

GENERIC · NETWORK

U3541

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

U3541

High Voltage System Interlock Circuit O

U3541 is a generic network code indicating that the high-voltage system interlock circuit O has reported a voltage above the expected range, which the vehicle's control modules interpret as a potential safety breach. The interlock is a low-voltage loop that runs through high-voltage connectors and covers; when it is broken or shorted high, the computer detects an abnormal voltage and sets this code to prevent high-voltage exposure.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Network	Generic (all makes)	High	Professional	Network communication

Symptoms you may notice

- The high-voltage system may be disabled, preventing the vehicle from starting or entering ready mode.
- A red high-voltage warning light or service vehicle soon message appears on the dashboard.
- The vehicle may refuse to shift out of park or may limit power output.
- Often no symptoms besides the warning light, especially if the fault is intermittent.
- The high-voltage contactors may open, causing a complete loss of electric drive.
- The 12-volt battery may drain if the interlock fault keeps modules awake.

Common causes, most likely first

- A high-voltage connector that is not fully seated or has a damaged interlock pin.
- Corrosion or water intrusion in a high-voltage connector or junction box.
- A damaged interlock wire harness, often from rodent damage or chafing.
- A faulty high-voltage component cover that is not properly installed, breaking the interlock loop.
- A short to voltage in the interlock circuit, possibly from a pinched wire or failed component.
- A failed high-voltage component (such as the battery pack, inverter, or motor) with an internal interlock fault.
- A software or calibration issue in a control module that misreads the interlock voltage.



How to diagnose and fix it

- 1 Inspect all high-voltage connectors for proper seating, corrosion, and damaged pins, especially those recently serviced.
- 2 Check the interlock circuit wiring for continuity, shorts to voltage, and physical damage along its routing.
- 3 Verify that all high-voltage component covers and service plugs are correctly installed and latched.
- 4 Use a scan tool to monitor interlock circuit voltage and compare it to the manufacturer's specification.
- 5 Disconnect and reconnect each high-voltage connector one at a time to isolate the fault location.
- 6 If the interlock is integrated into a component, test that component's interlock resistance or voltage signal.
- 7 Follow the manufacturer's diagnostic flow chart for U3541, which may involve reprogramming or replacing a module.

Interlock faults that fool good technicians

- A common oversight is a high-voltage service disconnect plug that is not fully latched after maintenance, which breaks the interlock loop and sets U3541 without any visible damage.
The interlock circuit often carries a low-voltage pilot signal, so a short to voltage can be caused by a nearby 12-volt wire chafing against it, not just by high-voltage component failure.
 - Some vehicles set U3541 when the 12-volt battery is weak because the interlock monitoring module misreads voltage thresholds during low-supply conditions.
 - After any high-voltage component replacement, the interlock circuit may need a learn or reset procedure with a scan tool, or the code will persist even with correct hardware.
- A faulty interlock switch inside a high-voltage connector can test fine with a multimeter but fail under vibration, so a wiggle test while monitoring live data is essential.

Can I keep driving with U3541?

Do not drive the vehicle with U3541 present, because the high-voltage system may be disabled or in a safe state that affects steering, braking, or power delivery. Have the vehicle towed to a qualified service facility to avoid potential high-voltage exposure or loss of propulsion.

Tools that help

- Diagnostic scan tool with live data and manufacturer-specific software
- Digital multimeter with high-voltage safety rating
- Insulation tester (megohmmeter) for high-voltage circuit checks
- High-voltage safety gloves and insulated tools
- Wiring diagram and connector pinout reference



Reading U3541

- U** Network: communication between the vehicle's control modules.
- 3** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 5** Network communication.
- 41** The exact fault within that area.

Often seen with

P0A0D High Voltage System Interlock Circuit A High · **P0AA6** Hybrid/EV Battery Voltage System Isolation Fault
 · **U0111** Lost Communication With Battery Energy Control Module 'A' · **U3540** High Voltage System Interlock Circuit N High · **U3542** High Voltage System Interlock Circuit O Performance

See it working

Watch the animated explainer [How Coil-on-Plug Ignition Works: Coil and Spark Plug](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/u3541/>

