

CORROSION PROTECTION

Corrosion Protection

Information on drive unit/transom assembly corrosion protection is presented in this section. The pages are copied from the Bravo Drive Unit Service Manual #28 Supplement (P/N 90-863160030, Nov. 2003), Section 7A.

The service manual section page numbering has been changed to match the page numbering in this manual. This section covers the continuity circuit, anodes, MerCathode System, Galvanic Isolator and corrosion protection testing and troubleshooting.

CORROSION PROTECTION

Section 6 - Corrosion Protection - All Models

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Torque Specifications

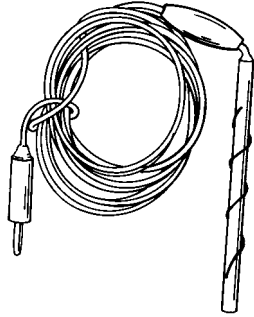
NOTE: Securely tighten all fasteners not listed below.

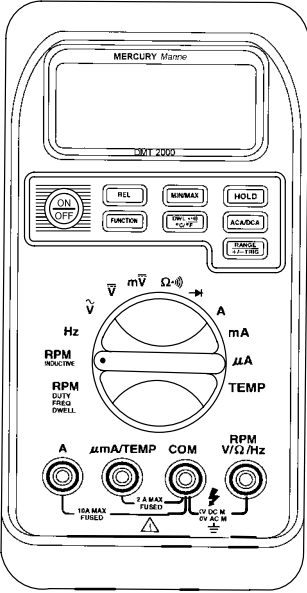
Description	Nm	lb-in.	lb-ft
Anodic plate screw	41		30
MerCathode assembly mounting screws	2.8	25	

Lubricants / Sealants / Adhesives

Description	Where used	Part number
Liquid Neoprene	All electrical connections	92-25711-3
Mercury Phantom Black	Bare metal	92-802878-1
Special Lubricant 101	Propeller shaft	92-802865A1
2-4-C with Teflon		92-802859A1
Anti-Corrosion Grease		92-802867A1

Special Tools

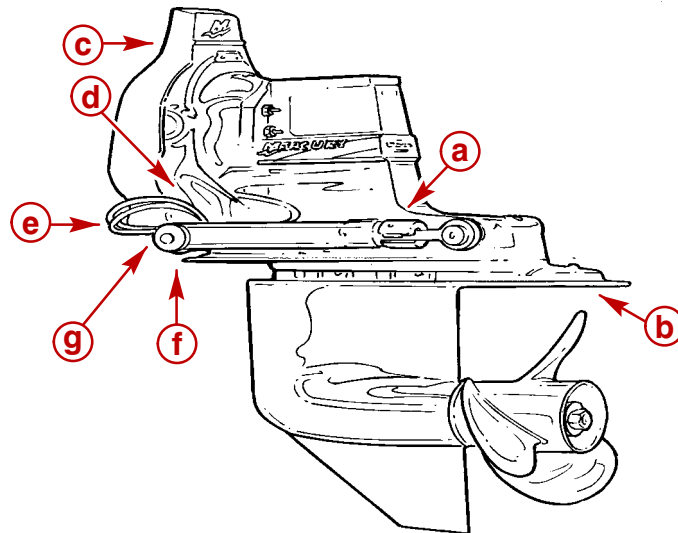
Reference Electrode		
 <p>73446</p>	<p>Senses an electrical current in the water when testing the MerCathode System. Use to check hull potential.</p>	<p>91-76675T1</p>

DMT 2000A Tachometer / Multi-meter Kit ¹		
 <p>77959</p>	<p>Measures rpm on both 2 and 4 cycle marine engines, records the maximums and minimums simultaneously and will read accurately in high RFI environments.</p> <p>Replacement components: 91-854010-1 Inductive Pick-Up 8 ft (2.4 m)</p> <p>91-854011-1 Temperature Probe</p> <p>91-854012 Ferrite Core</p> <p>91-854013-1 Interface Module</p> <p>91-854014-1 Hard Carrying Case</p> <p>91-854015-1 User's Guide</p> <p>91-802651 Test Leads</p> <p>Optional Accessories: 84-854016T 8 ft (2.4 m) Inductive Pick-Up Extension</p> <p>91-802650-1 Clamp-On Current Probe</p> <p>91-89045-1 Direct Voltage Adapter</p>	<p>91-854009A3</p>

² You may use a digital multi-meter; do not use a standard analog meter as inaccurate readings will result.

NOTE: Quicksilver Volt/Ohm Multi-meter DVA/Tester 91-99750A1 is no longer recommended for testing corrosion protection.

General Information



78283

Standard Bravo sterndrive unit

- c** - Sacrificial trim cylinder anode
- d** - Sacrificial anode / anodic plate
- e** - Steering lever ground wire
- f** - Ground wire between gimbal ring and bell housing
- g** - Stainless steel hoses
- h** - Ground wire between gimbal ring and gimbal housing
- i** - Ground wire between gimbal housing and trim cylinder

The following maintenance items are recommended to ensure that your sterndrive unit stays corrosion free.

- Maintain a complete paint covering on the sterndrive unit.
- Check the finish regularly, prime and paint nicks and scratches using Mercury enamel paint and touch up paint. Use only tin based anti-fouling paint or equivalent on or near aluminum surfaces below the waterline.
- If bare metal is showing, apply 2 coats of paint.

Description	Where used	Part number
Mercury Phantom Black	Bare metal	92-802878-1

- Spray all electrical connections with sealant.

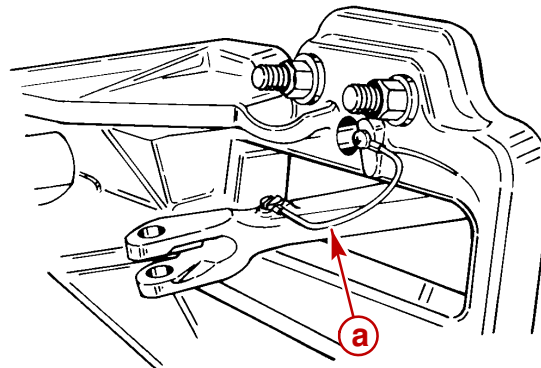
Description	Where used	Part number
Liquid Neoprene	All electrical connections	92-25711-3

- Inspect the sacrificial trim tab or anode plate if equipped, at regular intervals and replace it before it is half gone. If a stainless steel propeller is installed, additional anodes or a MerCathode System will be required.
- Inspect the propeller shaft for fishing line, which can cause corrosion on stainless steel shaft.
- Remove propeller at least every 60 days and lubricate the propeller shaft.
- Do not use lubricants containing graphite on or near aluminum in saltwater.
- Do not paint trim tabs or the mounting surface.

Continuity Circuit

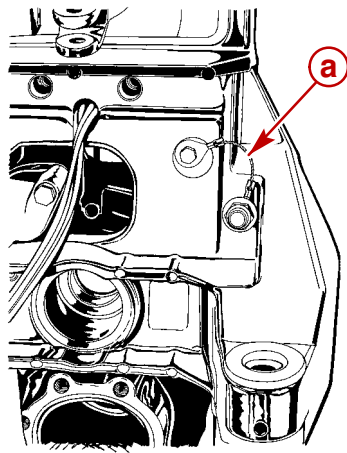
The transom assembly and sterndrive unit are equipped with ground circuit wires to ensure good electrical continuity between engine, transom assembly, and sterndrive components. Good continuity is essential for the anode and MerCathode System to function most effectively.

8. Inspect the following ground circuit components at intervals for loose connections or broken or fraying wires.

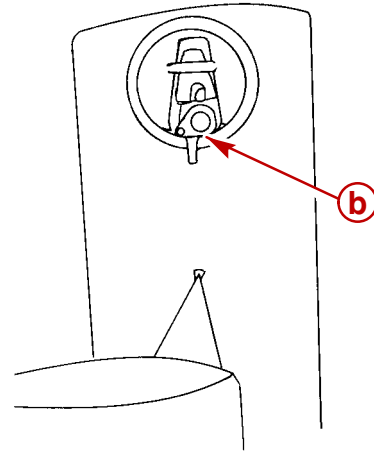


a - Steering lever ground wire

22028

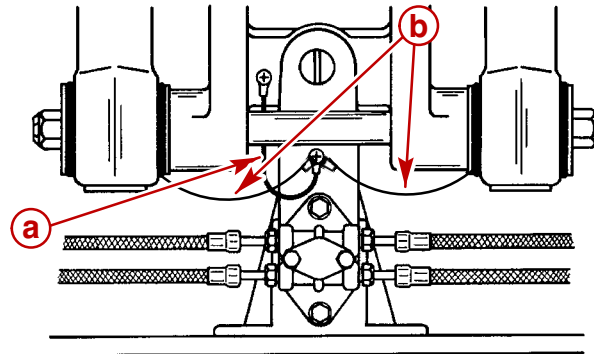


22650



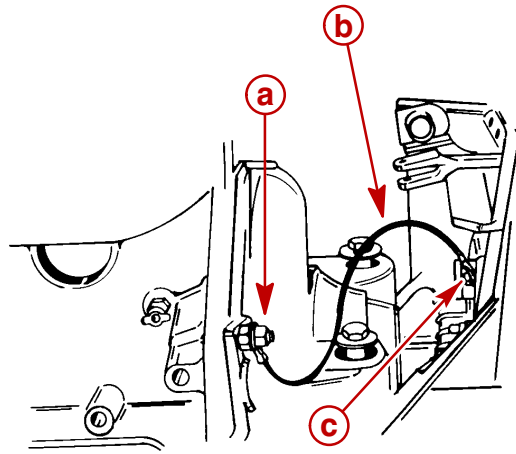
77079

- a** - Inner transom plate to gimbal housing ground wire
- b** - Drive shaft housing to gear housing ground plate (inside anode cavity)

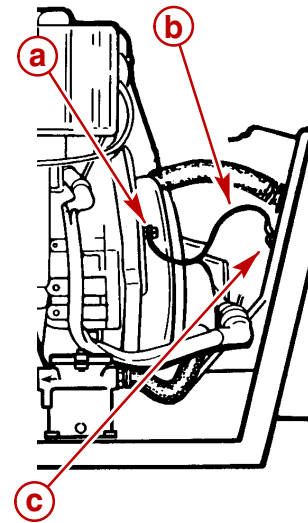


77100

- a** - Gimbal housing to gimbal ring ground wire
- b** - Gimbal housing to trim cylinder ground wires



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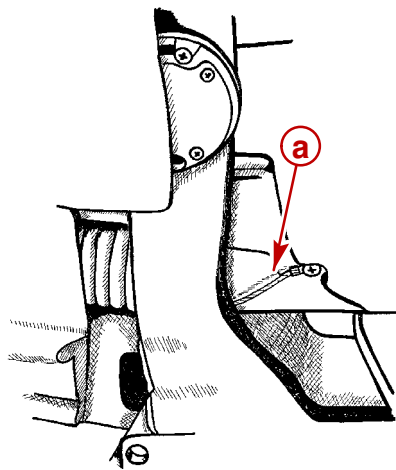


50242

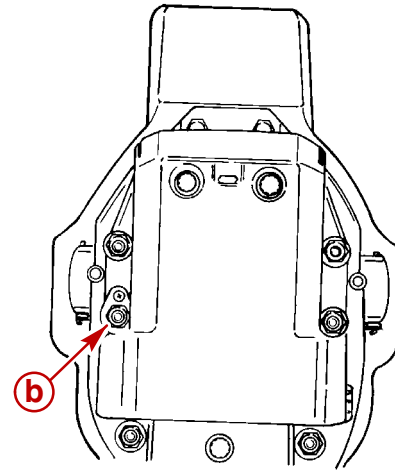
Gasoline models

Diesel models

- a** - Flywheel housing grounding stud
- b** - Ground wire
- c** - Inner transom plate grounding screw

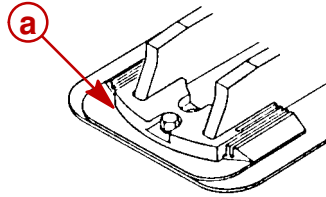


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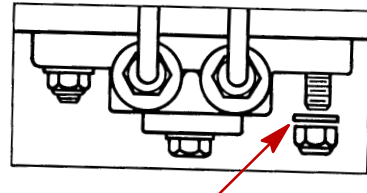


22031

- a** - Gimbal ring to bell housing ground wire
- b** - Sterndrive unit to bell housing ground plate

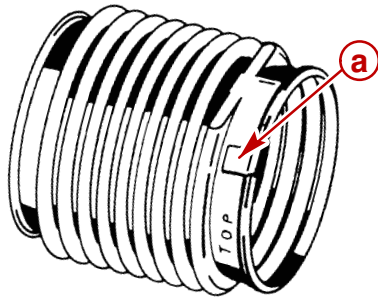


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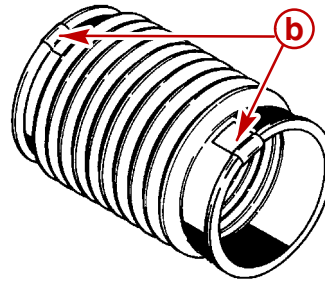


22230

- a** - Drive shaft housing anodic plate
- b** - Continuity washers between fasteners and hydraulic manifold block to gimbal housing



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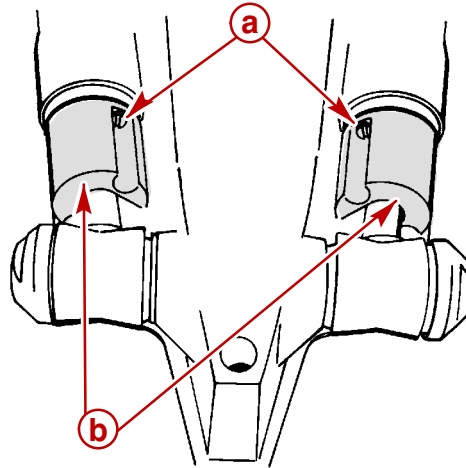
- a** - U-joint bellows ground clip
- b** - Exhaust bellows ground clips

Trim Cylinder Anodes

⚠ CAUTION

Do not paint new trim cylinder anodes as this will render them ineffective as a galvanic corrosion inhibitor.

1. Remove screws that secure anodes to trim cylinders.
2. Remove anodes.



- a** - Screws
b - Trim cylinder anodes

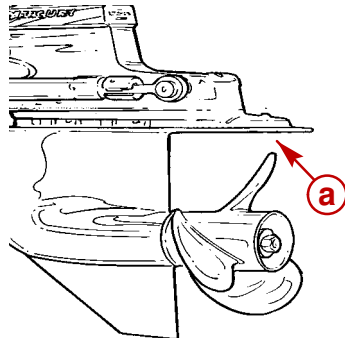
3. Clean thread holes with a 10-32 standard tap.
4. Install new anodes and tighten securely.

71966

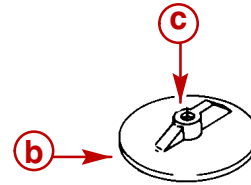
Anodic Plate

⚠ CAUTION

Do not paint new anodic plate as this will render it ineffective as a galvanic corrosion inhibitor.



78283

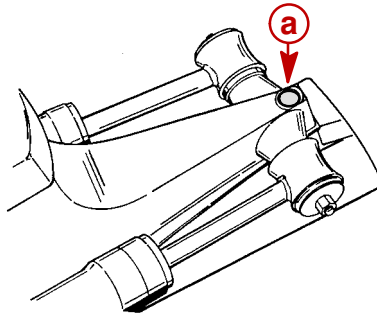


75251

- a** - Anodic plate location
- b** - Anodic plate
- c** - Threaded boss (up)

Bravo One Sterndrive Units

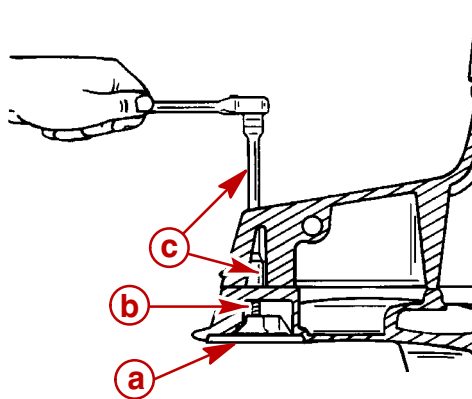
1. Remove plug from drive shaft housing to gain access to attaching screw.



22093

- a** - Rubber plug or plastic cap

2. Loosen screw and remove anodic plate.



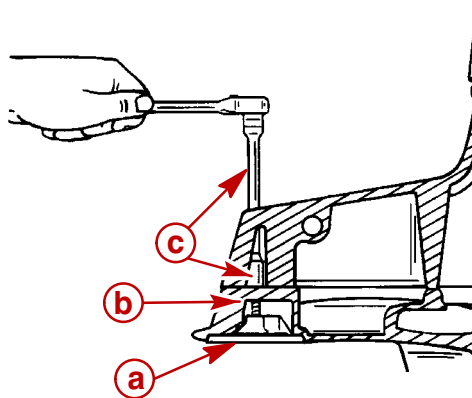
76800

- a - Anodic plate
- b - Screw
- c - Socket and extension

⚠ CAUTION

Without proper contact with the gear housing, the anodic plate will not function properly. Avoid corrosion to the gear housing and damage to the drive, ensure that the anodic plate is installed properly.

3. Install anodic plate, screw, and continuity washer. Torque screw.

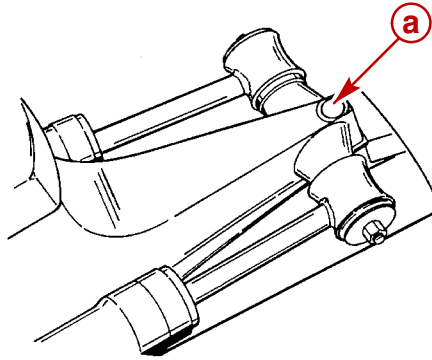


76800

- a - Anodic plate
- b - Screw
- c - Socket and extension

Description	Nm	lb-in.	lb-ft
Anodic plate screw	41		30

- Reinstall plug in drive shaft housing.

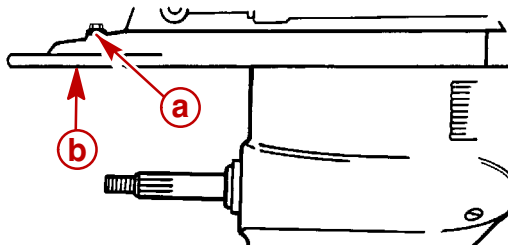


22093

a - Rubber plug or plastic cap

Bravo Two Sterndrive Units

- Loosen screw and remove anodic plate.
- Install anodic plate, screw, and continuity washer. Torque screw.



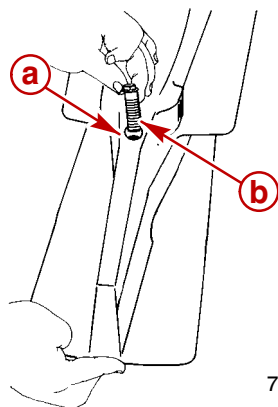
50323

a - Screw
b - Anodic plate

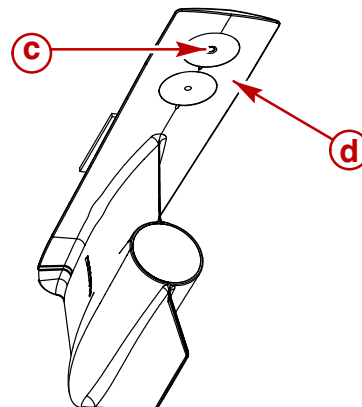
Description	Nm	lb-in.	lb-ft
Anodic plate screw	41		30

Bravo Three Sterndrive Units

1. Remove plastic cap to gain access to the first anode attaching screw.
2. Remove the second anode attaching screw located on the under side of the prop shaft housing.



76832



79285

- a** - Plastic cap (removed)
- b** - First anode attaching screw
- c** - Second anode attaching screw
- d** - Under side of prop shaft housing

3. Install new anode and continuity washer. Torque screw.

Description	Nm	lb-in.	lb-ft
Anodic plate screw	41		30

4. Reinstall plastic cap.

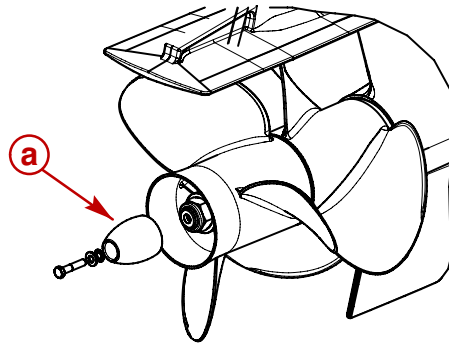
Propshaft Anode (Bravo Three Only, kits are available for other drives) - is located behind the propeller.

5. Install the propeller shaft anode over the propeller shaft nut.
6. Place the flat washer onto the propeller shaft anode screw.
7. Place the star washer onto the propeller shaft anode screw.

NOTE: If the propeller shaft anode is removed after initial installation and is to be reinstalled, it will be necessary to apply Loctite Thread Locker 271 to the threads of the propeller shaft anode screw.

8. Secure the propeller shaft anode to the propeller shaft using the propeller shaft anode screw and washers. Torque the screw.

Description	Nm	lb-in.	lb-ft
Propeller shaft anode screw 0.3125-18 x 1.5 in. (38 mm) long	27		20



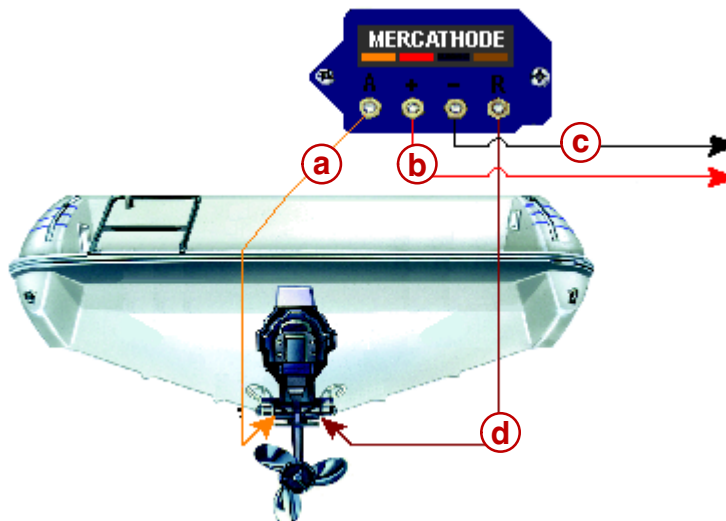
79161

a - Propshaft anode

Integral MerCathode System

The MerCathode system automatically protects the drive unit from corrosion. The increased output provides greater protection for underwater aluminum parts. Its reliable, efficient operation requires an insignificant amount of current when protection is needed.

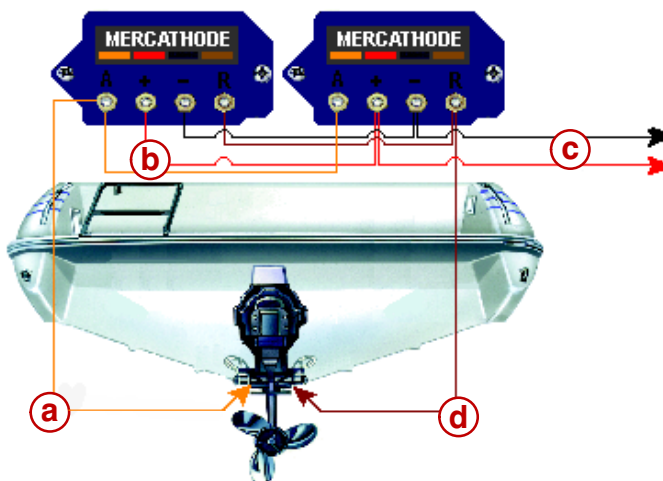
The blue MerCathode controller output is limited to approximately 200 mA to avoid rapid drain of the boat's battery.



79094

Single MerCathode application

In saltwater, a second MerCathode system blue controller may be added in parallel to increase protection to 400 mA. Please note that this will also increase the drain on your battery. Refer to the *Mercury Precision Parts / Marine Corrosion Protection Guide (90-881813003)*.



79095

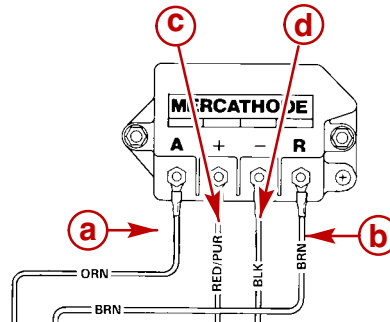
Dual MerCathode application

- a** - ORANGE lead - from anode on transom assembly
- b** - RED/PURPLE lead - connect to positive (+) battery terminal
- c** - BLACK lead - from engine harness or battery ground
- d** - BROWN lead - from reference electrode on transom assembly

Removing Gimbal Mounted MerCathode Assembly

The Hull Potential Test should be performed to ensure that the system is functioning properly. Refer to Corrosion Protection Testing and Troubleshooting following in this section.

1. Disconnect the battery leads from the battery to the MerCathode controller.

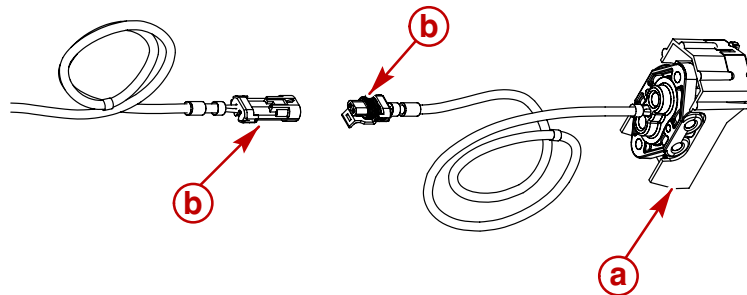


74251

Standard controller shown

- a** - Lead to anode of MerCathode assembly (ORANGE)
- b** - Lead to reference electrode of MerCathode assembly (BROWN)
- c** - Lead to the positive terminal of the battery (RED/PURPLE)
- d** - Lead to the negative terminal of the battery (BLACK)

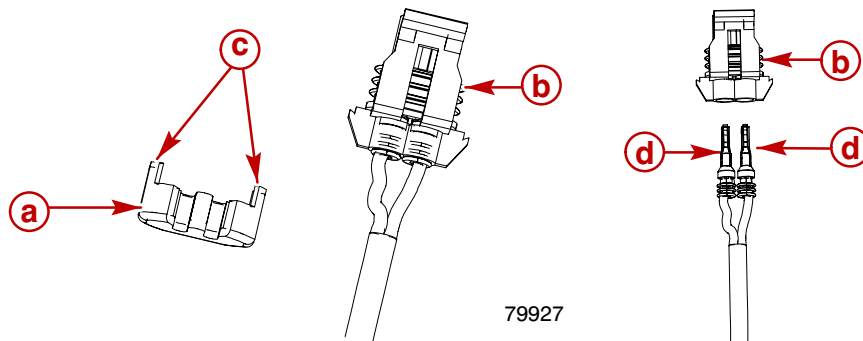
2. Disconnect MerCathode assembly harness connector.



79133

- a** - MerCathode assembly
- b** - Harness connector

3. Remove the wire retainer from the connector by prying out on the locking tabs and pulling the wire retainer away from the connector
4. Remove the wire leads from the connector by gently pulling them from the back of the connector.

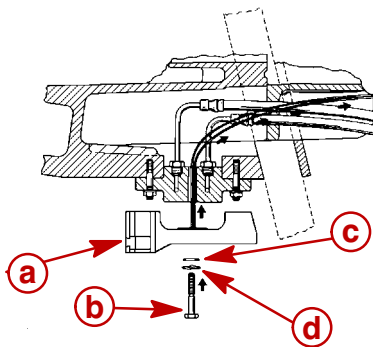


79927

79926

- a** - Wire lead retainer
- b** - Connector
- c** - Locking tab
- d** - Wire lead

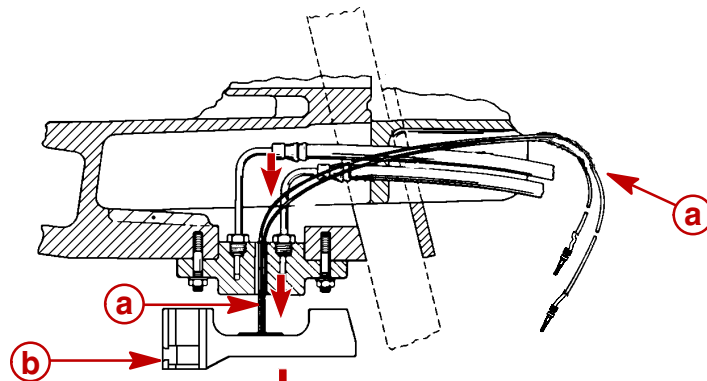
5. Remove the two mounting screws and washers holding the MerCathode assembly to the gimbal housing.



70771

- a** - MerCathode assembly
- b** - Screw (2)
- c** - Flat washer (2)
- d** - Lockwasher (2)

- Gently remove the MerCathode assembly and wires from the gimbal housing.



70771

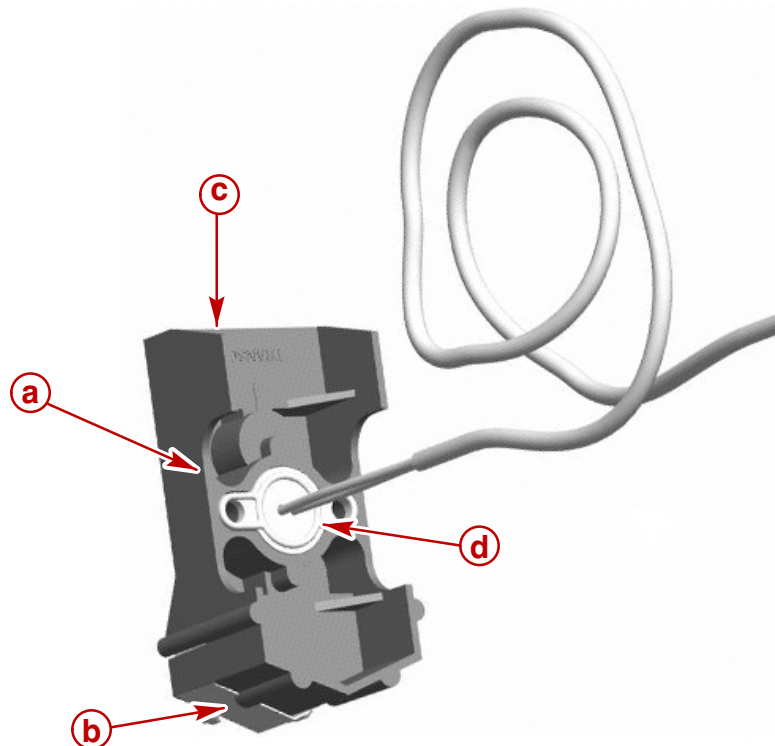
- a** - MerCathode assembly wires
b - MerCathode assembly

Installing Gimbal Mounted MerCathode System

⚠ CAUTION

Rubber seal must be properly seated in groove of electrode assembly or water will leak into boat.

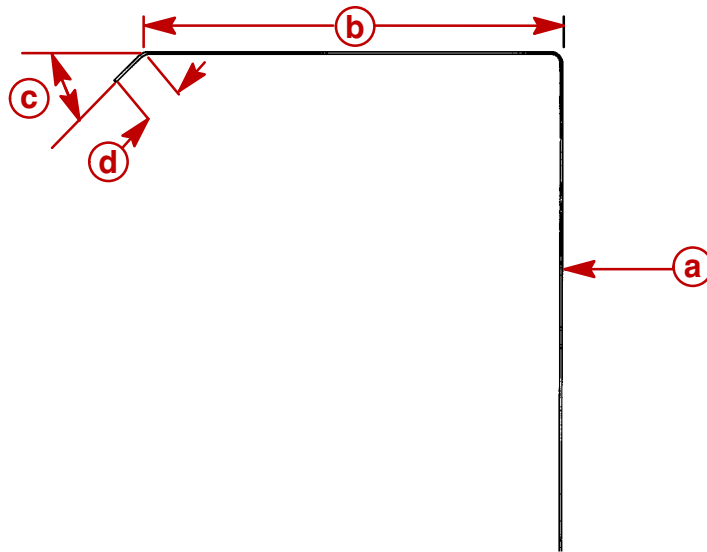
- The gimbal mounted MerCathode assembly has a factory installed rubber seal and does not require an O-ring.



79928

- a** - MerCathode assembly
b - Anode
c - Reference electrode
d - Rubber seal

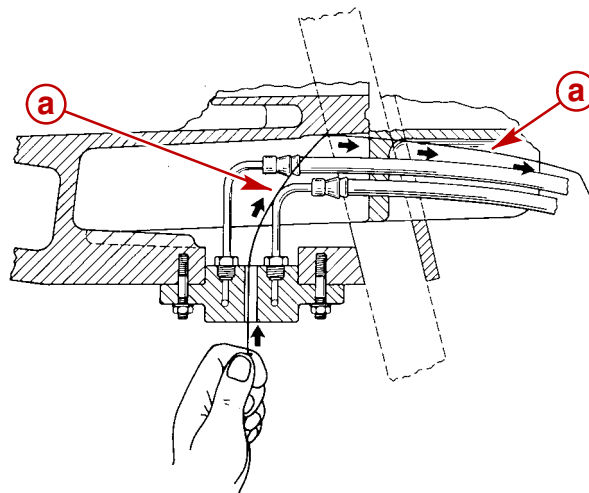
- Form a 61 cm (2 ft) long piece of 0.8 mm (0.032 in.) diameter wire to the dimensions specified.



74106

- a** - 61 cm (2 ft) of approximately 0.8 mm (0.032 in.) diameter wire
- b** - 12.3 cm (5 in.)
- c** - 45 degree angle
- d** - 13 mm (1/2 in.)

- Insert 45 degree angle end of wire through center hole in hydraulic connector block.
- Guide wire through hole until wire protrudes through cavity at the bottom of exhaust pipe.



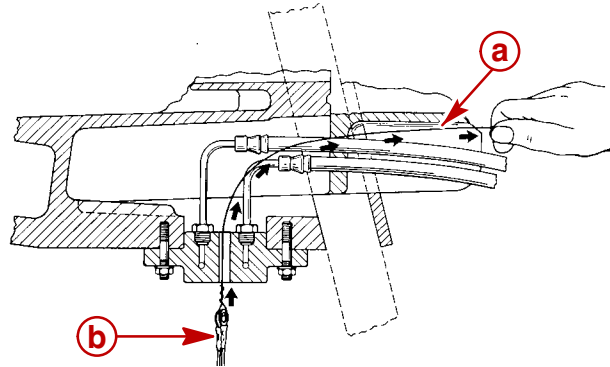
22235

- a** - Wire

5. Secure ring terminals to guide wire.
6. Guide leads through center hole in connector block.

IMPORTANT: ORANGE lead is approximately 15 cm (6 in.) longer than the BROWN lead.

7. Pull leads into the boat.



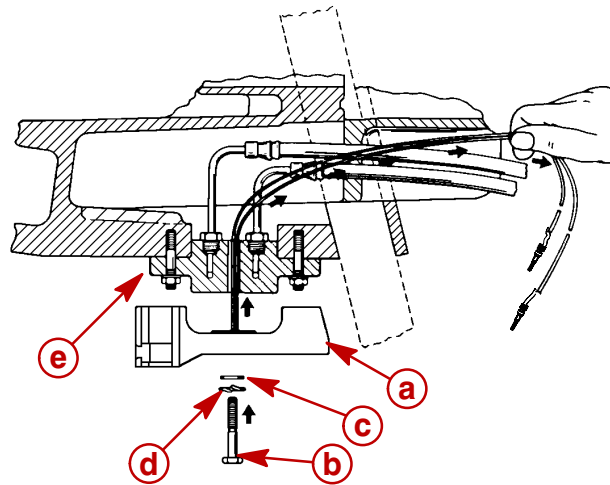
22234

- a - Guide wire
- b - Leads

⚠ CAUTION

Do not paint sacrificial anodes or MerCathode System anode/reference electrode assembly, as this will render them ineffective as galvanic corrosion inhibitors.

8. Position and secure MerCathode assembly to gimbal housing using two 35 mm (1-3/8 in.) long screws, flat washers, and lockwashers.
9. Torque screws. Do not overtighten.



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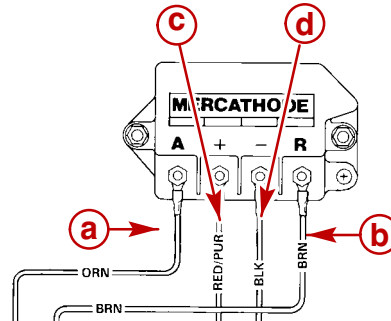
- a - MerCathode assembly
- b - Screw (2)
- c - Flat washer (2)
- d - Lockwasher (2)
- e - Hydraulic connector block

Description	Nm	lb-in.	lb-ft
MerCathode assembly mounting screws	2.8	25	

Connect to MerCathode Controller Assembly

NOTE: If BLACK (ground) wire is not available at terminal block or from wire harness, install a separate lead between controller negative (-) terminal and negative (-) battery cable attaching point on engine.

1. Securely connect electrical leads to MerCathode controller assembly. (Refer to Wiring Diagrams.)



74251

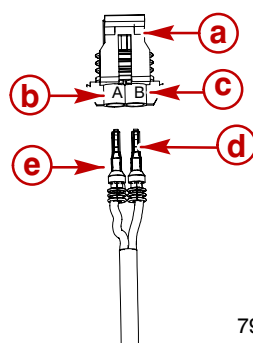
Standard controller shown

- a** - Lead to anode of MerCathode assembly (ORANGE)
- b** - Lead to reference electrode of MerCathode assembly (BROWN)
- c** - Lead to the positive terminal of the battery (RED/PURPLE)
- d** - Lead to the negative terminal of the battery (BLACK)

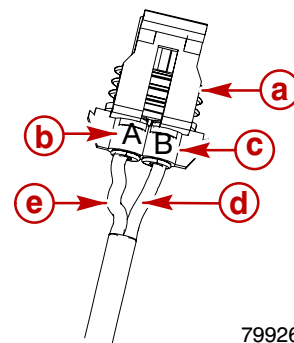
2. Apply a thin coat of sealant to all electrical connections.

Description	Where used	Part number
Liquid Neoprene	All electrical connections	92-25711-3

3. Install the BROWN wire lead from the MerCathode assembly harness into connector terminal "A" by firmly pushing it into the back of the connector until completely seated.
4. Install the ORANGE wire lead from the MerCathode assembly harness into connector terminal "B" by firmly pushing it into the back of the connector until completely seated.



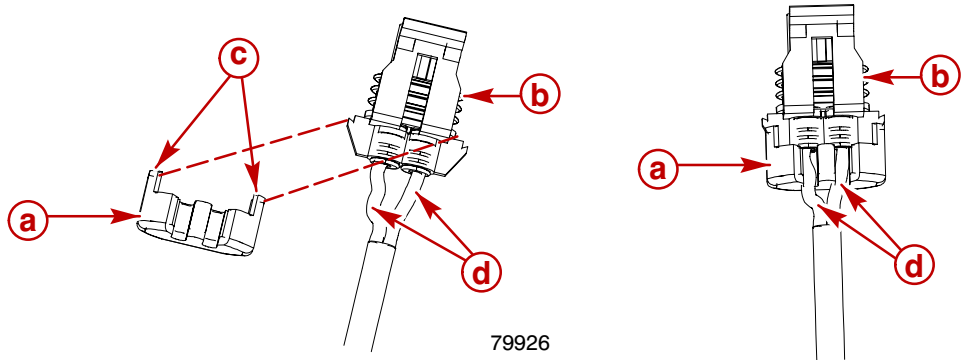
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79926

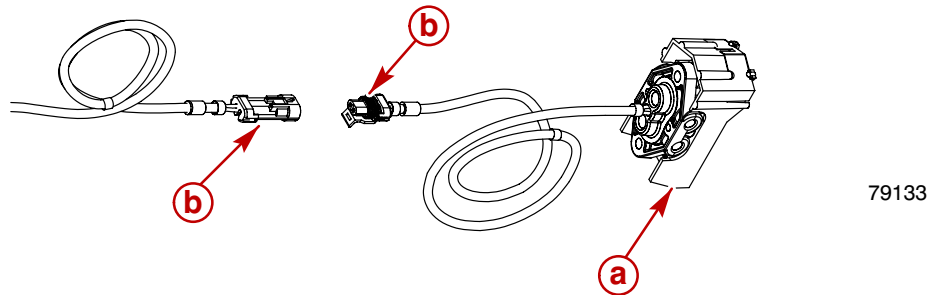
- a** - Connector
- b** - Connector terminal "A"
- c** - Connector terminal "B"
- d** - ORANGE wire lead
- e** - BROWN wire lead

5. Install the wire lead retainer onto the MerCathode assembly harness wires and push it onto the connector until the locking tabs are fully engaged.



- a - wire lead retainer
- b - Connector
- c - Wire lead

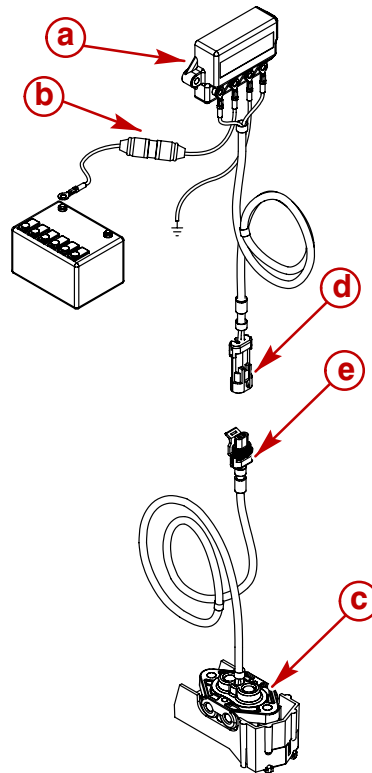
6. Connect the MerCathode assembly harness connector.



- a - MerCathode assembly
- b - Harness connector

Wiring Diagrams

MerCathode Controller - Quick Connect Models



79133

- a** - MerCathode controller
- b** - 20 Amp fuse
- c** - MerCathode assembly
- d** - Female terminal
- e** - Male terminal

Galvanic Isolator

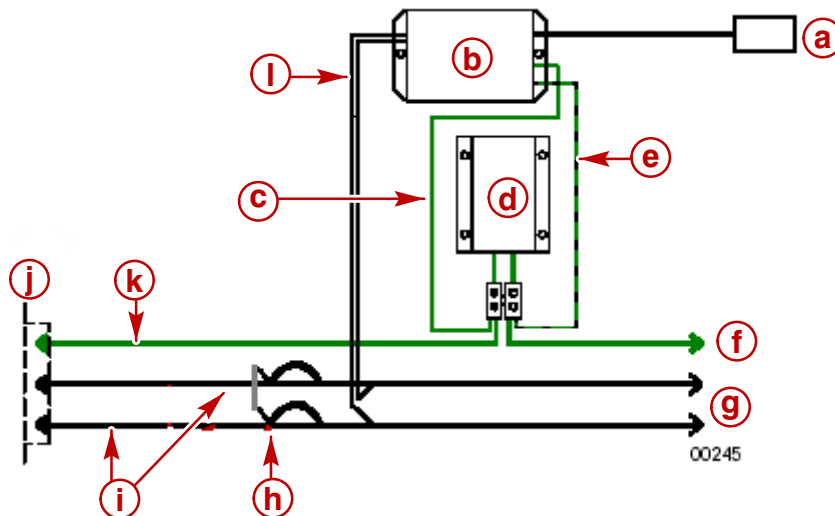
Boats that are connected to AC shore power require additional protection to prevent destructive low voltage galvanic currents from passing through the shore power ground wire. A Quicksilver Isolator (888557Q01) can be installed to block the passage of these currents, while still providing a path to ground for dangerous fault (shock) currents.

⚠ CAUTION

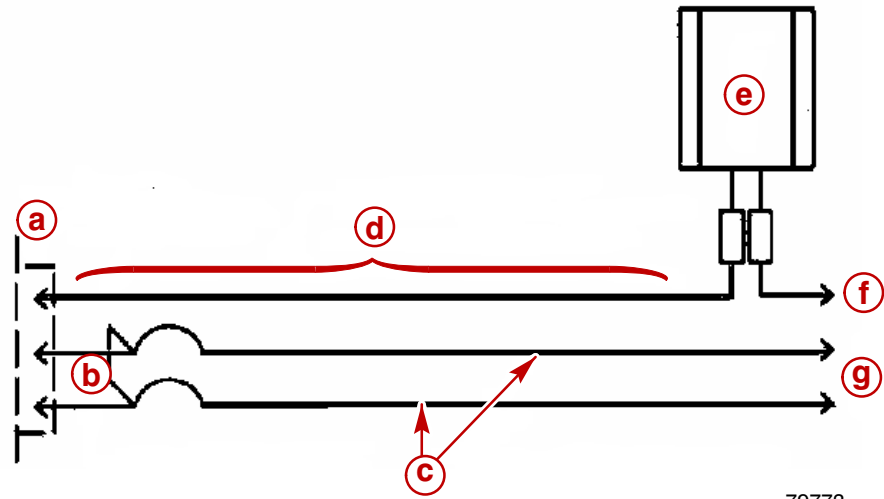
If AC shore power is not isolated from boat ground, the MerCathode system and sacrificial anodes may be unable to handle the increased galvanic corrosion potential.

The Quicksilver Galvanic Isolator is a solid state device that is series connected in line with the boat's safety grounding lead ahead of all grounding connections on the boat. This device functions as a filter, blocking the flow of destructive low voltage galvanic (DC) currents, but still maintaining the integrity of the safety grounding circuit.

If the galvanic isolator kit is improperly installed, false audio and visual warnings will result.



- | | |
|--------------------------------------|--|
| a - Display | g - To distribution panel |
| b - Galvanic Isolator monitor | h - Circuit breaker |
| c - GREEN | i - Power conductors |
| d - Galvanic Isolator | j - Boat shore power connection |
| e - GREEN/BLACK | k - Safety grounding conductor |
| f - Boat ground | l - 110 VAC power cord |



- a** - Boat shore power connection
- b** - Circuit breaker
- c** - Power conductor
- d** - See Note
- e** - Galvanic Isolator
- f** - Boat ground
- g** - To distribution panel

NOTE: Green conductor cannot be connected to boat in this section.

Corrosion Protection Testing and Troubleshooting

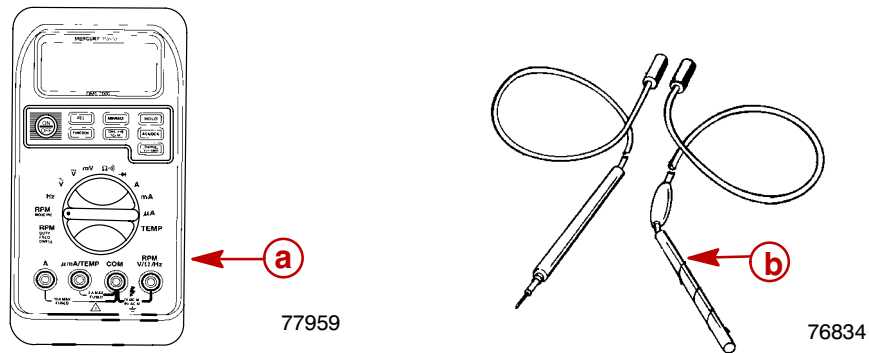
NOTE: The following corrosion protection test supersedes all previously issued tests. This test can be used on applications with or without a MerCathode system.

This test should be performed on all boats annually where the boat is moored to ensure that the system is functioning properly.

Test requires the use of MerCathode Reference Electrode and a digital multi-meter.

IMPORTANT: A standard analog meter cannot be used, as an inaccurate reading will result.

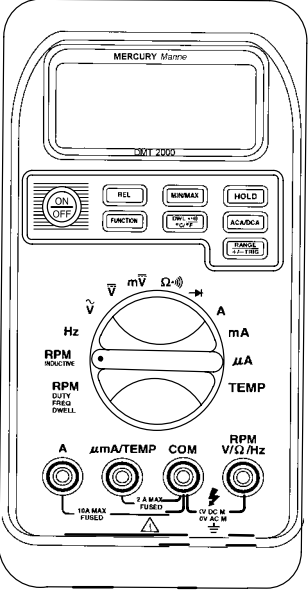
The MerCathode Reference Electrode Tester is equipped with a special connector containing a resistor to provide the proper scale reading when used with a digital multimeter. **Do not remove this plug or use analog meters.** Resistor jack can be left in place when using digital meters.



Digital Multi-meter and MerCathode Reference Tester

- a** - DMT 2000A Tachometer / Multi-meter
- b** - Reference Electrode

Reference Electrode		
<p>73446</p>	<p>Senses an electrical current in the water when testing the MerCathode System. Use to check hull potential.</p>	<p>91-76675T1</p>

DMT 2000A Tachometer / Multi-Meter Kit		
 <p style="text-align: right; margin-top: 10px;">77959</p>	<p>Measures rpm on both 2 and 4 cycle marine engines, records the maximums and minimums simultaneously and will read accurately in high RFI environments.</p> <p>Replacement components:</p> <ul style="list-style-type: none"> 91-854010-1 Inductive Pick-Up 8 ft (2.4 m) 91-854011-1 Temperature Probe 91-854012 Ferrite Core 91-854013-1 Interface Module 91-854014-1 Hard Carrying Case 91-854015-1 User's Guide 91-802651 Test Leads <p>Optional Accessories:</p> <ul style="list-style-type: none"> 84-854016T 8 ft. (2.4 m) Inductive Pick-Up Extension 91-802650-1 Clamp-On Current Probe 91-89045-1 Direct Voltage Adapter 	<p>91-854009A3</p>

IMPORTANT: If equipped with MerCathode System, ensure that battery is fully charged (12.6 volts or above).

IMPORTANT: Boats recently placed in service usually will produce a reading higher than normal because the sterndrive unit is protected by a good finish and new sacrificial anodes. To obtain an accurate diagnosis, the test should be performed after the boat has been in service at least one or two weeks. This will give the paint a chance to soak and minor abrasions and scratches will have appeared resulting in a more accurate reading.

IMPORTANT: Boats should be moored, without being operated, for at least 8 hours before performing tests. This is necessary to allow the MerCathode system and/or sacrificial anodes to polarize the surrounding water. Be careful not to rock the boat excessively while boarding to perform a test as this will alter the test reading.

1. Set meter on scale required to read 0-2000 millivolts.
2. Connect the negative meter lead to the negative (-) battery terminal or other convenient engine ground.
3. Connect Reference Electrode Tester lead into positive (+) receptacle of meter.
4. Immerse Electrode Tester in the water within 15 cm (6 in.) of aft end of sterndrive unit.

IMPORTANT: There will be different voltage readings depending on the type of MerCathode system you are testing.

5. The following readings indicate the corrosion protection status of the sterndrive unit. Refer to **Section 1C - Troubleshooting** of the appropriate Mercury MerCruiser Service Manual.

Freshwater	Digital Multi-meter	Corrosion protection
	Between 750 - 1050 millivolts	Sterndrive is protected
	Below 750 millivolts	Sterndrive is corroding
	Above 1050 millivolts	Sterndrive is overprotected

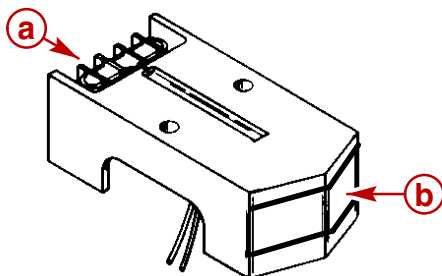
Salt, Polluted, or Mineral Laden Water	Digital Multi-meter	Corrosion protection
	Between 850 - 1100 millivolts	Sterndrive is protected
	Below 850 millivolts	Sterndrive is corroding
	Above 1100 millivolts	Sterndrive is overprotected

⚠ CAUTION

Removing the Silver/Silver Chloride coating from the reference wire will make the MerCathode system inoperable. Do not power wash the MerCathode or damage to the MerCathode system will occur.

Continuity Test

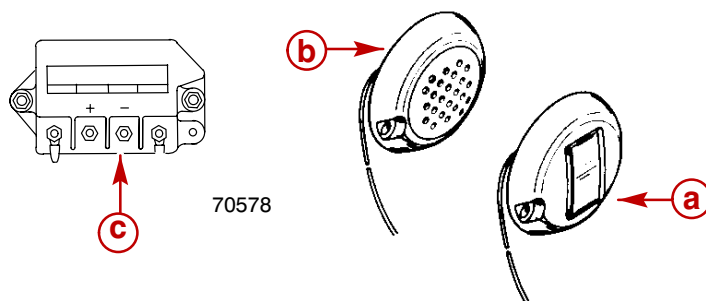
1. Connect the end of the positive meter lead to each metallic component on the sterndrive. Ensure that there is good electrical contact to each metal surface. Reading should drop below 2 millivolts.
2. A reading higher than 2 millivolts indicates improper grounding.
3. If the reading is not within specified limits, or if reading is within specifications, but there is evidence of corrosion on sterndrive unit, refer to the following troubleshooting charts to aid in diagnosis.



76868

Gimbal mounted MerCathode on bottom of transom assembly

- a** - Reference wire
- b** - Anode plate



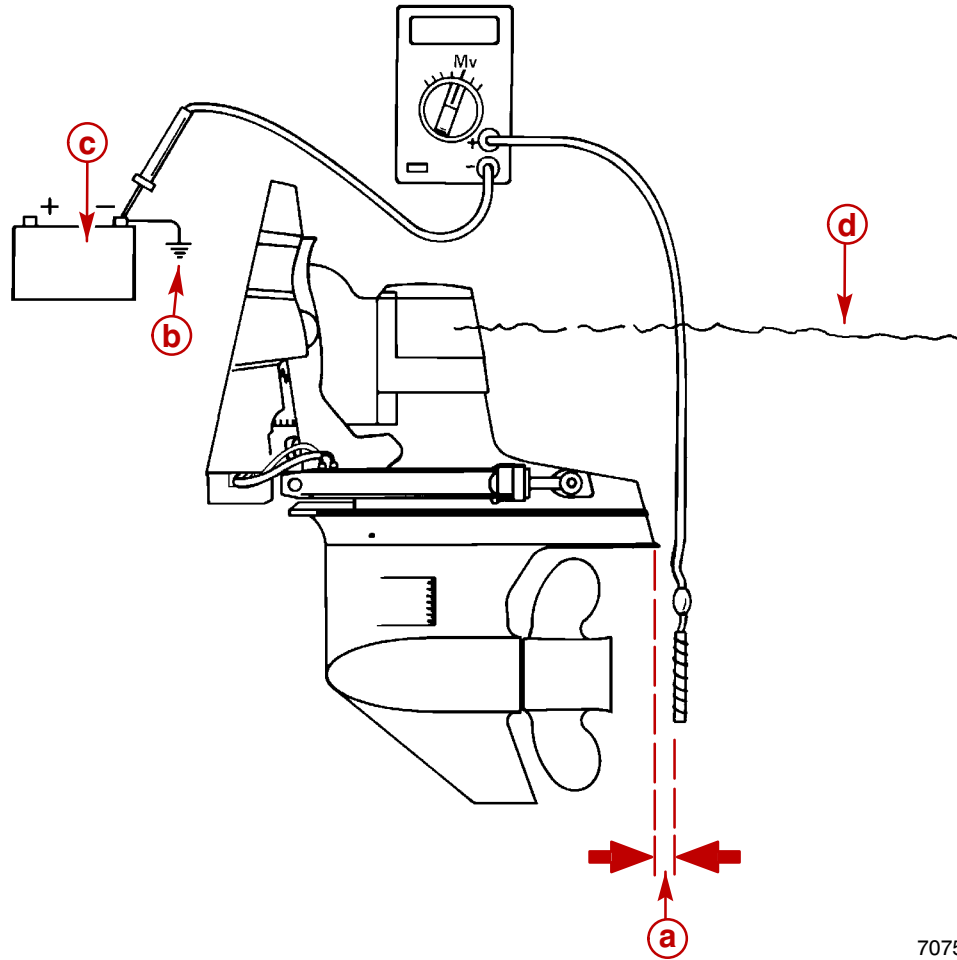
70578

71895

Transom mounted MerCathode on boat transom

- a** - Anode
- b** - Reference electrode
- c** - MerCathode

Test Equipment Set-Up



70755

- a** - 15 cm (6 in.) maximum
- b** - Power package ground
- c** - Battery
- d** - Waterline

Low Readings

Cause	Special instructions
Loss of continuity between sterndrive unit components and negative (-) battery terminal.	Ensure that continuity devices are not missing or damaged and that connections are clean and tight.
Shore power green safety grounding lead not isolated from the power package ground on boats equipped with shore power.	Disconnect shore power and verify if reading increases. If so, install a Quicksilver Isolator (888557Q01) or an isolation transformer.
Underwater metal parts on the sterndrive unit and/or boat are unpainted or the paint is in poor condition. The boat has more exposed metal than the anodes and/or MerCathode System can protect.	Prime and paint underwater metal parts. This will reduce the load on the anodes and/or MerCathode System.
Anodes painted.	Remove paint or replace anodes.
The anodes are improperly grounded or inactive.	Clean anode mounting surface or replace anodes if they have oxidized.
Anodes consumed (no longer protect).	Replace anodes if eroded 50% or more.
Sterndrive unit and/or boat bottom painted with anti-fouling paint containing tin.	Avoid any electrical interconnection between the Mercury MerCruiser product, anodic blocks, or MerCathode system and the paint by allowing a minimum of 40 mm (1-1/2 in.) of UNPAINTED area around these items on the transom of the boat.
MerCathode reference electrode or anode painted.	Remove paint.
Anodic heads used instead of plastic caps.	Reinstall the plastic caps.
No power to MerCathode controller.	Connect the positive (+) volt meter lead (set on 0-20 volt scale) to the positive (+) controller terminal and the negative (-) volt meter lead to the negative (-) terminal. The meter should indicate battery voltage. Check for a blown fuse (if equipped) on the starboard MerCathode system. Clean the connection or repair wiring as required.
Poor connection between reference electrode lead (BROWN) or anode lead (ORANGE) and MerCathode controller.	Clean and/or tighten the connection. Repair the wiring.

Low Readings (continued)

Cause	Special instructions
Faulty MerCathode reference electrode.	Disconnect the reference electrode lead (brown) from the controller "R" terminal. Connect the lead to the positive (+) terminal of a digital multimeter (set on 0-2000 millivolt scale). Connect the negative (-) meter lead to the negative (-) battery terminal. Note the meter reading; then repeat the test using a MerCathode Reference Electrode Tester (76675T1). You should obtain the same reading in both cases. If not, replace the reference electrode.
Faulty MerCathode Controller.	With anode and reference electrode leads connected to the controller, connect the jumper wire between "R" and negative (-) terminals on the controller. Connect the positive (+) lead of the volt meter (set on 0-20 scale) to terminal "A" on the controller. Connect the negative (-) meter lead to the negative (-) controller terminal. Reading should be as follows: <ul style="list-style-type: none"> ● Freshwater Areas - 750 - 1050 millivolts ● Saltwater Areas - 850 - 1050 millivolts If the reading is low, replace the controller.
Additional corrosion protection required. Boats equipped with a sizable amount of underwater metal (stainless steel propeller, after planes, etc.), or that are moored in an area with warm or rapid flowing water may require additional protection.	Install additional anodes or MerCathode system (88334A2). If the unit is already equipped with a MerCathode System, a second system may be required.

High Reading

Cause	Special instructions
Stray current corrosion. If an electrical current flowing along a metal conductor leaves the metal for a water path, it will cause ionization of the metal, and an area of rapid corrosion.	Observe the reading while disconnecting the electrical components one at a time until you eliminate the high reading. Correct the course of stray current.
Poor connection between MerCathode reference electrode lead (BROWN) and "R" terminal on controller.	Clean and/or tighten connection. Repair wiring as required.
Faulty MerCathode reference electrode.	Disconnect the reference electrode lead (BROWN) from "R" terminal on the controller. Connect the lead to the positive (+) terminal of a digital multi-meter (set on 0-2000 millivolt scale). Connect the negative (-) meter lead to the negative (-) battery terminal. Note the meter reading; then, repeat the test using MerCathode Reference Electrode Tester (76675T1). Both tools should produce the same reading. If not, replace the reference electrode.
Faulty MerCathode controller.	Replace the controller.

Normal Reading But Corrosion is Evident

CORROSION ON THE ENTIRE STERNDRIVE UNIT

Cause	Special instructions
The sterndrive unit is raised so that the sacrificial anodic trim tab is out of the water.	Leave the sterndrive unit in the IN/DOWN position when the boat is moored to ensure the trim tab is in the water, providing protection.

CORROSION PROBLEM DEVELOPED AFTER REFINISHING THE STERNDRIVE UNIT

Cause	Special instructions
A steel wire brush was used to clean the aluminum casting. Steel particles became entrapped and set up a small galvanic cell.	Use only a nylon or bristle brush.

PAINT BLISTERING ON STERNDRIVE UNIT

Cause	Special instructions
Battery charger, using 110 volt shore power improperly connected to the battery.	Ensure the charger is connected correctly.

TRIM CYLINDER CORRODING

Cause	Special instructions
Continuity lost between trim cylinder and sterndrive unit.	Install proper continuity devices.

ONLY ONE OR TWO COMPONENTS CORRODING

Cause	Special Instructions
Continuity lost between sterndrive unit and components.	If not already done, install Continuity Circuit Kit (99940A2).

CORROSION IN THE EXHAUST OUTLET AREA

Cause	Special instructions
Exhaust gas deposits accumulating on the sterndrive exterior can result in paint blistering and corrosion.	Remove deposits with marine or automotive wax.

CORROSION OCCURS AFTER THE UNIT IS REMOVED FROM THE WATER

Cause	Special instructions
Salt crystals remaining on the surface of the sterndrive components combine with high humidity to cause electrolyte formation resulting in corrosion.	Wash sterndrive exterior and flush sterndrive interior with fresh water.

CORROSION BETWEEN SURFACES

Cause	Special instructions
Salt buildup between surfaces.	Protect mating parts with lubricant.

Description	Where used	Part number
Special Lubricant 101	Propeller shaft	92-802865A1
2-4-C with Teflon		92-802859A1
Perfect Seal		92-34227-1

ALUMINUM CORRODING IN LUBRICATED AREAS

Cause	Special instructions
Graphite in the lubricant.	Never use lubricants containing graphite because they accelerate corrosion. Use specially formulated marine lubricants.

Description	Where used	Part number
Special Lubricant 101	Propeller shaft	92-802865A1
2-4-C with Teflon		92-802859A1
Perfect Seal		92-34227-1

STAINLESS STEEL COMPONENTS CORRODING

Cause	Special instructions
Foreign matter (fishing line, marine growth, etc.) covering the steel and starving it of oxygen. This causes a breakdown of the protective oxide film and subsequent corrosion (known as oxygen starvation corrosion). Burying stainless steel in sand or silt can also cause this problem.	Remove foreign matter and prevent surfaces from being covered by sand or silt.

STAINLESS STEEL PROPELLER CORRODING

Cause	Special instructions
Continuity lost between propeller and propeller shaft.	Clean the mating surfaces on the propeller, propeller shaft, and attaching parts. If applicable, install a continuity washer. Lubricate the propeller shaft before reinstalling the propeller.

Description	Where Used	Part Number
Special Lubricant 101	Propeller shaft	92-802865A1
2-4-C with Teflon		92-802859A1
Anti-Corrosion Grease		92-802867A1
Perfect Seal		92-34227-1

PAINT BLISTERING - THE METAL UNDER THE BLISTERED PAINT IS NOT PITTED

Cause	Special Instructions
The surface was not properly prepared before paint was applied.	Sand the surface down to bare metal, prime and repaint with Quicksilver Spray Paint.