

E: Manifold Absolute Pressure (MAP) Sensor

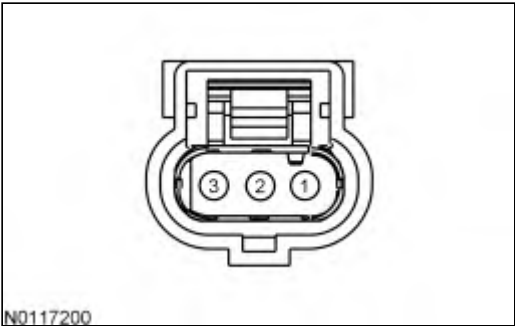
Note: Regeneration may occur during normal operation. During regeneration, diagnostic procedures may display biased values. If a regeneration occurs during diagnostic procedures, allow the process to complete before continuing diagnostics.

This pinpoint test is intended to diagnose the following:

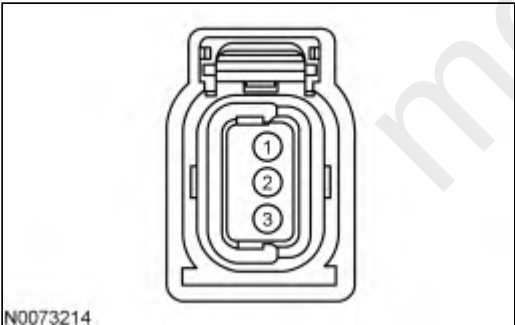
- harness circuits: MAP, SIGRTN, and VREF
- MAP sensor (14A464)
- MAP/CACT
- PCM (12A650)

Manifold Absolute Pressure (MAP) Sensor Connector

A

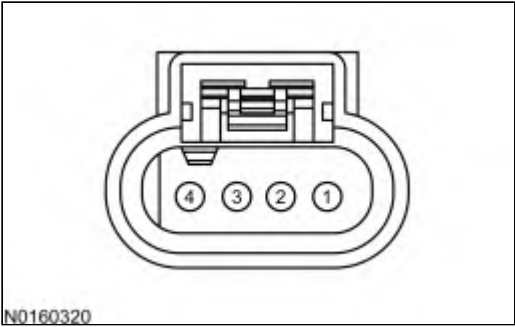


B



Vehicle	Connector	Pin	Circuit
F-150, F-Series Super Duty	A	1	MAP
		2	SIGRTN
		3	VREF
All other vehicles	B	2	MAP
		1	SIGRTN
		3	VREF

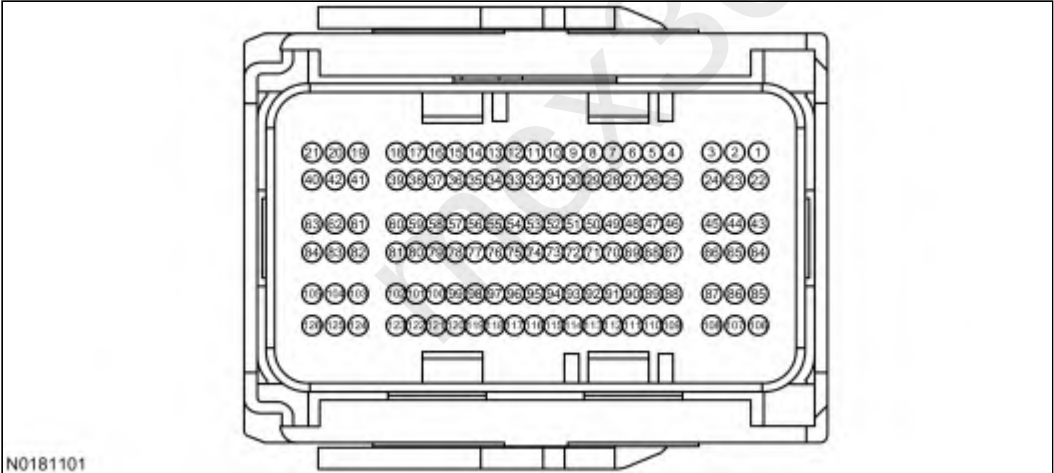
Manifold Absolute Pressure/Charge Air Cooler Temperature (MAP/CACT) Sensor Connector



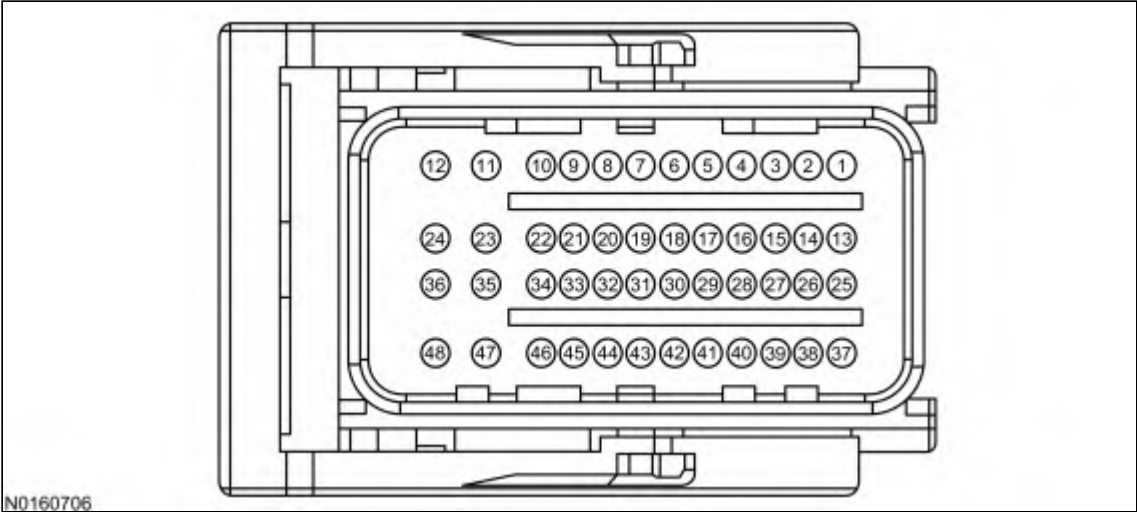
Pin	Circuit
1	MAP (Manifold Absolute Pressure)
4	SIGRTN (Signal Return)
2	VREF (Reference Voltage)

Powertrain Control Module-E (PCM-E) Connector

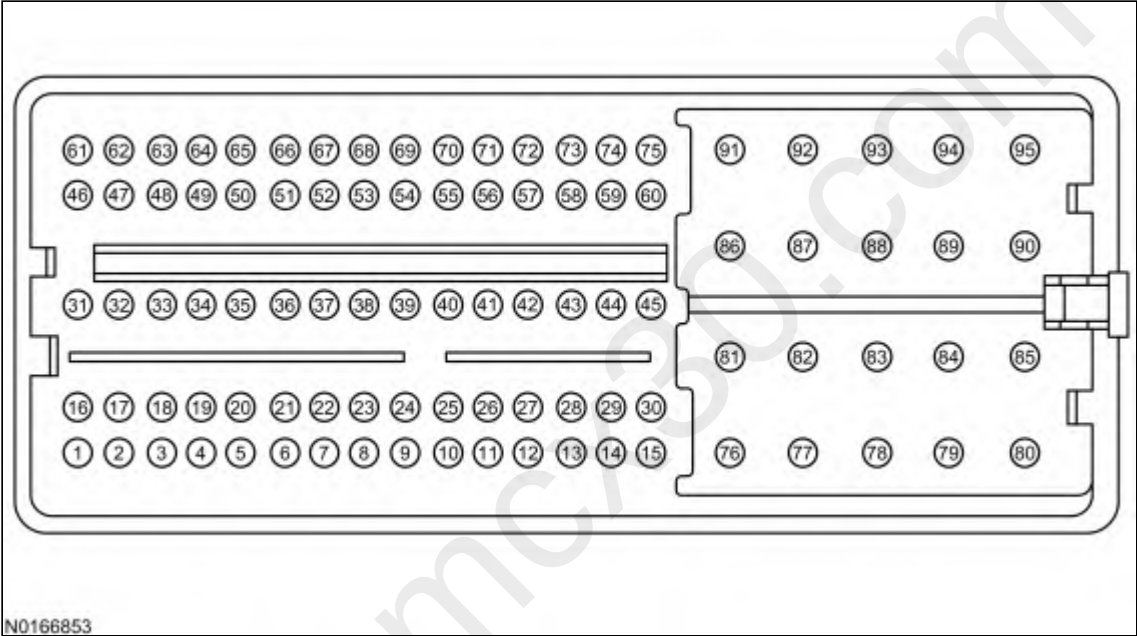
A



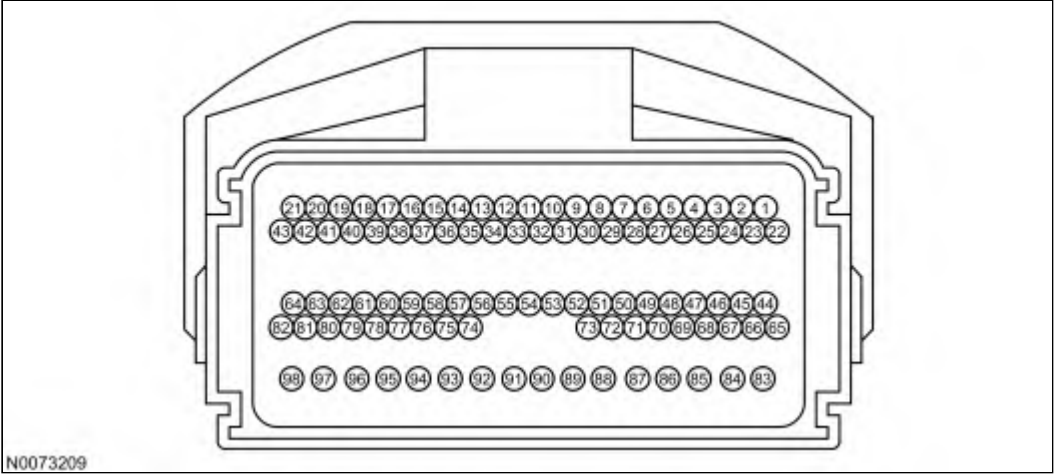
B



C



D



Vehicle	Connector	Pin	Circuit
F-Series Super Duty	A	31	MAP
Transit	B	28	MAP
Transit Connect	C	43	MAP
All other vehicles	D	59	MAP

E1 PRELIMINARY DIAGNOSIS

Are DTCs P0105, P0106, P0107, P0108 or U0609 present?

Yes	GO to E2 .
No	For symptoms without DTCs, GO to E7 . For all others, RETURN to Section 3, Symptom Charts for further direction.

E2 CHECK FOR VOLTAGE AT THE SENSOR

- Ignition OFF.
- Ignition ON, engine OFF.
- For Transit Connect,
- MAP/CACT Sensor connector disconnected.
- Measure the voltage between:

(+) MAP/CACT Sensor Connector, Harness Side	(-) MAP/CACT Sensor Connector, Harness Side
VREF - Pin 2	SIGRTN - Pin 4

- For all others,
- MAP Sensor connector disconnected.
- Measure the voltage between:

(+) MAP Sensor Connector, Harness Side	(-) MAP Sensor Connector, Harness Side
VREF	SIGRTN

Is the voltage between 4.5 - 5.5 V?

Yes	GO to E3 .
No	GO to Pinpoint Test B .

E3 CHECK FOR AN OPEN

- Ignition OFF.
- PCM-E connector disconnected.
- For Transit Connect,
- Measure the resistance between:

(+) MAP/CACT Sensor Connector, Harness Side	(-) PCM-E Connector, Harness Side
MAP - Pin 1	MAP

- For all others,
- Measure the resistance between:

(+) MAP Sensor Connector, Harness Side	(-) PCM-E Connector, Harness Side
MAP	MAP

Is the resistance less than 5 ohms?

Yes	GO to E4 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

E4 CHECK FOR A SHORT BETWEEN CIRCUITS

- For Transit Connect,
- Measure the resistance between:

(+) MAP/CACT Sensor Connector, Harness Side	(-)
MAP - Pin 1	Ground

- Measure the resistance between:

(+) MAP/CACT Sensor Connector, Harness Side	(-) MAP Sensor Connector, Harness Side
MAP - Pin 1	VREF
MAP - Pin 1	SIGRTN

- For all others,
- Measure the resistance between:

(+) MAP Sensor Connector, Harness Side	(-)
MAP	Ground

- Measure the resistance between:

(+) MAP Sensor Connector, Harness Side	(-) MAP Sensor Connector, Harness Side
MAP	VREF
MAP	SIGRTN

Are the resistances greater than 10K ohms?

Yes	GO to E5 .
No	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.

E5 CHECK FOR A SHORT TO VOLTAGE

- Ignition ON, engine OFF.
- For Transit Connect,
- Measure the voltage between:

(+) MAP/CACT Sensor Connector, Harness Side	(-)
MAP - Pin 1	Ground

- For all others,
- Measure the voltage between:

(+) MAP Sensor Connector, Harness Side	(-)
MAP	Ground

Is any voltage present?

Yes	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.
No	GO to E6 .

E6 INTERMITTENT CHECK

- Ignition OFF.
- MAP Sensor connector connected.
- MAP/CACT Sensor connector connected.
- PCM-E connector connected.
- Ignition ON, engine OFF.
- Access the PCM and monitor the MAP_V (VOLT) PID.
- While observing the PID, carry out the following:
 - Wiggle all accessible harness from the MAP sensor to the PCM and lightly tap on the sensor.
 - Wiggle the MAP sensor connector.
 - Look for sudden changes in the voltage when the harness and connector are wiggled or when the MAP sensor is tapped.

Is a concern present?

Yes	REPAIR as necessary. Clear the PCM DTCs. REPEAT the self-test.
No	For DTC P0106. GO to Pinpoint Test KA . For all others, INSTALL a new MAP sensor. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. CLEAR the DTCs. REPEAT the self-test.

E7 CHECK THE SENSOR FOR BIAS

Note: All PIDs may not be available on all vehicles.

- Ignition ON, engine OFF.
- Access the PCM and monitor the BARO (PRESS), EBP (PRESS) and MAP (PRESS) PIDs.

Is the suspect sensor PID reading within 4.5 kPa (0.65 psi) of the other sensors?

Yes	REMOVE and CHECK the MAP and MAP/CACT sensor for moisture, ice or any other type of restriction. REPAIR as necessary. REFER to Section 3, Symptom Charts, if a driveability concern exists.
No	INSTALL a new MAP sensor. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. Clear the PCM DTCs. REPEAT the self-test.

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