

KF: Fan Control (FC) Relays

This pinpoint test is intended to diagnose the following:

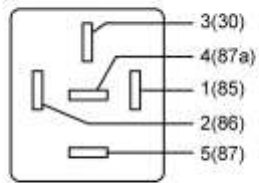
- LFC, MFC, HFC relays
- harness circuits: HFC, LFC, MFC, VPWR
- powertrain control module (PCM) (12A650)

Three Speed Fan Operation

Although the PCM output circuits are called low, medium and high fan control (FC), cooling fan operation is controlled by a combination of these outputs.

Refer to Section 1, [Engine Control Components](#).

Low Fan Control (LFC) Relay Connector

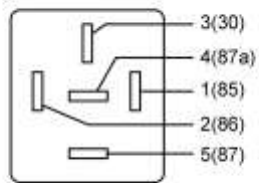


A0077582

Pin	Circuit
2	LFC (Low Fan Control)
1	VPWR (Vehicle Power)

NOTE: The VPWR and LFC circuits may be reversed in the harness connector. Also, the LFC circuit may be wired to 2 separate relays. Refer to the Wiring Diagrams Manual for additional information.

Medium Fan Control (MFC) Relay Connector

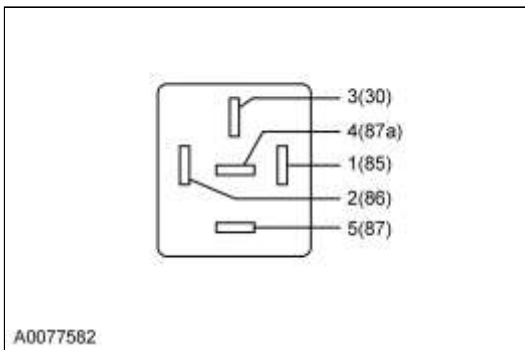


A0077582

Pin	Circuit
2	MFC (Medium Fan Control)
1	VPWR (Vehicle Power)

NOTE: The VPWR and MFC circuits may be reversed in the harness connector. Also, the MFC circuit may be wired to 2 separate relays. Refer to the Wiring Diagrams Manual for additional information.

High Fan Control (HFC) Relay Connector



Pin	Circuit
2	HFC (High Fan Control)
1	VPWR (Vehicle Power)

NOTE: The VPWR and HFC circuits may be reversed in the harness connector. Also, the HFC circuit may be wired to 2 separate relays. Refer to the Wiring Diagrams Manual for additional information.

Powertrain Control Module (PCM) Connector

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

Vehicle	Pin	Circuit
Escape 2.3L, Mariner 2.3L	B38	HFC
	B17	MFC
	B39	LFC
Focus	B38	HFC
	B4	MFC
	B39	LFC
Freestar/Monterey	46	HFC
	43	MFC
	28	LFC
Ford GT	46	HFC
	28	LFC
Mustang	E7	HFC
	E6	LFC

Vehicle	Pin	Circuit
Ranger	45	LFC
Taurus	46 42 28	HFC MFC LFC
All other vehicles	B38 B39	HFC LFC

KF1 CHECK FOR DTCS

Are DTCS P0480, P0481, P0482, P1474, P1477 or P1479 present?

Yes	<p>For KOEO and KOER DTCS P0480 or P1474, Freestar/Monterey, GO to KF18.</p> <p>For continuous memory DTCS P0480 or P1474, Freestar/Monterey, GO to KF51.</p> <p>For KOEO and KOER DTCS P0480 or P1474, all others, GO to KF3.</p> <p>For continuous memory DTCS P0480 or P1474, GO to KF45.</p> <p>For DTCS P0481, P0482, P1477 or P1479, GO to KF2.</p>
No	<p>For fans always on: components, GO to KF58.</p> <p>For fans always on: all others, GO to KF57.</p> <p>For cooling fan circuits, GO to KF58.</p> <p>For all others, GO to Section 4, Diagnostic Trouble Code (DTC) Charts and Descriptions.</p>

KF2 DTCS P0481, P0482, P1477 OR P1479: CHECK FOR THE PRESENCE OF THESE DTCS

Are DTCS P0481, P0482, P1477, or P1479 present? P0481 or P1479.

Yes	<p>For KOEO and KOER DTCS P0481 or P1479, Taurus, Escape 3.0L, Mariner 3.0L, Ford GT, GO to KF36.</p> <p>For continuous memory DTCS P0481 or P1479, Taurus, Escape 3.0L, Mariner 3.0L, Ford GT, GO to KF55.</p> <p>For KOEO and KOER DTCS P0481 or P1479, all others, GO to KF13.</p> <p>For continuous memory DTCS P0481 or P1479, all others, GO to KF47.</p>
No	<p>For KOEO and KOER DTCS P0482 or P1477, Freestar /Monterey, Focus, GO to KF27.</p> <p>For continuous memory DTCS P0482 or P1477, Freestar /Monterey, Focus, GO to KF53.</p> <p>For KOEO and KOER DTCS P0482 or P1477, all others, GO to KF8.</p> <p>For continuous memory DTCS P0482 or P1477, all others, GO to KF49.</p>

KF3 KOEO AND KOER DTCS P0480 OR P1474: CHECK THE VPWR VOLTAGE TO THE LOW SPEED FC RELAY

- LFC Relay connector disconnected.
- Key ON, engine OFF.

- Measure the voltage between:

(+) LFC Relay Connector, Harness Side	(-)
VPWR - Pin 1	Ground

Is the voltage greater than 10 V?

Yes	GO to KF4 .
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF4 CHECK FOR LFC CIRCUIT CYCLING

- Key ON, engine OFF.
- Connect a non-powered test lamp between:

(+) LFC Relay Connector, Harness Side	(-) LFC Relay Connector, Harness Side
VPWR - Pin 1	LFC - Pin 2

- Enter output test mode. Refer to Section 2, [Output Test Mode \(OTM\)](#).
- Command the low speed fan ON.
- Command the high speed fan ON.
- Command the outputs OFF.

Does the test lamp illuminate on and off when either the low or high speed cooling fan output is commanded on and off?

Yes	INSTALL a new LFC relay. CLEAR the DTCs. REPEAT the self-test.
No	GO to KF5 .

KF5 CHECK THE LFC CIRCUIT FOR A SHORT TO VOLTAGE IN THE HARNESS

- Remove the test lamp.
- PCM connector disconnected.
- Key ON, engine OFF.
- Measure the voltage between:

(+) LFC Relay Connector, Harness Side	(-)
LFC - Pin 2	Ground

Is the voltage less than 1 V?

Yes	GO to KF6 .
No	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

KF6 CHECK THE LFC CIRCUIT FOR A SHORT TO GROUND IN THE HARNESS

- Measure the resistance between:

(+) LFC Relay Connector, Harness Side	(-)
LFC - Pin 2	Ground

Is the resistance greater than 10K ohms?

Yes	GO to KF7 .
No	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

KF7 CHECK THE LFC CIRCUIT FOR AN OPEN IN THE HARNESS

- Measure the resistance between:

(+) LFC Relay Connector, Harness Side	(-) PCM Connector, Harness Side
LFC - Pin 2	LFC

Is the resistance less than 5 ohms?

Yes	GO to KF70 .
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF8 KOEO AND KOER DTCS P0482 OR P1477: CHECK THE VPWR VOLTAGE TO THE MEDIUM SPEED FC RELAY

- MFC Relay connector disconnected.
- Key ON, engine OFF.
- Measure the voltage between:

(+) MFC Relay Connector, Harness Side	(-)
VPWR - Pin 1	Ground

Is the voltage greater than 10 V?

Yes	GO to KF9 .
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF9 CHECK FOR MFC CIRCUIT CYCLING

- Key ON, engine OFF.
- Connect a non-powered test lamp between:

(+) MFC Relay Connector, Harness Side	(-) MFC Relay Connector, Harness Side
VPWR - Pin 1	MFC - Pin 2

- Enter output test mode. Refer to Section 2, [Output Test Mode \(OTM\)](#).
- Command the low speed fan ON.
- Command the high speed fan ON.
- Command the outputs OFF.

Does the test lamp illuminate on and off when either the low or high speed cooling fan output is commanded on and off?

Yes	INSTALL a new MFC relay. CLEAR the DTCs. REPEAT the self-test.
No	GO to KF10 .

KF10 CHECK THE MFC CIRCUIT FOR A SHORT TO VOLTAGE IN THE HARNESS

- Remove the test lamp.
- PCM connector disconnected.
- Key ON, engine OFF.
- Measure the voltage between:

(+) MFC Relay Connector, Harness Side	(-)
MFC - Pin 2	Ground

Is the voltage less than 1 V?

Yes	GO to KF11 .
No	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

KF11 CHECK THE MFC CIRCUIT FOR A SHORT TO GROUND IN THE HARNESS

- Key in OFF position.
- Measure the resistance between:

(+) MFC Relay Connector, Harness Side	(-)
MFC - Pin 2	Ground

Is the resistance greater than 10K ohms?

Yes	GO to KF12 .
No	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

KF12 CHECK THE MFC CIRCUIT FOR AN OPEN IN THE HARNESS

- Measure the resistance between:

(+) MFC Relay Connector, Harness Side	(-) PCM Connector, Harness Side
MFC - Pin 2	MFC

Is the resistance less than 5 ohms?

Yes	GO to KF70 .
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF13 KOEO AND KOER DTCS P0481 OR P1479: CHECK THE VPWR VOLTAGE TO THE HIGH SPEED FC RELAY

- HFC Relay connector disconnected.
- Key ON, engine OFF.
- Measure the voltage between:

(+) HFC Relay Connector, Harness Side	(-)
VPWR - Pin 1	Ground

Is the voltage greater than 10 V?

Yes	GO to KF14 .
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF14 CHECK FOR HFC CIRCUIT CYCLING

- Key ON, engine OFF.
- Connect a non-powered test lamp between:

(+) HFC Relay Connector, Harness Side	(-) HFC Relay Connector, Harness Side
VPWR - Pin 1	HFC - Pin 2

- Enter output test mode. Refer to Section 2, [Output Test Mode \(OTM\)](#).
- Command the low speed fan ON.
- Command the high speed fan ON.
- Command the outputs OFF.

Does the test lamp illuminate on and off when either the low or high speed cooling fan output is commanded on and off?

Yes	INSTALL a new HFC relay. CLEAR the DTCs. REPEAT the self-test.
No	GO to KF15 .

KF15 CHECK THE HFC CIRCUIT FOR A SHORT TO VOLTAGE IN THE HARNESS

- Remove the test lamp.
- PCM connector disconnected.
- Key ON, engine OFF.
- Measure the voltage between:

(+) HFC Relay Connector, Harness Side	(-)
HFC - Pin 2	Ground

Is the voltage less than 1 V?

Yes	GO to KF16 .
No	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

KF16 CHECK THE HFC CIRCUIT FOR A SHORT TO GROUND IN THE HARNESS

- Key in OFF position.
- Measure the resistance between:

(+) HFC Relay Connector, Harness Side	(-)
HFC - Pin 2	Ground

Is the resistance greater than 10K ohms?

Yes	GO to KF17 .
No	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

KF17 CHECK THE HFC CIRCUIT FOR AN OPEN IN THE HARNESS

- Measure the resistance between:

(+) HFC Relay Connector, Harness Side	(-) PCM Connector, Harness Side
HFC - Pin 2	HFC

Is the resistance less than 5 ohms?

Yes	GO to KF70 .
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF18 KOEO AND KOER DTCS P0480 OR P1474: CHECK THE VPWR VOLTAGE TO THE LFC1 RELAY

Note: This application has 2 relays wired to the LFC circuit. This procedure may call out LFC1 and LFC2 relays. Either of the relays may be used as the number 1, with the other relay being number 2.

- LFC1 Relay connector disconnected.
- Key ON, engine OFF.
- Measure the voltage between:

(+) LFC1 Relay Connector, Harness Side	(-)
VPWR	Ground

Is the voltage greater than 10 V?

Yes	GO to KF19 .
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF19 CHECK FOR LFC CIRCUIT CYCLING

- Connect a non-powered test lamp between:

(+) LFC1 Relay Connector, Harness Side	(-) LFC1 Relay Connector, Harness Side
VPWR	LFC

- Enter output test mode. Refer to Section 2, [Output Test Mode \(OTM\)](#).
- Command the low speed fan ON.
- Command the high speed fan ON.

- Command the outputs OFF.

Does the test lamp illuminate on and off when either the low or high speed cooling fan output is commanded on and off?

Yes	INSTALL a new LFC1 relay. LEAVE the relay disconnected. CLEAR the DTCs. REPEAT the self-test. GO to KF24 .
No	Leave the test lamp connected. GO to KF20 .

KF20 CHECK FOR LFC CIRCUIT CYCLING WITH THE LFC2 RLY DISCONNECTED

- Connect a non-powered test lamp between:

(+) LFC1 Relay Connector, Harness Side	(-) LFC1 Relay Connector, Harness Side
VPWR	LFC

- LFC2 Relay connector disconnected.
- Command the low speed fan ON.
- Command the high speed fan ON.
- Command the outputs OFF.

Does the test lamp illuminate on and off when either the low or high speed cooling fan output is commanded on and off?

Yes	INSTALL a new LFC2 relay. CLEAR the DTCs. REPEAT the self-test.
No	GO to KF21 .

KF21 CHECK THE LFC CIRCUIT FOR A SHORT TO VOLTAGE IN THE HARNESS

- PCM connector disconnected.
- Key ON, engine OFF.
- Measure the voltage between:

(+) LFC1 Relay Connector, Harness Side	(-)
LFC	Ground

Is the voltage less than 1 V?

Yes	GO to KF22 .
No	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

KF22 CHECK THE LFC CIRCUIT FOR A SHORT TO GROUND IN THE HARNESS

- Key in OFF position.
- Measure the resistance between:

(+) LFC1 Relay Connector, Harness Side	(-)
LFC	Ground

Is the resistance greater than 10K ohms?

Yes	GO to KF23 .
No	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

KF23 CHECK THE LFC CIRCUIT FOR AN OPEN IN THE HARNESS

- Measure the resistance between:

(+) LFC1 Relay Connector, Harness Side	(-) PCM Connector, Harness Side
LFC	LFC

Is the resistance less than 5 ohms?

Yes	GO to KF70 .
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF24 VERIFY THERE IS NOT AN OPEN IN THE CIRCUIT SPECIFIC TO THE LFC2 RELAY

- Access the PCM and monitor the LFCF PID.
- Command the high speed fan ON.
- Command the outputs OFF.
- Command the low speed fan ON.
- Command the outputs OFF.

Does the PID indicate a concern (yes) when either the high or low speed cooling fan output is commanded on and off?

Yes	GO to KF25 .
No	INSTALL a new LFC1 relay. CLEAR the DTCs. REPEAT the self-test.

KF25 CHECK THE VPWR VOLTAGE TO THE LFC2 RELAY

- LFC2 Relay connector disconnected.
- Key ON, engine OFF.
- Measure the voltage between:

(+) LFC2 Relay Connector, Harness Side	(-)
VPWR	Ground

Is the voltage greater than 10 V?

Yes	GO to KF26 .
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF26 CHECK THE LFC CIRCUIT BETWEEN THE LOW SPEED FC RELAY(S)

- Key in OFF position.
- Measure the resistance between:

(+) LFC1 Relay Connector, Harness Side	(-) LFC2 Relay Connector, Harness Side
LFC	LFC

Is the resistance less than 5 ohms?

Yes	INSTALL new LFC relays. CLEAR the DTCs. REPEAT the self-test.
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF27 KOEO AND KOER DTCS P0482 OR P1477: CHECK THE VPWR VOLTAGE TO THE MFC1 RELAY

Note: This application has 2 relays wired to the MFC circuit. This procedure may call out MFC1 and MFC2 relays. Either of the relays may be used as the number 1, with the other relay being number 2.

- MFC1 Relay connector disconnected.
- Key ON, engine OFF.
- Measure the voltage between:

(+) MFC1 Relay Connector, Harness Side	(-)
VPWR	Ground

Is the voltage greater than 10 V?

Yes	GO to KF28 .
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF28 CHECK FOR MFC CIRCUIT CYCLING

- Connect a non-powered test lamp between:

(+) MFC1 Relay Connector, Harness Side	(-) MFC1 Relay Connector, Harness Side
VPWR	MFC

- Enter output test mode. Refer to Section 2, [Output Test Mode \(OTM\)](#).
- Command the low speed fan ON.
- Command the high speed fan ON.
- Command the outputs OFF.

Does the test lamp illuminate on and off when either the low or high speed cooling fan output is commanded on and off?

Yes	INSTALL a new MFC1 relay at the end of diagnostics. Leave the relay disconnected. CLEAR the DTCs. REPEAT the self-test. GO to KF33 .
No	Leave the test lamp connected. GO to KF29 .

KF29 CHECK FOR MFC CIRCUIT CYCLING WITH THE MFC2 RLY DISCONNECTED

- Connect a non-powered test lamp between:

(+) MFC1 Relay Connector, Harness Side	(-) MFC1 Relay Connector, Harness Side
VPWR	MFC

- MFC2 Relay connector disconnected.
- Command the low speed fan ON.
- Command the high speed fan ON.
- Command the outputs OFF.

Does the test lamp illuminate on and off when either the low or high speed cooling fan output is commanded on and off?

Yes	INSTALL a new MFC2 relay. CLEAR the DTCs. REPEAT the self-test.
No	GO to KF30 .

KF30 CHECK THE MFC CIRCUIT FOR A SHORT TO VOLTAGE IN THE HARNESS

- PCM connector disconnected.
- Key ON, engine OFF.
- Measure the voltage between:

(+) MFC1 Relay Connector, Harness Side	(-)
MFC	Ground

Is the voltage less than 1 V?

Yes	GO to KF31 .
No	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

KF31 CHECK THE MFC CIRCUIT FOR A SHORT TO GROUND IN THE HARNESS

- Key in OFF position.
- Measure the resistance between:

(+) MFC1 Relay Connector, Harness Side	(-)
MFC	Ground

Is the resistance greater than 10K ohms?

Yes	GO to KF32 .
No	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

KF32 CHECK THE MFC CIRCUIT FOR AN OPEN IN THE HARNESS

- Measure the resistance between:

(+) MFC1 Relay Connector, Harness Side	(-) PCM Connector, Harness Side
MFC	MFC

Is the resistance less than 5 ohms?

Yes	GO to KF70 .
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No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.
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KF33 VERIFY THERE IS NOT AN OPEN IN THE CIRCUIT SPECIFIC TO THE MFC2 RELAY

- Access the PCM and monitor the MFCF PID.
- Command the high speed fan ON.
- Command the outputs OFF.
- Command the low speed fan ON.
- Command the outputs OFF.

Does the PID indicate a concern (yes) when either the high or low speed cooling fan output is commanded on and off?

Yes	GO to KF34 .
No	INSTALL a new MFC relay. CLEAR the DTCs. REPEAT the self-test.

KF34 CHECK THE VPWR VOLTAGE TO THE MFC2 RELAY

- MFC2 Relay connector disconnected.
- Key ON, engine OFF.
- Measure the voltage between:

(+) MFC2 Relay Connector, Harness Side	(-)
VPWR	Ground

Is the voltage greater than 10 V?

Yes	GO to KF35 .
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF35 CHECK THE MFC CIRCUIT BETWEEN THE MEDIUM SPEED FC RELAY(S)

- Key in OFF position.
- Measure the resistance between:

(+) MFC1 Relay Connector, Harness Side	(-) MFC2 Relay Connector, Harness Side
MFC	MFC

Is the resistance less than 5 ohms?

Yes	INSTALL a new MFC relay(s). CLEAR the DTCs. REPEAT the self-test.
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF36 KOEO AND KOER DTCS P0481 OR P1479: CHECK THE VPWR VOLTAGE TO THE HFC1 RELAY

Note: This application has 2 relays wired to the HFC circuit. This procedure may call out HFC1 and HFC2 relays. Either of the relays may be used as the number 1, with the other relay being number 2.

- HFC1 Relay connector disconnected.
- Key ON, engine OFF.
- Measure the voltage between:

(+) HFC1 Relay Connector, Harness Side	(-)
VPWR	Ground

Is the voltage greater than 10 V?

Yes	GO to KF37 .
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF37 CHECK FOR HFC CIRCUIT CYCLING

- Connect a non-powered test lamp between:

(+) HFC1 Relay Connector, Harness Side	(-) HFC1 Relay Connector, Harness Side
VPWR	HFC

- Enter output test mode. Refer to Section 2, [Output Test Mode \(OTM\)](#).
- Command the low speed fan ON.
- Command the high speed fan ON.
- Command the outputs OFF.

Does the test lamp illuminate on and off when either the low or high speed cooling fan output is commanded on and off?

Yes	INSTALL a new HFC1 relay at the end of diagnostics. Leave the relay disconnected. CLEAR the DTCs. REPEAT the self-test. GO to KF42 .
No	Leave the test lamp connected. GO to KF38 .

KF38 CHECK FOR HFC CIRCUIT CYCLING WITH THE HFC2 RLY DISCONNECTED

- Connect a non-powered test lamp between:

(+) HFC1 Relay Connector, Harness Side	(-) HFC1 Relay Connector, Harness Side
VPWR	HFC

- HFC2 Relay connector disconnected.
- Command the low speed fan ON.
- Command the high speed fan ON.
- Command the outputs OFF.

Does the test lamp illuminate on and off when either the low or high speed cooling fan output is commanded on and off?

Yes	INSTALL a new HFC2 relay. CLEAR the DTCs. REPEAT the self-test.
No	GO to KF39 .

KF39 CHECK THE HFC CIRCUIT FOR A SHORT TO VOLTAGE IN THE HARNESS

- PCM connector disconnected.
- Key ON, engine OFF.
- Measure the voltage between:

(+) HFC1 Relay Connector, Harness Side	(-)
HFC	Ground

Is the voltage less than 1 V?

Yes	GO to KF40 .
No	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

KF40 CHECK THE HFC CIRCUIT FOR A SHORT TO GROUND IN THE HARNESS

- Key in OFF position.
- Measure the resistance between:

(+) HFC1 Relay Connector, Harness Side	(-)
HFC	Ground

Is the resistance greater than 10K ohms?

Yes	GO to KF41 .
No	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

KF41 CHECK THE HFC CIRCUIT FOR AN OPEN IN THE HARNESS

- Measure the resistance between:

(+) HFC1 Relay Connector, Harness Side	(-) PCM Connector, Harness Side
HFC	HFC

Is the resistance less than 5 ohms?

Yes	GO to KF70 .
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF42 VERIFY THERE IS NOT AN OPEN IN THE CIRCUIT SPECIFIC TO THE HFC2 RELAY

- Access the PCM and monitor the HFCF PID.
- Command the high speed fan ON.
- Command the outputs OFF.
- Command the low speed fan ON.
- Command the outputs OFF.

Does the PID indicate a concern (yes) when either the high or low speed cooling fan output is commanded on and off?

Yes	GO to KF43 .
No	INSTALL a new HFC1 relay. CLEAR the DTCs. REPEAT the self-test.

KF43 CHECK THE VPWR VOLTAGE TO HFC2 RLY

- HFC2 Relay connector disconnected.

- Key ON, engine OFF.
- Measure the voltage between:

(+) HFC2 Relay Connector, Harness Side	(-)
VPWR	Ground

Is the voltage greater than 10 V?

Yes	GO to KF44 .
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF44 CHECK THE HFC CIRCUIT BETWEEN THE HIGH SPEED FC RELAY(S)

- Key in OFF position.
- Measure the resistance between:

(+) HFC1 Relay Connector, Harness Side	(-) HFC2 Relay Connector, Harness Side
HFC	HFC

Is the resistance less than 5 ohms?

Yes	INSTALL a new HFC relay(s). CLEAR the DTCs. REPEAT the self-test.
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF45 CONTINUOUS MEMORY DTCS P0480 OR P1474: CHECK THE LFC CIRCUIT FOR AN INTERMITTENT OPEN OR SHORT TO VOLTAGE

Note: *If the test lamp does not turn on, command the high speed fan on.*

- A/C and defrost off.
- Left Fan Motor connector disconnected.
- Right Fan Motor connector disconnected.
- LFC Relay connector disconnected.
- Connect a non-powered test lamp between:

(+) LFC Relay Connector, Harness Side	(-) LFC Relay Connector, Harness Side
VPWR - Pin 1	LFC - Pin 2

- Key ON, engine OFF.
- Enter output test mode. Refer to Section 2, [Output Test Mode \(OTM\)](#).
- Command the low speed fan ON.
- Observe the test lamp for an indication of a concern while carrying out the following. Note that the lamp turns off when a concern is detected.
 - Shake, wiggle, and bend the LFC circuit(s).
 - Shake, wiggle, and bend the VPWR circuit to the LFC relay.
 - Inspect the LFC relay component for signs of damage.

Is a concern present?

Yes	ISOLATE the concern and REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.
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No	GO to KF46 .
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KF46 CHECK THE LFC CIRCUIT FOR AN INTERMITTENT SHORT TO GROUND

- Key ON, engine OFF.
- Command the outputs OFF.
- Observe the test lamp for an indication of a concern while carrying out the following. Note that the lamp turns on when a concern is detected.
 - Shake, wiggle, and bend the LFC circuit
 - Lightly tap on the LFC RLY to simulate road shock

Is a concern present?

Yes	ISOLATE the concern and REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.
No	Unable to duplicate or identify the concern at this time. GO to Pinpoint Test Z.

KF47 CONTINUOUS MEMORY DTCS P0481 OR P1479: CHECK THE HFC CIRCUIT FOR AN INTERMITTENT OPEN OR SHORT TO VOLTAGE

Note: *If the test lamp does not turn on, command the low speed fan ON.*

- A/C and defrost off.
- Left Fan Motor connector disconnected.
- Right Fan Motor connector disconnected.
- HFC Relay connector disconnected.
- Connect a non-powered test lamp between:

(+) HFC Relay Connector, Harness Side	(-) HFC Relay Connector, Harness Side
VPWR - Pin 1	HFC - Pin 2

- Key ON, engine OFF.
- Enter output test mode. Refer to Section 2, [Output Test Mode \(OTM\)](#).
- Command the high speed fan ON.
- Observe the test lamp for an indication of a concern while carrying out the following. Note that the lamp turns off when a concern is detected.
 - Shake, wiggle, and bend the HFC circuit(s)
 - Shake, wiggle, and bend the VPWR circuit to the HFC relay
 - Lightly tap on the HFC RLY to simulate road shock

Is a concern present?

Yes	ISOLATE the concern and REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.
No	GO to KF48 .

KF48 CHECK THE HFC CIRCUIT FOR AN INTERMITTENT SHORT TO GROUND

- Key ON, engine OFF.
- Command the outputs OFF.
- Observe the test lamp for an indication of a concern. Note that the lamp illuminates when a concern is detected. Wiggle, shake, and bend the HFC circuit(s). Shake, wiggle, and bend the PCM on both high speed FC relays.

Is a concern present?

Yes	ISOLATE the concern and REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.
No	Unable to duplicate or identify the concern at this time.

KF49 CONTINUOUS MEMORY DTCS P0482 OR P1477: CHECK THE MFC CIRCUIT FOR AN INTERMITTENT OPEN OR SHORT TO VOLTAGE

Note: If the test lamp does not turn on, command the high speed fan on.

- A/C and defrost off.
- Left Fan Motor connector disconnected.
- Right Fan Motor connector disconnected.
- MFC Relay connector disconnected.
- Connect a non-powered test lamp between:

(+) MFC Relay Connector, Harness Side	(-) MFC Relay Connector, Harness Side
VPWR - Pin 1	MFC - Pin 2

- Key ON, engine OFF.
- Enter output test mode. Refer to Section 2, [Output Test Mode \(OTM\)](#).
- Command the low speed fan ON.
- Observe the test lamp for an indication of a concern while carrying out the following. Note that the lamp turns off when a concern is detected.
 - Shake, wiggle, and bend the MFC circuit(s).
 - Shake, wiggle, and bend the VPWR circuit to the MFC relay.
 - Inspect the MFC RLY component for signs of damage.

Is a concern present?

Yes	ISOLATE the concern and REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.
No	GO to KF50 .

KF50 CHECK THE MFC CIRCUIT FOR AN INTERMITTENT SHORT TO GROUND

- Key ON, engine OFF.
- Command the outputs OFF.
- Observe the test lamp for an indication of a concern. Note that the lamp illuminates when a concern is detected. Wiggle, shake, and bend the HFC circuit(s). Shake, wiggle, and bend the PCM on both high speed FC relays.

Is a concern present?

Yes	ISOLATE the concern and REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.
No	Unable to duplicate or identify the concern at this time. GO to Pinpoint Test Z.

KF51 CONTINUOUS MEMORY DTCS P0480 OR P1474: CHECK THE LFC CIRCUIT FOR AN INTERMITTENT OPEN OR SHORT TO VOLTAGE

Note: This application has 2 relays wired to the LFC circuit. This procedure may call out LFC1 and LFC2 relays. Either of the relays may be used as the number 1, with the other relay being number 2.

Note: Command the high speed fan ON.

- A/C and defroster OFF.
- Left Fan Motor connector disconnected.
- Right Fan Motor connector disconnected.
- LFC1 Relay connector disconnected.
- Connect a non-powered test lamp between:

(+) LFC1 Relay Connector, Harness Side	(-) LFC1 Relay Connector, Harness Side
VPWR	LFC

- Key ON, engine OFF.
- Enter output test mode. Refer to Section 2, [Output Test Mode \(OTM\)](#).
- Command the low speed fan ON.
- Observe the test lamp for an indication of a concern while carrying out the following. Note that the lamp turns off when a concern is detected.
 - Shake, wiggle, and bend the LFC circuit between the PCM and both low speed FC relays
 - Shake, wiggle, and bend the VPWR circuit to both low speed FC relays
 - Lightly tap on the low speed FC relay that is still connected to simulate road shock

Is a concern present?

Yes	ISOLATE the concern and REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.
No	GO to KF52 .

KF52 CHECK THE LFC CIRCUIT FOR A SHORT TO GROUND IN THE HARNESS

- Key ON, engine OFF.
- Command the outputs OFF.
- Exit output test mode.
- Observe the test lamp for an indication of a concern while carrying out the following. Note that the lamp turns on when a concern is detected.
 - Shake, wiggle, and bend the LFC circuit between the PCM and both low speed FC relays
- Inspect low speed FC relay that is disconnected for intermittent concerns.

Is a concern present?

Yes	ISOLATE the concern and REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.
No	GO to Pinpoint Test Z .

KF53 CONTINUOUS MEMORY DTCS P0482 OR P1477: CHECK THE MFC CIRCUIT FOR AN INTERMITTENT OPEN OR SHORT TO VOLTAGE

Note: This application has 2 relays wired to the MFC circuit. This procedure may call out MFC1 and MFC2 relays. Either of the relays may be used as the number 1, with the other relay being number 2.

Note: If the test lamp does not turn on, command the high speed fan ON.

- AC and defroster OFF.
- Left Fan Motor connector disconnected.
- Right Fan Motor connector disconnected.
- MFC1 Relay connector disconnected.
- Connect a non-powered test lamp between:

(+) MFC1 Relay Connector, Harness Side	(-) MFC1 Relay Connector, Harness Side
VPWR	MFC

- Key ON, engine OFF.
- Enter output test mode. Refer to Section 2, [Output Test Mode \(OTM\)](#).
- Command the low speed fan ON.
- Observe the test lamp for an indication of a concern while carrying out the following. Note that the lamp turns off when a concern is detected.
 - Shake, wiggle, and bend the MFC circuit between the PCM and both medium speed FC relays
 - Shake, wiggle, and bend the VPWR circuit to both medium speed FC relays

- Lightly tap on the medium speed FC relay that is still connected to simulate road shock

Is a concern present?

Yes	ISOLATE the concern and REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.
No	GO to KF54 .

KF54 CHECK THE MFC CIRCUIT FOR A SHORT TO GROUND IN THE HARNESS

- Key ON, engine OFF.
- Command the outputs OFF.
- Exit output test mode.
- Observe the test lamp for an indication of a concern. Note that the lamp illuminates when a concern is detected. Wiggle, shake, and bend the MFC circuit(s).
- Inspect the medium speed FC relay that is disconnected for intermittent concerns.

Is a concern present?

Yes	ISOLATE the concern and REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.
No	GO to Pinpoint Test Z .

KF55 CONTINUOUS MEMORY DTCS P0481 OR P1479: CHECK THE HFC CIRCUIT FOR AN INTERMITTENT OPEN OR SHORT TO VOLTAGE

Note: This application has 2 relays wired to the HFC circuit. This procedure may call out HFC1 and HFC2 relays. Either of the relays may be used as the number 1, with the other relay being number 2.

Note: If the test lamp does not turn on, command the high speed fan ON.

- A/C and defroster OFF.
- Left Fan Motor connector disconnected.
- Right Fan Motor connector disconnected.
- HFC1 Relay connector disconnected.
- Connect a non-powered test lamp between:

(+) HFC1 Relay Connector, Harness Side	(-) HFC1 Relay Connector, Harness Side
VPWR	HFC

- Key ON, engine OFF.
- Enter output test mode. Refer to Section 2, [Output Test Mode \(OTM\)](#).
- Command the low speed fan ON.
- Observe the test lamp for an indication of a concern while carrying out the following. Note that the lamp turns off when a concern is detected.
 - Shake, wiggle, and bend the PCM and both high speed FC relays.
 - Shake, wiggle, and bend the VPWR circuit to both high speed FC relays
 - Lightly tap on the high speed FC relay that is still connected to simulate road shock

Is a concern present?

Yes	ISOLATE the concern and REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.
No	GO to KF56 .

KF56 CHECK THE HFC CIRCUIT FOR A SHORT TO GROUND IN THE HARNESS

- Key ON, engine OFF.

- Command the outputs OFF.
- Exit output test mode.
- Observe the test lamp for an indication of a concern. Note that the lamp illuminates when a concern is detected. Wiggle, shake, and bend the HFC circuit(s) between the PCM and on both high speed FC relays.
- Inspect the high speed FC relay that is disconnected for intermittent concerns.

Is a concern present?

Yes	ISOLATE the concern and REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.
No	GO to Pinpoint Test Z.

KF57 THE COOLING FAN ALWAYS RUNS (NO DTCS): VERIFY THE FAN IS NOT ON BECAUSE OF A/C HIGH PRESSURE SWITCH INPUT TO THE PCM

- Key ON, engine running.
- Access the PCM and monitor the ACP PID.

Is the PID state CLOSED?

Yes	The PCM turns the fan on when the medium pressure, normally open contacts of the ACHP switch are closed. GO to KF68 .
No	The input is OK. GO to KF58 .

KF58 COOLING FAN CONCERN (NO DTCS): CHECK THE FAN CONTROL PRIMARY CIRCUITS

Note: *Chose the PIDs below as appropriate, according to which circuits the vehicle has.*

- Verify that the A/C is OFF.
- Verify engine temperature is below the temperature where the cooling fan comes on.
- Key ON, engine OFF.
- Access the PCM and monitor the LFCF, MFCF and HFCF PIDs.

Does either PID indicate a concern?

Yes	A concern is present in the primary circuit(s). GO to KF59 .
No	For all except Ranger, the PCM primary circuit(s) is OK. To check for secondary wiring, REFER to the Workshop Manual Section 303-03, Engine Cooling for cooling system diagnosis. For Ranger: GO to KF61 .

KF59 DOES THE LFCF PID INDICATE A CONCERN?

Does the LFCF PID indicate a concern?

Yes	The low fan control (LFC) circuitry has a primary circuit concern. For Freestar/Monterey, GO to KF18 . For all others, GO to KF3 .
No	GO to KF60 .

KF60 DOES THE MFCF PID INDICATE A CONCERN?

Does the MFCF PID indicate a concern?

Yes	The medium fan control (MFC) primary circuitry has a circuit concern. For Focus, and Freestar/Monterey, GO to KF27 . For all others, GO to KF8 .
No	The high fan control (HFC) primary circuitry has a circuit concern. For Taurus, Escape 3.0L, Mariner 3.0L, and Ford GT, GO to KF36 . For all others, GO to KF13 .

KF61 IS THE SYMPTOM: COOLING FAN ALWAYS RUNS?

Is the symptom: cooling fan always runs?

Yes	GO to KF67 .
No	GO to KF62 .

KF62 ELECTRIC COOLING FAN CONCERN (WITH NO DTCS): ELECTRIC COOLING FAN FUNCTIONAL CHECK

- Key ON, engine OFF.
- Enter output test mode. Refer to Section 2, [Output Test Mode \(OTM\)](#).
- Command the low speed fan ON.

Does the fan operate?

Yes	All cooling fan circuit checks are OK. RETURN to Section 3, Symptom Charts to continue diagnosis.
No	GO to KF63 .

KF63 FAN INOPERATIVE: COMMAND THE LOW SPEED FAN ON AND CHECK FOR VOLTAGE TO THE CF

- Key in OFF position.
- CF Motor connector disconnected.
- Key ON, engine OFF.
- Enter output test mode. Refer to Section 2, [Output Test Mode \(OTM\)](#).
- Command the low speed fan ON.
- Measure the voltage between:

(+) CF Motor Connector, Harness Side	(-)
FAN PWR	Ground

Is the voltage greater than 10 V?

Yes	GO to KF64 .
No	GO to KF65 .

KF64 CHECK THE GROUND CIRCUIT TO THE COOLING FAN

- Key in OFF position.
- Measure the resistance between:

(+) CF Motor Connector, Harness Side	(-)
GND	Ground

Is the resistance less than 5 ohms?

Yes	INSTALL a new CF motor. CLEAR the DTCs. REPEAT the self-test.
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF65 CHECK THE B+ VOLTAGE TO THE FC RELAY

- FC Relay connector disconnected.
- Measure the voltage between:

(+) FC Relay Connector, Harness Side	(-)
B+	Ground

Is the voltage greater than 10 V?

Yes	GO to KF66 .
No	REPAIR the open circuit. There is a B+ circuit concern. CHECK the condition of the related fuse/fuse links. If OK, REPAIR the open circuit. If the fuse/fuse link is damaged, CHECK the circuit for a short to ground before replacing the fuse/fuse link. CLEAR the DTCs. REPEAT the self-test.

KF66 CHECK THE FAN PWR CIRCUIT FOR AN OPEN IN THE HARNESS

- Measure the resistance between:

(+) FC Relay Connector, Harness Side	(-) CF Motor Connector, Harness Side
FAN PWR	FAN PWR

Is the resistance less than 5 ohms?

Yes	INSTALL a new FC relay. CLEAR the DTCs. REPEAT the self-test.
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KF67 CHECK FOR FC RLY CONTACTS ALWAYS CLOSED

Note: Verify the A/C and defrost are off.

- FC Relay connector disconnected.
- Key ON, engine OFF.

Does the fan run with the key in the ON position?

Yes	REPAIR the short circuit to PWR. CLEAR the DTCs. REPEAT the self-test.
No	INSTALL a new FC relay. CLEAR the DTCs. REPEAT the self-test.

KF68 CHECK THE A/CHPSW (MEDIUM PRESSURE, NORMALLY OPEN CONTACTS)

- A/CHPSW connector disconnected.
- Key ON, engine OFF.
- Access the PCM and monitor the ACP PID.

Is the PID state CLOSED?

Yes	GO to KF69 .
No	CONNECT the A/CHPSW. REFER to the Climate Control System, Section 412-03 in the Workshop Manual to diagnose the A/C system pressure. If OK, INSTALL a new A/CHPSW. CLEAR the DTCs. REPEAT the self-test.

KF69 CHECK THE A/CPSW CIRCUIT FOR A SHORT TO GROUND IN THE HARNESS

- Key in OFF position.
- PCM connector disconnected.
- Measure the resistance between:

(+) A/CHPSW Connector, Harness Side	(-)
A/CPSW	Ground

Is the resistance greater than 10K ohms?

Yes	VERIFY the results of the previous test steps. RETURN to Section 3, Symptom Charts to continue diagnosis. GO to KF70 .
No	REPAIR the short circuit to GND. CLEAR the DTCs. REPEAT the self-test.

KF70 CHECK FOR CORRECT PCM OPERATION

- Disconnect all the PCM connectors.
- Visually inspect for:
 - pushed out pins.
 - corrosion.
- Connect all the PCM connectors and make sure they seat correctly.
- Carry out the PCM self-test and verify the concern is still present.

Is the concern still present?

Yes	INSTALL a new PCM. REFER to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.

