Electronic Engine Controls

DTC Chart: Powertrain Control Module (PCM)

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.
REFER to: Diagnostic Methods (100-00 General Information, Description and Operation).

Powertrain Control Module (PCM) DTC Chart

DTC	Description	Action **New:** *hover over Pinpoint Test links to show title*
P0128	Coolant Thermostat (Coolant Temp Below Thermostat Regulating Temperature)	REFER to: Engine Cooling (303-03B Engine Cooling - 6.7L Power Stroke Diesel, Diagnosis and Testing).
P0195	Engine Oil Temperature Sensor "A" Circuit	GO to Pinpoint Test H
P0196	Engine Oil Temperature Sensor "A" Range/Performance	GO to Pinpoint Test H
P0504	Brake Switch A / B Correlation	Without adaptive cruise control, REFER to: Cruise Control (419-03A Cruise Control, Diagnosis and Testing). With adaptive cruise control, REFER to: Cruise Control (419-03B Cruise Control - Vehicles With: Adaptive Cruise Control, Diagnosis and Testing).
P0520	Engine Oil Pressure Sensor/Switch "A" Circuit	GO to Pinpoint Test H
P0521	Engine Oil Pressure Sensor/Switch "A" Circuit Range/Performance	GO to Pinpoint Test H
P0524	Engine Oil Pressure Too Low	GO to Pinpoint Test H
P0532	A/C Refrigerant Pressure Sensor â€œAâ€ Circuit Low	With DATC With EMTC, REFER to: Climate Control System - Vehicles With: Electronic Manual Temperature Control (EMTC) (412-00 Climate Control System - General Information, Diagnosis and Testing).
P0533	A/C Refrigerant Pressure Sensor â€œAâ€ Circuit High	With DATC With EMTC, REFER to: Climate Control System - Vehicles With: Electronic Manual Temperature Control (EMTC) (412-00 Climate Control System - General Information, Diagnosis and Testing).
P0562	System Voltage Low	
P0563	System Voltage High	
P0570	Cruise Control ACCEL Circuit	Without adaptive cruise control, REFER to: Cruise Control (419-03A Cruise Control, Diagnosis and Testing). With adaptive cruise control, REFER to: Cruise Control (419-03B Cruise Control - Vehicles With: Adaptive Cruise Control, Diagnosis and Testing).
P0572	Brake Switch A Circuit Low	Without adaptive cruise control, REFER to: Cruise Control (419-03A Cruise Control, Diagnosis and Testing). With adaptive cruise control, REFER to: Cruise Control (419-03B Cruise Control - Vehicles With: Adaptive Cruise Control, Diagnosis and Testing).
P0573	Brake Switch A Circuit High	Without adaptive cruise control, REFER to: Cruise Control (419-03A Cruise Control, Diagnosis and Testing). With adaptive cruise control, REFER to: Cruise Control (419-03B Cruise Control - Vehicles With: Adaptive Cruise Control, Diagnosis and Testing).

DTC	Description	Action **New:** *hover over Pinpoint Test links to show title*
P0578	Cruise Control Multi-Function Input "A" Circuit Stuck	Without adaptive cruise control, REFER to: Cruise Control (419-03A Cruise Control, Diagnosis and Testing). With adaptive cruise control, REFER to: Cruise Control (419-03B Cruise Control - Vehicles With: Adaptive Cruise Control, Diagnosis and Testing).
P05BB	Restraints Deployed	RESET the event notification system. REFER to: Airbag and Seatbelt Pretensioner Supplemental Restraint System (SRS) - System Operation and Component Description (501-20B Supplemental Restraint System, Description and Operation).
P0620	Generator Control Circuit	
P0625	Generator Field Terminal Circuit Low	
P0626	Generator Field Terminal Circuit High	
P0645	A/C Clutch Relay Control Circuit	With DATC With EMTC, REFER to: Climate Control System - Vehicles With: Electronic Manual Temperature Control (EMTC) (412-00 Climate Control System - General Information, Diagnosis and Testing).
P06A0	Variable A/C Compressor Control Circuit	With DATC With EMTC, REFER to: Climate Control System - Vehicles With: Electronic Manual Temperature Control (EMTC) (412-00 Climate Control System - General Information, Diagnosis and Testing).
P06DA	Engine Oil Pressure Control Circuit/Open	GO to Pinpoint Test I
P06DB	Engine Oil Pressure Control Circuit Low	GO to Pinpoint Test I
P06DC	Engine Oil Pressure Control Circuit High	GO to Pinpoint Test I
P06DD	Engine Oil Pressure Control Circuit Performance/Stuck Off	GO to Pinpoint Test I
P065B	Generator Control Circuit Range/Performance	
P06E9	No engine rotation detected during crank event	REFER to: Starting System (303-06B Starting System - 6.7L Power Stroke Diesel, Diagnosis and Testing).
P0850	Park / Neutral Switch Input Circuit	REFER to: Starting System (303-06B Starting System - 6.7L Power Stroke Diesel, Diagnosis and Testing).
P1397	System Voltage Out Of Self Test Range	
P1501	Vehicle Speed Sensor Out Of Self Test Range	REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control, Diagnosis and Testing).
P1637	CAN Link ECM/ABS Control Module Circuit/Network	REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control, Diagnosis and Testing).
P163A	Generator "B" Control Circuit	
P163B	Generator "B" Field Terminal Circuit	
P163C	Generator "B" Field Terminal Circuit Low	
P163D	Generator "B" Field Terminal Circuit High	
P1942	Invalid Torque Request Data Received From Anti-Lock Brake System (ABS) Control Module	REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control, Diagnosis and Testing).
P2534	Ignition Switch Run/Start Position Circuit Low	REFER to: Starting System (303-06B Starting System - 6.7L Power Stroke Diesel, Diagnosis and Testing).
P2535	Ignition Switch Run/Start Position Circuit High	REFER to: Starting System (303-06B Starting System - 6.7L Power Stroke Diesel, Diagnosis and Testing).

DTC	Description	Action **New:** *hover over Pinpoint Test links to show title*
P2681	Engine Coolant Bypass Valve "A" Control Circuit/Open	REFER to: Transmission Cooling (307-02B Transmission Cooling - 10-Speed Automatic Transmission â€“ 10R140, Diagnosis and Testing).
P2682	Engine Coolant Bypass Valve "A" Control Circuit Low	REFER to: Transmission Cooling (307-02B Transmission Cooling - 10-Speed Automatic Transmission â€“ 10R140, Diagnosis and Testing).
P2683	Engine Coolant Bypass Valve "A" Control Circuit High	REFER to: Transmission Cooling (307-02B Transmission Cooling - 10-Speed Automatic Transmission â€“ 10R140, Diagnosis and Testing).
U0102	Lost Communication with Transfer Case Control Module	GO to Pinpoint Test A
U0121	Lost Communication With Anti-Lock Brake System (ABS) Control Module	GO to Pinpoint Test B
U0235	Lost Communication With Front Distance Range Sensor	GO to Pinpoint Test D
U023A	Lost Communication With Image Processing Module A	GO to Pinpoint Test E
U0151	Lost Communication With Restraints Control Module	GO to Pinpoint Test F
U0212	Lost Communication With Steering Column Control Module	GO to Pinpoint Test C
U0402	Invalid Data Received from TCM	GO to Pinpoint Test G
U0415	Invalid Data Received from Anti-Lock Brake System (ABS) Control Module "A"	GO to Pinpoint Test G
U0426	Invalid Data Received From Vehicle Immobilizer Control Module	GO to Pinpoint Test G
U0600	Lost Communication With Engine Oil Pressure Sensor "A"	GO to Pinpoint Test H
U0667	Lost Communication With Engine Oil Temperature Sensor "A"	GO to Pinpoint Test H
U1012	Invalid Internal Control Module Monitoring Data Received from Anti-Lock Brake System (ABS) Control Module	GO to Pinpoint Test G
U2107	Collision Mitigation By Braking	GO to Pinpoint Test G
All Other DTCs	â€”	Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. Section 3 Symptom Charts.

Pinpoint Tests

PINPOINT TEST A : U0102

Normal Operation and Fault Conditions

REFER to: Communications Network - System Operation and Component Description (418-00 Module Communications Network, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM U0102:00	Lost Communication with Transfer Case Control Module: No Sub Type Information	The PCM sets this DTC if data messages from the TCCM through the GWM are missing.

Possible Sources

- Communications network concern
- TCCM module
- GWM
- PCM

A1 VERIFY THE CUSTOMER CONCERN

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

Is an observable symptom present?

Yes	GO to A2
No	The system is operating normally at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

A2 CHECK THE COMMUNICATION NETWORK

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

Did the ABS module pass the network test?

Yes	GO to A3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

A3 PERFORM TCCM (TRANSFER CASE CONTROL MODULE) CONTROL MODULE SELF-TEST

- Using a diagnostic scan tool, perform a ABS control module self-test.

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	REFER to: Four-Wheel Drive Systems - Electronic Shift (308-07A Four-Wheel Drive Systems, Diagnosis and Testing).
No	GO to A4

A4 CHECK THE GWM (GATEWAY MODULE A) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, retrieve the GWM Diagnostic Trouble Codes (DTCs).

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
No	GO to A5

A5 PERFORM THE PCM (POWERTRAIN CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the PCM self-test.

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

Yes	REFER to PCM DTC Chart in this section.
No	GO to A6

A6 RECHECK THE PCM (POWERTRAIN CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

NOTE: *If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during the PMI, or the PMI may not have been carried out.*

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

Is DTC U0102 still present?

Yes	GO to A7
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

A7 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration can be incorrectly set during the PMI or the PMI may not have been carried out.*

- CHECK the vehicle service history for recent service actions related to the TCCM, GWM or PCM. If recent service history is found:
  - verify correct replacement module was installed
    - HVBOM may be used to verify correct part fitment
  - verify the configuration of replacement module was correct
    - re-configure module using as-built data if prior configuration is suspect
  - verify the module was not obtained from a like vehicle and installed into customer vehicle
    - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to A8
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

A8 CHECK FOR CORRECT ABS (ANTI-LOCK BRAKE SYSTEM) MODULE OPERATION

- Ignition OFF.
- Disconnect and inspect the TCCM control module connector.
- Repair:
  - corrosion (install new connector or terminals â€“ clean module pins)
  - damaged or bent pins â€“ install new terminals/pins
  - pushed-out pins â€“ install new pins as necessary
- Reconnect the ABS control module connector. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new TCCM. REFER to: Transfer Case Control Module (TCCM) (308-07A Four-Wheel Drive Systems, Removal and Installation).
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.

PINPOINT TEST B : U0121

Normal Operation and Fault Conditions

REFER to: Communications Network - System Operation and Component Description (418-00 Module Communications Network, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM U0121:00	Lost Communication With Anti-Lock Brake System (ABS) Control Module "A": No Sub Type Information	The PCM sets this DTC if data messages from the ABS module through the GWM are missing.

Possible Sources

- Communications network concern
- ABS module
- GWM
- PCM

B1 VERIFY THE CUSTOMER CONCERN

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

Is an observable symptom present?

Yes	GO to B2
No	The system is operating normally at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

B2 CHECK THE COMMUNICATION NETWORK

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

Did the ABS module pass the network test?

Yes	GO to B3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

B3 PERFORM ABS (ANTI-LOCK BRAKE SYSTEM) CONTROL MODULE SELF-TEST

- Using a diagnostic scan tool, perform a ABS control module self-test.

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control, Diagnosis and Testing).
No	GO to B4

B4 CHECK THE GWM (GATEWAY MODULE A) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, retrieve the GWM Diagnostic Trouble Codes (DTCs).

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
No	GO to B5

B5 PERFORM THE PCM (POWERTRAIN CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the PCM self-test.

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

Yes	REFER to PCM DTC Chart in this section.
No	GO to B6

B6 RECHECK THE PCM (POWERTRAIN CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

NOTE: *If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during the PMI, or the PMI may not have been carried out.*

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

Is DTC U0121 still present?

Yes	GO to B7
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

B7 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration can be incorrectly set during the PMI or the PMI may not have been carried out.*

- CHECK the vehicle service history for recent service actions related to the ABS, GWM or PCM. If recent service history is found:
  - verify correct replacement module was installed
    - HVBOM may be used to verify correct part fitment
  - verify the configuration of replacement module was correct
    - re-configure module using as-built data if prior configuration is suspect
  - verify the module was not obtained from a like vehicle and installed into customer vehicle
    - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to B8
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

B8 CHECK FOR CORRECT ABS (ANTI-LOCK BRAKE SYSTEM) MODULE OPERATION

- Ignition OFF.
- Disconnect and inspect the ABS control module connector.
- Repair:
  - corrosion (install new connector or terminals â€“ clean module pins)
  - damaged or bent pins â€“ install new terminals/pins
  - pushed-out pins â€“ install new pins as necessary
- Reconnect the ABS control module connector. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new ABS module. REFER to: Anti-Lock Brake System (ABS) Module (206-09 Anti-Lock Brake System (ABS) and Stability Control, Removal and Installation).
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.

PINPOINT TEST C : U0212

Normal Operation and Fault Conditions

REFER to: Communications Network - System Operation and Component Description (418-00 Module Communications Network, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM U0212:00	Lost Communication With Steering Column Control Module: No Sub Type Information	The PCM sets this DTC if data messages from the SCCM through the GWM are missing.

Possible Sources

- Communications network concern
- SCCM
- GWM
- PCM

C1 VERIFY THE CUSTOMER CONCERN

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

Is an observable symptom present?

Yes	GO to C2
No	The system is operating normally at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

C2 CHECK THE COMMUNICATION NETWORK

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

Did the SCCM module pass the network test?

Yes	GO to C3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

C3 PERFORM SCCM (STEERING COLUMN CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform a SCCM self-test.

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	REFER to: Steering Wheel and Column Electrical Components (211-05 Steering Wheel and Column Electrical Components, Diagnosis and Testing).
No	GO to C4

C4 CHECK THE GWM (GATEWAY MODULE A) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, retrieve the GWM Diagnostic Trouble Codes (DTCs).

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
No	GO to C5

C5 PERFORM THE PCM (POWERTRAIN CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the PCM self-test.

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

Yes	REFER to PCM DTC Chart in this section.
No	GO to C6

C6 RECHECK THE PCM (POWERTRAIN CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

NOTE: *If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during the PMI, or the PMI may not have been carried out.*

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

Is DTC U0126 or U0212 still present?

Yes	GO to C7
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

C7 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration can be incorrectly set during the PMI or the PMI may not have been carried out.*

- CHECK the vehicle service history for recent service actions related to the SCCM, GWM or PCM. If recent service history is found:
  - verify correct replacement module was installed
    - HVBOM may be used to verify correct part fitment
  - verify the configuration of replacement module was correct
    - re-configure module using as-built data if prior configuration is suspect
  - verify the module was not obtained from a like vehicle and installed into customer vehicle
    - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to C8
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

C8 CHECK FOR CORRECT SCCM (STEERING COLUMN CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect the SCCM connector(s).
- Repair:
  - corrosion (install new connector or terminals â€“ clean module pins)
  - damaged or bent pins â€“ install new terminals/pins
  - pushed-out pins â€“ install new pins as necessary
- Reconnect the SCCM connector(s). Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new SCCM. REFER to: Steering Column Control Module (SCCM) (211-05 Steering Wheel and Column Electrical Components, Removal and Installation).
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.

PINPOINT TEST D : U0235

Normal Operation and Fault Conditions

REFER to: Communications Network - System Operation and Component Description (418-00 Module Communications Network, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM U0235:00	Lost Communication With Front Distance Range Sensor: No Sub Type Information	The PCM sets this DTC if data messages from the front distance range sensor through the GWM are missing.

Possible Sources

- Communications network concern
- CCM
- GWM
- PCM

D1 VERIFY THE CUSTOMER CONCERN

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

Is an observable symptom present?

Yes	GO to D2
No	The system is operating normally at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

D2 CHECK THE COMMUNICATION NETWORK

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

Did the CCM pass the network test?

Yes	GO to D3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

D3 PERFORM CCM (CRUISE CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform a CCM self-test.

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	REFER to: Cruise Control (419-03B Cruise Control - Vehicles With: Adaptive Cruise Control, Diagnosis and Testing).
No	GO to D4

D4 CHECK THE GWM (GATEWAY MODULE A) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, retrieve the GWM Diagnostic Trouble Codes (DTCs).

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
No	GO to D5

D5 PERFORM THE PCM (POWERTRAIN CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the PCM self-test.

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

Yes	REFER to PCM DTC Chart in this section.
No	GO to D6

D6 RECHECK THE PCM (POWERTRAIN CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

NOTE: *If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during the PMI, or the PMI may not have been carried out.*

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

Is DTC U0235 still present?

Yes	GO to D7
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

D7 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration can be incorrectly set during the PMI or the PMI may not have been carried out.*

- CHECK the vehicle service history for recent service actions related to the CCM, GWM or PCM. If recent service history is found:
  - verify correct replacement module was installed
    - HVBOM may be used to verify correct part fitment
  - verify the configuration of replacement module was correct
    - re-configure module using as-built data if prior configuration is suspect
  - verify the module was not obtained from a like vehicle and installed into customer vehicle
    - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to D8
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

D8 CHECK FOR CORRECT ABS (ANTI-LOCK BRAKE SYSTEM) MODULE OPERATION

- Ignition OFF.
- Disconnect and inspect the ABS control module connector.
- Repair:
  - corrosion (install new connector or terminals â€“ clean module pins)
  - damaged or bent pins â€“ install new terminals/pins
  - pushed-out pins â€“ install new pins as necessary
- Reconnect the ABS control module connector. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new CCM. REFER to: Cruise Control Module (CCM) (419-03B Cruise Control - Vehicles With: Adaptive Cruise Control, Removal and Installation).
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.

PINPOINT TEST E : U023A

Normal Operation and Fault Conditions

REFER to: Communications Network - System Operation and Component Description (418-00 Module Communications Network, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM U023A:00	Lost Communication With Image Processing Module A: No Sub Type Information	The PCM sets this DTC if data messages from the IPMA through the GWM are missing.

Possible Sources

- Communications network concern
- IPMA
- GWM
- PCM

E1 VERIFY THE CUSTOMER CONCERN

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

Is an observable symptom present?

Yes	GO to E2
No	The system is operating normally at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

E2 CHECK THE COMMUNICATION NETWORK

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

Did the IPMA pass the network test?

Yes	GO to E3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

E3 PERFORM IPMA (IMAGE PROCESSING MODULE A) SELF-TEST

- Using a diagnostic scan tool, perform a IPMA module self-test.

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	REFER to: Lane Keeping System (419-07 Lane Keeping System, Diagnosis and Testing).
No	GO to E4

E4 CHECK THE GWM (GATEWAY MODULE A) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, retrieve the GWM Diagnostic Trouble Codes (DTCs).

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
No	GO to E5

E5 PERFORM THE PCM (POWERTRAIN CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the PCM self-test.

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

Yes	REFER to PCM DTC Chart in this section.
No	GO to E6

E6 RECHECK THE PCM (POWERTRAIN CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

NOTE: *If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during the PMI, or the PMI may not have been carried out.*

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

Is DTC U023A still present?

Yes	GO to E7
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

E7 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration can be incorrectly set during the PMI or the PMI may not have been carried out.*

- CHECK the vehicle service history for recent service actions related to the IPMA, GWM or PCM. If recent service history is found:
  - verify correct replacement module was installed
    - HVBOM may be used to verify correct part fitment
  - verify the configuration of replacement module was correct
    - re-configure module using as-built data if prior configuration is suspect
  - verify the module was not obtained from a like vehicle and installed into customer vehicle
    - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to E8
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

E8 CHECK FOR CORRECT IPMA (IMAGE PROCESSING MODULE A) OPERATION

- Ignition OFF.
- Disconnect and inspect the IPMA connector(s).
- Repair:
  - corrosion (install new connector or terminals â€“ clean module pins)
  - damaged or bent pins â€“ install new terminals/pins
  - pushed-out pins â€“ install new pins as necessary
- Reconnect the IPMA connector(s). Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new IPMA. REFER to: Interior Rear View Mirror (501-09 Rear View Mirrors, Removal and Installation).
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.

PINPOINT TEST F : U0151

Normal Operation and Fault Conditions

REFER to: Communications Network - System Operation and Component Description (418-00 Module Communications Network, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM U0151:00	Lost Communication With Restraints Control Module: No Sub Type Information	The PCM sets this DTC if data messages from the RCM through the GWM are missing.

Possible Sources

- Communications network concern
- RCM
- GWM
- PCM

F1 VERIFY THE CUSTOMER CONCERN

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

Is an observable symptom present?

Yes	GO to F2
No	The system is operating normally at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

F2 CHECK THE COMMUNICATION NETWORK

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

Did the RCM pass the network test?

Yes	GO to F3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

F3 PERFORM RCM (RESTRAINTS CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform a RCM self-test.

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	REFER to: Airbag Supplemental Restraint System (SRS) (501-20B Supplemental Restraint System, Diagnosis and Testing).
No	GO to F4

F4 CHECK THE GWM (GATEWAY MODULE A) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, retrieve the GWM Diagnostic Trouble Codes (DTCs).

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
No	GO to F5

F5 PERFORM THE PCM (POWERTRAIN CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the PCM self-test.

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

Yes	REFER to PCM DTC Chart in this section.
No	GO to F6

F6 RECHECK THE PCM (POWERTRAIN CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

NOTE: *If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during the PMI, or the PMI may not have been carried out.*

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

Is DTC U0151 still present?

Yes	GO to F7
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

F7 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration can be incorrectly set during the PMI or the PMI may not have been carried out.*

- CHECK the vehicle service history for recent service actions related to the RCM, GWM or PCM. If recent service history is found:
  - verify correct replacement module was installed
    - HVBOM may be used to verify correct part fitment
  - verify the configuration of replacement module was correct
    - re-configure module using as-built data if prior configuration is suspect
  - verify the module was not obtained from a like vehicle and installed into customer vehicle
    - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to F8
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

F8 CHECK FOR CORRECT RCM (RESTRAINTS CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect the RCM module connector(s).
- Repair:
  - corrosion (install new connector or terminals â€“ clean module pins)
  - damaged or bent pins â€“ install new terminals/pins
  - pushed-out pins â€“ install new pins as necessary
- Reconnect the RCM module connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new RCM. REFER to: Restraints Control Module (RCM) (501-20B Supplemental Restraint System, Removal and Installation).
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.

PINPOINT TEST G : U0402, U0415, U0426, U1012, U2107

Normal Operation and Fault Conditions

Refer to the Powertrain Control/Emissions Diagnosis (PC/ED) Manual Section 1 Description and Operation.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM U0402:00	Invalid Data Received from TCM: No Sub Type Information	This DTC sets when the PCM receives invalid network data from the TCM.
PCM U0415:00	Invalid Data Received from Anti-Lock Brake System (ABS) Control Module "A": No Sub Type Information	This DTC sets when the PCM receives invalid network data from the vehicle ABS module.
PCM U0426:00	Invalid Data Received From Vehicle Immobilizer Control Module: No Sub Type Information	This DTC sets when the PCM receives invalid network data from the vehicle imobilizer control module.
PCM U1012:00	Invalid Internal Control Module Monitoring Data Received from Anti-Lock Brake System (ABS) Control Module: No Sub Type Information	This DTC sets when the PCM receives invalid network data from the vehicle ABS module.
PCM U2107:00	Collision Mitigation By Braking: No Sub Type Information	This DTC sets when the PCM receives invalid network data from the vehicle ABS module.

Possible Sources

- Suspect Module

G1 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 H : EOP (ENGINE OIL PRESSURE) AND TEMPERATURE SENSOR FAULTS

Refer to Wiring Diagrams Cell 25 for schematic and connector information.

Normal Operation and Fault Conditions

303-01DO

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM P0195:00	Engine Oil Temperature Sensor "A" Circuit: No Sub Type Information	Sets in the PCM when the EOP and temperature sensor are not within the predicted engine oil range, based on other PCM inputs.
PCM P0196:00	Engine Oil Temperature Sensor "A" Range/Performance: No Sub Type Information	Sets in the PCM when the engine oil temperature is outside of the expected range.
PCM P0520:00	Engine Oil Pressure Sensor/Switch "A" Circuit: No Sub Type Information	Sets in the PCM when the EOP and temperature sensor are not within the predicted engine oil range, based on other PCM inputs.
PCM P0521:00	Engine Oil Pressure Sensor/Switch "A" Circuit Range/Performance: No Sub Type Information	Sets in the PCM when the PCM detects signal variation outside outside of the module parameters on the hardwired input from the engine oil pressure sensor.
PCM P0524:00	Engine Oil Pressure Too Low: No Sub Type Information	Sets in the PCM when the PCM detects low engine oil pressure.
PCM U0600:00	Lost Communication With Engine Oil Pressure Sensor "A": No Sub Type Information	The PCM sets this DTC if data messages from the EOP sensor are missing.
PCM U0667:00	Lost Communication With Engine Oil Temperature Sensor "A": No Sub Type Information	The PCM sets this DTC if data messages from the EOP sensor are missing.

Possible Sources

- EOP sensor
- PCM
- Wiring, terminals or connectors

H1 CHECK THE EOP (ENGINE OIL PRESSURE) AND TEMPERATURE SENSOR REFERENCE VOLTAGE CIRCUIT

- Disconnect EOP Sensor C1936 .
- Ignition ON.
- Measure:

ENGINE OIL PRESSURE (EOP) SENSOR	

Positive Lead	Measurement / Action	Negative Lead
C1936-1	V	Ground

Is the voltage between 4.8 and 5.2 volts?

Yes	GO to H2
No	If the voltage is less than 4.8 volts, REPAIR the circuit for an open or high resistance. If the voltage is greater than 5.2 volts, REPAIR the circuit for a short to voltage.

H2 CHECK THE EOP (ENGINE OIL PRESSURE) AND TEMPERATURE SENSOR GROUND CIRCUIT

- Measure:

ENGINE OIL PRESSURE (EOP) SENSOR

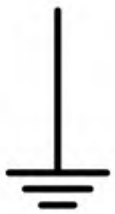
Positive Lead	Measurement / Action	Negative Lead
C1936-2	V	C1936-1

Is the voltage between 4.8 and 5.2 volts?

Yes	GO to H3
No	REPAIR the ground circuit for an open.

H3 CHECK THE EOP (ENGINE OIL PRESSURE) AND TEMPERATURE SENSOR FEEDBACK CIRCUIT FOR A SHORT TO VOLTAGE

- Disconnect PCM C1232E .
- Measure:

ENGINE OIL PRESSURE (EOP) SENSOR	

Positive Lead	Measurement / Action	Negative Lead
C1936-3		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to H4

H4 CHECK THE EOP (ENGINE OIL PRESSURE) AND TEMPERATURE SENSOR FEEDBACK CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:

ENGINE OIL PRESSURE (EOP) SENSOR	

Positive Lead	Measurement / Action	Negative Lead
C1936-3	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to H5
No	REPAIR the circuit.

H5 CHECK THE EOP (ENGINE OIL PRESSURE) AND TEMPERATURE SENSOR FEEDBACK CIRCUIT FOR AN OPEN

- Measure:

ENGINE OIL PRESSURE (EOP) SENSOR	POWERTRAIN CONTROL MODULE (PCM)

Positive Lead	Measurement / Action	Negative Lead
C1936-3	Ω	C1232E-11

Is the resistance less than 3 ohms?

Yes	GO to H6
No	REPAIR the circuit.

H6 CHECK FOR CORRECT PCM (POWERTRAIN CONTROL MODULE) OPERATION

- Ignition OFF.
- Inspect the PCM connector(s).
- Repair:
  - corrosion (install new connector or terminals â€“ clean module pins)
  - damaged or bent pins â€“ install new terminals/pins
  - pushed-out pins â€“ install new pins as necessary
- Reconnect the PCM connector(s). Make sure it seats and latches correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	GO to H7
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.

H7 CHECK THE ENGINE OIL PRESSURE

- Carry out the engine oil pressure test.
  REFER to: Engine (303-01B Engine - 6.7L Power Stroke Diesel, Diagnosis and Testing).

Is a concern present?

Yes	REPAIR the engine oil pressure concern. REFER to: Engine (303-01B Engine - 6.7L Power Stroke Diesel, Diagnosis and Testing).
No	INSTALL a new EOP and temperature sensor. REFER to: Engine Oil Pressure (EOP) Sensor (303-14B Electronic Engine Controls - 6.7L Power Stroke Diesel, Removal and Installation).

PINPOINT TEST I : OIL PRESSURE CONTROL SOLENOID FAULTS

Normal Operation and Fault Conditions

REFER to: Engine - Overview (303-01B Engine - 6.7L Power Stroke Diesel, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM P06DA:00	Engine Oil Pressure Control Circuit/Open: No Sub Type Information	ets when the PCM detects an open on the engine oil pressure control solenoid valve circuit.
PCM P06DB:00	Engine Oil Pressure Control Circuit Low: No Sub Type Information	Sets when the PCM detects a short to ground on the engine oil pressure control solenoid valve circuit.
PCM P06DC:00	Engine Oil Pressure Control Circuit High: No Sub Type Information	Sets when the PCM detects a short to voltage on the engine oil pressure control solenoid valve circuit.
PCM P06DD:00	Engine Oil Pressure Control Circuit Performance/Stuck Off: No Sub Type Information	Sets when the PCM detects the engine oil pressure control solenoid valve is stuck off.

Possible Sources

- Communications network concern
- Engine oil pressure control solenoid valve
- PCM
- Wiring, terminals or connectors

I1 CHECK THE ENGINE OIL PRESSURE CONTROL SOLENOID VALVE SUPPLY VOLTAGE

- Ignition OFF.
- Disconnect Engine oil pressure control solenoid valve C1469 .
- Ignition ON.
- Measure:

OIL PRESSURE CONTROL SOLENOID	

Positive Lead	Measurement / Action	Negative Lead
C1469-1		Ground

Is the voltage greater than 11 volts?

Yes	GO to I2
No	VERIFY BJB fuse F17 (20A) is OK. If OK, REPAIR the open circuit. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short.

I2 CHECK THE ENGINE OIL PRESSURE CONTROL SOLENOID VALVE CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect PCM C1232E .
- Ignition ON.
- Measure:

OIL PRESSURE CONTROL SOLENOID	

Positive Lead	Measurement / Action	Negative Lead
C1469-2	V	Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to I3

I3 CHECK THE ENGINE OIL PRESSURE CONTROL SOLENOID VALVE CIRCUIT FOR AN OPEN

- Ignition OFF.
- Measure:

POWERTRAIN CONTROL MODULE (PCM)	

Positive Lead	Measurement / Action	Negative Lead
C1232E-44	Ω	C1748-2

Is the resistance less than 3 ohms?

Yes	GO to I4
No	REPAIR the circuit.

I4 CHECK THE ENGINE OIL PRESSURE CONTROL SOLENOID VALVE CIRCUIT FOR A SHORT TO GROUND

- Measure:

OIL PRESSURE CONTROL SOLENOID	

Positive Lead	Measurement / Action	Negative Lead
C1469-2	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to I5
No	REPAIR the circuit.

I5 CHECK THE ENGINE OIL PRESSURE CONTROL SOLENOID VALVE OPERATION

- **NOTE:** *Engine oil level and contamination can affect the oil pressure reading.*

  Check the engine oil level and correct as necessary.
- Connect PCM C1232E .
- Connect Engine oil pressure control solenoid valve C1469 .
- Using a diagnostic scan tool, view the PCM PID EOP_PRESS.
- Start the engine.
- Access the PCM and monitor the EOP_PRESS (kPa) PID

  .
- Ignition OFF.
- Disconnect Engine oil pressure control solenoid valve C1469 .
- Start the engine.
- Access the PCM and monitor the EOP_PRESS (kPa) PID

  .
- Ignition OFF.

Did the engine oil pressure increase by greater than 276 kpa (40 psi) with the solenoid disconnected?

Yes	GO to I6
No	INSTALL a new oil pressure control solenoid valve. REFER to: Oil Pressure Control Solenoid (303-14B Electronic Engine Controls - 6.7L Power Stroke Diesel, Removal and Installation).

I6 VERIFY ENGINE OIL PRESSURE CONTROL SOLENOID VALVE CONNECTION AND WIRING

- Disconnect Engine oil pressure control solenoid valve C1469 .
- Disconnect PCM connectors.
- Inspect connectors and wiring:
  - corrosion (install new connector or terminals â€“ clean module pins)
  - damaged or bent pins - install new terminals/pins
  - pushed-out pins - install new pins as necessary
- Reconnect **all** connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	REPAIR the circuit or connector as needed.
No	The system is operating correctly at this time. The concern may have been caused by loose module connections. ADDRESS the root cause of any connector or pin issues.