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2020 Ford Ranger Service and Repair Manual

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If the PCM (powertrain control module) does not receive messages from other modules within a certain time frame the PCM (powertrain control module) sets a DTC (diagnostic trouble code) for lost communication.

DTC Fault Trigger Conditions

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
PCM (powertrain control module) U0298:00	Lost Communication With DC/DC Converter Control Module 'A': No Sub Type Information	The PCM (powertrain control module) sets this DTC (diagnostic trouble code) if data messages from the DC/DC Converter Control Module through the GWM (gateway module A) are missing.

Possible Sources

- Communications network concern
- DCDC (direct current/direct current converter control module)
- GWM (gateway module A)
- PCM (powertrain control module)

S1 VERIFY THE CUSTOMER CONCERN

- Ignition ON.
- Verify there is an observable symptom present.

Is an observable symptom present?

Yes	GO to S2
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No	The system is operating normally at this time. The DTC (diagnostic trouble code) may have been set due to high network traffic or an intermittent fault condition.
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S2 CHECK THE COMMUNICATION NETWORK

- Using a diagnostic scan tool, perform a network test.

Did the DCDC (direct current/direct current converter control module) pass the network test?

Yes	GO to S3
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- Using a diagnostic scan tool, perform the PCM (powertrain control module) self-test.

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to PCM DTC Chart in this section.
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No	GO to S6
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S6 RECHECK THE PCM (POWERTRAIN CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCs)

NOTE

If new modules were installed prior to the DTC (diagnostic trouble code) being set, the module configuration may be incorrectly set during the PMI (programmable module installation) , or the PMI (programmable module installation) may not have been carried out.

- Using a diagnostic scan tool, clear the Diagnostic Trouble Codes (DTCs).
- Wait 10 seconds.
- Repeat the PCM (powertrain control module) self-test.

Is DTC (diagnostic trouble code) U0298 still present?

Yes	GO to S7
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No	The system is operating correctly at this time. The DTC (diagnostic trouble code) may have been set due to high network traffic or an intermittent fault condition.
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S7 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE

If new modules were installed prior to the DTC (diagnostic trouble code) being set, the module configuration can be incorrectly set during the PMI (programmable module installation) or the PMI (programmable module installation) may not have been carried out.

- CHECK the vehicle service history for recent service actions related to the , DCDC (direct current/direct current converter control module) , GWM (gateway module A) or PCM (powertrain control module) . If

No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.
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PINPOINT TEST T : U0404, U0405, U0415, U0422, U0423, U0554, U1010, U1011, U1012, U1022

Normal Operation and Fault Conditions

If the PCM (powertrain control module) does not receive messages from other modules within a certain time frame the PCM (powertrain control module) sets a DTC (diagnostic trouble code) for invalid data.

DTC Fault Trigger Conditions

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
PCM (powertrain control module) U0404:00	Invalid Data Received from Gear Shift Control Module A: No Sub Type Information	The PCM (powertrain control module) sets this DTC (diagnostic trouble code) when the PCM (powertrain control module) receives invalid network data from the GSM (gear shift module) .
PCM (powertrain control module) U0405:00	Invalid Data Received From Cruise Control Module: No Sub Type Information	The PCM (powertrain control module) sets this DTC (diagnostic trouble code) when the PCM (powertrain control module) receives invalid network data from the CCM (cruise control module) .
PCM (powertrain control module) U0412:00	Invalid Data Received From Battery Energy Control Module 'A': No Sub Type Information	The PCM (powertrain control module) sets this DTC (diagnostic trouble code) when the PCM (powertrain control module) receives invalid network data from the BECM (battery energy control module) .
PCM (powertrain control module) U0415:00	Invalid Data Received from Anti-Lock Brake System (ABS) Control Module 'A': No Sub Type Information	The PCM (powertrain control module) sets this DTC (diagnostic trouble code) when the PCM (powertrain control module) receives invalid network data from the ABS (anti-lock brake system) module.
PCM (powertrain control module)	Invalid Data Received from Brake System Control Module 'A': No Sub	The PCM (powertrain control module) sets this DTC (diagnostic trouble code) when the PCM

PCM (powertrain control module) U1011:00	Invalid Internal Control Module Monitoring Data Received from ECM/PCM: No Sub Type Information	The PCM (powertrain control module) sets this DTC (diagnostic trouble code) when the PCM (powertrain control module) receives invalid network data from the PCM (powertrain control module) .
PCM (powertrain control module) U1012:00	Invalid Internal Control Module Monitoring Data Received from Anti-Lock Brake System (ABS) Control Module: No Sub Type Information	The PCM (powertrain control module) sets this DTC (diagnostic trouble code) when the PCM (powertrain control module) receives invalid network data from the ABS (anti-lock brake system) module.
PCM (powertrain control module) U1022:00	Invalid Internal Control Module Monitoring Data Received from Body Control Module: No Sub Type Information	The PCM (powertrain control module) sets this DTC (diagnostic trouble code) when the PCM (powertrain control module) receives invalid network data from the BCM (body control module) .

Possible Sources

- Suspect Module

T1 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCs) FROM THE MODULE SENDING INVALID DATA

- Using a diagnostic scan tool, carry out the self-test for the module in question sending the invalid data.

Are any Diagnostic Trouble Codes (DTCs) present from the module sending the invalid data?

Yes	DIAGNOSE the module sending the invalid data. REFER to the appropriate section in the Workshop Manual.
No	DIAGNOSE the observable symptom.

PINPOINT TEST U : U3003

Refer to Wiring Diagrams Cell 24 for schematic and connector information.

Normal Operation and Fault Conditions The PCM (powertrain control module) receives voltage at all times from the BJB (battery junction box) . **DTC Fault Trigger Conditions**

No	GO to U3
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U3 CHECK THE BATTERY CONDITION AND STATE OF CHARGE

- Check the battery condition and verify the battery is fully charged.
REFER to: [Battery](#)(414-01 Battery, Mounting and Cables, Diagnosis and Testing).

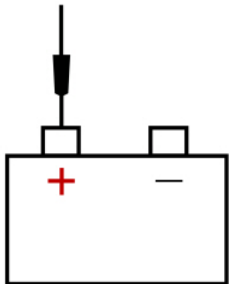

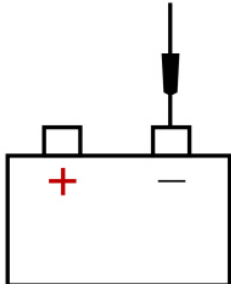
Is the battery OK and fully charged?

Yes	GO to U4
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No	<p>If the battery is discharged, DIAGNOSE the cause of the low battery condition. REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (BM) (414-00 Charging System - General Information, Diagnosis and Testing).</p> <p>If the battery condition fails, INSTALL a new battery. REFER to: Battery (414-01 Battery, Mounting and Cables, Removal and Installation).</p>
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U4 COMPARE THE PCM (POWERTRAIN CONTROL MODULE) BATT_V_INF (V) PID (PARAMETER IDENTIFICATION) WITH THE ACTUAL BATTERY VOLTAGE

- Start the engine.
- Turn on accessories (climate control blower on high speed, exterior lights).
- With the engine running at idle, measure and record battery voltage:

Positive Lead	Measurement / Action	Negative Lead
		

Yes	GO to U6
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No	REPAIR the circuit in question for high resistance.
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U6 CHECK THE PCM (POWERTRAIN CONTROL MODULE) GROUNDS

- Ignition OFF.
- Removed the fused jumper.
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C175B-46	Ω	Ground
C175B-47	Ω	Ground
C175B-61	Ω	Ground
C175B-62	Ω	Ground
C175B-76	Ω	Ground
C175B-77	Ω	Ground

Are the resistances less than 3 ohms?

Yes	GO to U7
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DTC (diagnostic trouble code)	Description	Fault Trigger Condition
PCM (powertrain control module) P0521:00	Engine Oil Pressure Sensor/Switch 'A' Circuit Range/Performance: No Sub Type Information	This DTC (diagnostic trouble code) sets when the PCM (powertrain control module) detects signal variation outside of the module parameters on the hardwired input from the engine oil pressure sensor.
PCM (powertrain control module) P0524:00	Engine Oil Pressure Too Low: No Sub Type Information	This DTC (diagnostic trouble code) sets when the PCM (powertrain control module) detects low engine oil pressure.
PCM (powertrain control module) P06DD:00	Engine Oil Pressure Control Circuit Performance/Stuck Off: No Sub Type Information	This DTC (diagnostic trouble code) sets when the PCM (powertrain control module) detects the engine oil pressure control solenoid valve is stuck off.
PCM (powertrain control module) P06DE:00	Engine Oil Pressure Control Circuit Stuck On: No Sub Type Information	This DTC (diagnostic trouble code) sets when the PCM (powertrain control module) detects the engine oil pressure control solenoid valve is stuck on.

Possible Sources

- Communications network concern
- Wiring, terminals or connectors
- Internal or external engine oil leak
- Low engine oil level
- Low engine oil pressure
- EOP (engine oil pressure) sensor
- Engine oil pressure control solenoid valve
- PCM (powertrain control module)

V1 CHECK THE PCM (POWERTRAIN CONTROL MODULE) FOR DIAGNOSTIC TROUBLE CODES (DTCs)

- Using a diagnostic scan tool, retrieve all PCM (powertrain control module) diagnostic trouble codes (DTCs)

Are there any PCM (powertrain control module) diagnostic trouble codes (DTCs) present?

Yes	If diagnostic trouble codes (DTCs) P0521, P0524, P06DD or P06DE are present GO to V2
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No

VISUALLY CHECK the wiring harness and electrical connector for signs of damage. REPAIR as necessary. If there on no signs of damage, INSTALL a new engine oil pressure sensor.
REFER to: [Engine Oil Pressure \(EOP\) Sensor](#)
(303-14E Electronic Engine Controls - 3.5L V6 PowerBoost (CN), Removal and Installation).

V4 CHECK THE ENGINE OIL PRESSURE AT IDLE

- Start the engine.
- Run the engine at idle for 2 minutes.
- Using the diagnostic scan tool, view PCM (powertrain control module) Parameter Identifications (PIDs).
- Access the PCM (powertrain control module) and monitor the ECT (Engine Coolant Temperature) (Deg C) PID (parameter identification) until the engine coolant temperature is equal or greater than 157.9 °F (70 °C).
- Access the PCM (powertrain control module) and monitor the EOPDC_CMD (Engine Oil Pressure Control Duty Cycle - Commanded) (% Duty Cycle) PID (parameter identification) Wait until the PID (parameter identification) display is greater than 60% DC (oil pump commanded low).
- Access the PCM (powertrain control module) and monitor the EOP_PRESS (Engine Oil Pressure) (kPa) PID (parameter identification)

Is the PID (parameter identification) equal or greater than 8.7 psi (60 kPa)?

Yes

GO to [V6](#)

No

GO to [V5](#)

V5 CARRY OUT THE VARIABLE OIL PRESSURE ACTUATOR UNBLOCK SEQUENCE AND RECHECK THE OIL PRESSURE

- Access the PCM (powertrain control module) and control the EOPDC_CMD (Engine Oil Pressure Control Duty Cycle - Commanded) (% Duty Cycle) PID (parameter identification)
- Command the PID (parameter identification) from MIN to MAX. Wait 15 seconds. Repeat this step 3 times waiting 15 seconds between steps.
- Access the PCM (powertrain control module) and monitor the EOP_PRESS (Engine Oil Pressure) (kPa) PID (parameter identification)

Is the EOP_PRESS PID (parameter identification) display equal or greater than 8.7 psi (60 kPa)?

- Access the PCM (powertrain control module) and monitor the EOP_PRESS (Engine Oil Pressure) (kPa) PID (parameter identification)

Is the EOP_PRESS PID (parameter identification) display equal or greater than 31.2 psi (215 kPa)?

Yes	GO to V8
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No	CHECK the oil pressure using a mechanical gauge. REFER to: Engine - Flex Fuel – Ethanol/Full Hybrid Electric Vehicle (FHEV)/Gasoline (303-00 Engine System - General Information, Diagnosis and Testing) .
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V8 CLEAR AND CHECK THE PCM (POWERTRAIN CONTROL MODULE) FOR DIAGNOSTIC TROUBLE CODES (DTCs)

- Using a diagnostic scan tool, clear all history PCM (powertrain control module) diagnostic trouble codes (DTCs)
- Ignition ON.
 - Wait 20 seconds.
- Start the engine and run at idle for 30 seconds.
- Hold the accelerator WOT (wide open throttle) for 30 seconds.
- Using a diagnostic scan tool, retrieve all PCM (powertrain control module) diagnostic trouble codes (DTCs).

Are there any PCM (powertrain control module) diagnostic trouble codes (DTCs) present?

Yes	CHECK the oil pressure using a mechanical gauge. REFER to: Engine - Flex Fuel – Ethanol/Full Hybrid Electric Vehicle (FHEV)/Gasoline (303-00 Engine System - General Information, Diagnosis and Testing) .
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No	The oil pressure concern is not present. The concern may have been resolved by carrying out the unblock sequence.
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PINPOINT TEST W : P06DA, P06DB, P06DC

Refer to Wiring Diagrams Cell 24 for schematic and connector information.

Normal Operation and Fault Conditions Refer to the DTC (diagnostic trouble code) Fault Trigger Conditions. **DTC Fault Trigger Conditions**