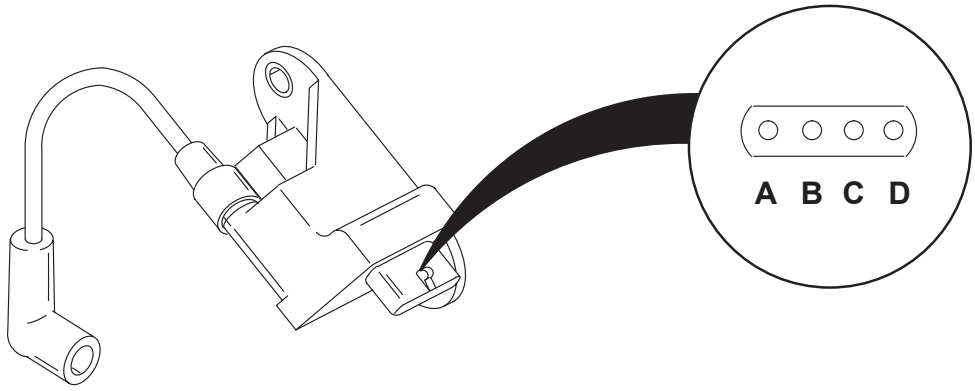
CDM (P/N 827509) Trouble Shooting Flowchart

Chart 1

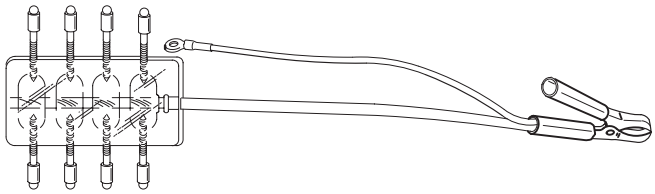
Step	Action	Value	Yes	No	Tools
1	Verify High Tension Leads, Spark Plug and Spark Boots are in good condition. Inspect wires for chafing. **Visual Inspection**	–	Step 2	Replace Failed Component Step 2	High Tension lead pin P/N 84-813706A56
2	Verify 4 Pin Connector Integrity **Visual Inspection**	–	Step 3	Repair/Replace Connector Components Step 3	–
3	Verify Ground from CDM connector to block	0.2 Ohms and below	Step 4	Correct Ground Path Step 4	DVA/Multimeter P/N 91-99750 Test Harness P/N 84-825207A2
4	Test all CDMs at Cranking with Spark Gap Tester **Spark on All CDMs?** Will spark jump a 7/16 in. (11.11 mm) gap?	7/16 in. (11.11 mm) gap	If at least one CDM has spark, continue with Chart #3	Continue with Chart #2	Spark Gap Tester P/N 91-850439

CDM (P/N 827509)

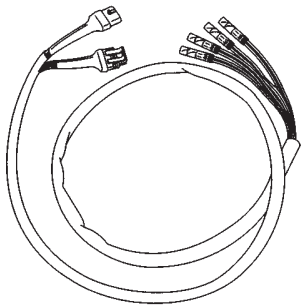


a - Ground
b - Black/Yellow
c - Trigger Connection
d - Stator Connection

Spark Gap Tester P/N 91-850439



CDM Test Harness 84-825207A2



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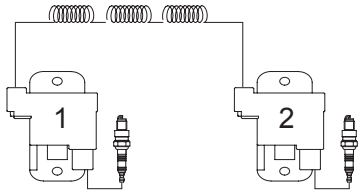
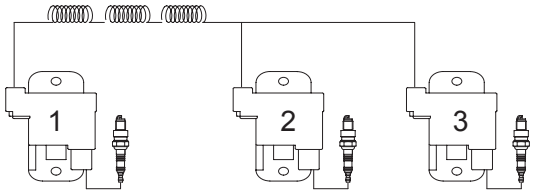
CDM Stop Diode Trouble Shooting

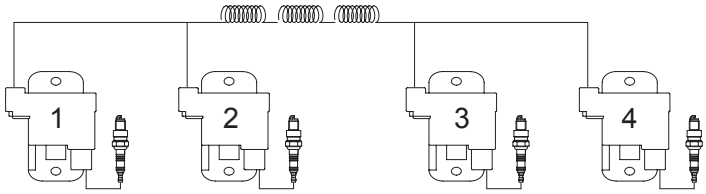
2 Cyl.:
CDM #1 gets its charging ground path through CDM #2
CDM #2 gets its charging ground path through CDM #1
A shorted Stop Diode in either CDM would prevent the opposite one from sparking.



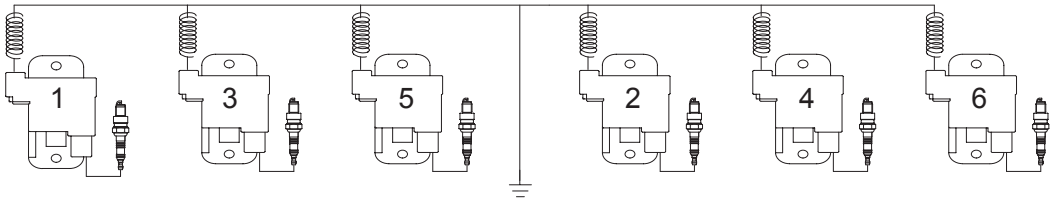
3 Cyl.:
CDM #1 gets its charging ground path through CDM #2 or #3
CDM #2 and #3 get their charging ground path through CDM #1
A shorted Stop Diode in CDM #1 would prevent CDMs #2 and #3 from sparking.
A shorted Stop Diode in CDM #2 or #3 would prevent CDM #1 from sparking.



4 Cyl.:
CDM #1 and #2 get their charging ground path through CDM #3 or #4
CDM #3 and #4 get their charging ground path through CDM #1 or #2
A shorted Stop Diode in CDM #1 or #2 would prevent CDMs #3 and #4 from sparking.
A shorted Stop Diode in CDM #3 or #4 would prevent CDM #1 and #2 from sparking.



6 Cyl.:
All CDMs get their charging ground path independently through the stator's white leads.
A shorted Stop Diode in any one CDM will prevent at least 2 other CDMs from sparking



CDM Trouble Shooting Flowchart

Chart #2 (No Spark on any CDM)

Step	Action	Value	Yes	No	Tools
1	With the key switch ON: Verify continuity between BLK/YEL harness wire and ground. **This Test Checks:** Lanyard Switch Key Switch Rev Limiter (external) Chafed BLK/YEL wire CDM Stop Circuit	NO continuity	Step 2	Repair or Replace Component Run Engine Verify Repair Step 6	DVA/Multimeter P/N 91-99750
2	Check Stator Resistance between GRN/WHT and WHT/GRN Open circuit voltage at cranking should be no less than 100 Volts on the DVA	660-710 Ohms 2, 3 & 4 Cyl. Models 990 - 1210 Ohms 6 Cyl.	Step 3	Replace Stator Run Engine Verify Repair Step 6	DVA/Multimeter P/N 91-99750
3	Check Trigger/Crank Shaft Position Sensor Output: Cranking with CDM disconnected. Cranking with CDM connected.	1 Volt and above - CDM disconnected. 0.2 - 5 Volts-CDM connected.	Step 5	2, 3, & 4 Cyl Replace Trigger Run Engine Verify Repair Step 6 6 Cyl. - Step 4	DVA/Multimeter P/N 91-99750 TPI/CDM Test Harness 84-825207A2
4	V-6 Models Resistance Check Crank Position Sensor	900 - 1300 Ohms	Step 5	Replace Crank Position Sensor Run Engine Verify Repair Step 6	DVA/Multimeter P/N 91-99750
5	Test all CDMs at Cranking with Spark Gap Tester **Spark on All CDMs?** Will spark jump a 7/16 in. (11.11 mm) gap?	7/16 in. (11.11 mm) gap	Step 6	Verify All Preceding Steps	Spark Gap Tester P/N 91-850439
6	If mis-firing is in a repeatable range: Perform DVA readings on stator and trigger at all running speeds.*	Stator: 200 Volts and above Trigger: 2 Volts and above	Run Engine Verify Repair END	Refer to *Note Below	DVA/Multimeter P/N 91-99750 TPI/CDM Test Harness 84-825207A2

* Note: Stator tests will only isolate problem down to a charging pair. Further testing is necessary to determine faulty CDM. Disconnecting one CDM of the charging pair is recommended.

CDM Trouble Shooting Flowchart

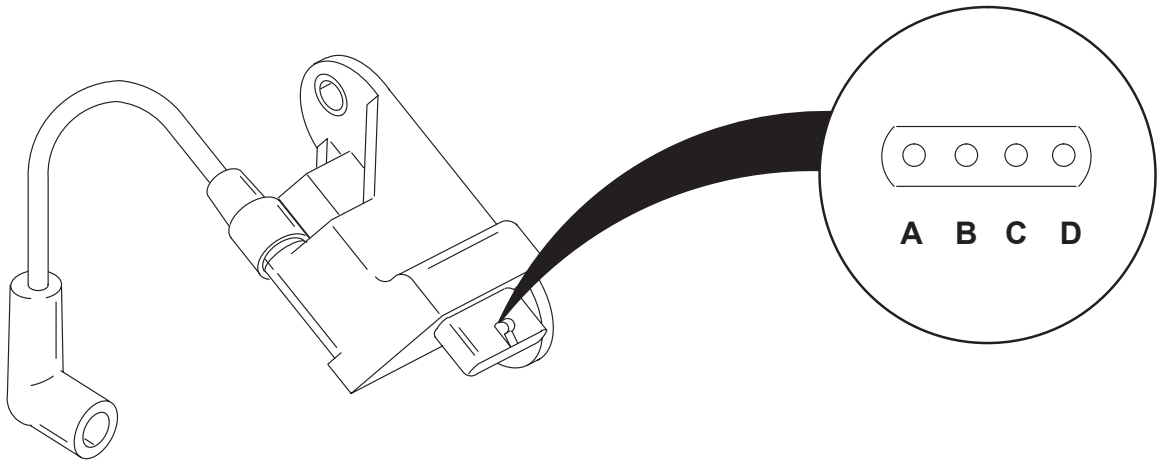
Chart #3 (At least one CDM has spark)

Step	Action	Value	Yes	No	Tools
1	Resistance Check ALL CDMs	Refer to chart	Step 3	Replace any CDMs that do not pass specifications even if they fire Step 2	DVA/Multimeter P/N 91-99750
2	Test all CDMs at Cranking with Spark Gap Tester **Spark on All CDMs** Will spark jump a 7/16 in. (11.11 mm) gap?	7/16 in. (11.11 mm) gap	Run Engine Verify Repair Step 6	Step 3	Spark Gap Tester P/N 91-850439
3	Check Trigger Output: Cranking with CDM disconnected. Cranking with CDM connected.	1 Volt and above - CDM disconnected. 0.2 - 5 Volts - CDM connected.	Step 5	2, 3, & 4 Cyl - Replace Trigger Run Engine Verify Repair Step 6 6 Cyl–Step 4	DVA/Multimeter P/N 91-99750 TPI/CDM Test Harness 84-825207A2
4	V6 Models Resistance Check Crank Position Sensor	900 - 1300 Ohms	Step 5	Replace Crank Position Sensor Run Engine Verify Repair Step 6	DVA/Multimeter P/N 91-99750
5	Test all CDMs at Cranking with Spark Gap Tester **Spark on All CDMs?** Will spark jump a 7/16 in. (11.11 mm) gap?	7/16 in. (11.11 mm) gap	Run Engine Verify Repair Step 6	Replace any non-firing CDMs Step 6	Spark Gap Tester P/N 91-850439
6	If mis-firing is in a repeatable range: Perform DVA readings on stator and trigger at all running speeds.*	Stator: 200 Volts and above Trigger: 2 Volts and above	Run Engine Verify Repair END	Refer to *Note Below.	DVA/Multimeter P/N 91-99750 TPI/CDM Test Harness 84-825207A2

* Note: Stator tests will only isolate problem down to a charging pair. Further testing is necessary to determine faulty CDM. Disconnecting one CDM of the charging pair is recommended.

CAPACITOR DISCHARGE MODULE

IMPORTANT Spark plug wires are screwed into CDM.



a - Ground
b - Black/Yellow
c - Trigger Connection
d - Stator Connection

A resistance check is required and can be performed on the CDM as follows:

NOTE: *This test can be performed using the test harness (P/N 84-825207A2). Do Not connect the test harness plug to the stator/trigger engine wire harness.*

CAPACITOR DISCHARGE MODULE				
Circuit Test	**Connect Negative (–) Meter Lead To:**	**Connect Positive (+) Meter Lead To:**	**Ohms Scale**	**Results:**
Stop Diode Forward Bias	Green (D)/ or Green test harness lead	Black/Yellow (B)/ or Black/Yellow test harness lead	R x 100 Diode Reading*	Continuity
Stop Diode Reverse Bias	Black/Yellow (B)/ or Black/Yellow test harness lead	Green (D)/ or Green test harness lead	R x 100 Diode Reading*	No Continuity
Return Ground Path Diode, Reverse Bias	Green (D)/ or Green test harness lead	Ground Pin (A) or Black test harness lead	R x 100 Diode Reading*	No Continuity
Return Ground Path Diode, Forward Bias	Ground Pin (A)/ or Black test harness lead	Green (D)/ or Green test harness lead	R x 100 Diode Reading*	Continuity
CDM Trigger Input Resistance	Ground Pin (A)/ or Black test harness lead	White (C)/ or White test harness lead	R x 100	1000 - 1250 Ohms
Coil Secondary Impedance	Ground Pin (A) or Black test harness lead	Spark Plug Terminal (At Spark Plug Boot)	R x 100	900 - 1200 Ohms

*Diode Readings: Due to the differences in test meters, results other than specified may be obtained. In such a case, reverse meter leads and re-test. If test results then read as specified CDM is O.K. The diode measurements above will be opposite if using a Fluke equivalent multimeter.

Ignition Test Procedures

Direct Voltage Adaptor (DVA) Test

⚠ CAUTION

DVA checks can be made while cranking engine with starter motor. To prevent engine from starting while being cranked, all spark plugs must be removed.

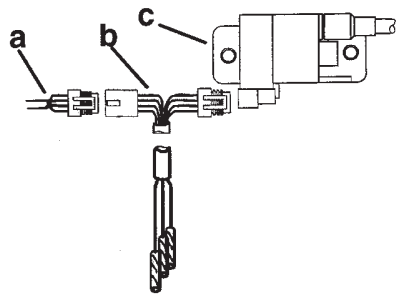
⚠ CAUTION

To protect against meter and/or component damage, observe the following precautions:

- **INSURE that the Positive (+) meter lead is connected to the DVA receptacle on the meter.**
- **DO NOT CHANGE meter selector switch position while engine is running and/or being "cranked".**

NOTE: *Each CDM is grounded through the engine wiring harness via the connector plug. It is not necessary to have the CDM mounted on the ignition plate for testing.*

1. Remove all spark plugs.
2. Insert spark gap tool (P/N 91-63998A1) into each spark plug boot and attach alligator clips to a good engine ground.
3. Disconnect remote fuel line from engine.
4. Make sure all CDMs are plugged in.
5. Test Stator and Trigger voltage to CDM:
   a. Install test harness (84-825207A2) between ignition harness and CDM.

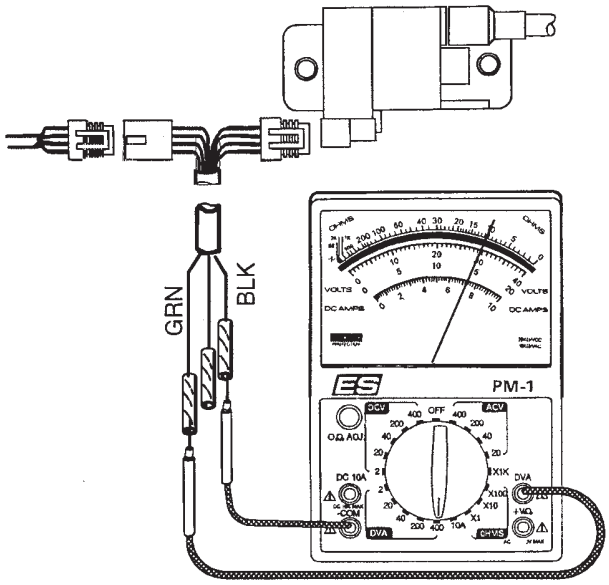


a - Stator/Trigger Harness
b - Test Harness (84-825207A2)
c - Capacitor Discharge Module

   b. Test each CDM.

Stator Output Test		400 DVA Scale
Positive Meter Lead (+)	**Negative Meter Lead (–)**	**DVA Reading**
Connect to Green Test Harness Lead	Connect to Black Test Harness Lead	100 - 350

If only one CDM stator reading is below specifications, replace that CDM. If all CDM stator voltage readings are low, go to "Testing Stator Resistance".

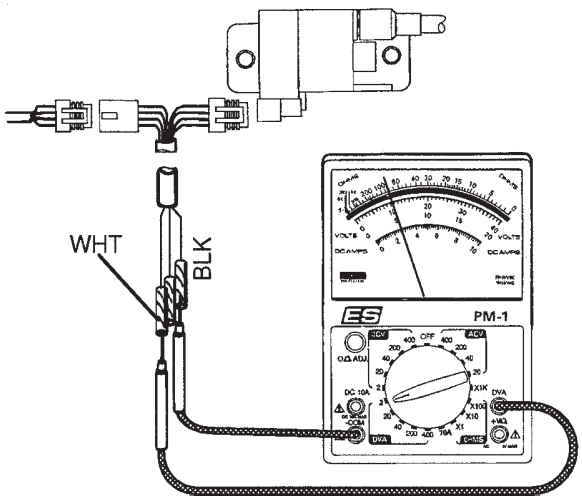


Test each CDM.

Trigger Output Test		2 DVA Scale
Positive Meter Lead (+)	**Negative Meter Lead (–)**	**DVA Reading**
White Test Harness Lead	Black Test Harness Lead	0.2 - 2.0

If reading is below specifications, replace trigger. If reading is above specifications, check CDM.

NOTE: *If voltage remains low after installing a new trigger, replaced CDM.*



ENGINE RUNNING AT IDLE

It is not necessary to perform this test if the voltage output was tested in the previous step.

Stator Output Test		400 DVA Scale
Positive Meter Lead (+)	**Negative Meter Lead (–)**	**DVA Reading**
Connect to Green Test Harness Lead	Connect to Black Test Harness Lead	200 - 350

If stator output is low, go to “Testing Stator Resistance”.

Trigger Output Test		20 DVA Scale
Positive Meter Lead (+)	**Negative Meter Lead (–)**	**DVA Reading**
White Test Harness Lead	Black Test Harness Lead	2 - 8 Volts

If reading is below specifications, replace trigger. If reading is above specifications, check CDM.

NOTE: *If voltage remains low after installing a new trigger, replace CDM.*

Resistance Tests

TRIGGER

A resistance test is not used on the trigger. Test trigger as outlined under “Testing Voltage Output to CDM” - “Trigger Output Test”.

STATOR

1. Disconnect stator leads.

NOTE: *Resistance varies greatly with temperature. Measurements should be taken with an ambient temperature range of 65° to 85° F.*

Stator Resistance Test		R x 1 Ohms Scale
Positive Meter Lead (+)	**Negative Meter Lead (–)**	
Connect to White/Green stator lead	Connect to Green/White stator lead	660-710
Connect to White/Green stator lead	Connect to engine ground	No continuity
Connect to Green/White stator lead	Connect to engine ground	No continuity

IMPORTANT If all CDM stator output voltage is low and stator resistance tests are within specifications, then each CDM (one at a time) must be replaced with a CDM known to be good until stator output voltage returns to proper levels. This process of elimination will reveal a defective CDM.