SECTION 15

Ignition Systems, Timing Procedures and Diagnostics

Contents

PLEASE REFER TO TSB **89-5A** FOR: REVISED IGNITION COIL AND SECONDARY WIRE TEST STEP PROCEDURES AND ILLUSTRATION.

Initial Timing Set Procedure

PRELIMINARY NOTE

The procedure described below for setting initial timing is to be used under normal circumstances. If problems are encountered setting initial timing using this procedure, the spark timing procedure that follows should be used to diagnose the problem.

Procedure	Non-EEC	EEC-IV
① Place transmission in PARK or NEUTRAL, A/C and heater in OFF position.	X	X
② Remove vacuum hoses from the distributor vacuum advance connection at the distributor and plug the hoses.	X	
③ Connect an inductive timing light, Rotunda 059-00006 or equivalent.	X	X
④ Connect a tachometer, Rotunda 059-00010 or equivalent.	X	
⑤ Disconnect the single wire in-line spout connector or remove the shorting bar from the double wire spout connector.		X
⑥ If the vehicle is equipped with a barometric pressure switch (-12A243-) disconnect it from the ignition module and place a jumper wire across the pins at the ignition module connector (yellow and black wires).	X	
⑦ Start the engine and allow it to warm up to operating temperature.	X	X
⑧ With engine at timing rpm if specified, check/adjust initial timing to specification.	X	X
⑨ Reconnect single wire in-line spout connector or reinstall the shorting bar on the double wire spout connector. Check timing advance to verify distributor is advancing beyond the initial setting. If it is not, refer to Section 16 Quick Test 04.		X
⑩ Remove test instruments.	X	X
⑪ Unplug and reconnect vacuum hoses.	X	
⑫ Remove jumper from ignition connector and reconnect if applicable.	X	

PLEASE REFER TO TSB **87-21-9** FOR: NEW TFI DIAGNOSTIC PROCEDURES.

SPARK TIMING ADVANCE

Spark Timing Advance
EEC-IV Equipped Vehicles

CHECKOUT

- Visually inspect the engine compartment to ensure all vacuum hoses and spark plug wires are properly routed and securely connected.
- Examine all wiring harnesses and connectors for insulation damage, burned, overheated, loose or broken conditions.
- Be certain battery is fully charged.
- All accessories should be off during diagnosis.

EQUIPMENT

Obtain the following test equipment or an equivalent:

- Small straight pin.
- Volt/Ohm Meter Rotunda 014-00407.

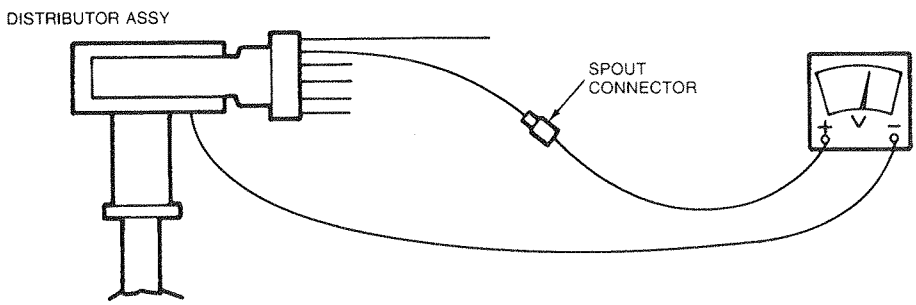
NOTES

- This procedure is applicable to all EEC-IV equipped vehicles.
- Spark Timing Advance is controlled by the EEC system. This procedure checks the capability of the ignition module to receive the spark timing command from the EEC module.

Spark Timing Advance — EEC

Test 1

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Key in OFF position. 2. Disconnect the pin in-line connector near the TFI module (SPOUT). 3. Attach the negative (-) VOM lead to the distributor base. 4. Start the engine and measure the battery voltage at idle. 5. Measure the voltage on the TFI module side of the pin in-line connector. 6. Is the result between 30 percent and 60 percent of battery voltage?	Yes ▶	TFI is OK. GO to EEC Diagnostics, Section 16 Computed Timing.
	No ▶	GO to Test 2.

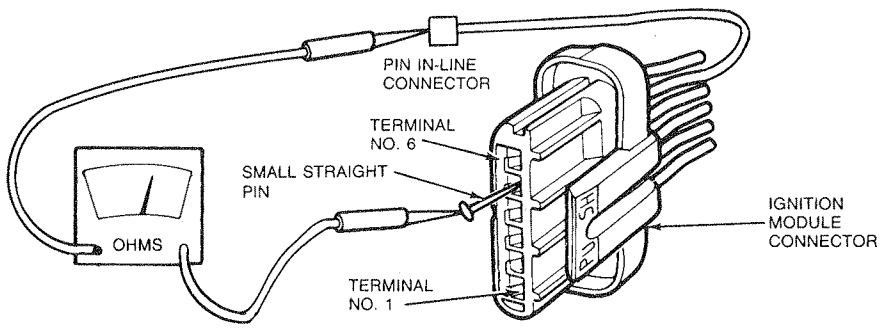


A9368-A

Spark Timing Advance — EEC

Test 2

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Separate wiring harness connector from ignition module. Inspect for dirt, corrosion and damage. **NOTE: PUSH connector tabs to separate.** 2. Using small straight pin inserted into connector terminal 5, measure resistance between the terminal and the TFI module side of the pin in-line connector. 3. Is the result less than 5 ohms?	Yes ▶	REPLACE the TFI module.
	No ▶	SERVICE the wiring between the pin in-line connector and the TFI connector.



Spark Timing Advance
Non-EEC Equipped Vehicles

CHECKOUT

- Visually inspect the engine compartment to ensure all vacuum hoses and spark plug wires are properly routed and securely connected.
- Examine all wiring harnesses and connectors for insulation damage, burned, overheated, loose or broken conditions.
- Be certain battery is fully charged.
- All accessories should be off during diagnosis.

EQUIPMENT

Obtain the following test equipment or an equivalent:

- Inductive Timing Light, Rotunda 059-00006.
- Tachometer, Rotunda 099-00003.
- Vacuum Gauge, Rotunda 059-00008.

NOTES

- This procedure is not applicable to EEC-IV equipped vehicles.
- This procedure checks the operation of the centrifugal and vacuum advance mechanisms in the distributor. It is also to be used to check the operation of the retard feature of the (-12A244-) Ignition Module.

Spark Timing Advance — Non-EEC

TEST STEP	RESULT ▶	ACTION TO TAKE
STEP 1		
• Disconnect and plug distributor vacuum hose(s). • Connect timing light and tachometer.		GO to Step 2.
STEP 2		
If Ignition Module (-12A244-) is used: • Disconnect two wire connector (YELLOW and BLACK wires). • Jumper pins in module connector. • If (-12A244-) Ignition Module not used, skip this Step.		GO to Step 3.
STEP 3		
• Start and warm-up engine. • Check that engine speed is at or below timing rpm.*	Engine speed at or below timing rpm* ▶	OK. GO to Step 4.
	Engine speed above timing rpm* ▶	RESET rpm below timing rpm. GO to Step 4.

***Refer to Vehicle Emission Control Information Decal.**

Spark Timing Advance — Non-EEC

TEST STEP	RESULT ▶	ACTION TO TAKE
STEP 4		
• Positive-Buy timing?	Yes ▶	GO to Step 5.
	No ▶	GO to Step 6.
STEP 5		
• Check initial timing. **NOTE: Record reading for later use.**	Within ± 4 degrees of required* ▶	GO to Step 7.
	Not within ± 4 degrees of required* ▶	RESET timing. REMOVE or deface positive buy label. GO to Step 7.
STEP 6		
• Check initial timing. **NOTE: Record reading for later use.**	Within ± 2 degrees of required ▶	GO to Step 7.
	Not within ± 2 degrees of required ▶	RESET timing. GO to Step 7.

***Refer to Vehicle Emission Control Information Decal.**

Spark Timing Advance — Non-EEC

TEST STEP	RESULT ▶	ACTION TO TAKE
STEP 7		
• Basic Part No. (-12A244-) on ignition module?	Yes ▶	REMOVE jumper in two wire connector. RECONNECT two wire connector. GO to Step 8.
	No ▶	GO to Step 11.
STEP 8		
• Check initial timing at timing rpm.	Timing same as Step 5 or Step 6 ▶	DISCONNECT two wire connector (YELLOW and BLACK wires) at ignition module. GO to Step 9. **NOTE: Engine may die when connector is separated due to excessive spark retard. If this happens spark retard operation is OK. RECONNECT two wire connector, GO to Step 11.**
	Timing not same as Step 5 or Step 6 ▶	REFER to the MCU Diagnosis Manual then return to Step 2.
STEP 9		
• Check initial timing at timing rpm.	Timing retarded from Step 8 ▶	Retard operation OK. REMOVE vacuum gauge and RECONNECT vacuum hose (if used). GO to Step 11.
	Timing not retarded from Step 8 ▶	GO to Step 10.

Spark Timing Advance — Non-EEC

TEST STEP	RESULT ▶	ACTION TO TAKE
STEP 10		
• Substitute new ignition module. • Connect two wire (RED and WHITE wires) and four wire connectors. • Jumper pins in two wire (YELLOW and BLACK wires) connector. • Check initial timing at timing rpm.	Timing same as Step 5 or Step 6 ▶	RETURN to Step 8. **NOTE: If ignition module substitution appears to correct problem, RECONNECT original module and REPEAT this Step to verify service.**
	Timing not same as Step 5 or Step 6 ▶	REPEAT Step 10.
STEP 11		
• Increase engine speed to 2,500 rpm. • Check spark timing. • Return to idle rpm. **NOTE: Refer to the Service Performance Manual for total advance at 2,500 rpm/vacuum advance disconnected under the correct engine calibration for specification.**	Timing within specification ▶	GO to Step 12.
	Timing not within specification ▶	REPLACE distributor. REPEAT this Step.
STEP 12		
• Check initial timing at timing rpm.	Timing same as Step 5 or Step 6 ▶	Distributor mechanical advance mechanism OK. GO to Step 13.
	Timing not same as Step 5 or Step 6 ▶	REPLACE distributor. RETURN to Step 11.

Spark Timing Advance — Non-EEC

TEST STEP	RESULT ▶	ACTION TO TAKE
STEP 13		
• Install distributor vacuum **advance** hose without spark delay valve if used. • Increase engine speed to 2,500 rpm, hold for 60 seconds. • Check spark timing. • Return to idle rpm. **NOTE: Refer to the Service Performance Manual for total advance at 2,500 rpm/vacuum advance connected under the correct engine calibration for specification.**	Timing within specification ▶	Distributor vacuum advance mechanism OK. REFER to Section 3. CHECK operation of spark-delay valve if used. GO to Step 17.
	Timing not within specification ▶	GO to Step 14.
STEP 14		
• Install vacuum gauge in vacuum advance hose, using Tee connector. • Increase engine speed to 2,500 rpm, hold for 60 seconds. • Check for presence of vacuum. • Return to idle rpm.	51 kPa (15 in-Hg) vacuum minimum ▶	INSPECT diaphragm for vacuum leaks and stator assembly for sticking/binding. SERVICE/REPLACE as necessary. RETURN to Step 13.
	Less than 51 kPa (15 in-Hg) vacuum ▶	GO to Step 15.
STEP 15		
• Check engine for vacuum lockout devices. (Refer to Vehicle Emission Control Information Decal)	Has lockout devices ▶	GO to Step 16.
	No lockout devices ▶	SERVICE vacuum source. RETURN to Step 13.

Spark Timing Advance — Non-EEC

TEST STEP	RESULT ▶	ACTION TO TAKE
STEP 16		
• Disconnect and plug distributor vacuum advance hose. • Attach vacuum hose between distributor vacuum advance diaphragm connection and manifold vacuum. • Increase engine speed to 2,500 rpm. • Check spark timing. • Return to idle rpm. **NOTE: Refer to the Service Performance Manual for total advance at 2,500 rpm/vacuum advance connected under the correct engine calibration for specification.**	Timing within specification ▶	SERVICE vacuum source. DISCONNECT manifold vacuum. REMOVE vacuum gauge and Tee. RETURN to Step 13.
	Timing not within specification ▶	INSPECT diaphragm for leaks and stator assembly for sticking/binding. SERVICE/REPLACE as necessary. DISCONNECT manifold vacuum. RECONNECT normal vacuum source. RETURN to Step 13.
STEP 17		
• Does distributor have dual diaphragm?	Yes ▶	GO to Step 18.
	No ▶	Spark timing systems OK.

Spark Timing Advance — Non-EEC

TEST STEP	RESULT ▶	ACTION TO TAKE
STEP 18		
• Disconnect and plug vacuum hose to vacuum advance connection on diaphragm. • Connect vacuum hose to retard connection on diaphragm. • Check spark timing at idle rpm.	Timing retarded from Step 5 or Step 6 ▶	Spark timing systems OK. RECONNECT vacuum hose to vacuum advance connection.
	Timing not retarded from Step 5 or Step 6 ▶	GO to Step 19.
STEP 19		
• Install vacuum gauge in vacuum hose to retard connection on diaphragm. • Check for presence of vacuum at idle rpm.	51 kPa (15 in-Hg) vacuum minimum ▶	REPLACE distributor diaphragm assembly. RETURN to Step 18.
	Less than 51 kPa (15 in-Hg) vacuum ▶	SERVICE vacuum source. RETURN to Step 18.

Diagnostic Procedures

PRELIMINARY NOTES

The engine analyzer is used to diagnose problems in the secondary side of the ignition system. This is covered in Part 1, which is common for all ignition systems used in 1988.

For problems in the primary side of the ignition system, there is a separate Part 2 for each of the three basic types of ignition systems.

The beginning point for Ignition System Diagnosis is the Symptom Index. This will direct you to the proper part for your engine symptom.

If after completing a Part 1 or Part 2 diagnosis and a problem has not been solved, the problem is either an intermittent one or is not in the ignition system. If you suspect it to be intermittent, refer to intermittent diagnosis. Otherwise return to the Diagnostic Routines, (Section 2), for additional assistance.

SYMPTOM INDEX

ENGINE SYMPTOM	START AT
• CRANKS NORMALLY BUT WON'T START	PART 2
• STARTS NORMALLY BUT WON'T RUN (STALLS)	PART 2
• CRANKS NORMALLY BUT SLOW TO START	PART 1
• ROUGH IDLE	PART 1
• ENGINE MISS	PART 1
• POOR FUEL ECONOMY	PART 1

PART 1

Preliminary Checkout & Equipment

CHECKOUT

- Visually inspect the engine compartment to ensure all vacuum hoses and spark plug wires are properly routed and securely connected.
- Examine all wiring harnesses and connectors for insulation damage, burned, overheated, loose or broken conditions.
- Be certain the battery is fully charged.
- All accessories should be off during diagnosis.

EQUIPMENT

Obtain the following test equipment or an equivalent:

- Spark Tester, Special Service Tool D81P-6666-A. See note.
- Engine Analyzer, Rotunda 002-00373.
- Volt/Ohm Meter, Rotunda 014-00407.

NOTE

- A spark plug with a broken side electrode **is not** sufficient to check for spark and may lead to incorrect results.

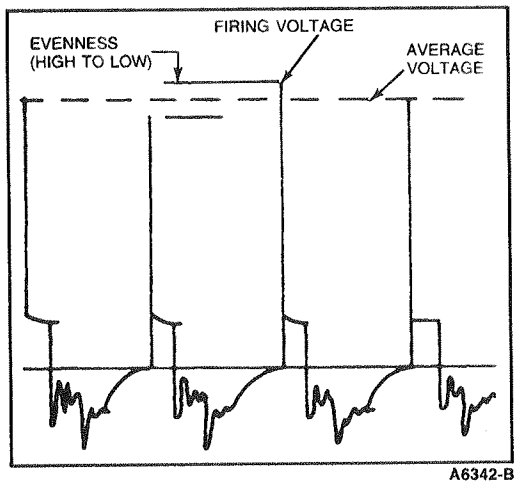
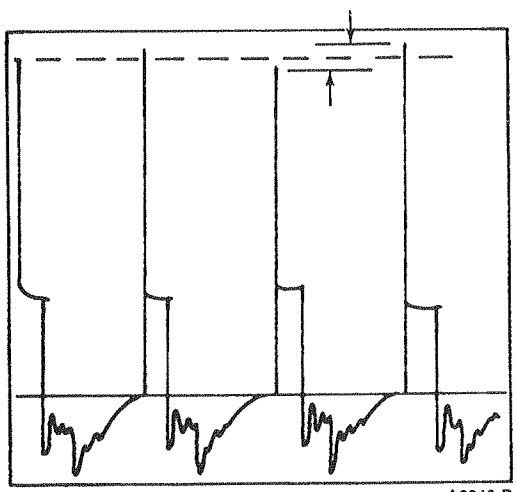
Ignition Coil Secondary Voltage | Part 1 | Test 1

TEST STEP	RESULT ▶	ACTION TO TAKE
• Will engine start and run?	Yes ▶	Test Result OK. GO to Part 1, Test 2.
	No ▶	INSPECT ignition coil for damage, carbon tracking. MEASURE resistance of ignition coil wire. REPLACE if greater than 7,000 ohms per foot. GO to Part 2, Test 1.

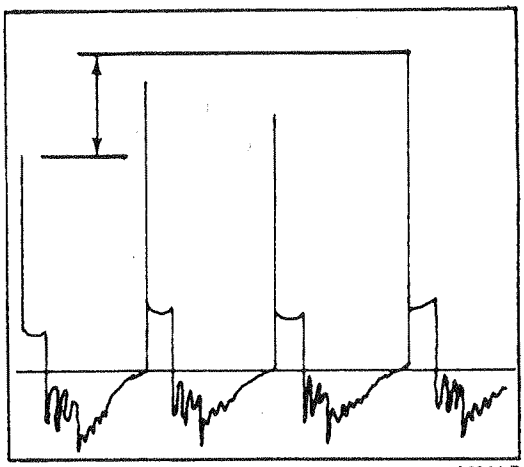
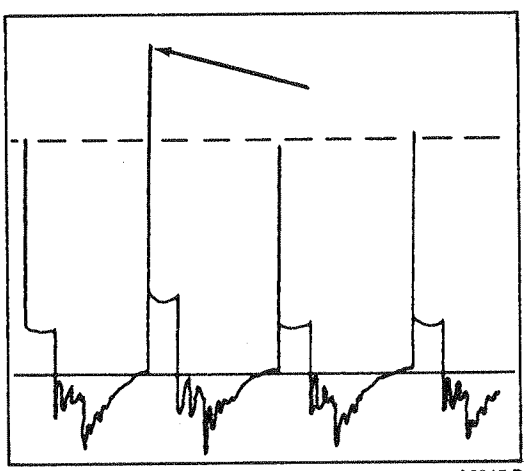
Secondary Display	Part 1	Test 2

TEST STEP	RESULT ▶	ACTION TO TAKE
NOTE: If this portion of the diagnostic procedure is to provide accurate results, it is essential that the calibration of your engine analyzer be maintained. Refer to your equipment manual. If this is not available, an estimate of the calibration can be made by connecting the spark tester (D81P-6666-A or equivalent) to a properly operating ignition system and measuring the firing voltage of the spark tester only. Do not include the firing voltage of the rotor-to-cap gap. The spark tester firing voltage should be approximately 28 KV.		
1. Connect engine analyzer to view **parade** display of ignition system secondary. 2. While **slowly** increasing engine rpm from idle to 2,000 rpm, compare engine analyzer display to the following illustrations. The illustrations shown are four cylinder but are typical for all engines. 3. Disconnect engine analyzer.		

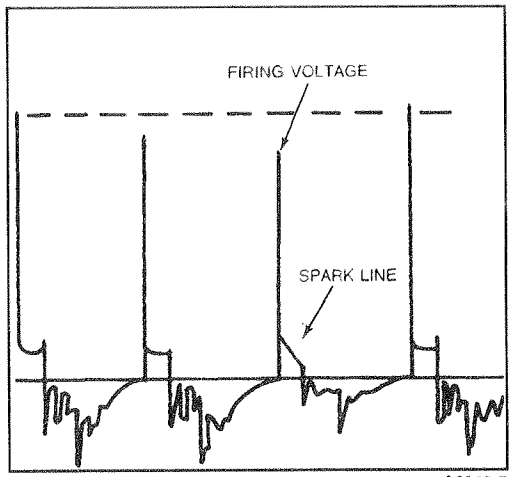
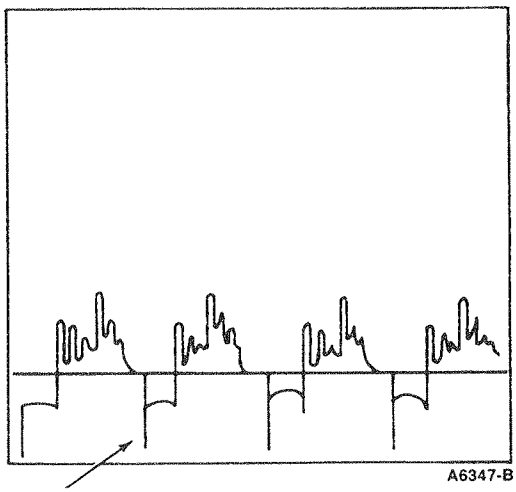
Secondary Display — Continued | Part 1 | Test 2

TEST STEP	RESULT ▶	ACTION TO TAKE
 A6342-B	The average value of spark plug firing voltage: 15 KV or less with evenness of spark plug firing voltage: 5 KV or less ▶	These are normal values for a properly operating ignition system.
 A6343-B	The average value of spark plug firing voltage: greater than 15 KV with evenness of spark plug firing voltage: 5 KV or less ▶	**Problems affecting all cylinders:** CHECK ignition coil wire for proper installation in coil and distributor cap. MEASURE resistance of ignition coil wire. REPLACE if greater than 7,000 ohms per foot. Wide spark plug gaps — all cylinders, (usually from worn electrodes due to high mileage). INSPECT cap and rotor for problems causing excessive cap-to-rotor gap.

Secondary Display — Continued | Part 1 | Test 2

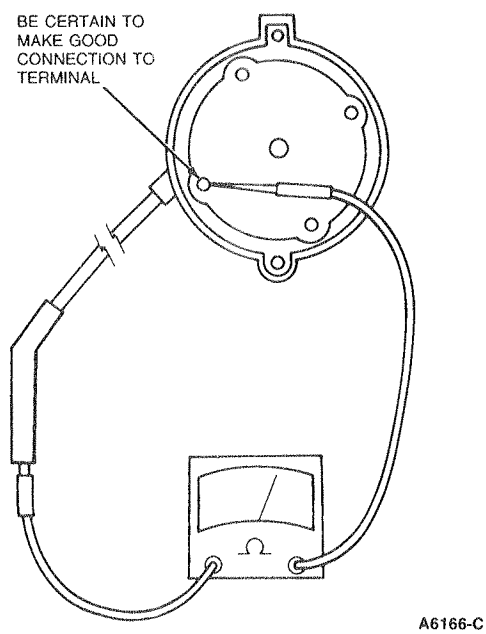
TEST STEP	RESULT ▶	ACTION TO TAKE
 A6344-B	Evenness of spark plug firing voltage: greater than 5 KV ▶	**Problems affecting some cylinders:** Wide spark plug gap(s) or worn electrode(s). Improperly installed cap, adapter, or rotor.
 A6345-B	Consistently high spark plug firing voltage in one or more cylinders ▶	Spark plug wire(s) not firmly connected to distributor cap or spark plug. Disconnected spark plug wire(s). Wide spark plug gap(s). Open plug wire(s). GO to Part 1, Test 3.

Secondary Display — Continued | Part 1 | Test 2

TEST STEP	RESULT ▶	ACTION TO TAKE
	Consistently low spark plug firing voltage or sloping spark line in one or more cylinders ▶	Fouled spark plug(s). Narrow spark plug gap(s). Spark plug wire(s) grounding on engine. Inspect for damage. Carbon tracking in cap and adapter.
	Spark plug firing voltage negative going ▶	Ignition coil primary circuit reversed. CHECK wiring harness for ignition coil primary circuit. If OK, REPLACE ignition coil.

Spark Plug Wire Resistance | Part 1 | Test 3

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Remove distributor cap from distributor. 2. Check for spark plug wires firmly seated on cap. 3. Disconnect spark plug end of suspect wire(s). 4. Measure resistance from terminal in cap to spark plug terminal. 5. Reinstall distributor cap and connect spark plug wire to spark plug. **CAUTION: Do not, under any circumstances, puncture a spark plug wire when measuring resistance. Measure only as instructed.**	Less than 7,000 ohms per foot ▶	Spark plug wire resistance OK.
	Greater than 7,000 ohms per foot ▶	REPLACE spark plug wire(s).



A6166-C

PART 2
DURASPARK II
IGNITION SYSTEM

Preliminary Checkout, Equipment & Notes

CHECKOUT

- Visually inspect the engine compartment to ensure all vacuum hoses and spark plug wires are properly routed and securely connected.
- Examine all wiring harnesses and connectors for insulation damage, burned, overheated, loose or broken conditions.
- Be certain the battery is fully charged.
- All accessories should be off during diagnosis.

EQUIPMENT

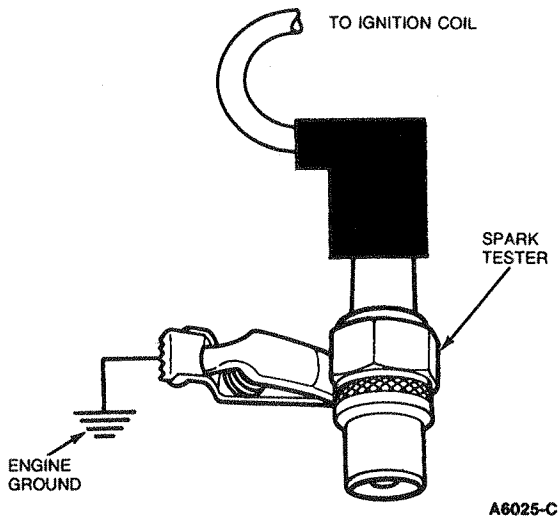
Obtain the following test equipment or an equivalent:

- Spark Tester, Special Service Tool D81P-6666-A. See note.
- Volt/Ohm Meter Rotunda 014-00407.
- 12 Volt Test Lamp.
- Small straight pins (2).

NOTES

- A spark plug with a broken side electrode **is not** sufficient to check for spark and may lead to incorrect results.
- All wire colors referred to in this part relate to the colors of the ignition module wires. When working with a wiring harness, the wires must be traced back to the ignition module for proper color identification.
- When instructed to inspect a wiring harness, both a visual inspection and a continuity test should be performed.
- When making measurements on a wiring harness or connector, it is good practice to wiggle the wires while measuring.

Start Circuits	DS II	Part 2 Test 1

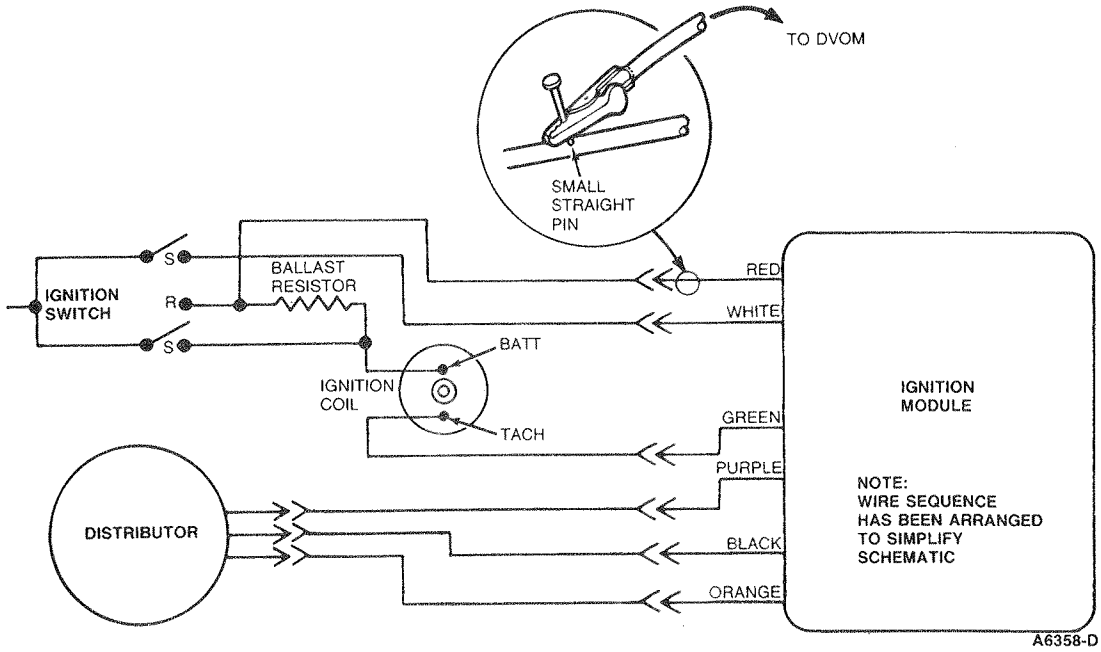
TEST STEP	RESULT ▶	ACTION TO TAKE
1. Connect spark tester between ignition coil wire and engine ground. 2. Crank engine using ignition switch.  	Sparks ▶	GO to Part 2, Test 2.
	No Sparks ▶	MEASURE resistance of ignition coil wire. REPLACE if greater than 7,000 ohms per foot. INSPECT ignition coil for damage, carbon tracking. CRANK engine to verify distributor rotation. REFER to Shop Manual, Group 23 and service as required. GO to Part 2, Test 5.

Run Circuits	DS II	Part 2 Test 2

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Turn ignition switch from OFF to RUN to OFF position several times. 2. Spark should occur each time switch goes from RUN to OFF position. 3. Remove spark tester, reconnect coil wire to distributor cap.	Sparks ▶	INSPECT distributor cap, adapter, rotor for cracks, carbon tracking. CHECK for roll pin securing armature to sleeve in distributor. CHECK that ORANGE and PURPLE wires not crossed between distributor and ignition module. If ignition module has Basic Part No. (-12A244-), GO to Spark Timing Advance to check spark retard operation.
	No Sparks ▶	GO to Part 2, Test 3.

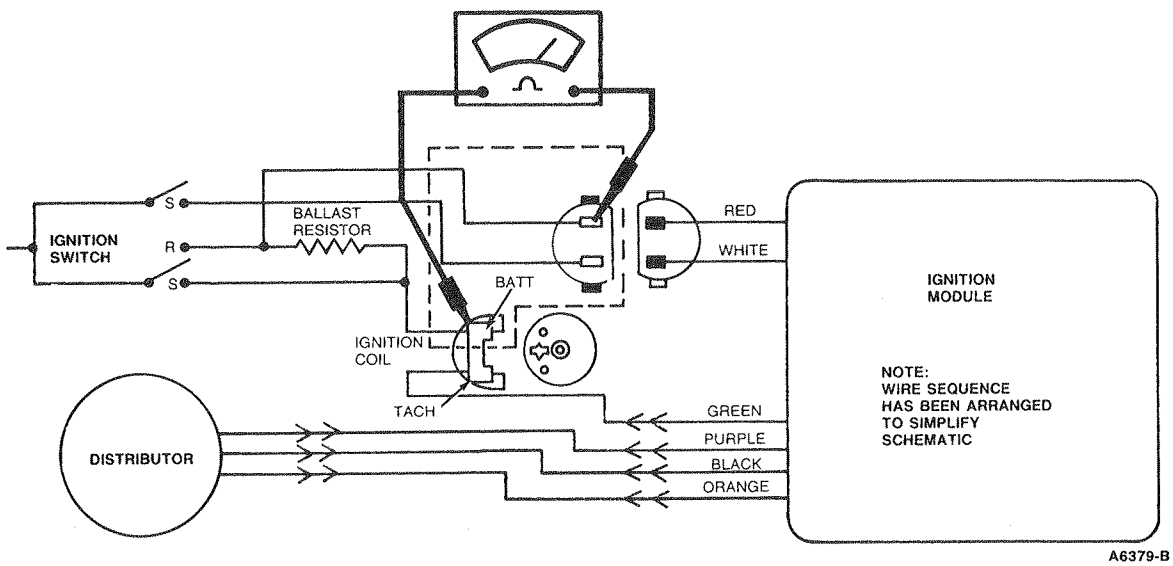
Module Voltage | DS II | Part 2 Test 3

TEST STEP	RESULT ▶	ACTION TO TAKE
• Turn ignition switch off. 1. Carefully insert small straight pin in RED module wire. **CAUTION: Do not allow straight pin to contact electrical ground.** 2. Attach negative (–) VOM lead to distributor base. 3. Measure battery voltage. 4. Measure voltage at straight pin with ignition switch in RUN position. 5. Turn ignition switch to OFF position. 6. Remove straight pin.	90 percent of battery voltage or greater ▶ Less than 90 percent of battery voltage ▶	GO to Part 2, Test 4. REFER to vehicle wiring diagram. INSPECT wiring harness between module and ignition switch. Damaged or worn ignition switch. REFER to Shop Manual, Group 31.



Ballast Resistor	DS II	Part 2 Test 4

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Separate and inspect ignition module two wire connector with RED and WHITE wires. 2. Disconnect and inspect ignition coil connector. 3. Measure ballast resistor between BATT terminal of ignition coil connector and wiring harness connector mating with RED module wire.	0.8 to 1.6 ohms ▶	Problem is either intermittent or not in ignition system. REFER to Intermittent Diagnosis or RETURN to Section 2, Diagnostic Routines.
4. Reconnect all connectors.	Less than 0.8 or greater than 1.6 ohms ▶	REPLACE ballast resistor.



Supply Voltage Circuits

DS II

Part 2 Test 5

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Remove SPARK TESTER, reconnect coil wire to distributor cap. 2. If starter relay has I terminal, disconnect cable from starter relay to starter motor. 3. If starter relay does not have I terminal, disconnect wire to S terminal of starter relay. 4. Carefully insert small straight pins in RED and WHITE module wires. **CAUTION: Do not allow straight pins to contact electrical ground.** 5. Measure battery voltage. 6. Following table below, measure voltage at points listed with ignition switch in position shown. **NOTE: Attach negative (-) VOM lead to distributor base.** **Wiggle wires in wiring harness when measuring.**	90 percent of battery voltage or greater ▶	Test result OK. GO to Part 2, Test 6.
	Less than 90 percent of battery voltage ▶	REFER to vehicle wiring diagram. INSPECT wiring harness and connector(s) in faulty circuit(s). Damaged or worn ignition switch. REFER to Shop Manual, Group 31. Radio interference capacitor on ignition coil.

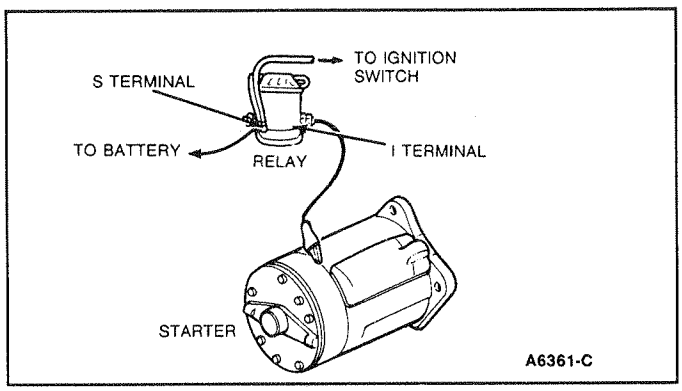
Wire/ Terminal	Circuit	Ignition Switch Test Position
Red	Run	Run
White	Start	Start
'Batt' Terminal Ignition Coil	Ballast Resistor Bypass	Start

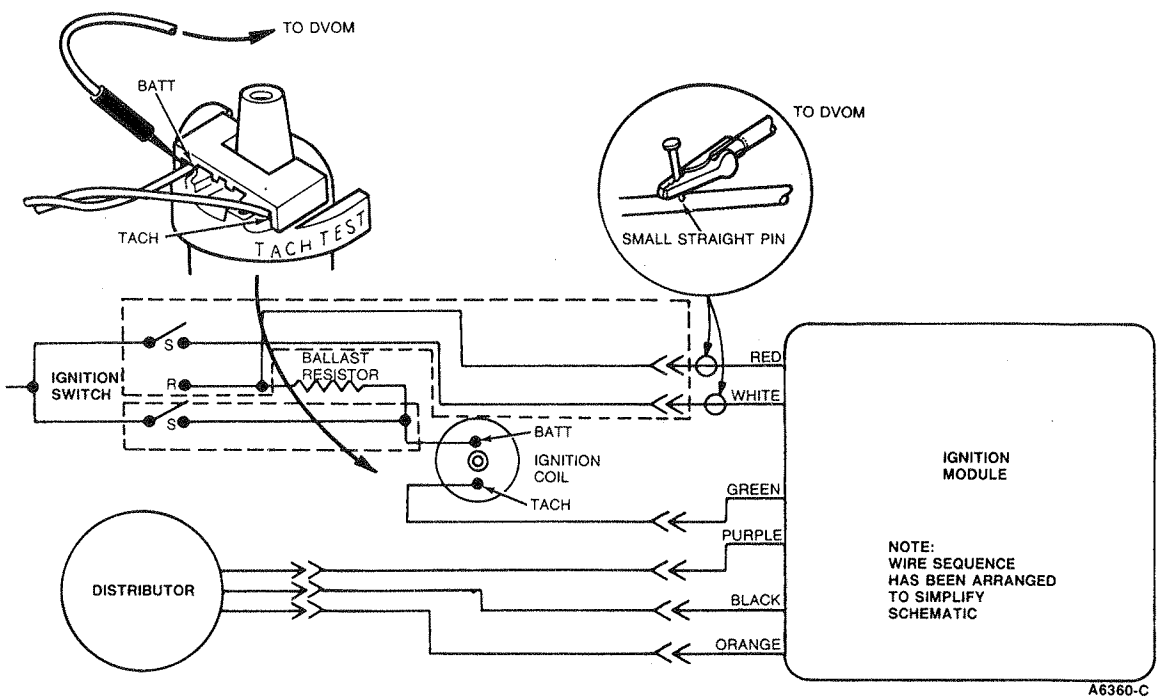
7. Turn ignition switch to OFF position.
8. Remove straight pins.
9. Reconnect any cables/wires removed from starter relay.

Supply Voltage Circuits — Continued

DS II

Part 2 Test 5



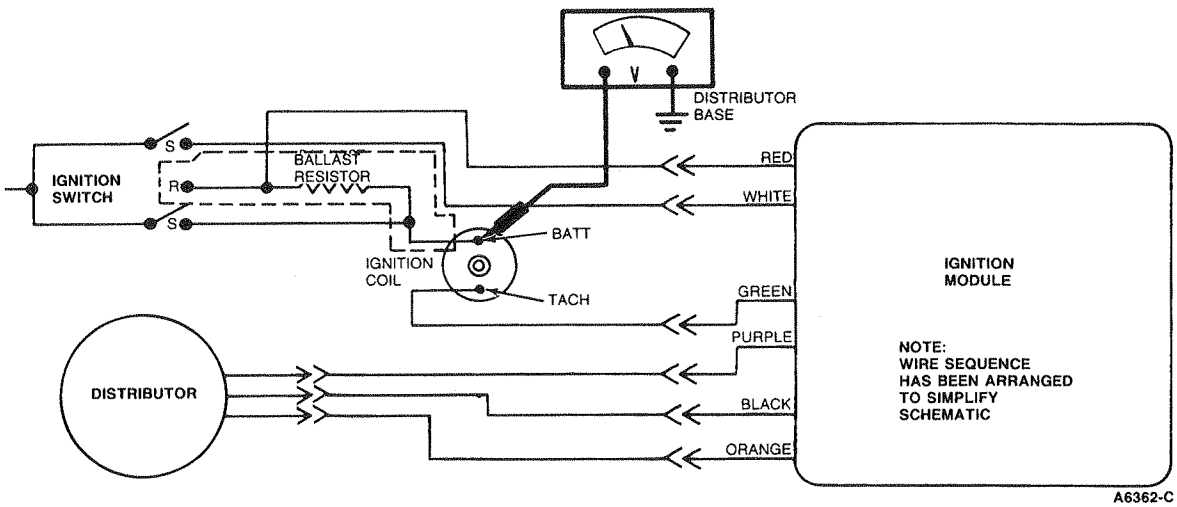


Ignition Coil Supply Voltage

DS II

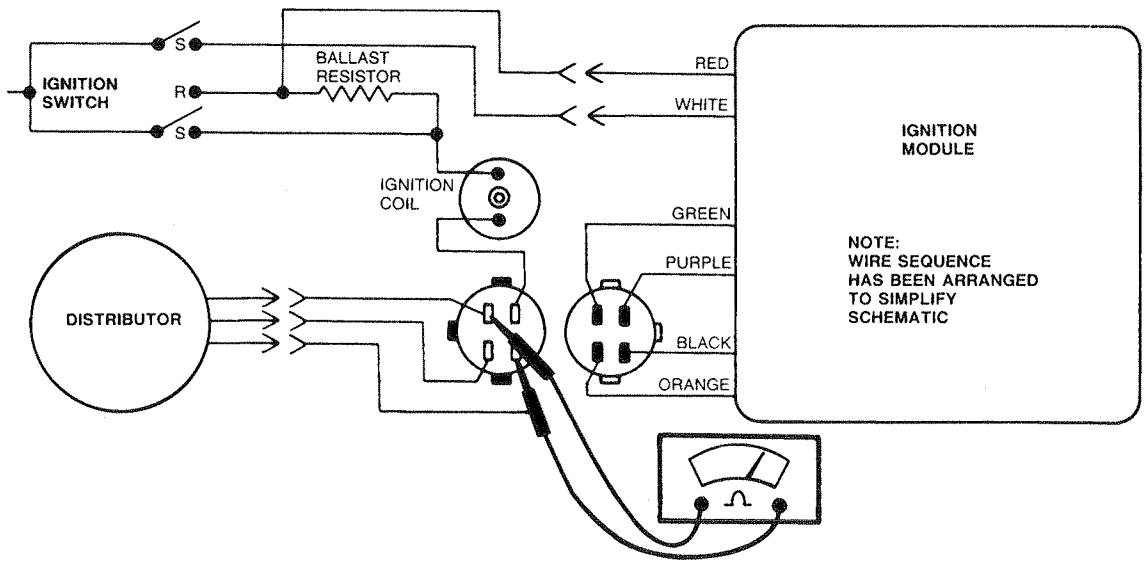
Part 2 Test 6

TEST STEP	RESULT	ACTION TO TAKE
1. Attach negative (-) lead of VOM to distributor base. 2. Turn ignition switch to RUN position. 3. Measure voltage at BATT terminal of ignition coil. 4. Turn ignition switch to OFF position.	6 to 8 volts ▶	GO to Part 2, Test 7.
	Less than 6 volts or greater than 8 volts ▶	GO to Part 2, Test 12.



Distributor Stator Assembly and Wiring Harness	DS II	Part 2 Test 7

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Separate ignition module four wire connector. Inspect for dirt, corrosion, and damage. 2. Measure stator assembly and wiring harness resistance between wiring harness terminals mating with ORANGE and PURPLE module wires. **NOTE: Wiggle wires in wiring harness when measuring.**	400 to 1,300 ohms ▶ Less than 400 or greater than 1,300 ohms ▶	Test result OK. GO to Part 2, Test 8. GO to Part 2, Test 11.



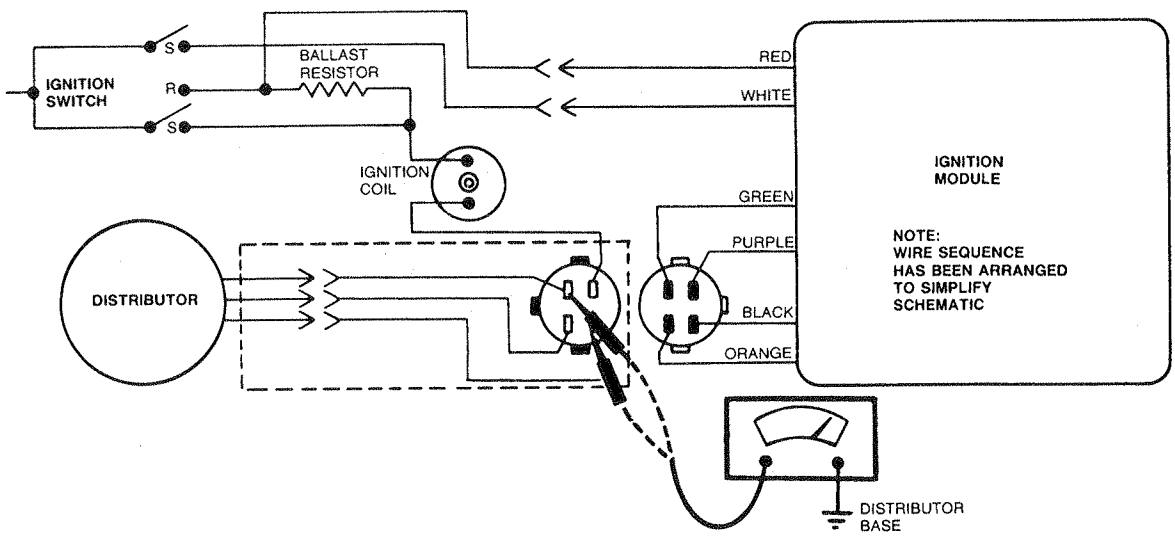
A6363-D

Ignition Module to Distributor Stator Assembly Wiring Harness

DS II

Part 2 Test 8

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Attach one VOM lead to distributor base. 2. Alternately measure resistance between wiring harness terminals mating with ORANGE and PURPLE module wires and ground. 3. Reconnect four wire connector.	Greater than 70,000 ohms ▶	TEST result OK. GO to Part 2, Test 9.
	Less than 70,000 ohms ▶	INSPECT wiring harness between module connector and distributor, including distributor grommet.



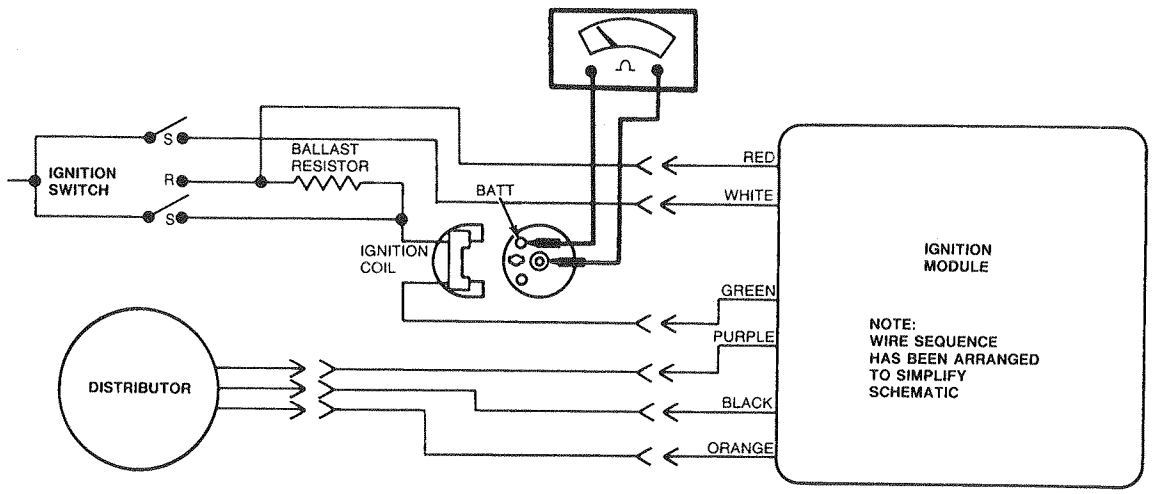
A6364-D

Ignition Coil Secondary Resistance

DS II

Part 2 Test 9

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Disconnect and inspect ignition coil connector and coil wire. 2. Measure secondary resistance from BATT terminal to high voltage terminal. 3. Reconnect ignition coil wire.	7,700 to 10,500 ohms ▶	Test result OK. GO to Part 2, Test 10.
	Less than 7,700 ohms or greater than 10,500 ohms ▶	REPLACE ignition coil.



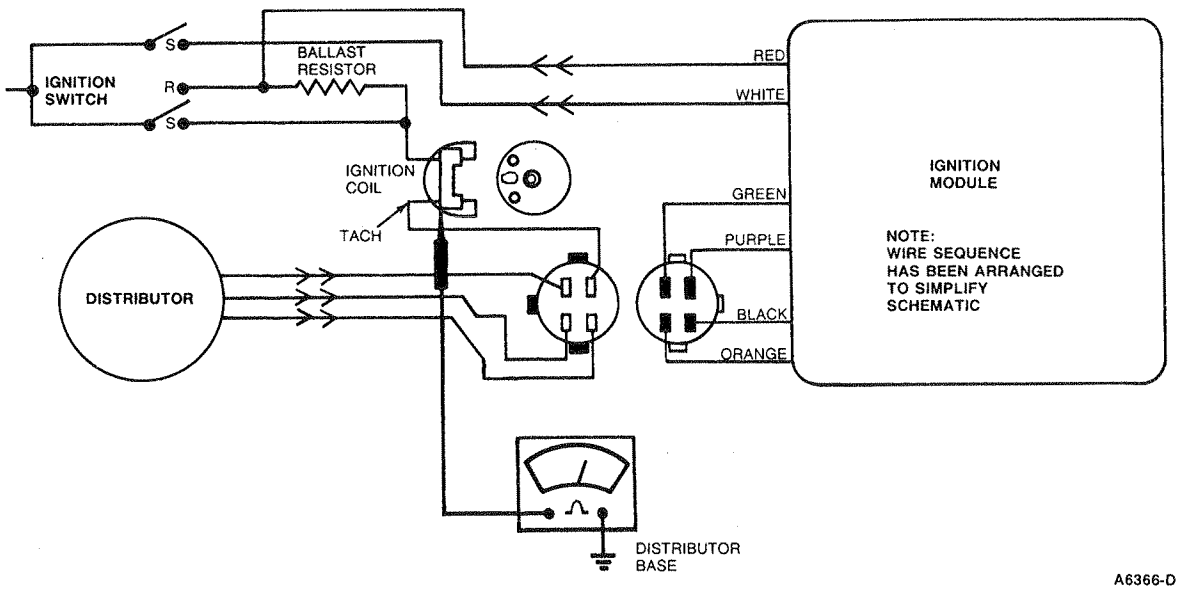
A6365-C

Module to Coil Wire

DS II

Part 2 Test 10

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Separate and inspect ignition module four wire connector and ignition coil connector from coil. 2. Connect one lead of VOM to distributor base. 3. Measure resistance between TACH terminal of ignition coil connector and ground. 4. Reconnect ignition module and coil connectors.	Greater than 100 ohms ▶ 100 ohms or less ▶	REPLACE ignition module. INSPECT wiring harness between ignition module and coil.

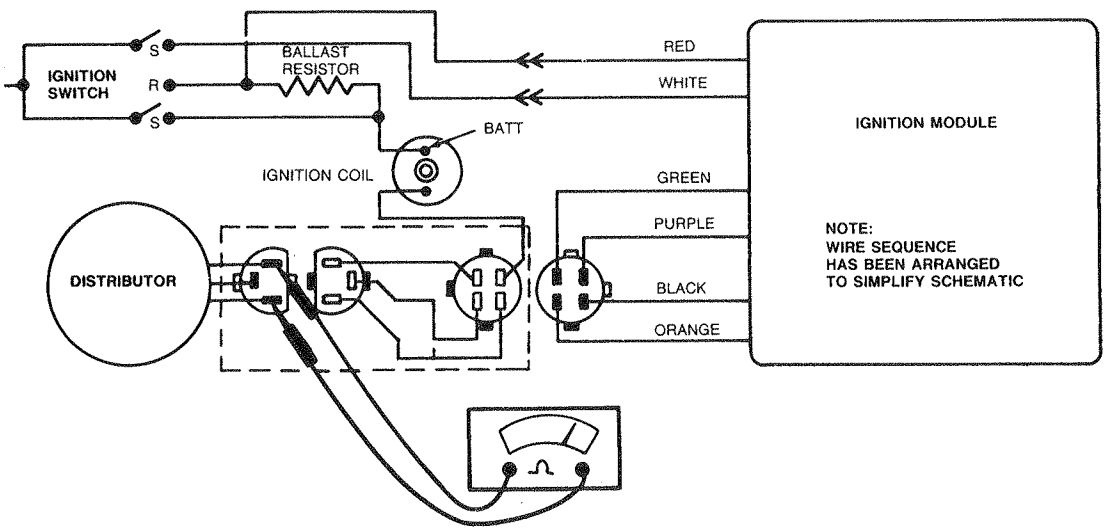


Distributor Stator Assembly

DS II

Part 2 Test 11

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Separate distributor connector from harness. Inspect for dirt, corrosion, and damage. 2. Measure stator assembly resistance across ORANGE and PURPLE wires at distributor connector. 3. Reconnect distributor and module connectors.	400 to 1,000 ohms ▶	Test result OK. INSPECT wiring harness between distributor and ignition module.
	Less than 400 or greater than 1,000 ohms ▶	REPLACE stator assembly.



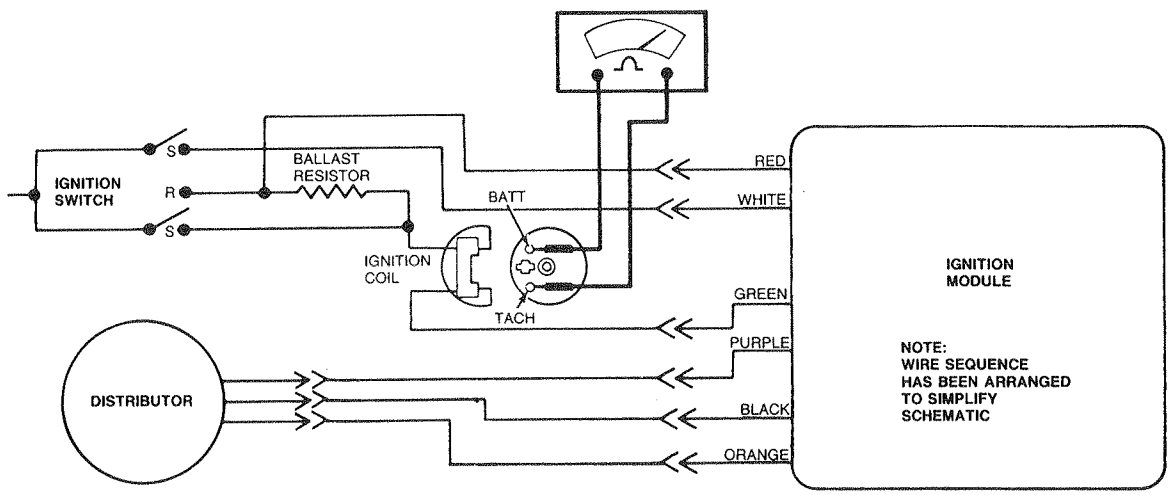
A6368-D

Ignition Coil Primary Resistance

DS II

Part 2 Test 12

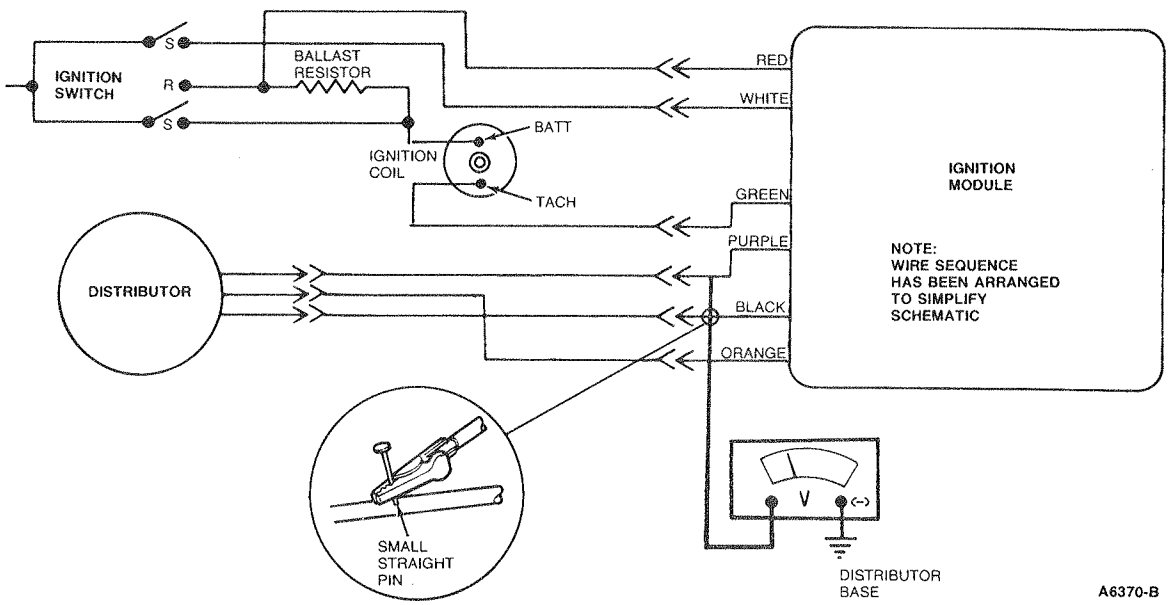
TEST STEP	RESULT ▶	ACTION TO TAKE
1. Disconnect ignition coil connector. 2. Measure primary resistance from BATT to TACH terminal. 3. Reconnect ignition coil connector.	0.8 to 1.6 ohms ▶	Test result OK. GO to Part 2, Test 13.
	Less than 0.8 or greater than 1.6 ohms ▶	REPLACE ignition coil.



A6369-C

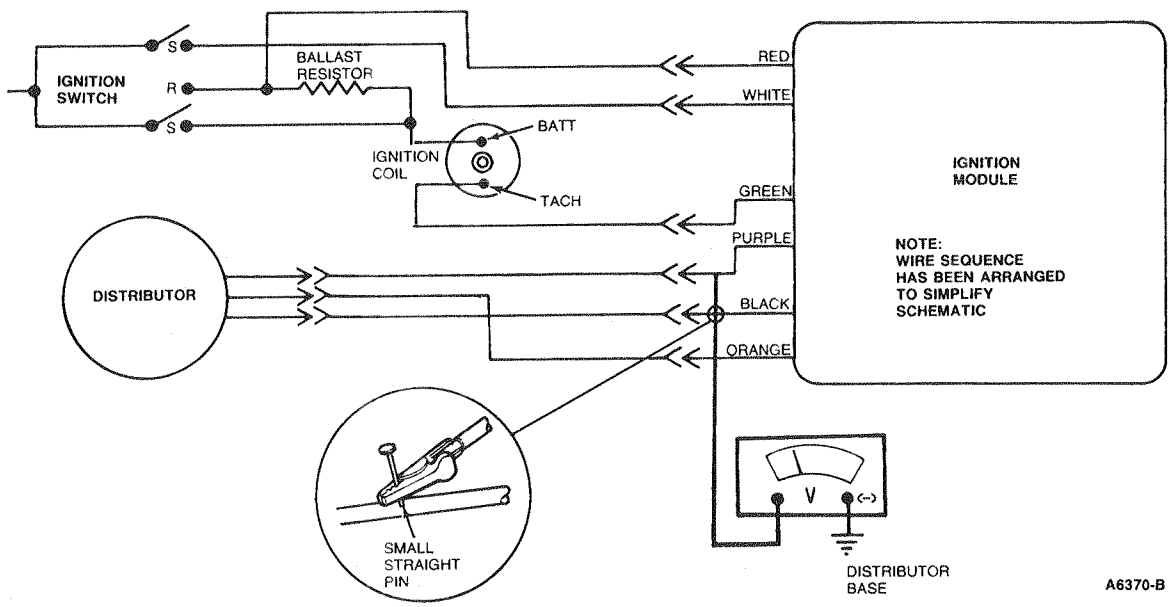
Primary Circuit Continuity	DS II	Part 2 Test 13

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Carefully insert small straight pin in module GREEN wire. **CAUTION: Do not allow straight pin to contact electrical ground.** 2. Attach negative (–) VOM lead to distributor base. 3. Turn ignition switch to RUN position. 4. Measure voltage at GREEN module wire. 5. Turn ignition switch to OFF position. 6. Remove straight pin.	Greater than 1.5 volts ▶ 1.5 volts or less ▶	GO to Part 2, Test 14. INSPECT wiring harness and connectors between ignition module and coil.



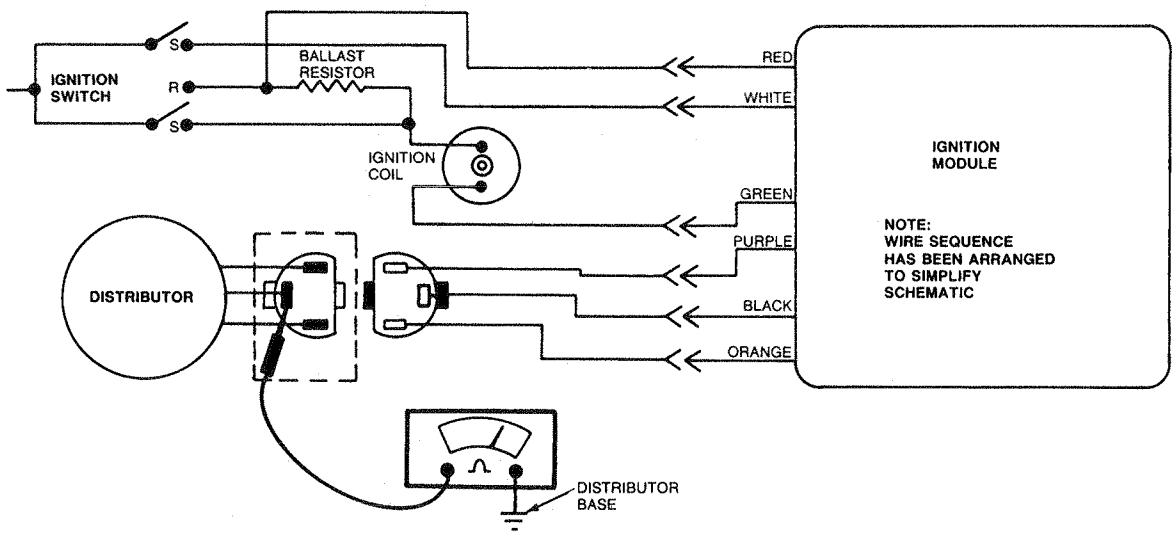
Ground Circuit Continuity | DS II | Part 2 Test 14

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Carefully insert small straight pin in module BLACK wire. **CAUTION: Do not allow straight pin to contact electrical ground.** 2. Attach negative (–) VOM lead to distributor base. 3. Turn ignition switch to RUN position. 4. Measure voltage at BLACK wire. 5. Turn ignition switch to OFF position. 6. Remove straight pin.	Greater than 0.5 volt ▶ 0.5 volt or less ▶	GO to Part 2, Test 15. REPLACE ignition module.



Distributor Ground Circuit Continuity	DS II	Part 2 Test 15

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Separate distributor connector from harness. Inspect for dirt, corrosion, and damage. 2. Attach one lead of VOM to distributor base. 3. Measure resistance by attaching other VOM lead to BLACK wire in distributor connector. **NOTE: Wiggle distributor grommet when measuring.** 4. Reconnect distributor connector.	Less than one ohm ▶ Greater than one ohm ▶	Test result OK. INSPECT wiring harness and connectors between distributor and ignition module. INSPECT ground screw in distributor.



PART 2
TFI-IV
IGNITION SYSTEM

Preliminary Checkout, Equipment & Notes

CHECKOUT

- Visually inspect the engine compartment to ensure all vacuum hoses and spark plug wires are properly routed and securely connected.
- Examine all wiring harnesses and connectors for insulation damage, burned, overheated, loose or broken conditions.
- Check that the TFI module is securely fastened to the distributor base.
- Be certain the battery is fully charged.
- All accessories should be off during diagnosis.

EQUIPMENT

Obtain the following test equipment or an equivalent:

- Spark Tester, Special Service Tool D81P-6666-A. See note.
- Volt/Ohm Meter Rotunda 014-00407.
- 12 Volt Test Light.
- Small straight pin.
- Remote Starter Switch.

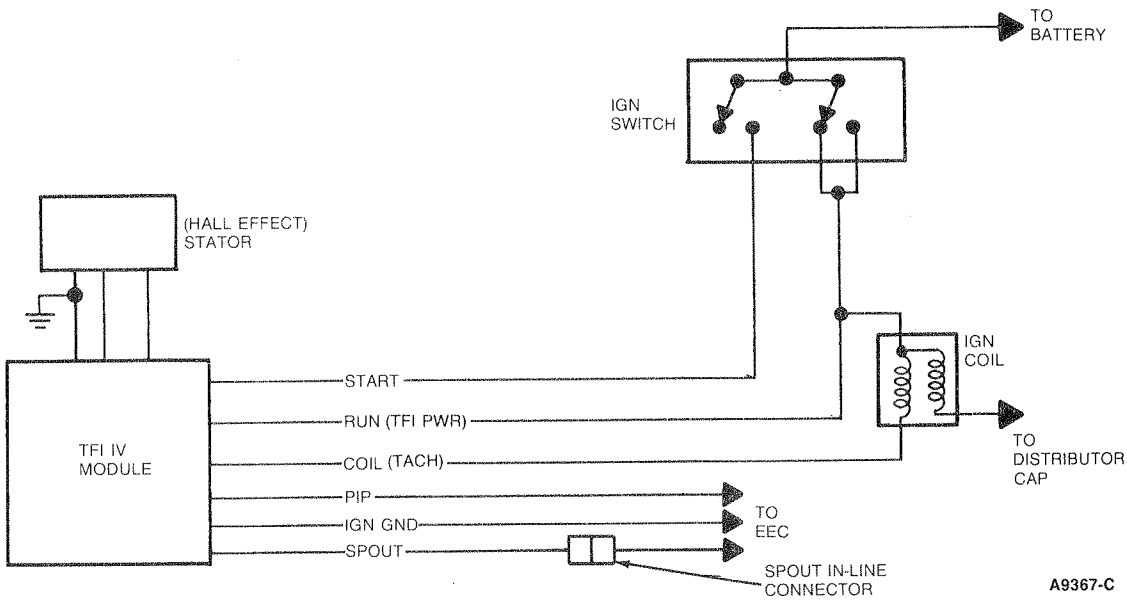
NOTES

- A spark plug with a broken side electrode **is not** sufficient to check for spark and may lead to incorrect results.
- When instructed to inspect a wiring harness, both a visual inspection and a continuity test should be performed.
- When making measurements on a wiring harness or connector, it is good practice to wiggle the wires while measuring.

Functional Schematic

TFI-IV

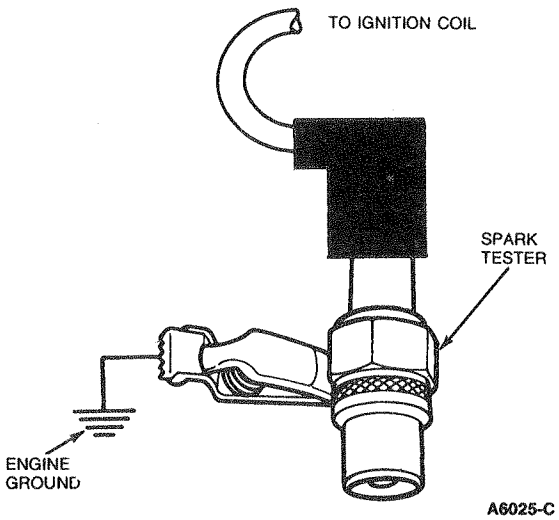
The TFI-IV system electrical schematic is shown below. For detailed information, refer to the vehicle wiring diagram.



Ignition Coil Secondary Voltage Crank Mode

TFI-IV

Part 2 Test 1

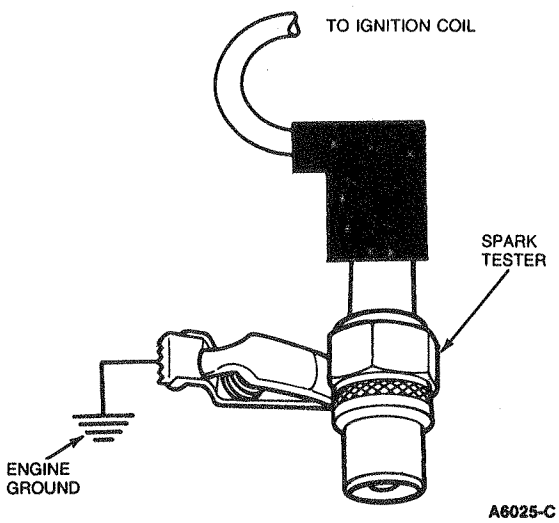
TEST STEP	RESULT ▶	ACTION TO TAKE
1. Connect spark tester between ignition coil wire and engine ground. 2. Crank engine.  	Spark ▶	Test result OK. INSPECT distributor cap, rotor for damage, carbon tracking. If engine starts, GO to Part 1, Test 2, otherwise GO to Test 2.
	No spark ▶	MEASURE resistance of ignition coil wire. REPLACE if greater than 7,000 ohms per foot. INSPECT ignition coil for damage, carbon tracking. CRANK engine to verify distributor rotation. REFER to Shop Manual Group 23 and SERVICE as required. GO to Test 4.

Ignition Coil Secondary Voltage (Run Mode)

TFI-IV

Part 2 Test 2

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Place the transmission shift lever in the PARK (A/T) or NEUTRAL (M/T) position and set the parking brake. **CAUTION: Failure to perform this step may result in the vehicle moving when the starter is subsequently engaged during the test.** 2. Disconnect wire at S terminal of starter relay. 3. Attach remote starter switch. 4. Turn ignition switch to the RUN position. 5. Crank the engine using remote starter switch. 6. Turn ignition switch to the OFF position. 7. Remove remote starter switch. 8. Reconnect wire to S terminal of starter relay.	Spark ▶	Test result OK. Problem is not in the ignition system. RETURN to Diagnostic Routines, Section 2 to identify possible cause.
	No Spark ▶	GO to Test 3.

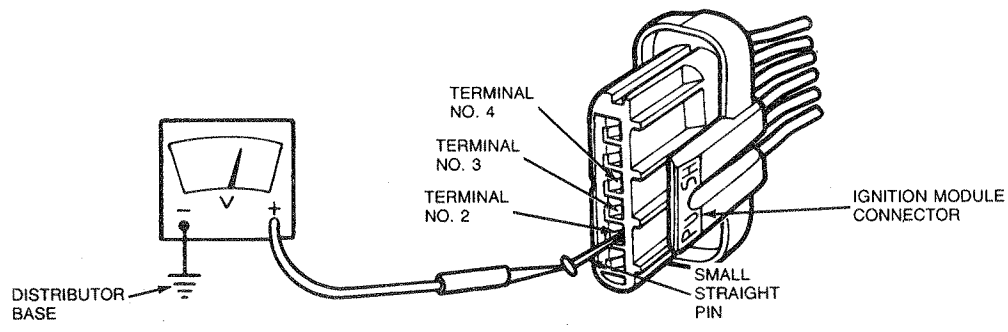


Wiring Harness | TFI-IV | Part 2 Test 3

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Separate wiring harness connector from ignition module. Inspect for dirt, corrosion, and damage. **NOTE: Push connector tabs to separate.** 2. Disconnect wire at S terminal of starter relay. 3. Attach negative (–) VOM lead to distributor base. 4. Measure battery voltage. 5. Following table below, measure connector terminal voltage by attaching VOM to small straight pin inserted into connector terminal and turning ignition switch to position shown. **CAUTION: Do not allow straight pin to contact electrical ground.**	90 percent of battery voltage minimum ▶	REPLACE TFI module.
	Less than 90 percent of battery voltage ▶	INSPECT for faults in wiring harness and connectors. REFER to vehicle wiring diagram for appropriate circuit. Damaged or worn ignition switch. REFER to Shop Manual, Group 31.

Connector Terminal	Wire/Circuit	Ignition Switch Test Position
#2	To Ignition Coil (–) Terminal	Run
#3	Run Circuit	Run and Start
#4	Start Circuit	Start

6. Turn ignition switch to OFF position.
7. Remove straight pin.
8. Reconnect wire to S terminal of starter relay.

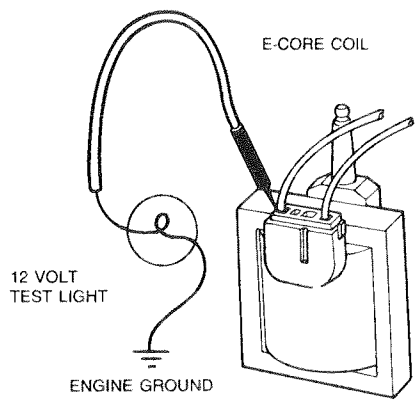


Ignition Coil Primary Circuit Switching

TFI-IV

Part 2 Test 4

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Separate wiring harness connector from ignition module. INSPECT for dirt, corrosion and damage. Reconnect harness. **NOTE: Push connector tabs to separate.** 2. Attach 12 volt DC test light between coil Tach terminal and engine ground. 3. Crank engine. 4. Remove test light.	Light flashes ▶ or Light but no flash	GO to Test 5.
	No light or very dim light ▶	GO to Test 14.



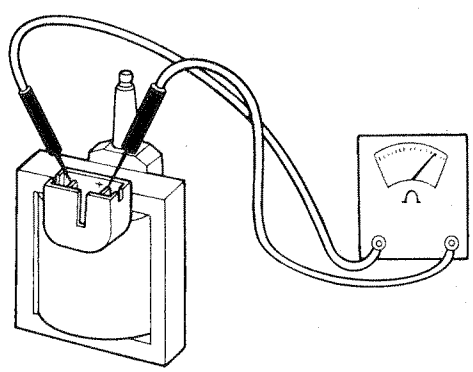
A7251-C

Ignition Coil Primary Resistance

TFI-IV

Part 2 Test 5

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Turn ignition switch to off. 2. Disconnect ignition coil connector. Inspect for dirt, corrosion and damage. 3. Measure resistance from positive (+) to negative (−) terminal of ignition coil.	0.3 to 1.0 ohm ▶	Test result OK. GO to Test 6.
	Less than 0.3 ohm or greater than 1.0 ohm ▶	REPLACE ignition coil and CHECK for spark using the procedure in Test 1. If spark is not present, INSPECT wiring between coil and TFI for short circuit to ground. If OK, REPLACE TFI module also.



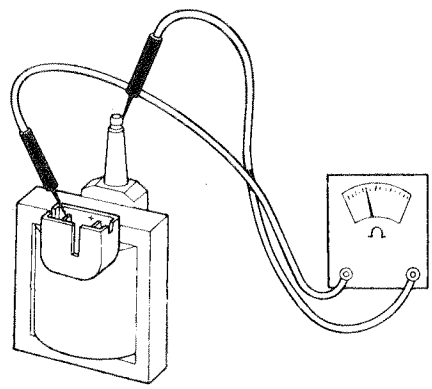
A6385-B

Ignition Coil Secondary Resistance

TFI-IV

Part 2 Test 6

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Measure resistance from negative (–) terminal to high voltage terminal of ignition coil. 2. Reconnect ignition coil connector.	6,500 to 11,500 ohms ▶	Test result OK. GO to Test 7.
	Less than 6,500 ohms or greater than 11,500 ohms ▶	REPLACE ignition coil.



A6386-B

Wiring Harness

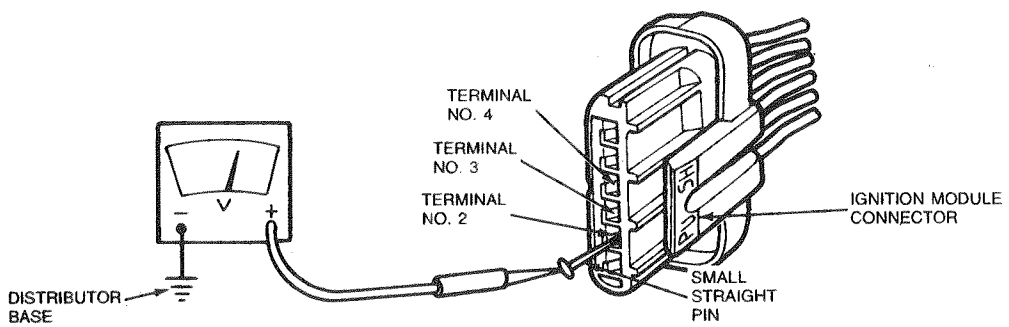
TFI-IV

Part 2 Test 7

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Separate wiring harness connector from ignition module. Inspect for dirt, corrosion and damage. **NOTE: Push connector tabs to separate.** 2. Disconnect wire at S terminal of starter relay. 3. Attach negative (–) VOM lead to distributor base. 4. Measure battery voltage. 5. Following table below, measure connector terminal voltage by attaching VOM to small straight pin inserted into connector terminal and turning ignition switch to position shown. **CAUTION: Do not allow straight pin to contact electrical ground.**	90 percent of battery voltage minimum Less than 90 percent of battery voltage	Test result OK. GO to Part 2, Test 8. INSPECT for faults in wiring harness and connectors. REFER to vehicle wiring diagram for appropriate circuit. Damaged or worn ignition switch. REFER to Shop Manual, Group 31.

Connector Terminal	Wire/Circuit	Ignition Switch Test Position
#2	To Ignition Coil (–) Terminal	Run
#3	Run Circuit	Run and Start
#4	Start Circuit	Start

6. Turn ignition switch to Off position.
7. Remove straight pin.
8. Reconnect wire to S terminal of starter relay.



Stator	TFI-IV	Part 2 Test 8

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Turn ignition switch to OFF position. 2. Remove coil wire and ground it. 3. Attach negative (−) VOM lead to distributor base. 4. Disconnect the pin in-line connector near distributor and attach positive (+) VOM lead to TFI module side of connector. 5. Turn ignition switch to ON position. 6. Bump the starter so that the engine rotates a small amount and stops. Record the voltage reading. (Allow sufficient time for digital voltage reading to stabilize before taking measurement). 7. Repeat Step 6 until 10 values have been recorded. Is the highest reading greater than 70 percent of battery voltage?	Yes ▶	GO to Part 2, Test 9.
	No ▶	REMOVE distributor from engine. REMOVE TFI module from distributor and inspect stator connector terminals and TFI terminals for misalignment. SERVICE as necessary. If OK, GO to Test 10.

Stator	TFI-IV	Part 2 Test 9

TEST STEP	RESULT ▶	ACTION TO TAKE
Use values obtained from Part 2, Test 8.	Lowest value greater than 0.5 volts ▶	REMOVE distributor from engine. REMOVE TFI module from distributor and inspect stator connector terminals and TFI terminals for misalignment. SERVICE as necessary. If OK, GO to Test 10.
	Lowest value less than 0.5 volts ▶	GO to Part 2, Test 11.

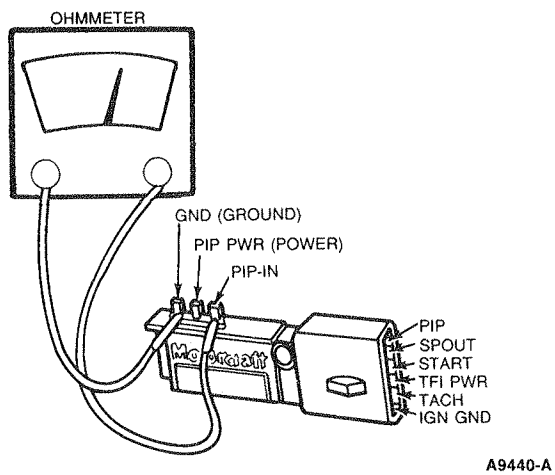
Stator — TFI-IV

TFI-IV

Part 2 Test 10

TEST STEP	RESULT ▶	ACTION TO TAKE
• Measure resistance between TFI module terminals as shown: • Are all of these readings as specified?	Yes ▶ No ▶	REPLACE stator. REPLACE TFI.

Measure Between These Terminals	Resistor Should Be
• GND - PIP In	Greater than 500 Ohms
• PIP PWR - PIP In	Less than 2K Ohms
• PIP PWR - TFI PWR	Less than 200 Ohms
• GND - IGN GND	Less than 2 Ohms
• PIP In - PIP	Less than 200 Ohms



Stator	TFI-IV	Part 2 Test 11

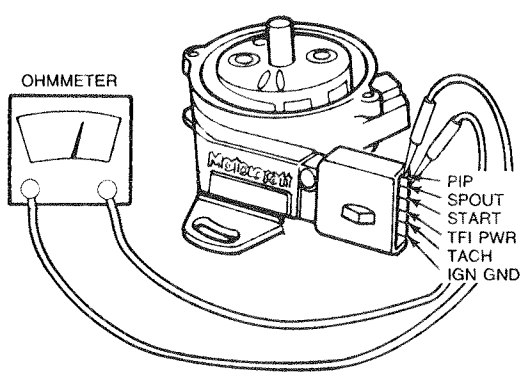
TEST STEP	RESULT ▶	ACTION TO TAKE
Use values obtained from Part 2, Test 8.	Values between 0.5 volts and 70 percent of battery voltage ▶	REPLACE stator assembly.
	No values between 0.5 volts and 70 percent of battery voltage ▶	GO to Part 2, Test 12.

Stator — TFI-IV

TFI-IV

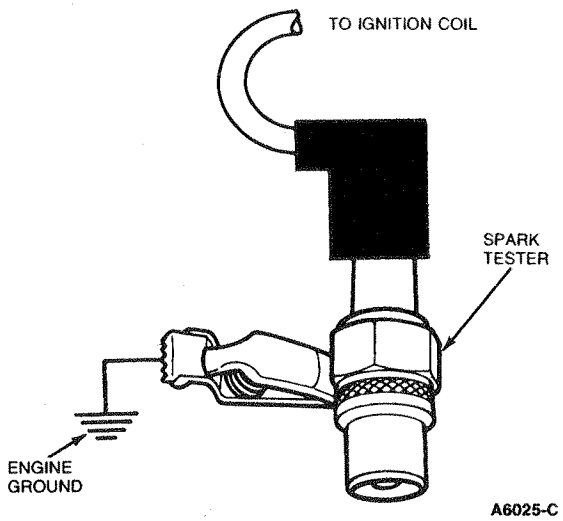
Part 2 Test 12

TEST STEP	RESULT ▶	ACTION TO TAKE
• Measure resistance between TFI module terminals as shown. **Measure Between These Terminals** / **Resistance Should Be** • PIP - Spout / Less than 7K ohms • Is the resistance as specified?	Yes ▶ No ▶	GO to Test 13. REPLACE TFI.



A9441-A

EEC-IV — TFI-IV	TFI-IV	Part 2 Test 13

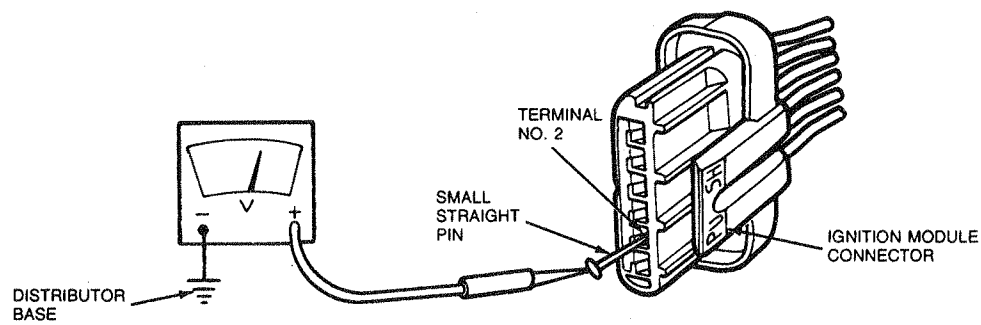
TEST STEP	RESULT ▶	ACTION TO TAKE
1. Connect spark tester between ignition coil wire and engine ground. 2. Crank engine.  	Spark ▶	CHECK PIP and Ignition ground wires for continuity. SERVICE as necessary. If OK GO to EEC-IV Diagnostics.
	No spark ▶	REPLACE TFI-IV module. MEASURE coil primary resistance using procedure in Test 3. If less than 0.3 ohms, REPLACE coil also.

Primary Circuit Continuity

TFI-IV

Part 2 Test 14

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Separate wiring harness connector from ignition module. Inspect for dirt, corrosion, and damage. **NOTE: Push connector tabs to separate.** 2. Attach negative (–) VOM lead to distributor base. 3. Measure battery voltage. 4. Attach VOM to small straight pin inserted into connector terminal No. 2. **CAUTION: Do not allow straight pin to contact electrical ground.** 5. Turn ignition switch to RUN position and measure terminal No. 2 voltage. 6. Turn ignition switch to OFF position. 7. Remove straight pin.	90 percent of battery voltage minimum ▶ Less than 90 percent of battery voltage ▶	GO to Part 2, Test 7. GO to Part 2, Test 15.

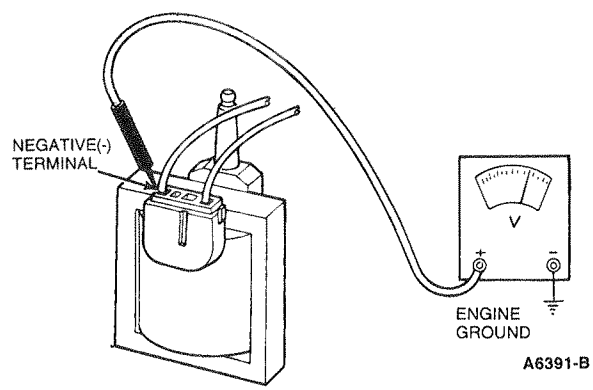


Ignition Coil Primary Voltage

TFI-IV

Part 2 Test 15

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Attach negative (–) VOM lead to distributor base. 2. Measure battery voltage. 3. Turn ignition switch to RUN position. 4. Measure voltage at negative (–) terminal of ignition coil. 5. Turn ignition switch to OFF position.	90 percent of battery voltage minimum ▶	INSPECT wiring harness between ignition module and coil negative (–) terminal.
	Less than 90 percent of battery voltage ▶	INSPECT wiring between ignition module and coil negative (–) terminal for short to ground. If OK GO to Part 2, Test 16.

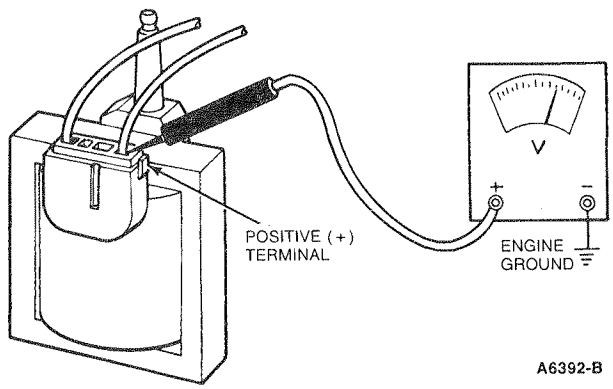


Ignition Coil Supply Voltage

TFI-IV

Part 2 Test 16

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Attach negative (−) VOM lead to distributor base. 2. Measure battery voltage. 3. Turn ignition switch to RUN position. 4. Measure voltage at POSITIVE (+) terminal of ignition coil. 5. Turn ignition switch to OFF position. 6. Reconnect ignition module connector.	90 percent of battery voltage minimum ▶	INSPECT ignition coil connector for dirt, corrosion, and damage. INSPECT ignition coil terminals for dirt, corrosion, and damage. REPLACE ignition coil.
	Less than 90 percent of battery voltage ▶	INSPECT and SERVICE wiring between ignition coil and ignition switch. REFER to vehicle wiring diagram. Damaged or worn ignition switch. REFER to Shop Manual, Group 31.



PART 2
TFI-IV
CLOSED BOWL
DISTRIBUTOR
IGNITION SYSTEM

Preliminary Checkout, Equipment & Notes

CHECKOUT

- Visually inspect the engine compartment to ensure all vacuum hoses and spark plug wires are properly routed and securely connected.
- Examine all wiring harnesses and connectors for insulation damage, burned, overheated, loose, or broken conditions.
- Be certain the battery is fully charged.
- All accessories should be off during diagnosis.

EQUIPMENT

Obtain the following test equipment or an equivalent:

- Spark Tester, Special Service Tool D81P-6666-A. See note.
- Volt/Ohm Meter Rotunda 014-00407.
- 12 Volt Test Light.
- Small straight pin.
- Remote Starter Switch.

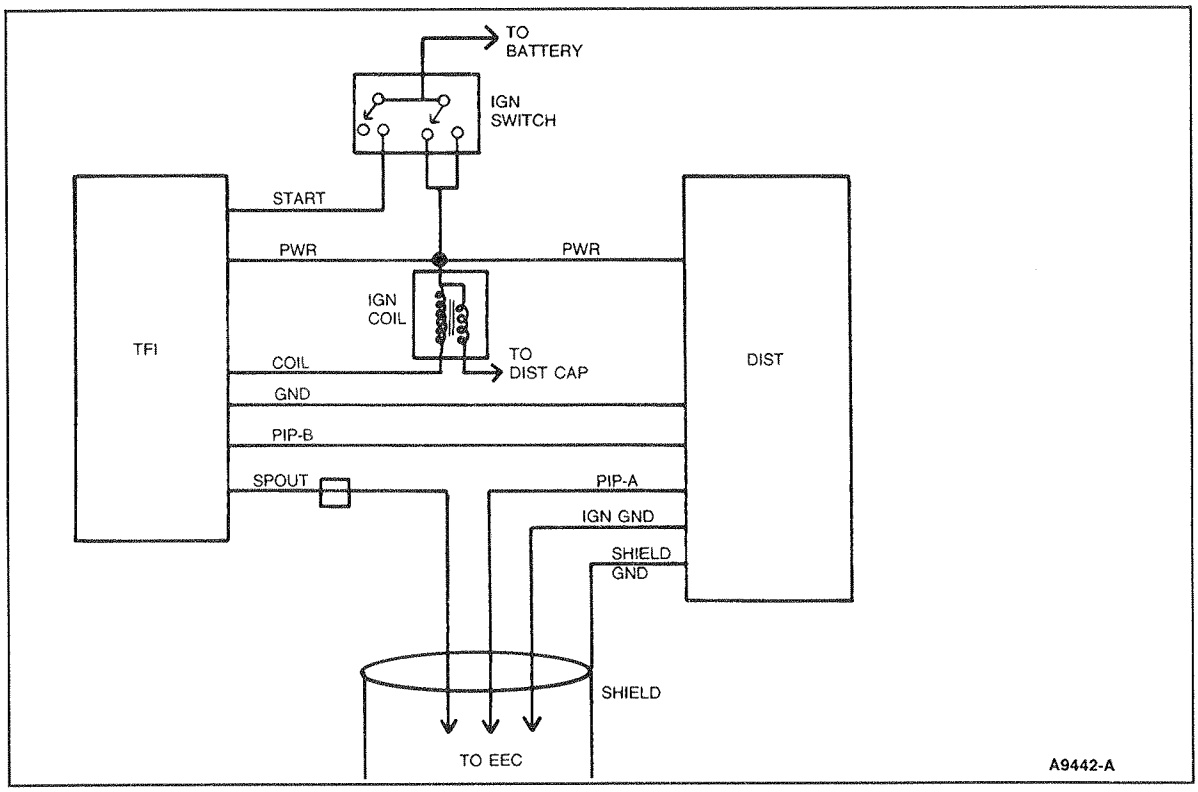
NOTES

- A spark plug with a broken side electrode is not sufficient to check for spark and may lead to incorrect results.
- When instructed to inspect a wiring harness, both a visual inspection and a continuity test should be performed.
- When making measurements on a wiring harness or connector, it is good practice to wiggle the wires while measuring.

Functional Schematic

TFI-IV Closed Bowl Distributor

The TFI-IV Closed Bowl Distributor system electrical schematic is shown below. For detailed information, refer to the vehicle wiring diagram.

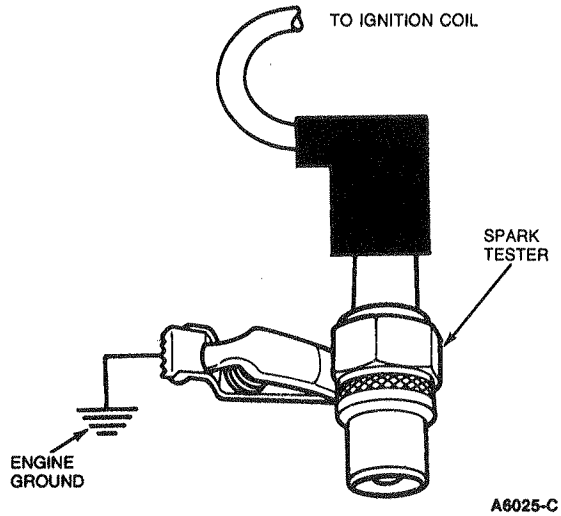


Ignition Coil Secondary Voltage — Crank Mode

TFI-IV Closed Bowl Distributor

Part 2 Test 1

TEST STEP	RESULT ▶	ACTION TO TAKE
1. Connect spark tester between ignition coil wire and engine ground. 2. Crank engine. 3. Is spark present?	Yes ▶	Test result OK. INSPECT distributor cap, rotor for damage, carbon tracking. If engine starts, GO to Part 1, Test 2, otherwise GO to Test 2.
	No ▶	MEASURE resistance of ignition coil wire. REPLACE if greater than 7,000 ohms per foot. INSPECT ignition coil for damage, carbon tracking. Crank engine to verify distributor rotation. REFER to Shop Manual, Group 23 and SERVICE as required. GO to Test 4.

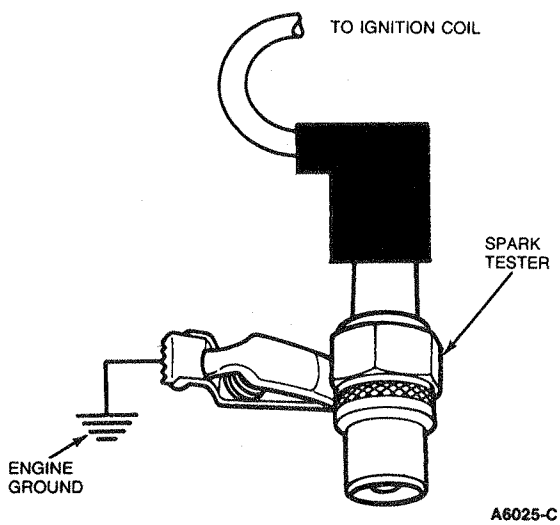


Ignition Coil Secondary Voltage — Run Mode

TFI-IV Closed Bowl Distributor

Part 2 Test 2

TEST PROCEDURE	RESULT ▶	ACTION TO TAKE
1. Place the transmission shift lever in the PARK (A/T) or NEUTRAL (M/T) position and set the Parking Brake. **CAUTION: Failure to perform this step may result in the vehicle moving when the starter is subsequently engaged during the test.** 2. Disconnect wire at S terminal of starter relay. 3. Attach remote starter switch. 4. Turn ignition switch to RUN position. 5. Crank the engine using remote starter switch. 6. Turn ignition switch to OFF position. 7. Remove the remote starter switch. 8. Reconnect wire to S terminal of starter relay. 9. Is spark present?	Yes ▶	Test result OK. Problem is not in the ignition system primary circuit components. RETURN to the Diagnostic Routines to identify other possible causes.
	No ▶	GO to Test 3.



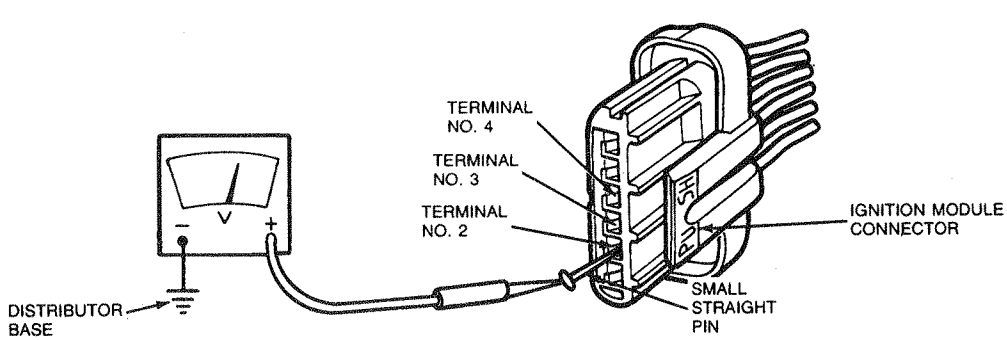
Wiring Harness

TFI-IV Closed Bowl Distributor

Part 2 Test 3

TEST PROCEDURE	RESULT ▶	ACTION TO TAKE
1. Separate wiring harness connector from ignition module. Inspect for dirt, corrosion, and damage. **NOTE: Push connector tabs to separate.** 2. Disconnect wire at S terminal of starter relay. 3. Attach negative (-) VOM lead to distributor base. 4. Measure battery voltage. 5. Following table below, measure connector terminal voltage by attaching VOM to small straight pin inserted into connector terminal and turning ignition switch to position shown. **CAUTION: Do not allow straight pin to contact electrical ground.** 6. Turn ignition switch to OFF position. 7. Remove straight pin. 8. Reconnect wire to S terminal of starter relay. 9. Is the voltage measured in each case greater than 90 percent of battery voltage?	Yes ▶ No ▶	REPLACE the TFI module. INSPECT for faults in wiring harness and connectors. REFER to vehicle wiring diagram for appropriate circuit. Damaged or worn ignition switch. REFER to Shop Manual, Group 31.

Connector Terminal	Wire/Circuit	Ignition Switch Test Position
#2	To Ignition Coil (-) Terminal	Run
#3	Run Circuit	Run and Start
#4	Start Circuit	Start

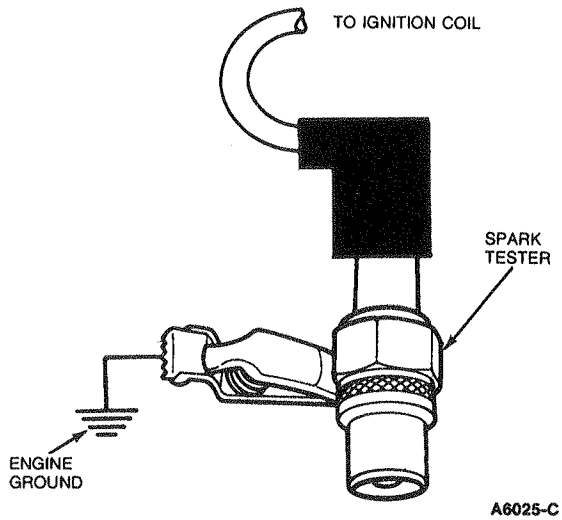


EEC-IV — TFI-IV

TFI-IV Closed Bowl Distributor

Part 2 Test 4

TEST PROCEDURE	RESULT ▶	ACTION TO TAKE
1. Disconnect the pin in-line connector near the TFI module. 2. Connect spark tester between ignition coil wire and engine ground. 3. Crank engine. 4. Is spark present?	Yes ▶ No ▶	GO to Test 5. GO to Test 7.

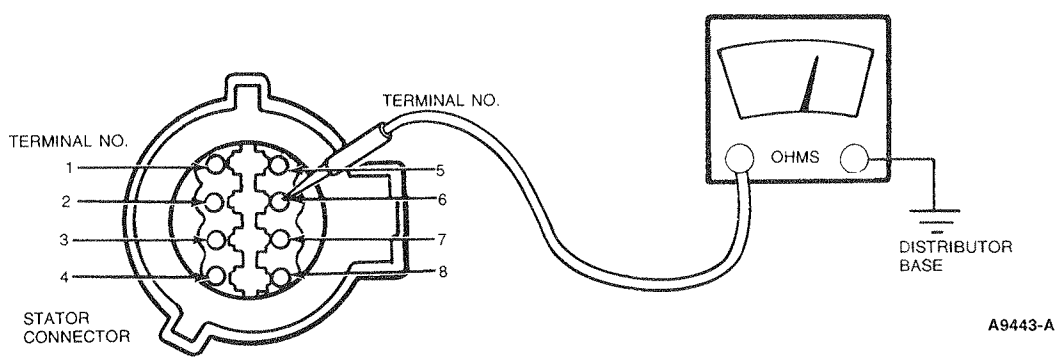


Stator

TFI-IV Closed Bowl Distributor

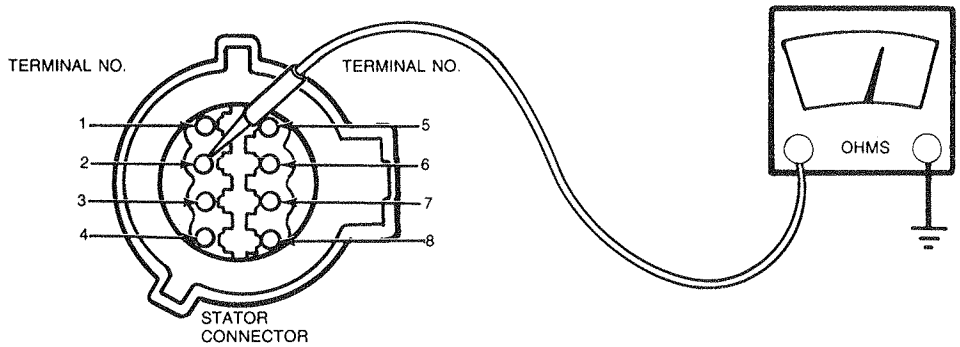
Part 2 Test 5

TEST PROCEDURE	RESULT ▶	ACTION TO TAKE
1. Separate wiring harness connector from the distributor. Inspect for dirt, corrosion and damage. 2. Measure resistance between the stator connector terminals 1 and 5. 3. Is the resistance between stator terminals 1 and 5 less than 5 ohms?	Yes ▶ No ▶	GO to Test 6. REPLACE the stator.



Stator	TFI-IV Closed Bowl Distributor	Part 2 Test 6

TEST PROCEDURE	RESULT ▶	ACTION TO TAKE
1. Measure resistance between stator connector terminal 2 and the distributor base. 2. Is the resistance less than 5 ohms?	Yes ▶	CHECK PIP-A and IGN GND signal wires for continuity to EEC. SERVICE as necessary. If OK, GO to EEC IV Diagnostics.
	No ▶	REPLACE stator.



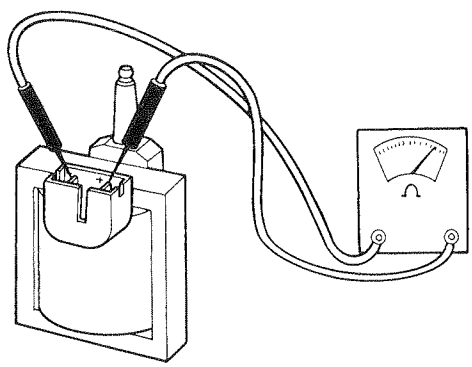
A9444-A

Ignition Coil Primary Resistance

TFI-IV Closed Bowl Distributor

Part 2 Test 7

TEST PROCEDURE	RESULT ▶	ACTION TO TAKE
1. Turn ignition switch to OFF. 2. Disconnect ignition coil connector. Inspect for dirt, corrosion, and damage. 3. Measure resistance from positive (+) to negative (−) terminal of ignition coil. 4. Is the resistance between 0.3 and 1.0 ohm?	Yes ▶	Test result OK. GO to Test 8.
	No ▶	REPLACE the ignition coil and check for spark using the method described in Test 1. If spark is not present, INSPECT wiring between coil and TFI for short circuit to ground. If OK, REPLACE TFI module also.



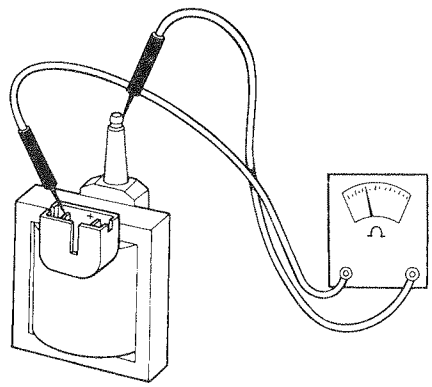
A6385-B

Ignition Coil Secondary Resistance

TFI-IV Closed Bowl Distributor

Part 2 Test 8

TEST PROCEDURE	RESULT ▶	ACTION TO TAKE
1. Measure resistance from negative (–) terminal to high voltage terminal of ignition coil.	Yes ▶	Test result OK. GO to Test 9.
2. Is the resistance between 6,500 and 11,500 ohms?	No ▶	REPLACE ignition coil.



A6386-B

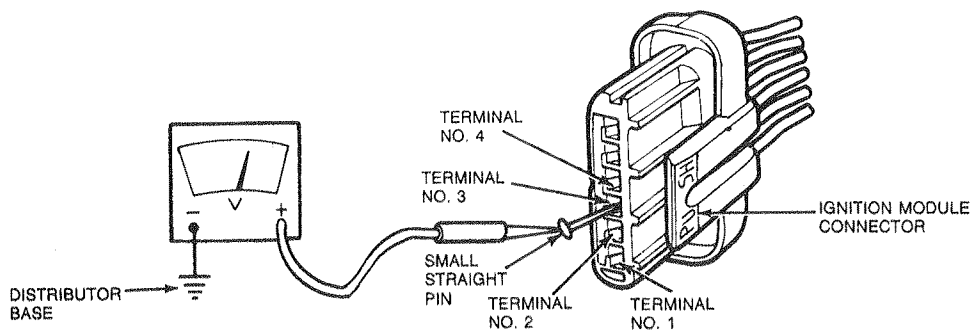
Wiring Harness

TFI-IV Closed Bowl Distributor

Part 2 Test 9

TEST PROCEDURE	RESULT ▶	ACTION TO TAKE
1. Separate wiring harness connector from ignition module. Inspect for dirt, corrosion, and damage. **NOTE: Push connector tabs to separate.** 2. Disconnect wire at S terminal of starter relay. 3. Attach negative (–) VOM lead to distributor base. 4. Measure battery voltage. 5. Following table below, measure connector terminal voltage by attaching VOM to small straight pin inserted into connector terminal and turning ignition switch to position shown. **CAUTION: Do not allow straight pin to contact electrical ground.** 6. Turn ignition switch to OFF position. 7. Remove straight pin. 8. Reconnect wire to S terminal of starter relay. 9. Was the voltage measured in each case greater than 90 percent of battery voltage?	Yes ▶ No ▶	Test result OK. GO to Test 10. INSPECT for faults in wiring harness and connectors. REFER to vehicle wiring diagram for appropriate circuit. Damaged or worn ignition switch. REFER to Shop Manual, Group 31.

Connector Terminal	Wire/Circuit	Ignition Switch Test Position
#3	Run Circuit	Run and Start
#4	Start Circuit	Start

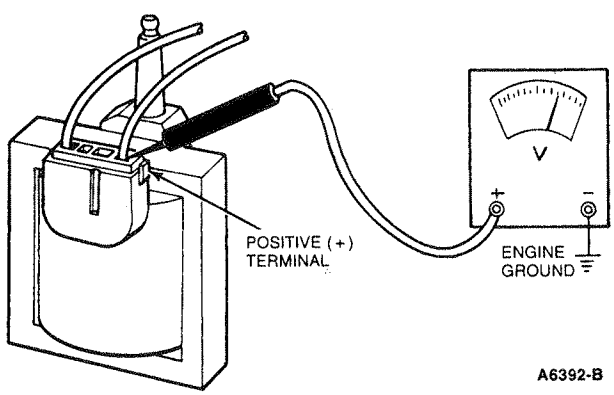


Ignition Coil Supply Voltage

TFI IV Closed Bowl Distributor

Part 2 Test 10

TEST PROCEDURE	RESULT ▶	ACTION TO TAKE
1. Reconnect harness connector to the ignition coil. 2. Attach negative (−) VOM lead to distributor base. 3. Measure battery voltage. 4. Turn ignition switch to RUN position. 5. Measure voltage at positive (+) terminal of ignition coil. 6. Turn ignition switch to OFF position. 7. Was the voltage at coil positive terminal at least 90 percent of battery voltage?	Yes ▶	INSPECT ignition coil connector for dirt, corrosion, and damage. INSPECT ignition coil terminals for dirt, corrosion, and damage. GO to Test 11.
	No ▶	INSPECT and SERVICE wiring between ignition coil and ignition switch. REFER to vehicle wiring diagram. Damaged or worn ignition switch. REFER to Shop Manual, Group 31.

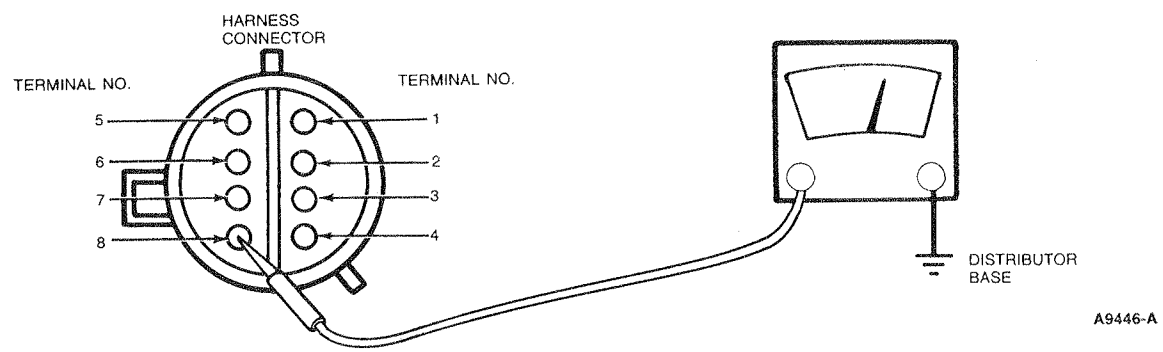


Wiring Harness

TFI IV Closed Bowl Distributor

Part 2 Test 11

TEST PROCEDURE	RESULT ▶	ACTION TO TAKE
1. Attach negative (−) VOM lead to distributor base. 2. Measure battery voltage. 3. Turn ignition switch to RUN position. 4. Measure voltage at terminal 8 of the harness connector which connects to the stator. 5. Turn ignition switch to the OFF position. 6. Was the result greater than 90 percent of battery voltage?	Yes ▶ No ▶	GO to Test 12. INSPECT and SERVICE wiring between stator and ignition switch. REFER to vehicle wiring diagram. Damaged or worn ignition switch. REFER to Shop Manual, Group 31.

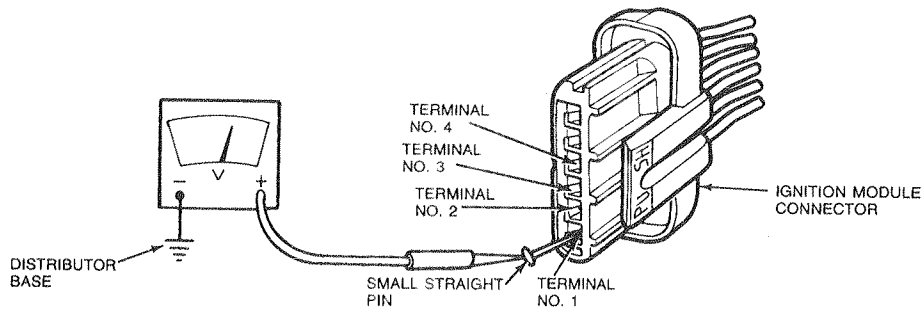


Wiring Harness

TFI IV Closed Bowl Distributor

Part 2 Test 12

TEST PROCEDURE	RESULT ▶	ACTION TO TAKE
1. Measure resistance between the distributor base and terminal 1 of the harness connector at the ignition module. 2. Is the resistance less than 1 ohm?	Yes ▶ No ▶	GO to Test 14. GO to Test 13.

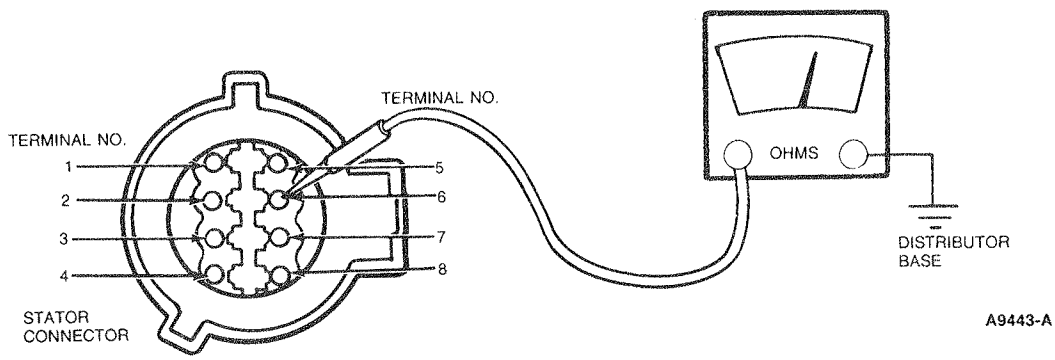


Stator

TFI IV Closed Bowl Distributor

Part 2 Test 13

TEST PROCEDURE	RESULT ▶	ACTION TO TAKE
1. Measure resistance between the distributor base and stator connector terminal 6. 2. Is the resistance less than 1.0 ohm?	Yes ▶	INSPECT and SERVICE wiring between the harness connector at the ignition module and the harness connector at the distributor ground circuit.
	No ▶	INSPECT the retaining screws to stator in the distributor bowl. If OK, REPLACE the STATOR.

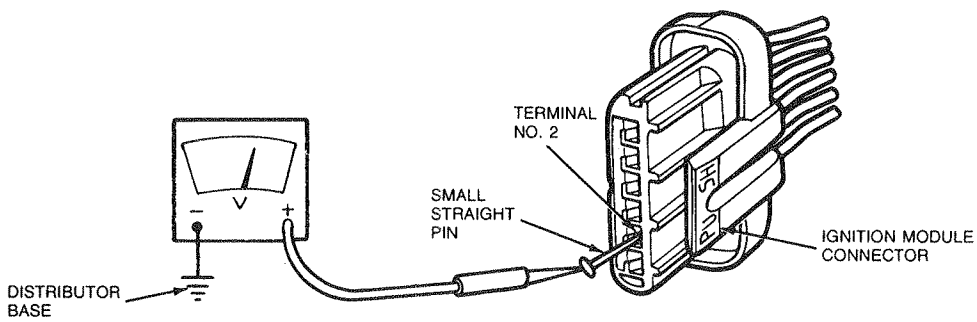


Primary Circuit Continuity

TFI IV Closed Bowl Distributor

Part 2 Test 14

TEST PROCEDURE	RESULT ▶	ACTION TO TAKE
1. Attach negative (–) VOM lead to distributor base. 2. Measure battery voltage. 3. Attach VOM to small straight pin inserted into connector terminal No. 2 **CAUTION: Do not allow straight pin to contact electrical ground.** 4. Turn ignition switch to RUN position and measure terminal No. 2 voltage. 5. Turn ignition switch to OFF position. 6. Remove straight pin. 7. Was the voltage at terminal 2 at least 90 percent of battery voltage?	Yes ▶ No ▶	GO to Test 15. INSPECT for faults in wiring harness and connectors between coil and ignition module. SERVICE as necessary.



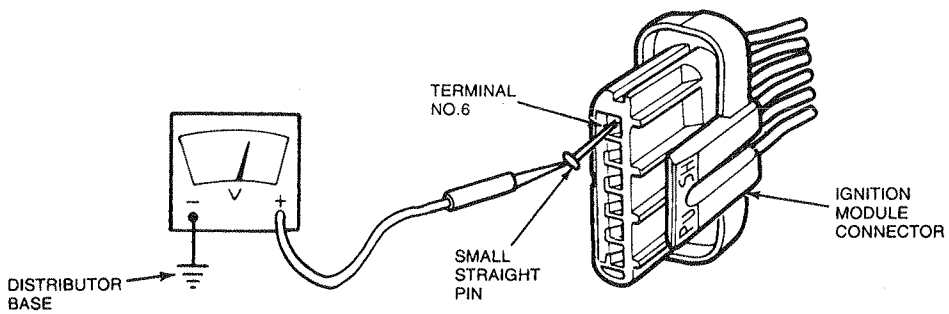
A6649-B

Stator

TFI IV Closed Bowl Distributor

Part 2 Test 15

TEST PROCEDURE	RESULT ▶	ACTION TO TAKE
1. Reconnect the stator connector and the mating harness connector. 2. Attach VOM negative (–) lead to distributor base. 3. Crank engine and measure the voltage at the TFI harness connector terminal #6. 4. Was the voltage between 3 volts and 6 volts?	Yes ▶ No ▶	REPLACE the TFI module. REPLACE the stator.



INTERMITTENT DIAGNOSIS PROCEDURE

Preliminary Checkout and Notes

NOTES

- This procedure begins with an owner complaint that the engine stops at unexpected times but can be restarted. In situations like this there are two things that are very important. The technician must obtain as much information directly from the owner about the conditions under which the problem occurs, and the service history of the vehicle must be thoroughly reviewed to avoid repeat replacement of good components. For example, replacing a stator assembly a second time will not correct a problem if the problem is actually in another area.
- Two testers are available for assistance with intermittent diagnosis. **Rotunda Ignition System Tester D80L-50-BIT** is used to diagnose problems in the primary circuit of the Duraspark ignition systems. It provides a means to direct the technician to a specific area in the primary circuit. **Rotunda Ignition System Tester 007-00008** provides a quick means of separating primary ignition system problems from fuel, carburetion, EGR or other system problems causing similar vehicle symptoms. It can be used on most ignition systems. It will detect any primary ignition system problem, but it is particularly useful in detection of intermittent problems.

CHECKOUT

- Visually inspect the engine compartment to ensure all vacuum hoses and spark plug wires are properly routed and securely connected.
- Examine all wiring harnesses and connectors for insulation damage, burned, overheated, loose or broken conditions.

Intermittent Diagnosis

TEST STEP	RESULT ▶	ACTION TO TAKE
STEP 1		
• Talk to owner.	▶	Symptoms.
STEP 2		
• Review vehicle service history.	▶	Number of previous repairs and components replaced.
STEP 3		
• Is a Rotunda Ignition System Tester model, 007-00008 or equivalent available?	Yes ▶	FOLLOW test procedure instructions supplied with tester.
	No ▶	GO to Step 4.
STEP 4		
• Will engine start?	Yes ▶	GO to Step 5.
	No ▶	GO to Ignition System Diagnostic Procedure, Part 2, Test 1 for engine ignition system (Duraspark II, or TFI-IV).
STEP 5		
• Engine at idle, raise hood, shake wiring harness and pull wires at connectors for ignition components. Does engine quit?	Yes ▶	SERVICE wiring harness or connector.
	No ▶	GO to Step 6.
STEP 6		
• Engine at idle, close hood, A/C On, blower on medium speed: allow engine to run for 15 minutes. Does engine quit?	Yes ▶	GO to Step 10.
	No ▶	GO to Step 7.

Intermittent Diagnosis

TEST STEP	RESULT ▶	ACTION TO TAKE
STEP 7		
• Engine off, hood closed, hot soak for 10 minutes. Will engine restart?	Yes ▶ No ▶	GO to Step 8. GO to Ignition System Diagnostic Procedure, Part 2, Test 1 for engine ignition system (Duraspark II, or TFI-IV).
STEP 8		
• Engine at idle, raise hood, shake wiring harness and pull wires at connectors for ignition components. Does engine quit?	Yes ▶ No ▶	SERVICE wiring harness or connector. GO to Step 9.
STEP 9		
• Road test. Does engine quit?	Yes ▶ No ▶	GO to Step 10. Test complete. (Problem not duplicated).
STEP 10		
• Raise hood, shake wiring harness, pull wires at connectors, separate and reconnect connectors for ignition components. Does engine start?	Yes ▶ No ▶	SERVICE wiring harness or connector. GO to Ignition System Diagnostic Procedure, Part 2, Test 1 for engine ignition system (Duraspark II, or TFI-IV).