC) List - Vehicle** .

- **Go to next step: If none of the DTCs are set**

3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K73 Telematics Communication Interface Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.

- If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
- If less than $2\ \Omega$, verify the fuse is OK and there is voltage at the fuse.
- **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If the test lamp illuminates**
- 6. If equipped, verify a test lamp illuminates between the serial data communication enable circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than $2\ \Omega$ in the serial data communication enable circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - If less than $2\ \Omega$, replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
- 7. Test for less than $4.5\ \text{V}$ between each gateway isolated high speed GMLAN serial data circuit terminal and ground.
 - **If $4.5\ \text{V}$ or greater**

Refer to [Scan Tool Does Not Communicate with Gateway Isolated High Speed GMLAN Device](#) to test for a short to voltage.

 - **Go to next step: If less than $4.5\ \text{V}$**
- 8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
- 9. Test for greater than $100\ \Omega$ between each gateway isolated high speed GMLAN serial data circuit terminal and ground.
 - **If $100\ \Omega$ or less**

Refer to [Scan Tool Does Not Communicate with Gateway Isolated High Speed GMLAN Device](#) to test for a short to ground.

 - **Go to next step: If greater than $100\ \Omega$**
- 10. Disconnect the harness connectors at the device setting the DTC.
- 11. Test for less than $2\ \Omega$ in each gateway isolated high speed GMLAN serial data circuits end to end between the K73 Telematics Communication Interface Control Module and the device setting the DTC.
 - **If $2\ \Omega$ or greater**

Repair the open/high resistance in the serial data circuit.

 - **Go to next step: If less than $2\ \Omega$**
- 12. Replace the K73 Telematics Communication Interface Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U184A

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U184A

Lost Communication with Body Control Module on Low Speed CAN Bus

For symptom byte information, refer to [Symptom Byte List](#) .

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U184A	U184A	-	-
Ignition	U184A	U184A	-	-
Low Speed GMLAN Serial Data	U0078*	U184A	U0078*	-
Ground	-	U184A	-	-
* Scan Tool Does Not Communicate With Low Speed GMLAN Device				

Circuit/System Description

The serial data circuit is the means by which the devices in the vehicle communicate with each other. Once the scan tool is connected to the serial data circuit through the Data Link Connector (DLC), the scan tool can be used to monitor each device for diagnostic purposes and to check for diagnostic trouble codes (DTC). When the vehicle is ON, each device communicating on the serial data circuit sends a state of health message to ensure that the device is operating properly. When a device stops communicating on the serial data circuit, for example if the device loses power or ground, the state of health message it normally sends on the serial data circuit disappears. Other devices on the serial data circuit, which expect to receive that state of health message, detect its absence; those devices in turn set a DTC associated with the loss of state of health of the non communicating device. A loss of serial data communications DTC does not represent a failure of the devices that contain the stored DTC.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0078, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**
Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K9 Body Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

6. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the device setting the DTC. It may take up to 10 min for all vehicle systems to power down.

7. Test for less than 2 Ω in the low speed GMLAN serial data circuits end to end between the K9 Body Control Module and the device setting the DTC.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

8. Replace the K9 Body Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U184C

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U184C

Lost Communication with Instrument Cluster on Low Speed CAN Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U184C	U184C	-	-
Ignition	U184C	U184C	-	-
Gateway Isolated Low Speed GMLAN Serial Data or Low Speed GMLAN Serial Data #2	U007D	U184C	U007D	-
Ground	-	U184C	-	-

Circuit/System Description

The serial data circuit is the means by which the devices in the vehicle communicate with each other. Once the scan tool is connected to the serial data circuit through the X84 Data Link Connector (DLC), the scan tool can be used to monitor each device for diagnostic purposes and to check for diagnostic trouble codes (DTC). When the vehicle is ON, each device communicating on the serial data circuit sends a state of health message to ensure that the device is operating properly. When a device stops communicating on the serial data circuit, for example if the device loses power or ground, the state of health message it normally sends on the serial data circuit disappears. Other devices on the serial data circuit, which expect to receive that state of health message, detect its absence; those devices in turn set a DTC associated with the loss of state of health of the non communicating device. A loss of serial data communications DTC does not represent a failure of the devices that contain the stored DTC.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#), or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

Data Link Communications Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the P16 Instrument Cluster. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.

- If infinite resistance, replace the P16 Instrument Cluster.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
- **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the P16 Instrument Cluster.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which is controlled by a control module, and ground.
- **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit and all devices that share the same ignition circuit.
 2. Test for infinite resistance between the ignition circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - Go to next step: If less than 2 Ω
 4. Reconnect the control module that controls the ignition circuit, ignition ON/Vehicle In Service Mode.
 5. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the control module that controls the ignition circuit.
 - Go to next step: If the test lamp illuminates
 6. Ignition/Vehicle OFF, reconnect the first device that shares the same ignition circuit, ignition ON/Vehicle In Service Mode.
 7. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the device that was just connected.
 - If the test lamp illuminates and there are more devices to connect, connect the next device and repeat step 6.7 until there are no more devices to connect.
 - **Go to next step: If the test lamp illuminates**
7. Test for less than 4.5 V between each gateway isolated low speed GMLAN serial data (low speed GMLAN serial data #2) circuit terminal and ground.
- **If 4.5 V or greater**

Refer to [Scan Tool Does Not Communicate with Gateway Isolated Low Speed GMLAN Device](#) to test for a short to voltage.
 - **Go to next step: If less than 4.5 V**
8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

9. Test for greater than 100 Ω between each gateway isolated low speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [Scan Tool Does Not Communicate with Gateway Isolated Low Speed GMLAN Device](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

10. Disconnect the harness connectors at the device setting the DTC.

11. Test for less than 2 Ω in each gateway isolated low speed GMLAN serial data circuits end to end between the P16 Instrument Cluster and the device setting the DTC.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

12. Replace the P16 Instrument Cluster.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

2021 ACCESSORIES & EQUIPMENT

Data Communications - Diagnostic Information and Procedures (2 of 2) - Canyon, Colorado

DIAGNOSTIC INFORMATION AND PROCEDURES

DTC U18A2

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC U18A2

Lost Communication with Fuel Pump Driver Control Module

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18A2	U18A2	-	-
Ignition	U18A2	U18A2	-	-
Accessory Wake Up Serial Data (circuit 5985)	U1814	U18A2	-	-
Fuel Pump Primary Relay Control (circuit 465)	U18A2	U18A2	-	-
Powertrain Sensor Bus Enable (circuit 4320)	U18A2	U18A2	-	-
Powertrain High Speed GMLAN Serial Data (+) (circuit 7493)	U0074*	U0074*	U0074*	-
Powertrain High Speed GMLAN Serial Data (-) (circuit 7494)	U0074*	U0074*	U0074*	-
Ground	-	U18A2	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, accessory wake up serial data, fuel pump primary relay control, fuel pump controller data out signal, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K111 Fuel Pump Driver Control Module. It

may take up to 10 min for all vehicle systems to power down.

NOTE: If the control module's chassis ground is shared with any tail lamp assembly, disconnect the harness connector at that tail lamp assembly to remove the alternative path to ground before proceeding with this step.

2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K111 Fuel Pump Driver Control Module.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K111 Fuel Pump Driver Control Module.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal (circuit 5985) and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**

7. If equipped, verify a test lamp illuminates between the powertrain sensor bus enable circuit terminal (circuit 4320) and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K20 Engine Control Module and all control modules connected to the powertrain sensor bus enable circuit.
2. Test for infinite resistance between the powertrain sensor bus enable circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - Go to next step: If infinite resistance
3. Test for less than 2 Ω in the powertrain sensor bus enable circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K20 Engine Control Module.

- **Go to next step: If the test lamp illuminates**

8. Verify if the K111 Fuel Pump Driver Control Module is equipped with the fuel pump primary relay control circuit (circuit 465).

- **If equipped**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K20 Engine Control Module.
2. Ignition ON/Vehicle In Service Mode.
3. Test for less than 1 V between the fuel pump primary relay control circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage in the circuit.
 - Go to next step: If less than 1 V
4. Ignition/Vehicle OFF.
5. Test for infinite resistance between the fuel pump primary relay control circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - Go to next step: If infinite resistance
6. Test for less than 2 Ω in the fuel pump primary relay control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K20 Engine Control Module.

- **Go to next step: If NOT equipped**

9. Ignition ON/Vehicle In Service Mode.

10. Test for less than 4.5 V between each powertrain high speed GMLAN serial data circuit terminal and ground.

- Circuit 7493
- Circuit 7494
- **If 4.5 V or greater**

Refer to [**DTC U0074**](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

11. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

12. Test for greater than 100 Ω between each powertrain high speed GMLAN serial data circuit terminal and ground.

- Circuit 7493
- Circuit 7494
- **If 100 Ω or less**

Refer to [**DTC U0074**](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

13. Disconnect the harness connectors at the device setting the DTC.

14. Test for less than 2 Ω in each serial data circuits end to end between the K111 Fuel Pump Driver Control Module and the device setting the DTC.

- Circuit 7493
- Circuit 7494
- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

15. Replace the K111 Fuel Pump Driver Control Module.

16. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

17. Ignition ON/Vehicle In Service Mode.

18. Verify DTC U18A2 does not set again.

- **If DTC U18A2 sets**

Replace the K20 Engine Control Module.

- **Go to next step: If DTC U18A2 does not set**

19. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U18AF-U18B4

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U18AF

Lost Communications With Telematics Communications Interface Control Module on Ethernet Bus

DTC U18B0

Lost Communications With Instrument Cluster on Ethernet Bus

DTC U18B1

Lost Communications With Audio Amplifier on Ethernet Bus

DTC U18B2

Lost Communication with Rear Audio Control Module on Ethernet Bus

DTC U18B3

DTC U18B4

Lost Communication with Radio on Ethernet Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18AF - U18B4	U18AF - U18B4	-	-
Ignition	U18AF - U18B4	U18AF - U18B4	-	-
Ethernet Serial Data (+)	U18AF - U18B4	U18AF - U18B4	U18AF - U18B4	-
Ethernet Serial Data (-)	U18AF - U18B4	U18AF - U18B4	U18AF - U18B4	-
Ground	-	U18AF - U18B4	-	-

Circuit/System Description

At the core of the infotainment system is the Radio Ethernet Audio Video Bridging switch which communicates directly to each contributing Infotainment control module terminator. The Ethernet harness consists of twisted pair wires from point to point. Each control module on the Ethernet infotainment system sends/receives data at 100 Mbit/s to/from a specified port at the Radio. The Radio Ethernet will also be used to program USB software update files to the control modules connected to the Ethernet ports.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#), or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

Data Link Communications Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the control module's ground, B+, ignition, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the control module specified by the DTC descriptor. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the control module specified by the DTC descriptor.
- **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the control module specified by the DTC descriptor.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which is controlled by a control module, and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit and all devices that share the same ignition circuit.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - Go to next step: If less than 2 Ω
 4. Reconnect the control module that controls the ignition circuit, ignition ON/Vehicle In Service Mode.
 5. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the control module that controls the ignition circuit.
 - Go to next step: If the test lamp illuminates
 6. Ignition/Vehicle OFF, reconnect the first device that shares the same ignition circuit, ignition ON/Vehicle In Service Mode.
 7. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the device that was just connected.
 - If the test lamp illuminates and there are more devices to connect, connect the next device and repeat step 6.7 until there are no more devices to connect.
 - **Go to next step: If the test lamp illuminates**
7. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal or the serial data communication enable circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the accessory wakeup serial data circuit or the serial data communication enable circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

8. Ignition/Vehicle OFF, disconnect the harness connectors at the device setting the DTC.

9. Ignition ON/Vehicle In Service Mode.

10. Test for less than 4.5 V between each Ethernet serial data circuit terminal and ground.

- **If 4.5 V or greater**

Repair the short to voltage in the serial data circuit.

- **Go to next step: If less than 4.5 V**

11. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

12. Test for infinite resistance between each Ethernet serial data circuit terminal and ground.

- **If less than infinite resistance**

Repair the short to ground in the serial data circuit.

- **Go to next step: If infinite resistance**

13. Test for infinite resistance between each pair of Ethernet serial data circuit terminals.

- **If less than infinite resistance**

Repair the short together in the serial data circuits.

- **Go to next step: If infinite resistance**

14. Test for less than 2 Ω in each Ethernet serial data circuit end to end.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

15. Replace the control module specified by the DTC descriptor.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U18B9-U18BF

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U18B9

Primary High Speed CAN Bus Subnet Configuration List

DTC U18BF

Secondary High Speed CAN Bus Subnet Configuration List

For symptom byte information, refer to [Symptom Byte List](#).

Circuit/System Description

Devices on the high speed GMLAN serial data bus and the chassis high speed GMLAN serial data bus must be programmed with software that specifically identifies the correct type and quantity of devices on the bus based on RPO configuration. If a device was not properly configured after installation, the appropriate U Code may be set for that device. No external circuit diagnosis is involved.

Conditions for Running the DTC

- Voltage supplied to the device is in the normal operating voltage range.
- The vehicle power mode requires serial data communication to occur.

Conditions for Setting the DTC

- The device is not configured properly.
- Control unit recognises a programming error.
- CAN-Bus configuration is invalid

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#), or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.

2. Verify DTC U18B9-U18BF is not set.

- **If DTC U18B9-U18BF is set along with other DTCs set**

Diagnose all other DTCs first. Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).

- **If DTC U18B9-U18BF is set without other DTCs set**

1. Program the device that sets the DTC.
2. Ignition/Vehicle OFF, remove the scan tool, open and close the driver door. Wait 60 s.
3. Ignition ON/Vehicle In Service Mode.
4. Verify the DTC does not set.
 - If the DTC sets, replace the appropriate device.
 - Go to next step: If the DTC does not set
5. All OK.

- **Go to next step: If DTC U18B9-U18BF is not set**

3. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U18BA

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U18BA

Lost Communication with Power Steering Control Module on High Speed CAN Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18BA	U18BA	-	-
Ignition	U18BA	U18BA	-	-
Serial Data Communication Enable	U1814, U2099	U18BA	-	-
High Speed GMLAN Serial Data (+)	U0073*	U0073, U18BA*	U0073*	-
High Speed GMLAN Serial Data (-)	U0073*	U0073, U18BA*	U0073*	-
Ground	-	U18BA	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - If any of the DTCs are set

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, serial data communication enable, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K43 Power Steering Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K43 Power Steering Control Module.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K43 Power Steering Control Module.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between the serial data communication enable circuit terminal and ground.
 - **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
2. Test for less than 2 Ω in the serial data communication enable circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

7. Test for less than 4.5 V between each high speed GMLAN serial data circuit terminal and ground.

- **If 4.5 V or greater**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

9. Test for greater than 100 Ω between each high speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

10. Disconnect the harness connectors at the device setting the DTC.

11. Test for less than 2 Ω in each high speed GMLAN serial data circuits end to end between the K43 Power Steering Control Module and the device setting the DTC.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

12. Replace the K43 Power Steering Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U18C8

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC U18C8

Glow Plug Control Module Lost Communication with Engine Control Module

For symptom byte information, refer to [Symptom Byte List](#) .

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18C8, U0100	U18C8, U0100	-	-
Ignition	U18C8, U0100	U18C8, U0100	-	-
Accessory Wake Up Serial Data	U1814, U2099	U18C8, U0100	-	-
Powertrain High Speed GMLAN Serial Data (+)	U0074*	U0074*	U0074*	-
Powertrain High Speed GMLAN Serial Data (-)	U0074*	U0074*	U0074*	-
Ground	-	U18C8, U0100	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)

- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, accessory wake up serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K20 Engine Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K20 Engine Control Module.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
- **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K20 Engine Control Module.
- **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
7. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K34 Glow Plug Control Module. It may take up to 10 min for all vehicle systems to power down.
8. Test for less than 2 Ω in each serial data circuits end to end between the K20 Engine Control Module and the K34 Glow Plug Control Module.
 - **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.
 - **Go to next step: If less than 2 Ω**
9. Replace the K20 Engine Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U18D5

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC U18D5

Central Gateway Module Lost Communication with Engine Control Module

For symptom byte information, refer to [Symptom Byte List](#) .

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18D5, U0100	U18D5, U0100	-	-
Ignition	U18D5, U0100	U18D5, U0100	-	-
Accessory Wake Up Serial Data	U1814, U2099	U18D5, U0100	-	-
High Speed GMLAN Serial Data (+)	U0073*	U0073*	U0073*	-
High Speed GMLAN Serial Data (-)	U0073*	U0073*	U0073*	-
Ground	-	U18D5, U0100	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**
 Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, accessory wake up serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K20 Engine Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K20 Engine Control Module.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K20 Engine Control Module.

- **Go to next step: If the test lamp illuminates**

6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

7. Test for less than 4.5 V between each high speed GMLAN serial data circuit terminal and ground.

- **If 4.5 V or greater**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
9. Test for greater than 100 Ω between each high speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

10. Disconnect the harness connectors at the K56 Serial Data Gateway Module.
11. Test for less than 2 Ω in each serial data circuits end to end between the K20 Engine Control Module and the K56 Serial Data Gateway Module.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

12. Replace the K20 Engine Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U18D7

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC U18D7

Central Gateway Module Lost Communication with Transmission Control Module

For symptom byte information, refer to [Symptom Byte List](#) .

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18D7, U0101	U18D7, U0101	-	-
Ignition	U18D7, U0101	U18D7, U0101	-	-
Accessory Wake Up Serial Data	U1814, U2099	U18D7, U0101	-	-
High Speed GMLAN Serial Data (+)	U0073*	U0073*	U0073*	-
High Speed GMLAN Serial Data (-)	U0073*	U0073*	U0073*	-
Ground	-	U18D7, U0101	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**
Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, accessory wake up serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K71 Transmission Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K71 Transmission Control Module.

- **Go to next step: If the test lamp illuminates**

5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K71 Transmission Control Module.

- **Go to next step: If the test lamp illuminates**

6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

7. Test for less than 4.5 V between each high speed GMLAN serial data circuit terminal and ground.

- **If 4.5 V or greater**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

9. Test for greater than 100 Ω between each high speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

10. Disconnect the harness connectors at the K56 Serial Data Gateway Module.
11. Test for less than 2 Ω in each serial data circuits end to end between the K71 Transmission Control Module and the K56 Serial Data Gateway Module.
 - **If 2 Ω or greater**
 Repair the open/high resistance in the serial data circuit.
 - **Go to next step: If less than 2 Ω**
12. Replace the K71 Transmission Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U18D9

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC U18D9

Central Gateway Module Lost Communication with Chassis Control Module

For symptom byte information, refer to [Symptom Byte List](#) .

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18D9, U012A	U18D9, U012A	-	-
Ignition	U18D9, U012A	U18D9, U012A	-	-
Accessory Wake Up Serial Data	U1814, U2099	U18D9, U012A	-	-
High Speed GMLAN Serial Data (+)	U0073*	U0073*	U0073*	-
High Speed GMLAN Serial Data (-)	U0073*	U0073*	U0073*	-
Ground	-	U18D9, U012A	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - If any of the DTCs are set
Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - Go to next step: If none of the DTCs are set
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, accessory wake up serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K38 Chassis Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K38 Chassis Control Module.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K38 Chassis Control Module.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
7. Test for less than 4.5 V between each high speed GMLAN serial data circuit terminal and ground.
 - **If 4.5 V or greater**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

9. Test for greater than 100 Ω between each high speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

10. Disconnect the harness connectors at the K56 Serial Data Gateway Module.

11. Test for less than 2 Ω in each serial data circuits end to end between the K38 Chassis Control Module and the K56 Serial Data Gateway Module.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

12. Replace the K38 Chassis Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U18DE

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)
- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

DTC Descriptors

DTC U18DE

Central Gateway Module Lost Communication with Glow Plug Control Module

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18DE	U18DE	-	-
Ignition	U18DE	U18DE	-	-
Accessory Wake Up Serial Data	U1814	U18DE	-	-
High Speed GMLAN Serial Data (+)	U0073*	U18DE	U0073*	-
High Speed GMLAN Serial Data (-)	U0073*	U18DE	U0073*	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ground	-	U18DE	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, P0562, P06E4, P1EB9, U0073 - U0078, U007A - U007D, U1814, or U2099 is not set.
 - **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, accessory wake up serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K34 Glow Plug Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each of the ground circuit terminals and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each of the B+ circuit terminals and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse. Refer to [Power Mode Mismatch](#) .
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K34 Glow Plug Control Module.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each of the ignition circuit terminals and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse. Refer to [Power Mode Mismatch](#) .
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the K34 Glow Plug Control Module.

• **Go to next step: If the test lamp illuminates**

6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.

• **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.

2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K9 Body Control Module.

• **Go to next step: If the test lamp illuminates**

7. Test for less than 4.5 V between each of the high speed GMLAN serial data circuit terminals and ground.

• **If 4.5 V or greater**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to voltage.

• **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

9. Test for greater than 100 Ω between each of the high speed GMLAN serial data circuit terminals and ground.

• **If 100 Ω or less**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to ground.

• **Go to next step: If greater than 100 Ω**

10. Disconnect the harness connectors at the K56 Serial Data Gateway Module.

11. Test for less than 2 Ω in each of the serial data circuits end to end between the K34 Glow Plug Control Module and the K56 Serial Data Gateway Module.

• **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

• **Go to next step: If less than 2 Ω**

12. Replace the K34 Glow Plug Control Module.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: [Diagnostic Repair Verification](#) .

For control module replacement, programming, and setup, refer to [Control Module References](#) .

DTC U18E1

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)

- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

DTC Descriptors

DTC U18E1

Glow Plug Control Module Lost Communication with Central Gateway Module

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18E1	U18E1	-	-
Ignition	U18E1	U18E1	-	-
Serial Data Communication Enable	U2099	U18E1	-	-
High Speed GMLAN Serial Data (+)	U0073*	U18E1	U0073*	-
High Speed GMLAN Serial Data (-)	U0073*	U18E1	U0073*	-
Ground	-	U18E1	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, P0562, P06E4, P1EB9, U0073 - U0078, U007A - U007D, U1814, or U2099 is not set.
 - **If any of the DTCs are set**
Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, accessory wake up serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K56 Serial Data Gateway Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each of the ground circuit terminals and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each of the B+ circuit terminals and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.

- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse. Refer to [Power Mode Mismatch](#).
- **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K56 Serial Data Gateway Module.
- **Go to next step: If the test lamp illuminates**
- 5. If equipped, verify a test lamp illuminates between each of the ignition circuit terminals and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse. Refer to [Power Mode Mismatch](#).
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K56 Serial Data Gateway Module.
 - **Go to next step: If the test lamp illuminates**
- 6. If equipped, verify a test lamp illuminates between the serial data communication enable circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the serial data communication enable circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
- 7. Test for less than 4.5 V between each of the high speed GMLAN serial data circuit terminals and ground.
 - **If 4.5 V or greater**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to voltage.
 - **Go to next step: If less than 4.5 V**
- 8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
- 9. Test for greater than 100 Ω between each of the high speed GMLAN serial data circuit terminals and ground.
 - **If 100 Ω or less**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to ground.
 - **Go to next step: If greater than 100 Ω**
- 10. Disconnect the harness connectors at the K34 Glow Plug Control Module.

11. Test for less than 2 Ω in each of the serial data circuits end to end between the K56 Serial Data Gateway Module and the K34 Glow Plug Control Module.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

12. Replace the K56 Serial Data Gateway Module.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: [Diagnostic Repair Verification](#) .

For control module replacement, programming, and setup, refer to [Control Module References](#) .

DTC U18E9

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U18E9

Lost Communication with Serial Data Gateway Module on Low Speed CAN Bus

For symptom byte information, refer to [Symptom Byte List](#) .

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18E9	U18E9	-	-
Ignition	U18E9	U18E9	-	-
Serial Data Communication Enable	U1814, U2099	U18E9	-	-
Low Speed GMLAN Serial Data	U0078	U18E9	U0078	-
Ground	-	U18E9	-	-

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, U1814, U2099, U2100, B1325, B1330, B1370, B1380, B1424, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, P0562, P06E4, or P1EB9 is not set.
 - **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, serial data communication enable, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K56 Serial Data Gateway Module. It may take up to 10 min for all vehicle systems to power down.

2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K56 Serial Data Gateway Module.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K56 Serial Data Gateway Module.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between the serial data communication enable circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the serial data communication enable circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
7. Test for less than 4.5 V between each low speed GMLAN serial data circuit terminal and ground.
 - **If 4.5 V or greater**

Refer to [Scan Tool Does Not Communicate with Low Speed GMLAN Device](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

9. Test for greater than 100 Ω between each low speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [Scan Tool Does Not Communicate with Low Speed GMLAN Device](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

10. Disconnect the harness connectors at the device setting the DTC.

11. Test for less than 2 Ω in the low speed GMLAN serial data circuits end to end between the K56 Serial Data Gateway Module and the device setting the DTC.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

12. Replace the K56 Serial Data Gateway Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U1980

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U1980

Security Calibration Identification Mismatch

For symptom byte information, refer to [Symptom Byte List](#) .

Circuit/System Description

A security policy value called Not Before ID is stored in K56 Serial Data Gateway Module memory. This is a hex number identifier used by cyber security calibrations to prevent programming an earlier model year security calibration into a current or subsequent model year. If the K56 Serial Data Gateway Module is reprogrammed with a security calibration that contains a security policy value greater than the value that is currently stored in memory, then the security policy value is updated in memory to the new value. The value in memory can only be incremented and can never be decremented. If the K56 Serial Data Gateway Module is reprogrammed with a security calibration that contains a security policy value lower than the value stored in the memory, then DTC U1980 will be set.

Conditions for Running the DTC

- Battery voltage is between 9 - 16 V.
- Vehicle power mode is Ignition/Vehicle OFF, ACCESSORY, or Ignition ON/Vehicle In Service Mode.

Conditions for Setting the DTC

On the first startup after the K56 Serial Data Gateway Module is reprogrammed, it detects that the security policy value in the security calibration is lower than the value stored in the memory.

Action Taken When the DTC Sets

The K56 Serial Data Gateway Module will not gate any message from dirty buses to clean buses.

Conditions for Clearing the DTC

The security policy value in the memory is updated with the new value in the security calibration which shall be equal to or greater than the value currently stored in the memory.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U1980 is not set.
 - **If DTC U1980 is set**
 1. Program the K56 Serial Data Gateway Module.
 2. Verify the DTC does not set.
 - If the DTC sets, replace the K56 Serial Data Gateway Module.
 - Go to next step: If the DTC does not set
 3. All OK.
 - **Go to next step: If DTC U1980 is not set**
3. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U2010-U2013

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U2010

Network Configuration List Not Programmed - Engine Control Module LIN Bus 1

DTC U2011

Network Configuration List Not Programmed - Engine Control Module LIN Bus 2

DTC U2012

Network Configuration List Not Programmed - Engine Control Module LIN Bus 3

DTC U2013

Network Configuration List Not Programmed - Engine Control Module LIN Bus 4

For symptom byte information, refer to [Symptom Byte List](#).

Circuit/System Description

The K20 Engine Control Module must be configured with LIN bus device ID information. If the K20 Engine Control Module was not properly configured with correct LIN bus device ID information after installation, it may set the appropriate communication DTCs. No external circuit diagnosis is involved.

Conditions for Running the DTC

Battery voltage is between 9 - 16 V and data link communications operate normally.

Conditions for Setting the DTC

The K20 Engine Control Module is not configured properly.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

[Circuit/System Verification](#)

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U2010 - U2013 is not set.
 - **If any of the DTCs are set**
 1. Program the K20 Engine Control Module.
 2. Verify the DTC does not set.
 - If the DTC sets, replace the K20 Engine Control Module.
 - Go to next step: If the DTC does not set
 - 3. All OK.
 - **Go to next step: If none of the DTCs are set**
3. All OK

[Repair Instructions](#)

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U2099

[Diagnostic Instructions](#)

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

[DTC Descriptor](#)

DTC U2099

High Speed Communication Enable Circuit

For symptom byte information, refer to [Symptom Byte List](#) .

[Diagnostic Fault Information](#)

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Serial Data Communication Enable	U2099*	U0100-U02FF	U0100-U02FF	-
* Vehicle may not start.				

Circuit/System Description

The body control module (BCM) activates the serial data communication enable circuit, when the ignition key is in ACC, ON or START. The serial data communication enable circuit wakes up the devices for serial data bus communication.

Conditions for Running the DTC

- The system voltage is between 9 - 16 V.
- The vehicle power mode master requires serial data communication to occur.

Conditions for Setting the DTC

The BCM senses a short to ground on the serial data communication enable circuit.

Action Taken When the DTC Sets

- The output command is turned off while the malfunction is present.
- The devices use a default value for the missing parameters until the next ignition cycle.
- The device(s) is never signaled. Therefore, the specific subsystem(s) will not function.
- The vehicle will not start while the circuit is shorted to ground.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

[Control Module References](#) for scan tool information

Circuit/System Testing

NOTE: Use the schematic to determine which devices are on the K9 Body Control Module's serial data communication enable circuit terminal 23 X4. Use the connector end view to identify the serial data communication enable circuit terminal for each of those devices.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K9 Body Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for greater than 100 Ω between the serial data communication enable circuit terminal 23 X4 and ground.
 - **If 100 Ω or less**
 1. Disconnect the harness connectors at all devices that share the serial data communication enable circuit.
 2. Test for infinite resistance between the serial data communication enable circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
 3. Reconnect the first device that shares the serial data communication enable circuit.
 4. Test for greater than 100 Ω between the serial data communication enable circuit terminal and ground.
 - If 100 Ω or less, replace the device that was just connected.
 - If greater than 100 Ω and there are more devices to connect, connect the next device and repeat step 2.4 until there are no more devices to connect.
 - **Go to next step: If greater than 100 Ω**
3. Replace the K9 Body Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U2160-U2231

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

For device DTC descriptors, refer to [Control Module U Code List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U2160 - U2231	U2160 - U2231	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ignition	U2160 - U2231, U1814, U2099	U2160 - U2231	-	-
Object High Speed GMLAN Serial Data (+)	U0075	U2160 - U2231	U0075	-
Object High Speed GMLAN Serial Data (-)	U0075	U2160 - U2231	U0075	-
Chassis High Speed GMLAN Serial Data (+)	U0074, U0077	U2160 - U2231	U0074, U0077	-
Chassis High Speed GMLAN Serial Data (-)	U0074, U0077	U2160 - U2231	U0074, U0077	-
High Speed GMLAN Serial Data (+)	U0073, 2	U2160 - U2231	U0073, 2	-
High Speed GMLAN Serial Data (-)	U0073, 2	U2160 - U2231	U0073, 2	-
Low Speed GMLAN Serial Data	U0078, 1	U2160 - U2231	U0078, 1	-
Ground	-	U2160 - U2231	-	-
1. Scan tool does not communicate with most low speed GMLAN device 2. Scan tool does not communicate with most high speed GMLAN device				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device. A loss of serial data communications DTC does not represent a failure of the devices that contain the stored code.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

[Circuit/System Verification](#)

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, U1814, U2099, U2100, B1325, B1330, B1370, B1380, B1424, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, P0562, P06E4, or P1EB9 is not set.
 - **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Determine the device that is not communicating. Refer to [Control Module U Code List](#) .
4. Refer to [Data Link References](#) to determine which data communication bus the non communicating device is on.
 - **If the device is on Gateway Expansion High Speed GMLAN bus**

Refer to [Scan Tool Does Not Communicate with Gateway Expansion High Speed GMLAN Device](#) to diagnose that device.
 - **If the device is on Gateway Isolated High Speed GMLAN bus**

Refer to [Scan Tool Does Not Communicate with Gateway Isolated High Speed GMLAN Device](#) to diagnose that device.
 - **If the device is on Gateway Isolated Low Speed GMLAN bus**

Refer to [Scan Tool Does Not Communicate with Gateway Isolated Low Speed GMLAN Device](#) to diagnose that device.
 - **Go to next step: If the device is not on Gateway Expansion High Speed GMLAN bus, Gateway Isolated High Speed GMLAN bus, and Gateway Isolated Low Speed GMLAN bus**
5. Refer to Circuit/System Testing.

[Circuit/System Testing](#)

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, accessory wakeup serial data, serial data communication enable,

and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect all the harness connectors at the device that is not communicating. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which is controlled by a control module, and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit and all devices that share the same ignition circuit.
 2. Test for infinite resistance between the ignition circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the ignition circuit end to end.

- If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - Go to next step: If less than $2\ \Omega$
4. Reconnect the control module that controls the ignition circuit, ignition ON/Vehicle In Service Mode.
 5. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the control module that controls the ignition circuit.
 - Go to next step: If the test lamp illuminates
 6. Ignition/Vehicle OFF, reconnect the first device that shares the same ignition circuit, ignition ON/Vehicle In Service Mode.
 7. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the device that was just connected.
 - If the test lamp illuminates and there are more devices to connect, connect the next device and repeat step 6.7 until there are no more devices to connect.
 - **Go to next step: If the test lamp illuminates**
7. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal or the serial data communication enable circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than $2\ \Omega$ in the accessory wakeup serial data circuit or the serial data communication enable circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - If less than $2\ \Omega$, replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
 8. Test for less than $4.5\ \text{V}$ between each GMLAN serial data circuit terminal and ground.
 - **If $4.5\ \text{V}$ or greater between a low speed GMLAN serial data circuit and ground**

Refer to [Scan Tool Does Not Communicate with Low Speed GMLAN Device](#) to test for a short to voltage.
 - **If $4.5\ \text{V}$ or greater between a high speed GMLAN serial data circuit and ground**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to voltage.
 - **Go to next step: If less than $4.5\ \text{V}$**
 9. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least $3\ \text{m}$ ($9.8\ \text{ft}$) away from vehicle. It may take up to $10\ \text{min}$ for all vehicle systems to power down.
 10. Test for greater than $100\ \Omega$ between each GMLAN serial data circuit terminal and ground.
 - **If $100\ \Omega$ or less between a low speed GMLAN serial data circuit and ground**

Refer to [Scan Tool Does Not Communicate with Low Speed GMLAN Device](#) to test for a short to ground.
 - **If $100\ \Omega$ or less between a high speed GMLAN serial data circuit and ground**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to ground.
 - **Go to next step: If greater than $100\ \Omega$**
 11. Disconnect the harness connectors at the device setting the DTC.

12. Test for less than 2 Ω in each of the GMLAN serial data circuits end to end between the non communicating device and the device setting the DTC.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit between the non communicating device and the device setting the DTC.

- **Go to next step: If less than 2 Ω**

13. Reconnect the harness connectors at the device setting the DTC.

NOTE: The following test step is only applicable to a high speed GMLAN device with 2 pairs of serial data circuits or a high speed GMLAN device with an internal terminating resistor.

14. Test for 110 - 130 Ω between each pair of high speed GMLAN serial data circuits.

- **If less than 110 Ω**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to ground or a short between the serial data circuits.

- **If greater than 130 Ω**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for an open/high resistance in the serial data circuit.

- **Go to next step: If between 110 - 130 Ω**

15. Replace the device that is not communicating.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U2412

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U2412

Reductant Control Module Powertrain Sensor Bus Off

For symptom byte information, refer to [Symptom Byte List](#) .

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Powertrain Sensor High Speed GMLAN Serial Data (+) or High Speed GMLAN Serial Data (+) (7)	U0076, U2412*	U0076, U2412*	U0076, U2412*	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Powertrain Sensor High Speed GMLAN Serial Data (-) or High Speed GMLAN Serial Data (-) (7)	U0076, U2412*	U0076, U2412*	U0076, U2412*	-
* Other DTCs may set with this fault.				

Circuit/System Description

The powertrain sensor high speed GMLAN serial data circuits are serial data buses used to communicate information between the devices. If this serial data system is inoperative, some devices may still be able to communicate with the scan tool due to other serial data systems but not with each other.

Conditions for Running the DTC

- Supply voltage to the devices are in the normal operating range.
- The vehicle power mode requires serial data communications.

Conditions for Setting the DTC

The K115 Reductant Control Module has attempted to establish communications on the powertrain sensor high speed GMLAN serial data circuits more than 3 times.

Action Taken When the DTC Sets

- The device suspends all message transmission.
- The device uses default values for all parameters received on the serial data circuits.
- The device inhibits the setting of all other communication DTCs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Verify DTC U2412 is not set.
 - **If DTC U2412 is set**

Refer to **DTC U0076** .
 - **Go to next step: If DTC U2412 is not set**
3. All OK

DTC U2413

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC U2413

Central Gateway Module High Speed CAN Bus Off

For symptom byte information, refer to **Symptom Byte List** .

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
High Speed GMLAN Serial Data (+)	U0073, U2413*	U0073, U2413*	U0073, U2413*	-
High Speed GMLAN Serial Data (-)	U0073, U2413*	U0073, U2413*	U0073, U2413*	-
* Other DTCs may set with this fault.				

Circuit/System Description

The high speed GMLAN serial data circuits are serial data buses used to communicate information between the devices. If this serial data system is inoperative, some devices may still be able to communicate with the scan tool due to other serial data systems but not with each other.

Conditions for Running the DTC

- Supply voltage to the devices are in the normal operating range.
- The vehicle power mode requires serial data communications.

Conditions for Setting the DTC

The K56 Serial Data Gateway Module has attempted to establish communications on the high speed GMLAN serial data circuits more than 3 times.

Action Taken When the DTC Sets

- The device suspends all message transmission.
- The device uses default values for all parameters received on the serial data circuits.
- The device inhibits the setting of all other communication DTCs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Verify DTC U2413 is not set.

- **If DTC U2413 is set**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#).

- **Go to next step: If DTC U2413 is not set**

3. All OK

DTC U2500-U25FF

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

Refer to [Control Module U Code List](#) .

Circuit/System Description

Some devices are constantly receiving information from other devices through serial data communication network. The invalid data code will be set when a receiving device detects a discrepancy in information it receives from another device causing its integrity to be questioned. The symptom byte listed in the DTC Descriptor is for engineering reference only. No external circuit diagnosis is involved.

Conditions for Running the DTC

Battery voltage is between 9 - 16 V and data link communications operate normally.

Conditions for Setting the DTC

The device is not configured properly.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

NOTE: An invalid data DTC is normally set along with another DTC or symptom. Diagnose other DTCs and/or symptoms before replacing any device.

1. Engine running for 10 s.
2. Ignition ON/Vehicle In Service Mode, engine OFF, verify DTC U2500-U25FF is not set.
 - If DTC U2500-U25FF is set along with other DTCs set

Diagnose all other DTCs first. Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **If DTC U2500-U25FF is set without other DTCs set**

1. Program the device specified by the DTC descriptor.
2. Verify the DTC does not set.

- If the DTC sets, replace the appropriate device.
- Go to next step: If the DTC does not set

3. All OK.

- **Go to next step: If DTC U2500-U25FF is not set**

3. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U2616

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC U2616

Fuel Pump Driver Control Module Lost Communication with ECM

For symptom byte information, refer to [Symptom Byte List](#) .

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U2616, U0100	U2616, U0100	-	-
Ignition	U2616, U0100	U2616, U0100	-	-
Accessory Wake Up Serial Data	U1814, U2099	U2616, U0100	-	-
Powertrain High Speed GMLAN Serial Data (+)	U0074*	U0074*	U0074*	-
Powertrain High Speed GMLAN Serial Data (-)	U0074*	U0074*	U0074*	-
Ground	-	U2616, U0100	-	-

* Other DTCs may set with this fault.

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, accessory wake up serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K20 Engine Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K20 Engine Control Module.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K20 Engine Control Module.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**

7. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K111 Fuel Pump Driver Control Module. It may take up to 10 min for all vehicle systems to power down.
8. Test for less than 2 Ω in each serial data circuits end to end between the K20 Engine Control Module and the K111 Fuel Pump Driver Control Module.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

9. Replace the K20 Engine Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U2626

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC U2626

Reductant Control Module Lost Communication With Engine Control Module on Powertrain Sensor CAN Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U2626	U2626	-	-
Ignition	U2626	U2626	-	-
Accessory Wakeup Serial Data	U1814, U2099	U2626	-	-
Powertrain Sensor High Speed GMLAN Serial Data (+) or High Speed GMLAN Serial Data (+) (7)	U0076*	U0076*	U0076*	-
Powertrain Sensor High Speed GMLAN Serial Data (-) or High Speed GMLAN Serial Data (-) (7)	U0076*	U0076*	U0076*	-
Ground	-	U2626	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have

prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

Data Link Communications Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, U2100, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, accessory wakeup serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K20 Engine Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K20 Engine Control Module.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K20 Engine Control Module.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.
 - **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.

2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K9 Body Control Module.

• **Go to next step: If the test lamp illuminates**

7. Test for less than 4.5 V between each powertrain sensor high speed GMLAN serial data circuit terminal and ground.

- **If 4.5 V or greater**

Refer to [DTC U0076](#) to test for a short to voltage.

• **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

9. Test for greater than 100 Ω between each powertrain sensor high speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [DTC U0076](#) to test for a short to ground.

• **Go to next step: If greater than 100 Ω**

10. Disconnect the harness connectors at the K115 Reductant Control Module.

11. Test for less than 2 Ω in each serial data circuits end to end between the K20 Engine Control Module and the K115 Reductant Control Module.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

• **Go to next step: If less than 2 Ω**

12. Replace the K20 Engine Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U3000

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U3000

Control Module

For symptom byte information, refer to [Symptom Byte List](#) .

Circuit/System Description

The internal fault detection is handled inside the device. The symptom byte information is for engineering reference only. No external circuit diagnosis is involved.

Conditions for Running the DTC

The device runs the program to detect an internal fault when power up is commanded. The only requirements are voltage and ground.

Conditions for Setting the DTC

The device has detected an internal malfunction.

Action Taken When the DTC Sets

The device refuses all additional inputs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Diagnostic Aids

- This DTC may be stored as a history DTC without affecting the operation of the device.
- If stored only as a history DTC and not retrieved as a current DTC, do not replace the device.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode, engine OFF.
2. Verify DTC U3000 is not set.
 - **If DTC U3000 is set with symptom byte 43, 47, or 4B**

1. Program the device that sets the DTC.
 2. Verify the DTC does not set.
 - If the DTC sets, replace the device that sets the DTC.
 - Go to next step: If the DTC does not set
 3. All OK.
- **If DTC U3000 is set with any symptom byte, except 43, 47, or 4B**

Replace the device that sets the DTC.

- **Go to next step: If DTC U3000 is not set**

3. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DTC U3012

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptor

DTC U3012

Control Module Improper Wake-up Performance

For symptom byte information, refer to [Symptom Byte List](#) .

Circuit/System Description

The internal fault detection is handled inside the device. The symptom byte information is for engineering reference only. No external circuit diagnosis is involved.

Conditions for Running the DTC

The device runs the program to detect an internal fault when power up is commanded. The only requirements are voltage and ground.

Conditions for Setting the DTC

The device has detected an internal malfunction.

Action Taken When the DTC Sets

The device refuses all additional inputs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Diagnostic Aids

- This DTC may be stored as a history DTC without affecting the operation of the device.
- If stored only as a history DTC and not retrieved as a current DTC, do not replace the device.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify DTC U3012 is not set.
 - **If DTC U3012 is set**
Replace the device that sets the DTC.
 - **Go to next step: If DTC U3012 is not set**
3. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

SYMPTOMS - DATA COMMUNICATIONS

NOTE: The following steps must be completed before using the symptom tables.

1. Perform the [Diagnostic System Check - Vehicle](#) before using the symptom tables in order to verify that all of the following are true:
 - There are no Diagnostic Trouble Codes (DTC) set.
 - The devices can communicate via the serial data links.

2. Review the system operation in order to familiarize yourself with the system functions. Refer to [Data Link Communications Description and Operation](#) .

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the systems.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to [Testing for Intermittent Conditions and Poor Connections](#) .

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- [Scan Tool Does Not Power Up](#)
- [Scan Tool Does Not Communicate with Vehicle](#)
- [Scan Tool Does Not Communicate with High Speed GMLAN Device](#)
- [Scan Tool Does Not Communicate with Chassis High Speed GMLAN Device](#)
- [Scan Tool Does Not Communicate with Low Speed GMLAN Device](#)
- [Scan Tool Does Not Communicate with Gateway Expansion High Speed GMLAN Device](#)
- [Scan Tool Does Not Communicate with Gateway Isolated High Speed GMLAN Device](#)
- [Scan Tool Does Not Communicate with Gateway Isolated Low Speed GMLAN Device](#)

SCAN TOOL DOES NOT POWER UP

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Data Link Connector B+	1	1	-	-
Data Link Connector Ground	-	1	-	-
1. Scan Tool Does Not Power Up				

Circuit/System Description

The data link connector (DLC) is a standardized 16 cavity connector. Connector design and location is dictated by an industry wide standard, and is required to provide the following:

- Scan tool B+ voltage at terminal 16
- Scan tool ground at terminal 4
- Common ground at terminal 5

Diagnostic Aids

- The scan tool will power up with the ignition OFF. Some devices however, will not communicate unless the ignition is ON and the power mode master device sends the appropriate power mode message.

- If the B+ circuit, ground circuits, and connections of the data link connector are functioning properly, the malfunction must be due to the scan tool.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Testing

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 minutes for all vehicle systems to power down.
2. Test for less than 2 Ω between each of the X84 Data Link Connector ground circuit terminals listed below and ground.
 - Ground circuit terminal 4
 - Ground circuit terminal 5
 - **If 2 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 2 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. Verify a test lamp illuminates between the B+ circuit terminal 16 at the X84 Data Link Connector and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF.
2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
- **Go to next step: If the test lamp illuminates**
5. Refer to the scan tool user guide.

SCAN TOOL DOES NOT COMMUNICATE WITH CHASSIS HIGH SPEED GMLAN DEVICE

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)
- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Chassis High Speed GMLAN Serial Data (+) or High Speed GMLAN Serial Data (+) 2	U0077	U0077, U0100 - U02FF*	U0077	-
Chassis High Speed GMLAN Serial Data (-) or High Speed GMLAN Serial Data (-) 2	U0077	U0077, U0100 - U02FF*	U0077	-
* An open in only one chassis high speed GMLAN serial data circuit may allow degraded communication between the devices. An open between the X84 Data Link Connector (DLC) and the K56 Serial Data Gateway Module will only affect the communication with the scan tool. The devices will still communicate.				

Circuit/System Description

The devices connected to the chassis high speed GMLAN serial data circuits (circuit numbers 6105 & 6106) monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices when the S39 Ignition Switch (or S38 Ignition Mode Switch) is in any position other than OFF. The chassis high speed GMLAN serial data bus uses terminating resistors that are in parallel with the chassis high speed GMLAN (+) and (-) circuits.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

Data Link Communications Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

[Circuit/System Verification](#)

1. Ignition ON/Vehicle In Service Mode.
2. Verify that the scan tool is communicating with vehicle.
 - **If the scan tool is not communicating with vehicle**

Refer to [Scan Tool Does Not Communicate with Vehicle.](#)

- **Go to next step: If the scan tool is communicating with vehicle**

3. Attempt to communicate with all devices on the chassis high speed GMLAN bus. Refer to [Data Link References](#) to determine how many devices should be communicating on the chassis high speed GMLAN bus.
4. Verify two or more devices are not communicating on the chassis high speed GMLAN bus.
 - **If only one device is not communicating**

Refer to Circuit/System Testing - Testing the Device Circuits.

- **Go to next step: If two or more devices are not communicating**

5. Ignition/Vehicle OFF, disconnect the scan tool from the X84 Data Link Connector. The following tests will be done at the X84 Data Link Connector.
6. Ignition ON/Vehicle In Service Mode.
7. Test for less than 4.5 V between each of the serial data circuit terminals listed below and ground.
 - Terminal 12
 - Terminal 13
 - **If 4.5 V or greater**

Repair the short to voltage in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
9. Test for greater than 100 Ω between each of the serial data circuit terminals listed below and ground.
 - Terminal 12
 - Terminal 13
 - **If 100 Ω or less**

Repair the short to ground in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If greater than 100 Ω**

10. Test for 110 - 130 Ω between the serial data circuit terminals 12 and 13.
 - **If less than 110 Ω**

Repair the short together in the serial data circuits between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **If greater than 130 Ω**

Repair the open/high resistance in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If between 110 - 130 Ω**

11. Refer to Circuit/System Testing - Serial Data Starting Point.

Circuit/System Testing

NOTE: Some devices with an internal terminating resistor have a loop in the harness that connects the internal terminating resistor to the serial data circuit. When wired this way, test these loop circuits for the appropriate failure mode short to voltage, short to ground, or open/high resistance prior to replacing the device for each of the following tests. Each device may need to be disconnected to isolate a circuit fault. Use the schematics and connector end views to identify the following:

- Chassis high speed GMLAN devices and terminating resistors the vehicle is equipped with
- Device locations on the chassis high speed GMLAN serial data circuits
- Each device's ground, B+, ignition, and chassis high speed GMLAN serial data circuit terminals

Serial Data Starting Point

1. Ignition/Vehicle OFF, disconnect the harness connectors with the chassis high speed GMLAN serial data circuits (circuit numbers 6105 & 6106) at an easily accessible device that is not communicating.
2. Ignition ON/Vehicle In Service Mode.
3. Test for less than 4.5 V between each of the chassis high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected and ground.

- **If 4.5 V or greater**

Refer to Testing the Serial Data Circuits for a Short to Voltage.

- **Go to next step: If less than 4.5 V**

4. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
5. Test for greater than 100 Ω between each of the chassis high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected and ground.

- **If 100 Ω or less**

Refer to Testing the Serial Data Circuits for a Short to Ground.

- **Go to next step: If greater than 100 Ω**

6. Test for 110 - 130 Ω between each pair of the chassis high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected.

- **If less than 110 Ω**

Refer to Testing the Serial Data Circuits for a Short between the Circuits.

- **If greater than 130 Ω**

Refer to Testing the Serial Data Circuits for an Open/High Resistance.

- **Go to next step: If between 110 - 130 Ω**

7. Replace the device that was just disconnected.

Testing the Serial Data Circuits for a Short to Voltage

1. Ignition/Vehicle OFF, disconnect the harness connectors with the chassis high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to voltage.
2. Ignition ON/Vehicle In Service Mode.
3. Test for greater than 4.5 V between each of the chassis high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected and ground.

- **If each serial data circuit is 4.5 V or less**

Replace the device that was disconnected.

- **Go to next step: If any serial data circuit is greater than 4.5 V**

4. Repeat step 1 until one of the following conditions are isolated:
 - A short to voltage on the serial data circuit between two devices or splice packs, if equipped.
 - A short to voltage on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short to Ground

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Disconnect the harness connectors with the chassis high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to ground.
3. Test for greater than 100 Ω between each of the chassis high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected and ground.

- **If each serial data is 100 Ω or greater**

Replace the device that was disconnected.

- **Go to next step: If any serial data circuit is less than 100 Ω**

4. Repeat step 1 until one of the following conditions are isolated:
 - A short to ground on the serial data circuit between two devices or splice packs, if equipped.
 - A short to ground on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short between the Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Connect the harness connectors at the device that was disconnected.
3. Disconnect the harness connectors with the chassis high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted together.
4. Test for greater than 110 Ω between each pair of the chassis high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected.

- **If each pair of serial data circuits is 110 Ω or greater**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is less than 110 Ω**

5. Repeat step 1 until one of the following conditions are isolated:
 - Serial data circuits shorted together between two devices or splice packs, if equipped.

- Serial data circuits shorted together between a device and a terminating resistor.
- A shorted terminating resistor.

Testing the Serial Data Circuits for an Open/High Resistance

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Connect the harness connectors at the device that was disconnected.
3. Disconnect the harness connectors with the chassis high speed GMLAN serial data circuits at another device, in the direction of the circuit with the open/high resistance.
4. Test for less than 130 Ω between each pair of the chassis high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected.

- **If each pair of serial data circuits is 130 Ω or less**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is greater than 130 Ω**

5. Repeat step 1 until one of the following conditions are isolated:
 - An open/high resistance on the serial data circuit between two devices or splice packs, if equipped.
 - An open/high resistance on the serial data circuit between a device and a terminating resistor.
 - An open/high resistance terminating resistor.

Testing the Device Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at a chassis high speed GMLAN device that is not communicating. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each of the ground circuit terminals and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.
2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/Vehicle In Service Mode
4. If equipped, verify a test lamp illuminates between each of the B+ circuit terminals and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse. Refer to **Power Mode Mismatch**.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.

- **Go to next step: If the test lamp illuminates**

5. If equipped, verify a test lamp illuminates between each of the ignition circuit terminals, which has a fuse in the circuit, and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse. Refer to [Power Mode Mismatch](#).

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.

- **Go to next step: If the test lamp illuminates**

6. If equipped, verify a test lamp illuminates between each of the ignition circuit terminals, which is controlled by a control module, and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit and all devices that share the same ignition circuit.
2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
3. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - Go to next step: If less than 2 Ω
4. Reconnect the control module that controls the ignition circuit, ignition ON/Vehicle In Service Mode.
5. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the control module that controls the ignition circuit.
 - Go to next step: If the test lamp illuminates
6. Ignition/Vehicle OFF, reconnect the first device that shares the same ignition circuit, ignition ON/Vehicle In Service Mode.
7. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the device that was just connected.
 - If the test lamp illuminates and there are more devices to connect, connect the next device and repeat step 6.7 until there are no more devices to connect.

- **Go to next step: If the test lamp illuminates**

7. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

8. If equipped, verify a test lamp illuminates between the serial data communication enable circuit terminal and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
2. Test for less than 2 Ω in the serial data communication enable circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

9. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
10. Disconnect the harness connectors at a chassis high speed GMLAN device that is still communicating and closest to the non communicating device.
11. Test for less than 2 Ω in each of the chassis high speed GMLAN serial data circuits end to end between the non communicating device and the device that was just disconnected.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

12. Replace the non communicating device.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: [Diagnostic Repair Verification](#) .

For control module replacement, programming, and setup, refer to [Control Module References](#) .

SCAN TOOL DOES NOT COMMUNICATE WITH GATEWAY EXPANSION HIGH SPEED GMLAN DEVICE

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)
- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Gateway Expansion High Speed GMLAN Serial Data (+) or High Speed GMLAN Serial Data (+) (8)	U007B	U007B	U007B	-
Gateway Expansion High Speed GMLAN Serial Data (-) or High Speed GMLAN Serial Data (-) (8)	U007B	U007B	U007B	-

Circuit/System Description

The devices connected to the gateway expansion high speed GMLAN serial data circuits (circuit numbers 3935 & 3936) monitor for serial data communications during normal vehicle operation. The K56 Serial Data Gateway Module acts as the gateway module between devices on primary high speed GMLAN bus and devices on gateway expansion high speed GMLAN bus. The gateway expansion high speed GMLAN serial data bus

uses terminating resistors that are in parallel with the gateway expansion high speed GMLAN (+) and (-) circuits.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that the scan tool is communicating with vehicle.
 - **If the scan tool is not communicating with vehicle**

Refer to [Scan Tool Does Not Communicate with Vehicle.](#)

- **Go to next step: If the scan tool is communicating with vehicle**

3. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

4. Attempt to communicate with all devices on the gateway expansion high speed GMLAN bus. Refer to [Data Link References](#) to determine which devices are on the gateway expansion high speed GMLAN bus.

5. Verify two or more devices are not communicating on the gateway expansion high speed GMLAN bus.

- **If only one device is not communicating**

Refer to Circuit/System Testing - Testing the Device Circuits.

- **Go to next step: If two or more devices are not communicating**

6. Ignition/Vehicle OFF, disconnect the scan tool from the X84 Data Link Connector. The following tests will be done at the X84 Data Link Connector.

7. Ignition ON/Vehicle In Service Mode.

8. Test for less than 4.5 V between each of the serial data circuit terminals listed below and ground.

- Terminal 6
- Terminal 14
- **If 4.5 V or greater**

Repair the short to voltage in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If less than 4.5 V**

9. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

10. Test for greater than 100 Ω between each of the serial data circuit terminals listed below and ground.

- Terminal 6
- Terminal 14
- **If 100 Ω or less**

Repair the short to ground in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If greater than 100 Ω**

11. Test for 110 - 130 Ω between the serial data circuit terminals 6 and 14.

- **If less than 110 Ω**

Repair the short together in the serial data circuits between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **If greater than 130 Ω**

Repair the open/high resistance in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If between 110 - 130 Ω**

12. Refer to Circuit/System Testing - Serial Data Starting Point.

Circuit/System Testing

NOTE: Some devices with an internal terminating resistor have a loop in the harness that connects the internal terminating resistor to the serial data circuit. When wired this way, test these loop circuits for the appropriate failure mode short to voltage, short to ground, or open/high resistance prior to replacing the device for each of the following tests. Each device may need to be disconnected to isolate a circuit fault. Use the schematic to identify the following:

- Gateway expansion high speed GMLAN devices and terminating resistors the vehicle is equipped with
- Device locations on the gateway expansion high speed GMLAN serial data circuits
- Each device's ground, B+, ignition, and gateway expansion high speed GMLAN serial data circuit terminals

Serial Data Starting Point

1. Ignition/Vehicle OFF, disconnect the harness connectors with the gateway expansion high speed GMLAN serial data circuits (circuit numbers 3935 & 3936) at an easily accessible device that is not communicating. Refer to [Data Link References](#) to determine which devices are on the gateway expansion high speed GMLAN bus.
2. Ignition ON/Vehicle In Service Mode.
3. Test for less than 4.5 V between each of the gateway expansion high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected and ground.

- **If 4.5 V or greater**

Refer to Testing the Serial Data Circuits for a Short to Voltage.

- **Go to next step: If less than 4.5 V**

4. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
5. Test for greater than 100 Ω between each of the gateway expansion high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected and ground.

- **If 100 Ω or less**

Refer to Testing the Serial Data Circuits for a Short to Ground.

- **Go to next step: If greater than 100 Ω**

6. Test for 110 - 130 Ω between each pair of the gateway expansion high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected:

- **If less than 110 Ω**

Refer to Testing the Serial Data Circuits for a Short between the Circuits.

- **If greater than 130 Ω**

Refer to Testing the Serial Data Circuits for an Open/High Resistance.

- **Go to next step: If between 110 - 130 Ω**

7. Replace the device that was just disconnected.

Testing the Serial Data Circuits for a Short to Voltage

1. Ignition/Vehicle OFF, disconnect the harness connectors with the gateway expansion high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to voltage.
2. Ignition ON/Vehicle In Service Mode.
3. Test for greater than 4.5 V between each of the gateway expansion high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected and ground.

- **If each serial data circuit is 4.5 V or less**

Replace the device that was disconnected.

- **Go to next step: If any serial data circuit is greater than 4.5 V**

4. Repeat step 1 until one of the following conditions are isolated:
 - A short to voltage on the serial data circuit between two devices or splice packs, if equipped.
 - A short to voltage on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short to Ground

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

2. Disconnect the harness connectors with the gateway expansion high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to ground.
3. Test for greater than 100 Ω between each of the gateway expansion high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected and ground.

- **If each serial data circuit is 100 Ω or greater**

Replace the device that was disconnected.

- **Go to next step: If any serial data circuit is less than 100 Ω**

4. Repeat step 1 until one of the following conditions are isolated:
 - A short to ground on the serial data circuit between two devices or splice packs, if equipped.
 - A short to ground on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short between the Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Connect the harness connectors at the device that was previously disconnected.
3. Disconnect the harness connectors with the gateway expansion high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted together.
4. Test for greater than 110 Ω between each pair of the gateway expansion high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected.

- **If each pair of serial data circuits is 110 Ω or greater**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is less than 110 Ω**

5. Repeat step 1 until one of the following conditions are isolated:
 - Serial data circuits shorted together between two devices or splice packs, if equipped.
 - Serial data circuits shorted together between a device and a terminating resistor.
 - A shorted terminating resistor.

Testing the Serial Data Circuits for an Open/High Resistance

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Connect the harness connectors at the device that was previously disconnected.
3. Disconnect the harness connectors with the gateway expansion high speed GMLAN serial data circuits at another device, in the direction of the circuit with the open/high resistance.
4. Test for less than 130 Ω between each pair of the gateway expansion high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected.

- **If each pair of serial data circuits is 130 Ω or less**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is greater than 130 Ω**

5. Repeat step 1 until one of the following conditions are isolated:
 - An open/high resistance on the serial data circuit between two devices or splice packs, if equipped.
 - An open/high resistance on the serial data circuit between a device and a terminating resistor.
 - An open/high resistance terminating resistor.

Testing the Device Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the gateway expansion high speed GMLAN device that is not communicating. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each of the ground circuit terminals and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each of the B+ circuit terminals and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse. Refer to [Power Mode Mismatch](#).
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each of the ignition circuit terminals, which has a fuse in the circuit, and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse. Refer to [Power Mode Mismatch](#).
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between each of the ignition circuit terminals, which is controlled by a control module, and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit and all devices that share the same ignition circuit.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
 3. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
 - Go to next step: If less than 2 Ω
4. Reconnect the control module that controls the ignition circuit, ignition ON/Vehicle In Service Mode.
 5. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the control module that controls the ignition circuit.
 - Go to next step: If the test lamp illuminates
 6. Ignition/Vehicle OFF, reconnect the first device that shares the same ignition circuit, ignition ON/Vehicle In Service Mode.
 7. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the device that was just connected.
 - If the test lamp illuminates and there are more devices to connect, connect the next device and repeat step 6.7 until there are no more devices to connect.
 - **Go to next step: If the test lamp illuminates**
7. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
 8. If equipped, verify a test lamp illuminates between the serial data communication enable circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the serial data communication enable circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
 9. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K56 Serial Data Gateway Module. It may take up to 10 min for all vehicle systems to power down.
 10. Test for less than 2 Ω in each of the gateway expansion high speed GMLAN serial data circuits end to end between the non communicating device and the K56 Serial Data Gateway Module.
 - **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.
 - **Go to next step: If less than 2 Ω**
 11. Replace the non communicating device.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: [Diagnostic Repair Verification](#) .

For control module replacement, programming, and setup, refer to [Control Module References](#) .

SCAN TOOL DOES NOT COMMUNICATE WITH GATEWAY ISOLATED HIGH SPEED GMLAN DEVICE

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)
- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Gateway Isolated High Speed GMLAN Serial Data (+) or High Speed GMLAN Serial Data (+) (9)	U007C	U007C	U007C	-
Gateway Isolated High Speed GMLAN Serial Data (-) or High Speed GMLAN Serial Data (-) (9)	U007C	U007C	U007C	-

Circuit/System Description

The devices connected to the gateway isolated high speed GMLAN serial data circuits (circuit numbers 1304 & 1305) monitor for serial data communications during normal vehicle operation. The K56 Serial Data Gateway Module acts as the gateway module between devices on primary high speed GMLAN bus and devices on gateway isolated high speed GMLAN bus. The gateway isolated high speed GMLAN serial data bus uses terminating resistors that are in parallel with the gateway isolated high speed GMLAN (+) and (-) circuits.

Conditions for Running the DTC

- The system voltage is between 9 - 16 V.
- The vehicle power mode requires serial data communications.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

- The device suspends all message transmission.
- The device uses default values for all parameters received on the serial data circuits.
- The device inhibits the setting of all other communication DTCs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

[Circuit/System Verification](#)

1. Ignition ON/Vehicle In Service Mode.
2. Verify that the scan tool is communicating with vehicle.
 - **If the scan tool is not communicating with vehicle**

Refer to [Scan Tool Does Not Communicate with Vehicle](#).

- **Go to next step: If the scan tool is communicating with vehicle**

3. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

4. Attempt to communicate with all devices on the gateway isolated high speed GMLAN bus. Refer to [Data Link References](#) to determine which devices are on the gateway isolated high speed GMLAN bus.

5. Verify two or more devices are not communicating on the gateway isolated high speed GMLAN bus.

- **If only one device is not communicating**

Refer to Circuit/System Testing - Testing the Device Circuits.

- **Go to next step: If two or more devices are not communicating**

6. Ignition/Vehicle OFF, disconnect the scan tool from the X84 Data Link Connector. The following tests will be done at the X84 Data Link Connector.

7. Ignition ON/Vehicle In Service Mode.

8. Test for less than 4.5 V between each of the serial data circuit terminals listed below and ground.

- Terminal 6
- Terminal 14
- **If 4.5 V or greater**

Repair the short to voltage in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If less than 4.5 V**

9. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

10. Test for greater than 100 Ω between each of the serial data circuit terminals listed below and ground.

- Terminal 6
- Terminal 14
- **If 100 Ω or less**

Repair the short to ground in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If greater than 100 Ω**

11. Test for 110 - 130 Ω between the serial data circuit terminals 6 and 14.

- **If less than 110 Ω**

Repair the short together in the serial data circuits between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **If greater than 130 Ω**

Repair the open/high resistance in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If between 110 - 130 Ω**

12. Refer to Circuit/System Testing - Serial Data Starting Point.

Circuit/System Testing

NOTE:

Some devices with an internal terminating resistor have a loop in the harness that connects the internal terminating resistor to the serial data circuit. When wired this way, test these loop circuits for the appropriate failure mode short to voltage, short to ground, or open/high resistance prior to replacing the device for each of the following tests. Each device may need to be disconnected to isolate a circuit fault. Use the schematic to identify the following:

- Gateway isolated high speed GMLAN devices and terminating resistors the vehicle is equipped with
- Device locations on the gateway isolated high speed GMLAN serial data circuits
- Each device's ground, B+, ignition, and gateway isolated high speed GMLAN serial data circuit terminals

Serial Data Starting Point

1. Ignition/Vehicle OFF, disconnect the harness connectors with the gateway isolated high speed GMLAN serial data circuits (circuit numbers 1304 & 1305) at an easily accessible device that is not communicating. Refer to [Data Link References](#) to determine which devices are on the gateway isolated high speed GMLAN bus.

2. Ignition ON/Vehicle In Service Mode.

3. Test for less than 4.5 V between each of the gateway isolated high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected and ground.

- **If 4.5 V or greater**

Refer to Testing the Serial Data Circuits for a Short to Voltage.

- **Go to next step: If less than 4.5 V**

4. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
5. Test for greater than 100 Ω between each of the gateway isolated high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected and ground.

- **If 100 Ω or less**

Refer to Testing the Serial Data Circuits for a Short to Ground.

- **Go to next step: If greater than 100 Ω**

6. Test for 110 - 130 Ω between each pair of the gateway isolated high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected:

- **If less than 110 Ω**

Refer to Testing the Serial Data Circuits for a Short between the Circuits.

- **If greater than 130 Ω**

Refer to Testing the Serial Data Circuits for an Open/High Resistance.

- **Go to next step: If between 110 - 130 Ω**

7. Replace the device that was just disconnected.

Testing the Serial Data Circuits for a Short to Voltage

1. Ignition/Vehicle OFF, disconnect the harness connectors with the gateway isolated high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to voltage.
2. Ignition ON/Vehicle In Service Mode.
3. Test for greater than 4.5 V between each of the gateway isolated high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected and ground.

- **If each serial data circuit is 4.5 V or less**

Replace the device that was disconnected.

- **Go to next step: If any serial data circuit is greater than 4.5 V**

4. Repeat step 1 until one of the following conditions are isolated:
 - A short to voltage on the serial data circuit between two devices or splice packs, if equipped.
 - A short to voltage on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short to Ground

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Disconnect the harness connectors with the gateway isolated high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to ground.
3. Test for greater than 100 Ω between each of the gateway isolated high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected and ground.

- **If each serial data circuit is 100 Ω or greater**

Replace the device that was disconnected.

- **Go to next step: If any serial data circuit is less than 100 Ω**

4. Repeat step 1 until one of the following conditions are isolated:
 - A short to ground on the serial data circuit between two devices or splice packs, if equipped.

- A short to ground on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short between the Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Connect the harness connectors at the device that was previously disconnected.
3. Disconnect the harness connectors with the gateway isolated high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted together.
4. Test for greater than 110 Ω between each pair of the gateway isolated high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected.

- **If each pair of serial data circuits is 110 Ω or greater**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is less than 110 Ω**

5. Repeat step 1 until one of the following conditions are isolated:
 - Serial data circuits shorted together between two devices or splice packs, if equipped.
 - Serial data circuits shorted together between a device and a terminating resistor.
 - A shorted terminating resistor.

Testing the Serial Data Circuits for an Open/High Resistance

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Connect the harness connectors at the device that was previously disconnected.
3. Disconnect the harness connectors with the gateway isolated high speed GMLAN serial data circuits at another device, in the direction of the circuit with the open/high resistance.
4. Test for less than 130 Ω between each pair of the gateway isolated high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected.

- **If each pair of serial data circuits is 130 Ω or less**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is greater than 130 Ω**

5. Repeat step 1 until one of the following conditions are isolated:
 - An open/high resistance on the serial data circuit between two devices or splice packs, if equipped.
 - An open/high resistance on the serial data circuit between a device and a terminating resistor.
 - An open/high resistance terminating resistor.

Testing the Device Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the gateway isolated high speed GMLAN device that is not communicating. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each of the ground circuit terminals and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/Vehicle In Service Mode.

4. If equipped, verify a test lamp illuminates between each of the B+ circuit terminals and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse. Refer to [Power Mode Mismatch](#).

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the B+ circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the disconnected device.

- **Go to next step: If the test lamp illuminates**

5. If equipped, verify a test lamp illuminates between each of the ignition circuit terminals, which has a fuse in the circuit, and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse. Refer to [Power Mode Mismatch](#).

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the disconnected device.

- **Go to next step: If the test lamp illuminates**

6. If equipped, verify a test lamp illuminates between each of the ignition circuit terminals, which is controlled by a control module, and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit and all devices that share the same ignition circuit.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- Go to next step: If infinite resistance

3. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- Go to next step: If less than 2 Ω

4. Reconnect the control module that controls the ignition circuit, ignition ON/Vehicle In Service Mode.

5. Verify a test lamp illuminates between the ignition circuit terminal and ground.

- If the test lamp does not illuminate, replace the control module that controls the ignition circuit.
- Go to next step: If the test lamp illuminates

6. Ignition/Vehicle OFF, reconnect the first device that shares the same ignition circuit, ignition ON/Vehicle In Service Mode.

7. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the device that was just connected.
 - If the test lamp illuminates and there are more devices to connect, connect the next device and repeat step 6.7 until there are no more devices to connect.
 - **Go to next step: If the test lamp illuminates**
7. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
8. If equipped, verify a test lamp illuminates between the serial data communication enable circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the serial data communication enable circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
9. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K56 Serial Data Gateway Module. It may take up to 2 min for all vehicle systems to power down.
10. Test for less than 2 Ω in each of the gateway isolated high speed GMLAN serial data circuits end to end between the non communicating device and the K56 Serial Data Gateway Module.
 - **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.
 - **Go to next step: If less than 2 Ω**
11. Replace the non communicating device.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: [Diagnostic Repair Verification](#) .

For control module replacement, programming, and setup, refer to [Control Module References](#) .

SCAN TOOL DOES NOT COMMUNICATE WITH GATEWAY ISOLATED LOW SPEED GMLAN DEVICE

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)
- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Gateway Isolated Low Speed GMLAN Serial Data or Low Speed GMLAN Serial Data #2 (Circuit #1102)	1	U0100-U02FF	1	-
1. No communication with gateway isolated low speed GMLAN device, except K56 Serial Data Gateway Module.				

Circuit/System Description

The gateway isolated low speed GMLAN serial data bus is used to communicate information between the devices. The serial data is transmitted over a single wire (circuit number 1102) to the appropriate devices. The K56 Serial Data Gateway Module acts as the gateway module between devices on low speed GMLAN bus and devices on gateway isolated low speed GMLAN bus.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that the scan tool is communicating with vehicle.
 - **If the scan tool is not communicating with vehicle**

Refer to [Scan Tool Does Not Communicate with Vehicle](#).

- **Go to next step: If the scan tool is communicating with vehicle**
3. Verify that DTC U0073, U0074, U0075, U0076 U0077, U0078, U007A, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

4. Attempt to communicate with all devices on the gateway isolated low speed GMLAN bus. Refer to [Data Link References](#) to determine which devices are on the gateway isolated low speed GMLAN bus.

5. Verify two or more devices are not communicating on the gateway isolated low speed GMLAN bus.

- **If only one device is not communicating**

Refer to Circuit/System Testing - Testing the Device Circuits.

- **Go to next step: If two or more devices are not communicating**

6. Ignition/Vehicle OFF, disconnect the scan tool from the X84 Data Link Connector. The following tests will be done at the X84 Data Link Connector.

7. Ignition ON/Vehicle In Service Mode.

8. Test for less than 4.5 V between the serial data circuit terminal 1 and ground.

- **If 4.5 V or greater**

Repair the short to voltage in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If less than 4.5 V**

9. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

10. Test for greater than 100 Ω between the serial data circuit terminal 1 and ground.

- **If 100 Ω or less**

Repair the short to ground in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If greater than 100 Ω**

11. Test for less than infinite resistance between the serial data circuit terminal 1 and ground.

- **If infinite resistance**

Repair the open/high resistance in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If less than infinite resistance**

12. Refer to Circuit/System Testing - Serial Data Starting Point.

Circuit/System Testing

NOTE: Use the schematic to identify the following:

- Gateway isolated low speed GMLAN devices the vehicle is equipped with
- Device and splice pack locations on the gateway isolated low speed GMLAN serial data circuit
- The gateway isolated low speed GMLAN serial data circuit terminals for each device or splice pack

Serial Data Starting Point

1. Ignition/Vehicle OFF, disconnect the harness connectors at the K56 Serial Data Gateway Module.

2. Ignition ON/Vehicle In Service Mode.

3. Test for less than 4.5 V between each of the gateway isolated low speed GMLAN serial data circuit terminals (circuit number 1102) and ground.

- **If 4.5 V or greater**

Refer to Testing the Serial Data Circuits for a Short to Voltage.

- **Go to next step: If less than 4.5 V**

4. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
5. Test for greater than 100 Ω between each of the gateway isolated low speed GMLAN serial data circuit terminals and ground.

- **If 100 Ω or less**

Refer to Testing the Serial Data Circuits for a Short to Ground.

- **Go to next step: If greater than 100 Ω**

6. Refer to Testing the Serial Data Circuits for an Open/High Resistance.

Testing the Serial Data Circuits for a Short to Voltage

1. Ignition/Vehicle OFF, cut the appropriate harness at a gateway isolated low speed GMLAN serial data splice closest to the K56 Serial Data Gateway Module, at least 40 mm (1.57 in) from the splice. Do not cut the wires right at the splice because these wires need to be repaired after the test is done.
2. Ignition ON/Vehicle In Service Mode.
3. Test for less than 4.5 V between each of the gateway isolated low speed GMLAN serial data circuits at the splice and ground.

- **If any serial data circuit is 4.5 V or greater**

1. Ignition/Vehicle OFF, repair all serial data circuits at the tested splice except the faulted serial data circuit, ignition ON/Vehicle In Service Mode.
2. Verify the gateway isolated low speed GMLAN devices that are still not communicating to identify the faulted serial data circuit.
3. Ignition/Vehicle OFF, disconnect all devices on the faulted serial data circuit, ignition ON/Vehicle In Service Mode.
4. Test for less than 1 V between each section of the faulted serial data circuit and ground.
 - If 1 V or greater, repair the short to voltage in the serial data circuit.
 - Go to next step: If less than 1 V
5. Ignition/Vehicle OFF, repair the faulted serial data circuit to the splice and connect the first device on the faulted serial data circuit, ignition ON/Vehicle In Service Mode.
6. Verify the scan tool communicates or not with the gateway isolated low speed GMLAN serial data circuit.
 - If the scan tool does not communicate, replace the device that was just connected.
 - If the scan tool communicates and there are more devices to connect, connect the next device and repeat step 3.6.
 - Go to next step: If the scan tool communicates and there are no more devices to connect
7. All OK.

- **Go to next step: If each serial data circuit is less than 4.5 V**

4. Inspect all gateway isolated low speed GMLAN splices for damage.

Testing the Serial Data Circuits for a Short to Ground

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down. Cut the appropriate

harness at a gateway isolated low speed GMLAN serial data splice closest to the K56 Serial Data Gateway Module, at least 40 mm (1.57 in) from the splice. Do not cut the wires right at the splice because these wires need to be repaired after the test is done.

2. Test for greater than 100 Ω between each of the gateway isolated low speed GMLAN serial data circuits at the splice and ground.
 - **If any serial data circuit is 100 Ω or less**
 1. Repair all serial data circuits at the tested splice except the faulted serial data circuit, ignition ON/Vehicle In Service Mode.
 2. Verify the gateway isolated low speed GMLAN devices that are still not communicating to identify the faulted serial data circuit.
 3. Ignition/Vehicle OFF, disconnect all devices on the faulted serial data circuit.
 4. Test for infinite resistance between each section of the faulted serial data circuit and ground.
 - If less than infinite resistance, repair the short to ground in the serial data circuit.
 - Go to next step: If infinite resistance
 5. Repair the faulted serial data circuit to the splice and connect the first device on the faulted serial data circuit, ignition ON/Vehicle In Service Mode.
 6. Verify the scan tool communicates or not with the gateway isolated low speed GMLAN serial data circuit.
 - If the scan tool does not communicate, replace the device that was just connected.
 - If the scan tool communicates and there are more devices to connect, connect the next device and repeat step 2.6.
 - Go to next step: If the scan tool communicates and there are no more devices to connect
 7. All OK.
 - **Go to next step: If each serial data circuit is greater than 100 Ω**
3. Inspect all gateway isolated low speed GMLAN splices for damage.

Testing the Serial Data Circuits for an Open/High Resistance

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Disconnect the harness connectors at the gateway isolated low speed GMLAN device that is not communicating and closest to the K56 Serial Data Gateway Module.
3. Disconnect the harness connectors at the K56 Serial Data Gateway Module.
4. Test for less than 2 Ω in each of the gateway isolated low speed GMLAN serial data circuits (circuit number 1102) end to end between the non-communicating device and the K56 Serial Data Gateway Module.
 - **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.
 - **Go to next step: If less than 2 Ω**
5. Inspect all gateway isolated low speed GMLAN splices for damage.
6. Replace the non-communicating device that was disconnected.
7. Reconnect the harness connectors at the K56 Serial Data Gateway Module.
8. Ignition ON/Vehicle In Service Mode.
9. Verify that all gateway isolated low speed GMLAN devices are communicating.
 - **If the devices are not communicating**

Replace the K56 Serial Data Gateway Module.
 - **Go to next step: If the devices are communicating**

10. All OK.

Testing the Device Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the gateway isolated low speed GMLAN device that is not communicating. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each of the ground circuit terminals at the device that was just disconnected and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. If equipped, verify a test lamp illuminates between each of the B+ circuit terminals and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse. Refer to [Power Mode Mismatch](#).
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.
 - **Go to next step: If the test lamp illuminates**
4. Ignition ON/Vehicle In Service Mode.
5. If equipped, verify a test lamp illuminates between each of the ignition circuit terminals, which has a fuse in the circuit, and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse. Refer to [Power Mode Mismatch](#).
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between each of the ignition circuit terminals, which is controlled by a control module, and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit and all devices that share the same ignition circuit.

2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
3. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - Go to next step: If less than 2 Ω
4. Reconnect the control module that controls the ignition circuit, ignition ON/Vehicle In Service Mode.
5. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the control module that controls the ignition circuit.
 - Go to next step: If the test lamp illuminates
6. Ignition/Vehicle OFF, reconnect the first device that shares the same ignition circuit, ignition ON/Vehicle In Service Mode.
7. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the device that was just connected.
 - If the test lamp illuminates and there are more devices to connect, connect the next device and repeat step 6.7 until there are no more devices to connect.
- **Go to next step: If the test lamp illuminates**
7. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K56 Serial Data Gateway Module. It may take up to 10 min for all vehicle systems to power down.
8. Test for less than 2 Ω in each of the gateway isolated low speed GMLAN serial data circuits end to end between the non communicating device and the K56 Serial Data Gateway Module.
 - **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.
 - **Go to next step: If less than 2 Ω**
9. Replace the non communicating device that was disconnected.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: [Diagnostic Repair Verification](#) .

For control module replacement, programming, and setup, refer to [Control Module References](#) .

SCAN TOOL DOES NOT COMMUNICATE WITH HIGH SPEED GMLAN DEVICE

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)
- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
High Speed GMLAN Serial Data (+)	1	U0100 - U02FF*	1	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
High Speed GMLAN Serial Data (-)	1	U0100 - U02FF*	1	-
* No communications with one or more high speed GMLAN devices. An open in only one high speed GMLAN serial data circuit may allow degraded communication between the devices. An open between the X84 Data Link Connector (DLC) and the K56 Serial Data Gateway Module will only affect the communication with the scan tool. The devices will still communicate. 1. No communication with any high speed GMLAN device				

Circuit/System Description

The devices connected to the high speed GMLAN serial data circuits monitor for serial data communications during normal vehicle operation. The serial data is transmitted on two twisted wires that allow speeds up to 500 kbit/s. The twisted pair is terminated with two 120 Ω resistors, one is internal to the K20 Engine Control Module (ECM) and the other can be a separate resistor in a connector assembly or in another device. The resistors are used as the load for the High Speed GMLAN bus during normal vehicle operation. The high speed GMLAN is a differential bus. The high speed GMLAN serial data bus (+) and high speed GMLAN serial data bus (-) are driven to opposite extremes from a rest or idle level of approximately 2.5 V. Driving the lines to their extremes, adds 1 V to the high speed GMLAN serial data bus (+) circuit and subtracts 1 V from the high speed GMLAN serial data bus (-) circuit. If serial data is lost, devices will set a no communication code against the non-communicating device. Note that a loss of serial data DTC does not represent a failure of the device that set it.

Diagnostic Aids

- Sometimes, while diagnosing a specific customer concern or after a repair, you may notice a history U code present. However, there is no associated "current" or "active" status. Loss of communication U codes such as these can set for a variety of reasons. Many times, they are transparent to the vehicle operator and technician, and/or have no associated symptoms. Eventually, they will erase themselves automatically after a number of fault-free ignition cycles. This condition would most likely be attributed to one of these scenarios:
 - A device on the data communication circuit was disconnected while the communication circuit is awake.
 - Power to one or more devices was interrupted during diagnosis.
 - A low battery condition was present, so some devices stop communicating when battery voltage drops below a certain threshold.
 - Battery power was restored to the vehicle and devices on the communication circuit did not all re-initialize at the same time.
 - If a loss of communication U code appears in history for no apparent reason, it is most likely associated with one of the scenarios above. These are all temporary conditions and should never be interpreted as an intermittent fault, causing you to replace a part.
- Do not replace a device reporting a U code. The U code identifies which device needs to be diagnosed for a communication issue.
- Communication may be available between some devices and the scan tool with the high speed GMLAN serial data system inoperative. This condition is due to those devices using multiple serial data communication systems.
- An open in the X84 Data Link Connector ground circuit terminal 5 will allow the scan tool to operate but not communicate with the vehicle.
- The engine will not start when there is a total malfunction of the high speed GMLAN serial data bus.
- Technicians may find various Local Area Network (LAN) communication Diagnostic Trouble Codes (DTC) and no high speed GMLAN communications with the scan tool.
- Some devices may not have internal protection for specific voltage outputs and may open a battery positive voltage or ignition voltage source fuse. If a voltage input fuse is open and no short is found in that circuit, ensure that no device output voltage circuit is shorted to ground before replacing the device.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that the scan tool is communicating with vehicle.
 - **If the scan tool is not communicating with vehicle**
Refer to [Scan Tool Does Not Communicate with Vehicle.](#)
 - **Go to next step: If the scan tool is communicating with vehicle**
3. Attempt to communicate with all devices on the high speed GMLAN bus. Refer to [Data Link References](#) to determine how many devices should be communicating on the high speed GMLAN bus.
4. Verify two or more devices are not communicating on the high speed GMLAN bus.
 - **If only one device is not communicating**
Refer to Circuit/System Testing - Testing the Device Circuits.
 - **Go to next step: If two or more devices are not communicating**
5. Ignition/Vehicle OFF, disconnect the scan tool from the X84 Data Link Connector. The following tests will be done at the X84 Data Link Connector.
6. Ignition ON/Vehicle In Service Mode.
7. Test for less than 4.5 V between each of the serial data circuit terminals listed below and ground.
 - Terminal 6
 - Terminal 14
 - **If 4.5 V or greater**
Repair the short to voltage in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.
 - **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
9. Test for greater than 100 Ω between each of the serial data circuit terminals listed below and ground.
 - Terminal 6
 - Terminal 14
 - **If 100 Ω or less**

Repair the short to ground in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If greater than 100 Ω**

10. Test for 110 - 130 Ω between the serial data circuit terminals 6 and 14.

- **If less than 110 Ω**

Repair the short together in the serial data circuits between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **If greater than 130 Ω**

Repair the open/high resistance in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If between 110 - 130 Ω**

11. Refer to Circuit/System Testing - Serial Data Starting Point.

Circuit/System Testing

NOTE:

Some devices with an internal terminating resistor have a loop in the harness that connects the internal terminating resistor to the serial data circuit. When wired this way, test these loop circuits for the appropriate failure mode short to voltage, short to ground, or open/high resistance prior to replacing the device for each of the following tests. Each device may need to be disconnected to isolate a circuit fault. Use the schematics to identify the following:

- High speed GMLAN devices and terminating resistors the vehicle is equipped with
- Device locations on the high speed GMLAN serial data circuits
- Each device's ground, B+, ignition, and high speed GMLAN serial data circuit terminals

Serial Data Starting Point

1. Ignition/Vehicle OFF, disconnect the harness connectors with the high speed GMLAN serial data circuits (circuit numbers 2500 & 2501) at an easily accessible device that is not communicating.
2. Ignition ON/Vehicle In Service Mode.
3. Test for less than 4.5 V between each of the high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected and ground.
 - **If 4.5 V or greater**

Refer to Testing the Serial Data Circuits for a Short to Voltage.

- **Go to next step: If less than 4.5 V**

4. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

5. Test for greater than 100 Ω between each of the high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected and ground.

- **If 100 Ω or less**

Refer to Testing the Serial Data Circuits for a Short to Ground.

- **Go to next step: If greater than 100 Ω**

6. Test for 110 - 130 Ω between each pair of the high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected.

- **If less than 110 Ω**

Refer to Testing the Serial Data Circuits for a Short between the Circuits.

- **If greater than 130 Ω**

Refer to Testing the Serial Data Circuits for an Open/High Resistance.

- **Go to next step: If between 110 - 130 Ω**

7. Replace the device that was just disconnected.

Testing the Serial Data Circuits for a Short to Voltage

1. Ignition/Vehicle OFF, disconnect the harness connectors with the high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to voltage.

2. Ignition ON/Vehicle In Service Mode.

3. Test for greater than 4.5 V between each of the high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected and ground.

- **If each serial data circuit is 4.5 V or less**

Replace the device that was disconnected.

- **Go to next step: If any serial data circuit is greater than 4.5 V**

4. Repeat step 1 until one of the following conditions are isolated:

- A short to voltage on the serial data circuit between two devices or splice packs, if equipped.
- A short to voltage on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short to Ground

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

2. Disconnect the harness connectors with the high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to ground.

3. Test for greater than 100 Ω between each of the high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected and ground.

- **If each serial data circuit is 100 Ω or greater**

Replace the device that was disconnected.

- **Go to next step: If any serial data circuit is less than 100 Ω**

4. Repeat step 1 until one of the following conditions are isolated:

- A short to ground on the serial data circuit between two devices or splice packs, if equipped.
- A short to ground on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short between the Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Connect the harness connectors at the device that was disconnected.
3. Disconnect the harness connectors with the high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted together.
4. Test for greater than 110 Ω between each pair of the high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected.

- **If each pair of serial data circuits is 110 Ω or greater**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is less than 110 Ω**

5. Repeat step 1 until one of the following conditions are isolated:
 - Serial data circuits shorted together between two devices or splice packs, if equipped.
 - Serial data circuits shorted together between a device and a terminating resistor.
 - A shorted terminating resistor.

Testing the Serial Data Circuits for an Open/High Resistance

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Connect the harness connectors at the device that was disconnected.
3. Disconnect the harness connectors with the high speed GMLAN serial data circuits at another device, in the direction of the circuit with the open/high resistance.
4. Test for less than 130 Ω between each pair of the high speed GMLAN serial data circuit terminals at the device connectors that was just disconnected.

- **If each pair of serial data circuits is 130 Ω or less**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is greater than 130 Ω**

5. Repeat step 1 until one of the following conditions are isolated:
 - An open/high resistance on the serial data circuit between two devices or splice packs, if equipped.
 - An open/high resistance on the serial data circuit between a device and a terminating resistor.
 - An open/high resistance terminating resistor.

Testing the Device Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at a high speed GMLAN device that is not communicating. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each of the ground circuit terminals and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. If equipped, verify a test lamp illuminates between each of the B+ circuit terminals and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse. Refer to [Power Mode Mismatch](#).

• **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the B+ circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the disconnected device.

• **Go to next step: If the test lamp illuminates**

4. Ignition ON/Vehicle In Service Mode.

5. If equipped, verify a test lamp illuminates between each of the ignition circuit terminals, which has a fuse in the circuit, and ground.

• **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse. Refer to [Power Mode Mismatch](#).

• **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the disconnected device.

• **Go to next step: If the test lamp illuminates**

6. If equipped, verify a test lamp illuminates between each of the ignition circuit terminals, which is controlled by a control module, and ground.

• **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit and all devices that share the same ignition circuit.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- Go to next step: If infinite resistance

3. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- Go to next step: If less than 2 Ω

4. Reconnect the control module that controls the ignition circuit, ignition ON/Vehicle In Service Mode.

5. Verify a test lamp illuminates between the ignition circuit terminal and ground.

- If the test lamp does not illuminate, replace the control module that controls the ignition circuit.
- Go to next step: If the test lamp illuminates

6. Ignition/Vehicle OFF, reconnect the first device that shares the same ignition circuit, ignition ON/Vehicle In Service Mode.

7. Verify a test lamp illuminates between the ignition circuit terminal and ground.

- If the test lamp does not illuminate, replace the device that was just connected.

- If the test lamp illuminates and there are more devices to connect, connect the next device and repeat step 6.7 until there are no more devices to connect.

- **Go to next step: If the test lamp illuminates**

7. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

8. If equipped, verify a test lamp illuminates between the serial data communication enable circuit terminal and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
2. Test for less than 2 Ω in the serial data communication enable circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

9. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
10. Disconnect the harness connector at a high speed GMLAN device that is still communicating and closest to the non communicating device.
11. Test for less than 2 Ω in each of the high speed GMLAN serial data circuits end to end between the non communicating device and the device that was just disconnected.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

12. Replace the non communicating device.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: [Diagnostic Repair Verification](#) .

For control module replacement, programming, and setup, refer to [Control Module References](#) .

SCAN TOOL DOES NOT COMMUNICATE WITH LOW SPEED GMLAN DEVICE

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)
- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Low Speed GMLAN Serial Data	1	U0100-U02FF*	1	-
* An open between the X84 Data Link Connector (DLC) and the K56 Serial Data Gateway Module will only affect the communication with the scan tool. 1. No communication with any low speed GMLAN device				

Circuit/System Description

The devices connected to the low speed GMLAN serial data circuits monitor for serial data communications during normal vehicle operation. The serial data is transmitted over a single wire to the appropriate devices. The transmission speed for GMLAN low speed is up to 83.33 kbit/s. Under normal vehicle operating conditions, the speed of the bus is 33.33 kbit/s. The devices toggle the serial data circuit between 0 - 5 V during normal communications. To wake the devices connected to the low speed GMLAN serial data circuit, a voltage wake up pulse of 10 V is sent out. If serial data is lost, devices will set a no communication code against the non-communicating device. A loss of serial data communications DTC does not represent a failure of the device that set it.

Diagnostic Aids

- Sometimes, while diagnosing a specific customer concern or after a repair, you may notice a history U code present. However, there is no associated "current" or "active" status. Loss of communication U codes such as these can set for a variety of reasons. Many times, they are transparent to the vehicle operator and technician, and/or have no associated symptoms. Eventually, they will erase themselves automatically after a number of fault-free ignition cycles. This condition would most likely be attributed to one of these scenarios:
 - A device on the data communication circuit was disconnected while the communication circuit is awake.
 - Power to one or more devices was interrupted during diagnosis
 - A low battery condition was present, so some devices stop communicating when battery voltage drops below a certain threshold.
 - Battery power was restored to the vehicle and devices on the communication circuit did not all re-initialize at the same time.
 - If a loss of communication U code appears in history for no apparent reason, it is most likely associated with one of the scenarios above. These are all temporary conditions and should never be interpreted as an intermittent fault, causing you to replace a part.
- Do not replace a device reporting a U code. The U code identifies which device needs to be diagnosed for a communication issue.
- Communication may be available between the device and the scan tool with the low speed GMLAN serial data system inoperative. This condition is due to the device using both the high and low speed GMLAN systems.
- An open in the low speed GMLAN serial data circuit between the splice pack and a device will only affect that specific device. This type of failure will set a loss of communication DTC for each device affected, and the other devices will still communicate.
- An open in the X84 Data Link Connector ground circuit terminal 5 will allow the scan tool to operate but not communicate with the vehicle.
- The engine may not start when there is a total malfunction of the low speed GMLAN serial data circuit.
- Technicians may find various Local Area Network (LAN) communication Diagnostic Trouble Codes (DTC) and no low speed LAN communications with the scan tool.
- These conditions may be caused by the installation of an aftermarket navigation radio device (see bulletins). Some customers may comment of one or more of the following concerns:
 - Vehicle will not crank
 - Vehicle cranks but will not start

- Vehicle stability enhancement system warning lights and messages
- PRNDL gear indicator position errors
- Some devices may not have internal protection for specific voltage outputs and may open a battery positive voltage or ignition voltage source fuse. If a voltage input fuse is open and no short is found in that circuit, ensure that no device output voltage circuit is shorted to ground before replacing the device.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that the scan tool is communicating with vehicle.
 - **If the scan tool is not communicating with vehicle**
 Refer to [Scan Tool Does Not Communicate with Vehicle.](#)
 - **Go to next step: If the scan tool is communicating with vehicle**
3. Attempt to communicate with all devices on the low speed GMLAN bus. Refer to [Data Link References](#) to determine how many devices should be communicating on the low speed GMLAN bus.
4. Verify two or more devices are not communicating on the low speed GMLAN bus.
 - **If only one device is not communicating**
 Refer to Circuit/System Testing - Testing the Device Circuits.
 - **Go to next step: If two or more devices are not communicating**
5. Ignition/Vehicle OFF, disconnect the scan tool from the X84 Data Link Connector. The following tests will be done at the X84 Data Link Connector.
6. Ignition ON/Vehicle In Service Mode.
7. Test for less than 4.5 V between the serial data circuit terminal 1 and ground.
 - **If 4.5 V or greater**

Repair the short to voltage in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

9. Test for greater than 100 Ω between the serial data circuit terminal 1 and ground.

- **If 100 Ω or less**

Repair the short to ground in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If greater than 100 Ω**

10. Test for less than infinite resistance between the serial data circuit terminal 1 and ground.

- **If infinite resistance**

Repair the open/high resistance in the serial data circuit between the X84 Data Link Connector and the K56 Serial Data Gateway Module.

- **Go to next step: If less than infinite resistance**

11. Refer to Circuit/System Testing - Serial Data Starting Point.

Circuit/System Testing

NOTE: Each device may need to be disconnected to isolate a circuit fault. Use the schematics and connector end views to identify the following:

- All low speed GMLAN devices the vehicle is equipped with
- Low speed GMLAN device and splice (or splice pack) locations on the low speed GMLAN serial data circuit
- The low speed GMLAN serial data circuit terminals for each device or splice pack

Serial Data Starting Point

1. Ignition/Vehicle OFF, disconnect the harness connectors at the K56 Serial Data Gateway Module.

2. Ignition ON/Vehicle In Service Mode.

3. Test for less than 4.5 V between each of the low speed GMLAN serial data circuit terminals (circuit number 5060) and ground.

- **If 4.5 V or greater**

Refer to Testing the Serial Data Circuits for a Short to Voltage.

- **Go to next step: If less than 4.5 V**

4. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

5. Test for greater than 100 Ω between each of the low speed GMLAN serial data circuit terminals and ground.

- **If 100 Ω or less**

Refer to Testing the Serial Data Circuits for a Short to Ground.

- **Go to next step: If greater than 100 Ω**

6. Refer to Testing the Serial Data Circuits for an Open/High Resistance.

Testing the Serial Data Circuits for a Short to Voltage

1. Ignition/Vehicle OFF, cut the appropriate harness at a low speed GMLAN serial data splice closest to the K56 Serial Data Gateway Module, at least 40 mm (1.57 in) from the splice. Do not cut the wires right at the splice because these wires need to be repaired after the test is done.
2. Ignition ON/Vehicle In Service Mode.
3. Test for less than 4.5 V between each of the low speed GMLAN serial data circuits at the splice and ground.
 - **If any serial data circuit is 4.5 V or greater**
 1. Ignition/Vehicle OFF, repair all serial data circuits at the tested splice except the faulted serial data circuit, ignition ON/Vehicle In Service Mode.
 2. Verify the low speed GMLAN devices that are still not communicating to identify the faulted serial data circuit.
 3. Ignition/Vehicle OFF, disconnect all devices on the faulted serial data circuit, ignition ON/Vehicle In Service Mode.
 4. Test for less than 1 V between each section of the faulted serial data circuit and ground.
 - If 1 V or greater, repair the short to voltage in the serial data circuit.
 - Go to next step: If less than 1 V
 5. Ignition/Vehicle OFF, repair the faulted serial data circuit to the splice and connect the first device on the faulted serial data circuit, ignition ON/Vehicle In Service Mode.
 6. Verify the scan tool communicates or not with the low speed GMLAN serial data circuit.
 - If the scan tool does not communicate, replace the device that was just connected.
 - If the scan tool communicates and there are more devices to connect, connect the next device and repeat step 3.6.
 - Go to next step: If the scan tool communicates and there are no more devices to connect
 7. All OK.
 - **Go to next step: If all serial data circuits are less than 4.5 V**
4. Inspect all low speed GMLAN splices for damage.

Testing the Serial Data Circuits for a Short to Ground

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down. Cut the appropriate harness at a low speed GMLAN serial data splice closest to the K56 Serial Data Gateway Module, at least 40 mm (1.57 in) from the splice. Do not cut the wires right at the splice because these wires need to be repaired after the test is done.
2. Test for greater than 100 Ω between each of the low speed GMLAN serial data circuits at the splice and ground.
 - **If any serial data circuit is 100 Ω or less**
 1. Repair all serial data circuits at the tested splice except the faulted serial data circuit, ignition ON/Vehicle In Service Mode.
 2. Verify the low speed GMLAN devices that are still not communicating to identify the faulted serial data circuit.
 3. Ignition/Vehicle OFF, disconnect all devices on the faulted serial data circuit.
 4. Test for infinite resistance between each section of the faulted serial data circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - Go to next step: If infinite resistance
 5. Repair the faulted serial data circuit to the splice and connect the first device on the faulted serial data circuit, ignition ON/Vehicle In Service Mode.
 6. Verify the scan tool communicates or not with the low speed GMLAN serial data circuit.

- If the scan tool does not communicate, replace the device that was just connected.
- If the scan tool communicates and there are more devices to connect, connect the next device and repeat step 2.6.
- Go to next step: If the scan tool communicates and there are no more devices to connect

7. All OK.

- **Go to next step: If each serial data circuit is greater than 100 Ω**

3. Inspect all low speed GMLAN splices for damage.

Testing the Serial Data Circuit for an Open/High Resistance

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Disconnect the harness connectors at the low speed GMLAN device that is not communicating and closest to the K56 Serial Data Gateway Module.
3. Disconnect the harness connectors at the K56 Serial Data Gateway Module.
4. Test for less than 2 Ω in each of the low speed GMLAN serial data circuits (circuit number 5060) end to end between the non-communicating device and the K56 Serial Data Gateway Module.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

5. Inspect all low speed GMLAN splices for damage.
6. Replace the non-communicating device that was disconnected.
7. Reconnect the harness connectors at the K56 Serial Data Gateway Module.
8. Ignition ON/Vehicle In Service Mode.
9. Verify that all low speed GMLAN devices are communicating.

- **If the devices are not communicating**

Replace the K56 Serial Data Gateway Module.

- **Go to next step: If the devices are communicating**

10. All OK.

Testing the Device Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the low speed GMLAN device that is not communicating. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each of the ground circuit terminals at the device that was just disconnected and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. If equipped, verify a test lamp illuminates between each of the B+ circuit terminals and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
- If less than $2\ \Omega$, verify the fuse is not open and there is voltage at the fuse. Refer to [Power Mode Mismatch](#).
- **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.
- **Go to next step: If the test lamp illuminates**
- 4. Ignition ON/Vehicle In Service Mode.
- 5. If equipped, verify a test lamp illuminates between each of the ignition circuit terminals, which has a fuse in the circuit, and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than $2\ \Omega$ in the ignition circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - If less than $2\ \Omega$, verify the fuse is OK and there is voltage at the fuse. Refer to [Power Mode Mismatch](#).
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.
 - **Go to next step: If the test lamp illuminates**
- 6. If equipped, verify a test lamp illuminates between each of the ignition circuit terminals, which is controlled by a control module, and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit and all devices that share the same ignition circuit.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: If infinite resistance
 3. Test for less than $2\ \Omega$ in the ignition circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - Go to next step: If less than $2\ \Omega$
 4. Reconnect the control module that controls the ignition circuit, ignition ON/Vehicle In Service Mode.
 5. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the control module that controls the ignition circuit.
 - Go to next step: If the test lamp illuminates
 6. Ignition/Vehicle OFF, reconnect the first device that shares the same ignition circuit, ignition ON/Vehicle In Service Mode.
 7. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the device that was just connected.
 - If the test lamp illuminates and there are more devices to connect, connect the next device and repeat step 6.7 until there are no more devices to connect.

- **Go to next step: If the test lamp illuminates**

7. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K56 Serial Data Gateway Module. It may take up to 10 min for all vehicle systems to power down.
8. Test for less than 2 Ω in each of the low speed GMLAN serial data circuits end to end between the non communicating device and the K56 Serial Data Gateway Module.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

9. Replace the non communicating device that was disconnected.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: [Diagnostic Repair Verification](#) .

For control module replacement, programming, and setup, refer to [Control Module References](#) .

SCAN TOOL DOES NOT COMMUNICATE WITH VEHICLE

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	1	1	-	-
Ignition	1	1	-	-
High Speed GMLAN Serial Data (+)	1	1	1	-
High Speed GMLAN Serial Data (-)	1	1	1	-
Object High Speed GMLAN Serial Data (+)	1	1	1	-
Object High Speed GMLAN Serial Data (-)	1	1	1	-
Chassis High Speed GMLAN Serial Data (+)	1	1	1	-
Chassis High Speed GMLAN Serial Data (-)	1	1	1	-
Low Speed GMLAN Serial Data	1	1	1	-
Ground	-	1	-	-
Ground (X84 Data Link Connector terminal 5)	-	1	-	-
1. No communication with the vehicle.				

Circuit/System Description

The K56 Serial Data Gateway Module is used to handle communications between multiple GMLAN busses and functions as a gateway to isolate the secure networks from the unsecured networks. When the K56 Serial

Data Gateway Module is not communicating, the scan tool can not communicate with the vehicle.

Diagnostic Aids

- An open in the X84 Data Link Connector ground circuit terminal 5 will allow the scan tool to operate but not communicate with the vehicle.
- Some devices may not have internal protection for specific voltage outputs and may open a battery positive voltage or ignition voltage source fuse. If a voltage input fuse is open and no short is found in that circuit, ensure that no device output voltage circuit is shorted to ground before replacing the device.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[Master Electrical Component List](#) , or [Inline Harness Connector End Views - Index](#) or [Component Connector End Views - Index](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 5 at the X84 Data Link Connector and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. Verify that the scan tool is communicating with vehicle.
 - **If the scan tool is not communicating with vehicle**

Refer to Circuit/System Testing.
 - **Go to next step: If the scan tool is communicating with vehicle**

5. All OK.

Circuit/System Testing

NOTE: Use the schematics and connector end views to identify the device's ground, B+, ignition, serial data communication enable, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K56 Serial Data Gateway Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K56 Serial Data Gateway Module.
 - **Go to next step: If the test lamp illuminates**
4. Ignition ON/Vehicle In Service Mode.
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which has a fuse in the circuit, and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K56 Serial Data Gateway Module.
 - **Go to next step: If the test lamp illuminates**
6. Verify a test lamp illuminates between the serial data communication enable circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the serial data communication enable circuit end to end.

- If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
- If less than $2\ \Omega$, replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

7. Test for less than 4.5 V between each GMLAN serial data circuit terminal listed below and ground:

- Terminal 13 X1
- Terminal 14 X1
- Terminal 15 X1
- Terminal 16 X1
- Terminal 17 X1
- Terminal 18 X1
- Terminal 26 X1
- **If 4.5 V or greater**

Repair the short to voltage in the serial data circuit.

- **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

9. Test for infinite resistance between each GMLAN serial data circuit terminal listed below and ground:

- Terminal 13 X1
- Terminal 14 X1
- Terminal 15 X1
- Terminal 16 X1
- Terminal 17 X1
- Terminal 18 X1
- Terminal 26 X1
- **If less than infinite resistance**

Repair the short to ground in the serial data circuit.

- **Go to next step: If infinite resistance**

10. Test for infinite resistance between each pair of the GMLAN serial data circuit terminals listed below and ground:

- Terminals 13 X1 and 14 X1
- Terminals 15 X1 and 16 X1
- Terminals 17 X1 and 18 X1
- **If less than infinite resistance**

Repair the short together in the serial data circuits.

- **Go to next step: If infinite resistance**

11. Test for less than $2\ \Omega$ in each GMLAN serial data circuit end to end between the K56 Serial Data Gateway Module and the X84 Data Link Connector.

- **If $2\ \Omega$ or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than $2\ \Omega$**

12. Replace the K56 Serial Data Gateway Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for device replacement, programming and setup

DATA LINK REFERENCES

This table identifies which serial data link that a particular device uses for in-vehicle data transmission. Some devices may use more than one data link to communicate. Some devices may have multiple communication circuits passing through them without actively communicating on that data link. This table is used to assist in correcting a communication malfunction. Not all devices listed will be applicable to all vehicles. Refer to the schematics to determine which devices apply. For the description and operation of these serial data communication circuits, refer to [Data Link Communications Description and Operation](#).

Code	Device	Data Link Type	Diagnostic Procedure
Schematic Reference: Data Communication Wiring Schematics			
A11	Radio	- Gateway Isolated High Speed GMLAN - Gateway Isolated Low Speed GMLAN - Ethernet Bus	Scan Tool Does Not Communicate with Gateway Isolated High Speed GMLAN Device Scan Tool Does Not Communicate with Gateway Isolated Low Speed GMLAN Device DTC U18AF-U18B4
A26	HVAC Controls	- Low Speed GMLAN - Local Interconnect Network (LIN)	Scan Tool Does Not Communicate with Low Speed GMLAN Device DTC U1500-U15FF
B136	Exhaust Particulate Matter Sensor	Powertrain NOX Bus (LWN)	DTC U0076
B174W	Frontview Camera - Windshield	Low Speed GMLAN	Scan Tool Does Not Communicate with Low Speed GMLAN Device
B195A	Nitrogen Oxides Sensor 1	Powertrain NOX Bus (LWN)	DTC U0076
B195B	Nitrogen Oxides Sensor 2	Powertrain NOX Bus (LWN)	DTC U0076
G10	Cooling Fan Motor	Local Interconnect Network (LIN)	DTC U1500-U15FF
K9	Body Control Module	- High Speed GMLAN - Low Speed GMLAN - Local Interconnect Network (LIN)	Scan Tool Does Not Communicate with High Speed GMLAN Device Scan Tool Does Not Communicate with Low Speed GMLAN Device DTC U1500-U15FF
K17	Electronic Brake Control Module	- High Speed GMLAN - Chassis High Speed GMLAN	Scan Tool Does Not Communicate with High Speed GMLAN Device Scan Tool Does Not Communicate with

Code	Device	Data Link Type	Diagnostic Procedure
Schematic Reference: Data Communication Wiring Schematics			
			Chassis High Speed GMLAN Device
K20	Engine Control Module	• High Speed GMLAN • Powertrain Expansion Bus (LCV/LGZ) • Powertrain NOX Bus (LWN) • Local Interconnect Network (LIN)	• Scan Tool Does Not Communicate with High Speed GMLAN Device • DTC U0074 • DTC U0076 • DTC U1500-U15FF
K29	Seat Heating Control Module	Local Interconnect Network (LIN)	DTC U1500-U15FF
K33	HVAC Control Module	• Low Speed GMLAN • Local Interconnect Network (LIN)	• Scan Tool Does Not Communicate with Low Speed GMLAN Device • DTC U1500-U15FF
K36	Inflatable Restraint Sensing and Diagnostic Module	• Low Speed GMLAN • Chassis High Speed GMLAN	• Scan Tool Does Not Communicate with Low Speed GMLAN Device • Scan Tool Does Not Communicate with Chassis High Speed GMLAN Device
K38A	Chassis Control Module - Auxiliary	• High Speed GMLAN • Local Interconnect Network (LIN)	• Scan Tool Does Not Communicate with High Speed GMLAN Device • DTC U1500-U15FF
K43	Power Steering Control Module	• High Speed GMLAN • Chassis High Speed GMLAN	• Scan Tool Does Not Communicate with High Speed GMLAN Device • Scan Tool Does Not Communicate with Chassis High Speed GMLAN Device
K56	Serial Data Gateway Module	• Gateway Isolated High Speed GMLAN • High Speed GMLAN • Gateway Isolated Low Speed GMLAN • Low Speed GMLAN • Chassis High Speed GMLAN	• Scan Tool Does Not Communicate with Gateway Isolated High Speed GMLAN Device • Scan Tool Does Not Communicate with High Speed GMLAN Device • Scan Tool Does Not Communicate with Gateway Isolated Low Speed GMLAN Device

Code	Device	Data Link Type	Diagnostic Procedure
Schematic Reference: Data Communication Wiring Schematics			
			• Scan Tool Does Not Communicate with Low Speed GMLAN Device • Scan Tool Does Not Communicate with Chassis High Speed GMLAN Device
K69	Transfer Case Control Module	High Speed GMLAN	Scan Tool Does Not Communicate with High Speed GMLAN Device
K71 / Q8	Transmission Control Module / Control Solenoid Valve Assembly	High Speed GMLAN	Scan Tool Does Not Communicate with High Speed GMLAN Device
K73	Telematics Communication Interface Control Module	• Gateway Isolated High Speed GMLAN • Gateway Isolated Low Speed GMLAN • Ethernet Bus	• Scan Tool Does Not Communicate with Gateway Isolated High Speed GMLAN Device • Scan Tool Does Not Communicate with Gateway Isolated Low Speed GMLAN Device • DTC U18AF-U18B4
K85	Passenger Presence Module	Low Speed GMLAN	Scan Tool Does Not Communicate with Low Speed GMLAN Device
K89	Immobilizer Control Module	Local Interconnect Network (LIN)	DTC U1500-U15FF
K111	Fuel Pump Driver Control Module	Powertrain Expansion Bus (LCV/LGZ)	DTC U0074
K115	Reductant Control Module	Powertrain NOX Bus (LWN)	DTC U0076
K133	Trailer Brake Power Control Module	Local Interconnect Network (LIN)	DTC U1500-U15FF
K182	Parking Assist Control Module	Low Speed GMLAN	Scan Tool Does Not Communicate with Low Speed GMLAN Device
M74D	Window Motor - Driver	Local Interconnect Network (LIN)	DTC U1500-U15FF
M96A	Active Grille Air Shutter 1 Actuator	Local Interconnect Network (LIN)	DTC U1500-U15FF
P2	Transmission Shift Lever Position Indicator	Local Interconnect Network (LIN)	DTC U1500-U15FF
P16	Instrument Cluster	• Gateway Isolated Low Speed GMLAN • Ethernet Bus • Local Interconnect Network (LIN)	• DTC U007D • DTC U18AF-U18B4 • DTC U1500-U15FF
S32D	Seat Heating Switch - Driver	Local Interconnect Network (LIN)	DTC U1500-U15FF

Code	Device	Data Link Type	Diagnostic Procedure
Schematic Reference: Data Communication Wiring Schematics			
S32P	Seat Heating Switch - Passenger	Local Interconnect Network (LIN)	DTC U1500-U15FF
S70R	Steering Wheel Controls Switch - Right	Local Interconnect Network (LIN)	DTC U1500-U15FF
S79D	Window Switch - Driver	Local Interconnect Network (LIN)	DTC U1500-U15FF
S79LR	Window Switch - Left Rear	Local Interconnect Network (LIN)	DTC U1500-U15FF
S79P	Window Switch - Passenger	Local Interconnect Network (LIN)	DTC U1500-U15FF
S79RR	Window Switch - Right Rear	Local Interconnect Network (LIN)	DTC U1500-U15FF
T3	Audio Amplifier	- Gateway Isolated Low Speed GMLAN - Ethernet Bus	Scan Tool Does Not Communicate with Gateway Isolated Low Speed GMLAN Device DTC U18AF-U18B4