

## Warranty Message

The product you have purchased comes with a **limited warranty** from Mercury Marine; the terms of the warranty are set forth in the *Warranty Information* section of this manual. The warranty statement contains a description of what is covered, what is not covered, the duration of coverage, how to best obtain warranty coverage, **important disclaimers and limitations of damages**, and other related information. Please review this important information.

### **WARNING**

**The operator (driver) is responsible for the correct and safe operation of the boat, the equipment aboard and the safety of all occupants aboard. We strongly recommend that the operator read this Operation and Maintenance Manual and thoroughly understand the operational instructions for the power package and all related accessories before the boat is used.**

### **WARNING**

**The engine exhaust from this product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.**

The description and specifications contained herein were in effect at the time this guide was approved for printing. Mercury Marine, whose policy is one of continuous improvement, reserves the right to discontinue models at any time, or to change specifications or designs, without notice and without incurring obligation.

Mercury Marine, Fond du Lac, Wisconsin, U.S.A.

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# Thank You...

for your purchase of one of the finest marine power packages available. It incorporates numerous design features to assure operating ease and durability.

With proper care and maintenance, you will thoroughly enjoy using this product for many boating seasons. To ensure maximum performance and carefree use, we ask that you thoroughly read this manual.

The Operation and Maintenance Manual contains specific instructions for using and maintaining your product. We suggest that this manual remain with the product for ready reference whenever you are on the water.

Again, thank you for purchasing one of our MerCruiser products. We sincerely hope your boating will be pleasant!



Mercury Racing,  
N7480 County Road "UU"  
Fond du Lac, WI 54935-9585

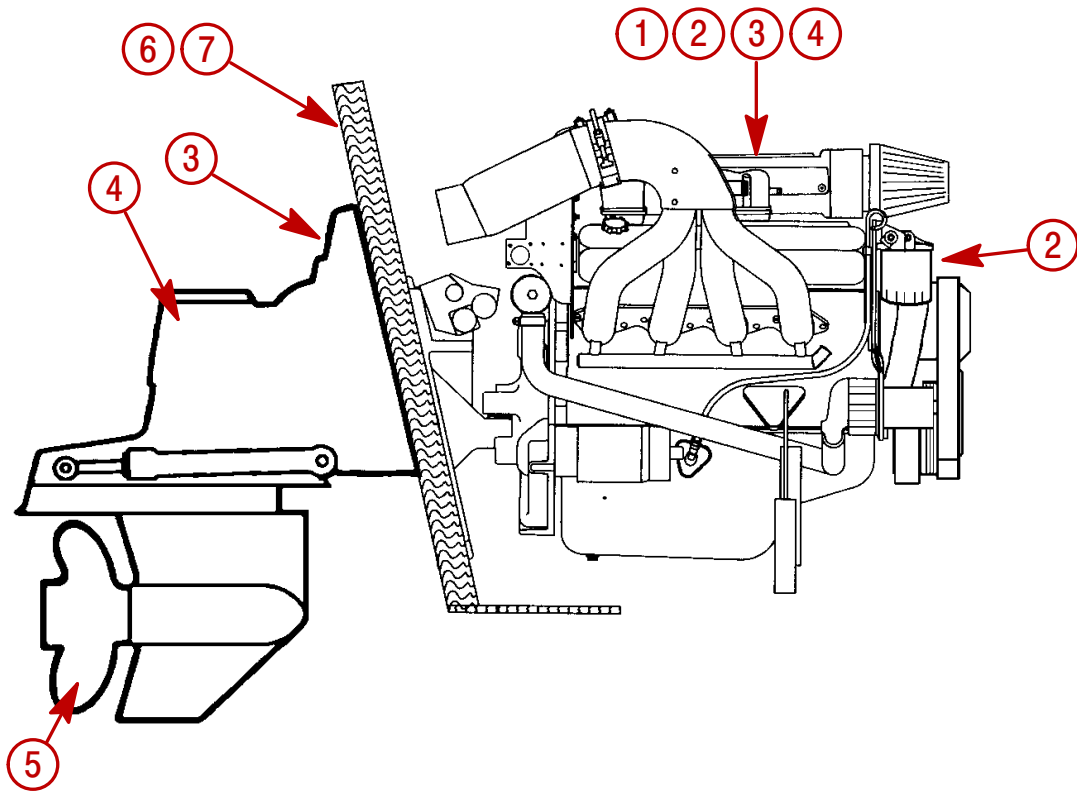
# IDENTIFICATION RECORD

**PLEASE RECORD THE FOLLOWING INFORMATION:**

- 1 Engine Model/Horsepower: \_\_\_\_\_
- 2 Engine S/N: \_\_\_\_\_
- 3 Transom Assembly S/N: \_\_\_\_\_
- 4 Stern Drive S/N & Gear Ratio: \_\_\_\_\_
- 5 Propeller Number/Pitch: \_\_\_\_\_
- 6 Hull ID Number: \_\_\_\_\_
- 7 Boat Model & Length: \_\_\_\_\_

## **SERIAL NUMBERS**

The serial numbers are the manufacturer's keys to numerous engineering details which apply to your MerCruiser® power package. When contacting your Authorized MerCruiser Dealer about service, **always specify model and serial numbers.**



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# WARRANTY INFORMATION

## <sup>ou1</sup>Warranty Registration

### UNITED STATES AND CANADA

1. It is important that your selling dealer fills out the Warranty Registration Card completely and mails it to the factory immediately upon sale of the new product.
2. It identifies name and address of the original purchaser, product model and serial number(s), date of sale, type of use and selling dealer's code, name and address. The dealer also certifies that you are the original purchaser and user of the product.
3. Upon receipt of the Warranty Registration Card at the factory, you will be issued a plastic Owner Warranty Registration Card which is your only valid registration identification. It must be presented to the servicing dealer should warranty service be required. Warranty claims will not be accepted without presentation of this card.
4. A temporary Owner Warranty Registration Card will be presented to you when you purchase the product. It is valid only for 30 days from date of sale while your plastic Owner Warranty Registration Card is being processed. Should your product need service during this period, present the temporary registration card to the dealer. He will attach it to your warranty claim form.
5. Because of your selling dealer's continuing personal interest in your satisfaction, the product should be returned to him for warranty service.
6. If your plastic card is not received within 30 days from date of new product sale, please contact your selling dealer.
7. The product warranty is not effective until the product is registered at the factory.

**NOTE:** *Registration lists must be maintained by factory and dealer on marine products sold in the United States, should notification under the Federal Boat Safety Act be required.*

# WARRANTY INFORMATION

ou2

## Warranty Registration (cont.)

### OUTSIDE THE UNITED STATES AND CANADA

1. It is important that your selling dealer fills out the Warranty Registration Card completely and mails it to the distributor or Marine Power Service Center responsible for administering the warranty registration/claim program for your area.
2. The Warranty Registration Card identifies your name and address, product model and serial number(s), date of sale, type of use and the selling distributor's/dealer's code number, name and address. The distributor/dealer also certifies that you are the original purchaser and user of the product.
3. A copy of the Warranty Registration Card, designated as the "Purchaser's Copy", MUST be given to you immediately after the card has been completely filled out by the selling distributor/dealer. This card represents your factory registration identification, and should be retained by you for future use when required. Should you ever require warranty service on this product, your dealer may ask you for the Warranty Registration Card to verify date of purchase and to use the information on the card to prepare the warranty claim form(s).
4. In some countries, the Marine Power Service Center will issue you a permanent (plastic) Warranty Registration Card within 30 days after receiving the "Factory Copy" of the Warranty Registration Card from your distributor/dealer. If you receive a plastic Warranty Registration Card, you may discard the "Purchaser's Copy" that you received from the distributor/dealer when you purchased the product. Ask your distributor/dealer if this plastic card program applies to you.
5. For further information concerning the Warranty Registration Card and its relationship to Warranty Claim processing, refer to the "International Warranty".

**IMPORTANT: Registration lists must be maintained by the factory and dealer in some countries by law. It is our desire to have ALL products registered at the factory should it ever be necessary to contact you. Make sure your dealer/distributor fills out the warranty registration card immediately and sends the factory copy to the Marine Power International Service Center for your area.**

# WARRANTY INFORMATION

## <sup>oq2</sup> **Transfer Of Warranty**

The limited warranty is transferable to a subsequent purchaser, but only for the remainder of the unused portion of the limited warranty. This will not apply to products used for commercial applications.

### **DIRECT SALE BY OWNER**

The second owner can be registered as the new owner and retain the unused portion of the limited warranty by sending the former owner's plastic Owner Warranty Registration Card and a copy of the bill of sale to show proof of ownership. In the United States and Canada, mail to:

Mercury Marine  
W6250 W. Pioneer Road  
P.O. Box 1939  
Fond du Lac, WI 54936-1939  
Attn: Warranty Registration Department

A new Owner Warranty Registration Card will be issued with the new owner's name and address. Registration records will be changed on the factory computer registration file.

There is no charge for this service.

For products purchased outside the United States and Canada, contact the distributor in your country, or the Mercury Marine Service Office closest to you.

# **WARRANTY INFORMATION**

## **Mercury RACING DIVISION One Year Limited Warranty**

### **WHAT IS COVERED**

Mercury Marine warrants its new products to be free of defects in material and workmanship during the period described below.

### **DURATION OF COVERAGE**

This Limited Warranty provides coverage for one (1) year from either the date the product is first sold to a recreational use retail purchaser, or the date on which the product is first put into service, whichever occurs first. The repair or replacement of parts, or the performance of service under this warranty, does not extend the life of this warranty beyond its original expiration date. Unexpired warranty coverage can be transferred to a subsequent purchaser upon proper re-registration of the product.

### **CONDITIONS THAT MUST BE MET IN ORDER TO OBTAIN WARRANTY COVERAGE**

Warranty coverage is available only to retail customers that purchase from a Dealer authorized by Mercury Marine to distribute the product in the country in which the sale occurred, and then only after the Mercury Marine specified pre-delivery inspection process is completed and documented. Warranty coverage becomes available upon proper registration of the product by the authorized dealer. Inaccurate warranty registration information regarding recreational use, or subsequent change of use from recreational to commercial may void the warranty at the sole discretion of Mercury Marine. Routine maintenance outlined in the Operation, Maintenance and Warranty Manual must be timely performed in order to maintain warranty coverage. Mercury Marine reserves the right to make warranty coverage contingent upon proof of proper maintenance.

# **WARRANTY INFORMATION**

## **Mercury RACING DIVISION One Year Limited Warranty (cont.)**

### **WHAT MERCURY WILL DO**

Mercury's sole and exclusive obligation under this warranty is limited to, at our option, repairing a defective part, replacing such part or parts with new or Mercury Marine certified re-manufactured parts, or refunding the purchase price of the Mercury product. Mercury reserves the right to improve or modify products from time to time without assuming an obligation to modify products previously manufactured.

### **HOW TO OBTAIN WARRANTY COVERAGE**

The customer must provide Mercury with a reasonable opportunity to repair and reasonable access to the product for warranty service. Warranty claims shall be made by delivering the product for inspection to a Mercury dealer authorized to service the product. If purchaser cannot deliver the product to such a dealer, written notice must be given to Mercury. We will then arrange for the inspection and any covered repair. Purchaser in that case shall pay for all related transportation charges and/or travel time. If the service provided is not covered by this warranty, purchaser shall pay for all related labor and material, and any other expenses associated with that service. Purchaser shall not, unless requested by Mercury, ship the product or parts of the product directly to Mercury. The warranty registration card is the only valid registration identification and must be presented to the dealer at the time warranty service is requested in order to obtain coverage.

# WARRANTY INFORMATION

## Mercury RACING DIVISION One Year Limited Warranty (cont.)

### WHAT IS NOT COVERED

This limited warranty does not cover routine maintenance items, tune ups, adjustments, normal wear and tear, damage caused by abuse, abnormal use, use of a propeller or gear ratio that does not allow the engine to run in its recommended wide-open-throttle rpm range (see the Operation, Maintenance & Warranty Manual), operation of the product in a manner inconsistent with the recommended operation/duty cycle section of the Operation, Maintenance & Warranty Manual, neglect, accident, submersion, improper installation (proper installation specifications and techniques are set forth in the installation instructions for the product), improper service, use of an accessory or part not manufactured or sold by us, operation with fuels, oils or lubricants which are not suitable for use with the product (see the Operation, Maintenance & Warranty Manual), alteration or removal of parts, water entering the engine through the fuel intake, air intake or exhaust system, or damage to the product from insufficient cooling water caused by blockage of the cooling system by a foreign body, running the engine out of water, mounting the drive too high on the transom, or running the boat with the drive trimmed out too far. The commercial use of the product, defined as any work or employment related use of the product, or any income generating use of the product, even if such use is only occasional, will void the warranty. Use of the product for racing or other competitive activity, at any point, even by a prior owner of the product, voids the warranty.

Expenses related to haul-out, launch, towing, storage, telephone, rental, inconvenience, slip fees, insurance coverage, loan payments, loss of time, loss of income, or any other type of incidental or consequential damages are not covered by this warranty. Also, expenses associated with the removal and/or replacement of boat partitions or material caused by boat design for access to the product are not covered by this warranty.

# WARRANTY INFORMATION

## Mercury RACING DIVISION One Year Limited Warranty (cont.)

No individual or entity, including Mercury Marine authorized dealers, has been given authority by Mercury Marine to make any affirmation, representation or warranty regarding the product, other than those contained in this limited warranty, and if made, shall not be enforceable against Mercury Marine.

For additional information regarding events and circumstances covered by this warranty, and those that are not, see the Warranty Coverage section of the Operation, Maintenance & Warranty Manual, incorporated by reference into this warranty.

### **DISCLAIMERS AND LIMITATIONS**

**THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. TO THE EXTENT THAT THEY CANNOT BE DISCLAIMED, THE IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIFE OF THE EXPRESS WARRANTY. INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM COVERAGE UNDER THIS WARRANTY. SOME STATES/COUNTRIES DO NOT ALLOW FOR THE DISCLAIMERS, LIMITATIONS AND EXCLUSIONS IDENTIFIED ABOVE, AS A RESULT, THEY MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS WHICH VARY FROM STATE TO STATE AND COUNTRY TO COUNTRY.**

### **PRODUCTS SOLD TO GOVERNMENT AGENCIES**

Contact the Mercury Racing Sales Department for a copy of the Government Agencies Warranty Packet Kit which explains the conditions required for government agencies to receive warranty when purchasing Mercury Racing Outboard or Sterndrive product.

Mercury Racing  
Sales Department  
N7480 County Rd. UU  
Fond du Lac, WI 54935-9585

Phone: 920-921-5330

Fax: 920-921-6533

# **WARRANTY INFORMATION**

## **3 Year Limited Warranty Against Corrosion (Worldwide)**

### **WHAT IS COVERED**

Mercury Marine warrants that each new Mercury, Mariner, Mercury Racing, Sport Jet, M<sup>2</sup> Jet Drive, Tracker by Mercury Marine Outboard, MerCruiser Inboard or Sterndrive engine (Product) will not be rendered inoperative as a direct result of corrosion for the period of time described below.

### **DURATION OF COVERAGE**

This limited corrosion warranty provides coverage for three (3) years from either the date the product is first sold, or the date on which the product is first put into service, whichever occurs first. The repair or replacement of parts, or the performance of service under this warranty does not extend the life of this warranty beyond its original expiration date. Unexpired warranty coverage can be transferred to subsequent (noncommercial use) purchaser upon proper re-registration of the product.

### **CONDITIONS THAT MUST BE MET IN ORDER TO OBTAIN WARRANTY COVERAGE**

Warranty coverage is available only to retail customers that purchase from a Dealer authorized by Mercury Marine to distribute the product in the country in which the sale occurred, and then only after the Mercury Marine specified pre-delivery inspection process is completed and documented. Warranty coverage becomes available upon proper registration of the product by the authorized dealer. Corrosion prevention devices specified in the Operation, Maintenance & Warranty Manual must be in use on the boat, and routine maintenance outlined in the Operation, Maintenance & Warranty Manual must be timely performed (including without limitation the replacement of sacrificial anodes, use of specified lubricants, and touch-up of nicks and scratches) in order to maintain warranty coverage. Mercury Marine reserves the right to make warranty coverage contingent upon proof of proper maintenance.



# WARRANTY INFORMATION

## 3 Year Limited Warranty Against Corrosion (Worldwide) (cont.)

### WHAT MERCURY WILL DO

Mercury's sole and exclusive obligation under this warranty is limited to, at our option, repairing a corroded part, replacing such part or parts with new or Mercury Marine certified re-manufactured parts, or refunding the purchase price of the Mercury product. Mercury reserves the right to improve or modify products from time to time without assuming an obligation to modify products previously manufactured.

### HOW TO OBTAIN WARRANTY COVERAGE

The customer must provide Mercury with a reasonable opportunity to repair, and reasonable access to the product for warranty service. Warranty claims shall be made by delivering the product for inspection to a Mercury dealer authorized to service the product. If purchaser cannot deliver the product to such a dealer, written notice must be given to Mercury. We will then arrange for the inspection and any covered repair. Purchaser in that case shall pay for all related transportation charges and/or travel time. If the service provided is not covered by this warranty, purchaser shall pay for all related labor and material, and any other expenses associated with that service. Purchaser shall not, unless requested by Mercury, ship the product or parts of the product directly to Mercury. The warranty registration card is the only valid registration identification and must be presented to the dealer at the time warranty service is requested in order to obtain coverage.

### WHAT IS NOT COVERED

This limited warranty does not cover electrical system corrosion; corrosion resulting from damage, corrosion which causes purely cosmetic damage, abuse or improper service; corrosion to accessories, instruments, steering systems; corrosion to factory installed jet drive unit; damage due to marine growth; product sold with less than a one year limited Product warranty; replacement parts (parts purchased by customer); products used in a commercial application. Commercial use is defined as any work or employment related use of the product, or any use of the product which generates income, for any part of the warranty period, even if the product is only occasionally used for such purposes.

# WARRANTY INFORMATION

## 3 Year Limited Warranty Against Corrosion (Worldwide) (cont.)

Corrosion damage caused by stray electrical currents (on-shore power connections, nearby boats, submerged metal) is not covered by this corrosion warranty and should be protected against by the use of a corrosion protection system, such as the Mercury Precision Parts or Quicksilver MerCathode system and/or Galvanic Isolator. Corrosion damage caused by improper application of copper base anti-fouling paints is also not covered by this limited warranty. If anti-fouling protection is required, Tri-Butyl-Tin-Adipate (TBTA) base anti-fouling paints are recommended on Outboard and MerCruiser boating applications. In areas where TBTA base paints are prohibited by law, copper base paints can be used on the hull and transom. Do not apply paint to the outboard or MerCruiser product. In addition, care must be taken to avoid an electrical interconnection between the warranted product and the paint. For MerCruiser product, an unpainted gap of at least 1.5 inches (38 mm) should be left around the transom assembly. Refer to the Operation, Maintenance & Warranty Manual for additional details.

For additional information regarding events and circumstances covered by this warranty, and those that are not, see the Warranty Coverage section of the Operation, Maintenance & Warranty Manual, incorporated by reference into this warranty.

### **DISCLAIMERS AND LIMITATIONS**

**THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. TO THE EXTENT THAT THEY CANNOT BE DISCLAIMED, THE IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIFE OF THE EXPRESS WARRANTY. INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM COVERAGE UNDER THIS WARRANTY. SOME STATES/COUNTRIES DO NOT ALLOW FOR THE DISCLAIMERS, LIMITATIONS AND EXCLUSIONS IDENTIFIED ABOVE, AS A RESULT, THEY MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS WHICH VARY FROM STATE TO STATE AND COUNTRY TO COUNTRY.**

# WARRANTY INFORMATION

## Warranty Coverage and Exclusions for Mercury Racing Outboard and Sterndrive Products

The purpose of this section is to help eliminate some of the more common misunderstandings regarding warranty coverage. The following information explains some of the types of services that are not covered by warranty. The provisions set forth following have been incorporated by reference into the Mercury Racing Division Three Year Limited Warranty Against Corrosion Failure, the Mercury Racing Division 90 Day and One Year Limited Warranties.

Keep in mind that warranty covers repairs that are needed within the warranty period because of defects in material and workmanship. Installation errors, accidents, normal wear, and a variety of other causes that affect the product are not covered.

Warranty is limited to defects in material or workmanship, but only to retail customers that purchase from a Dealer authorized by Mercury Marine to distribute the product in the country in which the sale occurred, and then only after the Mercury Marine specified pre-delivery inspection process is completed and documented.

Should you have any questions concerning warranty coverage, contact your authorized dealer. They will be pleased to answer any questions that you may have.

### GENERAL EXCLUSIONS FROM WARRANTY

- 1** Corrosion damage incurred by your 900 SC MerCruiser product(s) is not covered under this warranty.
- 2** Minor adjustments and tune-ups, including checking, cleaning or adjusting spark plugs, ignition components, carburetor or EFI settings, filters, belts, controls, and checking lubrication made in connection with normal services.
- 3** Damage caused by lack of maintenance.
- 4** Haul-out, launch, towing charges, and all related transportation charges and/or travel time, etc.
- 5** Additional service work requested by customer other than that necessary to satisfy the warranty obligation.

# WARRANTY INFORMATION

## Warranty Coverage and Exclusions for Mercury Racing Outboard and Sterndrive Products (cont.)

- 6** Labor performed by other than an authorized dealer may be covered only under following circumstances: When performed on emergency basis (providing there are no authorized dealers in the area who can perform the work required or have no facilities to haul out, etc., and prior factory approval has been given to have the work performed at this facility).
- 7** Use of other than Mercury Precision or Quicksilver parts when making warranty repairs.
- 8** Engine noise does not necessarily indicate a serious engine problem. If diagnosis indicates a serious internal engine condition which could result in a failure, condition responsible for noise should be corrected under the warranty.
- 9** Lower unit and/or propeller damage caused by striking a submerged object is considered a marine hazard.
- 10** Water in the starter motor.
- 11** Starter motors and/or armatures or field coil assembly, which are burned, or where lead is thrown out of commutator because of excess cranking.
- 12** Valve or valve seat grinding required because of wear.
- 13** Removal of the tamper proof seals without prior pre-approval from Mercury Racing.

# GENERAL INFORMATION

oba1

## Boater's Responsibilities

The boat driver is responsible for correct and safe operation of the boat and safety of its occupants and general public. It is strongly recommended that each operator (driver) read and understand this entire manual before operating the outboard.

Be sure at least one additional person on board is instructed in the basics of starting, operating and boat handling in case the driver is unable to operate the boat.

obb1

## Before Operating Your Boat

Read this manual carefully. Safety and operating information that is practiced along with using good common sense can help prevent personal injury and product damage. If you have any questions, contact your dealer.

This manual as well as safety labels posted on the engine package use safety alerts to draw your attention to special safety instructions that must be followed.

### **WARNING**

**WARNING – Hazards or unsafe practices which COULD result in severe personal injury or death.**

### **CAUTION**

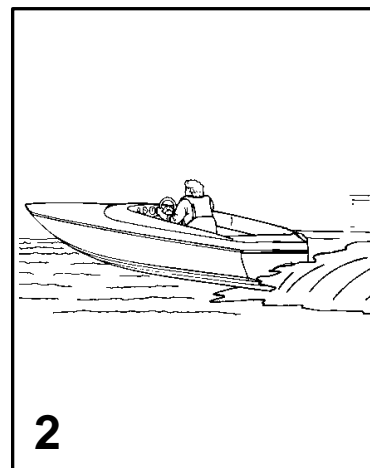
**CAUTION – Hazards or unsafe practices which could result in minor injury or product or property damage.**

**IMPORTANT:** - Indicates information or instructions that are necessary for proper operation and/or maintenance.

# GENERAL INFORMATION

US COAST GUARD CAPACITY	
MAXIMUM HORSEPOWER	XXX
MAXIMUM PERSON CAPACITY (POUNDS)	XXX
MAXIMUM WEIGHT CAPACITY	XXX

1



obc1

## Boat Horsepower Capacity

- 1 Do not overpower or overload your boat. Most boats will carry a required capacity plate indicating the maximum acceptable power and load as determined by the manufacturer following certain federal guidelines. If in doubt, contact your dealer or the boat manufacturer.

### **⚠ WARNING**

#### Overpowering a Boat Can Cause:

- Serious injury, death, or boat damage.
- Loss of Boat Control.
- Flotation Characteristics of Boat to be Altered from Placing Too Much Weight on Transom.
- Boat to Break Apart, Particularly Around the Transom Area.

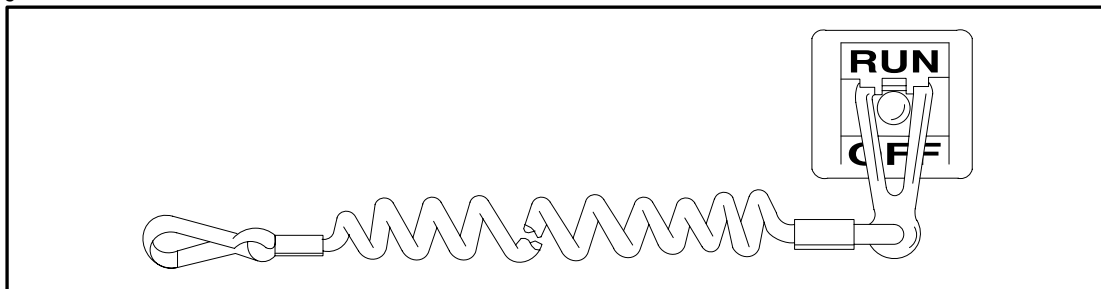
## High-Speed and High-Performance Boat Operation

- 2 If you are not familiar with high-performance boat operation we recommend that you first request an orientation/demonstration ride with your dealer or an operator experienced with your boat/sterndrive combination. Refer to the "Guide to Hi-Performance Boat Operation" booklet (P/N 90-849250R1) included in your literature packet.

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# GENERAL INFORMATION

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## Lanyard Stop Switch

### **⚠ WARNING**

**Should the operator fall out of the boat, the possibility of serious injury or death from being run over by the boat can be greatly reduced by stopping the engine immediately. Always properly connect both ends of the stop switch lanyard to the stop switch and the operator.**

- 1** The purpose of a lanyard stop switch is to turn off the engine when the operator moves far enough away from the operator's position (as in accidental ejection from the operator's position) to activate the switch. A lanyard stop switch can be installed as an accessory – generally on the dashboard or side adjacent to the operator's position.
- 2** While activation of the lanyard stop switch will stop the engine immediately, a boat will continue to coast for some distance depending upon the velocity and degree of any turn at shut-down. However, the boat will not complete a full circle. While the boat is coasting, it can cause injury to anyone in the boat's path as seriously as the boat would when under power.

(continued on next page)

# GENERAL INFORMATION

## Lanyard Stop Switch (Continued)

### **WARNING**

**Avoid serious injury or death from deceleration forces resulting from in accidental stop switch activation. The boat operator should never leave the operator's station without first disconnecting the stop switch lanyard cord from themselves.**

Accidental or unintended activation of the Lanyard Stop Switch during normal operation is a possibility and could cause any, or all, of the following potentially hazardous situations:

- 3** Occupants could be thrown forward due to unexpected loss of forward motion – a particular concern for passengers in the front of the boat who could be ejected over the bow and possibly struck by the gear case or propeller.
- 4** Loss of power and directional control in heavy seas, strong current or high winds.
- 5** Loss of control when docking.

CA19

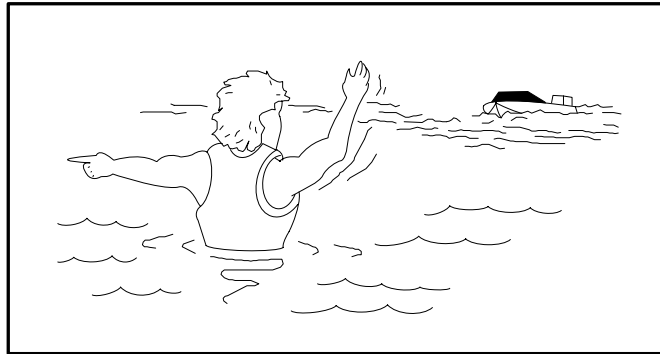
## **Trailing Boat**

Boat can be trailered with drive unit in “up” or “down” position. Adequate road clearance is required between road and gear housing skeg when trailering with drive unit in “down” position.

If adequate road clearance is a problem, place drive unit in full trailer position and support with an optional trailer kit which is available from your Authorized MerCruiser Dealer.



# GENERAL INFORMATION



gob3

## Protecting People In The Water

### WHILE YOU ARE CRUISING

It is very difficult for a person in the water to take quick action to avoid a boat heading in their direction even at slow speed.

Always slow down and exercise extreme caution any time you are boating in an area where there might be people in the water.

Whenever a boat is moving (even coasting) even with the drive unit in neutral position, there is sufficient force by the water to rotate the propeller. This neutral propeller rotation can cause serious injury.

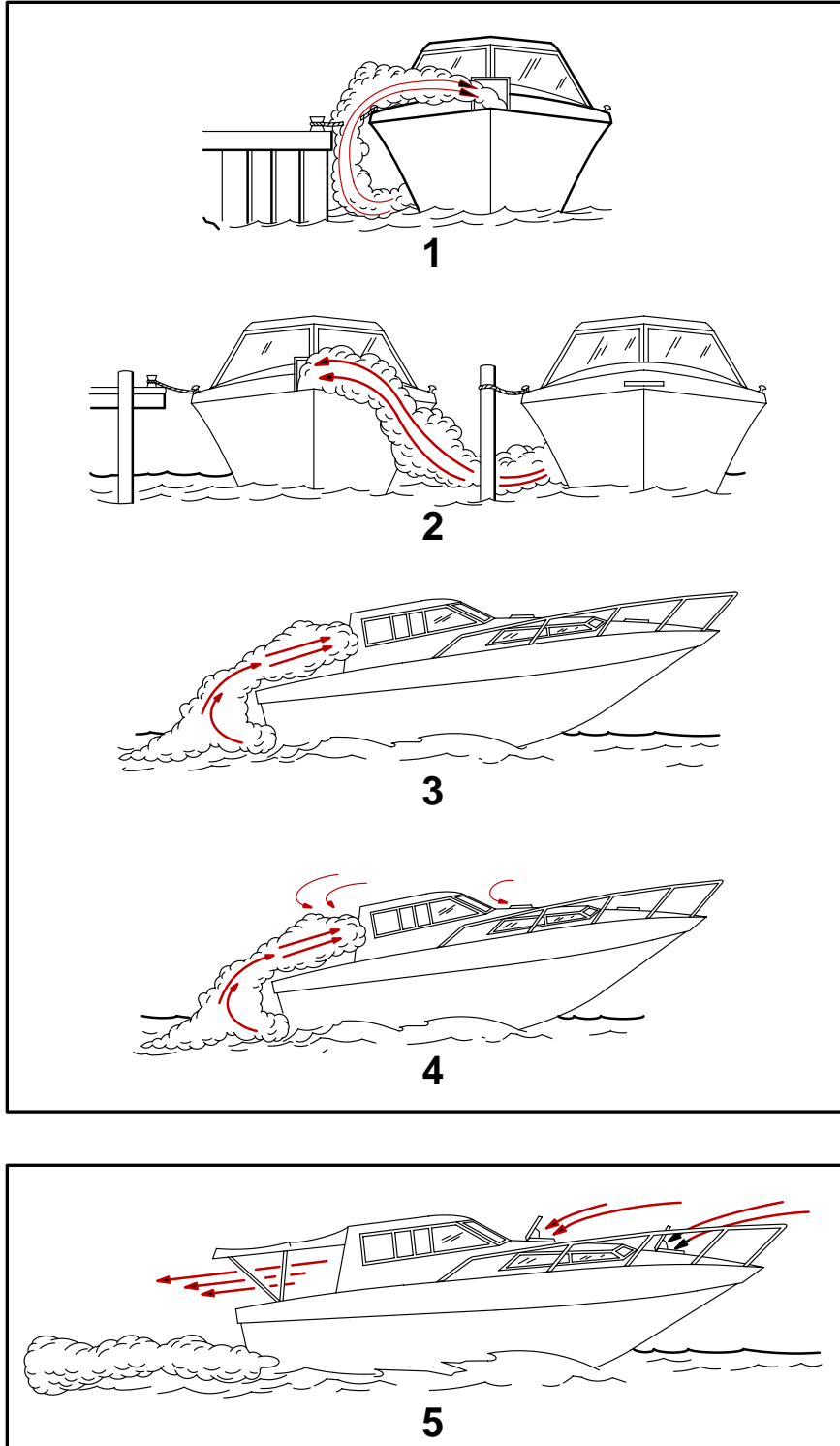
### WHILE BOAT IS STATIONARY

Shift the drive unit into neutral and shut off the engine before allowing people to swim or be in the water near your boat.

## **WARNING**

**Stop your engine immediately whenever anyone in the water is near your boat. Serious injury to the person in the water is likely if contacted by a rotating propeller, a moving boat, a moving gear case, or any solid device rigidly attached to a moving boat or gear case.**

# GENERAL INFORMATION



Courtesy of ABYC

# GENERAL INFORMATION

## Carbon Monoxide Risk

### **WARNING**

**Avoid the combination of a running engine and poor ventilation. Prolonged exposure to carbon monoxide in sufficient concentration can lead to unconsciousness, brain damage, or death.**

Carbon monoxide is a deadly gas that is odorless, colorless and tasteless and is present in the exhaust fumes of all internal combustion engines.

Early symptoms of carbon monoxide poisoning which should not be confused with seasickness or intoxication, include headache, dizziness, drowsiness, and nausea.

### **INSUFFICIENT FRESH AIR FLOW**

Under certain conditions, enclosed or canvas enclosed cabins or cockpits with insufficient ventilation may draw in carbon monoxide. Install one or more carbon monoxide detectors in your boat.

Although rare, on a very calm day, swimmers and passengers in an open stationary boat with a running engine, or near a running engine may be exposed to a hazardous level of carbon monoxide.

### **Insufficient Air Flow Could Occur If:**

#### **While boat is stationary**

- 1 Boat moored in a confined space with the engine running.
- 2 Boat is moored close to another boat with its engine running.

#### **While boat is moving**

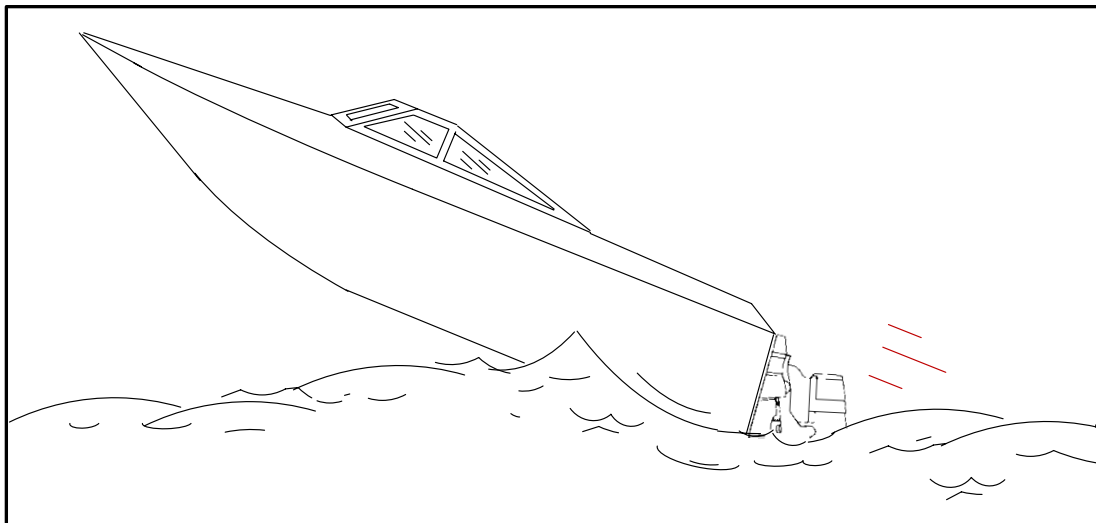
- 3 Running the boat with the trim angle of the bow too high.
- 4 Running the boat with no forward hatches open (station wagon effect).

### **SUFFICIENT FRESH AIR FLOW**

- 5 Example of desired air flow through the boat.

Ventilate passenger area, open side curtains, or forward hatches to remove carbon monoxide fumes.

# GENERAL INFORMATION



## Wave And Wake Jumping

Operating recreational boats over waves and wakes is a natural part of boating. However, when this activity is done with speed to force the boat hull partially or completely out of the water, certain hazards arise, particularly when the boat re-enters the water.

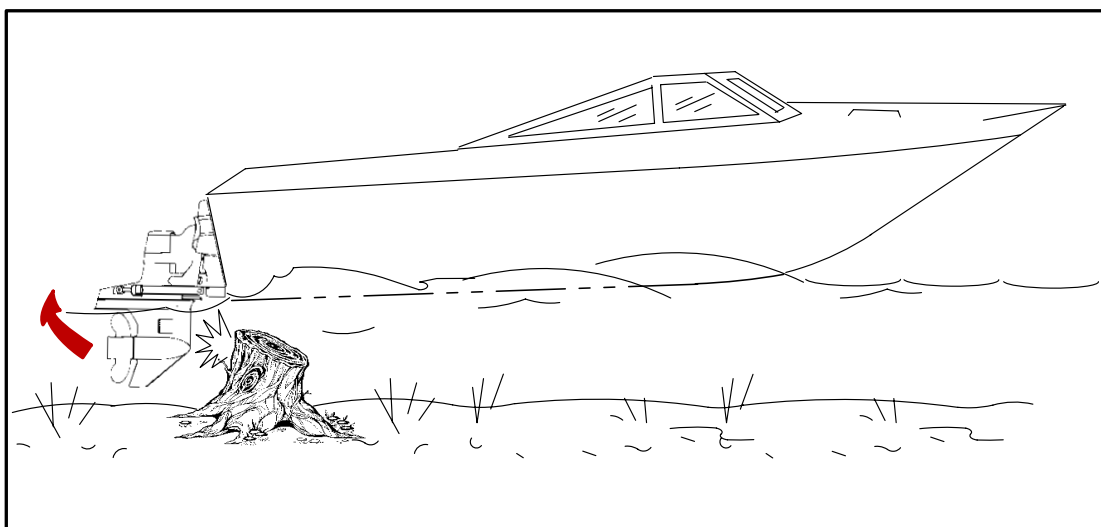
The primary concern is the boat changing direction while in the midst of the jump. In such case the landing may cause the boat to violently veer in a new direction. Such a sharp change in direction or turn can cause occupants to be thrown out of their seats or out of the boat.

There is another less common hazardous result from allowing your boat to launch off a wave or wake. If the bow of your boat pitches down far enough while airborne, upon water contact it may penetrate under the water surface and “submarine” for an instant. This will bring the boat nearly to a stop in an instant and can send the occupants flying forward. The boat may also steer sharply to one side.

### **⚠ WARNING**

**Avoid serious injury or death from being thrown within or out of a boat when it lands after jumping a wave or wake. Avoid wave or wake jumping whenever possible. Instruct all occupants that if a wake or wave jump occurs, get low and hang on to any boat hand hold.**

# GENERAL INFORMATION



## Impact With Underwater Hazards

Reduce speed and proceed with caution whenever you're driving a boat in shallow water areas or in areas where the waters are suspected of having underwater obstacles that could be struck by the sterndrive or the boat bottom. The Power Trim hydraulic system is designed to provide some impact protection for the drive unit if a submerged object is struck while boat is moving forward. There is no impact protection in REVERSE. The hydraulic system will cushion the kickup of the drive unit as it clears the object, reducing damage to unit. After drive unit has cleared object, the drive will return to the original operating position, preventing loss of steering control and engine over-speed. **The most important thing you can do to help reduce injury or impact damage from striking a floating or underwater object is control the boat speed. When driving in waters known to have floating or underwater obstacles, boat speed should be kept to a minimum planing speed (15 to 25 mph).**

**IMPORTANT:** The impact protection system cannot be designed to ensure total protection from impact damage under all conditions.

(continued on next page)

# GENERAL INFORMATION

## Impact With Underwater Hazards (cont.)

Striking a floating/underwater object may result in an infinite number of situations. Some of these situations could result in the following:

- The boat could move suddenly in a new direction. Such a sharp change in direction or turn can cause occupants to be thrown out of their seats or out of the boat.
- A rapid reduction in speed. This will cause occupants to be thrown forward, even out of the boat.
- Impact damage to the sterndrive and/or boat.

After striking a submerged object, stop engine as soon as possible and inspect the sterndrive unit for any broken or loose parts. If damage is present or suspected, the power package should be taken to an authorized dealer for a thorough inspection and necessary repair.

The boat should also be checked for any hull fractures, transom fractures, water leaks.

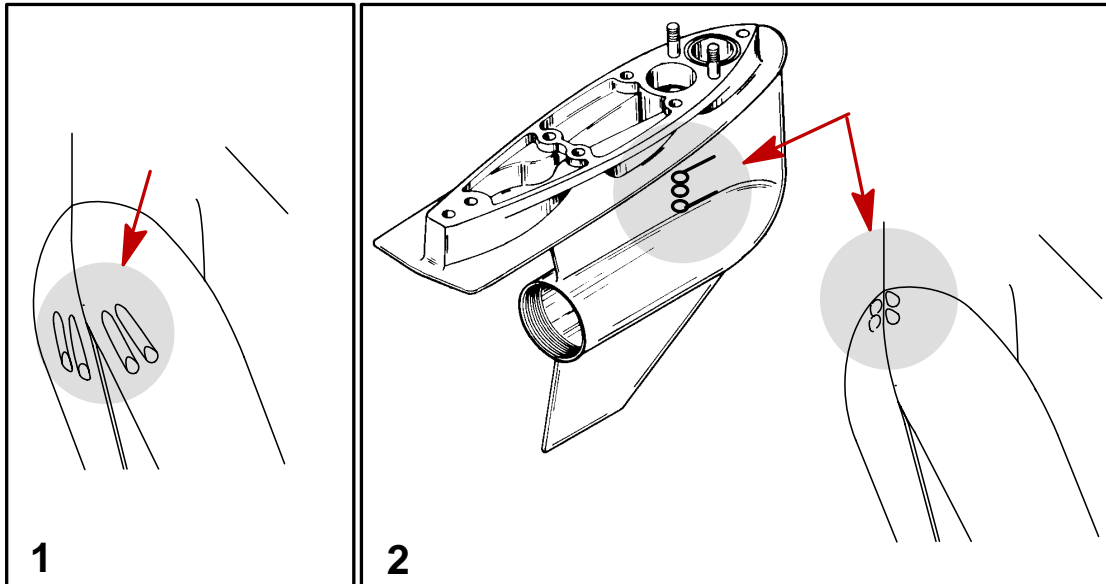
Operating a damaged sterndrive could cause additional damage to other parts of the power package, or could affect control of the boat. If continued running is necessary, do so at greatly reduced speeds.

### **WARNING**

**Avoid serious injury or death from loss of boat control. Continued boating with major impact damage can result in sudden component failure with or without subsequent impacts, Have the power package thoroughly inspected and any necessary repairs made.**

# GENERAL INFORMATION

CA802



## Operating In Shallow Water

### ⚠ CAUTION

**Serious engine damage could occur by failing to follow these instructions. Sand, silt or mud could be sucked into the water inlets restricting or shutting off the water supply to the engine.**

- 1 Low Water Inlet Gear Cases:** Extreme care should be exercised when operating a boat equipped with **only** low water inlets while maneuvering in shallow water. Due to a small amount of total water inlet area, there is high suction at the water inlets. These inlets will easily clog with bottom contact and are susceptible to clogging when operated in shallow or weedy water.
- 2 Dual Water Inlet Gear Cases:** The design of the dual water inlet gear case reduces the risk of restricting or shutting off the water supply to the engine, but caution should still be used when operating in shallow weedy water.

### Clearing a Dual Water Inlet Gear Case

- Idle the boat out to deep water.
- Bring the boat up on plane but operate at a moderate speed until the engine temperature and block water pressure returns to normal. Engine block pressure at the gauge can still be low if the line to the gauge is clogged.

# GENERAL INFORMATION

## Safe Boating Suggestions

In order to safely enjoy the waterways, familiarize yourself with local and other governmental boating regulations and restrictions, and consider the following suggestions.

- **Know and obey all nautical rules and laws of the waterways.** Boat operators should complete a boating safety course. Courses are offered in the U.S.A. by (1) The US Coast Guard Auxiliary, (2) The Power Squadron, (3) The Red Cross and (4) your state or provincial boating law enforcement agency. Inquiries may be made to the Boating Hotline, 1-800-368-5647 or the Boat US Foundation information number 1-800-336-BOAT.

We strongly recommend that all powerboat operators attend one of these courses.

You should also review the NMMA Sources of Waterway Information booklet. It lists regional sources of safety, cruising and local navigation and is available at no charge by writing to:

Sources of Waterway Information  
National Marine Manufacturers Association  
410 N. Michigan Avenue  
Chicago, IL 60611 U.S.A.

- **Perform safety checks and required maintenance.** Follow a regular schedule and ensure that all repairs are properly made.
- **Check safety equipment on board.** Here are suggestions of the types of safety equipment to carry when boating:
  - a. Approved fire extinguisher(s); paddle or oar.
  - b. Signal devices: flashlight, rockets or flares, flag and whistle or horn.
  - c. Spare propeller, thrust hubs and an appropriate wrench.
  - d. Tools for necessary minor repairs; first aid kit and book.
  - e. Anchor, extra anchor line; water-proof storage containers.
  - f. Manual bilge pump and extra drain plugs; compass and map or chart of area.
  - g. Spare operating equipment; batteries, bulbs, fuses, etc.
  - h. Transistor radio and drinking water.

(continued on next page)



# GENERAL INFORMATION

## Safe Boating Suggestions (Continued)

- **Know signs of weather change and avoid foul weather and rough-sea boating.**
- **Tell someone where you are going and when you expect to return.**
- **Passenger boarding.** Stop the engine whenever passengers are boarding, unloading or are near the back (stern) of the boat. Just shifting the drive unit into neutral is not sufficient.
- **Use personal flotation devices.** Federal Law requires that there be a U. S. Coast Guard approved, wearable-type life jacket (personal flotation device), correctly sized and readily accessible for every person on board, plus a throwable cushion or ring. We strongly advise that everyone wear a life jacket at all times while in the boat.
- **Prepare other boat operators.** Instruct at least one person on board in the basics of starting and operating the engine and boat handling in case the driver becomes disabled or falls overboard.
- **Do not overload your boat.** Most boats are rated and certified for maximum load (weight) capacities (refer to your boat capacity plate). When in doubt, contact your dealer or the boats manufacturer. Know your boat's operating and loading limitations.
- **Make sure everyone in the boat is properly seated.** Don't allow anyone to sit or ride on any part of the boat that was not intended for such use. This includes backs of seats, gunwales, transom, bow, decks, raised fishing seats, any rotating fishing seat; anywhere that sudden unexpected acceleration, sudden stopping, unexpected loss of boat control or sudden boat movement could cause a person to be thrown overboard or into the boat.
- **Never be under the influence of alcohol or drugs while boating (it is the law).** They impair your judgment and greatly reduce your ability to react quickly.

(continued on next page)

# GENERAL INFORMATION

## Safe Boating Suggestions (Continued)

- **Know your boating area and avoid hazardous locations.**
- **Be alert.** The operator of the boat is responsible by law to “maintain a proper lookout by sight (and hearing).” The operator must have an unobstructed view particularly to the front. No passengers, load, or fishing seats should block the operators view when operating the boat above idle or planing transition speed. Watch “the other guy,” the water and your wake.
- **Never drive your boat directly behind a water skier in case the skier falls.** As an example, your boat traveling at 25 miles per hour (40 km/h) in 5 seconds will overtake a fallen skier who was 200 feet in front of you.
- **Watch fallen skiers.** When using your boat for water skiing or similar activities, always keep a fallen or down skier on the operator’s side of the boat while returning to attend the skier. The operator should always have the down skier in sight and never back up to the skier or anyone in the water.
- **Report accidents.** Boat operators are required by law to file a Boating Accident Report with their state boating law enforcement agency when their boat is involved in certain boating accidents. A boating accident must be reported if (1) there is loss of life or probable loss of life, (2) there is personal injury requiring medical treatment beyond first aid, (3) there is damage to boats or other property where the damage value exceeds \$500.00 or (4) there is complete loss of the boat. Seek further assistance from local law enforcement.

CA21

## Stolen Power Package

If your power package is stolen, immediately advise the local authorities and Mercury Marine of the model and serial number(s) and to whom the recovery is to be reported. This “Stolen Motor” information is placed into a file at Mercury Marine to aid authorities and dealers in recovery of stolen motors.

# SPECIFICATIONS

## Fuel Requirements

### WARNING

**FIRE AND EXPLOSION HAZARD:** Fuel leakage from any part of fuel system can be a fire and explosion hazard which can cause serious bodily injury or death. Careful periodic inspection of entire fuel system is mandatory, particularly after storage. All fuel components including fuel tanks, whether plastic metal or fiberglass, fuel lines, fittings, fuel filters and carburetors/fuel injection components should be inspected for leakage, softening, hardening, swelling or corrosion. Any sign of leakage or deterioration requires replacement before further engine operation.

### CAUTION

Use of improper gasoline can damage your engine seriously. Engine damage resulting from use of improper gasoline is considered misuse of engine, and damage caused thereby will not be covered under the limited warranty.

### OCTANE REQUIREMENTS FOR YOUR ENGINE: (UNITED STATES AND CANADA)

FUEL TYPE	MINIMUM POSTED OCTANE
Unleaded regular or premium <sup>1</sup>	$(R+M) \div 2 = 87$ or $RON^* = 92$

*\*Research Octane Number*

### WHEN UNLEADED FUEL IS NOT AVAILABLE USE: (OUTSIDE THE UNITED STATES AND CANADA)

FUEL TYPE	MINIMUM POSTED OCTANE
Leaded regular	$(R+M) \div 2 = 89$ or $RON^* = 94$

*\*Research Octane Number*

<sup>1</sup> The use of premium unleaded fuels with octane ratings higher than  $(R+M) \div 2 = 87$  are acceptable to use but will not give any increase in performance or durability.

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# SPECIFICATIONS

## **USING REFORMULATED (OXYGENATED) GASOLINES (USA ONLY)**

This type of gasoline is required in certain areas of the US. The two types of “oxygenates” used in these fuels are alcohol (Ethanol) or Ether (MTBE or ETBE). If Ethanol is the “oxygenate” that is used in the gasoline in your area, refer to “Gasolines Containing Alcohol” also.

These “Reformulated Gasolines” are acceptable for use in your MerCruiser engine.

CA277hp

## **GASOLINES CONTAINING ALCOHOL**

If the gasoline in your area contains either “methanol” (methyl alcohol) or “ethanol” (ethyl alcohol), you should be aware of certain adverse effects that can occur. These adverse effects are more severe with “methanol”. Increasing the percentage of alcohol in the fuel can also worsen these adverse effects.

Some of these adverse effects are caused because the alcohol in the gasoline can absorb moisture from the air, resulting in a separation of the water/alcohol from the gasoline in the fuel tank.

The fuel system components on your MerCruiser engine will withstand up to 10% alcohol content in the gasoline. We do not know what percentage your boat’s fuel system will withstand. Contact your boat manufacturer for specific recommendations on the boats fuel system components (fuel tanks, fuel lines, and fittings).

(continued on next page)

# SPECIFICATIONS

## **GASOLINE CONTAINING ALCOHOL MAY INCREASE:**

- Corrosion of metal parts.
- Deterioration of rubber or plastic parts.
- Fuel permeation through rubber fuel lines.
- Starting and operating difficulties and decrease in performance.

**Because of possible adverse effects of alcohol in gasoline, it is recommended that only alcohol-free gasoline be used where possible.** If only fuel containing alcohol is available, or if the presence of alcohol is unknown, increased inspection frequency for leaks and abnormalities is required.

**IMPORTANT:** When operating a MerCruiser engine on gasoline containing alcohol, storage of gasoline in the fuel tank for long periods should be avoided. Long periods of storage, common to boats, create unique problems. In cars alcohol-blend fuels normally are consumed before they can absorb enough moisture to cause trouble, but boats often sit idle long enough for phase separation to take place. In addition, internal corrosion may take place during storage if alcohol has washed protective oil films from internal components.

# SPECIFICATIONS

## Crankcase Oil

### OIL RECOMMENDATIONS

PREFERRED OILS	API CLASSIFICATION
Quicksilver 4-Cycle Marine Engine Oil (25W-40)	SH, SG, CF/CF-2
Premium grade multi-viscosity 20W-50 automotive oil	SH, SG, CF/CF-2
<b>OTHER RECOMMENDATIONS IF PREFERRED OILS ARE NOT AVAILABLE</b>	
Premium multi-viscosity 20W-40 automotive oil	SH, SG, CF/CF-2
Straight weight detergent automotive oil of correct viscosity (See Chart Below)	SH, SG, CF/CF-2
<b>Oil filter should always be changed with oil</b>	

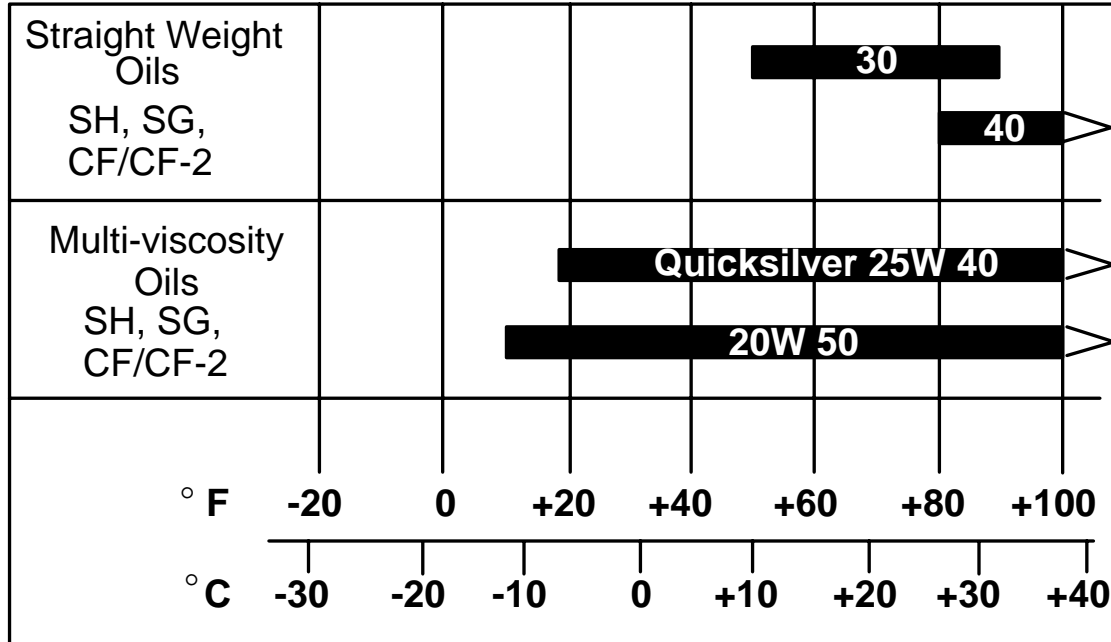
### IMPORTANT OIL PRACTICES

<b>Do Not Use</b>
• Non-detergent oils
• Oils containing solid additives
• Multi-viscosity oils other than the ones recommended
• Low quality oils
<b>Do Not Mix</b>
• Straight weight and multi-viscosity oils
• Different brands of oils, straight weight or multi-viscosity
• Different weights of straight weight or different weights of multi-viscosity oils.

# SPECIFICATIONS

## Crankcase Oil (con't)

### TEMPERATURE/OIL VISCOSITY CHART



## Capacities

MODEL	500 EFI
Crankcase Oil Capacity w/New Filter <sup>1</sup>	8 US qts (7.6 L)
<b>Bravo XR/XZ</b> - Drive Unit Oil Capacity (w/Monitor)	2.8 US qts (2.65 L)
<b>Bravo III</b> - Drive Unit Oil Capacity (w/Monitor)	3 US qts (2.8 L)
Seawater Cooling System <sup>2</sup>	20 US qts (18.9 L)

<sup>1</sup> Always use dipstick to determine exact quantity of oil required.

<sup>2</sup> Seawater Cooling System capacity information is for winterization use only.

# SPECIFICATIONS

## Engine Specifications

**NOTE:** Where applicable, specifications are derived at sea level.

<b>MODEL</b>	<b>500 EFI</b>
Displacement cid/L	502 (8.2)
Propshaft Horsepower	470
Propshaft Kilowatts	350
Bore	4.47 in. (113.5 mm)
Stroke	4.00 in. (101.6 mm)
Compression Ratio	8.75:1
Compression Pressure	175 psi (1207 kPa)
Maximum rpm @ WOT <sup>1</sup>	4800-5200
Idle rpm in or out of Gear	750 Minimum
Fuel Pump Pressure (Mechani- cal Fuel Pump	3-7 psi (21-48 kPa)
Fuel pump pressure (@ Fuel Rail)	IDLE 39 psi. (269 kPa) W.O.T 41 psi. (282 kPa)

(continued on next page)



# SPECIFICATIONS

## Engine Specifications (cont.)

<b>MODEL</b>	<b>500 EFI</b>
Oil Pressure @ Idle rpm (Hot)	30 psi (207 kPa)
Min. Oil Pressure @ W.O.T.	45 psi Min. (310 kPa)
Engine Oil Temp. @ 5200 rpm	170°-180°F (77° –82°C)
Thermostat	140°F (61°C)
Engine Water Pressure @ 4800–5200 rpm	20 psi min.-30 psi max. measured at the lower block drain position

<sup>1</sup> Engines are equipped with an ignition system that have a built-in 5400 rpm rev limiter. Engine is performing normally if it will not exceed this rpm.

## Tune Up Specifications

<b>MODEL</b>	<b>500 EFI</b>
Spark Plug Type	AC-MR43T, NGK BR6FS, P/N 33-59571 or Champion RV8C
Spark Plug Gap	.035 in. (0.9 mm)
Timing @ Idle rpm	8° BTDC (See Note)
Firing Order	1-8-4-3-6-5-7-2
Serpentine Belt Tension (Note 2)	New 120 lbs. (530 N) Used 80 lbs (350 N)

Note 1: A special procedure must be followed to check or adjust timing. Consult your Authorized MerCruiser Dealer before attempting this procedure.

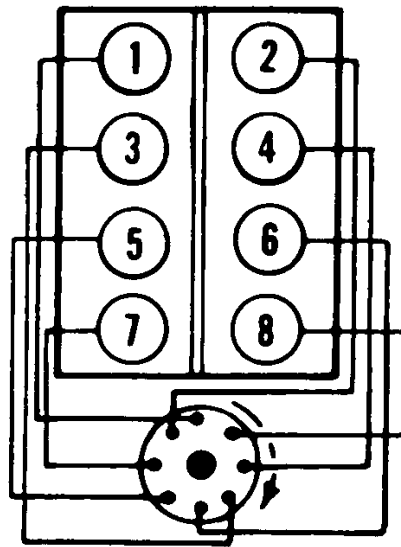
Note 2: Special belt tension tool required.

# SPECIFICATIONS

## Tune Up Specifications (cont.)

<b>MODEL</b>	<b>500 EFI</b>
Electrical System	12-Volt Negative (-) Ground
Alternator	50 Amps
Valve Lash	1 turn down from zero lash
Recommended Battery Rating	Minimum 550 CCA or 700 mca or 120 Amp/Hrs

LH ROTATION  
FRONT



Firing Order  
1-8-4-3-6-5-7-2

# OPERATION

## Engine Break-in

### CAUTION

Severe damage to the engine can result by not complying with the Engine Break-in Procedure.

#### 5 HR. BREAK-IN PROCEDURE

- Allow engine to warm-up for 30 - 60 seconds.
- Do not exceed 3/4 throttle.
- Avoid full throttle acceleration from IDLE speed.
- Always vary throttle setting.
- Run engine the majority of time between 3000 - 4500 rpm.
- Frequently check crankcase oil level. Add oil if needed. It is normal for oil consumption to be high during break-in period.

CA211hp

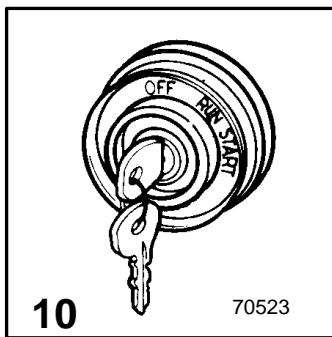
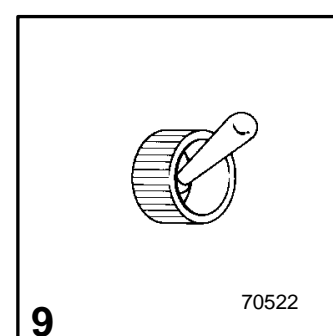
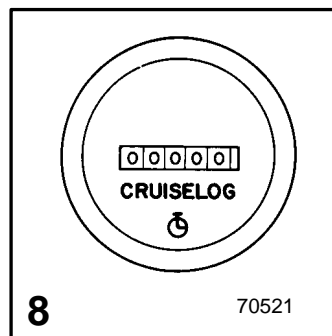
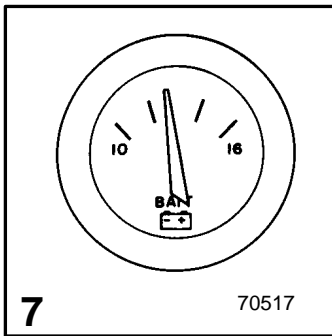
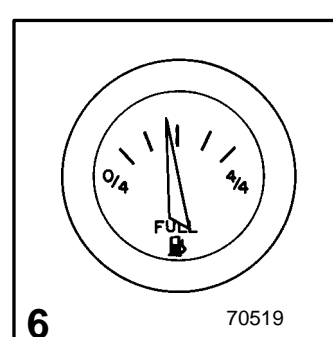
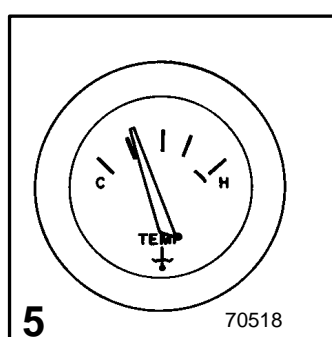
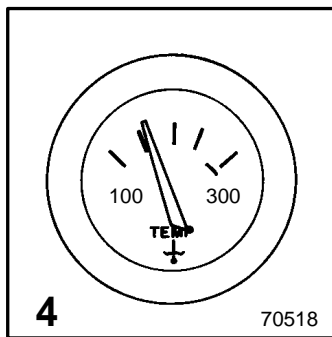
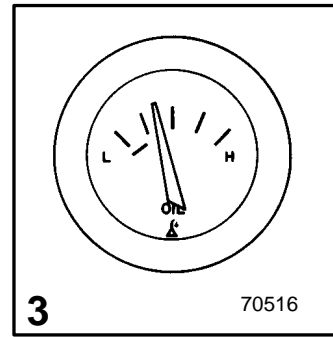
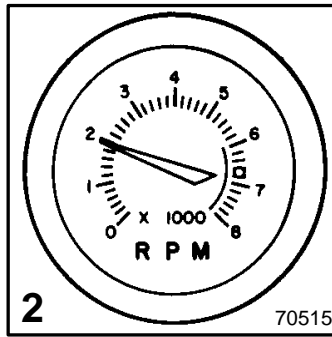
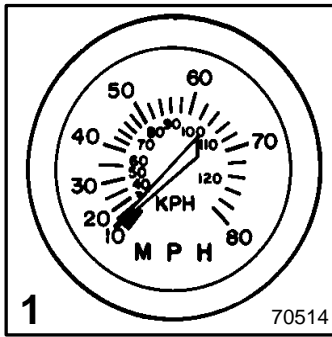
## After Break-In Period

To help extend the life of your MerCruiser power package, the following recommendations should be considered:

#### AFTER 5 HR. BREAK-IN

- Use a propeller that allows the engine to operate at or near the top of the maximum rpm range (See "Specifications" section) when at full throttle with a normal boat load.
- Operation at 3/4 throttle setting or lower is recommended. Refrain from prolonged operation at maximum (full throttle) rpm.
- Do not operate at full throttle until engine reaches normal operating temperature.
- Follow the maintenance schedule in this manual.

# OPERATION



# OPERATION

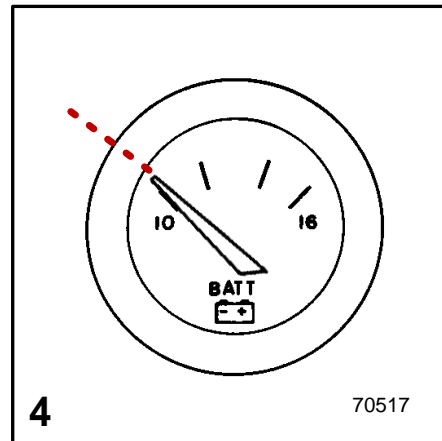
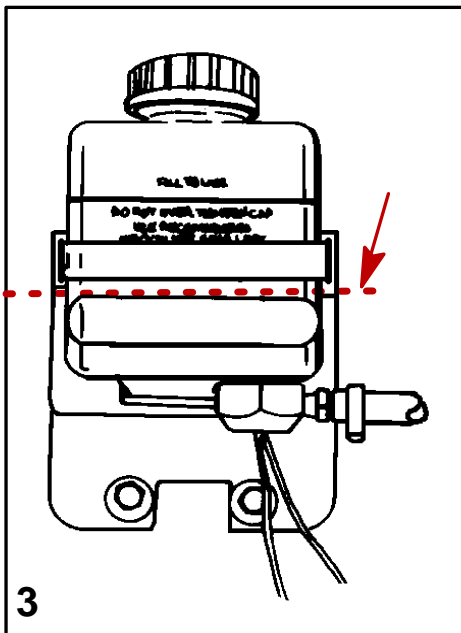
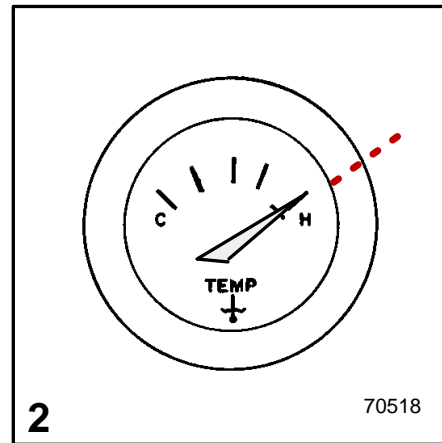
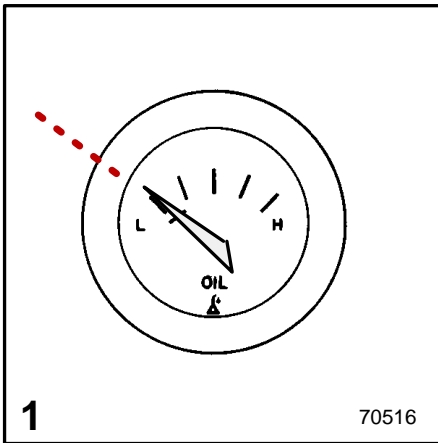
## Instrumentation

The following is a brief explanation of instrumentation typically found on some boats. The owner/operator should be familiar with all instruments and their functions on the boat.

- 1** Speedometer - indicates boat speed.
- 2** Tachometer - indicates engine rpm.
- 3** Oil Pressure Gauge - indicates engine oil pressure.
- 4** Oil Temperature Gauge - indicates engine oil operating temperature.
- 5** Water Temperature Gauge - indicates engine operating temperature.
- 6** Fuel Gauge - indicates fuel tank volume.
- 7** Battery Meter - indicates battery voltage.
- 8** Hour Meter - records engine running time.
- 9** Bilge Blower Switch - must be operated for five minutes before starting engine to ventilate bilge.
- 10** Ignition Switch - allows operator to start and stop engine.

# OPERATION

CB218



# OPERATION

## Audio Warning System

Your MerCruiser power package may be equipped with an Audio Warning System.

**NOTE:** *Testing the System: The buzzer will sound when the ignition switch is turned to the RUN position, prior to cranking the engine. Once the engine starts, the buzzer should stop.*

### CAUTION

**Avoid engine damage. Do not operate engine once a continuous buzzer has sounded EXCEPT TO AVOID A HAZARDOUS SITUATION. The Audio Warning System will not protect the engine from damage. It is designed to warn the operator that a problem has occurred.**

When the buzzer sounds with the engine running, stop engine immediately. Investigate cause and correct it, if possible. If cause cannot be determined, consult your Authorized MerCruiser Dealer.

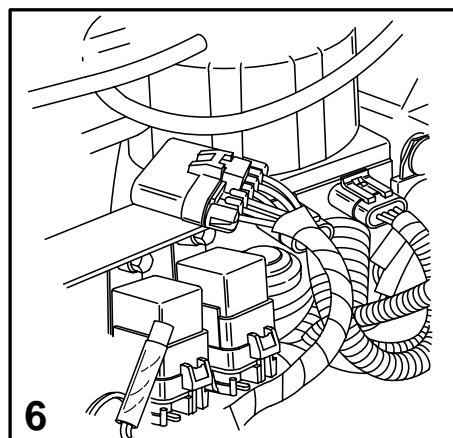
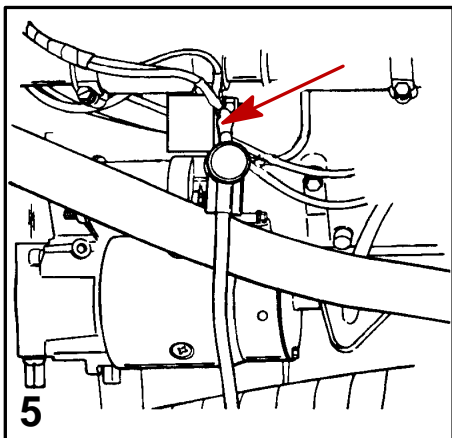
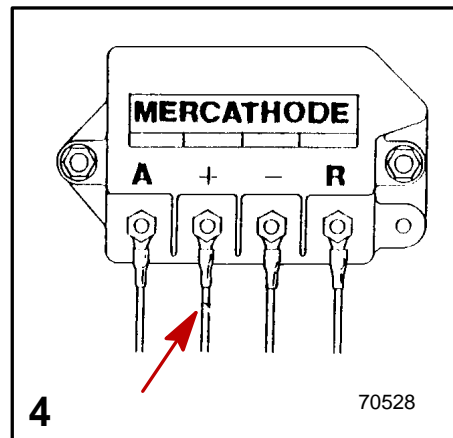
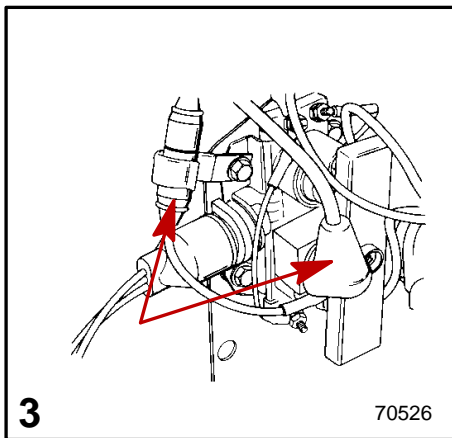
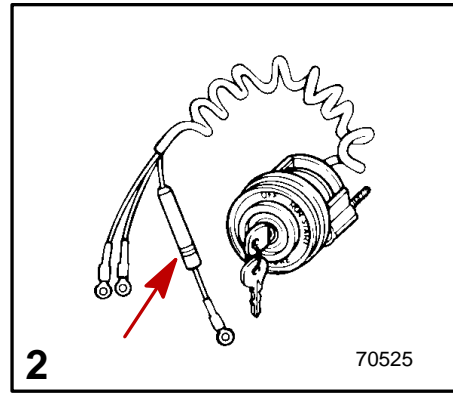
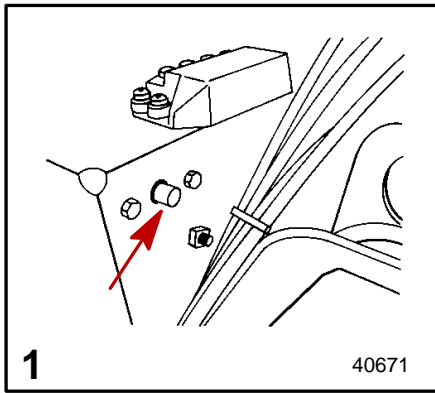
The audio warning system buzzer will sound continuously if any of the following occur:

- 1 Insufficient Oil Pressure.
- 2 Excessive Engine Temperature.
- 3 Insufficient Drive Lubricant.
- 4 Low Voltage (At or below 10V).

The audio warning system will beep steadily if the ECM detects a fault code from one of the engine sensors. A fault code will be set in the ECM.

- 1 The beeping warning can be stopped by turning the engine off. If beeping continues on restart, a fault code was detected again. Correct problem before further operation.
- 2 On restart, if the beeping has stopped, a fault code has been set in the ECM and will need to be diagnosed and cleared by an Authorized MerCruiser Dealer.

# OPERATION





# OPERATION

## Electrical System Overload Protection

If an electrical overload occurs, a fuse will blow or the circuit breaker will trip open. The cause must be found and corrected before replacing fuse or resetting circuit breaker.

- 1 A circuit breaker provides protection for engine wiring harness and instrumentation power lead. Reset by pushing RESET button IN.

In an emergency, when engine must be operated and cause for high current draw cannot be located and corrected, perform the following:

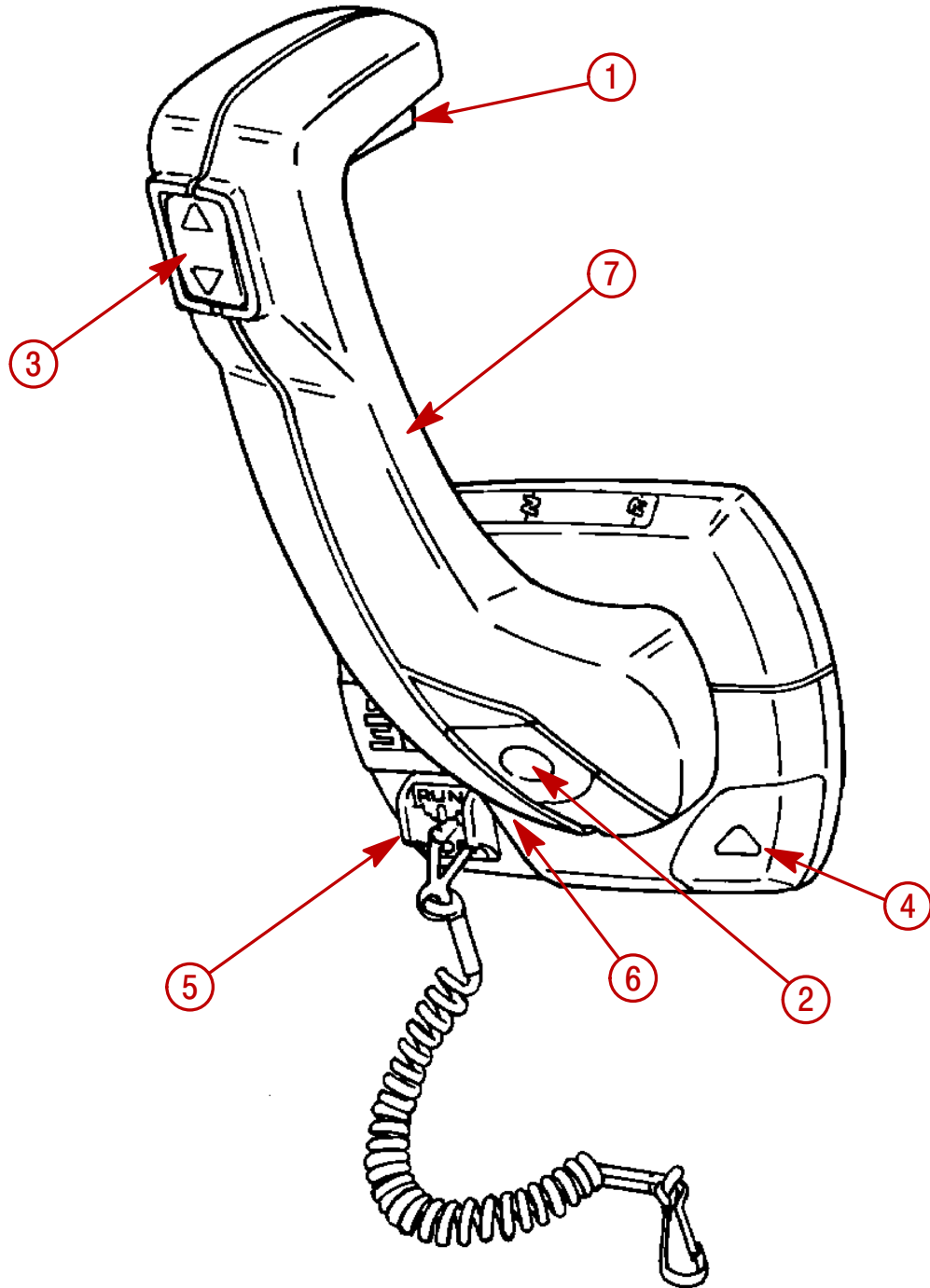
- Turn OFF or disconnect all accessories connected to engine and instrumentation wiring.
  - Reset circuit breaker.
  - If breaker remains open, electrical overload has not been eliminated.
  - Further checks must be made on electrical system.
- 2 A 20 amp fuse may be located in ignition switch "I" terminal lead to protect electrical system. Check for blown fuse if key is turned to START and nothing happens (and circuit breaker is not tripped).
  - 3 The Power Trim System is protected from overload by 110 amp fuse and a 20 amp in-line fuse on Power Trim pump.

**NOTE:** *Dual Power Trim Control Models-Refer to wiring diagrams for fuse location.*

- 4 The Quicksilver MerCathode System has a 20 amp in-line fuse in the wire which connects to positive (+) terminal on controller. If fuse is blown, system will not operate and a loss of corrosion protection will result.
- 5 A 90 amp. fuse is located on the starter.
- 6 Three fuses are located at the upper rear of the engine.
  - 15 amp. = Fuel Pump
  - 15 amp. = Electronic Control Module (ECM), Data Link Connector (DLC) / Battery
  - 10 amp. = ECM / Ignition / Injectors / Battery

# OPERATION

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# OPERATION

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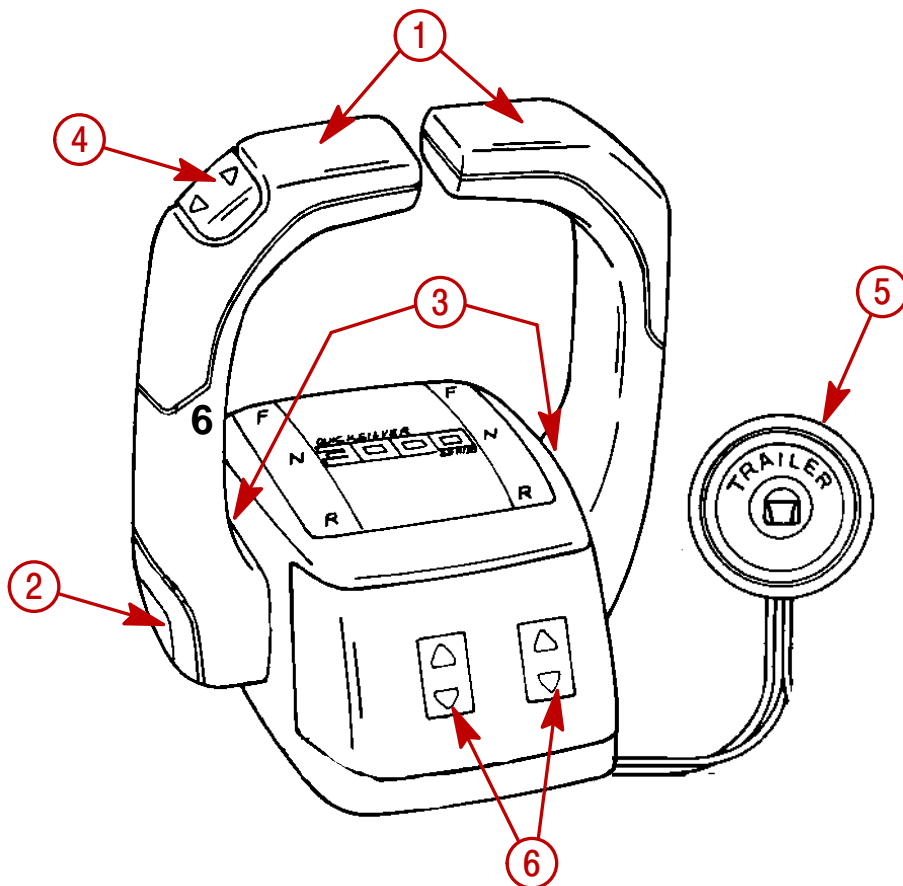
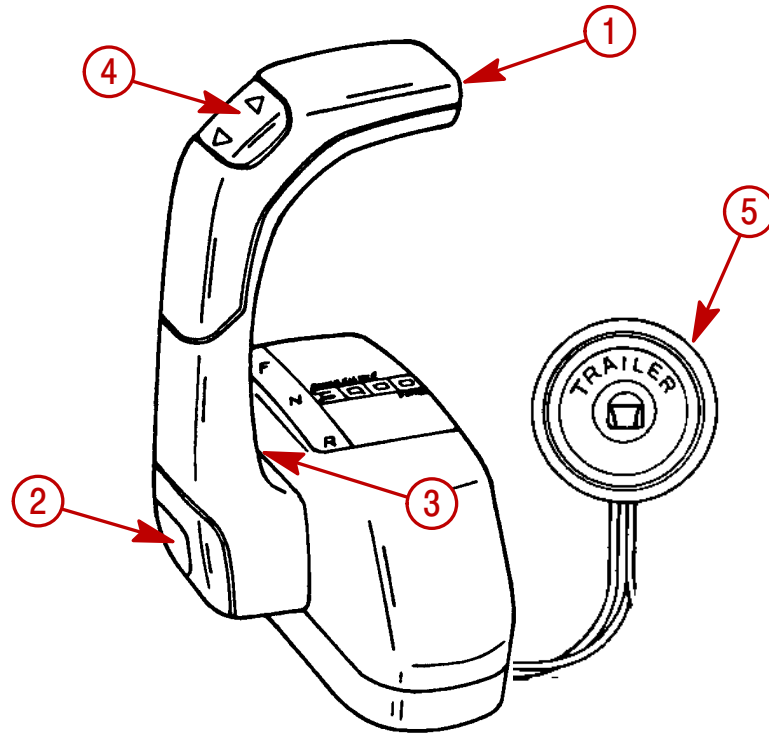
## Remote Controls (Panel Mounted)

Your boat may be equipped with one of many Quicksilver® remote controls available. All controls feature an integral safety switch that allows starting engine in NEUTRAL only. Also, all controls may not have all features shown. If boat is equipped with a remote control other than shown, consult your dealer for a description and/or demonstration of the control.

- 1 Neutral Lock Bar** - Prevents accidental shift and throttle engagement. Neutral lock bar must be pulled “Up” to move the control handle out of neutral.
- 2 Throttle Only Button** - Allows throttle advancement without shifting the engine. This is done by disengaging the shift mechanism from the control handle. The throttle only button can be depressed only when the remote control handle is in the “Neutral” position, and should only be used to assist in starting the engine.
- 3 Power Trim Switch** - See “Power Trim” for detailed power trim operating procedures.
- 4 Trailer Switch - (Not used with Bravo Heavy Duty Transoms)**  
See “Power Trim” for detailed trailer switch operation.
- 5 Lanyard Stop Switch** - Turns the ignition “Off”. See “Lanyard Stop Switch” at the front of this manual for operation and safety warning on the use of this switch.
- 6 Control Handle Tension Adjustment Screw** - This screw can be adjusted to “Increase” or “Decrease” the tension on the control handle. This will help prevent “Creep” of the remote control handle. Turn screw “Clockwise” to increase tension and “Counter-clockwise” to decrease tension. Adjust to tension desired.
- 7 Control Handle** - Operation of the shift and throttle are controlled by the movement of the control handle. “Push” the control handle forward from “Neutral” with a quick firm motion to the first detent for “Forward” gear. Continue pushing forward to increase speed. Pull the control handle back from “Neutral” with a quick firm motion to the first detent for “Reverse” gear. Continue pulling back to increase speed.

# OPERATION

CB183



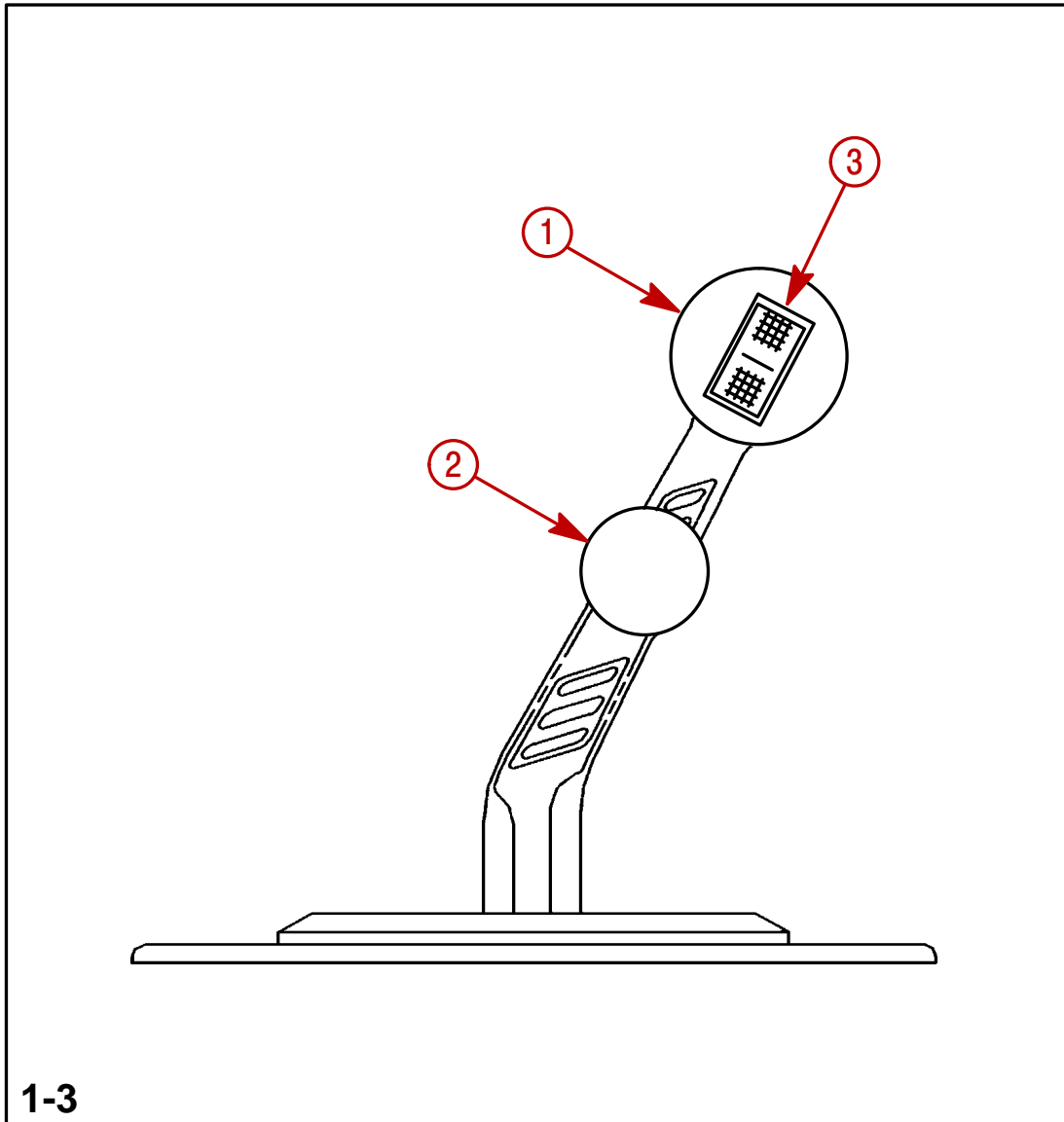
# OPERATION

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## Remote Controls (Console Mounted)

- 1 Control Handle(s)** - Operation of the shift and throttle are controlled by the movement of the control handle. "Push" the control handle forward from "Neutral" with a quick firm motion to the first detent for "Forward" gear. Continue pushing forward to increase speed. Pull the control handle back from "Neutral" with a quick firm motion to the first detent for "Reverse" gear. Continue pulling back to increase speed.
- 2 Throttle Only Button** - Allows engine throttle advancement without shifting the engine. This is done by disengaging the shift mechanism from the control handle. The throttle only button can be depressed only when the remote control handle is in the "Neutral" position, and should only be used to assist in starting the engine.
- 3 Control Handle Tension Adjustment Screw** - This screw can be adjusted to "Increase" or "Decrease" the tension on the control handle (cover must be removed to adjust). This will help prevent "Creep" of the remote control handle. Turn screw "Clockwise" to increase tension and "Counterclockwise" to decrease tension. Adjust to tension desired.
- 4 Power Trim Switch** - See "Power Trim" section for detailed power trim operating procedures.
- 5 Trailer Switch - (Not used with Bravo Heavy Duty Transoms)** See "Power Trim" for detailed trailer switch operation.
- 6 Power Trim Adjustment Switch's (Used on Three Button Trim Control Only)** - See "Power Trim" section for detailed power trim operating procedures.

# OPERATION



# OPERATION

CB184

## Remote Controls (Console Mounted Zero Effort)

- 1 Throttle Control Lever(s)** - Operation of the throttle is controlled by the movement of the longer control lever(s). "Pushing" the control lever forward increases engine speed. Detentes are used to give the movement of the lever a "notched" precise feel. The detentes also help to hold the lever at the desired engine rpm to reduce operator fatigue.

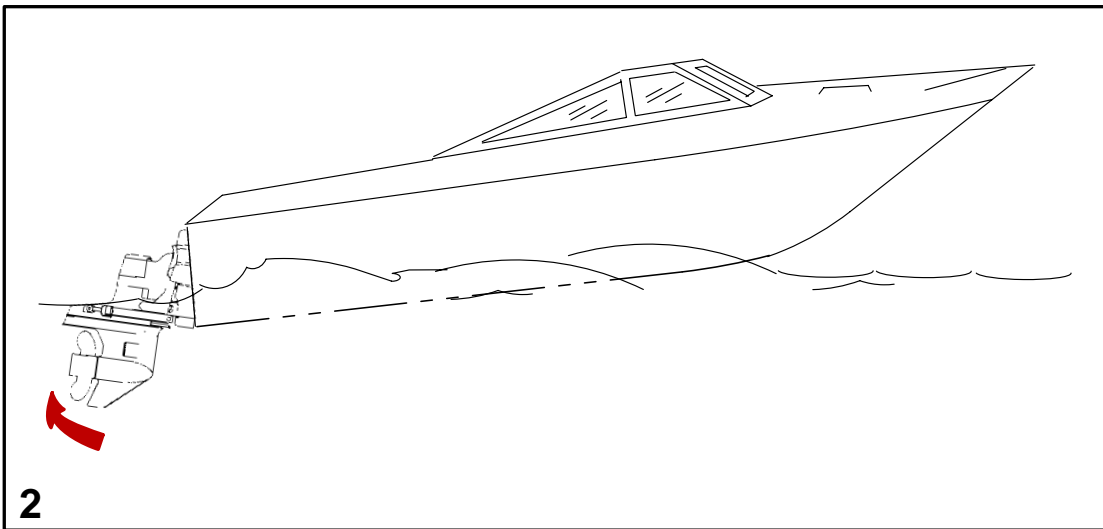
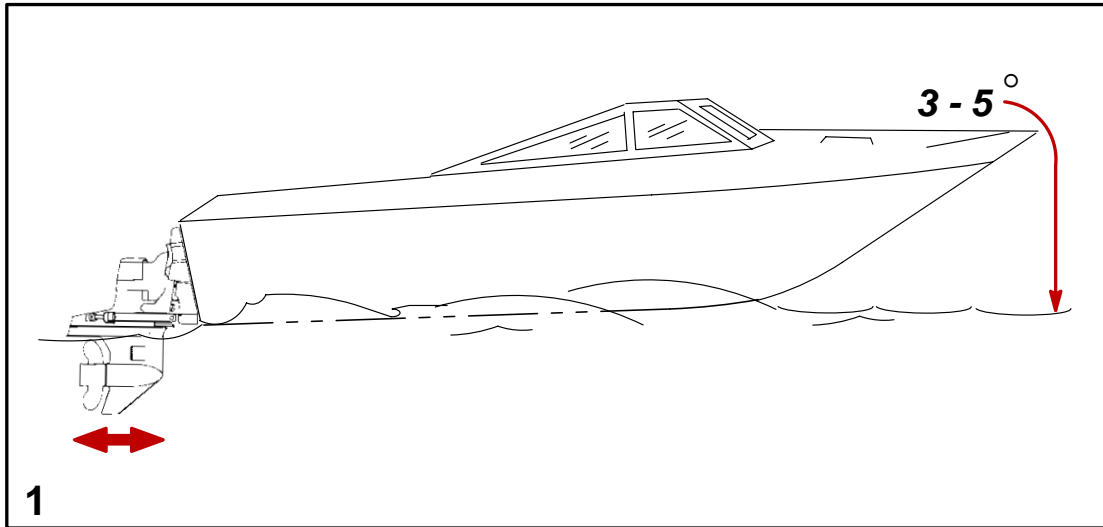
### CAUTION

**Never shift unit into or out of gear unless the engine is at idle rpm.**

- 2 Shift Control Lever(s)** - Shifting is controlled by the shorter control lever(s). This control shifts unit into gear with full lever movement. Move lever forward to engage FORWARD gear. Move lever backward to engage REVERSE gear. Lever in center position shifts to NEUTRAL. Shifting should occur only with the engine at idle speed. Always move to the desired gear position with a quick, firm motion. The control handle should be adjusted by your dealer to engage forward, reverse and neutral when the lever is at the appropriate detent.
- 3 Power Trim Switch** - See "Power Trim" section for detailed power trim operating procedures.

# OPERATION

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# OPERATION

## Power Trim

Power Trim allows the operator to adjust the drive angle, while underway, to provide the ideal boat angle for varying load and water conditions.

### CAUTION

Engine must maintain a minimum of 20 psi of water pressure and should not exceed 30 psi maximum at 4800 to 5200 RPM as measured at the lower block drain position (either side of the block).

**IMPORTANT:** In order to significantly raise the strength of the Hi-Performance heavy duty gimbal ring, the trim limit and electric trim indicator sending unit mounting position has been eliminated. Having no trim limit switch permits the operator to trim the drive to any position at any throttle setting.

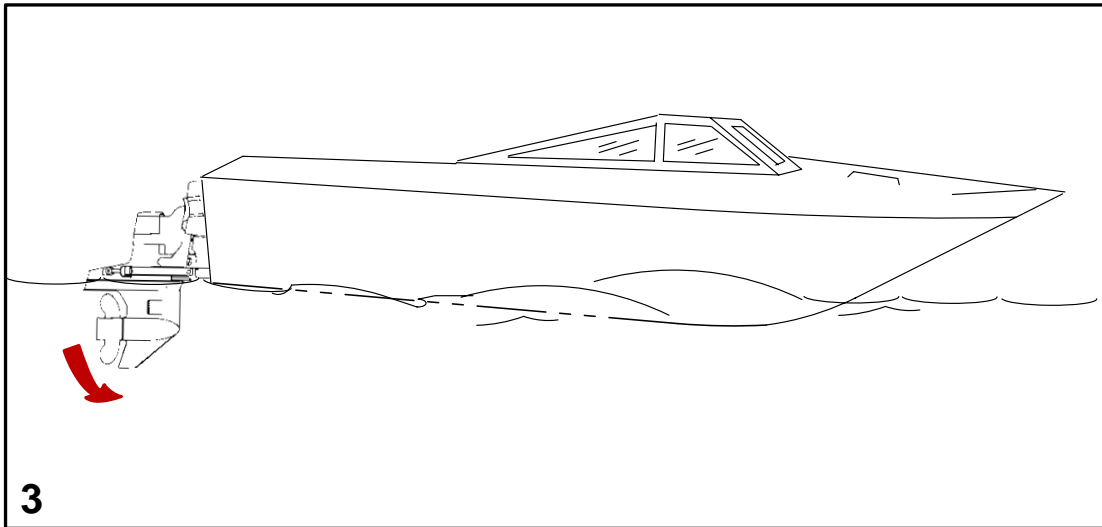
### CAUTION

Use extreme caution when operating with drive unit raised. Severe damage to the drive unit may result if unit is raised beyond the gimbal ring support flanges at engine speeds above 1200 rpm. It is recommended that Bravo heavy duty gimbal rings use manual indicators to help keep the operator aware of the drive positioning.

- 1 In most cases, best overall performance is obtained with the drive unit adjusted so the boat bottom will run at a 3° to 5° angle to the water.
- 2 **Trimming Drive Unit UP/OUT Can:**
  - Generally increase top speed.
  - Increase clearance over submerged objects or a shallow bottom.
  - Cause boat to accelerate and plane off slower.
  - In excess, cause boat porpoising” (bouncing) or propeller ventilation.
  - Cause engine overheating if trimmed UP/OUT to a point where any cooling water intake holes are above the water line.

(continued on next page)

# OPERATION



## Power Trim (cont.)

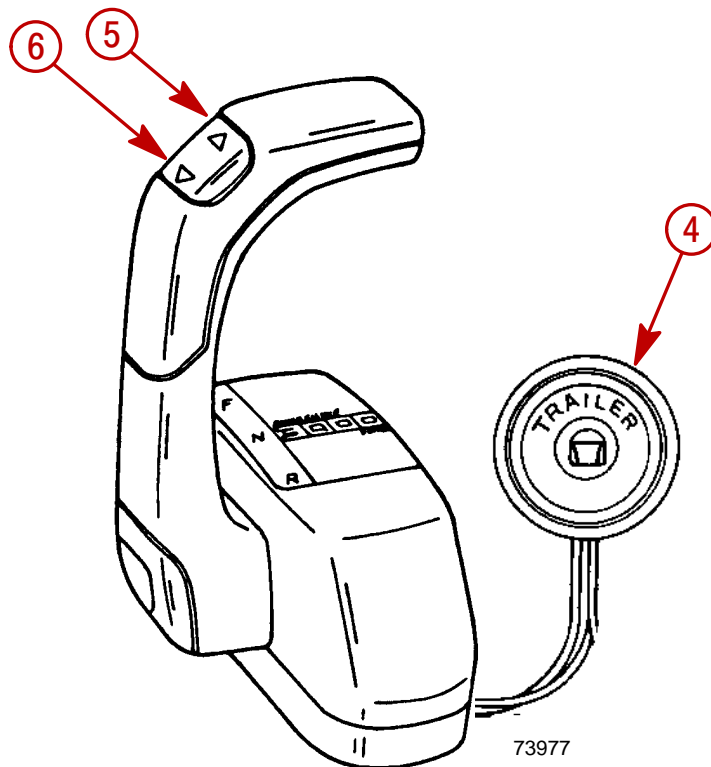
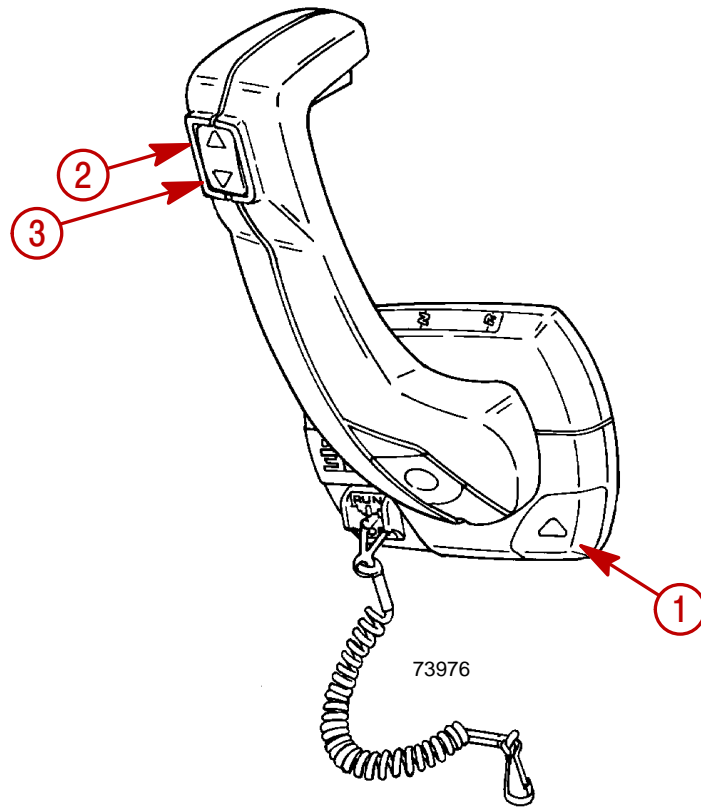
### 3 Trimming Drive Unit DOWN/IN Can:

- Help the boat accelerate and plane off quicker.
- Generally improve the ride in choppy water.
- In most cases, reduce boat speed.
- If in excess, lower the bow of some boats to a point at which they begin to plow with their bow in the water while on plane. This can result in an unexpected turn in either direction called “bow steering” or “over steering” if any turn is attempted, or if a significant wave is encountered.

# NOTES

# OPERATION

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# OPERATION

## POWER TRIM OPERATION - PANEL MOUNT REMOTE CONTROL

**IMPORTANT:** If TRAILER button is held depressed after drive unit reaches end of upward travel, an internal circuit breaker will open and pump will stop. Should this happen, release button and allow motor to cool for about one minute. Circuit breaker will reset and Power Trim operation may be resumed.

### CAUTION

The Bravo heavy duty gimbal does not have a trim limit switch. Depressing the trim and/or trailer buttons will allow the drive to be tilted to its full extension without stopping at a preset trim limit. Manual indicators are recommended to help keep the operator aware of the drive positioning.

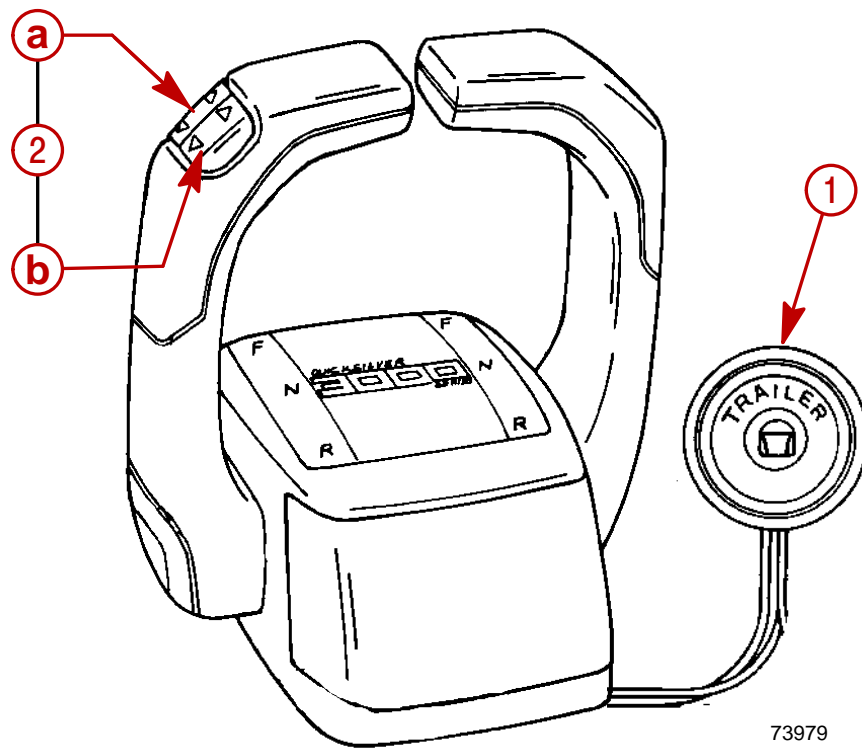
- 1 Trailer Button: **(Not used with Bravo Heavy Duty Transoms)**  
Press button until drive unit reaches desired height.
- 2 Trim Up/Out: Press UP on Trim switch until drive unit reaches desired trim position.
- 3 Lower Drive Unit: Press DOWN on Trim switch until drive unit reaches desired position.

## POWER TRIM OPERATION - CONSOLE MOUNT REMOTE CONTROL (SINGLE ENGINE VERSION)

- 4 Trailer Position: **(Not used with Bravo Heavy Duty Transoms)**  
Press button until drive unit reaches desired height.
- 5 Trim Up/Out: Press UP on Trim switch until drive unit reaches desired trim position.
- 6 Lower Drive Unit: Press DOWN on Trim switch until drive unit reaches desired position.

# OPERATION

CB190



# OPERATION

## POWER TRIM OPERATION - DUAL ENGINE CONSOLE MOUNT REMOTE CONTROL (TWO BUTTON VERSION)

**IMPORTANT:** If TRAILER button is held depressed after drive unit reaches end of upward travel, an internal circuit breaker will open and pump will stop. Should this happen, release button and allow motor to cool for about one minute. Circuit breaker will reset and Power Trim operation may be resumed.

### CAUTION

When lowering or raising stern drives equipped with a dual engine tie bar kit; in the trailering position, stern drives must be lowered evenly to prevent tie bar from becoming twisted. Failure to lower stern drives evenly may result in tie bar or stern drive(s) damage.

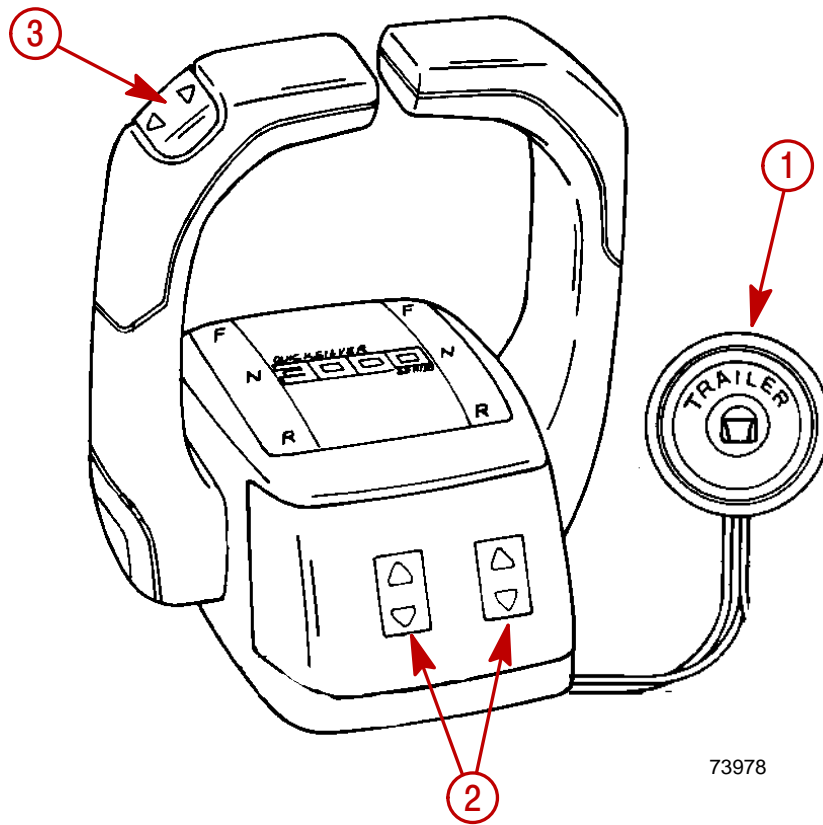
### CAUTION

The Bravo heavy duty gimbal does not have a trim limit switch. Depressing the trim and/or trailer buttons will allow the drive to be tilted to its full extension without stopping at a preset trim limit. Manual indicators are recommended to help keep the operator aware of the drive positioning.

- 1 Trailer Button - **(Not used with Bravo Heavy Duty Transoms)**  
Press button until drive unit reaches desired height for trailering drive units.
- 2 **Two Button Trim Control (Dual Buttons in Handle)** - used to control both drive units from the handle. Press UP on button(s) to trim drive unit UP/OUT. Press down on button(s) to trim drive unit DOWN/IN.
  - a -Forward Trim Button - Used to trim the port drive unit.
  - b -Rear Trim Button - Used to trim the starboard drive unit.

# OPERATION

CB190





# OPERATION

## POWER TRIM OPERATION - DUAL ENGINE CONSOLE MOUNT REMOTE CONTROL (THREE BUTTON VERSION)

**IMPORTANT:** If TRAILER button is held depressed after drive unit reaches end of upward travel, an internal circuit breaker will open and pump will stop. Should this happen, release button and allow motor to cool for about one minute. Circuit breaker will reset and Power Trim operation may be resumed.

### CAUTION

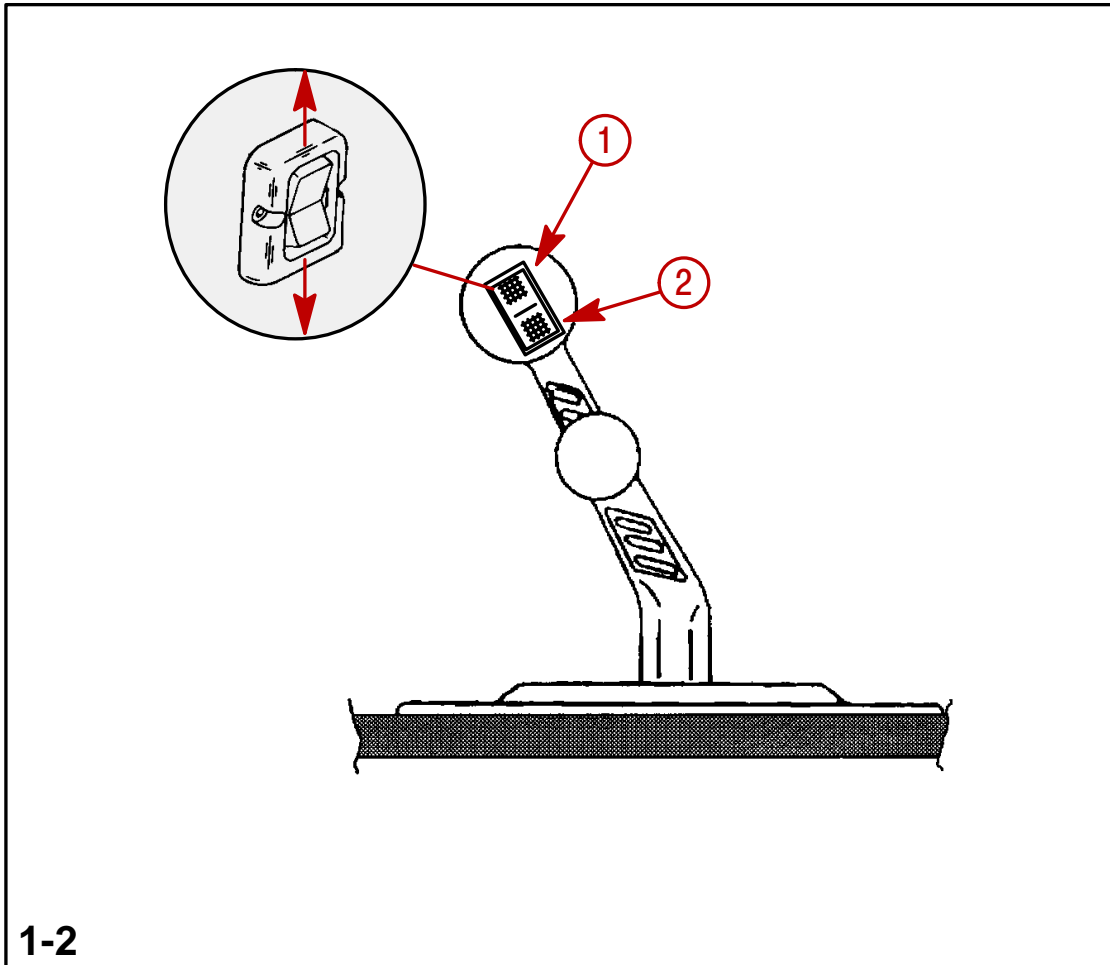
When lowering or raising stern drives equipped with a dual engine tie bar kit; in the trailering position, stern drives must be lowered evenly to prevent tie bar from becoming twisted. Failure to lower stern drives evenly may result in tie bar or stern drive(s) damage.

### CAUTION

The Bravo heavy duty gimbal does not have a trim limit switch. Depressing the trim and/or trailer buttons will allow the drive to be tilted to its full extension without stopping at a preset trim limit. Manual indicators are recommended to help keep the operator aware of the drive positioning.

- 1 Trailer Button - (Not used with Bravo Heavy Duty Transoms)**  
Press button until drive unit reaches desired height for trailering drive units.
- 2 Three Button Trim Control (Trim Adjustment Switches) -**  
With a single integral trim button in the handle to control two drive units simultaneously, these two switches control the “Fine Tune” adjustment of each drive unit. Using these “Fine Tune Switches”, set each drive unit to the desired trim angle. Then use the single trim switch in the handle to control the trim of both drive units simultaneously.
- 3 Three Button Trim Control (Single Trim Switch in Handle) -**  
Used to trim both drives simultaneously after drives have been fine-tuned as described above.

# OPERATION



# OPERATION

## POWER TRIM OPERATION - ZERO EFFORT CONTROL WITH INTEGRAL TRIM SWITCH

The Bravo Heavy Duty Transom Assembly does not have an electrical trim limit switch or trim position sender, therefore the following precautions must be observed.

### **WARNING**

**Avoid personal injury or damage to stern drive unit. Without a Trim Limit Switch, the drive unit can be trimmed up/out beyond the position where the drive unit has side support from the gimbal ring at any throttle setting. It is highly recommended that a mechanical (cable actuated) Trim Position Indicator be used to provide important drive unit trim angle information to the operator and that the Trim Indicator be marked to clearly indicate the maximum up/out position where side support is still provided. The drive unit should not be trimmed to a position beyond gimbal ring side support at engine speeds above 1200 rpm.**

- 1 Trailing and Trimming UP/OUT Position: Press (Top) UP/OUT portion of switch until drive unit reaches desired trim/trailing position.

**NOTE:** *The word (Trim) is usually considered the first 20° OUT/UP movement from vertical position.*

- 2 Trim Drive Unit IN/DOWN Position: Press (Bottom) IN/DOWN portion of switch until drive unit reaches desired trim position.

# OPERATION

## Starting, Shifting and Stopping

### **WARNING**

Before starting engine, operate bilge blower for at least five minutes to remove any explosive fumes from engine compartment. If boat is not equipped with a bilge blower, open engine hatch and leave open while starting engine.

**IMPORTANT:** Observe the following:

- Do not start engine without water being supplied to seawater pickup pump (to prevent pump or engine damage).
  - Do not operate starter motor continuously for more than 30 seconds.
  - Never shift drive unit unless engine is at Idle rpm.
- 1 Perform the following as appropriate:
- Check all items listed in OPERATION CHART.
  - Perform any other necessary checks, as indicated by your dealer, or specified in your boat owner's manual.
  - Place drive unit in full down/in position.
  - Place control handle in NEUTRAL.
  - Position throttle setting as follows:

**COLD OR WARM ENGINE** - EFI engines require no throttle advance to start. The boat can be operated after the engine has started and is idling smoothly.

**NOTE:** Engines that have not been started for extended periods or have had fuel filter changes may not stay running on the first few initial attempts to start. Do not advance the throttle to keep engine running. Continue to restart the engine until it idles smoothly, which means the fuel system is primed. Allow engine to warm up to 130 ° F (54 ° C) before advancing throttle.

**FLOODED ENGINE** - Move control/throttle lever to **HALF** throttle. Be prepared to decrease engine speed to 1000-1500 rpm as soon as engine starts.

(continued on next page)

# OPERATION

## Starting, Shifting and Stopping (cont.)

- Turn ignition key to START. Release key when engine starts and allow switch to return to RUN position.
- Check oil pressure gauge immediately after engine starts. If oil pressure is not within specified range (see SPECIFICATIONS), stop engine immediately and determine cause.
- If engine is cold, make sure engine is idling smoothly before operating boat.
- After engine has warmed up, check water temperature gauge to ensure that engine temperature is not abnormally high. If it is, stop engine immediately and determine cause.
- Be sure charging system is functioning correctly.
- Observe power package for fuel, oil, water and exhaust leaks.
- To shift drive unit into gear, move control/shift lever with a firm, quick motion forward to shift to FORWARD gear, or backward to shift to REVERSE. After shifting drive unit, advance throttle to desired setting.
- To shift drive unit out of gear, move control/shift lever to NEUTRAL and allow engine to drop to IDLE speed. If engine has been run at high speed for a long period of time, allow engine to cool by running at IDLE speed for 3 to 5 minutes.
- Turn ignition key to OFF.

CB13

**IMPORTANT: Starting procedure if engine is shut-off or stops with drive unit in gear.**

- 1. Pull/push remote control handle to neutral-lock position (it will be necessary to exert force to move handle).**
- 2. Turn key to start position, momentarily, to release clutch from gear.**
- 3. Resume normal starting procedure.**

# OPERATION

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## Starting/Operation Chart Checklist

Before Starting	After Starting	While Underway	After Stopping
Open engine hatch	Observe all gauges to check condition of engine. If not normal, stop engine.	Observe all gauges to monitor engine condition.	Shift to Neutral. Turn ignition key OFF.
Turn battery switch ON, if so equipped.	Check for fuel, oil, water, fluid and exhaust leaks, etc.		Turn battery switch OFF, if so equipped.
Operate bilge blowers, if so equipped.	Check shift and throttle control operation.		Close fuel valve.
Open fuel shutoff valve.	Check steering operation		Close sea-cock, if so equipped.
Open sea-cock, if so equipped.			Flush cooling system if in saltwater area.
Perform all other checks specified by your dealer and/or boat builder.			

CA407

## Freezing Temperature Operation

**IMPORTANT:** If boat is operated during periods of freezing temperature, precautions must be taken to prevent freezing damage to power package. Damage caused by freezing **IS NOT** covered by MerCruiser Limited Warranty.

# OPERATION

CA408

## Drain Plug and Bilge Pump

The engine compartment in your boat is a natural place for water to collect. For this reason, boats are normally equipped with a drain plug and/or a bilge pump. It is very important to check these items on a regular basis to ensure that the water level does not rise to come in contact with your power package. Components on your engine will be damaged if submerged. Damage caused by submersion is not covered by the MerCruiser Limited Warranty.

CA20

## Launching And Boat Operation Care

### CAUTION

**During launching from a trailer, if the unloading ramp is steep or the trailer bed must be tilted, the boat may enter the water rapidly and at a steep angle. This may force water through the exhaust system into the cylinders. The more weight on the transom, the more likely this is to occur.**

**Slowing down rapidly or stopping suddenly may cause a following wave to “swamp” the transom. In this instance, water may enter the cylinders through the exhaust system.**

**When backing up rapidly, the same situation may occur as stated in the preceding paragraph.**

In any of these situations, water entering the engine could cause severe damage to internal parts. Refer to “Attention Required After Submersion” in the General Information section of this manual.

# CONDITIONS AFFECTING OPERATION

## Weight Distribution

Positioning of weight (passengers and gear) inside the boat has the following effects:

### Shifting weight to rear (stern) will:

- Generally increases speed and engine rpm.
- At extremes can cause boat to porpoise.
- Causes bow to bounce in choppy water.
- Increases danger of following wave splashing into boat when coming off plane.

### Shifting weight to front (bow) will:

- Improve ease of planing.
- Improve rough water ride.
- At extremes, can cause boat to veer back and forth (bow steer).

## Bottom Of Boat

To maintain maximum speed, the following conditions of the boat bottom should be observed:

- Clean, free of barnacles and marine growth.
- Free of distortion; nearly flat where it contacts the water.
- Straight and smooth, fore and aft.

Marine vegetation may accumulate when boat is docked. This growth must be removed before operation; it may clog water inlets and cause engine to overheat.



# CONDITIONS AFFECTING OPERATION

## Cavitation

Cavitation occurs when water flow cannot follow the contour of a fast-moving underwater object, such as a gear housing or propeller. Cavitation permits the propeller to speed up, but the boat speed to reduce. Cavitation can seriously erode the surface of the gear housing or propeller. Common causes of cavitation are:

- Weeds or other debris snagged on propeller or gear housing.
- Bent propeller blade or damaged gear housing skeg.
- Raised burrs or sharp edges on propeller or gear housing.

## Ventilation

Ventilation is caused by surface air or exhaust gases which are introduced around the propeller resulting in propeller speedup and a reduction in boat speed. Excessive ventilation is annoying and usually caused by:

- Drive unit trimmed out too far.
- Damaged propeller or gear housing, which allows exhaust gases to escape between propeller and gear housing.
- Drive unit installed too high on transom.

# CONDITIONS AFFECTING OPERATION

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## Propeller Selection

**IMPORTANT:** Installed propeller must allow engine to run at its specified maximum wide-open-throttle rpm. Use an accurate service tachometer to verify engine operating rpm.

It is the responsibility of the boat manufacturer and/or the selling dealer to equip the power package with the correct propeller(s). Specified engine wide-open-throttle (WOT) and operating rpm range are listed in "SPECIFICATIONS".

**IMPORTANT:** All MerCruiser Hi-Performance engines have a rpm rev-limiter that is set to an upper (or limited) rpm amount. This limit is slightly above the normal operating range of the engine and is designed to help prevent damage from excessive engine rpm. Once the rpm drops into the recommended operating rpm range normal engine operation resumes.

Select a propeller that allows the engine to operate in the upper half of the recommended full throttle rpm range with the boat normally loaded (Refer to specifications).

If full throttle operation is below the recommended range, the propeller must be changed to prevent loss of performance and possible engine damage. On the other hand, operating an engine above the recommended operating rpm range will cause higher than normal wear and/or damage. Generally, there is a 200-300 rpm change between propeller pitches.

**Rpm loss may require a change to a lower pitch propeller due to the following conditions:**

- Warmer weather and greater humidity.
- Operating in a higher elevation.
- Operating with a damaged propeller or dirty boat bottom.
- Operating with increased load (additional passengers, pulling skiers, etc.).

For better acceleration, such as is needed for water skiing, use the next lower pitch propeller. However, do not operate at full throttle (or above the recommended rpm range) when using the lower pitch propeller but not pulling skiers.

# CONDITIONS AFFECTING OPERATION

## Conditions That Lower Engine Performance

The following conditions **lower** engine performance and cannot be compensated by the engine fuel or electronic management systems.

1. Above sea level elevations
2. High temperature.
3. Low barometric pressure.
4. High humidity.

**These conditions (1 through 4 above) reduce air density to the engine which in turn lowers the following:**

- Boost pressure on supercharged engines
- Horsepower and torque throughout the rpm range
- Peak rpm
- Cranking compression

EXAMPLE: An engine run at an elevation of 8,000 feet will have over a 30% power loss while a loss of engine power on a hot and humid day could be as much as 14%. These losses apply to normally aspirated and supercharged engines.

**Compensating for power robbing conditions:**

- Switch to lower pitch propeller.
- Change gear ratio.

Some **boat** performance can be regained by dropping to a lower pitch propeller but engine performance will still remain lower. In some cases, a gear ratio reduction may be more beneficial. To optimize engine performance, prop the engine to allow it to operate at or near the top end of the recommended maximum rpm range at wide-open-throttle with a normal boat load.

Other advantages to propeller or gear ratio changes:

- Reduces the possibility of detonation.
- Enhances overall reliability and durability of the engine.

# MAINTENANCE

## Operation And Maintenance

### OWNER/OPERATOR RESPONSIBILITIES

It is the owner/operator's responsibility to perform the following:

- Perform all safety checks.
- Make sure lubrication and maintenance instructions are complied with for safe operation.
- Return the unit to an Authorized MerCruiser Dealer for a periodic checkup.
- Normal maintenance service and replacement parts.

Proper maintenance and care of your power package will assure optimum performance and dependability, and will keep your overall operating expenses at a minimum. See your Authorized MerCruiser Dealer for service aids.

CA14

### DEALER RESPONSIBILITIES

In general, a dealer's responsibilities to the customer include predelivery inspection and preparation such as:

- Your selling dealer should fill out the Warranty Registration Card completely and mail it to the factory immediately upon sale of the new product.
- Make sure that the boat is properly equipped.
- Prior to delivery, make certain that the MerCruiser power package and other equipment are in proper operating condition.
- Make all necessary adjustments for maximum efficiency.
- Familiarize the customer with the on-board equipment.
- Explain and demonstrate the operation of the power package and boat.
- At the time of delivery, the dealer should provide you with a copy of a Predelivery Inspection Checklist.

# MAINTENANCE

## Replacement Service Parts

### WARNING

**Electrical, ignition and fuel system components on MerCruiser gasoline power packages are designed and manufactured to comply with US Coast Guard rules and regulations to minimize risks of fire or explosion.**

**Use of replacement electrical, ignition or fuel system components, which do not comply to these rules and regulations, could result in a fire or explosion hazard and should be avoided.**

**When servicing the electrical, ignition and fuel systems, it is extremely important that all components are properly installed and tightened. If not, any electrical or ignition component would permit sparks to ignite fuel vapors from fuel system leaks, if they existed.**

Marine engines are expected to operate at or near full-throttle for most of their life. They are also expected to operate in fresh and saltwater environments. These conditions require numerous special parts. Care should be exercised when replacing marine engine parts as specifications are quite different from those of the standard automotive engine.

For example, one of the most important, and probably the least suspected special replacement part, is the cylinder head gasket. Since saltwater is highly corrosive, the steel-type automotive head gasket cannot be used. A marine engine head gasket uses special materials to resist corrosive action.

Since marine engines must be capable of running at or near maximum rpm much of the time, special valve springs, valve lifters, pistons, bearings, camshafts and other heavy-duty moving parts are required for long life and peak performance.

These are but a few of the many special modifications that are required in MerCruiser marine engines to provide long life and dependable performance.

# MAINTENANCE

## Do-It-Yourself Maintenance Suggestions

If you are one of those persons who likes to do-it-yourself, here are some suggestions for you.

- Present-day marine equipment, such as your MerCruiser power package, are highly technical pieces of machinery. Electronic ignition and special fuel delivery systems provide greater fuel economies, but also are more complex for the untrained mechanic.
- Do not attempt any repairs which are not covered in this manual unless you are aware of the precautions (“Cautions” and “Warnings”) and procedures required. Your safety is of our concern.
- If you attempt to service the product yourself, we suggest you order the service manual for that model. This manual outlines the correct procedures to follow. It is written for the trained mechanic, so there may be procedures you don’t understand. Do not attempt repairs if you do not understand the procedures.
- Special tools and equipment may be required to perform some repairs. Do not attempt these repairs unless you have these special tools and/or equipment. You can cause damage to the product in excess of the cost a dealer would charge you.
- Also, if you partially disassemble an engine or drive assembly and are unable to repair it, the dealer’s mechanic must reassemble the components and test to determine the problem. This will cost you more than taking it to the dealer immediately upon having a problem. It may be a very simple adjustment to correct the problem.
- Do not telephone the dealer, service office or the factory to attempt for them to diagnose a problem or request the repair procedure. It is difficult for them to diagnose a problem over the telephone.
- Your Authorized Dealer is there to service your power package. They have qualified factory-trained mechanics.

Recommended you have the dealer do periodic maintenance checks on your power package. Have them winterize it in the fall and service it before the boating season. This will reduce the possibility of any problems occurring during your boating season when you want trouble-free boating pleasure.

# MAINTENANCE

## WARNING

**Avoid Injury or Electrical System Damage: Always disconnect battery cables from battery before working around electrical system components. See IMPORTANT statement following:**

**IMPORTANT: Refer to MAINTENANCE CHART for complete listing of all scheduled maintenance to be performed. Some listings can be done by owner/operator, while others should be performed by an Authorized MerCruiser Dealer. Before attempting maintenance or repair procedures not covered in this manual, it is recommended that a MerCruiser Service Manual(s) be purchased and read thoroughly.**

<b>Maintenance Aids</b>	
Power Steering System	Mercury Precision Power Trim and Steering Fluid or Dexron III automatic transmission fluid (ATF)
All Pivot Points	SAE 30W motor oil
Propeller Shaft	Anti-Corrosion Grease
Stern Drive Unit	High Performance Gear Lube
All Grease Fittings and Universal Joints	2-4-C Marine Lubricant with Teflon
All Exterior Surfaces	Quicksilver Primer and Spray Paint and Quicksilver Corrosion Guard
Power Trim System	Mercury Precision Power Trim and Steering Fluid, or SAE 10W-30 motor oil
Crankcase Oil	(Refer to SPECIFICATIONS for oil recommendations at varying ambient temperatures)

(continued on next page)

# MAINTENANCE

<b>Maintenance Aids (cont.)</b>	
Gasoline Stabilizer	Gasoline Stabilizer and Conditioner
Engine Coupler and Splined Shaft	Engine Coupler Spline Grease P/N 92-816391A4
Thread Sealant	Loctite Pipe sealant P/N 92-809822



# MAINTENANCE

CA426hp

## Maintenance Charts

### SCHEDULED MAINTENANCE TO BE PERFORMED BY OWNER/OPERATOR

Task	Interval
Engine Crankcase Oil - Check Level	Check every 3 hrs. of operation
Power Steering Fluid - Check level	Weekly
Stern Drive Unit Oil - Check Level	
Battery - Check level and inspect for damage	
Power Trim Pump Oil - Check Level	
Anodes - Inspect for erosion	
Gear Housing Water Pick-ups - Check for marine growth or debris	
Serpentine Belt - Inspect condition and check tension	Every 100 Hours of Operation or 120 Days, Whichever Occurs First.
Propeller Shaft - Lubricate	<b>Saltwater use:</b> Every 50 Hours of Operation or 60 Days, Whichever Occurs First.
Power Package Exterior Surfaces - Spray with rust preventative	<b>Freshwater use:</b> Every 100 Hours of Operation or 120 Days, Whichever Occurs First.
Power Package Exterior Surfaces - Clean and paint	Once a Year
Cooling System - Flush seawater section	<b>Saltwater use:</b> After Each Use

# MAINTENANCE

## Maintenance Charts (cont.)

Only perform maintenance which applies to your particular power package.

### SCHEDULED MAINTENANCE TO BE PERFORMED BY DEALER

Task	Interval
Seawater Pickup Pump - Disassemble and Inspect	Whenever Insufficient Seawater Flow is Suspected. (If Operating Temperature Exceeds Normal Range)
Crankcase Oil and Filter - Change	Every 25 Hours of Operation or Once Every 30 Days, Whichever Occurs First
Stern Drive Unit Oil - Change	Every 50 Hours of Operation or Once Yearly, Whichever Occurs First.
Universal Joint Cross Bearings - Inspect	
Gimbal Ring Clamping Screws - Re-torque to 50-55 lb-ft (67-74 Nm)	
Gimbal Bearing - Lubricate	
Engine Coupling, Universal Joint Shaft Spline - Lubricate	

(continued on next page)

# MAINTENANCE

## Maintenance Charts (cont.)

### SCHEDULED MAINTENANCE TO BE PERFORMED BY DEALER (CONT.)

Task	Interval
Ignition System - Clean and inspect condition	Every 100 Hours of Operation or Once Yearly, Whichever Occurs First.
Flame Arrestor and Crankcase Ventilation Hose - Clean and inspect	
Engine Alignment - Check	
Serpentine Belt - Inspect condition and check tension	
Replace Positive Crankcase Ventilation (PCV) valve	
Transom Gimbal Housing Assembly Swivel Shaft and Gimbal Bearing - Lubricate	<b>Saltwater use:</b> Every 50 Hours of Operation or 60 Days, Whichever Occurs First  <b>Freshwater use:</b> Every 100 Hours of Operation or 120 Days, Whichever Occurs First.
Engine Drive Shaft - Lubricate (if so equipped)	
Cooling System Hoses and Clamps - Inspect for damage and deterioration. Check clamps for tightness	
Electrical System - Check for loose or damaged wiring	
Steering System - Lubricate and inspect for loose, damaged or missing parts	

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# MAINTENANCE

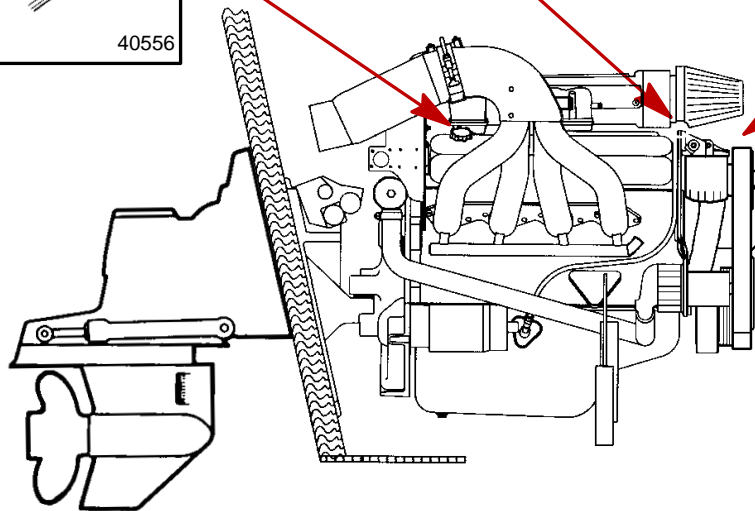
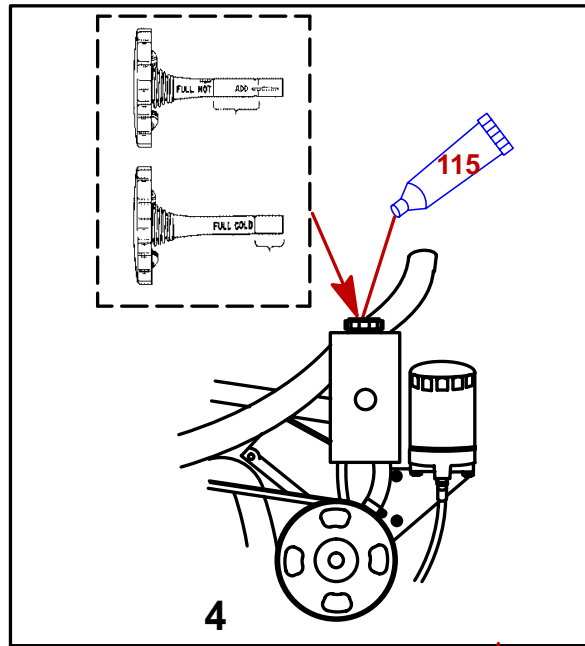
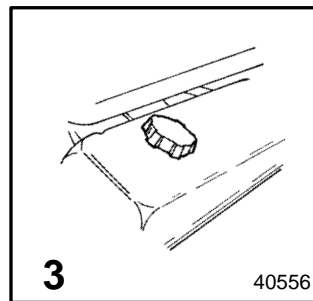
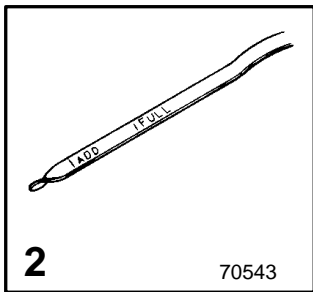
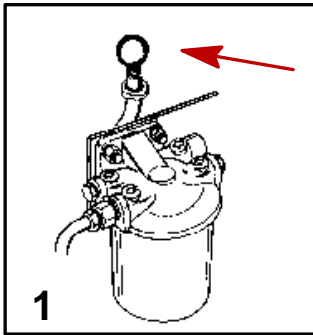
## Maintenance Charts (cont.)

### SCHEDULED MAINTENANCE TO BE PERFORMED BY DEALER (CONT.)

Task	Interval
Continuity Circuit - Check components for loose connections, broken or frayed wires	<b>Saltwater use:</b> Every 50 Hours of Operation or 60 Days, Whichever Occurs First  <b>Freshwater use:</b> Every 100 Hours of Operation or 120 Days, Whichever Occurs First.
Shift and Throttle Cable and Linkage - Lubricate and inspect for loose, damaged or missing parts	
Engine Exhaust System - Inspect for damage, deterioration and restrictions. Check clamps for tightness.	
Ignition System - Check timing and adjust if needed	Once a Year
Fuel Filters - Replace	
Quicksilver MerCathode System - Test output	
Oil Cooler - Clean seawater section	
Steering Head and Remote Control - Inspect and lubricate	
Drive Unit Bellows and Clamps - Inspect	

# NOTES

# MAINTENANCE



Quicksilver Power Trim and Steering Fluid (92-90100A12)

# MAINTENANCE

## Checking Fluid Levels

### CHECKING CRANKCASE OIL

ENGINE CRANKCASE OIL MUST BE CHECKED AT INTERVALS SPECIFIED IN "MAINTENANCE CHART". It is normal for an engine to use a certain amount of oil in the process of lubricating and cooling the engine. Oil consumption will be higher on these engines which utilize forged (rather than cast) aluminum pistons to withstand the higher stresses created by their higher horsepower output. The forged pistons require increased piston-to-cylinder bore clearance to accommodate their higher thermo-expansion rate and thus, it is normal for some oil to get past the piston rings and be burned-up in the combustion chambers. The amount of oil consumption is greatly dependant upon engine speed, with consumption being highest at wide-open-throttle and decreasing substantially as engine speed is reduced. It is not uncommon for big block high performance engines to use up to 1 quart of oil in 1-5 hours if the engine is operated continuously at the upper end of the rpm range.

Stop engine. Allow approximately five minutes for oil to drain into oil pan. Boat must be at rest in water.

- 1 Remove dipstick. Wipe clean and reinstall fully into dipstick tube.
- 2 Remove dipstick and observe oil level. Oil level must be between FULL and ADD. If oil level is below ADD:
- 3 Remove oil filler cap,(Port or Starboard). Add specified oil to bring level up to, but not over, FULL mark on dipstick.

**IMPORTANT: Do not overfill crankcase oil.**

CA55

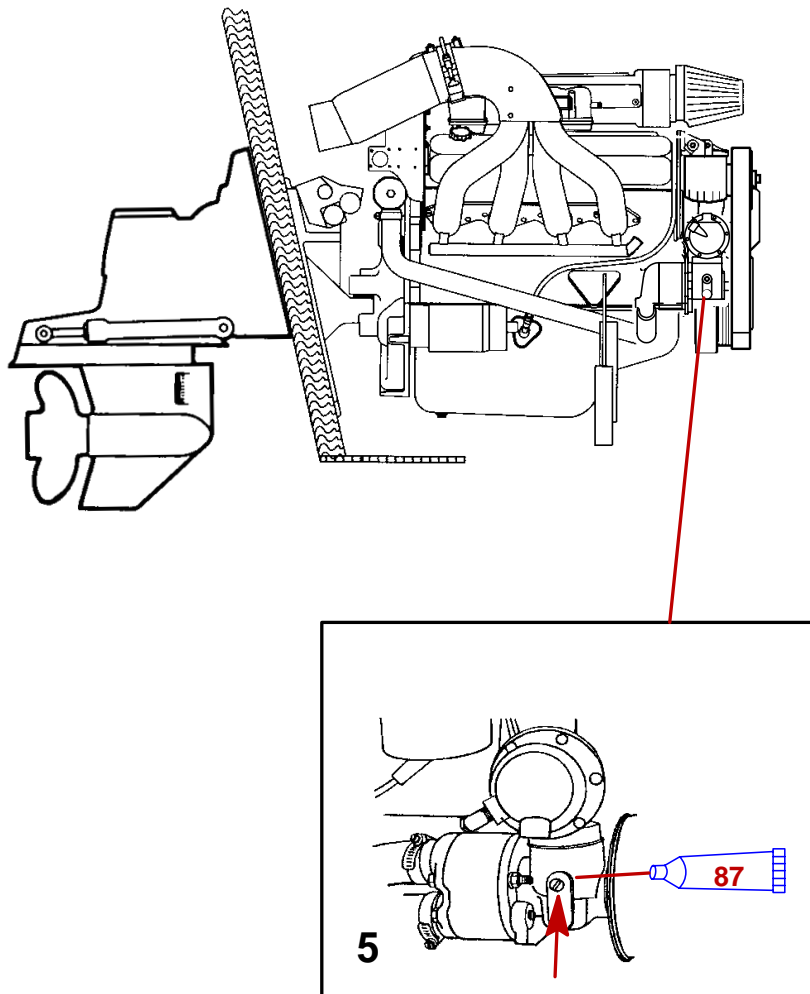
### CHECKING POWER STEERING PUMP FLUID

Stop engine and position drive unit straight back.

- 4 Remove FILLCAP/DIPSTICK and observe level. Add specified fluid if required. Reinstall FILLCAP/DIPSTICK.

**IMPORTANT: If fluid is not visible in pump, contact your Authorized MerCruiser Dealer.**

# MAINTENANCE



Quicksilver High Performance Gear Lube (92-816026A2)

CB42

## CHECKING SEAWATER/FUEL PUMP OIL

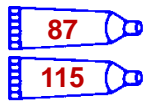
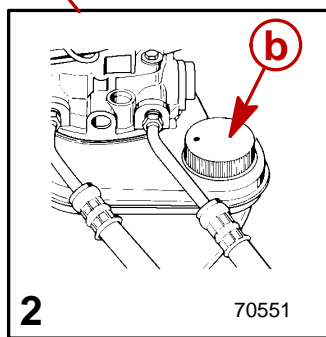
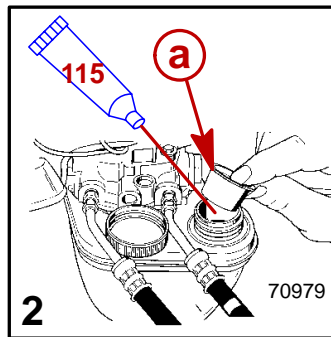
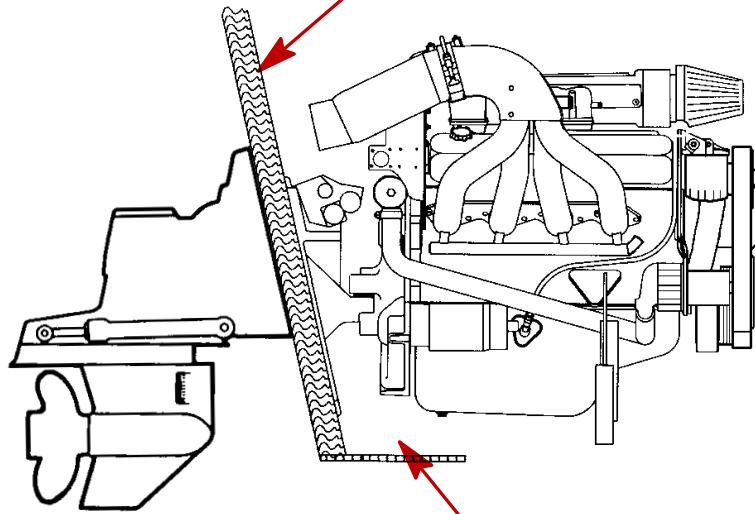
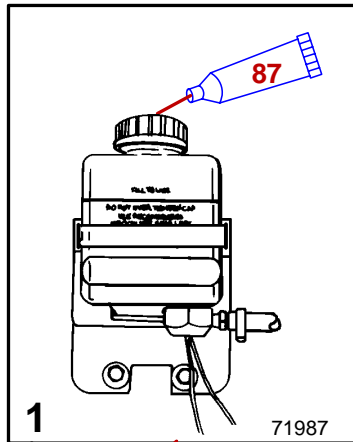
**IMPORTANT:** Oil must be changed at specified intervals. Refer to Maintenance Chart for specific requirements. Use only Quicksilver High Performance Gear Lube in pump.

- 5 Remove fill screw (top) and check oil level. Oil must come up to fill hole. If oil level is low, contact your Authorized MerCruiser Dealer for appropriate service. Do not operate engine if this oil level is low.



# NOTES

# MAINTENANCE



Quicksilver High Performance Gear Lube (92-816026A2)

Quicksilver Power Trim and Steering Fluid (92-90100A12)

# MAINTENANCE

CA433

## CHECKING DRIVE UNIT OIL

**NOTE:** *Oil level will fluctuate during operation. Oil level should be checked with cold engine before starting.*

- 1 Check gear lube monitor oil level; keep oil level at or near “Full” line. Check for water at bottom of monitor and/or if oil appears a milky tan, contact your Authorized MerCruiser Dealer immediately; both conditions indicate a water leak somewhere in the drive unit.

**IMPORTANT:** If more than 2 fl oz (59mL) of Quicksilver High Performance Gear Lube is required to fill monitor, a seal may be leaking. Damage to drive unit may occur due to lack of lubrication. Contact your Authorized MerCruiser Dealer for service.

CB41

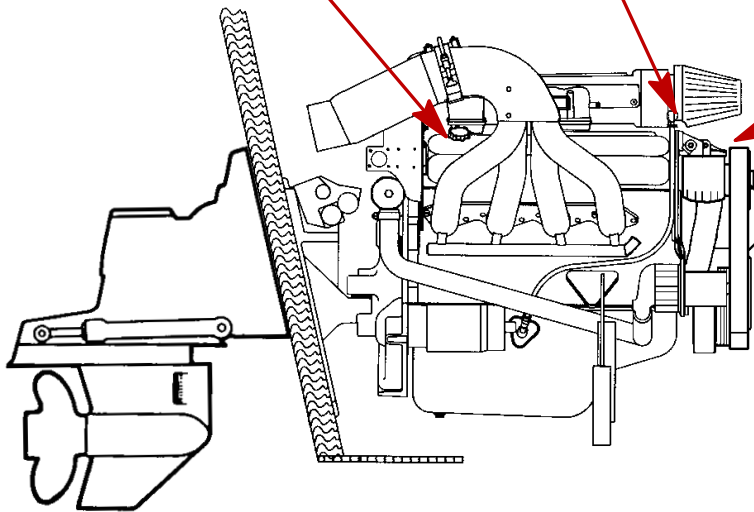
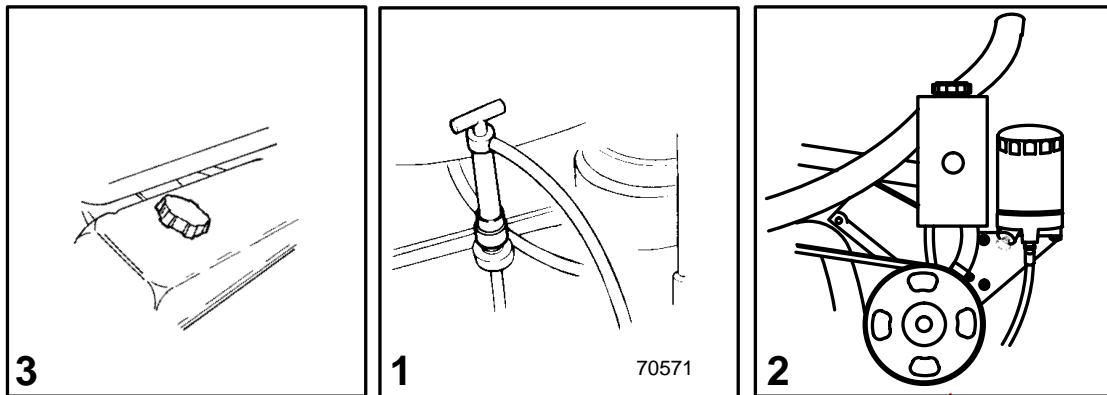
## CHECKING POWER TRIM PUMP FLUID

Place drive unit in full down/in position.

- 2 Remove fill cap from reservoir and observe oil level. Level must be up to, but not over bottom of filler neck. Add Quicksilver Power Trim and Steering Fluid or SAE 10W-30 motor oil, if required, to bring level to bottom of filler neck. Replace cap.
  - a -Check that “Cap plug” has been **removed** and **discarded** from filler neck.
  - b -Fill cap is vented; frequently check that vent is open and unrestricted.

# MAINTENANCE

HP



# MAINTENANCE

CA63

## Changing Fluids

See MAINTENANCE CHART for lubricant change frequency. Lubricant should be changed before placing boat in storage.

Power Trim or Power Steering fluids do not require changing.

### CHANGING CRANKCASE OIL AND FILTER

**IMPORTANT: Change oil when engine is warm from operation. Warm oil flows more freely, carrying away more impurities. Use only recommended motor oil (see SPECIFICATIONS).**

- 1 With engine at normal operating temperature, remove dipstick. Install Quicksilver Crankcase Oil Pump onto dipstick tube.

Insert hose end of crankcase oil pump into an appropriate container and using pump handle, pump until crankcase is empty. Remove crankcase oil pump.

- 2 Place a container below the oil filter.

**Filter removal tip: To allow the oil to drain from the filter, loosen the filter just enough to break the internal vacuum by turning oil filter counterclockwise (to left). Let the oil drain back into the system for 15 minutes prior to complete removal of the filter.**

- 3 Remove the oil filter from the adaptor and discard old oil filter and old sealing ring.

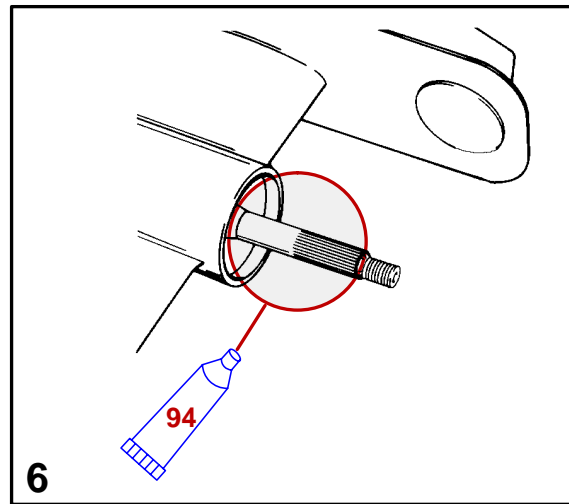
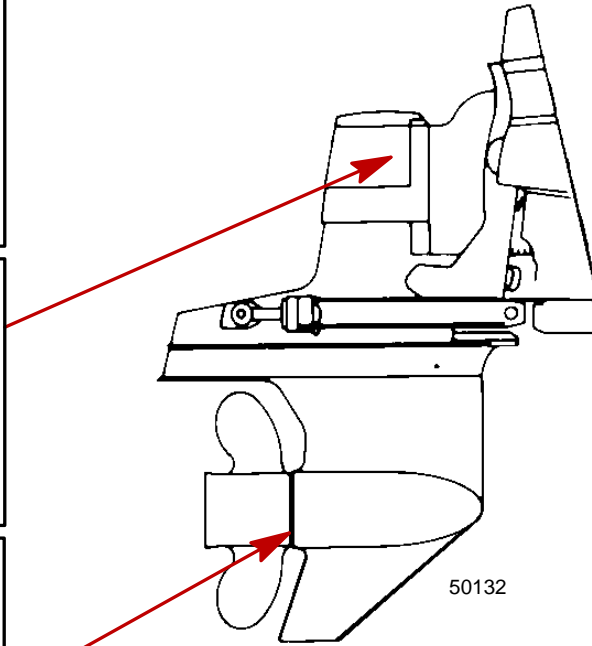
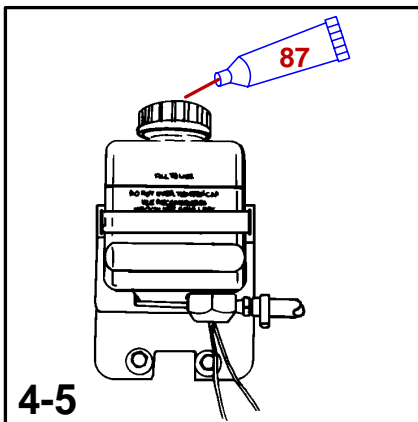
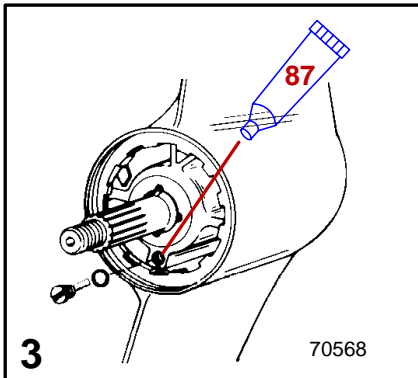
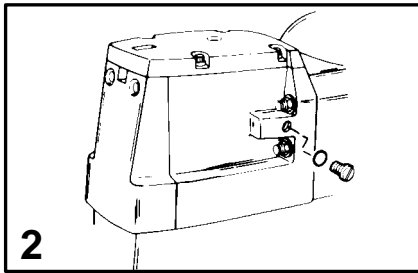
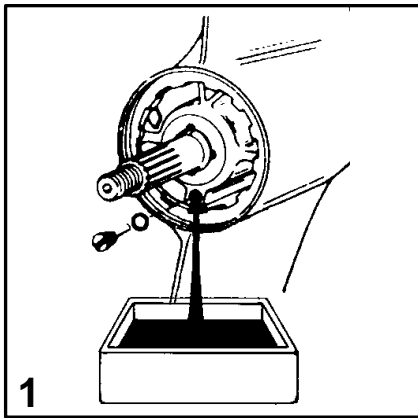
Coat sealing ring on new filter with motor oil. Install new sealing ring and filter by turning clockwise (to right). Tighten filter securely. Do not overtighten.

- 4 Remove oil filler cap (Port or Starboard). Add oil to bring level up to, but not over FULL mark on dipstick.

**IMPORTANT: Always use dipstick to determine exactly how much oil is required.**

# MAINTENANCE

## XR and XZ Models



Anti-Corrosion Grease (92-78376A6)



Quicksilver High Performance Gear Lube (92-816026A2)

# MAINTENANCE

## CHANGING DRIVE UNIT OIL (XR, XZ MODELS)

**IMPORTANT: Use only Quicksilver High Performance Gear Lube in drive unit.**

- 1 Remove propeller, place drive unit in full “down” position, remove OIL FILL/DRAIN SCREW and sealing washer, and drain oil.
- 2 Remove OIL VENT screw and sealing washer. Allow oil to drain completely.

**IMPORTANT: If any water drained from OIL FILL/DRAIN hole, or if oil appears milky, drive unit is leaking and should be checked immediately by your Authorized MerCruiser Dealer.**

- 3 Adjust drive unit so propeller shaft is level. Fill drive unit, through OIL FILL/DRAIN hole, with Specified Gear Lube until an air-free stream of lubricant flows from OIL VENT hole.

Remove tube from OIL FILL/DRAIN hole. Quickly install sealing washer and OIL FILL/DRAIN screw. Tighten securely.

- 4 Add Specified Gear Lube to the monitor bottle. When oil starts to run out the OIL VENT hole of the drive, reinstall drive OIL VENT screw and seal, and tighten securely.
- 5 Continue adding gear lube to the monitor bottle until the oil level is at the “FULL LINE” mark on the bottle. Lubricate O-ring on neck with stern drive oil, to ensure ease of installation and removal of cap; install cap. Do not over tighten.

**IMPORTANT: Recheck reservoir bottle oil level after first use.**

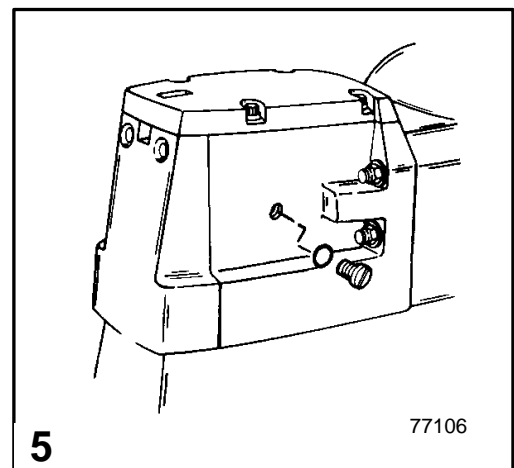
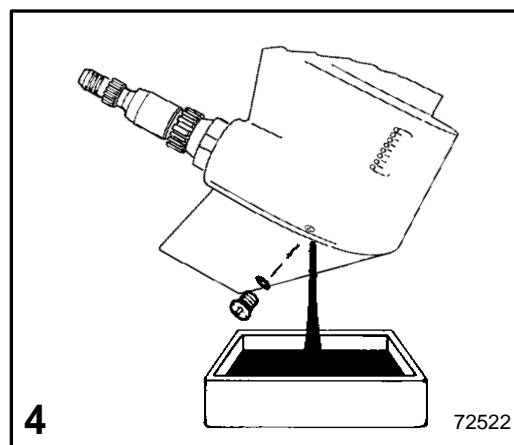
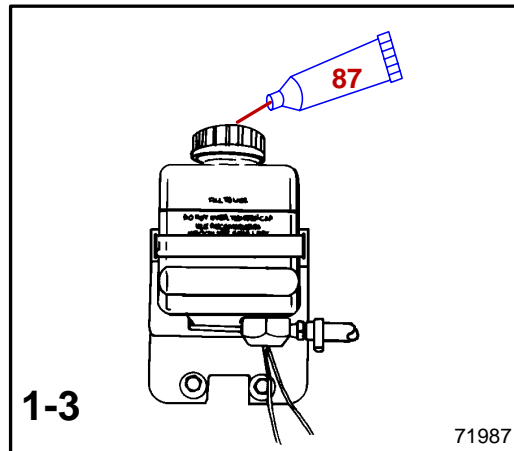
- 6 Grease propeller shaft heavily with Anti-Corrosion Grease. Reinstall propeller and torque nut to 55 lb-ft (75 Nm) MINIMUM.

**IMPORTANT: Oil level in gear lube monitor will rise and fall during drive operation; always check oil level when drive is cool and engine is shut down.**

# MAINTENANCE

## Bravo III

CB688



Anti-Corrosion Grease (92-78376A6)



Quicksilver High Performance Gear Lube (92-816026A2)



# MAINTENANCE

## CHANGING DRIVE UNIT OIL (BRAVO III)

- 1 Remove gear lube monitor bottle from bracket.
- 2 Empty contents into suitable container.
- 3 Install monitor in bracket.
- 4 Place drive unit in full trim limit OUT position, remove OIL FILL/DRAIN SCREW and sealing washer, and drain oil.
- 5 Remove OIL VENT screw and sealing washer. Allow oil to drain completely.

**IMPORTANT: If any water drained from OIL FILL/DRAIN hole, or if oil appears milky, drive unit is leaking and should be checked immediately by your Authorized Mercury MerCruiser Dealer.**

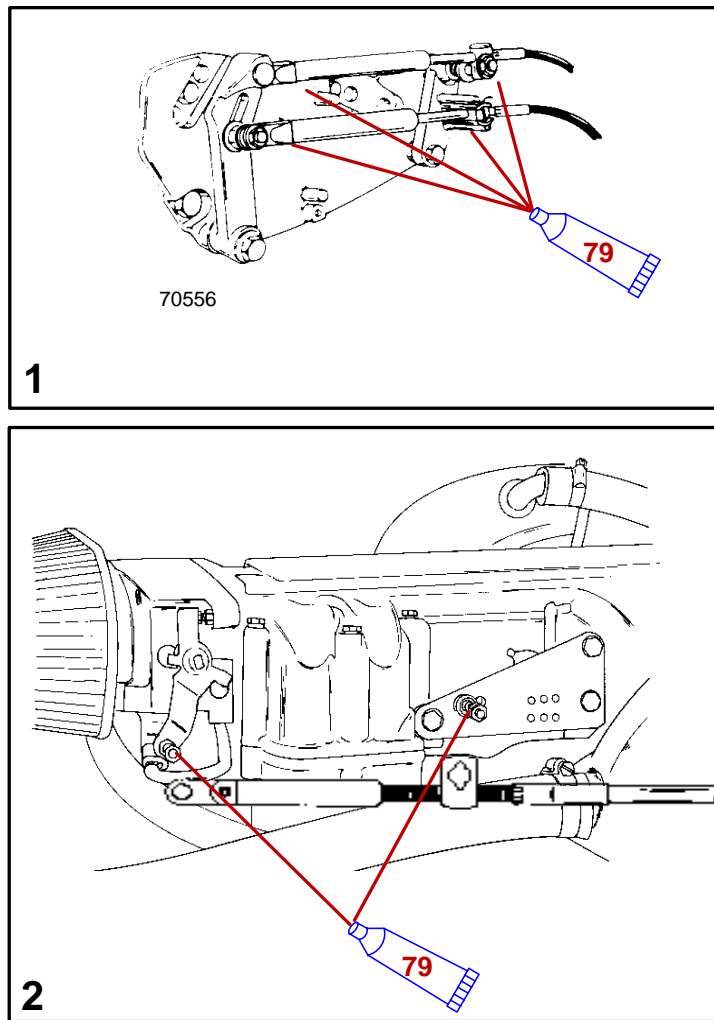
- 6 Lower drive unit so propeller shaft is level. Fill drive unit, through OIL FILL/DRAIN hole, with Specified Gear Lube until an air-free stream of lubricant flows from OIL VENT hole.

**IMPORTANT: Use only Quicksilver High Performance Gear Lube in drive unit.**

- 7 Install OIL VENT screw and sealing washer.
- 8 Continue to pump gear lube into the gear lube monitor circuit until gear lube appears in the gear lube monitor.
- 9 Fill monitor to FILL mark. Lubricate O-ring on neck with sterndrive oil. Install cap; do not overtighten.
- 10 Remove pump from OIL FILL/DRAIN hole. Quickly install sealing washer and OIL FILL/DRAIN screw. Tighten securely.
- 11 Grease propeller shaft heavily with Anti-Corrosion Grease. Reinstall propeller and torque nut to 55 lb-ft (75 Nm) MINIMUM.
- 12 Recheck oil level after first use.

**IMPORTANT: Oil level in gear lube monitor will rise and fall during drive operation; always check oil level when drive is cool and engine is shut down.**

# MAINTENANCE



25W40 Motor Oil (92-90024)

## Lubrication

### SHIFT CABLE

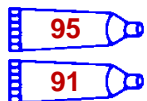
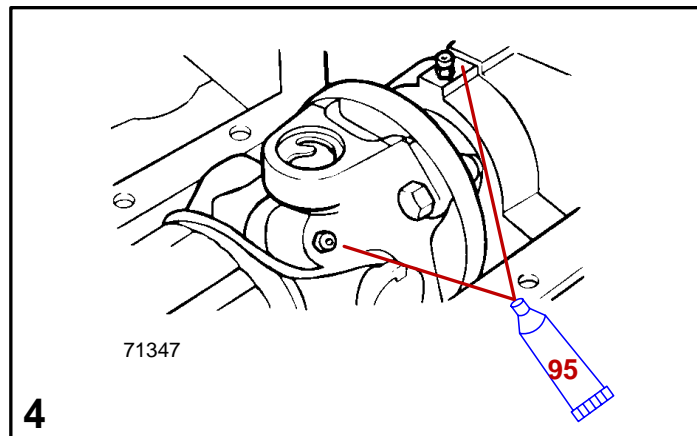
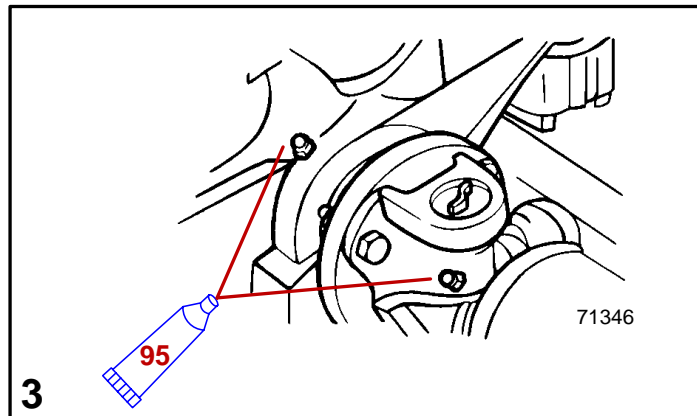
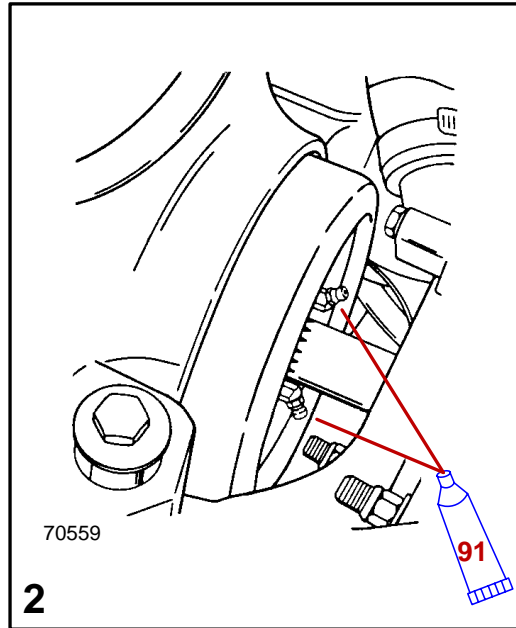
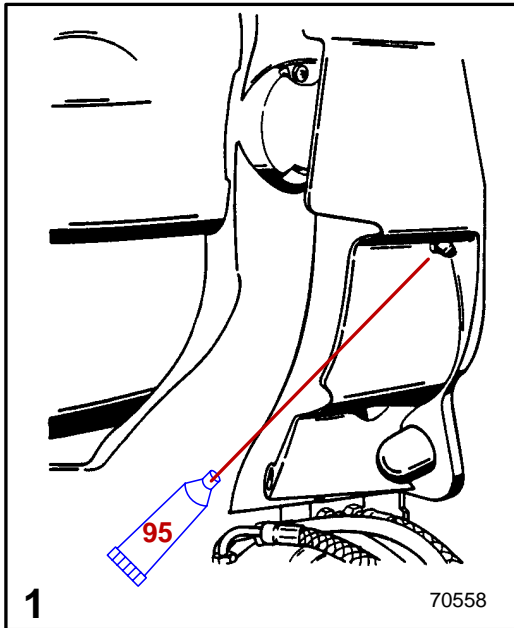
- 1 Lubricate pivot points with SAE 25W40 motor oil.

### THROTTLE CABLE

- 2 Lubricate pivot points with SAE 25W40 motor oil.

# NOTES

# MAINTENANCE



2-4-C With Teflon (92-825407A12)

Quicksilver Spline Grease (92-816391A4)

# MAINTENANCE

## Lubrication (cont.)

### DRIVE UNIT AND TRANSOM ASSEMBLY

- 1 Lubricate gimbal bearing with 2-4-C with Teflon Lubricant P/N (92-825407A12).

**NOTE:** Engine coupling and shaft splines are greased with Engine Coupler Spline Grease, P/N 92-816391A4; universal joints are greased with Quicksilver 2-4-C with Teflon Lubricant P/N (92-825407A12). Contact your Authorized MerCruiser Dealer for this service.

**IMPORTANT:** Stern drive must be removed to lubricate U-joints. Contact your authorized MerCruiser dealer for this service.

### CAUTION

Speedometer water hose must be disconnected from drive unit **BEFORE** removing drive unit. Failure to do this will result in a broken fitting if drive unit is removed.

CB56

### ENGINE COUPLER

- 2 Lubricate engine coupler and shaft splines with Quicksilver Engine Coupler Spline Grease P/N 92-816391A4.

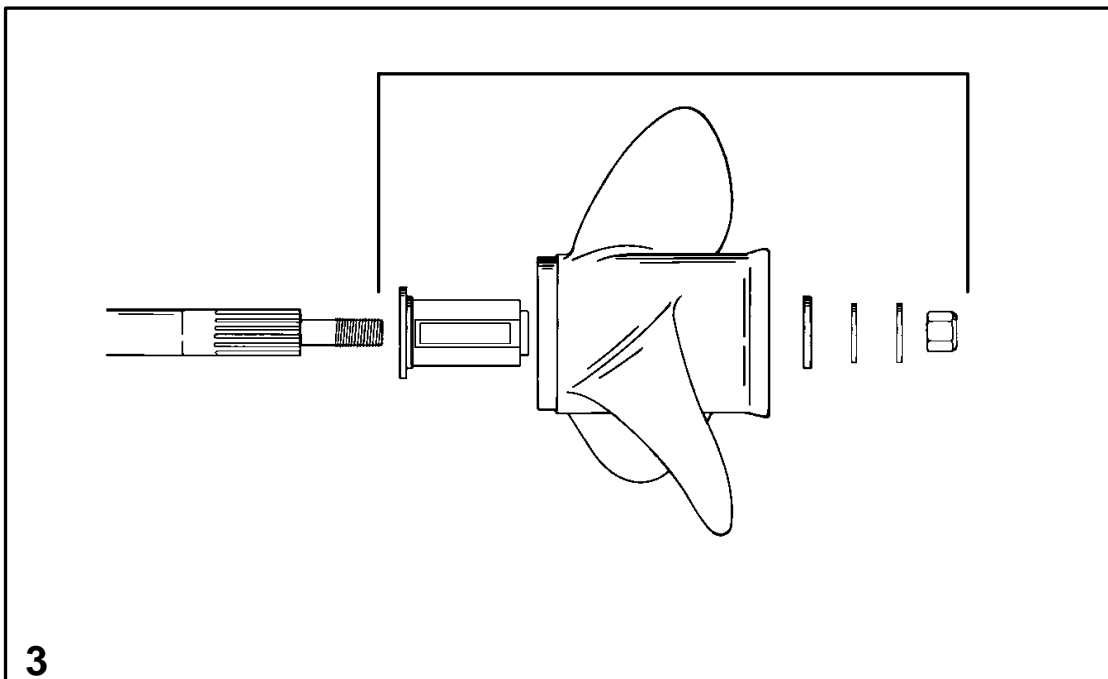
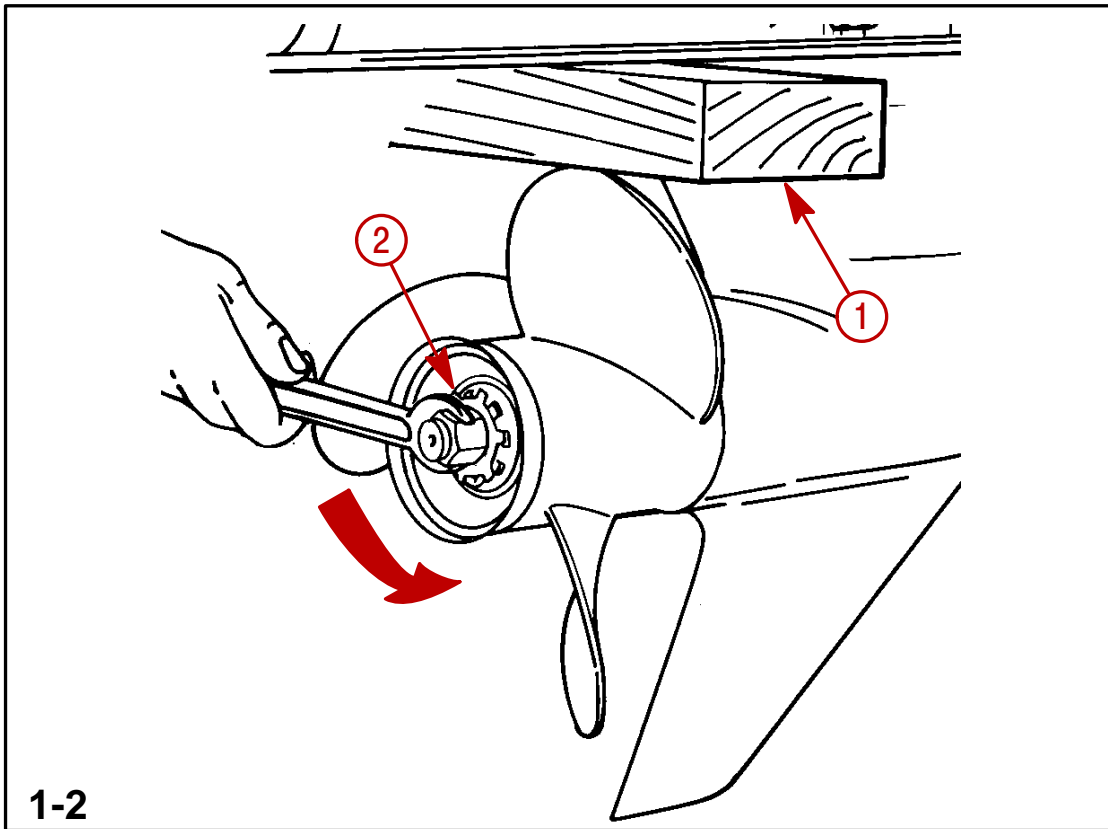
CB57

### DRIVE SHAFT EXTENSION MODELS

- 3 Lubricate drive shaft grease fittings, **at transom end**, with 2-4-C with Teflon Lubricant P/N (92-825407A12).
- 4 Lubricate drive shaft grease fittings, **at engine end**, with 2-4-C with Teflon Lubricant P/N (92-825407A12).

# MAINTENANCE

## XR, XZ Models



# MAINTENANCE

CB421hp

## Propellers (XR, XZ Models)

### WARNING

**Avoid Injury:** Remote Control must be in NEUTRAL and ignition key removed from switch before removing and/or installing propeller.

### WARNING

**Avoid Injury:** Place a block of wood between anti-ventilation plate and propeller to protect hands from propeller blades and to prevent propeller from rotating when removing propeller nut.

### CAUTION

**Avoid Injury:** Periodically check propeller nut for tightness during boating season. A minimum of 55 lb-ft (75 Nm) torque is required.

## REMOVAL

- 1 Place wood block between propeller blade and anti-ventilation plate to prevent rotation.
- 2 Turn propeller shaft nut counterclockwise to remove nut.
- 3 Remove washers, and propeller with prop hub assembly.

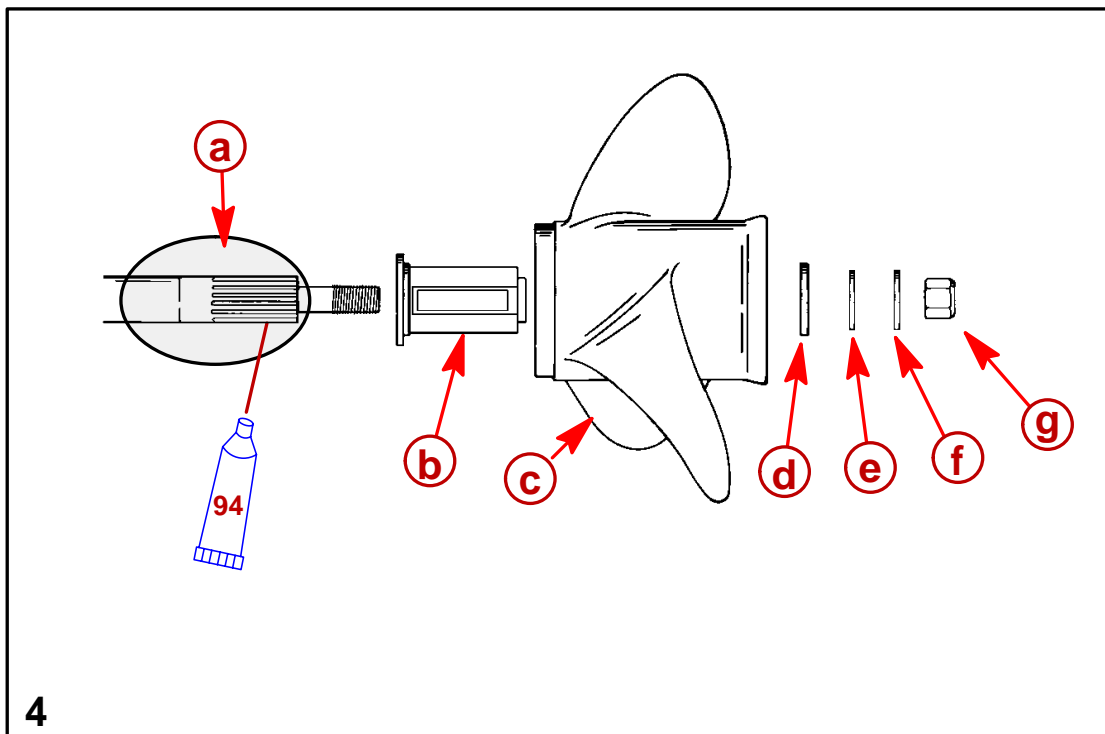
CA79

## REPAIR

Some damaged propellers can be repaired. See your dealer.

# MAINTENANCE

## XR, XZ Models



Anti-Corrosion Grease (92-78376A6)



# MAINTENANCE

CB421hp

## Propellers (XR, XZ Models)(cont.)

CB

### INSTALLATION

#### 4 Install Bravo XR/XZ Replaceable Hub Propeller Components in Order shown:

- a** - Apply Lubricant to entire exposed surface of Propshaft.  
**Salt Water:** Anti-Corrosion Grease (92-78376A-6)  
**Fresh Water:** Anti-Corrosion Grease or Optimal Paste White T Grease (92-847206)
- b** - Install prop hub assembly into propeller if removed
- c** - Propeller Assembly
- d** - Washer
- e** - Belleville Washer
- f** - Washer
- g** - Locknut

- Tighten propeller nut to a minimum of 55 lb-ft (75 Nm).

#### After first use:

- Retighten propeller nut to minimum 55 lb-ft torque (75 Nm).
- Check propeller at least every 20 hours of operation.
- Do not operate with loose propeller.

# NOTES

# MAINTENANCE

CB421hp

## Propellers (Bravo III)

### WARNING

**Avoid Injury: Remote Control must be in NEUTRAL and ignition key removed from switch before removing and/or installing propeller.**

### WARNING

**Avoid Injury: Place a block of wood between anti-ventilation plate and propeller to protect hands from propeller blades and to prevent propeller from rotating when removing propeller nut.**

### CAUTION

**Avoid Injury: Periodically check propeller nut for tightness during boating season. A minimum of 55 lb-ft (75 Nm) torque is required.**

## REMOVAL

- 1 Place wood block between propeller blades and anti-ventilation plate to prevent rotation.
- 2 Turn aft propeller shaft nut (1-7/16 in. or 37 mm) counterclockwise to remove nut.
- 3 Slide propeller and thrust hub off propeller shaft.
- 4 Turn front propeller shaft nut (2-3/4 in. or 70 mm) counterclockwise to remove nut.
- 5 Slide propeller and thrust hub off propeller shaft.

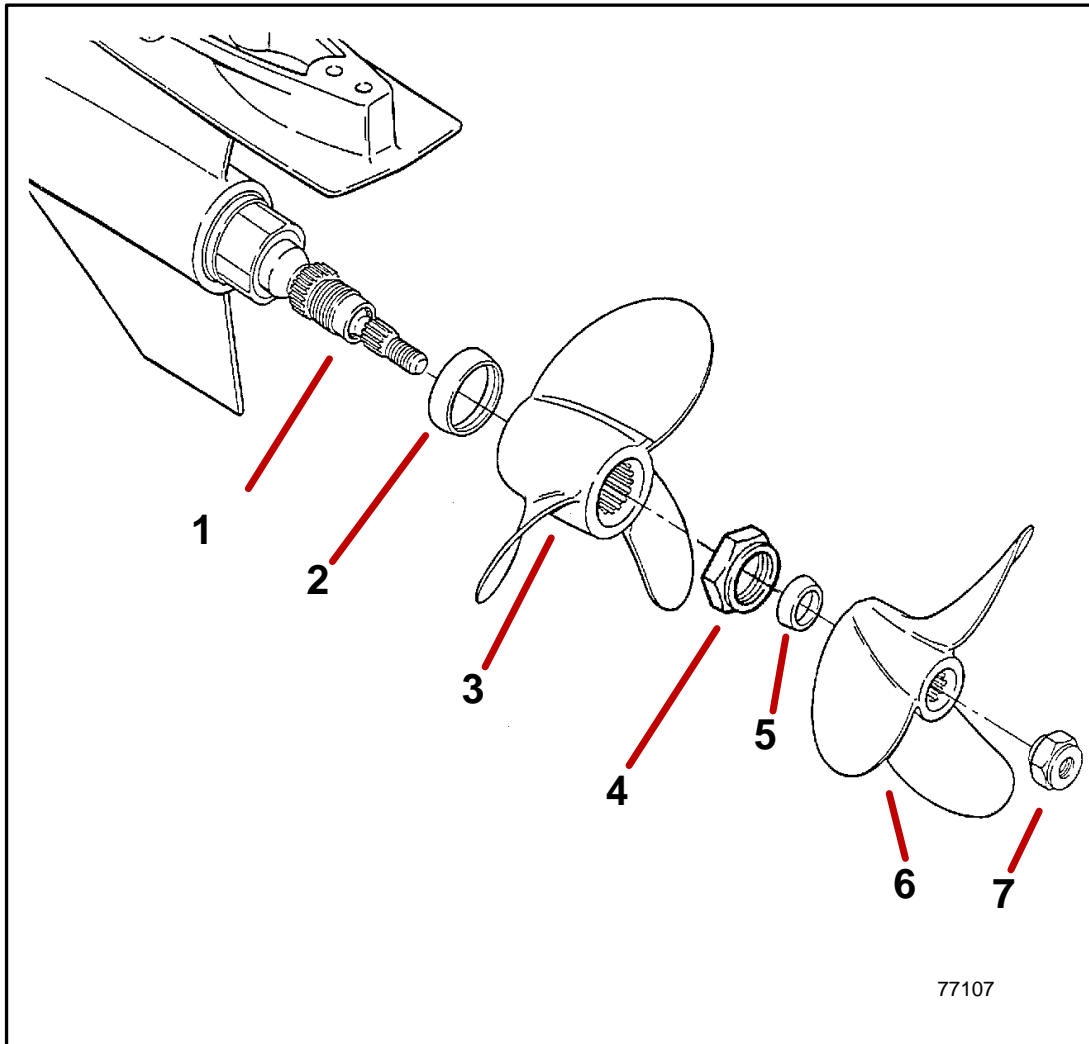
## REPAIR

Some damaged propellers can be repaired. See your dealer.

# MAINTENANCE

CB150

## Bravo III Models



# MAINTENANCE

CB421hp

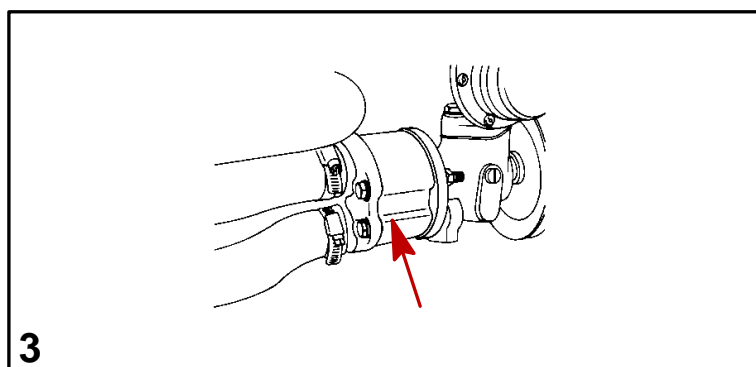
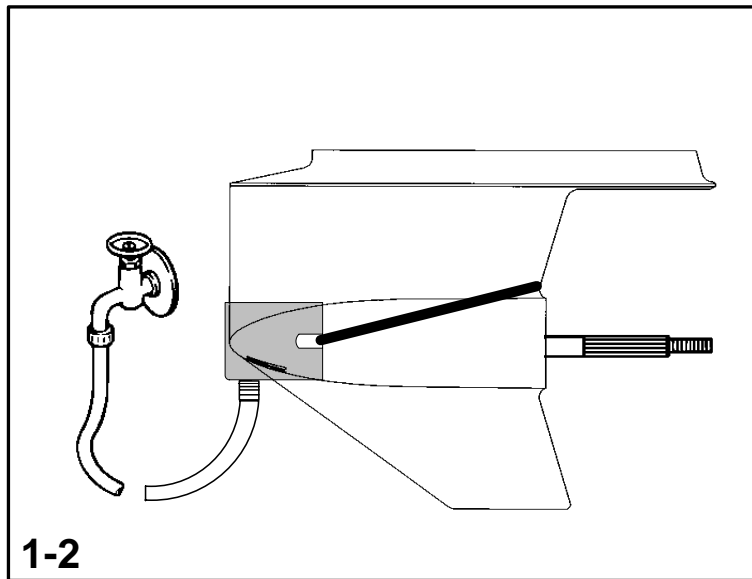
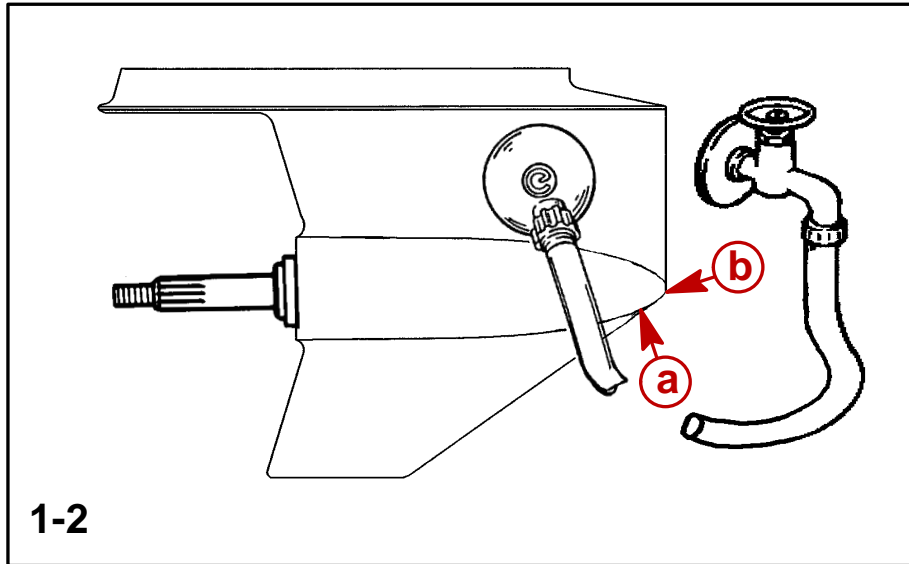
## Propellers (Bravo III)(cont.)

CA820

### INSTALLATION

- 1** Apply a liberal coat of one of the following Quicksilver lubricants to both propeller shafts: Special Lubricant 101, 2-4-C Marine Lubricant with Teflon, or Anti-Corrosion Grease.
- 2** Slide forward thrust hub onto propeller shaft, with tapered side toward propeller hub (toward end of shaft).
- 3** Align splines and place propeller on propeller shaft.
- 4** Install propeller nut. Tighten nut securely. A minimum of 100 lb-ft (136 Nm) torque is required. Check propeller at least after 20 hours of operation. Do not operate with loose propeller.
- 5** Slide aft thrust hub onto propeller shaft, with tapered side toward propeller hub (toward end of shaft).
- 6** Align splines and place propeller on propeller shaft.
- 7** Install propeller nut. Tighten nut securely. A minimum of 60 lb-ft (81 Nm) torque is required. Check propeller at least after 20 hours of operation. Do not operate with loose propeller.

# MAINTENANCE



# MAINTENANCE

## Flushing Cooling System

### WARNING

To avoid possible injury when flushing remove propeller.

### CAUTION

Do not run engine above 1500 rpm when flushing. Suction created by seawater pickup pump may collapse flushing hose, causing engine and/or drive unit to overheat. Watch temperature gauge on dash to ensure that engine does not overheat.

To prevent silt and/or salt buildup in cooling system, flush with fresh-water at specified intervals.

**NOTE:** A cap is available to seal off the torpedo nose water pickups but will not fit on the low (below torpedo) water pickups.

If flushing cooling system with boat in water, raise drive unit up, install flushing attachment and lower drive unit to full down/in position. **On dual water inlet drives** cover the low water inlets with suitable tape (a), or a water pickup cap (b) is also available for the torpedo water pickup.

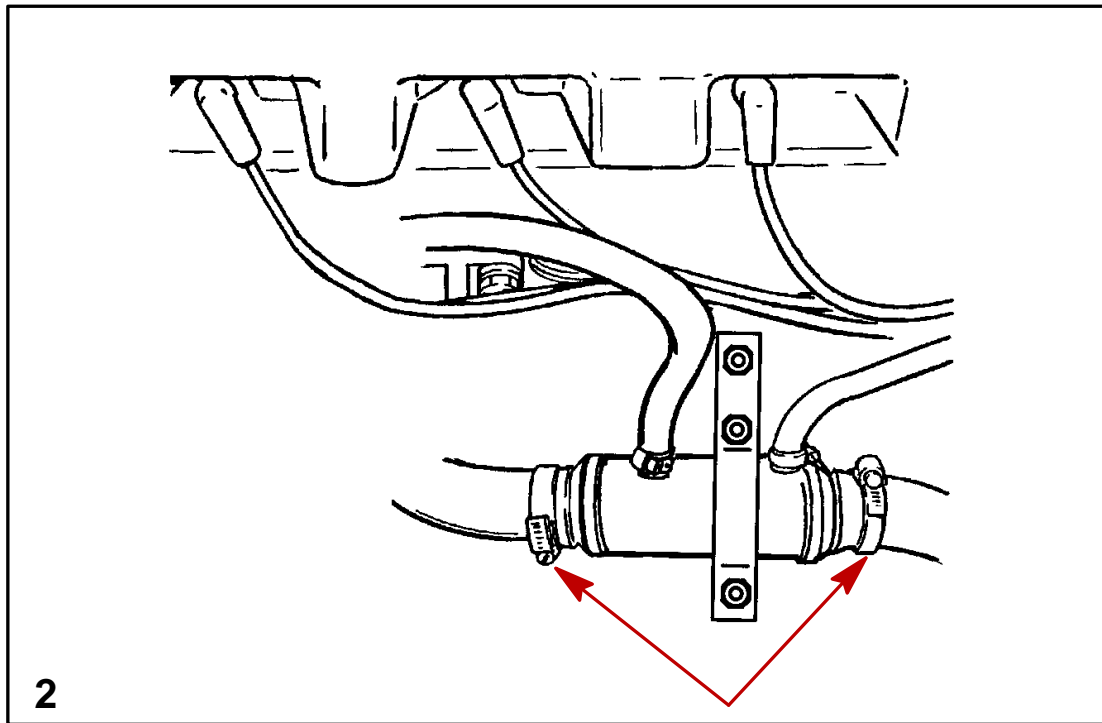
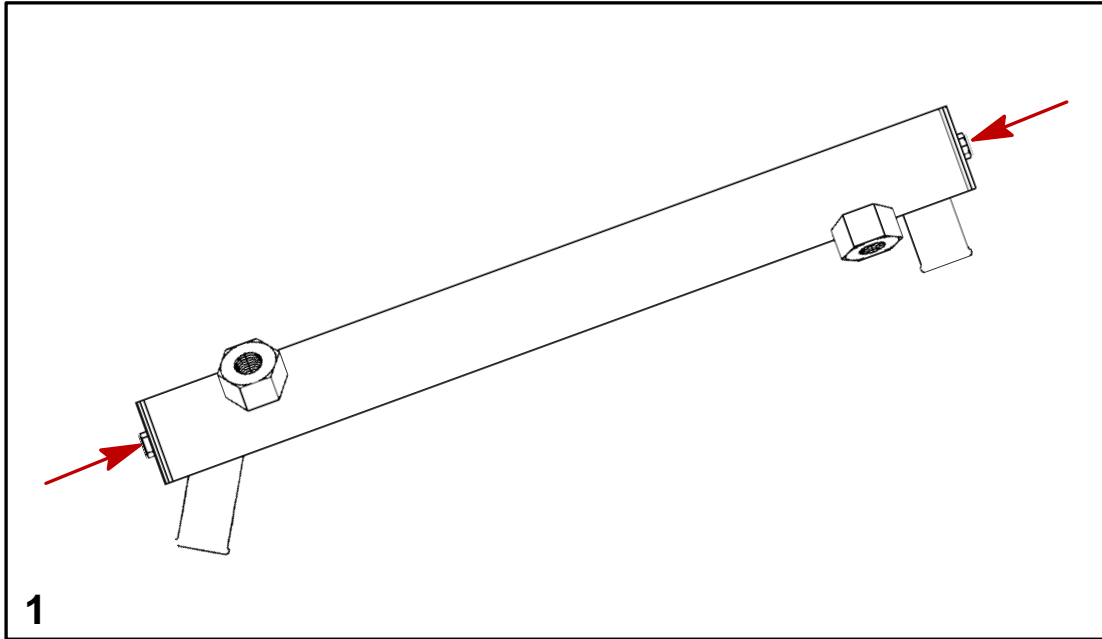
- 1 Install Quicksilver flushing attachments (or equivalent) over water intake holes and attach water hose. **On dual water inlet drives** cover the low water inlets with suitable tape (a) or torpedo water pickup cap (b).
- 2 With drive unit in normal operating position, partially open water tap (about 1/2 maximum). Place remote control in NEUTRAL, position and start engine. Operate engine at idle speed, in NEUTRAL, for about 10 minutes, or until discharge water is clear. Stop engine, shut off water and remove flushing attachment and low water inlet tape (a) or cap (b).

## Seawater Pump Impeller Inspection

Service should be performed by an Authorized MerCruiser Dealer.

- 3 Inspect seawater pump impeller if insufficient seawater flow occurs (if operating temperature exceeds normal range).

# MAINTENANCE





# MAINTENANCE

CB73

## Cleaning Seawater (Raw Water) Section of Oil Cooler

### CAUTION

When cleaning engine oil or power steering coolers with the boat in the water; be sure to close off the water supply from the seawater pump to the cooler or water may enter the boat when end plates or hoses are removed.

Seawater section of oil cooler should be cleaned at least once a year or whenever decreased cooling efficiency is noticed.

- 1 Engine Oil Cooler** - Remove end plates and gaskets. Clean oil cooler with a suitable brush. Flush passages with fresh water. Inspect gaskets for deterioration and replace if necessary. Install gaskets and end plates. Tighten screws securely.
- 2 Power Steering Cooler** - Loosen water hose clamps and remove hoses if it is necessary to inspect or clean cooler. If the oil hoses need to be removed from the cooler, be prepared to cap or plug them to avoid draining the power steering reservoir. Reinstall cooler and tighten hose clamps securely. Check power steering fluid level.

Start engine and inspect cooling system for leaks.

CA99

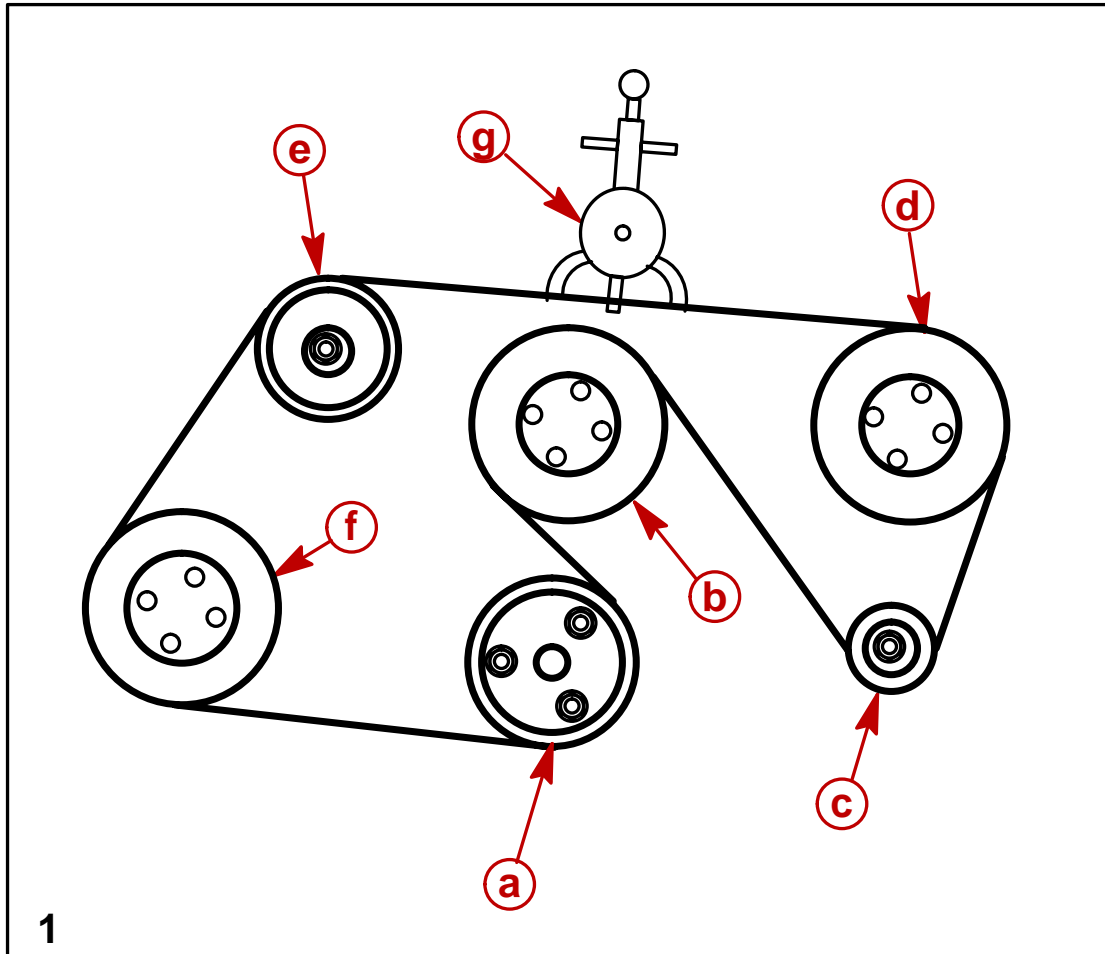
## Changing Positive Crankcase Ventilation Valve

This engine is equipped with a positive crankcase ventilation valve (PCV). This valve should be changed every 100 hours of operation or at least once a year, whichever occurs first.

- Remove hose from PCV valve and pull valve out of intake manifold.
- Install new PCV valve in intake manifold and reconnect hose.
- Ensure valve is tightly seated in manifold.

Use only MerCruiser replacement parts.

# MAINTENANCE



- a** -Crankshaft Pulley
- b** -Water Circulating Pulley
- c** -Alternator Pulley
- d** -Power Steering Pump Pulley
- e** -Idler Pulley (Adjustment Pulley)
- f** -Seawater Pump Pulley
- g** -Belt Tension Gauge - Check for belt tension here
  - New Belt - 120 lbs.(530 N.)
  - Used Belt - 80 lbs. (350 N.)

# MAINTENANCE

## Drive Belt

### **WARNING**

**Make sure engine is shut off and ignition key is removed before inspecting belts.**

Drive belt must be periodically inspected for condition and tension. Check for tension at location shown.

1 Inspect drive belt for proper tension and for the following:

- Excessive wear
- Cracks
- Fraying
- Glazed surfaces
- Use a belt tension tool on the belt at location indicated by arrow to check for correct belt tension.

**NOTE:** *Minor, transverse cracks (across the belt width) may be acceptable. Longitudinal cracks (in direction of belt length) that join transverse cracks are NOT acceptable.*

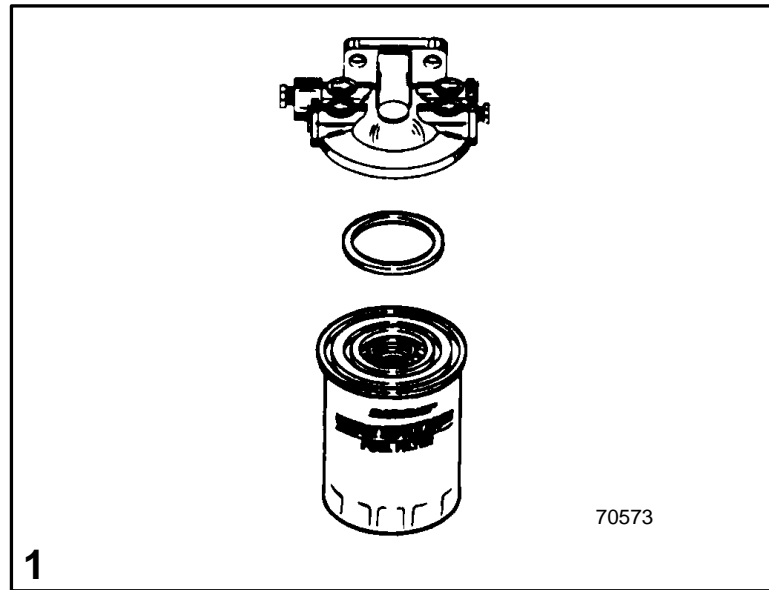
If drive belt needs replacement, see your Authorized MerCruiser Dealer.

### Drive Belt Routing and Tension

**IMPORTANT:** Drive belt must be routed as shown or damage may result.

- 2 Loosen the 5/8 in. locking nut on adjustment stud. Leave the wrench on the adjustment nut.
- 3 Install the belt tension gauge onto the belt.
- 4 Use a 5/16 in. socket and tighten adjusting stud until the belt tension conforms to the correct setting on the gauge (See specs).
- 5 Hold the adjustment stud and tighten the 5/8 in. locking nut.
- 6 Remove the belt tension gauge from the belt.
- 7 Run the engine for a short period of time and recheck tension.

# MAINTENANCE



CB172

## Fuel Filters

### **⚠ WARNING**

**Avoid Fire or Explosion: Be careful when changing fuel filters. Gasoline is extremely flammable and highly explosive under certain conditions. Be sure ignition key is OFF. Do not smoke or allow spark or open flame in area when changing fuel filter. Wipe up any spilled fuel immediately.**

- 1** Remove water separating fuel filter (by turning counterclockwise) and sealing ring from mounting bracket and discard. Coat sealing ring on new filter with motor oil. Thread filter clockwise onto bracket and tighten securely by hand. Do not use a filter wrench.
- 2** Start and run engine ( See Starting, Shifting and Stopping in the Operation Section of this manual). Check filter connection for gasoline leaks. If leaks exist, recheck filter installation. If leaks continue, stop engine immediately and contact your Authorized MerCruiser Dealer.

### **⚠ WARNING**

**Avoid Fire or Explosion: Make sure no fuel leaks exist before closing engine hatch.**

# MAINTENANCE

## Corrosion and Corrosion Protection

Whenever two or more dissimilar metals (like those found on the stern drive) are submerged in a conductive solution, such as saltwater, polluted water, or water with a high mineral content, a chemical reaction takes place causing electrical current to flow between metals. The electrical current flow causes the metal that is most chemically active, or anodic, to erode. This is known as galvanic corrosion and, if not controlled, it will in time cause the need for replacement of power package components exposed to water.

Refer to booklet “**Everything you need to know about marine corrosion**” for more corrosion information, available through your Mercury/MerCruiser Dealer.

### **WARNING**

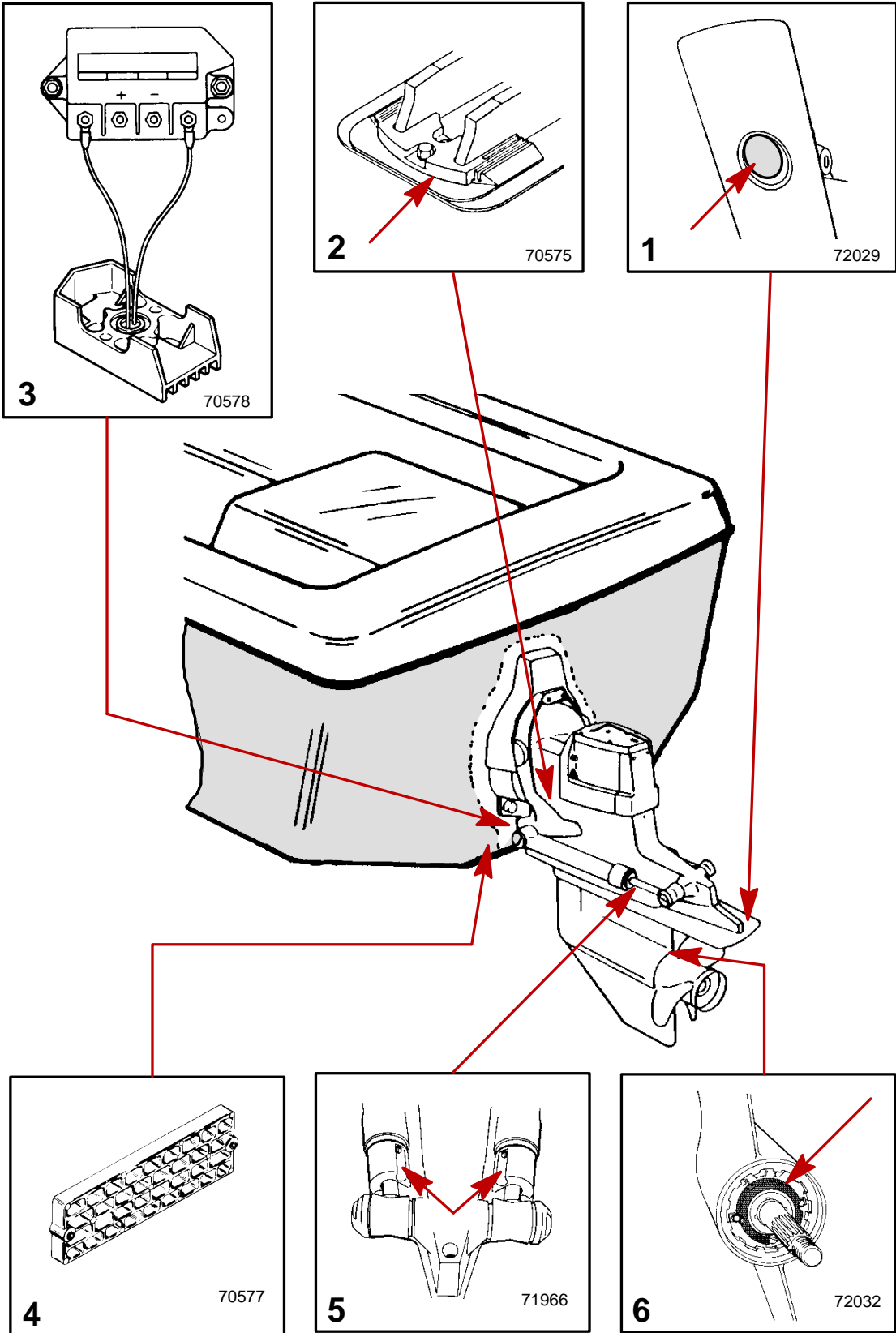
**DO NOT ATTEMPT TO USE MAGNESIUM ANODES IN SALT WATER.** They will provide overprotection, resulting in a different electrochemical reaction that will create hydrogen on the metal surface of the drive, under the paint, causing the paint to blister and peel completely from the surface of the overprotected drive.

### **CAUTION**

Mercury Marine recommends a MerCathode System or Anti-Corrosion Kit be installed whenever using a stainless steel propeller, or if boat is equipped with stainless steel components (immersed below the waterline) that are connected into the engine ground system. If a boat is equipped with stainless steel after planes, a large anode should be installed on EACH to handle the increased galvanic corrosion potential.

**IMPORTANT:** Replace sacrificial anodes if eroded 50% or more.

# MAINTENANCE



# MAINTENANCE

## Corrosion and Corrosion Protection (cont.)

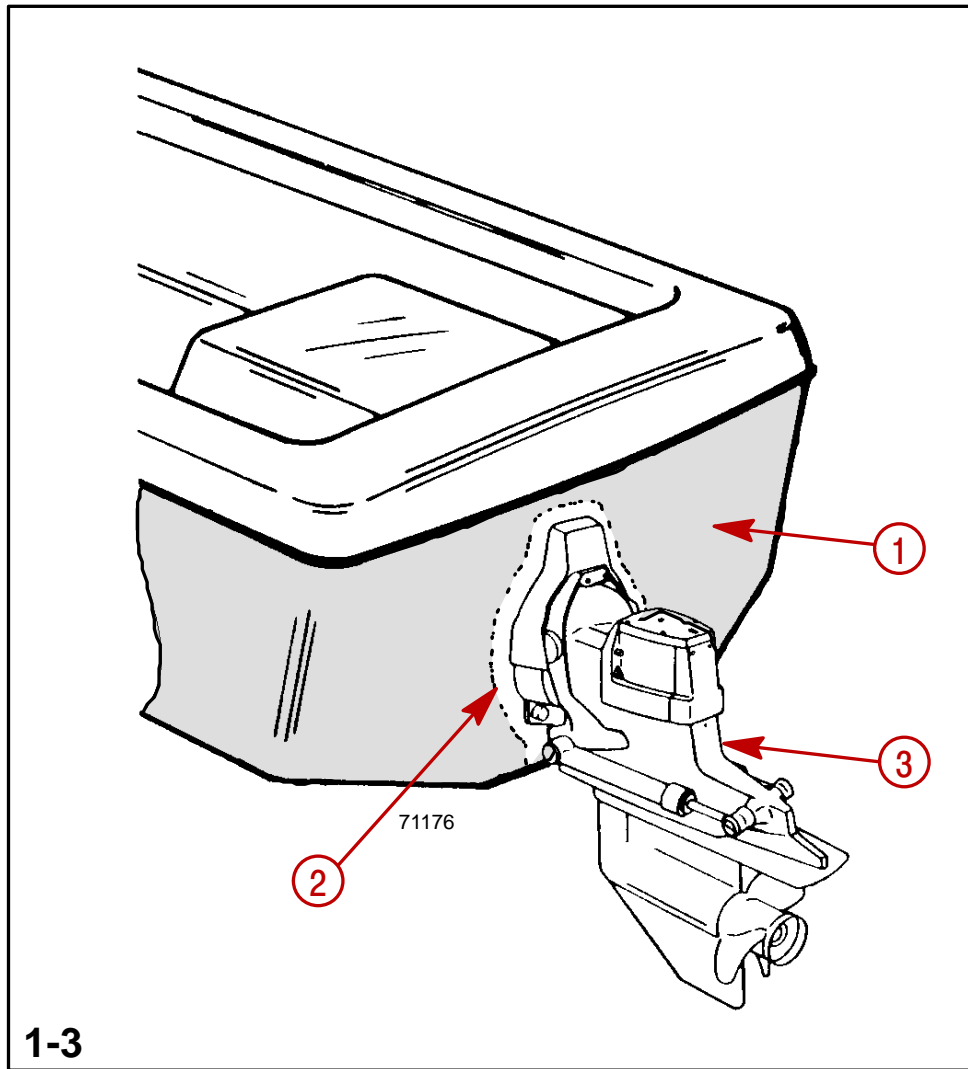
- 1 Gear Housing Anode** - is located in the splash plate, just above the propellers.
- 2 Anodic Plate** - serves as a sacrificial anode. Unscrew both attaching screws and remove. Install a new anodic plate and tighten securely.
- 3 MerCathode System** - should be tested to ensure adequate output.

Test should be made where boat is moored, using Quicksilver Reference Electrode and Test Meter. Contact your Authorized MerCruiser Dealer to arrange for this test.

- 4 Anodic Block Kit (Optional)** - Mounted to boat transom. Acts as a sacrificial anode. Replace as required.
- 5 Trim Cylinder Anodes** - are mounted on each trim cylinder. To replace the trim cylinder anodes:
  - Remove two screws from each anode.
  - Install new anodes and tighten securely.
- 6 Propeller Anode** - is located in front of the propeller, between the front side of the propeller and the gear housing. Refer to "Propeller" section in this manual for propeller removal and installation. To replace the propeller anode:
  - Remove propeller.
  - Remove two screws from anode.
  - Install new anode and tighten securely.
  - Reinstall propeller. See "Propeller Installation" for proper torque.

# MAINTENANCE

CB170





# MAINTENANCE

## Corrosion and Corrosion Protection (cont.)

CA168

In addition to the corrosion protection devices, the following steps should be taken to inhibit corrosion:

**IMPORTANT:** Corrosion damage that results from the improper application of antifouling paint will not be covered by the limited warranty.

- 1 Painting Boat Hull or Boat Transom:** Antifouling paint may be applied to boat hull and boat transom but you must observe the following precautions:

**IMPORTANT:** DO NOT paint zinc anodes or MerCathode System reference electrode and anode, as this will render them ineffective as galvanic corrosion inhibitors.

**IMPORTANT:** If antifouling protection is required for boat hull or boat transom, copper or tin base paints, if not prohibited by law, can be used. If using copper or tin based antifouling paints, observe the following:

- 2 Avoid any electrical interconnection between the MerCruiser Product, Anodic Blocks, or MerCathode System and the paint by allowing a minimum of 1 in. (26 mm) UNPAINTED area on transom of the boat around these items.**
- 3 Painting Drive Unit or Transom Assembly:** Drive unit and transom assembly can be painted with a good quality marine paint or an antifouling paint that DOES NOT contain copper, tin, or any other material that could conduct electrical current. Do not paint drain holes, anodes, MerCathode system, and items specified by boat manufacturer.
- 4 Spray power package components on inside of boat every 2-3 weeks with Quicksilver Corrosion Guard to protect finish from dulling and corrosion. External power package components may also be sprayed.**
- 5 All lubrication points, especially steering system, shift and throttle linkages, should be kept well lubricated.**
- 6 Flush cooling system periodically, preferably after each use.**

# MAINTENANCE

## Battery

All lead acid batteries discharge when not in use. Recharge every 30 to 45 days, or when specific gravity drops below battery manufacturer's specifications.

Refer to specific instructions and warnings accompanying your battery. If this information is not available, observe the following:

### **WARNING**

**Observe the following when jump starting, charging or handling a battery:**

- **Do not use jumper cables and a booster battery to start engine.**
- **When charging batteries, be sure battery compartment or area where batteries are located, is well-vented.**
- **Do not recharge a weak battery in the boat.**
- **Remove battery and recharge in a ventilated area away from fuel vapors, sparks or flames.**
- **Hydrogen gases that escape from the battery during charging are explosive.**
- **Batteries contain acid which can cause severe burns - Avoid contact with skin, eyes and clothing.**
- **Batteries produce hydrogen and oxygen gases when being charged.**
- **This explosive gas escapes fill/vent cell caps and may form an explosive atmosphere around the battery for several hours after it has been charged.**
- **Sparks or flames can ignite the gas and cause an explosion which may shatter the battery and could cause blindness or other serious injury.**

**Battery Handling:**

- **Safety glasses and rubber gloves are recommended when handling or filling a battery.**
- **Battery electrolyte is a corrosive acid and should be handled with care.**
- **If electrolyte is spilled or splashed on any part of the body, immediately flush the exposed area with liberal amounts of water and obtain medical aid as soon as possible.**

# MAINTENANCE

CA104

## Bottom of Boat

To maintain maximum speed, the following conditions of the boat bottom should be observed:

- Clean, free of barnacles and marine growth.
- Free of distortion, nearly flat where it contacts water.
- Straight and smooth, fore and aft.

## ANTIFOULING PAINTS

See Antifouling Paint recommendations and related information on previous pages.

**IMPORTANT: Refer to CORROSION AND CORROSION PROTECTION for additional information.**

CA105

## Inspection of Power Package

Inspect power package often, and at regular intervals, to help maintain its top operating performance, and correct potential problems before they occur. The entire power package should be checked carefully, including all accessible engine parts.

1. Check for loose, damaged or missing parts, hoses and clamps; tighten or replace as required.
2. Check plug leads and electrical leads for damage.
3. Remove and inspect propeller. If badly nicked, bent or cracked, see your dealer.
4. Repair nicks and corrosion damage on power package exterior finish. Use Quicksilver spray paints - see your Authorized MerCruiser Dealer.

CA409

## Attention Required After Submersion

- Before recovery, contact an Authorized MerCruiser Dealer.
- After recovery, immediate service by an Authorized MerCruiser Dealer is required to prevent serious damage to power package.





# COLD WEATHER OR EXTENDED STORAGE

## Power Package Lay-up

**IMPORTANT:** This service should be performed by an Authorized MerCruiser Dealer.

### CAUTION

**Avoid Engine or Stern Drive Damage: DO NOT** operate engine without water flowing thru seawater pickup pump, as pump impeller may be damaged and subsequent overheating damage to engine or stern drive unit may result.

**IMPORTANT:** Before starting engine a water source must be attached to the seawater intake openings in gear housing. Follow all warnings, and flushing attachment procedures stated, in “FLUSHING COOLING SYSTEM”.

- 1 Run engine sufficiently to bring it up to normal operating temperature. Shut off engine and change oil and oil filter.
- 2 Flush cooling system. Refer to “Flushing Cooling System” procedure shown earlier in this manual.

### WARNING

**Avoid Fire or Explosion: Be sure engine compartment is well ventilated and no gasoline vapors are present during the following operation.**

- 3 Prepare fuel system for extended storage as follows:
  - Fill fuel tank(s) with fresh gasoline (that does not contain alcohol) and a sufficient amount of Quicksilver Gasoline Stabilizer and Conditioner to treat gasoline. Follow instructions on container.
  - Remove flame arrestor and restart engine. While operating engine at fast idle (1000-1500 rpm), fog internal surfaces of engine by squirting approximately 8 ounces (227g) of Quicksilver Storage Seal into throttle bores. Stall engine by squirting last 2 ounces (57g) of Storage Seal rapidly into throttle bore. Turn ignition key to OFF position.

(continued on next page)

# COLD WEATHER OR EXTENDED STORAGE

## Power Package Lay-up (cont.)

**4 If boat is to be placed in storage with fuel containing alcohol in fuel tanks (if fuel without alcohol is not available):**

- Fuel tanks should be drained completely and Quicksilver Gasoline Stabilizer and Conditioner added to any fuel remaining in the tank.

Refer to “FUEL REQUIREMENTS” for additional information.

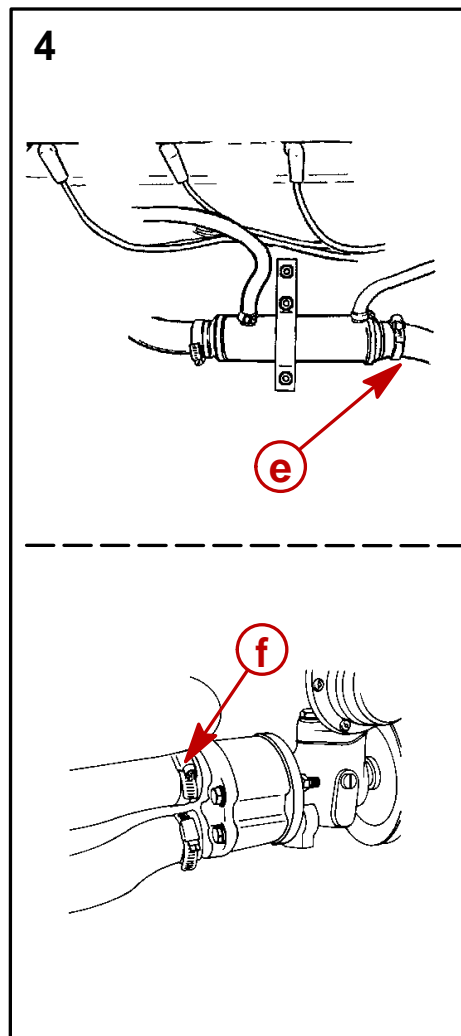
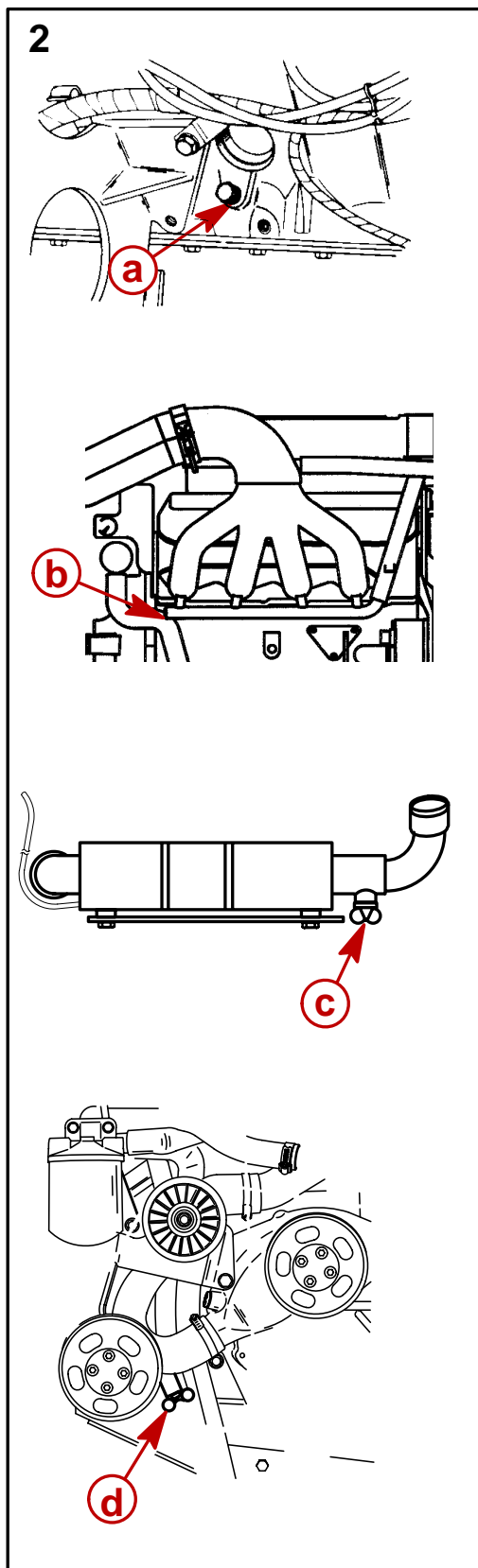
**5** Close fuel shut-off valve, if so equipped.

**⚠ CAUTION**

**Avoid Damage To Stern Drive Unit: Stern drive unit should be stored in full “down” position. Universal Joint bellows may develop a “set” if unit is stored in raised position and may fail when unit is returned to service.**

**6** Place drive unit in the full “down” position.

# COLD WEATHER OR EXTENDED STORAGE





# COLD WEATHER OR EXTENDED STORAGE

## Draining Instructions

### DRAINING SEAWATER (RAW-WATER) COOLED MODELS

#### CAUTION

If boat is to remain in water after draining, seawater inlet hose must be removed and plugged to prevent siphoning allowing seawater to flow from the drain holes or removed hoses.

#### CAUTION

Seawater section of cooling system **MUST BE COMPLETELY** drained for winter storage, or immediately after cold weather use, if the possibility of freezing temperatures exist. Failure to comply may result in trapped water causing freeze and/or corrosion damage to engine.

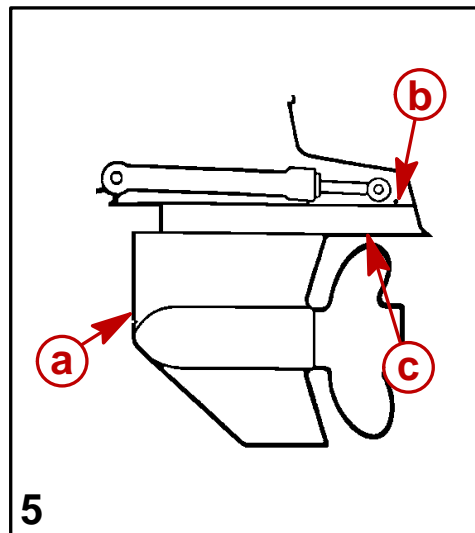
- 1 **Level** engine to ensure complete draining of cooling system.
- 2 **Remove** the following drain plugs:
  - a - Cylinder Block (port and starboard)
  - b - Bottom of exhaust manifolds
  - c - Fuel cooler (below engine front)
  - d - From engine circulating hose
- 3 **Repeatedly** clean out drain holes using a stiff piece of wire. Do this until entire system is drained.
- 4 Loosen hose clamps and remove the following hoses:

**NOTE:** *Lift or bend hoses to allow water to drain completely.*

- e - From rear of power steering cooler
- f - From inlet fitting of seawater pickup pump

After draining cooling system, install drain plugs (coat threads with Perfect Seal) (Perfect Seal is not required on fuel cooler plug), reconnect hoses and tighten all hose clamps securely.

# COLD WEATHER OR EXTENDED STORAGE

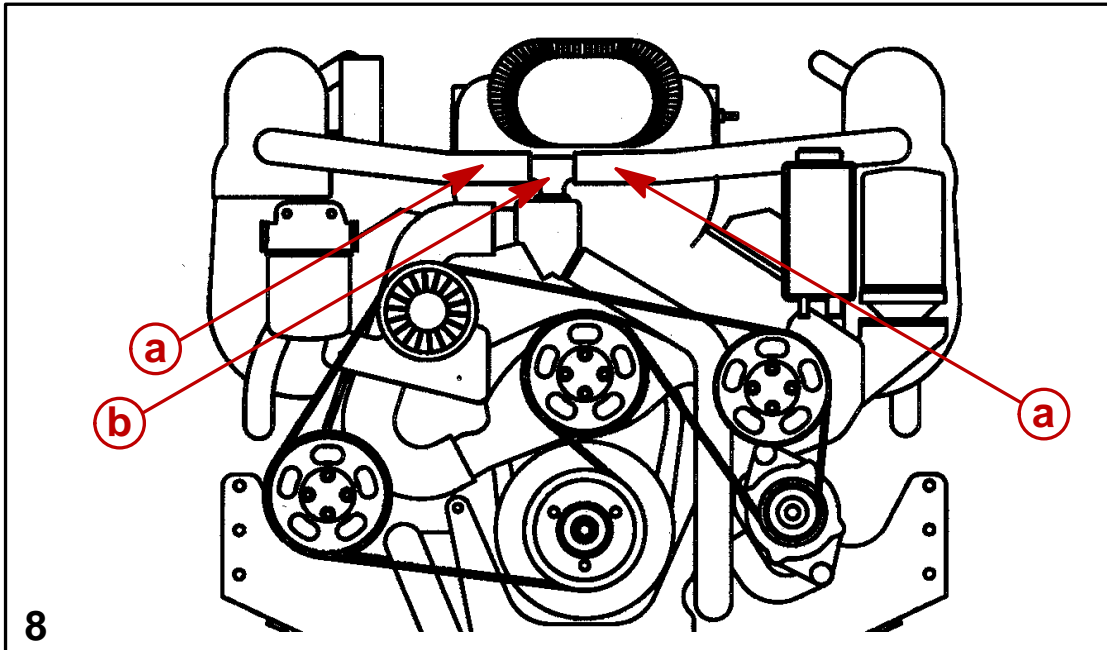


**5** Make sure the following passages are open and unobstructed:

- a** -Speedometer Pilot Tube
- b** -Trim Tab Cavity Vent Hole
- c** -Trim Tab Cavity Drain Passage

# COLD WEATHER OR EXTENDED STORAGE

## Draining Instructions (cont.)



**IMPORTANT:** MerCruiser recommends that propylene glycol (a nontoxic and environmentally safe) antifreeze be used in the seawater section of the cooling system for cold weather or extended storage. Make sure that the propylene glycol antifreeze contains a rust inhibitor and is recommended for use in marine engines. Be certain to follow the propylene glycol manufacturer's recommendations.

**a** -Remove Hoses

**b** -Remove "T" Fitting

- 6 For additional assurance against freezing and rust, remove the hoses from the "T" fitting of the thermostat cover and then remove the "T" fitting. Fill the engine seawater cooling system through this opening with a mixture of antifreeze and tap water mixed to manufacturer's recommendation to protect engine to the lowest temperature to which it will be exposed during cold weather or extended storage. Clean the threads of the "T" fitting and re-install into housing and re-connect hoses.

Perform all checks, inspections, lubrication, and fluid changes outlined in MAINTENANCE CHART under AT LEAST ONCE A YEAR.

# COLD WEATHER OR EXTENDED STORAGE

## Battery Winter Storage

Follow battery manufacturer's instructions for storage.

## Power Package Recommissioning

### **WARNING**

To prevent possible injury or damage to equipment, do not install battery until all maintenance has been performed on engine.

- 1 Check that all cooling system hoses are connected properly and hose clamps are tight and any removed drain plugs are installed and tight.

### **CAUTION**

When installing battery, be sure to connect **NEGATIVE (-)** battery cable to **NEGATIVE (-)** battery terminal and **POSITIVE (+)** battery cable to **POSITIVE (+)** battery terminal. If battery cables are reversed, electrical system damage will result.

- 2 Install fully-charged battery. Clean battery cable clamps and terminals and reconnect cables (see CAUTION listed above). Tighten each cable clamp securely when connecting.
- 3 Coat battery terminal connections with a anti-corrosion agent.
- 4 Perform all checks in OPERATION CHART in the BEFORE STARTING column.

### **CAUTION**

Refer to "Flushing Cooling System" before starting engine.

- 5 Supply water to engine cooling system, start engine and observe instrumentation to insure all systems are functioning.
- 6 Inspect engine for fuel, oil, fluid, water and exhaust leaks.
- 7 Check steering system, shift and throttle control for proper operation.

# TROUBLESHOOTING

## Starter Motor Will Not Crank Engine, or Cranks Slow

Possible Cause	Remedy
Battery switch turned off.	Turn switch on.
Remote control not in neutral position.	Position control lever in neutral.
Open circuit breaker or blown fuse.	Check and reset circuit breaker or replace fuse.
Loose or dirty electrical connections or damaged wiring.	Check all electrical connections and wires (especially battery cables). Clean and tighten faulty connection.
Bad battery.	Test and replace if bad.

## Engine Will Not Start or Is Hard to Start

Possible Cause	Remedy
Improper starting procedure.	Read starting procedure.
Empty fuel tank or fuel shutoff valve closed.	Fill tank or open valve.
Engine Flooded.	Do not attempt to start engine for at least 5 minutes. Refer to Starting Procedures.
Blown Fuse	Check Fuses.
Faulty Fuel Pump or Ignition Relay.	Test Relays.
Faulty ignition system component.	Service ignition system.

(continued on next page)

# TROUBLESHOOTING

## Engine Will Not Start, or Is Hard to Start (con't)

Lanyard Stop activated.	Reset.
Clogged fuel filters.	Replace filters.
Stale or contaminated fuel.	If contaminated, drain tank. Fill with fresh fuel.
Fuel line or tank vent line kinked or clogged.	Replace kinked lines or blow out lines with compressed air to remove obstruction.

## Engine Runs Rough, Misses, and/or Backfires

Possible Cause	Remedy
Idle speed too low.	Have adjustments checked by an Authorized MerCruiser Dealer.
Faulty ignition system component.	Service ignition system.
Clogged fuel filters.	Replace filters.
Stale or contaminated fuel.	If contaminated, drain tank. Fill with fresh fuel.
Kinked or clogged fuel line or fuel tank vent line.	Replace kinked lines or blow out lines with compressed air to remove obstruction.
Flame Arrestor plugged with foreign material.	Clean Flame Arrestor.
Rev Limiter engaging at wide-open-throttle.	Change to propeller with more pitch.

# TROUBLESHOOTING

## Poor Performance

Possible Cause	Remedy
Throttle not fully open.	Inspect throttle cable and linkages for proper operation.
Damaged / improper propeller.	Replace propeller.
Excessive bilge water.	Drain and check for cause of entry.
Boat overloaded or load improperly distributed.	Reduce load or redistribute load more evenly.
Boat bottom fouled or damaged.	Clean or repair as necessary.
Flame Arrestor dirty.	Clean Flame Arrestor.

## Excessive Engine Temperature

Possible Cause	Remedy
Seacock closed.	Open.
Drive belt loose or in poor condition.	Replace or adjust belt.
Seawater pickups obstructed.	Remove obstruction.
Faulty thermostat.	Replace.
Oil cooler cores plugged with foreign material.	Clean oil cooler.
Faulty seawater pickup pump.	Repair.
Seawater discharge restricted or plugged.	Clean exhaust elbows.
Faulty gauge or sender.	Test with shop gauge.
Aerated water supply to water pick-up.	Place water pick-up in a non-aerated water supply.

# TROUBLESHOOTING

## Insufficient Engine Temperature

Possible Cause	Remedy
Faulty water thermostat.	Replace.
Faulty oil thermostat.	Replace
Faulty gauge or sender.	Test with shop gauge.

## Low Engine Oil Pressure

Possible Cause	Remedy
Insufficient oil in crankcase.	Check and add oil.
Excessive oil in crankcase (causing it to become aerated).	Check and remove required amount of oil. Check for cause of excessive oil (improper filling, etc.).
Diluted or improper viscosity oil.	Change oil and oil filter, using correct grade and viscosity oil. Determine cause for dilution (excessive idling, etc.).
Faulty Oil Pressure Gauge or Oil Pressure Sender.	Check oil pressure with a mechanical shop gauge.

## Battery Will Not Come Up On Charge

Possible Cause	Remedy
Excessive current draw from battery.	Turn off non-essential accessories.
Loose or dirty electrical connections or damaged wiring.	Check all associated electrical connections and wires (especially battery cables). Clean and tighten faulty connections. Repair or replace damaged wiring.



# TROUBLESHOOTING

## Battery Will Not Come Up On Charge (cont.)

Possible Cause	Remedy
Alternator drive belt loose or in poor condition.	Replace and/or adjust.
Unacceptable battery condition.	Test battery.

## Power Trim Does Not Operate (Motor Doesn't Run)

Possible Cause	Remedy
Blown fuse.	Replace fuse.
Loose or dirty electrical connections or damaged wiring.	Check all associated electrical connections and wires (especially battery cables). Clean and tighten faulty connections. Repair or replace damaged wiring.

## Power Trim Does Not Operate (Motor Runs But Drive Unit Does Not Move)

Possible Cause	Remedy
Trim pump oil level low.	Fill pump to correct level.
Drive unit binding in gimbal ring.	Check for obstruction.

# TROUBLESHOOTING

## Remote Control Operates Hard, Binds, Has Excessive Free-Play or Makes Unusual Sounds

Possible Cause	Remedy
Insufficient lubrication on shift and throttle linkage fasteners.	Lubricate.
Loose or missing shift and throttle linkage fasteners.	Check all linkages. If any are loose or missing, see Authorized MerCruiser Dealer immediately.
Obstruction in shift or throttle linkages.	Remove obstruction.
Shift or throttle cable kinked.	Straighten cable, or have dealer replace cable if damaged beyond repair.
Friction adjustment excessive.	Adjust.

## Steering Wheel Turns Hard or Jerky

Possible Cause	Remedy
Low power steering pump fluid level.	Check for leaks. Refill to correct level.
Drive belt loose or damaged.	Adjust or replace.
Insufficient lubrication on steering system components.	Lubricate.
Loose or missing steering fasteners or parts.	Check all parts and fasteners. If any are loose or missing, see Authorized MerCruiser Dealer immediately.
Contaminated power steering fluid.	Drain and replace.

# TROUBLESHOOTING

## Block Water Pressure Is Below Specification

### (DUAL WATER INLET GEARCASE)

Possible Cause	Remedy
Insufficient water supply.	Lower the "X" dimension.
	Plug upper 4 strut water holes.
	Install low water pickup gearcase.
	Install a transom or through-hull water pickup.

## Block Water Pressure Is Below Specification

### (LOW WATER INLET GEARCASE)

Possible Cause	Remedy
Insufficient water supply.	Lower the "X" dimension.
	Change propeller that reduces trim out positioning.

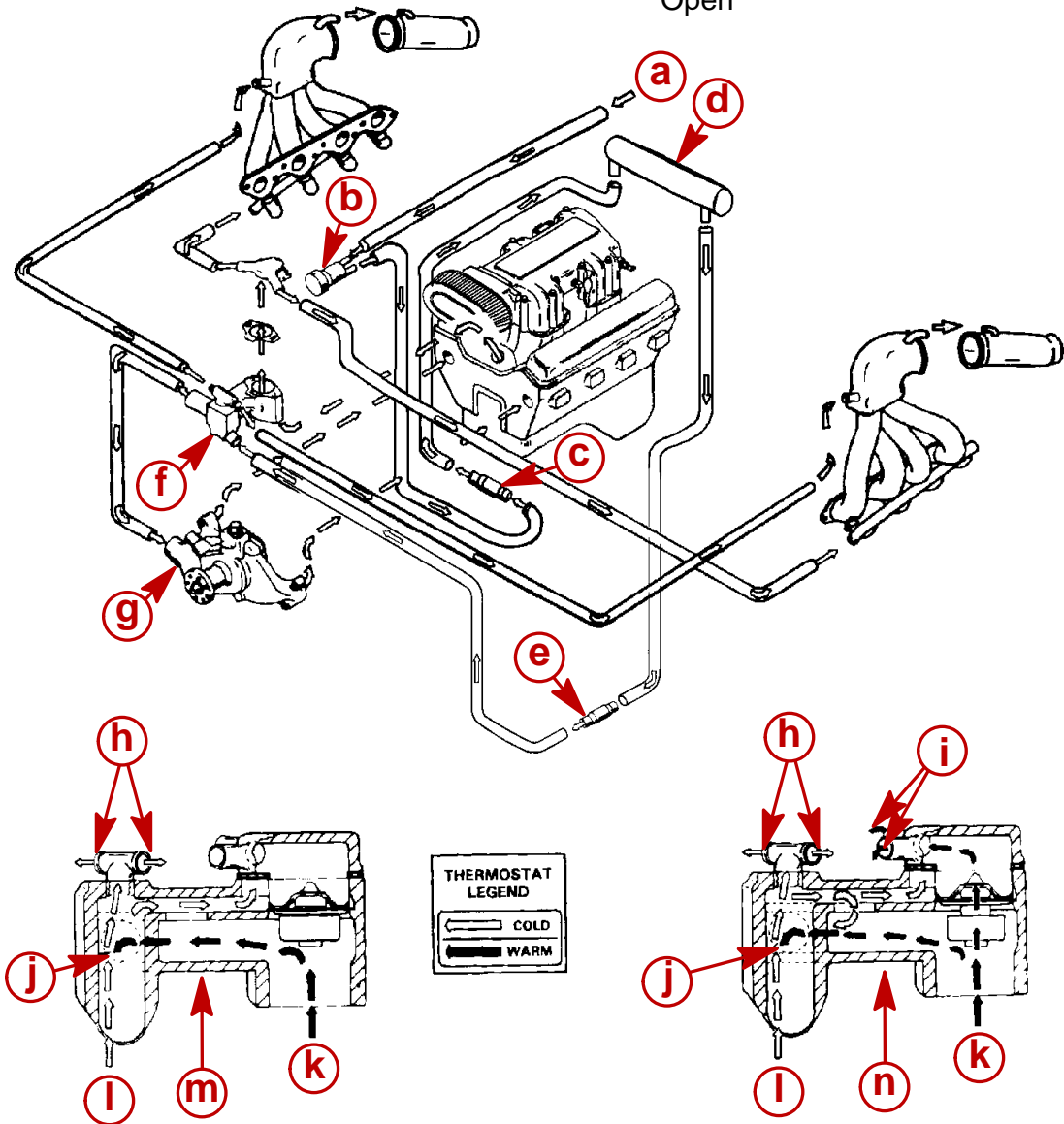
## Block Water Pressure Is Above Specification

### (DUAL AND LOW WATER INLET GEARCASE)

Possible Cause	Remedy
High boat speed causing high ram pressure	Install water bypass kit (Available at MerCruiser Dealerships)

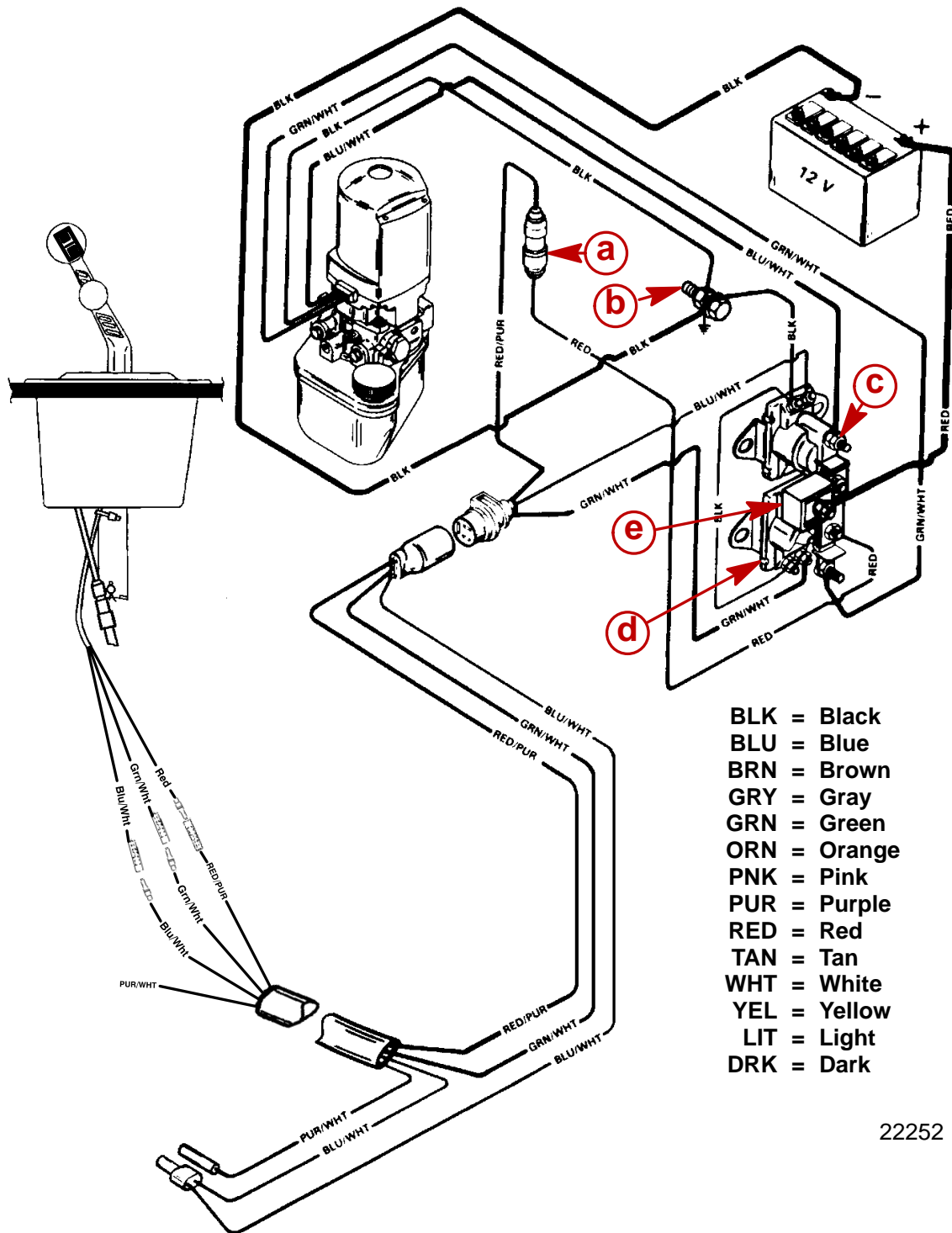
# WATER FLOW DIAGRAM

- a** - Seawater Inlet
- b** - Seawater Pickup Pump
- c** - Fuel Cooler
- d** - Engine Oil Cooler
- e** - Power Steering Cooler
- f** - Thermostat Housing
- g** - Engine Circulating Pump
- h** - To Exhaust Elbows
- i** - To Exhaust Manifold
- j** - To Engine Circulating Pump
- k** - Coolant From Engine
- l** - From Seawater Pickup Pump
- m** - Coolant Flow with Thermostat Closed
- n** - Coolant Flow With Thermostat Open



# WIRING DIAGRAMS

## Power Trim (Single Engine)



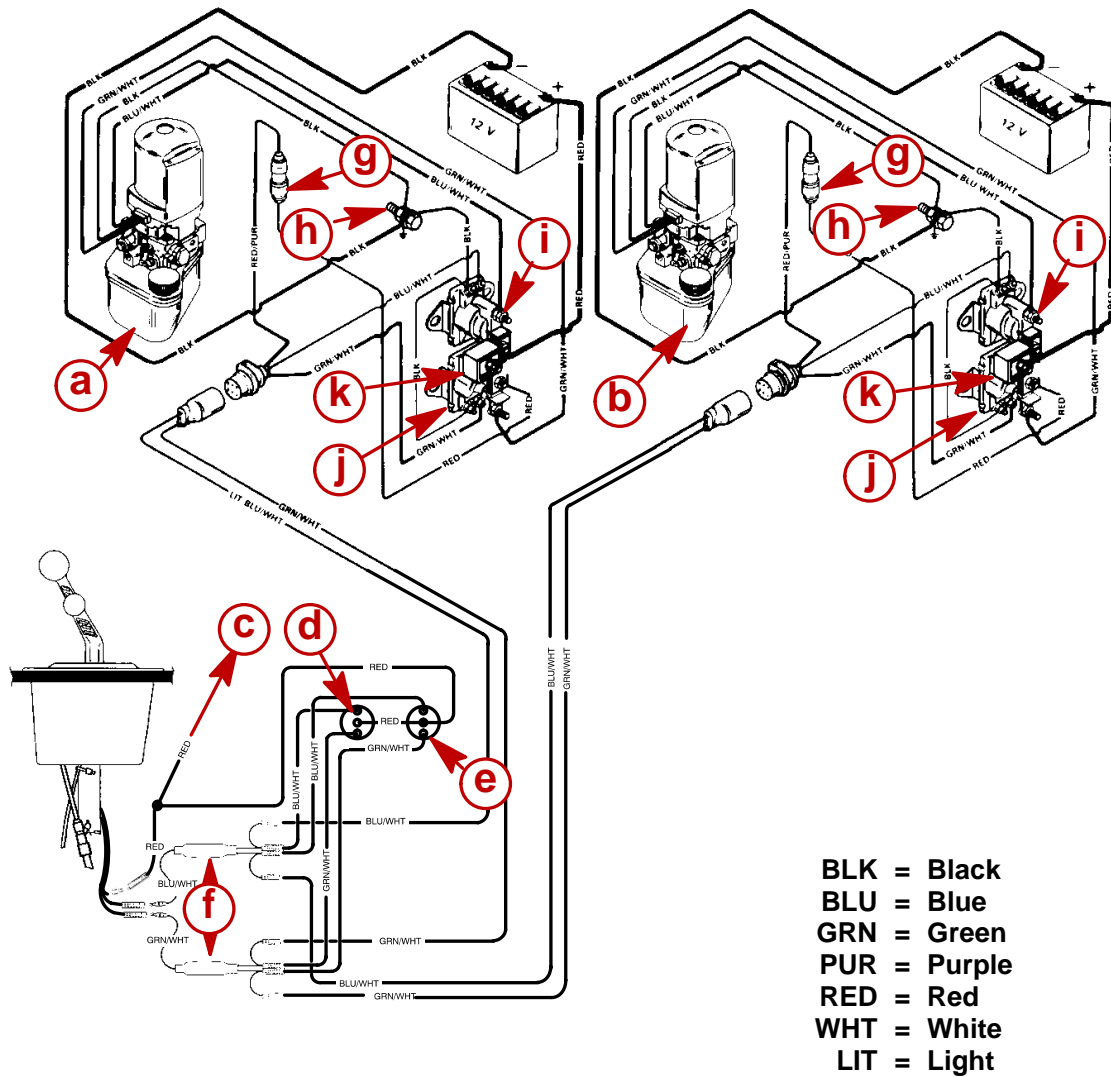
- BLK = Black
- BLU = Blue
- BRN = Brown
- GRY = Gray
- GRN = Green
- ORN = Orange
- PNK = Pink
- PUR = Purple
- RED = Red
- TAN = Tan
- WHT = White
- YEL = Yellow
- LIT = Light
- DRK = Dark

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- a** - 20 Amp Fuse
- b** - Ground Bolt (Floor Mount)
- c** - Up - Solenoid
- d** - Down - Solenoid
- e** - 110 Amp Fuse

# WIRING DIAGRAMS

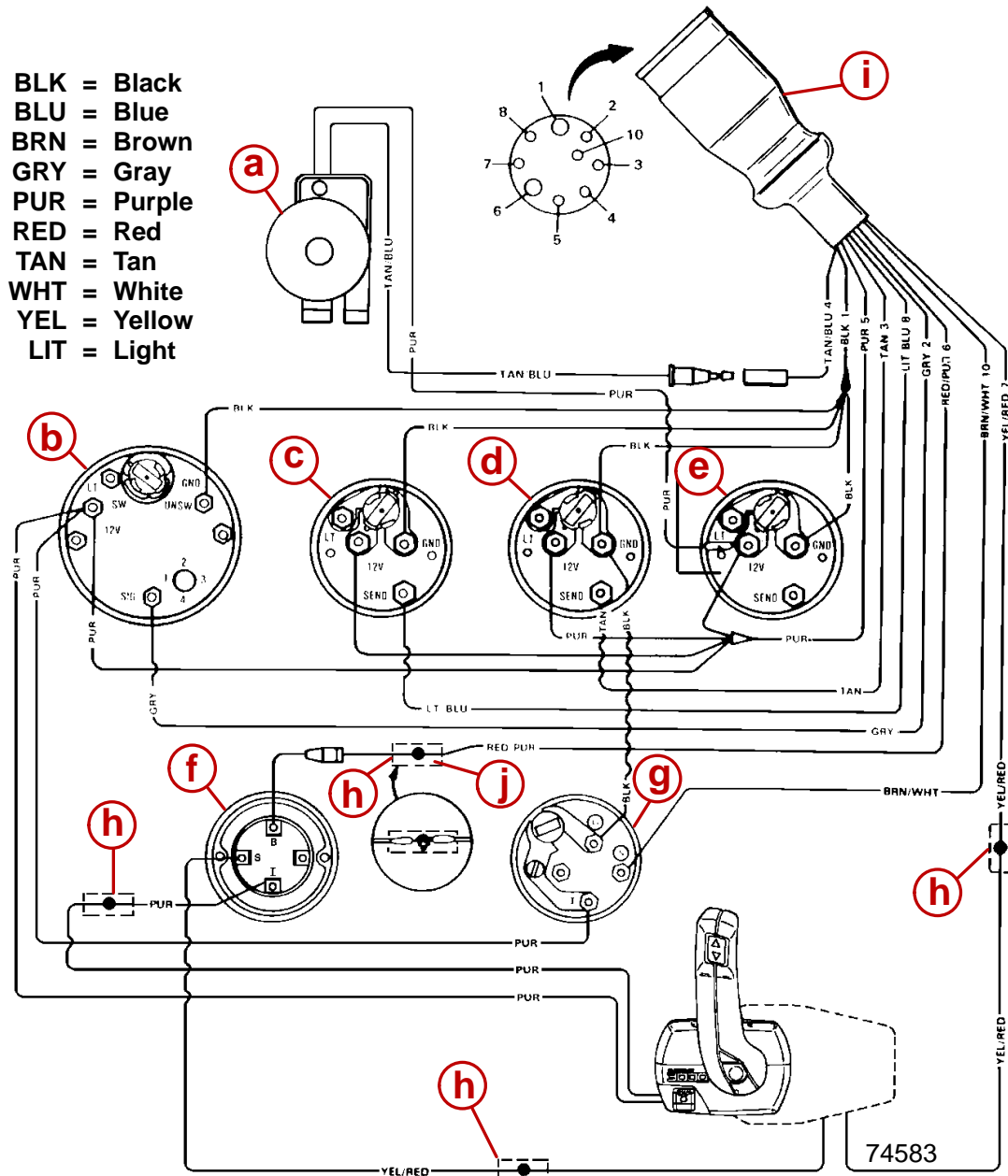
## Power Trim (Dual Engine)



- a** -Port Trim Pump
- b** -Starboard Trim Pump
- c** -To 12V Power Source
- d** -Console Mounted Port Trim Switch
- e** -Console Mounted Starboard Trim Switch
- f** -Diodes
- g** -20 Amp Fuse
- h** -Ground Bolt (Floor Mount)
- i** -UP - Solenoid
- j** -Down - Solenoid
- k** -110 Amp Fuse

# WIRING DIAGRAMS

## Instrument Wiring Harness



- a** -Audio Warning Buzzer
- b** -Tachometer
- c** -Oil Pressure
- d** -Water Temperature
- e** -Battery Meter
- f** - Ignition Switch
- g** - Oil Temperature
- h** - Electrical Connections
- i** - To Engine Wiring Harness
- j** - (See Note)

**NOTE:** Power for a Fused Accessory Panel May Be Taken from This Connection. Load Must Not Exceed 40 Amps. Panel Ground Wire Must Be Connected to Instrument Terminal That Has an 8-Gauge Black (Ground) Harness Wire Connected to it.

# OWNER SERVICE ASSISTANCE

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## Local Repair Service

Always return your Sterndrive or Inboard Product to your local authorized dealer should the need for service arise. Only they have the factory-trained mechanics, knowledge, special tools and equipment and the genuine parts and accessories to properly service your Mer-Cruiser product should the need occur. They know your engine best.

## Service Away From Home

If you are away from your local dealer and the need arises for service, contact the nearest authorized dealer. Refer to the Yellow Pages of the telephone directory. If, for any reason, you cannot obtain service, contact the nearest Mercury Marine Service Office. Outside the United States and Canada, contact the nearest Marine Power International Service Center.

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## Parts And Accessories Inquiries

All inquiries concerning genuine replacement parts and accessories should be directed to your local authorized dealer. The dealer has the necessary information to order parts and accessories for you. When inquiring on parts and accessories, the dealer requires the **model** and **serial number** to order the correct parts.



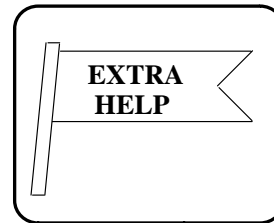
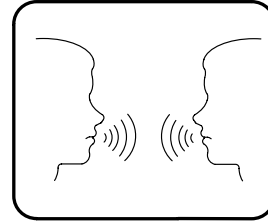
# OWNER SERVICE ASSISTANCE

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## Service Assistance

Satisfaction with your Sterndrive or Inboard product is very important to your dealer and to us. If you ever have a problem, question or concern about your Sterndrive or Inboard product, contact your dealer or any Authorized Mercury Marine Dealership. If additional assistance is required, take these steps.

- 1** *Talk with the dealership's sales manager or service manager. If this has already been done, then contact the owner of the dealership.*
- 2** *Should you have a question, concern or problem that cannot be resolved by your dealership, please contact Mercury Marine Service Office for assistance. Mercury Marine will work with you and your dealership to resolve all problems.*



The following information will be needed by the service office:

- Your name and address
- Daytime telephone number
- Model and serial number of your Engine and Drive Unit
- The name and address of your dealership
- Nature of problem




Mercury Marine Service Offices are listed on the next pages.

# OWNER SERVICE ASSISTANCE

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## Mercury Marine Service Offices



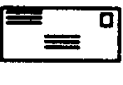
For assistance, call, fax, or write. *Please include your daytime telephone number with mail and fax correspondence.*

 Telephone	 Fax	 Mail
<b>United States</b>		
(405) 743-6566	(405) 743-6570	Mercury MerCruiser 3003 N. Perkins Road Stillwater OK. 74075
<b>United States (Mercury Racing)</b>		
(920) 924-2088	(920) 924-2096	Mercury Racing N7480 County Rd. "UU" Fond du Lac, WI 54935-9585
<b>Canada</b>		
(905) 567-6372	(905) 567-8515	Mercury Marine Ltd. 2395 Meadowpine Blvd. Mississauga, Ontario Canada L5N 7W6
<b>Australia, Pacific</b>		
(61) (3) 9791-5822	(61) (3) 9793-5880	Mercury Marine Australia 132-140 Frankston Road Dandenong, Victoria 3164 Australia
<b>Europe, Middle East, Africa</b>		
(32) (87) 32 • 32 • 11	(32) (87) 31 • 19 • 65	Marine Power - Europe, Inc. Parc Industriel de Petit-Rechain B-4800 Verviers Belgium
<b>Mexico, Central America, South America, Caribbean</b>		
(305) 385-9585	(305) 385-5507	Mercury Marine - Latin America & Caribbean 9010 S.W. 137th Ave. Suite 226 Miami, FL 33186 U.S.A.

# OWNER SERVICE ASSISTANCE

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## Mercury Marine Service Offices (cont.)

Telephone 	Fax 	Mail 
<b>Japan</b>		
81-53-423-2500	81-53-423-2510	Mercury Marine - Japan 283-1 Anshin-cho Hamamatsu Shizuoka, 435-0005 Japan
<b>Asia, Singapore</b>		
(65) 546-6160	(65) 546-7789	Mercury Marine Singapore 72 Loyang Way Singapore 508762

# Ordering Literature




Before ordering literature, please have the following information about your power package available:

**Model** \_\_\_\_\_ **Horsepower** \_\_\_\_\_  
**Serial Number** \_\_\_\_\_ **Year** \_\_\_\_\_

## United States and Canada

For information on additional literature that is available for your particular MerCruiser power package and how to order that literature contact your nearest dealer or contact:

Mercury Marine

Telephone 	Fax 	Mail 
(920) 929-5110	(920) 929-4894	Mercury Marine Attn: Publications Department P.O. Box 1939 Fond du Lac, WI 54936-1939

## Outside The United States and Canada

Contact your nearest dealer or Marine Power Service Center for information on additional literature that is available for your particular MerCruiser power package and how to order that literature.