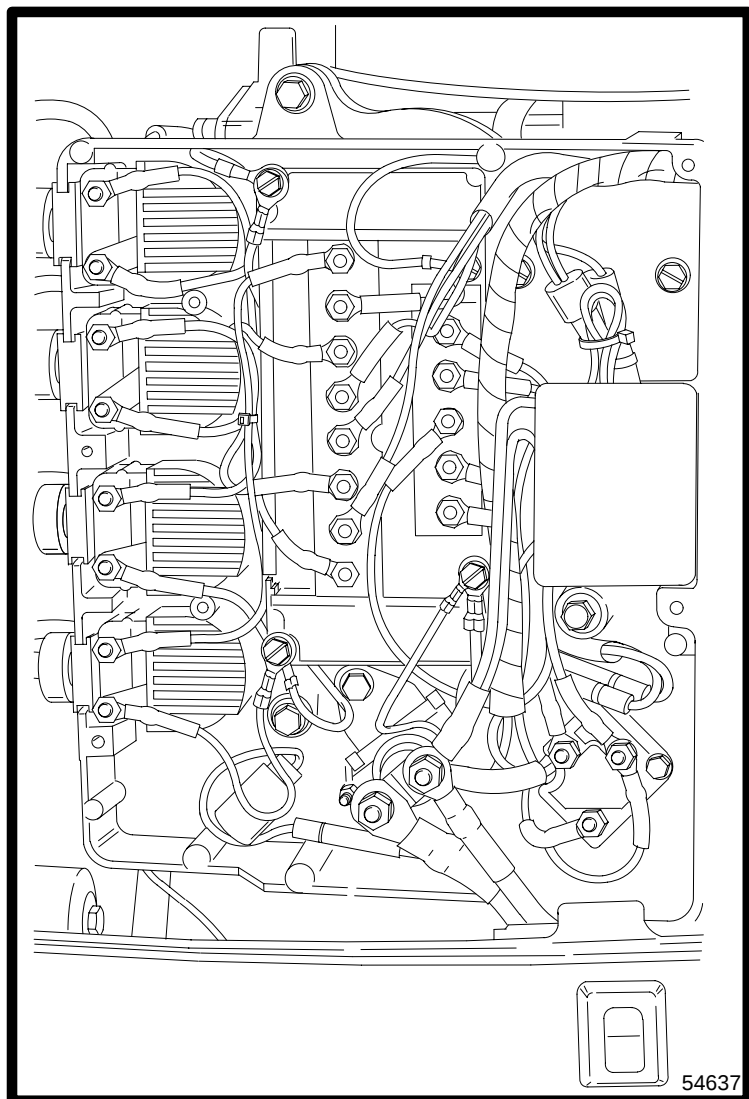




ELECTRICAL AND IGNITION

2

A



IGNITION SYSTEM

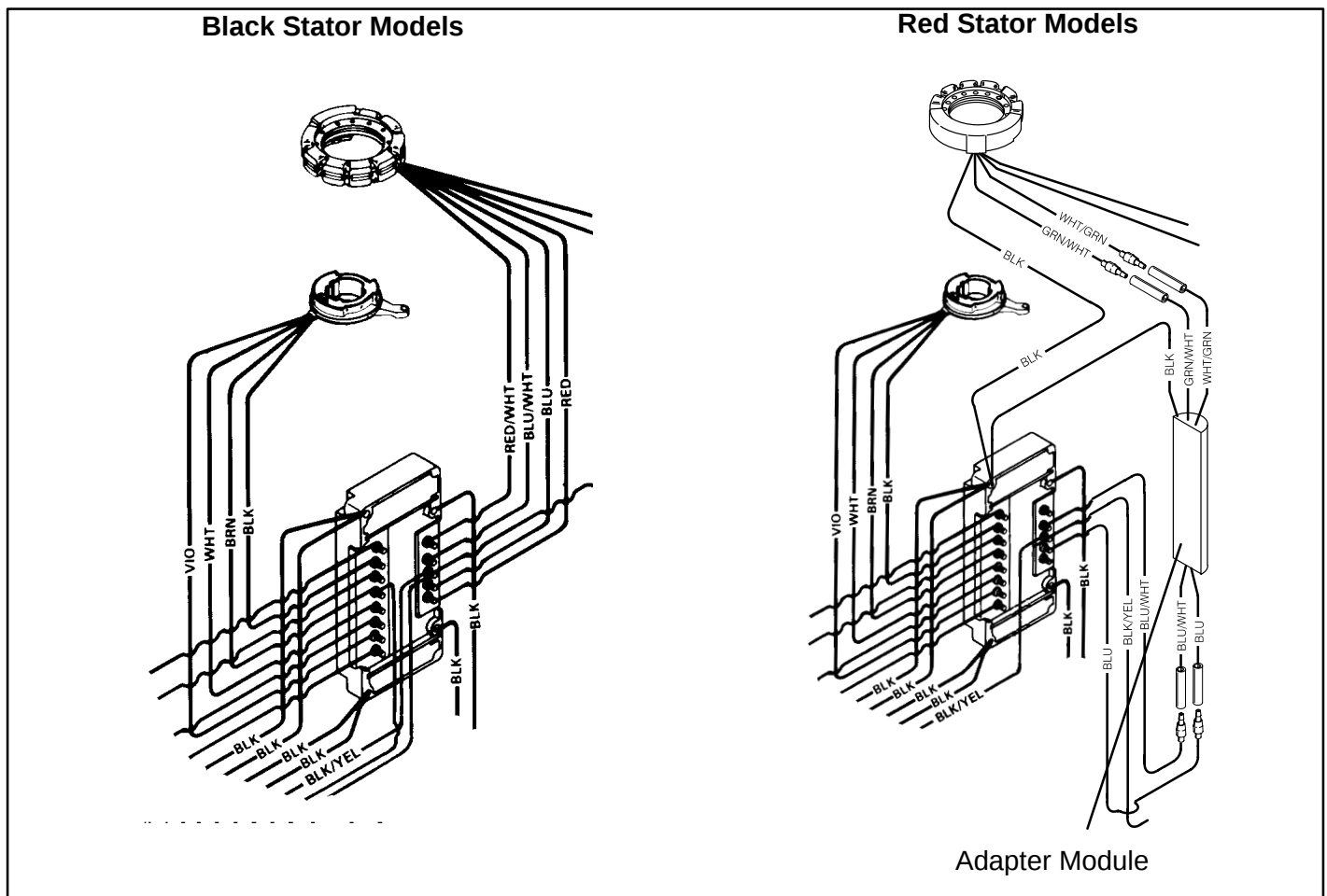


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Ignition System



Description

The ignition system is alternator-driven with distributor-less capacitor discharge. Major components of the ignition system are the flywheel, stator assembly, trigger assembly, switch box, ignition coils and spark plugs.

The stator assembly is mounted below the flywheel and has 2 coils. The flywheel is fitted with permanent magnets inside the outer rim. As the flywheel rotates, the permanent magnets pass the stationary stator ignition coils. This causes the ignition coils to produce AC voltage. The AC voltage then is conducted to the switch boxes where it is rectified and stored in a capacitor.

The trigger assembly (also mounted under the flywheel) has 2 coils. The flywheel likewise has a second set of magnets (located around the hub). As the flywheel rotates, the second set of permanent magnets passes the trigger coils. This causes the trigger coils, in turn, to produce an AC voltage that is conducted to an electronic switch (SCR) in the switch box.

The switch discharges the capacitor voltage into the ignition coil at the correct time and in firing order sequence.

Capacitor voltage is conducted to the ignition coil primary. The ignition coil multiplies this voltage to a value high enough to jump the gap at the spark plug.

The preceding sequence occurs once-per-engine-revolution for each cylinder.

Spark timing is changed (advanced/retarded) by rotating the trigger coil position in relation to the permanent magnets on the flywheel hub.

Red Stator Models

Red stators require an adapter module that gets connected between the stator and switch box. Without the adapter module, the voltage supplied by the stator would exceed the voltage capability of the switch box.



Ignition Troubleshooting

⚠ WARNING

DANGER - HIGH VOLTAGE/SHOCK HAZARD! Do not touch ignition components and/or metal test probes while engine is running and/or being "cranked". STAY CLEAR OF SPARK PLUG LEADS. To assure personal safety, each individual spark plug lead should be grounded to engine.

Before troubleshooting the ignition system, check the following:

- Make sure that electrical harness, lanyard switch, ignition switch, and mercury switch are not the source of the problem.
- Check that plug-in connectors are fully engaged and terminals are free of corrosion.
- Make sure that wire connections are tight and free of corrosion.
- Check all electrical components, that are grounded directly to engine, and all ground wires to see that they are grounded to engine.
- Check for disconnected wires and short and open circuits.

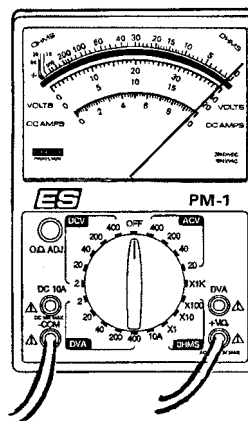
Checking for Loss of Spark

The use of an inductive timing light while cranking or running the engine will show whether there is spark present or not. The timing light will not show the strength of the spark. Incorrect spark strength may not allow the spark plug to fire under compression

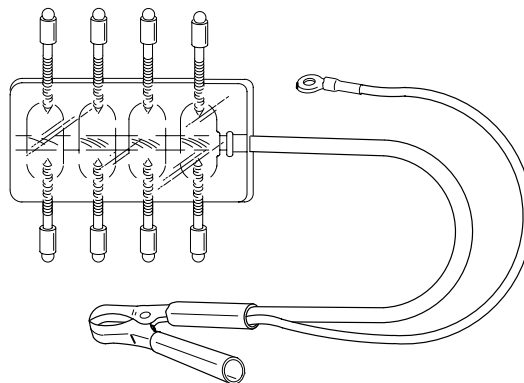
The use of a spark gap or spark gap board will give a visual indication of the strength of the spark. Normal ignition spark is BLUE in color. A YELLOW or RED spark indicates a weak ignition.

Troubleshooting Test Equipment

Multimeter / DVA Tester 91-99750



Spark Tester 91-850439

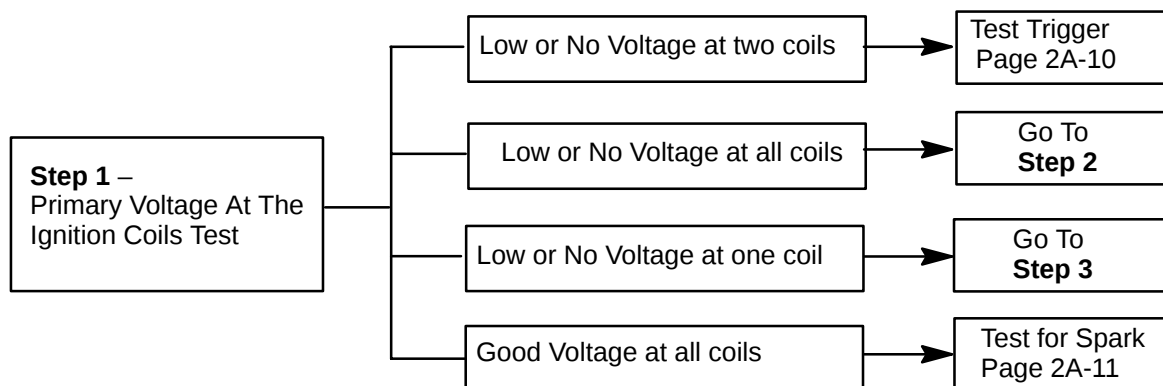




Ignition Troubleshooting (Engines With Black Stator)

Troubleshooting Sequence Chart – (Engines with Black Stator)

Start the ignition troubleshooting by first performing Step 1, then continue the series of steps to locate the problem. Refer to the troubleshooting steps on the following pages.



DVA TESTS – 9 AMP BLACK STATOR

Tested Part	Selector Position	Red	Black	Reading At 300 - 1000 RPM	Reading At 1000 - 4000 RPM
Coil Primary	400 VDC*	Coil (+) Terminal	Coil (-) Terminal	160 - 250	180 - 275
Stop Circuit	400 VDC*	Black/Yellow Terminal	Ground	200 - 360	200 - 360
Stator Low Speed	400 VDC*	Blue Sw. Box Term.	Ground	210 - 310	190 - 310
Stator High Speed	400 VDC*	Red Sw. Box Term.	Ground	25 - 90	140 - 310

DVA TESTS – 16 AMP BLACK STATOR (398-9710A33 & 398-9710A42)

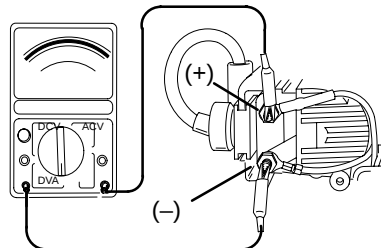
Tested Part	Selector Position	Red	Black	Voltage @ 300 RPM	Voltage @ 1000 RPM	Voltage @ 4000 RPM
Coil Primary	400 VDC*	Coil (+) Terminal	Coil (-) Terminal	110 - 140	250 - 300	215 - 265
Stop Circuit	400 VDC*	Black/Yellow Terminal	Ground	160 - 200	315 - 385	270 - 330
Stator Low Speed	400 VDC*	Blue Sw. Box Term.	Ground	160 - 200	315 - 385	270 - 330
Stator High Speed	400 VDC*	Red Sw. Box Term.	Ground	8 - 10	27 - 33	165 - 205
Switch Box Bias	20 VDC or 40 VDC	Ground	White/Black Switch Box Terminal	2 - 10	10 - 30	10 - 30

* If using a meter with a built-in DVA, place selector switch in the DVA/400 VDC position.



Ignition Troubleshooting (Engines With Black Stator)

STEP 1 – Primary Voltage At The Ignition Coils Test



TEST RESULTS

- No voltage output or low voltage output on all coils. Go to STEP 2 – Stop Circuit Test.
- Good voltage on two coils. Go to Trigger Test.
- Good voltage on all coils. Go to Testing For Spark.

1. Use Multimeter / DVA Tester 91-99750.
2. Crank engine and observe meter reading.

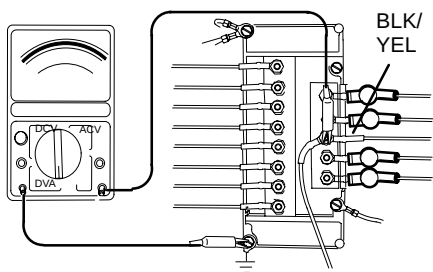
IGNITION VOLTAGE – 9 AMP STATOR

Tested Part	Selector Position	Red	Black	Reading At 300 - 1000 RPM	Reading At 1000 - 4000 RPM
Coil Primary	400 VDC	Coil (+) Terminal	Coil (-) Terminal	160 - 250	180 - 275

IGNITION VOLTAGE – 16 AMP STATOR (398-9710A33 & 398-9710A42)

Tested Part	Selector Position	Red	Black	Voltage @ 300 RPM	Voltage @ 1000 RPM	Voltage @ 4000 RPM
Coil Primary	400 VDC	Coil (+) Terminal	Coil (-) Terminal	110 - 140	250 - 300	215 - 265

STEP 2 – Stop Circuit Test



TEST RESULTS

- Good voltage output. Go to STEP 3 – Stator Low Speed and High Speed Test
- High voltage output. The trigger or switch box is defective. Go to Trigger Test and test trigger. If trigger tests OK, replace switch box and repeat step.
- No voltage output or low voltage output. Remove BLK/YEL wires from switch box terminal and repeat test. If voltage output is now OK, either the ignition switch, stop switch or wiring is defective. If no voltage or low voltage remains, go to STEP 5 – Stator, Low and High Speed Test.

1. Use Multimeter / DVA Tester 91-99750.
2. Crank engine and observe meter reading.

IGNITION VOLTAGE – 9 AMP STATOR

Tested Part	Selector Position	Red	Black	Reading At 300 - 1000 RPM	Reading At 1000 - 4000 RPM
Stop Circuit	400 VDC	Black/Yellow Terminal	Ground	200 - 360	200 - 360

IGNITION VOLTAGE – 16 AMP STATOR (398-9710A33 & 398-9710A42)

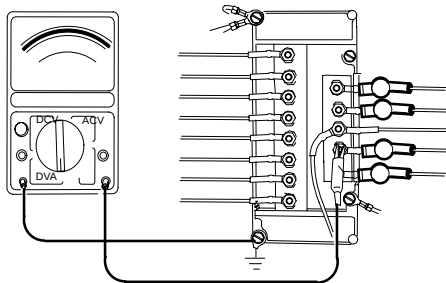
Tested Part	Selector Position	Red	Black	Voltage @ 300 RPM	Voltage @ 1000 RPM	Voltage @ 4000 RPM
Stop Circuit	400 VDC	Black/Yellow Terminal	Ground	160 - 200	315 - 385	270 - 330



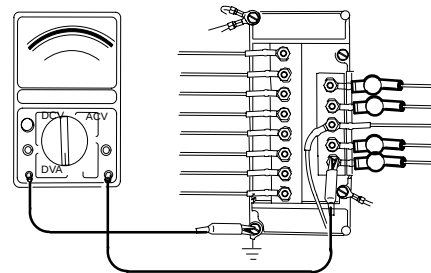
Ignition Troubleshooting (Engines With Black Stator)

STEP 3 – Stator Low Speed and High Speed Test

Stator Low Speed Test



Stator High Speed Test



1. Use Multimeter / DVA Tester 91-99750.
2. Crank engine and observe meter reading.

IGNITION VOLTAGE – 9 AMP STATOR

Tested Part	Selector Position	Red	Black	Reading At 300 - 1000 RPM	Reading At 1000 - 4000 RPM
Stator Low Speed	400 VDC	Blue Sw. Box Term.	Ground	210 - 310	190 - 310
Stator High Speed	400 VDC	Red Sw. Box Term.	Ground	25 - 90	140 - 310

IGNITION VOLTAGE – 16 AMP STATOR (398-9710A33 & 398-9710A42)

Tested Part	Selector Position	Red	Black	Voltage @ 300 RPM	Voltage @ 1000 RPM	Voltage @ 4000 RPM
Stator Low Speed	400 VDC	Blue Sw. Box Term.	Ground	160 - 200	315 - 385	270 - 330
Stator High Speed	400 VDC	Red Sw. Box Term.	Ground	8 - 10	27 - 33	165 - 205

TEST RESULTS

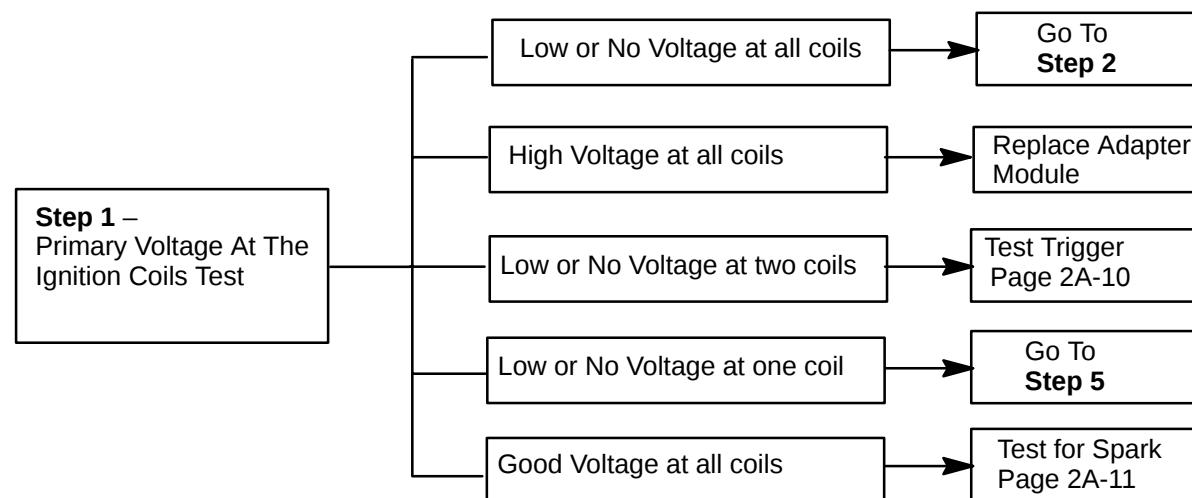
- If voltage output is low to either the stator low speed or stator high speed, the stator or switch box is defective. Go to stator test and test stator. If stator tests OK, replace switch box and repeat step.
- If voltage output is good to either the stator low speed or stator high speed, replace the switch box and repeat step



Ignition Troubleshooting (Engines With Red Stator)

Troubleshooting Sequence Chart – (Engine with Red Stator)

Start the ignition troubleshooting by first performing Step 1, then continue the series of steps to locate the problem. Refer to the troubleshooting steps on the following pages.



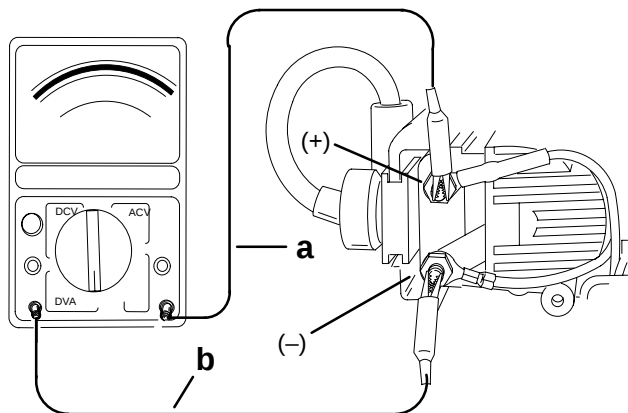
RED Stator DVA Test

Test	Selector Switch Position	RED DVA Lead	BLACK DVA Lead	Voltage @ 300 RPM	Voltage @ 1000 RPM	Voltage @ 4000 RPM
Coil Primary	400 VDC	Coil (+) Terminal	Coil (-) Terminal	130 Volts Minimum	195 to 275	195 to 275
Stop Circuit	400 VDC	Black/Yellow Sw. Box Terminal	Ground	190 Volts Minimum	275 to 320	260 to 320
Blue Sw. Box Terminal	400 VDC	Blue Sw. Box Terminal	Ground	190 Volts Minimum	275 to 320	260 to 320
Blue/White Sw. Box Terminal	400 VDC	Blue/White Sw. Box Terminal	Ground	190 Volts Minimum	275 to 320	260 to 320



Ignition Troubleshooting (Engines With Red Stator)

STEP 1 – Primary Voltage At The Ignition Coils Test



- a - Connect (+) Test Lead To (+) Coil Terminal
b - Connect (-) Test Lead To (-) Coil Terminal

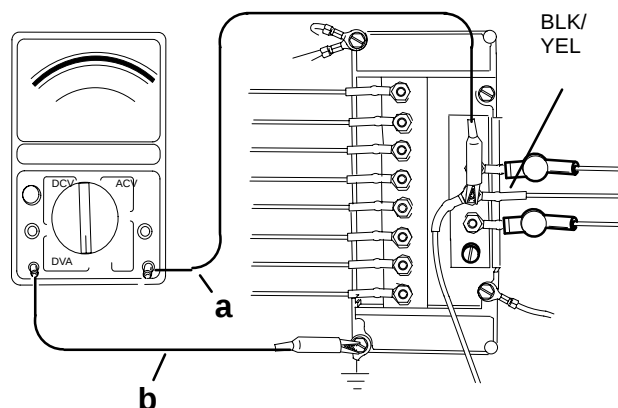
1. Use Multimeter / DVA Tester 91-99750. Set switch position to – 400 DVA.
2. Crank engine and observe meter reading.

Voltage at 300 RPM (cranking)	Voltage at 1000 – 4000 RPM (Running)
130 Volts	195 to 275 Volts

TEST RESULTS

- Voltage output is high on all coils. The adapter module is defective. Replace adapter module.
- No voltage output or low voltage output on all coils. Go to STEP 5 – Stator, Adapter Module, and Switch Box Test.
- Good voltage on two coils. Go to Trigger Test.
- Good voltage on all coils. Go to Testing For Spark.

STEP 2 – Stop Circuit Test



- a - Connect (+) Test Lead To BLK/YEL Wire Terminal On Switch Box
b - Connect (-) Test Lead To Engine Ground

1. Use Multimeter / DVA Tester 91-99750. Set switch position to – 400 DVA.
2. Crank engine and observe meter reading.

Voltage at 300 RPM (cranking)	Voltage at 1000 – 4000 RPM (Running)
190 Volts	275 to 320 Volts

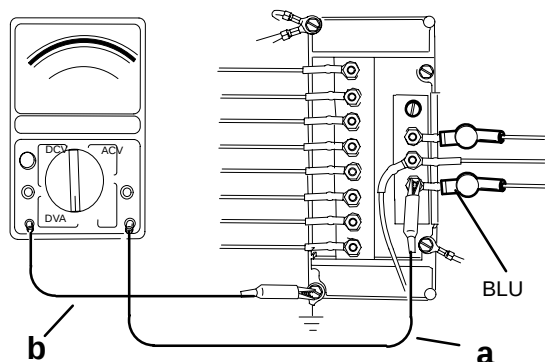
TEST RESULTS

- Voltage output is high. The adapter module is defective. Replace adapter module.
- Good voltage output. Go to STEP 3 – Switch Box (BLU Wire) Circuit Test.
- No voltage output or low voltage output. Remove BLK/YEL wires from switch box terminal and repeat test. If voltage output is now OK, either the ignition switch, stop switch or wiring is defective. If no voltage or low voltage remains, go to STEP 5 – Stator, Adapter Module, and Switch Box Test.



Ignition Troubleshooting (Engines With Red Stator)

STEP 3 – Switch Box (BLU Wire) Circuit Test



- a - Connect (+) Test Lead To BLU Wire Terminal On Switch Box
b - Connect (-) Test Lead To Engine Ground

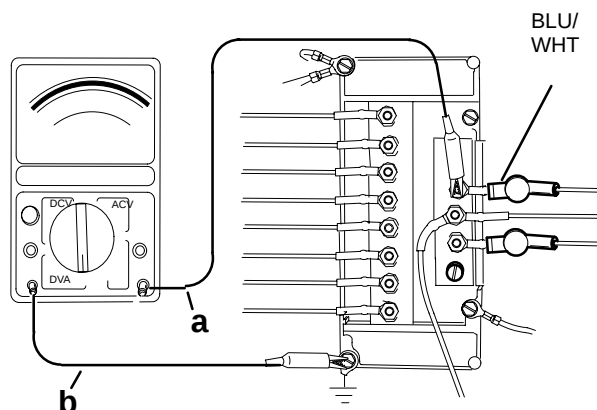
1. Use Multimeter / DVA Tester 91-99750. Set switch position to – 400 DVA.
2. Crank engine and observe meter reading.

Voltage at 300 RPM (cranking)	Voltage at 1000 – 4000 RPM (Running)
190 Volts	275 to 320 Volts

TEST RESULTS

- Voltage output is high. The adapter module is defective. Replace adapter module.
- Good voltage output. Go to STEP 3 – Switch Box (BLU/WHT Wire) Circuit Test.
- No voltage output or low voltage output. Go to STEP 5 – Stator, Adapter Module and Switch Box Test.

STEP 4 – Switch Box (BLU/WHT Wire) Circuit Test



- a - Connect (+) Test Lead To BLU/WHT Wire Terminal On Switch Box
b - Connect (-) Test Lead To Engine Ground

1. Use Multimeter / DVA Tester 91-99750. Set switch position to – 400 DVA.
2. Crank engine and observe meter reading.

Voltage at 300 RPM (cranking)	Voltage at 1000 – 4000 RPM (Running)
190 Volts	275 to 320 Volts

TEST RESULTS

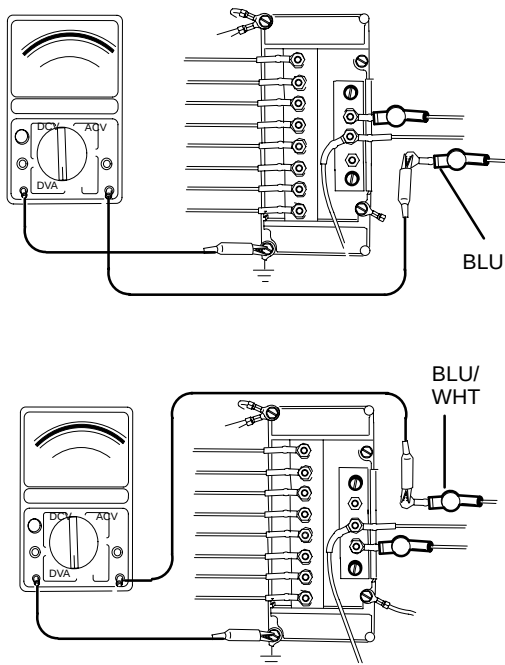
- Voltage output is high. The adapter module is defective. Replace adapter module.
- Good voltage output..
- No voltage output or low voltage output. Go to STEP 5 – Stator, Adapter Module and Switch Box Test.



Ignition Troubleshooting (Engines With Red Stator)

STEP 5 – Stator, Adapter Module, and Switch Box Test

Elimination Test



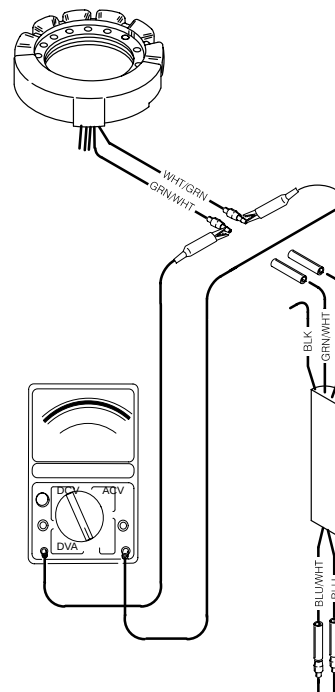
1. Set multipurpose switch position to – 400 DVA.
2. Disconnect only the BLU wire from the switch box. Connect test leads between BLU wire and engine ground.
3. Crank engine and observe meter reading.
4. Reconnect BLU wire.
5. Disconnect only the BLU/WHT wire from the switch box. Connect test leads between BLU/WHT wire and engine ground.
6. Crank engine and observe meter reading.

Voltage at 300 RPM (cranking)
190 to 260 Volts

TEST RESULTS

- If voltage output is good on both wires, the switch box is defective.
- Voltage output is low on either wire, continue with test.

7. Disconnect the GRN/WHT and WHT/GRN (stator) leads from the adapter module.



8. Measure the resistance between the GRN/WHT and WHT/GRN (stator) leads.

Test Leads To –	Ohm Scale	Meter Reading
Between GRN/WHT and WHT/GRN (Stator) leads	R x 100	660-710 Ohms

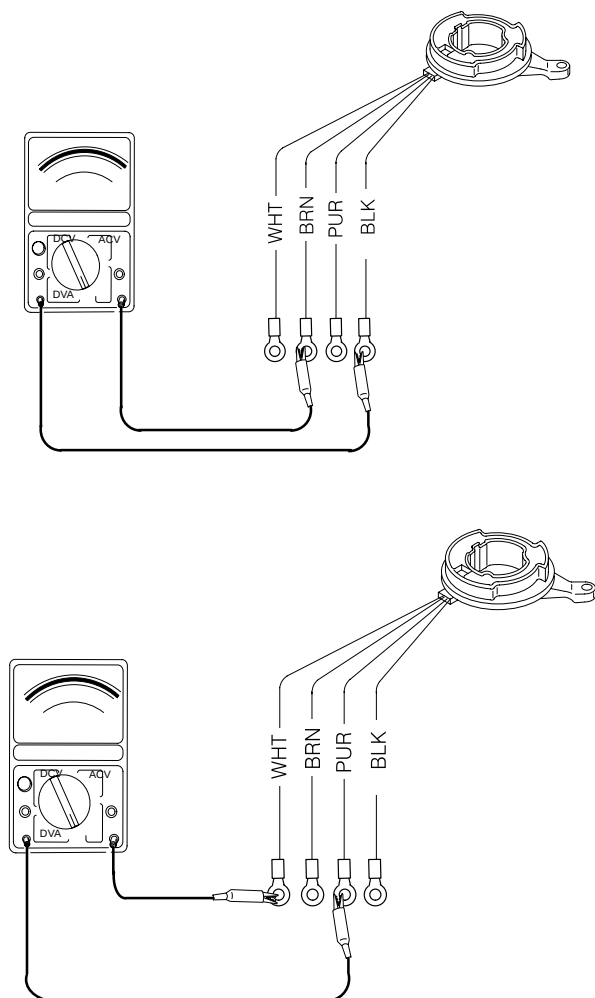
TEST RESULTS

- If the resistance is OK (660 to 710 ohms), the adapter module is defective. Replace adapter module.
- If the resistance is incorrect, the stator is defective. Replace stator.



Ignition Component Testing

Trigger Test



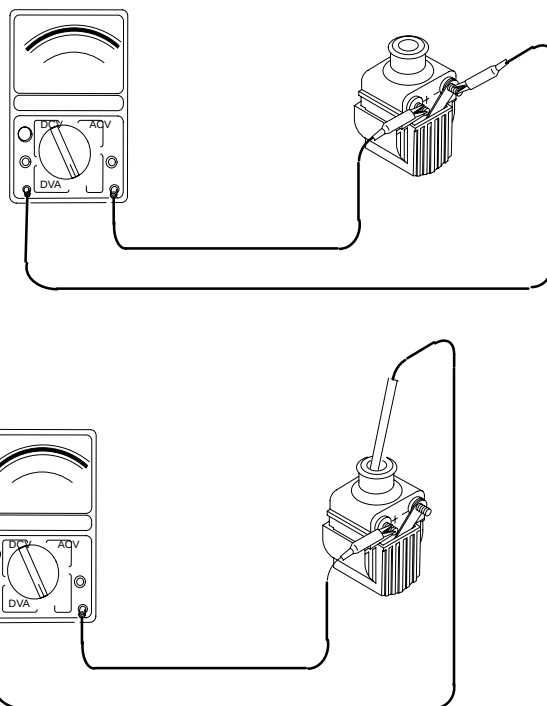
1. Disconnect all trigger leads from switch box.
2. Use a VOA meter and perform the following checks.

Test Leads To –	Ohm Scale	Meter Reading
Between BRN lead and BLK lead	R x 100	700-1000 Ohms
Between WHT lead and PUR trigger lead	R x 100	700-1000 Ohms

NOTE: Above resistance readings are for a cold engine (room temperature). Resistance will increase if engine is warm.

3. If meter readings are not as specified, replace trigger.

Ignition Coil Test



1. Disconnect wires from coil terminals.
2. Pull spark plug lead out of coil tower.
3. Use a VOA meter and perform the following checks.

Test Leads To –	Ohm Scale	Meter Reading
Between (+) and (-) Coil Terminals	R x 1	.02-.04* Ohms
Between Coil Tower and (-) Coil Terminal	R x 100	800-1100** Ohms

* The primary DC resistance of these coils generally is less than one (1) OHM. If a reading resembling a short is obtained, this would be acceptable.

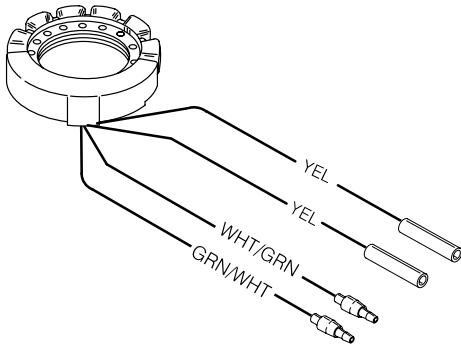
** Copper wire is an excellent conductor, but it will have a noticeable difference in resistance from cold to hot temperatures. Reasonable variations from these readings are acceptable.

4. If meter readings are not as specified, replace ignition coil.

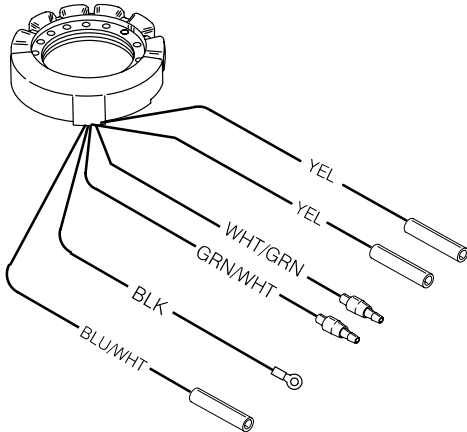


Stator Test (Red Stator)

Electric Start Engines



Manual Start Engines



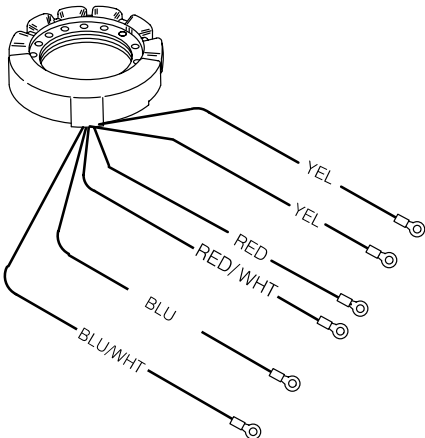
1. Disconnect all stator leads.
2. Use a VOA meter and perform the following checks.

Electric Start Engines		
Test Leads To –	Ohm Scale	Ohm Reading
GRN/WHT and WHT/GRN	R x 100	660-710
YEL and YEL	R x 1	0.165–0.181
Manual Start Engines		
Test Leads To –	Ohm Scale	Ohm Reading
GRN/WHT and WHT/GRN	R x 100	660-710
BLK/WHT and BLK	R x 100	130-145
YEL and YEL	R x 1	0.17–0.19

NOTE: Above resistance readings are for a cold engine (room temperature). Resistance will increase if engine is warm.

If meter readings are other than specified, replace stator.

Stator Test (Black Stator)



1. Disconnect all stator leads.
2. Use a VOA meter and perform the following checks.

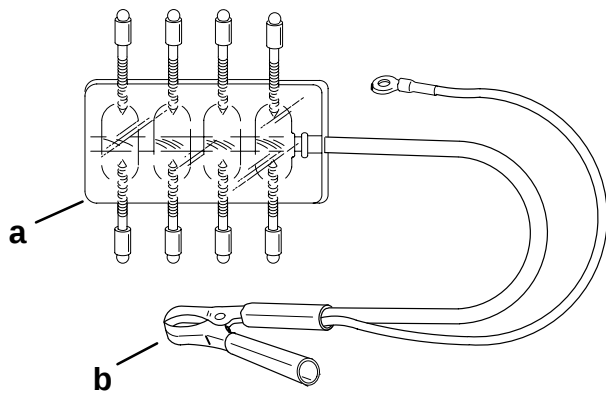
9 AMP Stator		
Test Leads To –	Ohm Scale	Ohm Reading
Blue and Blue/White	R x 1000	5.7-8.0
Red and Red/White	R x 1	56-76
Blue and Engine Ground	R X 1000	No Reading
Red and Engine Ground	R X 1000	No Reading
YEL and YEL	R x 1	.5-1.0
16 AMP Stator (398-9710A33 & 398-9710A42)		
Test Leads To –	Ohm Scale	Ohm Reading
Blue and Blue/White	R x 1000	1000-1400
Red and Red/White	R x 1	15-30
Blue and Engine Ground	R X 1000	No Reading
Red and Engine Ground	R X 1000	No Reading
YEL and YEL	R x 1	.10-.50

NOTE: Above resistance readings are for a cold engine (room temperature). Resistance will increase if engine is warm.

If meter readings are other than specified, replace stator.



Test For Spark (Cranking)



a - Spark Tester 91-850439

b - Connect Ground Lead To Engine Ground

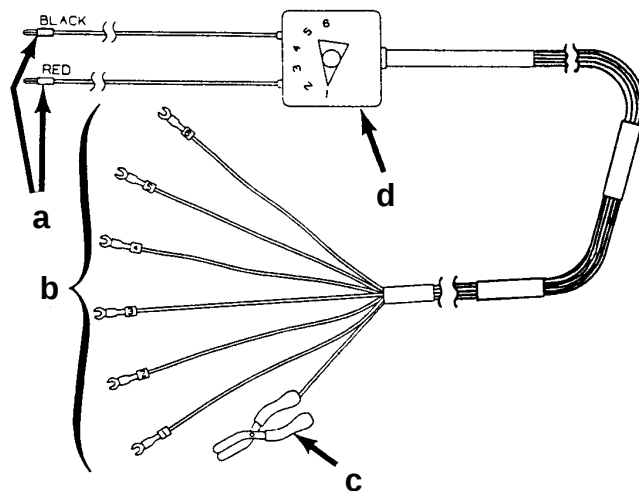
1. Remove the spark plug leads from the spark plugs.
2. Adjust the spark tester to 1/2 in. (12mm) gap setting.
3. Connect the spark plug leads to the tester. Attach the tester ground lead to engine ground.
4. Crank the engine. Spark should jump each tester gap.

TEST RESULTS

NOTE: Normal ignition spark is BLUE in color. A YELLOW or RED spark indicates a weak ignition.

- Normal spark on all cylinders. Go to Primary Voltage Test (Engine Running).
- Intermittent, weak or no spark output on all cylinders usually indicates a defective trigger. Go to Trigger Test.
- Intermittent, weak or no spark output on any one cylinder indicates a bad ground, defective ignition coil, defective spark plug lead, or switch box. Go to Ignition Coil Test.

Primary Voltage Test (Engine Running)



a - Plug into Meter

b - Attach to Appropriate Terminals

c - Attach to Engine Ground

d - Selector Switch

1. If the ignition system tests OK, it may be necessary to check the output voltage while running the engine under load up to 4000 RPM. Using Test Harness 91-14443A1 allows performing DVA Tests from the driver seat inside the boat. Refer to DVA Tests preceding.



Ignition (Key) Switch Test

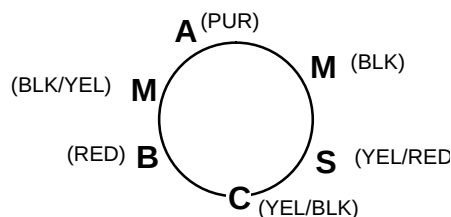
1. Disconnect remote control wiring harness and instrument panel connector.

NOTE: Wiring diagram for control boxes is located in SECTION 2D.

2. Set ohmmeter on R x 1 scale for the following tests:

COMMANDER KEY SWITCH

BLK • BLACK
PUR • PURPLE
RED • RED
YEL • YELLOW



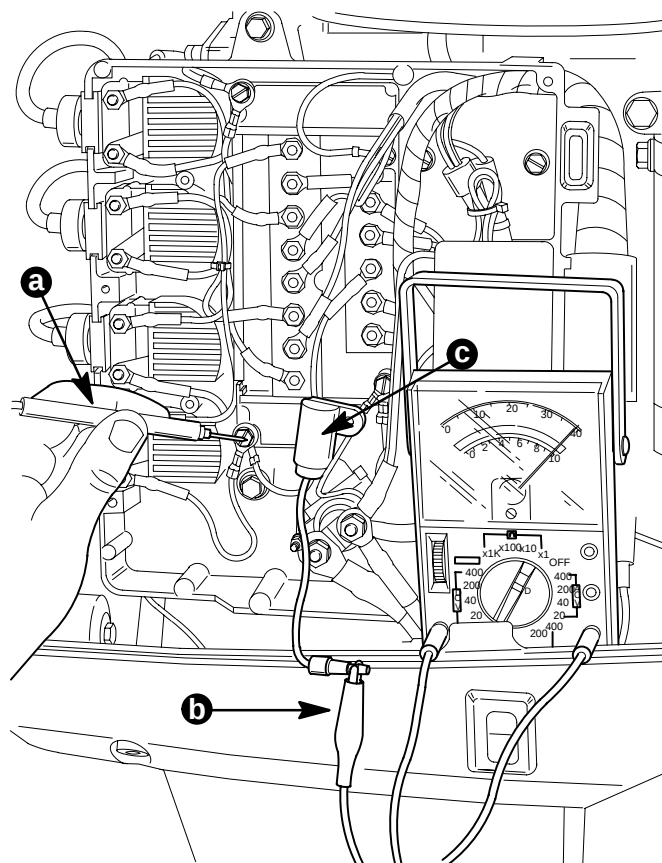
KEY POSITION	CONTINUITY SHOULD BE INDICATED AT THE FOLLOWING POINTS:					
	BLK	BLK/YEL	RED	YEL/RED	PUR	YEL/BLK
OFF	•	•				
RUN			•	•	•	
START			•	•	•	
CHOKE*			•	•	•	•

* Key switch must be positioned to "RUN" or "START" and key pushed in to actuate choke, for this continuity test.

3. If meter readings are other than specified in the preceding test, verify that switch and not wiring is faulty. If wiring checks OK, replace switch.

Mercury (Tilt) Stop Switch Test

1. Remove mounting screw that secures mercury switch to outboard.
2. Connect Ohmmeter (R x 1 scale) between black lead and black/yellow lead or terminal stud on mercury switch.
3. Test mercury switch as follows:
 - a. Position mercury switch as it would be installed when engine is in "down" position. The meter should indicate no continuity.
 - b. Tilt mercury switch up. The meter should indicate continuity.
 - c. If these readings are not obtained, replace mercury switch.



54638

- a - Red Ohm Lead
b - Black Ohm Lead
c - Mercury Switch



Flywheel Removal and Installation

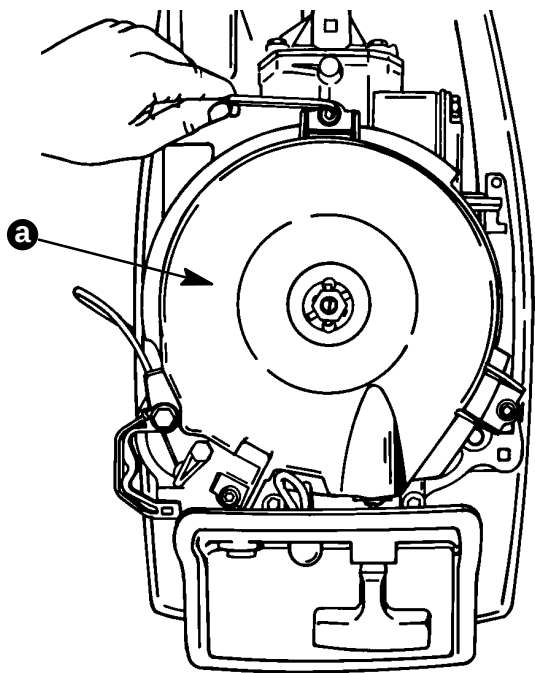
Flywheel Removal

⚠ CAUTION

To prevent accidental starting of outboard while removing engine components, on electric start models - remove engine battery cables from battery and verify ignition key is in the "OFF" position. When servicing manual start engines, verify lanyard switch is in the "OFF" position.

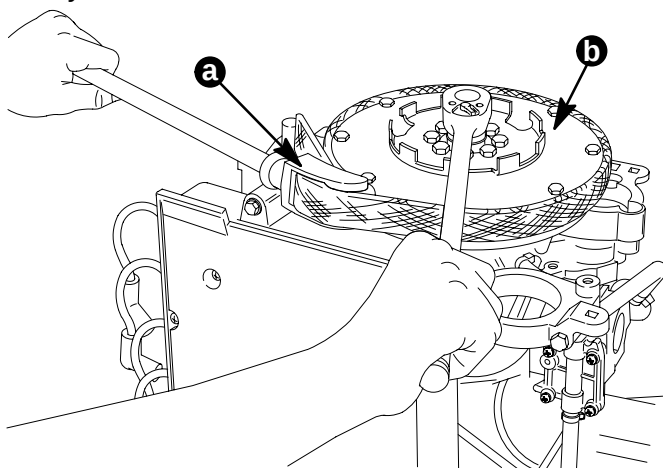
MANUAL START MODEL

1. Remove 3 bolts securing rewind starter and remove rewind from outboard.



a - Rewind Starter

2. Use strap wrench to hold flywheel while removing flywheel nut and washer.

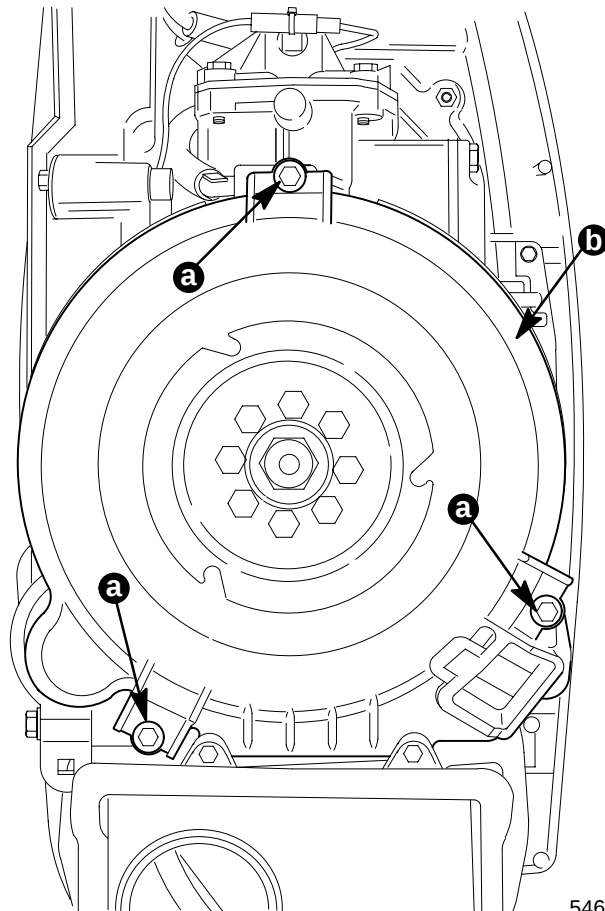


54639

a - Strap Wrench
b - Flywheel

ELECTRIC START MODEL

1. Remove 3 bolts securing flywheel cover and remove cover from outboard.

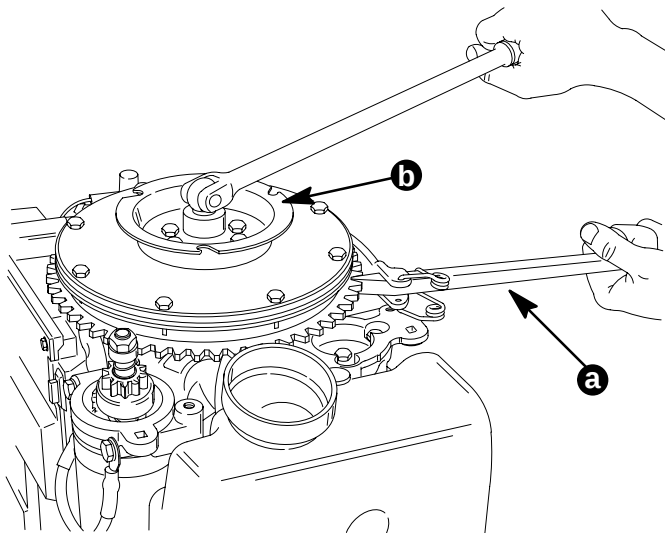


54640

a - Bolts
b - Flywheel Cover



2. Use flywheel holder (91-52344) to hold flywheel while removing flywheel nut and washer.



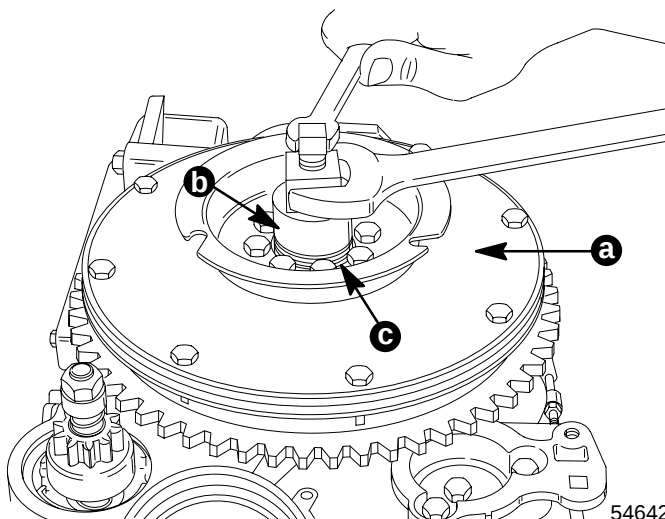
54641

- a - Flywheel Holder (91-52344)
b - Flywheel

NOTE: Use flywheel puller (91-73687A1) on both manual and electric start type flywheel. Always install crankshaft protector cap onto end of crankshaft before threading flywheel puller into flywheel. Do not strike flywheel puller bolt with hammer as crankshaft may be damaged.

⚠ CAUTION

Do not apply heat to flywheel or strike flywheel with hammer as flywheel or electrical components under flywheel may be damaged.



54642

- a - Flywheel
b - Flywheel Puller (91-73687A1)
c - Crankshaft Protector Cap (Hidden); Place on end of Crankshaft

Flywheel Installation

⚠ CAUTION

Inspect magnet side of flywheel for any debris clinging to magnets. Installing flywheel with debris on magnets will cause damage to flywheel and/or electrical components located under flywheel when outboard is initially started.

1. Secure flywheel on crankshaft with flat washer and nut.
2. On electric start type flywheel, use flywheel holder (91-52344) to hold flywheel while tightening flywheel nut. On manual start type flywheel, use strap wrench to hold flywheel while tightening flywheel nut.
3. Torque flywheel nut to 75 lb. ft. (101.7 N·m).
4. Reinstall rewind starter, if manual start, or flywheel cover, if electric start, with 3 bolts. Torque bolts to 100 lb. in. (11.3 N·m).

Ignition Components

⚠ CAUTION

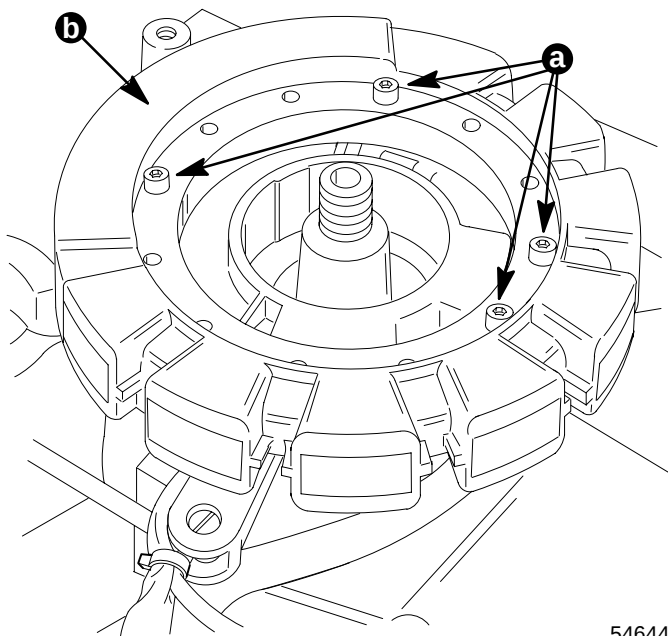
To prevent accidental starting of outboard while removing or installing engine components, on electric start models – remove engine battery cables from battery and verify ignition key is in the “OFF” position. When servicing manual start engines, verify lanyard switch is in the “OFF” position.

Stator Assembly Removal

1. Remove top cowl.
2. Remove 3 bolts securing rewind starter or flywheel cover and remove rewind or cover, whichever is applicable.
3. Remove flywheel as outlined in “FLYWHEEL REMOVAL AND INSTALLATION”, preceding.



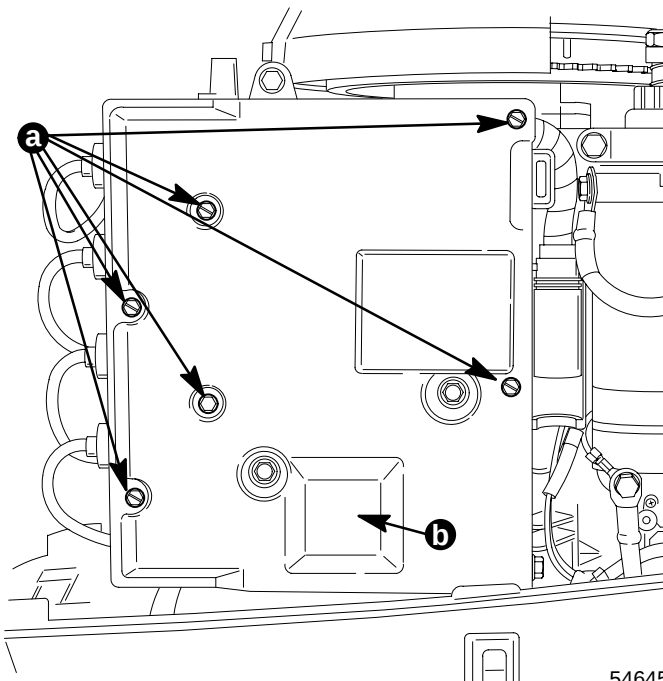
4. Remove 4 screws which secure stator to upper cap.



54644

a - Screws
b - Stator

5. Remove 6 bolts securing electrical box access cover and remove cover.



54645

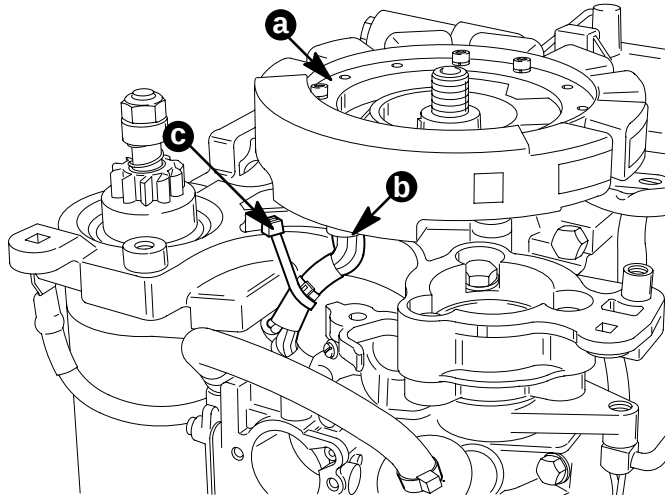
a - Bolts
b - Access Cover

6. Disconnect stator wiring from their respective terminals and remove stator assembly from outboard.



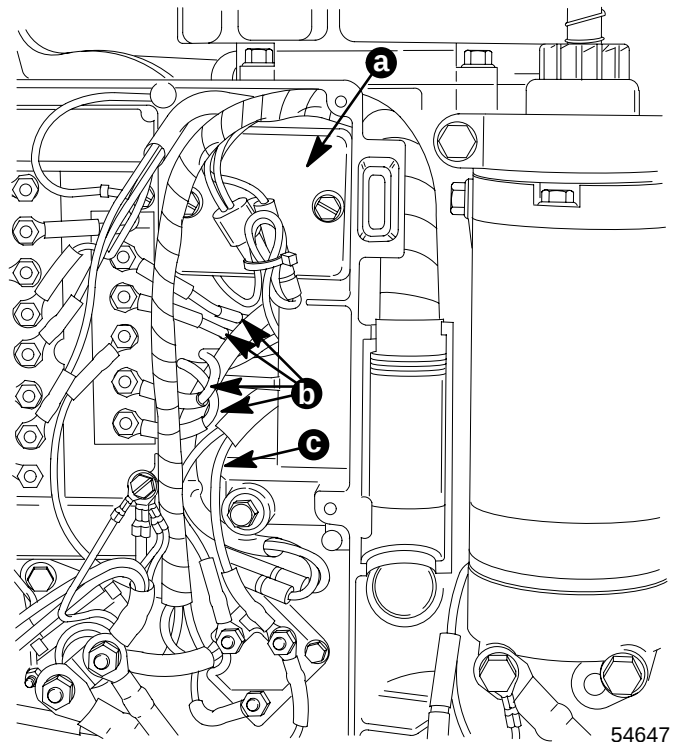
Black Stator Installation

1. Apply Loctite Grade A (92-32609-1) to threads of 4 stator attaching screws.
2. Install stator on upper end cap and torque attaching screws to 35 lb. in. (3.9 N·m).
3. Route stator wiring into electrical component box.



- a - Stator
- b - Wiring
- c - Sta-Strap

NOTE: Stator wiring is routed behind starter motor and enters electrical box through access holes under warning module.



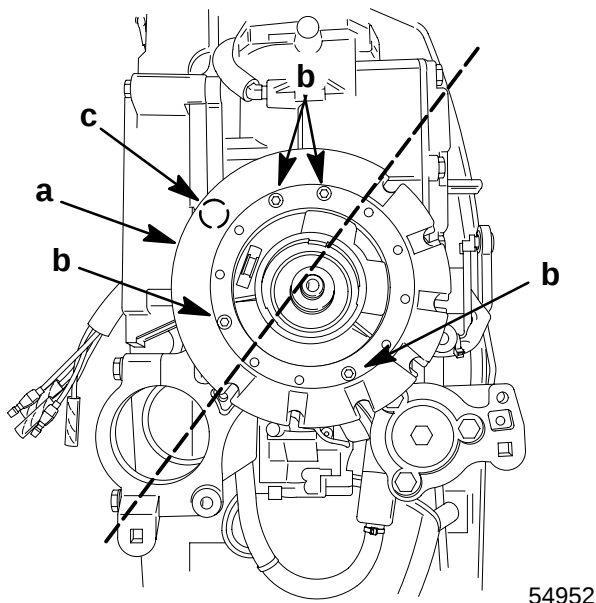
- a - Warning Module
- b - Stator Wiring to Switch Box
- c - Stator Wiring to Rectifier

4. Reconnect wires to proper terminals. Refer to wiring diagrams, Section 2D. Torque terminal nuts to 30 lb. in. (3.4 N·m).
5. Reinstall electrical box access cover.
6. Reinstall flywheel as outlined in "FLYWHEEL REMOVAL AND INSTALLATION", preceding.
7. On manual start models, reinstall rewind starter. On electric models, reinstall flywheel cover. On either manual or electric models, rewind or cover attaching bolts should be torqued to 100 lb. in. (11.3 N·m).
8. Reinstall top cowl.



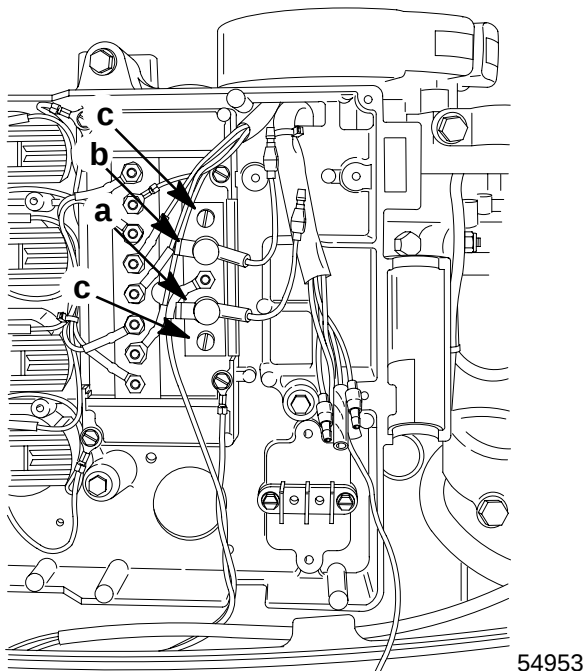
Red Stator Installation

1. Position stator on powerhead as shown. Secure stator with 4 screws. Apply Loctite 271 to screw threads. Torque screws to 35 lb. in. (4.0 N·m).



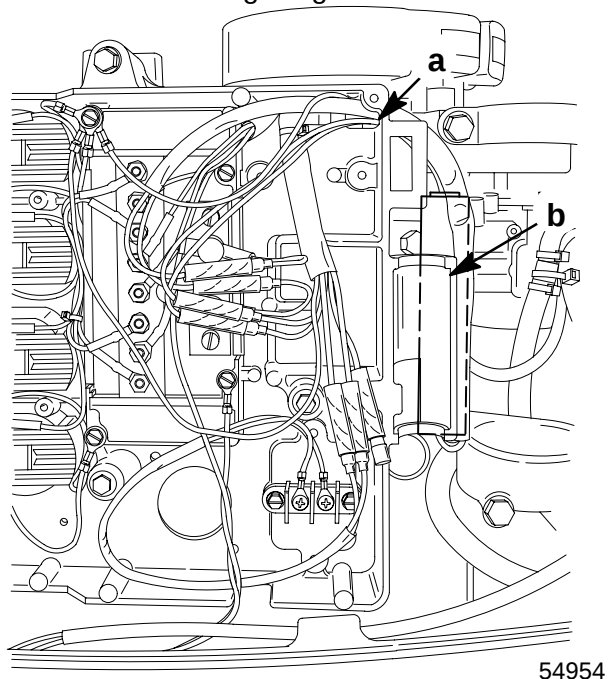
- a - Stator
- b - Screws [Torque to 35 lb. in. (4.0 N·m)]
- c - Stator Harness

2. Install BLUE and BLUE/WHITE cable adapters to BLUE and BLUE/WHITE terminals on switch box. Torque terminal nuts to 30 lb. in. (3.5 N·m). Install cap nuts on unused terminals.



- a - BLUE Cable Adapter
- b - BLUE/WHITE Cable Adapter
- c - Cap Nuts

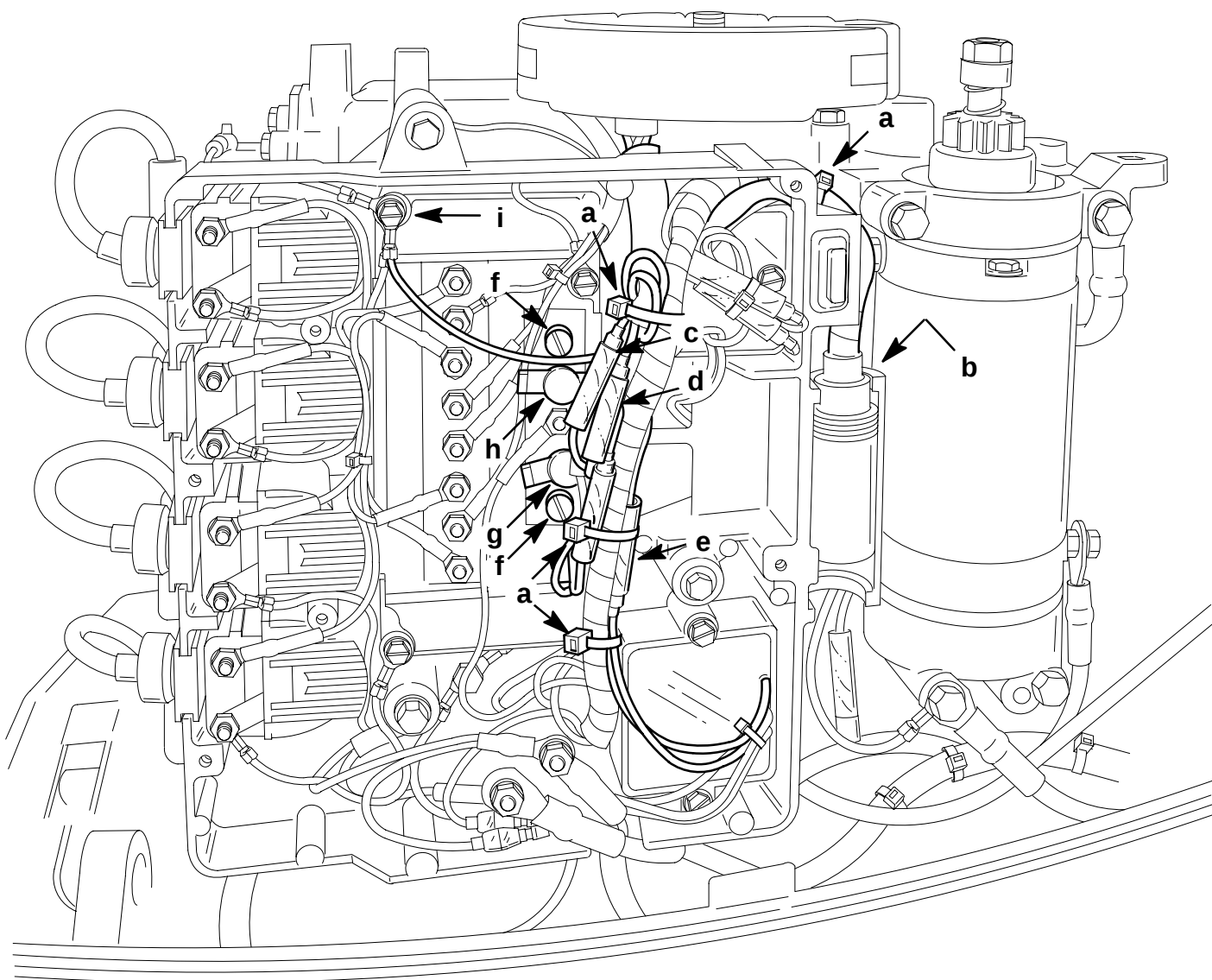
3. Install adapter module routing adapter wires through opening in upper right corner of electrical box. Connect stator, adapter module and switch box wires per appropriate model wiring diagram in Section 2D Wiring Diagrams.



- a - Upper Right Corner
- b - Adapter Module



Electric Models – Secure adapter module and wiring with sta-straps.

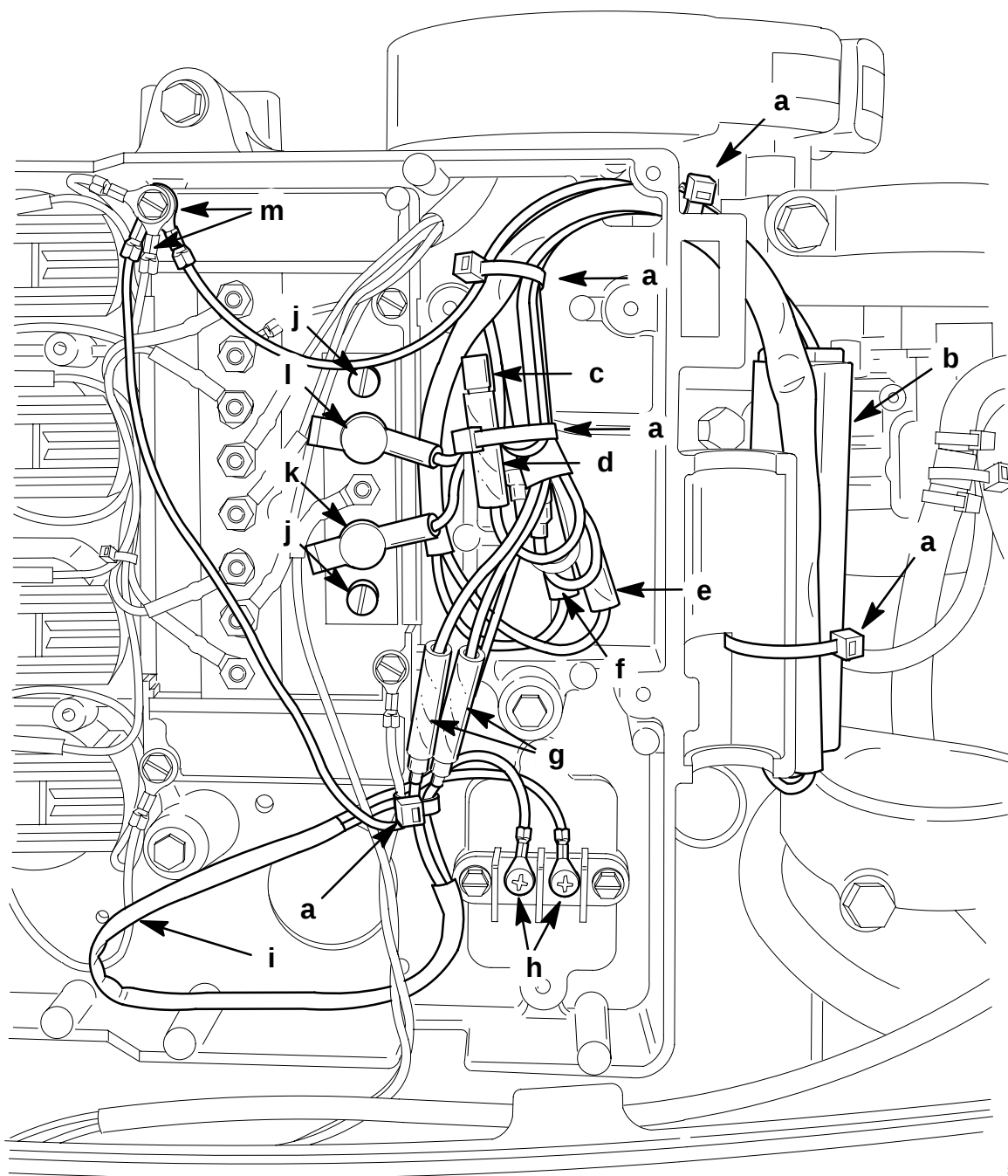


54957

- a - Sta-Straps
- b - Adapter Module (Hidden)
- c - Adapter Module WHITE/GREEN Lead
- d - Adapter Module GREEN/WHITE Lead
- e - Stator YELLOW Leads
- f - Caps
- g - Adapter Module BLUE Lead
- h - Adapter Module BLUE/WHITE Lead
- i - Adapter Module BLACK Lead – Torque bolt to 40 lb. in.
(4.5 N·m)



Manual Models – Secure adapter module and wiring with sta-straps.



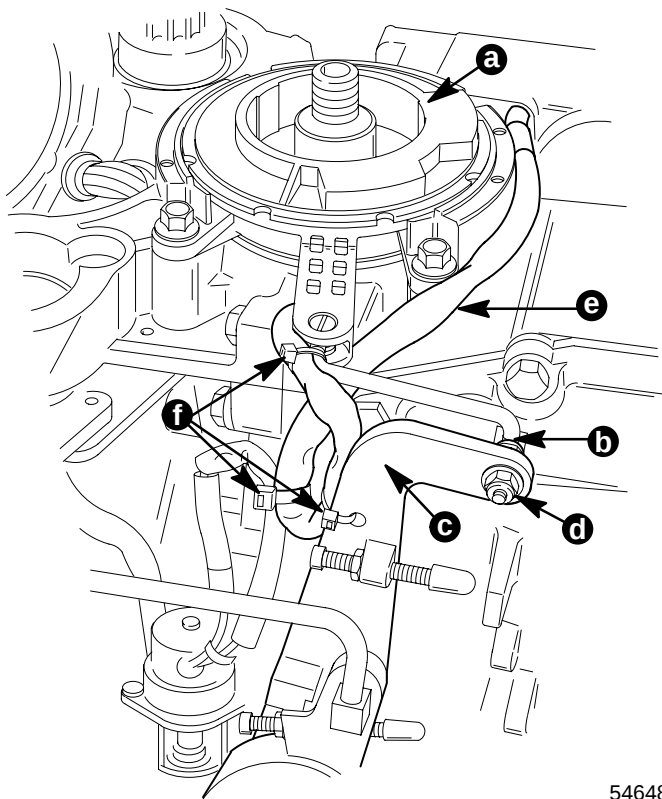
54955

- a - Sta-Straps
- b - Adapter Module
- c - Insulator Plug
- d - Stator BLUE/WHITE Lead (not used)
- e - Adapter Module WHITE/GREEN Lead
- f - Adapter Module GREEN/WHITE Lead
- g - Stator YELLOW Leads
- h - Terminal Block
- i - Harness Extension – Secure to Terminal Block w/screws (retained)
- j - Caps
- k - Adapter Module BLUE Lead
- l - Adapter Module BLUE/WHITE Leads
- m - Adapter Module BLACK Leads – Torque bolt to 40 lb. in. (4.5 N·m)



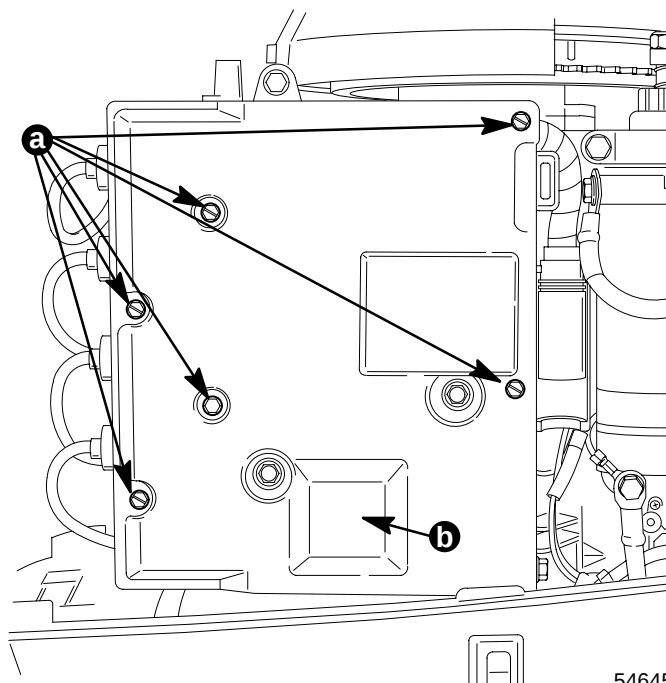
Trigger Plate Assembly Removal

1. Remove top cowl.
2. Remove 3 bolts securing rewind starter or flywheel cover and remove or cover, whichever is applicable.
3. Remove flywheel as outlined in "FLYWHEEL REMOVAL AND INSTALLATION", preceding.
4. Remove 4 screws which secure stator assembly to upper end cap. Lift stator off end cap and move to the side.
5. Remove locknut that secures link rod swivel into spark arm. Pull link rod swivel out of arm.



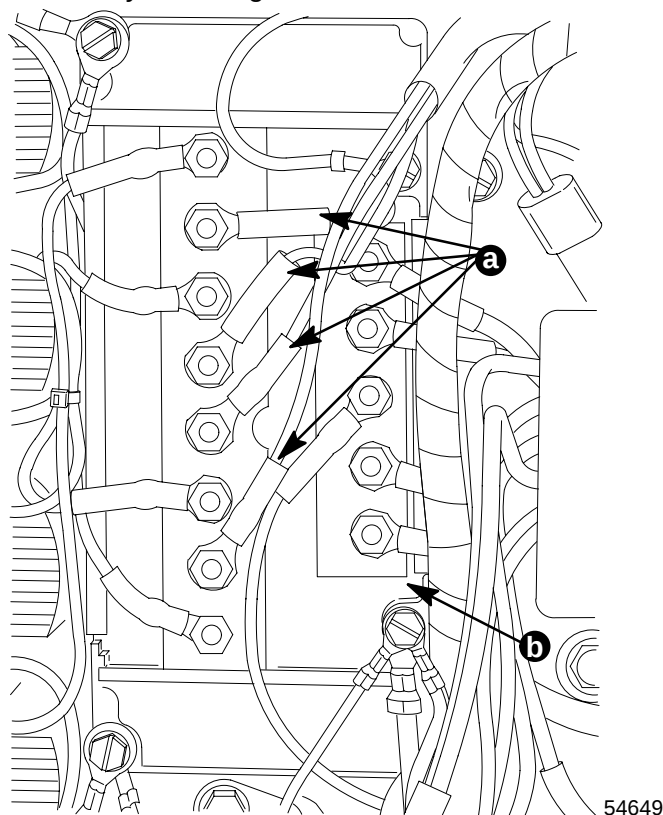
- a - Trigger Plate Assembly
- b - Link Rod Swivel
- c - Spark Arm
- d - Lock Nut
- e - Trigger Harness
- f - Sta-Straps

6. Remove 6 bolts from electrical box access cover and remove cover.



- a - Bolts
- b - Access Cover

7. Disconnect trigger leads from their respective terminals on switch box. Remove trigger plate assembly from engine.



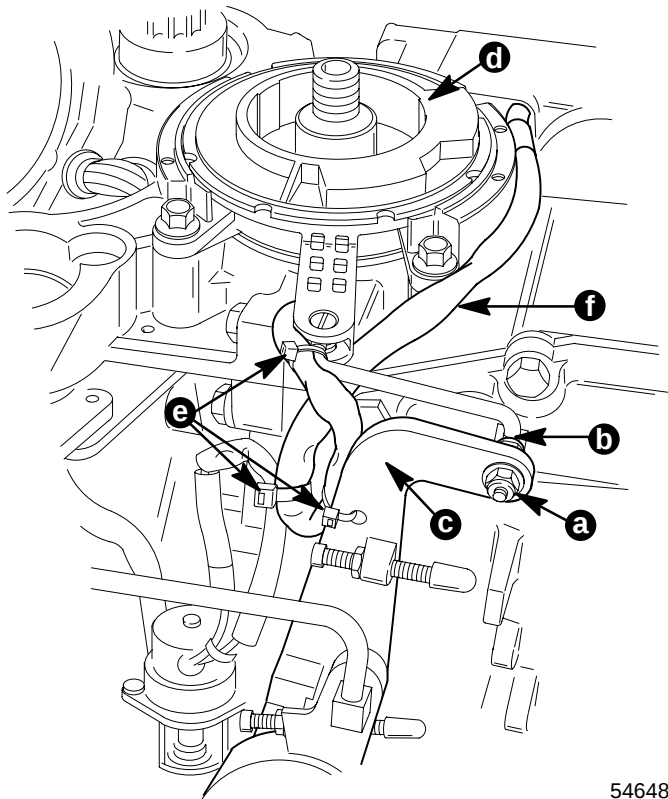
- a - Trigger Leads
- b - Switch Box

8. If trigger is defective, remove and retain link rod from trigger.



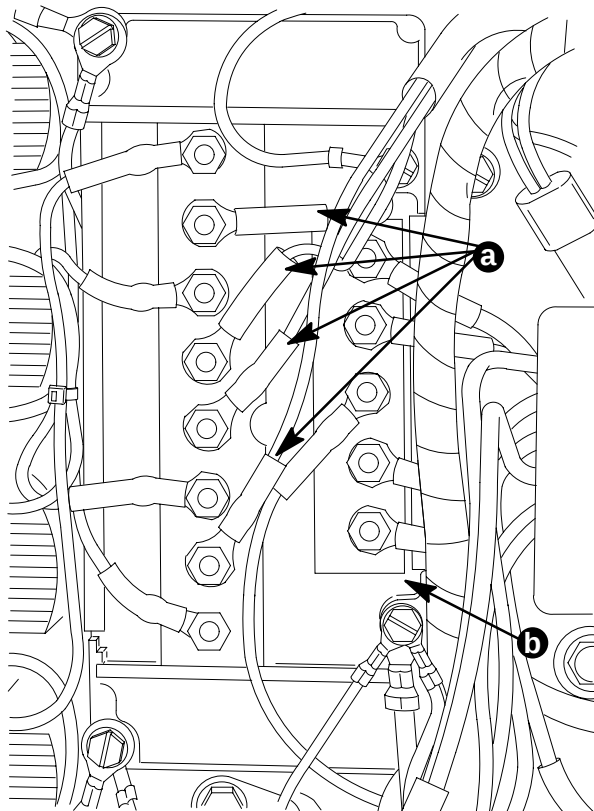
Trigger Plate Assembly Installation

1. If link rod was removed from trigger, reassemble to trigger.
2. Place trigger plate assembly in upper end cap. Fasten link rod swivel to spark arm lever with lock nut.
3. Route and secure trigger harness as shown.



- a - Lock Nut
- b - Link Rod Swivel
- c - Spark Arm
- d - Trigger Plate Assembly
- e - Sta-Straps
- f - Trigger Harness (Route as Shown)

4. Reconnect trigger wires to proper terminals of switch box. Refer to wiring diagram, Section 2D. Torque terminal nuts to 30 lb. in. (3.4 N·m).



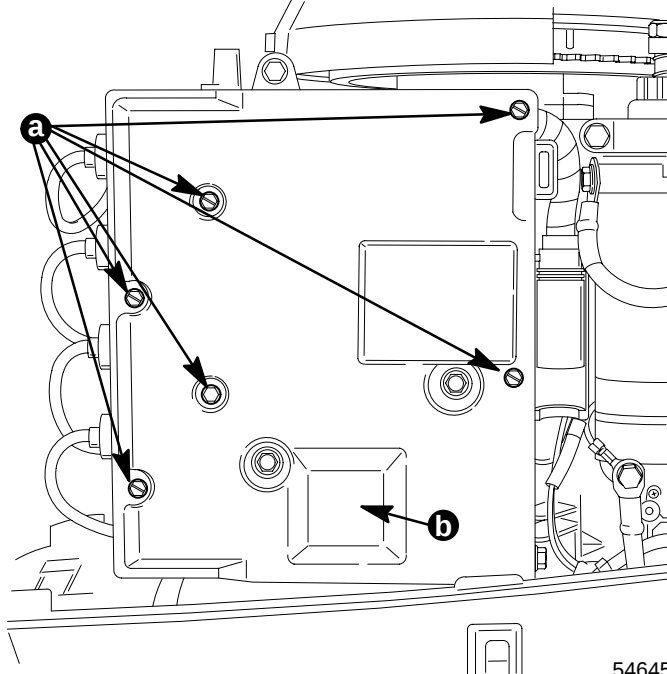
- a - Trigger Harness
- b - Switch Box

5. Reinstall electrical box access cover and secure cover with 6 bolts.
6. Reinstall stator as outlined in "STATOR ASSEMBLY INSTALLATION", previously.
7. Reinstall flywheel as outlined in "FLYWHEEL INSTALLATION", previously.
8. Reinstall rewind starter if manual start or flywheel cover if electric start. On either manual or electric models rewind or cover attaching bolts should be torqued to 100 lb. in. (11.3 N·m).
9. Reinstall top cowl.



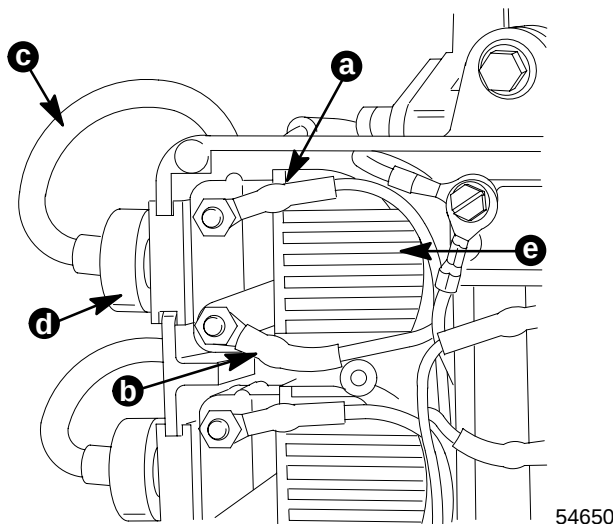
Ignition Coil Removal

1. Remove top cowl.
2. Remove 6 bolts from electrical box access cover and remove cover.



- a - Bolts
b - Access Cover

3. Disconnect wires from positive (+) and negative (-) terminals on defective coil.
4. Remove spark plug boot from spark plug.
5. Remove spark plug high tension lead/coil tower boot assembly from coil tower and discard defective coil.



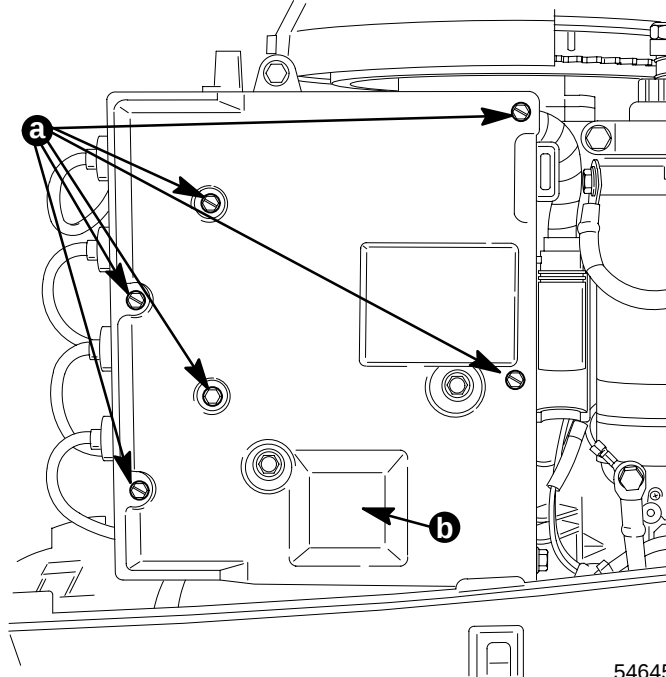
- a - Positive (+) Lead
b - Negative (-) Lead
c - High Tension Lead
d - Coil Tower Boot
e - Coil

Ignition Coil Installation

1. Install spark plug high tension lead/coil tower boot assembly (retained) onto new coil.
2. Position secondary coil into electrical box.
3. Reconnect positive (+) and negative (-) leads to their respective terminals on coil with 2 nuts. Torque nuts to 30 lb. in. (3.4 N·m).
4. Reconnect spark plug boot to spark plug.
5. Reinstall electrical box access cover and secure cover with 6 bolts.
6. Reinstall top cowl.

Switch Box Removal

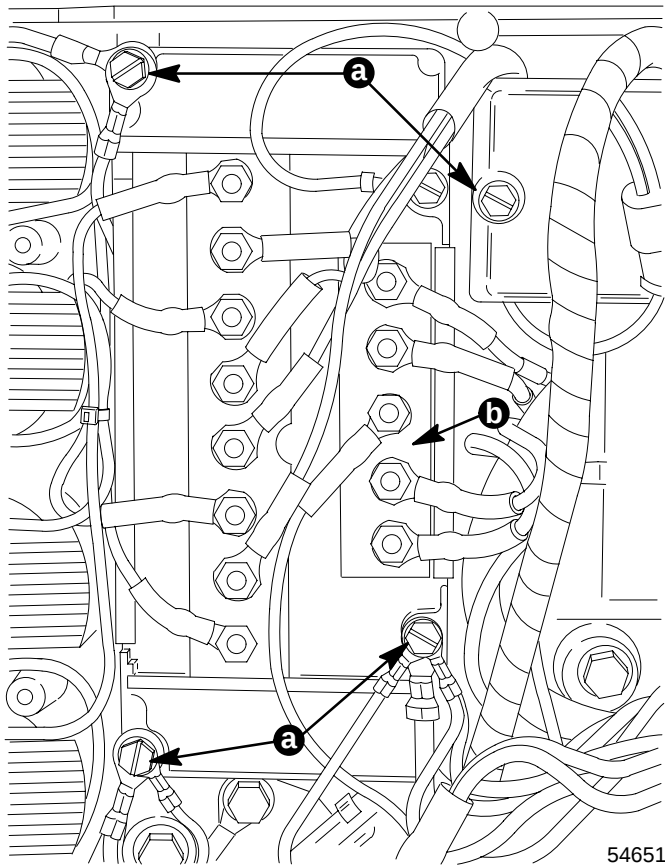
1. Remove top cowl.
2. Remove 6 bolts from electrical box access cover and remove cover.



- a - Bolts
b - Access Cover



3. Disconnect all leads from switch box.
4. Remove 4 bolts from switch box and remove switch box.



a - Bolts
b - Switch Box

Switch Box Installation

1. Secure switch box to electrical component box with 4 bolts and their respective ground leads. Torque bolts to 40 lb. in. (4.5 N·m).
2. Reconnect leads to switch box terminals. Refer to "WIRING DIAGRAM", SECTION 2D. Torque switch box terminal nuts to 30 lb. in. (3.4 N·m).
3. Reinstall electrical box access cover and secure cover with 6 bolts.
4. Reinstall top cowl.