



NISSAN/INFINITI RE5F22A FAILSAFE WITH DTC P0726

COMPLAINT: Before or after an overhaul, a Nissan/Infiniti vehicle equipped with the RE5F22A exhibits a failsafe condition consisting of 5th gear starts with DTC P0726, “Engine speed signal fault”, stored in TCM memory.

CAUSE: The cause may be a faulty Crank Position Sensor or faulty Cam Position Sensor. The Engine RPM Signal on these vehicles is a calculated value based on input from the Crank Position Sensor (POS) and Cam Position Sensor (PHASE) Bank 1 and Cam Position Sensor (PHASE) Bank 2. The Engine RPM Signal is computed by the ECM and sent via the CAN system to the Transmission Control Module (TCM). A quick look at the chart in Figure 1 will show the different input/output signals for TCM function, and as shown by the chart, if the Engine Speed Signal input is problematic, the TCM will default the vehicle into Failsafe Mode 5th gear.

CORRECTION: To correct this issue it will be necessary to determine which sensor or combination of the sensors may be contributing to the problem. Hook a capable scan tool up to read the ECM fault codes. See if any of the following DTC's are stored.

Crank Position Sensor; P0335 CKP Sensor (POS)
Cam Position Sensor; P0340 CMP Sensor (PHASE)
Cam Position Sensor; P0345 CMP Sensor (PHASE)

Typically if a DTC is stored for one of these components, replacement of the offending sensor usually corrects the issue. However it may be necessary to check the individual sensors using a DVOM and/or a Graphing Meter or Scope to monitor the signal in the event that the sensor hasn't failed completely.

For DTC P0335 CKP Sensor (POS) proceed to ***DTC P0335 Check.***
For DTC P0340 CMP Sensor (PHASE) proceed to ***DTC P0340 Check.***
For DTC P0345 CMP Sensor (PHASE) proceed to ***DTC P0345 Check.***

DTC: P0335 CHECK:

The Crankshaft Position Sensor CKP (POS) is used to detect engine revolution. When the engine is running, the sensor magnet detects the peaks and valleys of the reluctor then inputs a digital signal to the ECM. This signal can be seen on a hand held scanner in the form of an RPM reading that should be very similar to the Tachometer reading. A DTC for the CKP (POS) may be detected under the following conditions:

1. Crankshaft Position Sensor Signal is not detected by the ECM during the first few seconds of engine cranking.
2. The proper pulse signal from the Crankshaft Position Sensor is not detected by the ECM while the engine is running.
3. The Crankshaft Position Sensor Signal pattern detected is abnormal while the engine is running.



Technical Service Information

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INPUT AND OUTPUT SIGNAL OF TCM								
Control Item		Line Pressure Control	Vehicle Speed Control	Shift Control	Lock-Up Control	Engine Brake Control	Fail-Safe Function (*3)	Self Diagnostics Funtion
Input	Throttle Angle Signal (*5)	X	X	X	X	X	X	X
	Throttle Position Signal (*5)	x(*2)	x(*2)		X	x(*2)		x(*4)
	Revolution Sensor	X	X	X	X	X	X	X
	Turbine Revolution Sensor	X	X	X		X	X	X
	Vehicle Speed Signal MTR (*1)(*5)	X	X	X	X		X	X
	Engine Speed Signals (*5)		X	X	X		X	X
	Engine Torque Signals (*5)	X	X	X	X	X		X
	PNP Switch	X	X	X	X	X	X	x(*4)
	Manual Mode Switch		X	X		X	X	X
	Stop Lamp Switch Signal (*5)		X		X	X		x (*4)
	A/T Fluid Temperature Sensor		X	X	X	X	X	X
	ASCD	Operation Signal (*5)	X		X	X		X
		Overdrive Cancel Signal (*5)	X			X		X
	TCM Power Supply Voltage Signal	X	X	X	X	X	X	X
Output	Shift Solenoid Valve A/B/C/D/E		X	X			X	X
	Pressure Control Solenoid Valve A	X	X	X	X	X	X	X
	Pressure Control Solenoid Valve B		X	X		X	X	X
	Pressure Control Solenoid Valve C			X	X		X	X
	Self-Diagnostics Table (*5)							X
*1: Additional Signal For Revolution Sensor *2: Additional Signal For Throttle Angle Sensor *3: If These Input and Output Signals are Different, the TCM Triggers the Fail-Safe Function. *4: Used as a Condition for Starting Self-Diagnostics; if Self-Diagnostics are not Started, Assumption is a Signal Error. *5: Signals Via CAN Communications								

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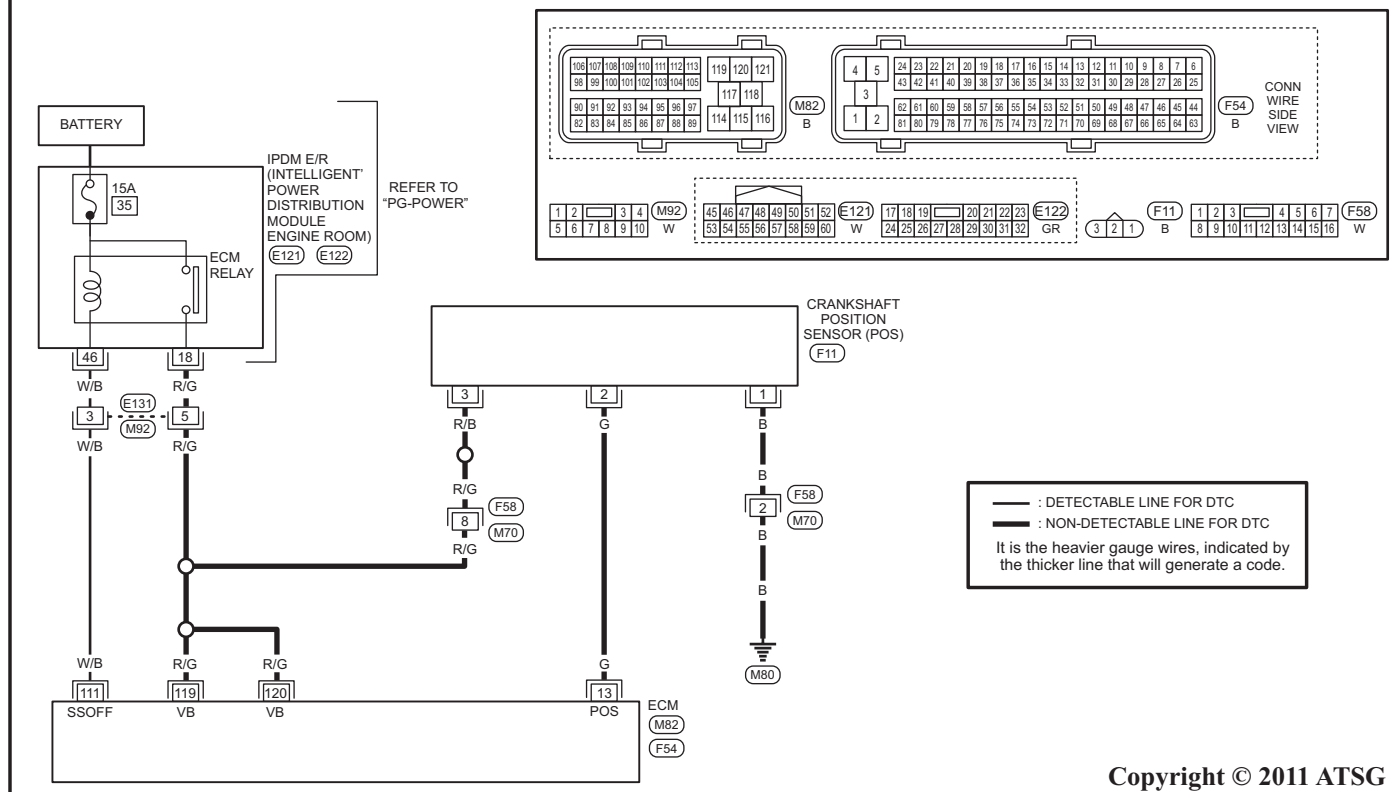
Figure 1

The diagram in Figure 2 illustrates the wiring and pin configurations for the CKP (POS) in a 2005 Nissan Maxima, and is typical. For correct wire color and pin numbers, refer to the appropriate factory manual for the vehicle. **DTC: P0335 CHECK ENGINE!** Verify correct voltage input to the CKP (POS) sensor (*system voltage with key on/engine running at pin 3*) of the sensor and verify sensor has a good ground (*less than .1 volts DC key on /engine running at pin 1*). Once this has been verified, hook up an appropriate graphing meter or oscilloscope and verify the pulsed signal output to the ECM. Refer to Figure 3 for a sample pattern of the pulsed signal.

NOTE: This signal is representative of a sample only, and should not be used for comparison. Refer to the appropriate factory manual or take a sample pattern from a known good source, such as a good working vehicle.

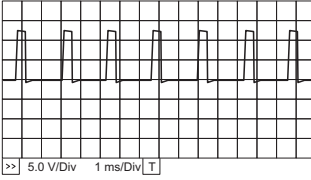
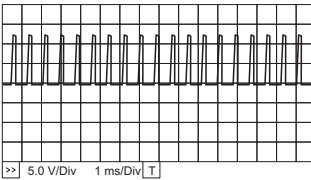
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CKP (POS) WIRING DIAGRAM AND CONNECTOR VIEWS



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Figure 2

PIN NO.	WIRE COLOR	ITEM TESTED	TESTING CONDITION	OUTPUT (DC Voltage)
13	GRN	Crankshaft Position Sensor (POS)	ENGINE RUNNING ENGINE AT OPERATING TEMPERATURE IDLE SPEED NOTE: The pulse frequency changes depending on rpm at idle.	Approximately 10V * 
			ENGINE RUNNING ENGINE RPM Approximately 2000 rpm.	Approximately 10V * 

* Average voltage of pulsed signal (Actual pulsed signal to be confirmed by graphing meter or oscilloscope.)

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Figure 3



Technical Service Information

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DTC: P0340

DTC: P0345 CHECK:

The Camshaft Position Sensor CMP 1 and CMP 2 (PHASE) are used to detect the rotation of the camshaft to identify a particular cylinder, and to recognize piston position. When the engine is running, the sensor magnet detects the peaks and valleys of the reluctor then inputs a digital signal to the ECM. If the Crankshaft Position Sensor (POS) system fails or is determined to be inoperative, the Camshaft Position Sensor (PHASE) signal is used to provide various controls of engine function instead, utilizing the timing of cylinder identification symbols. A DTC for the CMP 1 and CMP 2 (PHASE) may be detected under the following conditions:

1. The Cylinder Identification Signal is not detected by the ECM during the first few seconds of engine cranking.
2. The proper Cylinder Identification Signal is not detected by the ECM while the engine is running.
3. The Cylinder Identification Signal pattern detected is abnormal while the engine is running.

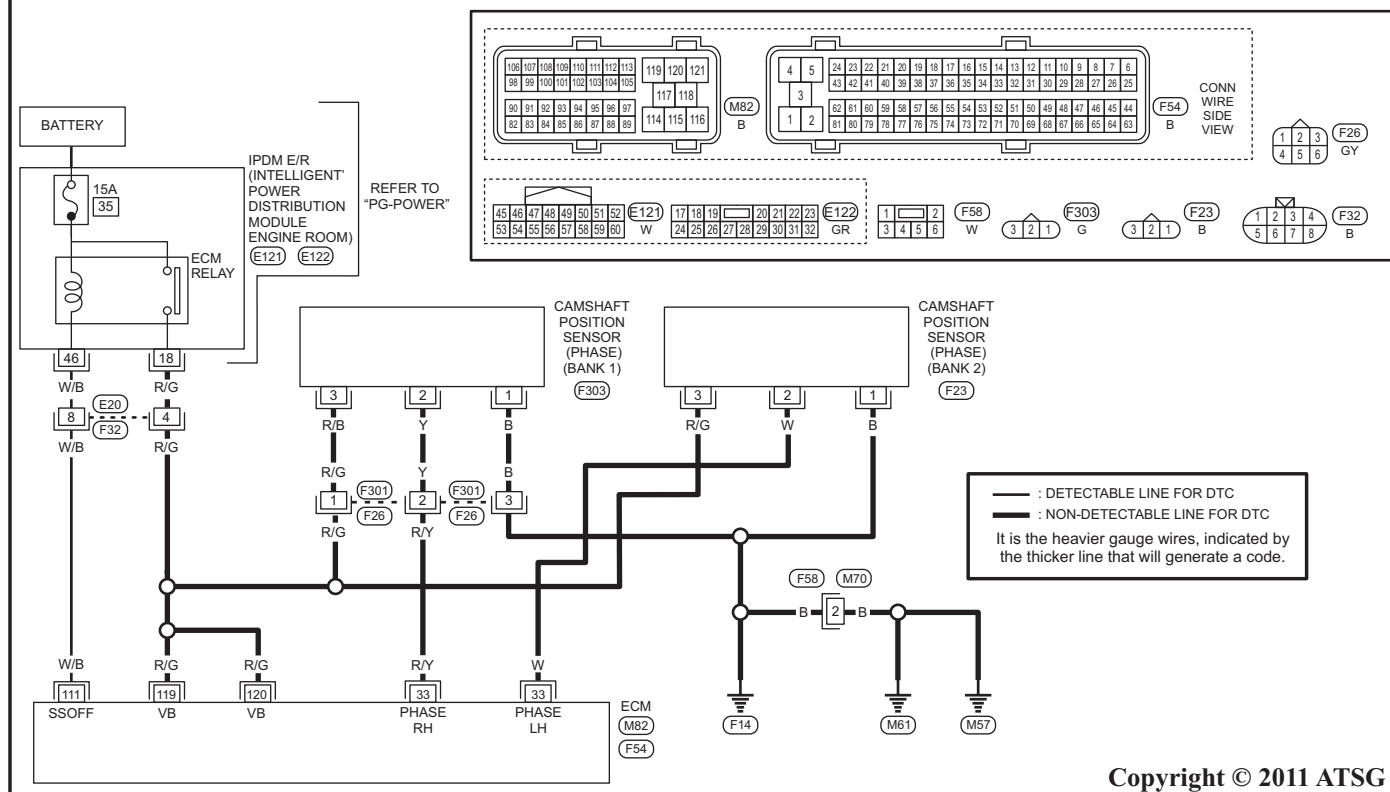
The diagram in Figure 4 illustrates the wiring and pin configurations for the CMP (PHASE) in a 2005 Nissan Maxima, and is typical. For correct wire color and pin numbers, refer to the appropriate factory manual for the vehicle you are working on. Verify correct voltage input to CMP (PHASE) BANK 1 and CMP (PHASE) BANK 2 (*system voltage with key on/engine running at pin 3*) of sensor CMP (PHASE) BANK 1 and CMP (PHASE) BANK 2 and verify the sensors each have a good ground (*less than .1 volts DC key on /engine running at pin 1*) of sensor CMP (PHASE) BANK 1 and CMP (PHASE) BANK 2. Once this has been verified, hook up an appropriate graphing meter or oscilloscope and verify the pulsed signal output to the ECM from the related sensor terminal. Refer to Figure 5 for a sample pattern of the pulsed signal.

NOTE: *This signal is representative of a sample only, and should not be used for comparison. Refer to the appropriate factory manual or take a sample pattern from a known good source, such as a good working vehicle.*

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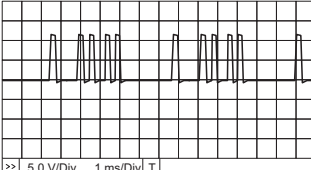
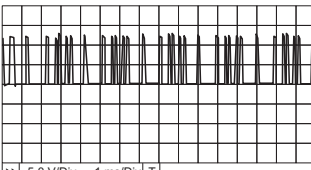
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CMP (PHASE) BANK 1/BANK 2 WIRING DIAGRAM AND CONNECTOR VIEWS



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Figure 4

PIN NO.	WIRE COLOR	ITEM TESTED	TESTING CONDITION	OUTPUT (DC Voltage)
33	R/Y	Camshaft Position Sensor (PHASE) (Bank 1)	ENGINE RUNNING ENGINE AT OPERATING TEMPERATURE IDLE SPEED NOTE: The pulse frequency changes depending on rpm at idle.	Approximately 1.0 - 4.0 V * 
14	W	Camshaft Position Sensor (PHASE) (Bank 2)	ENGINE RUNNING ENGINE RPM Approximately 200 rpm.	Approximately 1.0 - 4.0 V * 

* Average voltage of pulsed signal (Actual pulsed signal to be confirmed by graphing meter or oscilloscope.)

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Figure 5