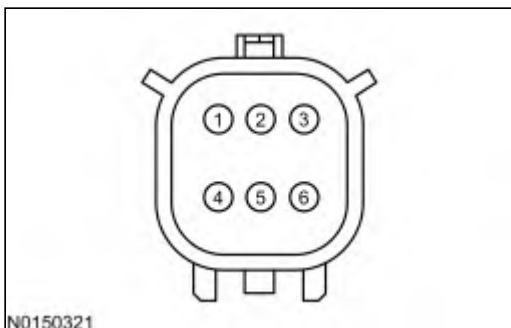
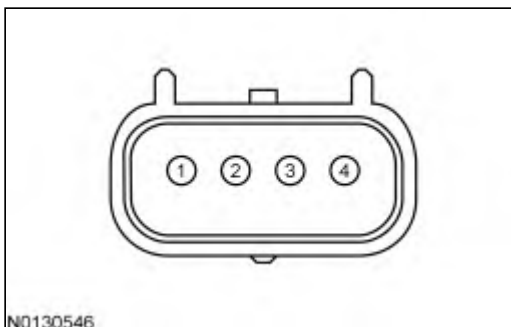
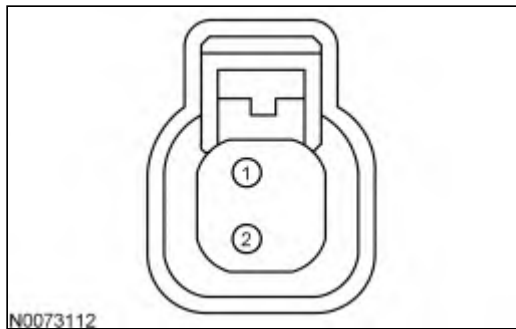


DG: Knock Sensor (KS)

This pinpoint test is intended to diagnose the following:

- knock sensor bank 1, sensor 1 (KS11), knock sensor bank 1, sensor 2 (KS12), knock sensor bank 2, sensor 1 (KS21) and knock sensor bank 2, sensor 2 (KS22) (12A699)
- harness circuits: KS11, KS11RTN, KS12, KS12RTN, KS21, KS21RTN, KS22, and KS22RTN
- PCM (12A650)

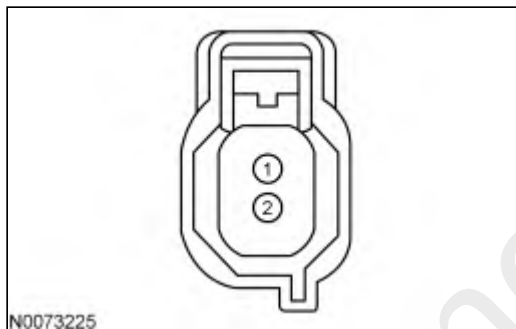
Knock Sensor Bank 1, Sensor 1 (KS11) Connector**A****B****C****D**



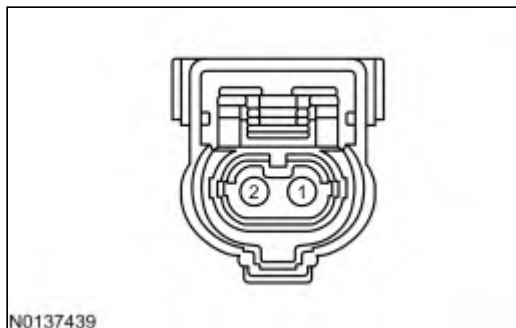
E



F



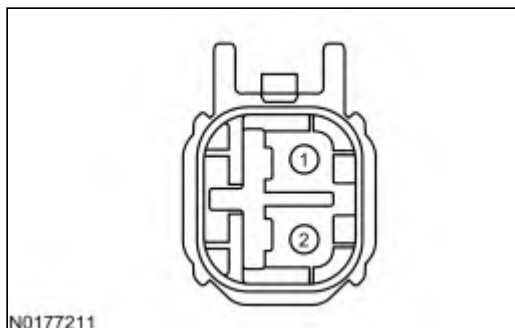
G



H



I

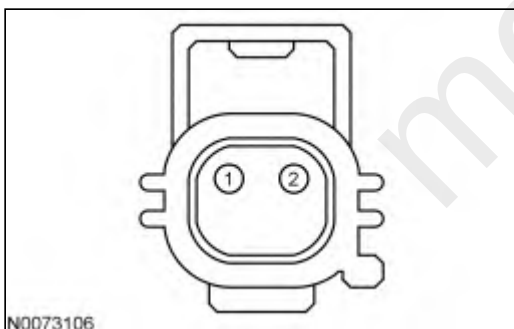


Vehicle	Connector	Pin	Circuit
Aviator, Continental 2.7L, Continental 3.0L, Explorer 3.0L	A	5 2	KS11RTN KS11
Continental 2.0L, EcoSport 2.0L, Fusion 2.0L, Fusion 2.5L, MKZ 2.0L, Mustang 2.3L, Ranger 2.5L, Transit Connect 2.5L	B	1 2	KS11RTN KS11
Continental 3.7L, Expedition, Explorer 3.3L, F-150 3.3L, F-150 3.5L, Flex, Navigator, Transit	C	2 1	KS11RTN KS11
E-Series	D	2 1	KS11RTN KS11
EcoSport 1.0L	E	1 2	KS11RTN KS11

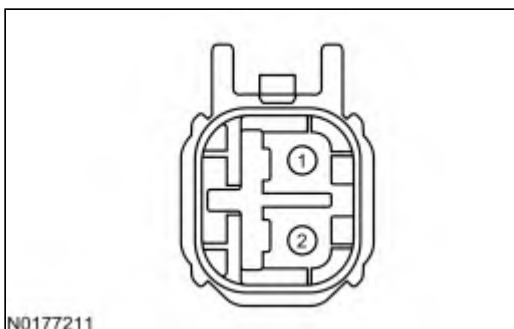
Vehicle	Connector	Pin	Circuit
Edge 2.7L, F-150 2.7L, F-650 / F-750, F-Series Super Duty, Fusion 2.7L, MKZ 3.0L, Motorhome / Stripped Chassis / Step Van, Mustang 5.2L Supercharged, Nautilus 2.7L	F	2 1	KS11RTN KS11
F-150 5.0L, Mustang 5.0L, Mustang TiVCT 5.2L, Transit Connect 1.0L	G	2 1	KS11RTN KS11
Ford GT	F	1 2	KS11RTN KS11
Fusion 1.5L, KA 1.0L	H	2 1	KS11RTN KS11
All other vehicles	I	1 2	KS11RTN KS11

Knock Sensor Bank 1, Sensor 2 (KS12) Connector

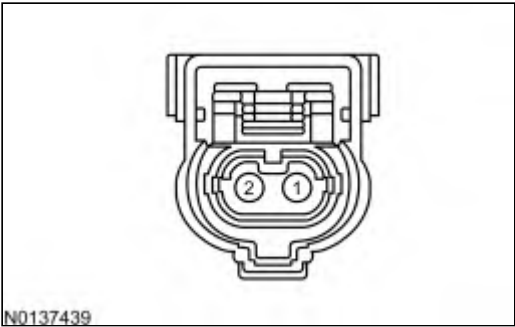
A



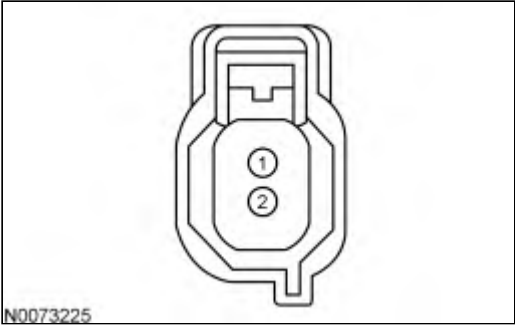
B



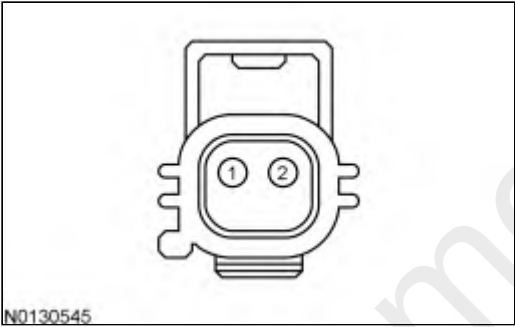
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D



E

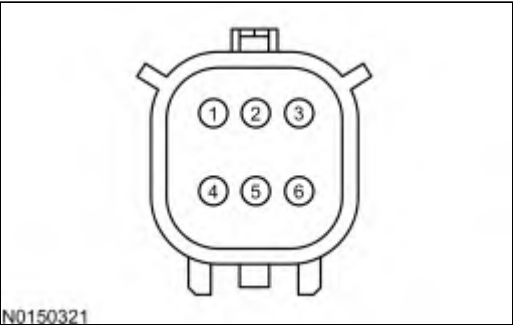


Vehicle	Connector	Pin	Circuit
Continental 2.0L, EcoSport 2.0L, Fusion 2.0L, MKZ 2.0L, Mustang 2.3L	A	1 2	KS12RTN KS12
Corsair 2.0L, Corsair 2.3L, Edge 2.0L, Escape/Kuga 2.0L, Explorer 2.3L, Nautilus 2.0L, Ranger 2.3L, Transit Connect 2.0L	B	1 2	KS12RTN KS12

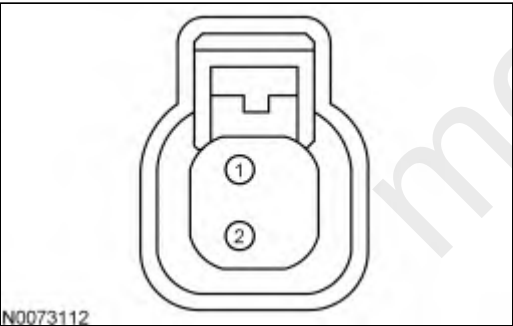
Vehicle	Connector	Pin	Circuit
F-150 5.0L, Mustang 5.0L	C	2 1	KS12RTN KS12
F-Series Super Duty 7.3L, Motorhome / Stripped Chassis / Step Van, Mustang 5.2L Supercharged	D	2 1	KS12RTN KS12
Fusion 1.5L	E	2 1	KS12RTN KS12

Knock Sensor Bank 2, Sensor 1 (KS21) Connector

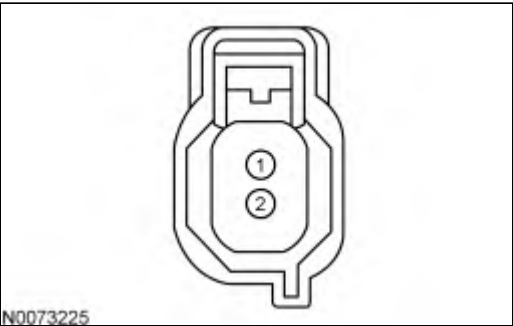
A



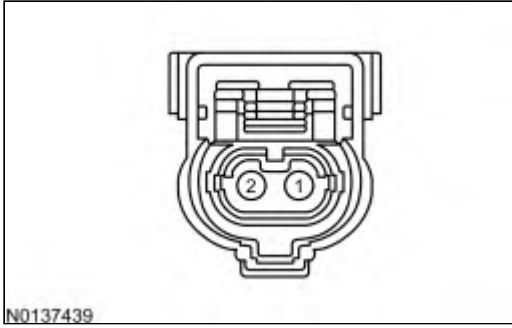
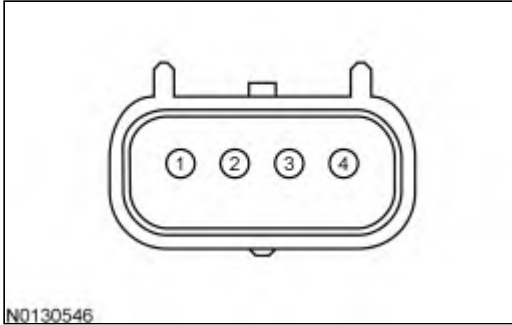
B



C



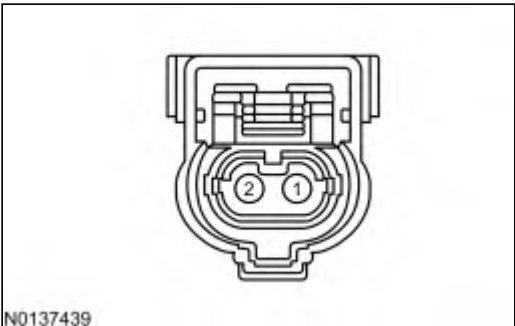
D

**E**

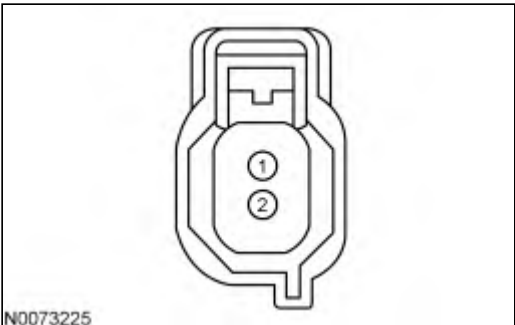
Vehicle	Connector	Pin	Circuit
Aviator, Continental 2.7L, Continental 3.0L, Explorer 3.0L	A	6 3	KS21RTN KS21
E-Series	B	2 1	KS21RTN KS21
Edge 2.7L, F-150 2.7L, F-650 / F-750, F-Series Super Duty, Fusion, MKZ, Motorhome / Stripped Chassis / Step Van, Mustang 5.2L Supercharged, Nautilus	C	2 1	KS21RTN KS21
F-150 5.0L, Mustang 5.0L, Mustang TiVCT 5.2L	D	2 1	KS21RTN KS21
Ford GT	C	1 2	KS21RTN KS21
All other vehicles	E	4 3	KS21RTN KS21

Knock Sensor Bank 2, Sensor 2 (KS22) Connector

A



B



Vehicle	Connector	Pin	Circuit
F-150 5.0L, Mustang 5.0L	A	2 1	KS22RTN KS22
F-Series Super Duty 7.3L, Motorhome / Stripped Chassis / Step Van, Mustang 5.2L Supercharged	B	2 1	KS22RTN KS22

Powertrain Control Module (PCM) Connector

For PCM connector views or reference values, refer to Section 6, Reference Values.

Vehicle	Connector	Pin	Circuit
Continental 2.0L, EcoSport 2.0L, Fusion 1.5L, Fusion 2.0L, MKZ 2.0L	198 PIN	E51 E50 E66 E65	KS12RTN KS12 KS11RTN KS11

Vehicle	Connector	Pin	Circuit
Continental 2.7L, Continental 3.0L, Flex GTDI 3.5L, Ford GT, Fusion 2.7L, MKZ 3.0L	198 PIN	E51 E50 E66 E65	KS21RTN KS21 KS11RTN KS11
Continental 3.7L, E-Series, F-650 / F-750, Flex TiVCT 3.5L, Mustang TiVCT 5.2L	198 PIN	E67 E68 E52 E53	KS21RTN KS21 KS11RTN KS11
Corsair 2.0L, Corsair 2.3L, Edge 2.0L, Escape/Kuga 2.0L, Explorer 2.3L, Mustang 2.3L, Nautilus 2.0L, Ranger 2.3L	198 PIN	E43 E42 E12 E11	KS12RTN KS12 KS11RTN KS11
Corsair 2.5L, EcoSport 1.5L Automatic Transmission, Escape/Kuga 2.5L, Fusion 2.5L, KA 1.5L Automatic Transmission, Transit Connect 2.5L	198 PIN	E57 E58	KS11RTN KS11
EcoSport 1.0L Automatic Transmission	198 PIN	E66 E65	KS11RTN KS11
EcoSport 1.0L Manual Transmission	198 PIN	E60 E59	KS11RTN KS11
EcoSport 1.5L Manual Transmission, KA 1.2L, KA 1.5L Manual Transmission	112 PIN	E43 E31	KS11RTN KS11
Escape/Kuga 1.5L, Transit Connect 1.0L	198 PIN	E12 E11	KS11RTN KS11
Expedition, F-150 3.5L High Output, Navigator	198 PIN	E9 E8 E67 E68	KS21RTN KS21 KS11RTN KS11

Vehicle	Connector	Pin	Circuit
F-150 5.0L, F-Series Super Duty 7.3L, Motorhome / Stripped Chassis / Step Van, Mustang 5.0L, Mustang 5.2L Supercharged	306 PIN	E79 E58 E72 E51 E74 E53 E9 E30	KS22RTN KS22 KS21RTN KS21 KS12RTN KS12 KS11RTN KS11
KA 1.0L	128 PIN	E30 E18	KS11RTN KS11
Ranger 2.5L	128 PIN	T25 T17	KS11RTN KS11
Transit Connect 2.0L	198 PIN	E12 E11 E43 E42	KS12RTN KS12 KS11RTN KS11
All other vehicles	306 PIN	E72 E51 E9 E30	KS21RTN KS21 KS11RTN KS11

DG1 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCs)

Note: The DTC P130D may be accompanied by other DTCs. Diagnose all other DTCs first.

Verify the KS is correctly installed before continuing diagnosis. Refer to the Workshop Manual Section 303-14, Electronic Engine Controls.

Are DTCs P0325, P0326, P0327, P0328, P032A, P032C, P032D, P0330, P0331, P0332, P0333, P033A, P033C, P033D, or P130D present?

Yes	For DTC P130D, GO to DG6 . For all others, GO to DG2 .
No	RETURN to Section 3, Symptom Charts for further direction.

DG2 CHECK THE KS CIRCUIT FOR AN OPEN

- Ignition OFF.
- KS connector disconnected.
- PCM connector disconnected.
- For KS11,
- Measure the resistance between:

(+) KS11 Connector, Harness Side	(-) PCM Connector, Harness Side
KS11	KS11
KS11RTN	KS11RTN

- For KS12,
- Measure the resistance between:

(+) KS12 Connector, Harness Side	(-) PCM Connector, Harness Side
KS12	KS12
KS12RTN	KS12RTN

- For KS21,
- Measure the resistance between:

(+) KS21 Connector, Harness Side	(-) PCM Connector, Harness Side
KS21	KS21
KS21RTN	KS21RTN

- For KS22,
- Measure the resistance between:

(+) KS22 Connector, Harness Side	(-) PCM Connector, Harness Side
KS22	KS22
KS22RTN	KS22RTN

Are the resistances less than 5 ohms?

Yes	GO to DG3 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

DG3 CHECK THE KS CIRCUIT FOR A SHORT TO GROUND

- For KS11,
- Measure the resistance between:

(+) KS11 Connector, Harness Side	(-)
KS11	Ground
KS11RTN	Ground

- For KS12,
- Measure the resistance between:

(+) KS12 Connector, Harness Side	(-)
KS12	Ground
KS12RTN	Ground

- For KS21,

- Measure the resistance between:

(+) KS21 Connector, Harness Side	(-)
KS21	Ground
KS21RTN	Ground

- For KS22,
- Measure the resistance between:

(+) KS22 Connector, Harness Side	(-)
KS22	Ground
KS22RTN	Ground

Are the resistances greater than 10K ohms?

Yes	GO to DG4 .
No	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.

DG4 CHECK THE KS CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition ON, engine OFF.
- For KS11,
- Measure the voltage between:

(+) KS11 Connector, Harness Side	(-)
KS11	Ground
KS11RTN	Ground

- For KS12,
- Measure the voltage between:

(+) KS12 Connector, Harness Side	(-)
KS12	Ground
KS12RTN	Ground

- For KS21,
- Measure the voltage between:

(+) KS21 Connector, Harness Side	(-)
KS21	Ground
KS21RTN	Ground

- For KS22,

- Measure the voltage between:

(+) KS22 Connector, Harness Side	(-)
KS22	Ground
KS22RTN	Ground

Is any voltage present?

Yes	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.
No	GO to DG5 .

DG5 CHECK THE KS CIRCUIT FOR INTERMITTENT CONCERNS

- Ignition OFF.
- While observing the resistance, wiggle, shake, and bend small sections of the wiring harness working from the sensor to the PCM.
- For KS11,
- Measure the resistance between:

(+) KS11 Connector, Harness Side	(-) PCM Connector, Harness Side
KS11	KS11
KS11RTN	KS11RTN

- For KS12,
- Measure the resistance between:

(+) KS12 Connector, Harness Side	(-) PCM Connector, Harness Side
KS12	KS12
KS12RTN	KS12RTN

- For KS21,
- Measure the resistance between:

(+) KS21 Connector, Harness Side	(-) PCM Connector, Harness Side
KS21	KS21
KS21RTN	KS21RTN

- For KS22,
- Measure the resistance between:

(+) KS22 Connector, Harness Side	(-) PCM Connector, Harness Side
KS22	KS22
KS22RTN	KS22RTN

Are the resistances less than 5 ohms?

Yes	INSTALL a new KS. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. Clear the PCM DTCs. REPEAT the self-test.
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

DG6 IDENTIFY THE TYPE OF KNOCK

Note: Knock counts on a single cylinder may indicate a concern with the ignition or fuel components for the suspect cylinder. Knock counts distributed among multiple cylinders may indicate a fuel quality concern.

- Ignition ON, engine running.
- Access the PCM and monitor the KNK_CNTR_CYL1 (MODE), KNK_CNTR_CYL2 (MODE), KNK_CNTR_CYL3 (MODE), KNK_CNTR_CYL4 (MODE), KNK_CNTR_CYL5 (MODE) and KNK_CNTR_CYL6 (MODE) PIDs.

Are the majority of the knock counts on a single cylinder?

Yes	DIAGNOSE ignition coil and fuel injection components for the suspect cylinder. REPAIR or INSTALL a new component as necessary. Clear the PCM DTCs. REPEAT the self-test.
No	GO to DG7 .

DG7 CHECK THE LEARNED OCTANE ADJUSTMENT

- Access the PCM and monitor the OCTADJ_R_LRND (PER) PID.

Does the OCTADJ_R_LRND PID read between -85% to -100%?

Yes	DRAIN and CLEAN the fuel system, REFILL with correct grade fuel. Clear the PCM DTCs. REPEAT the self-test.
No	INSTALL a new KS. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. Clear the PCM DTCs. REPEAT the self-test.