

1998 Gasoline Sterndrive Alpha Series

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Mercury Marine

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

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Welcome!

You have selected one of the finest marine power packages available. It incorporates numerous design features to assure operating ease and durability. Maximum performance and carefree use will continue through proper care and maintenance.

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

Likewise, whether on the water or on land, this Maintenance Procedures Manual provides information on topics not addressed in the Operation and Maintenance Manual. Before performing any of the following maintenance procedures, please read this manual thoroughly. Doing so will help ensure your safety and your ability to successfully complete each task.


Thank you for purchasing our MerCruiser products. We sincerely hope your maintenance experiences and boating seasons will be pleasant!

Consumer Affairs Department

Read This Manual Thoroughly

IF YOU DO NOT UNDERSTAND ANY PORTION OF THIS MANUAL, CONTACT YOUR DEALER.

NOTICE:

Throughout this publication, and on your power package, **WARNINGS** and **CAUTIONS**, accompanied by the International Hazard Symbol , may be used to alert the installer/user to special instructions concerning a particular service or operation that may be hazardous if performed incorrectly or carelessly. **Observe them carefully.**

These “Safety Alerts” alone cannot eliminate the hazards that they signal. Strict compliance with these special instructions while performing the service, plus “common sense” operation, are major accident prevention measures.

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 personal injury or product or property damage.

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

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 Maintenance Procedures Manual and thoroughly understand the procedural instructions for the power package and all related accessories before any maintenance work is started.

Safety Precautions and Related Information

IMPORTANT: This manual contains intermediate level maintenance information for your MerCruiser power package. If you are a skilled and trained technician that desires to perform more specialized service or repairs on your own, you should obtain a copy of the appropriate MerCruiser Service Manual(s) for your particular power package. Information for obtaining such manuals is located at the back of your "Operation and Maintenance Manual".

WARNING

Avoid personal injury and/or property damage. Improper or incomplete work may cause injury and/or a malfunction of the engine which could result in injury and/or property damage. Observe the following:

- Read and thoroughly understand the instructions in this manual and become familiar with your product before performing any maintenance procedures. Operating or working on unfamiliar equipment can cause accidents.
- Always wear the proper safety equipment for the job or work being done. Safety glasses, ear protectors, suitable gloves and other such devices or apparel may be necessary.
- Clothing should fit well and be in good repair to prevent a hazard when working around moving engine parts. Loose apparel could cause entanglement resulting in serious injury.
- Never wear jewelry, wrist watches, or rings that might get caught on moving or stationary components.
- A fire extinguisher should be nearby and easily accessible in case of emergency.
- Any area, in which you are running the engine, must be well-ventilated to avoid inhaling carbon monoxide.
- Always turn the engine OFF before beginning any work, unless the procedure or operation requires the engine running. We further recommend the key be removed from the switch.
- Fuel and gases from a battery are flammable and/or explosive. DO NOT smoke while working on the engine or related components.
- Battery cables and starter cables are capable of passing large amounts of current. Be cautious not to cause an electrical short circuit which could result in injury and/or property damage.
- Always disconnect battery cables BEFORE working on fuel system to prevent fire. This eliminates the engine wiring as a potential source of ignition.
- Always disconnect battery cables BEFORE working around electrical system components to prevent injury to yourself or damage to the electrical system.
- On engines with a Closed Cooling System: DO NOT remove coolant cap or any hoses when engine is hot - coolant may discharge violently causing injury. Allow the engine sufficient time to cool.
- On engines with Raw Water Cooling System: DO NOT remove any hoses when engine is hot - hot water may discharge under pressure causing injury. Allow the engine sufficient time to cool.
- Always remove any tools from the engine compartment. Tools can be struck by the moving parts of an engine causing injury and/or property damage.
- A first aid kit should be readily available for treatment of minor cuts and abrasions which might occur.
- Make sure no fuel leaks exist before closing engine hatch.

CAUTION

Avoid seawater pump impeller damage and subsequent overheating damage to engine or drive. DO NOT operate engine without water flowing through seawater pump.

Replacement Service Parts

WARNING

Electrical, ignition and fuel system components on MerCruiser gasoline power packages are designed and manufactured to comply with U.S. 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 could permit sparks to ignite fuel vapors from fuel system leaks, if they existed.

Marine engines operate at or near full-throttle for most of their lives. They are also expected to operate in both 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.

Do-It-Yourself Maintenance Suggestions

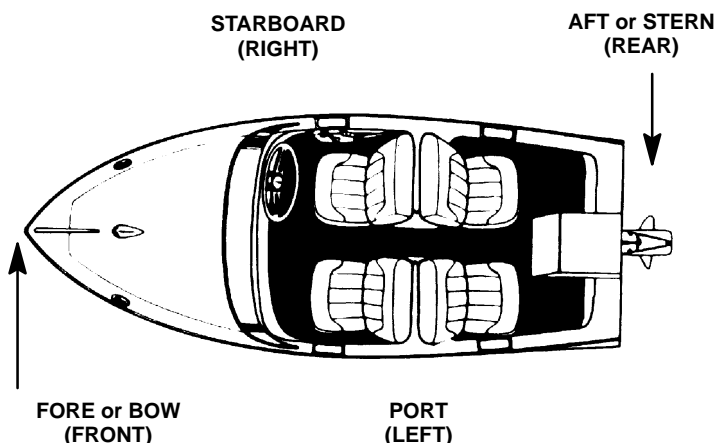
If you are a person who likes to do-it-yourself, here are some suggestions for you.

- Present-day marine equipment, such as your MerCruiser power package, are advanced technical pieces of machinery. Electronic ignition and special fuel delivery systems provide greater fuel economies, but are also more complex for the untrained mechanic.
- Do not attempt any maintenance or 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 beyond the scope of this manual, we suggest you order the Service Manual for that model. The Service Manual 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, regardless of the source.
- There are special tools and equipment that are required to perform some repairs. Do not attempt these repairs unless you have these special tools and/or equipment. You could cause damage to the product in excess of the cost a dealer might have charged you for the repair originally.
- 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 provide service for your power package. Dealers have qualified factory-trained mechanics.

It is 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.

Directional References

Front of boat is bow; rear is stern. Starboard side is right side; port side is left side. In this maintenance manual, all directional references are given as they appear when viewing boat from stern looking toward bow.



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SECTION 2 - Specifications

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Fuel Recommendations

IMPORTANT: 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.

Fuel Ratings

MerCruiser engines will operate satisfactorily when using a major brand of unleaded gasoline as follows:

USA and Canada - having a posted pump Octane Rating of 87 (R+M)/2 minimum. Premium gasoline [92 (R+M)/2 Octane] is also acceptable. DO NOT use leaded gasoline.

Outside USA and Canada - having a posted pump Octane Rating of 90 RON minimum. Premium gasoline (98 RON) is also acceptable. If unleaded gasoline is not available, use a major brand of leaded gasoline.

CA291

Using Reformulated (Oxygenated) Gasolines (USA Only)

This type of gasoline is required in certain areas of the USA. The two types of “oxygenates” used in these fuels is 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.

CA277

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 boat's fuel system components (fuel tanks, fuel lines, and fittings). Be aware that gasolines containing alcohol may cause increased:

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

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.

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.

Quicksilver Gasoline Stabilizer for Marine Engines (92-817529A12) is highly recommended for addition during storage periods. See "Cold Weather or Extended Storage" later in this manual.

CA494

Fuel System Additives (V-6 Models)

To maximize the life of valves and valve seats on your MerCruiser engine, use Quicksilver Valve Lubricant (92-826259A12) regularly.

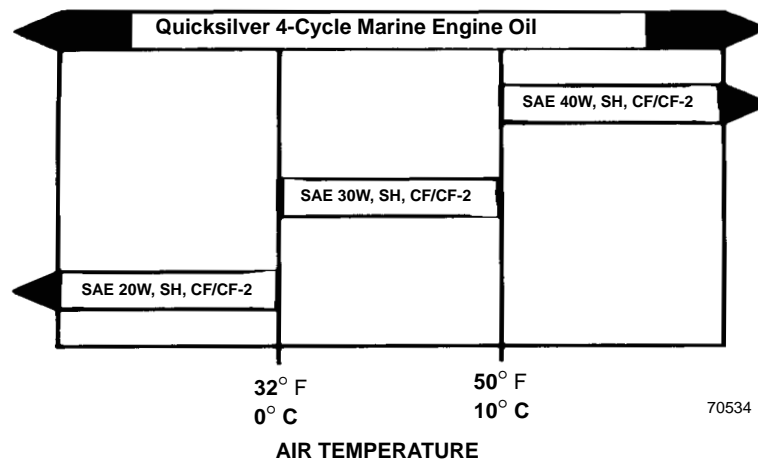
Crankcase Oil

To help obtain optimum engine performance and to provide maximum protection, we strongly recommend the use of Quicksilver 4-Cycle Marine Engine Oil. If not available, a good grade, straight weight, detergent automotive oil of correct viscosity, with an API classification of SH,CF/CF-2, may be used.

The chart below is a guide to crankcase oil selection. The oil filter should always be changed when changing the oil.

In those areas where the recommended straight weight oil is not available, a multiviscosity 20W-40 (SH, CF/CF-2) or, as a second but less preferable choice, 20W-50 (SH, CF/CF-2) may be used.

IMPORTANT: The use of non-detergent oils, multi-viscosity oils (other than 20W-40 or 20W-50), low quality oils or oils which contain solid additives, are specifically not recommended.



Engine and Tune-Up Specifications

MODEL	MCM 3.0L
Propshaft Horsepower (BSO/SAV Rating)	135 ¹ (114 ²)
Propshaft Kilowatts (BSO/SAV Rating)	101 ¹ (85 ²)
Number of Cylinders	4
Displacement	181 CID (3.0L)
Bore/Stroke In. (mm)	4.00 X 3.60 (101.6 X 91.4)
Compression Ratio	9.25:1
Compression Pressure	Minimum 100 PSI (690 kPa) ⁷
Idle RPM (In Neutral) ³	700 RPM ⁵
Max RPM (At W.O.T.) ³	4400-4800 RPM
Oil Pressure (at 2000 RPM)	Minimum 30 PSI (207 kPa)
Fuel Pump PSI (At 1000 RPM)	6-8 PSI (41-55 kPa)
Minimum Oil Pressure At Idle	4 PSI (28 kPa)
Electrical System	12 Volt Negative (-) Ground
Minimum Battery Requirements	375 cca / 475 mca / 90 Ah
Firing Order	1-3-4-2
Spark Plug Type	AC - MR43LTS Champion - RS12YC NGK - BPR6EFS
Spark Plug Gap	.035 In. (0.9 mm)
Timing (At Idle) ⁴	1° BTDC (EST Ignition)
Preliminary Idle Mixture	1 1/4 Turns
Thermostat	143° F (62° C)

¹ Power Rated in Accordance with NMMA (National Marine Manufacturers' Association) rating procedures.

² Power Rated in Accordance with BSO/SAV rating procedures. This rating procedure is used to certify that the engine complies with "Stage 1" Bodensee and Swiss Regulations. Horsepower differences shown result from differences in test RPM, allowable test tolerances, and/or installation of special kit components.

³ Measured using an accurate service tachometer with engine at normal operating temperature.

⁴ Timing must be set using a special procedure as outlined in the appropriate section of this manual. Timing cannot be properly set using the conventional method.

⁵ A special procedure must be followed to adjust idle RPM. Consult your Authorized MerCruiser Dealer before attempting this procedure.

⁷ Minimum recorded compression in any one cylinder should not be less than 70 percent of the highest recorded cylinder.

Engine and Tune-Up Specifications (Continued)

MODEL	MCM 4.3L	MCM 4.3LH	MCM 4.3L EFI
Propshaft Horsepower (BSO/SAV Rating)	190 ¹	205 ¹ (190 ²)	210 ¹ (188 ²)
Propshaft Kilowatts (BSO/SAV Rating)	142 ¹	153 ¹ (142 ²)	157 ¹ (140 ²)
Displacement	262 CID (4.3L)		
Bore/Stroke In. (mm)	4.00 x 3.48 (101.6 x 88.4)		
Compression Ratio	9.4:1		
Compression Pressure	Minimum 100 PSI (690 kPa) ⁷		
Idle RPM (in Neutral) ³	650 RPM ⁵		600 RPM ⁶
Maximum RPM (at W.O.T.) ³	4400-4800 RPM		
Oil Pressure (at 2000 RPM)	Minimum 30 PSI (207 kPa)		
Minimum Oil Pressure (at Idle)	4 PSI (28 kPa)		
Fuel Pump Pressure	6-9 PSI (41-62 kPa)		Does Not Apply
Fuel Pressure (Running) (EFI Only)	Does Not Apply		30 PSI (207 kPa)
Electrical System	12 V Negative (–) Ground		
Minimum Battery Requirements	375 cca/475 mca/90 Ah		550 cca/700 mca/120 Ah
Firing Order	1-6-5-4-3-2		
Spark Plug Type	AC - MR43LTS Champion - RS12YC NGK - BPR6EFS		
Spark Plug Gap	.045 inch (1.1 mm)		
Timing (at Idle RPM) ⁴	10° BTDC		8° BTDC
Preliminary Idle Mixture	1 1/4 Turns		Does Not Apply
Thermostat	160° F (71° C)		

¹ Power Rated in Accordance with NMMA (National Marine Manufacturers' Association) rating procedures.

² Power Rated in Accordance with BSO/SAV rating procedures. This rating procedure is used to certify that the engine complies with "Stage 1" Bodensee and Swiss Regulations. Horsepower differences shown result from differences in test RPM, allowable test tolerances, and/or installation of special kit components.

³ Measured using an accurate service tachometer with engine at normal operating temperature.

⁴ Timing must be set using a special procedure as outlined in the appropriate section of this manual. Timing cannot be properly set using the conventional method.

⁵ A special procedure must be followed to adjust idle RPM. Consult your Authorized MerCruiser Dealer before attempting this procedure.

⁶ Idle speed on EFI models is not adjustable.

⁷ Minimum recorded compression in any one cylinder should not be less than 70 percent of the highest recorded cylinder.

Engine and Tune-Up Specifications (Continued)

MODEL	MCM 5.0L	MCM 5.7L
Propshaft Horsepower (BSO/SAV Rating)	220 ¹	250 ¹
Propshaft Kilowatts (BSO/SAV Rating)	164 ¹	186 ¹
Number of Cylinders	V-8	
Displacement	305 CID (5.0L)	350 CID (5.7L)
Bore/Stroke In. (mm)	4.0 x 3.48 (101.6 x 88.4)	
Compression Ratio	9.4:1	
Compression Pressure	Minimum 100 PSI (690 kPa) ⁷	
Idle RPM In Neutral ³	650 RPM ⁵	
Maximum RPM (at W.O.T.) ³	4400-4800 RPM	
Oil Pressure (at 2000 RPM)	Minimum 30 PSI (207 kPa)	
Minimum Oil Pressure (at Idle)	4 PSI (28 kPa)	
Fuel Pump Pressure (at 1800 RPM)	6-10 PSI (41-69 kPa)	
Electrical System	12 V Negative (-) Ground	
Minimum Battery Requirements	375 cca/475 mca/90 Ah	
Firing Order	1-8-4-3-6-5-7-2	
Spark Plug Type	AC - MR43LTS Champion - RS12YC NGK - BPR6EFS	
Spark Plug Gap	.045 in (1.1 mm)	
Timing (at Idle RPM) ⁴	10° BTDC	
Preliminary Idle Mixture	1 1/4 Turns	
Thermostat	160° F (71° C)	

¹ Power Rated in Accordance with NMMA (National Marine Manufacturers' Association) rating procedures.

³ Measured using an accurate service tachometer with engine at normal operating temperature.

⁴ A special procedure must be followed to check or adjust timing. Consult your Authorized MerCruiser Dealer before attempting this procedure.

⁵ A special procedure must be followed to adjust idle RPM. Consult your Authorized MerCruiser Dealer before attempting this procedure.

⁷ Minimum recorded compression in any one cylinder should not be less than 70 percent of the highest recorded cylinder.

Engine and Tune-Up Specifications (Continued)

MODEL	MCM 5.0L EFI	MCM 5.7L EFI	MCM 350 MAG MPI
Propshaft Horsepower (BSO/SAV Rating)	230 ¹	260 ¹	300 ¹ (275 ²)
Propshaft Kilowatts (BSO/SAV Rating)	172 ¹	194 ¹	224 ¹ (205 ¹)
Number of Cylinders	V-8		
Displacement	305 CID (5.0L)	350 CID (5.7L)	
Bore/Stroke In. (mm)	4.0 x 3.48 (101.6 x 88.4)		
Compression Ratio	9.4:1		
Compression Pressure	Minimum 100 PSI (690 kPa) ⁷		
Idle RPM In Neutral ³	600 RPM ⁶		
Maximum RPM (at W.O.T.) ³	4400-4800 RPM		
Oil Pressure (at 2000 RPM)	Minimum 30 PSI (207 kPa)		
Minimum Oil Pressure (at Idle)	Minimum 4 PSI (28 kPa)		
Fuel Pump Pressure (at 1800 RPM)	30 PSI (207 kPa)		
Electrical System	12 V Negative (–) Ground		
Minimum Battery Require- ments	550 cca/700 mca/120 Ah		
Firing Order	1-8-4-3-6-5-7-2		
Spark Plug Type	AC - MR43LTS Champion - RS12YC NGK - BPR6EFS		
Spark Plug Gap	.045 in (1.1 mm)		
Timing (at Idle RPM) ⁴	8° BTDC		
Thermostat	160° F (71° C)		

¹ Power Rated in Accordance with NMMA (National Marine Manufacturers' Association) rating procedures.

² Power Rated in Accordance with BSO/SAV rating procedures. This rating procedure is used to certify that the engine complies with "Stage 1" Bodensee and Swiss Regulations. Horsepower differences shown result from differences in test RPM, allowable test tolerances, and/or installation of special kit components.

³ Measured using an accurate service tachometer with engine at normal operating temperature.

⁴ A special procedure must be followed to check or adjust timing. Consult your Authorized MerCruiser Dealer before attempting this procedure.

⁶ Idle speed on EFI models is not adjustable.

⁷ Minimum recorded compression in any one cylinder should not be less than 70 percent of the highest recorded cylinder.

Fluid Capacities

NOTICE

UNIT OF MEASUREMENT: U.S. Quarts (Liters)
All capacities are approximate fluid measures.

MODEL	MCM 181 CID / 3.0L
Crankcase (With Filter) ¹	4 (3.8)
Seawater Cooling System ²	9 (8.5)
Closed Cooling System	9 (8.5)

MODEL	MCM 262 CID / 4.3L
Crankcase (With Filter) ¹	4-1/2 (4.3)
Seawater Cooling System ²	15 (14.2)
Closed Cooling System	14 1/2 (13.7)

MODEL	MCM 305 CID/5.0L and 350 CID/5.7L
Crankcase Oil (With Filter) ¹	5-1/2 (5.25)
Seawater Cooling System ²	15 (14.1)
Closed Cooling System	20 (19)

¹ Always use dipstick to determine exact quantity of oil or fluid required.

² Seawater Cooling System capacity information is for winterization use only.

Drives

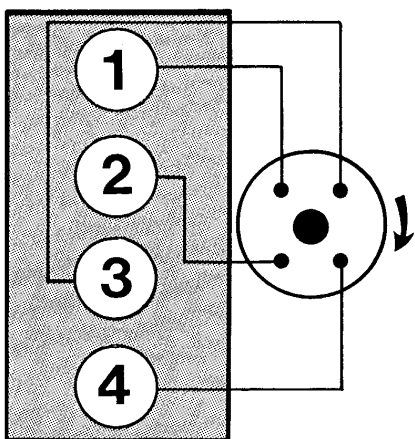
NOTICE

UNIT OF MEASUREMENT: U.S. Fluid Ounces (Milliliters)
All capacities are approximate fluid measures.

MODEL	ALPHA ONE
Drive Unit Oil Capacity	39-1/4 (1160)
Drive Unit Oil Capacity (With Gear Lube Monitor)	64 (1892)

Engine Rotation and Firing Order

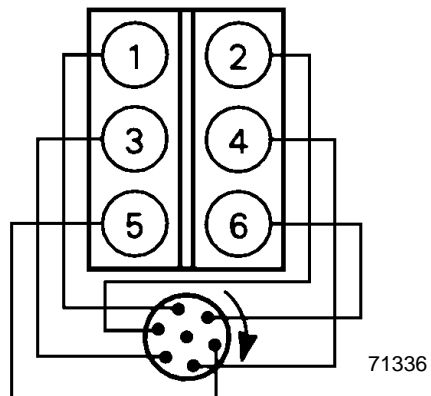
L.H. ROTATION
FRONT



Firing Order
1-3-4-2

4 Cylinder - 181 CID / 3.0L

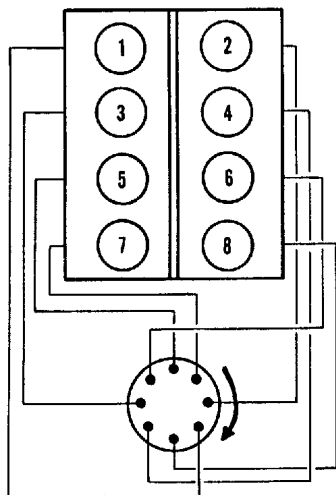
LH ROTATION
FRONT



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

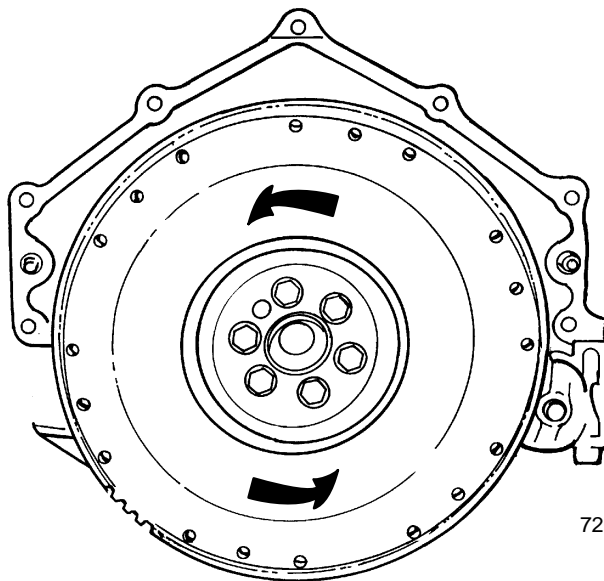
V-6 Cylinder - 262 CID / 4.3L

LH ROTATION
FRONT



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

V-8 Cylinder - 305 CID/5.0L and 350 CID/5.7L



**Left-Hand Rotation - All Engines
(Flywheel View)**

NOTE: Arrows indicate direction of rotation

Section 3 - Maintenance

Section 3 - Maintenance

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Maintenance

3

Lubricants/Sealers/Adhesives

DESCRIPTION	PART NUMBER
Quicksilver Power Trim and Steering Fluid	92-90100A12
Quicksilver Storage Seal	92-86145A12
Quicksilver Special Lubricant 101	92-13872A1
Quicksilver High Performance Gear Lube	92-816026A2
Quicksilver U-Joint and Gimbal Bearing Grease	92-828052A2
Quicksilver Engine Coupler Spline Grease	92-816391A4
Quicksilver Touch Up Paint (Small Bottle w/Brush)	92-822886--12
Quicksilver Primer	92-78374--12
Quicksilver Spray Paint	92-78373--12
Quicksilver Corrosion Guard Spray	92-815869A12
Quicksilver 4-Cycle Marine Engine Oil	92-816096A12
Quicksilver Premixed Marine Engine Coolant	92-813054A2
Quicksilver Gasoline Stabilizer for Marine Engines	92-817529A12
Quicksilver Crankcase Oil Pump	90265A2
SAE 10W-30 Motor Oil	Obtain Locally
SAE 20W Motor Oil	
SAE 30W Motor Oil	
Dexron III	

Torque Specifications

DESCRIPTION	Lb. In.	Lb. Ft.	N-m
Oil Drain Plug		15	20
Gimbal Ring Clamping Screws		50-55	67-74
Rear Engine Mounts		30-40	47-54
Propeller Nut		55 ¹	75 ¹
Spacer Block Screws (Mount Bracket Assembly-to-Engine Block - 4 Cyl.)		21	28
Alternator Brace		30	41
Alternator and Power Steering Bracket		30	41
Power Steering Brace		30	41

¹ : Amount specified is *minimum*. It may be necessary to increase the value to align tabs with spline washer. Refer to "Propeller".

Maintenance Aids

WARNING

Always disconnect battery cables from battery before working around electrical system components to prevent injury to yourself or damage to electrical system.

IMPORTANT: Refer to **MAINTENANCE SCHEDULES** 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.

NOTE: *Maintenance points are color coded for ease of identification. See the decal on engine for identification.*

- 1** Power Steering System - Quicksilver Power Trim and Steering Fluid or Dexron III automatic transmission fluid (ATF).
- 2** All Pivot Points - SAE 30W motor oil.
- 3** Fogging (Winterizing) Engine - Quicksilver Storage Seal or SAE 20W motor oil.
- 4** Exposed portion of Steering Cable and Propeller Shaft - Quicksilver Special Lubricant 101.
- 5** Sterndrive Unit - Quicksilver High Performance Gear Lube.
- 6** Gimbal Bearing - Quicksilver U-Joint and Gimbal Bearing Grease.
- 7** All Exterior Surfaces - Quicksilver Touch Up Paint, Primer, Spray Paint and Quicksilver Corrosion Guard.
- 8** Power Trim System - Quicksilver Power Trim and Steering Fluid, or SAE 10W-30 motor oil.
- 9** Crankcase Oil - Quicksilver 4-Cycle Marine Engine Oil (Refer to SPECIFICATIONS for alternatives and oil recommendations for varying ambient temperatures.)
- 10** Closed Cooling System Coolant - Quicksilver Premixed Marine Engine Coolant, or a 50/50 mixture of ethylene glycol antifreeze (must meet GM specification 1825 M) and tap water. Areas where temperatures generally do not go below 32° F (0° C), rust inhibitor and tap water is acceptable.
- 11** Gasoline Stabilizer - Quicksilver Gasoline Stabilizer for Marine Engines.
- 12** Grease Fittings on Drive Shaft Extension Models - Quicksilver U-Joint and Gimbal Bearing Grease.
- 13** Grease Fittings on Coupler - Quicksilver Engine Coupler Spline Grease.

See previous pages or SECTION 10 - "General Maintenance Parts" for specific part number information.

Maintenance Schedules

Scheduled Maintenance That Can Be Performed By Owner/Operator

NOTE: Only perform maintenance which applies to your particular power package.

Pg.	Task	Interval
29	Engine Crankcase Oil - Check level.	Weekly
31	Closed Cooling Coolant - Check level.	
29	Power Steering Fluid - Check level.	
31	Sterndrive Unit Oil - Check level.	
NC	Battery - Check level and inspect for damage.	
44, 106	Fuel Pump Sight Tube (If Equipped) - Check that no fuel is present.	
31	Power Trim Pump Oil - Check level.	
55	Anodes - Inspect for erosion.	
NC	Gear Housing Water Pickups - Check for marine growth or debris.	
51, 53	Drive Belts (All) - Inspect condition and check tension.	Every 100 hours of operation or 120 days, whichever occurs first.
49	Propeller Shaft - Lubricate.	Saltwater Use: Every 50 hours of operation or 60 days, whichever occurs first. Freshwater Use: Every 100 hours of operation or 120 days, whichever occurs first.
NC	Power Package Exterior Surfaces - Spray with rust preventative.	
NC	Power Package Exterior Surfaces - Clean and paint.	Once a year
85	Cooling System - Flush seawater section.	Saltwater Use: After every use.

M = See Manufacturer's Instructions

S = See MerCruiser Service Manual

NC = Not Covered (Self Explanatory)

Scheduled Maintenance That Should Be Performed By A Dealer

NOTE: Only perform maintenance which applies to your particular power package.

Pg.	Task	Interval
89, S	Seawater Pickup Pump - Disassemble and inspect.	Whenever insufficient seawater flow is suspected (if operating temperature exceeds normal range.)
33	Crankcase Oil and Filter - Change.	End of first boating season and thereafter, every 100 hours of operation or once yearly, whichever occurs first.
63	Ignition System - Clean and inspect condition.	
39,41	Flame Arrestor and Crankcase Ventilation Hose - Clean and inspect.	
59	Positive Crankcase Ventilation (PCV) Valve (If Equipped) - Change.	
35	Sterndrive Unit Oil - Change.	
S	Gimbal Ring Clamping Screws - Retorque to 50-55 lb. ft. (67-74 N·m).	
S	Rear Engine Mounts - Check, torque to 30-40 lb. ft. (47-54 N·m).	
45	Gimbal Bearing - Lubricate.	
85	Cooling System - Clean and inspect.	
43	Steering System - Lubricate and inspect for loose, damaged or missing parts.	
NC	Electrical System - Check for loose or damaged wiring.	
S	Closed Cooling System Pressure Cap - Clean, inspect and test .	
NC	Cooling System Hoses and Clamps - Inspect for damage and deterioration. Check clamps for tightness.	
S	Continuity Circuit - Check components for loose connections, broken or frayed wires.	
43	Shift and Throttle Cable and Linkage - Lubricate and inspect for loose, damaged or missing parts.	
S	Engine Exhaust System - Inspect externally for damage, deterioration and restrictions. Check for tightness.	
74	Ignition System - Check timing and adjust as needed.	

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NC = Not Covered (Self Explanatory)

Scheduled Maintenance That Should Be Performed By A Dealer

NOTE: Only perform maintenance which applies to your particular power package.

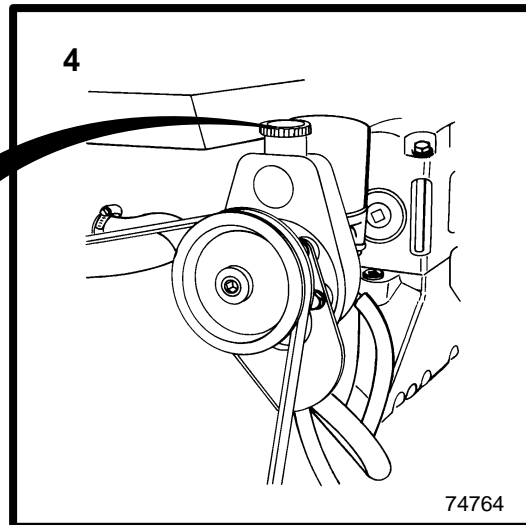
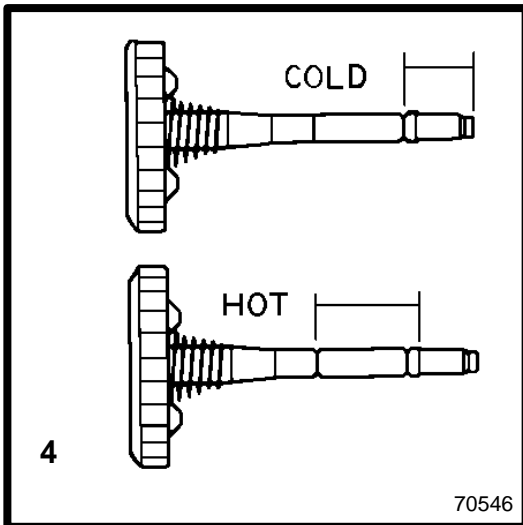
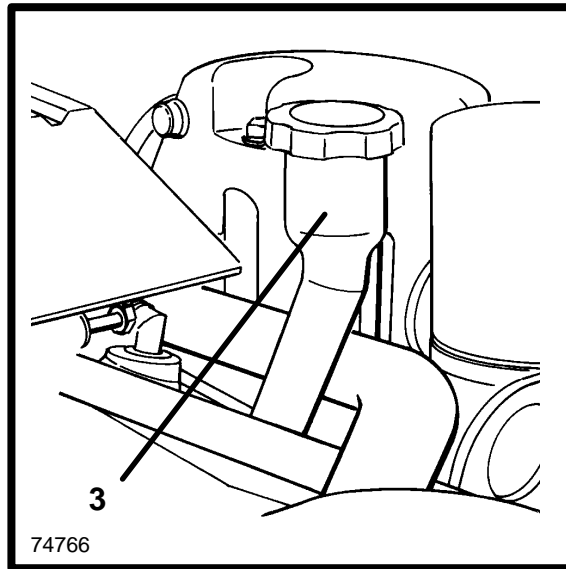
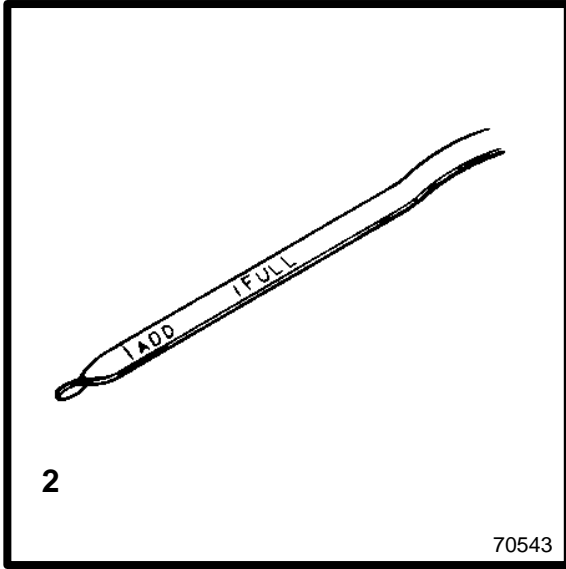
Pg.	Task	Interval
M	Steering Head and Remote Control - Inspect and lubricate.	End of first boating season and thereafter, every 100 hours of operation or once yearly, whichever occurs first.
S	Carburetor (If Equipped) - Inspect and adjust.	
S	Throttle Body (EFI Models) - Inspect.	
37	Fuel Filter - Replace.	Once a Year
S	Quicksilver Mercathode System - Test output.	
S	Closed Cooling Coolant - Test for Alkalinity	
87	Heat Exchanger - Clean seawater section.	
S	Drive Unit Bellows and Clamps - Inspect.	
S	Engine Alignment - Check.	End of first boating season and thereafter, Saltwater Use: Every 300 hours of operation or once yearly, whichever occurs first Freshwater Use: Every 300 hours of operation or once every two years, whichever occurs first.
43	Engine Coupling Universal Joint Shaft Splines - Lubricate.	
S	Universal Joint Cross Bearings- Inspect.	
S	Closed Cooling Coolant - Replace.	Every Two Years

M = See Manufacturer's Instructions

S = See MerCruiser Service Manual

NC = Not Covered (Self Explanatory)

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Checking Fluid Levels

Checking Crankcase Oil

Check before starting a cold engine or after engine reaches operating temperature. If engine is at operating temperature, 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.
- 3** If oil level is below the ADD mark, remove oil filler cap. Add specified oil to bring level up to, but not over, FULL mark on dipstick.

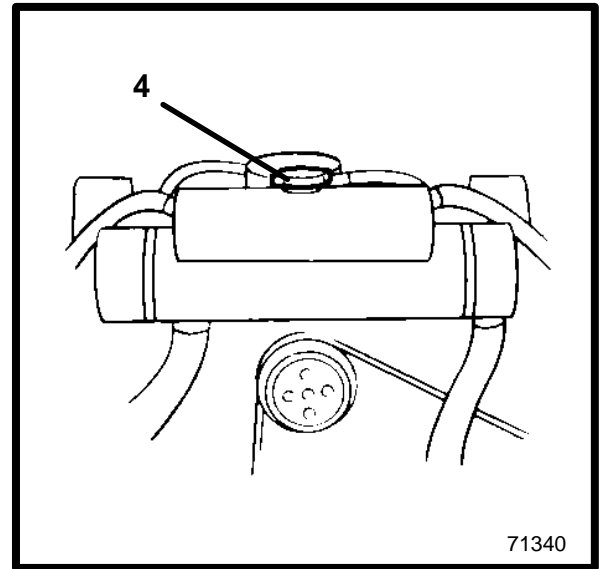
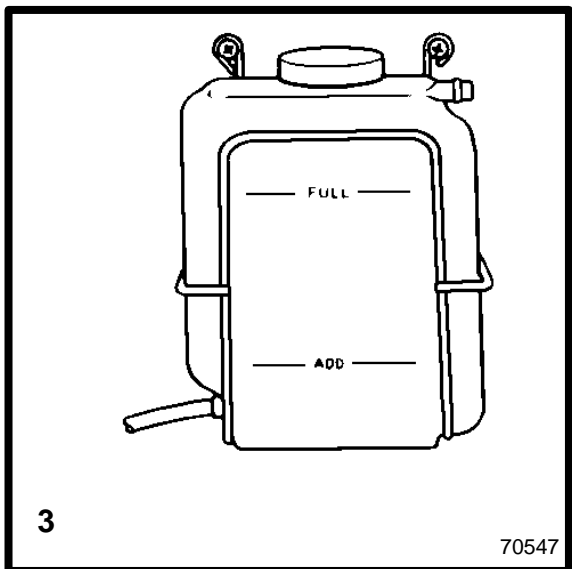
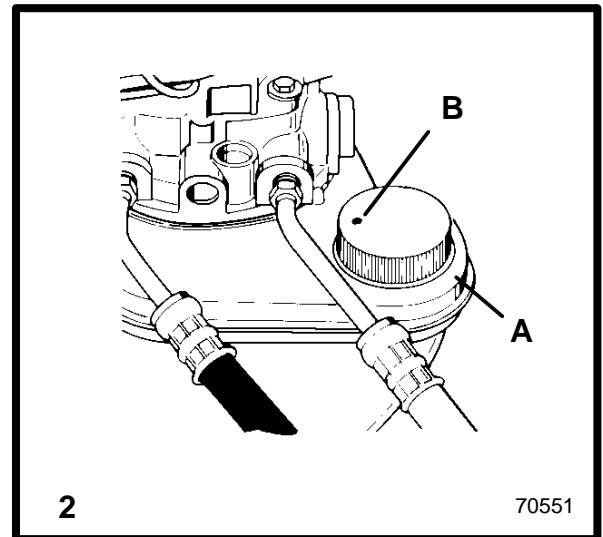
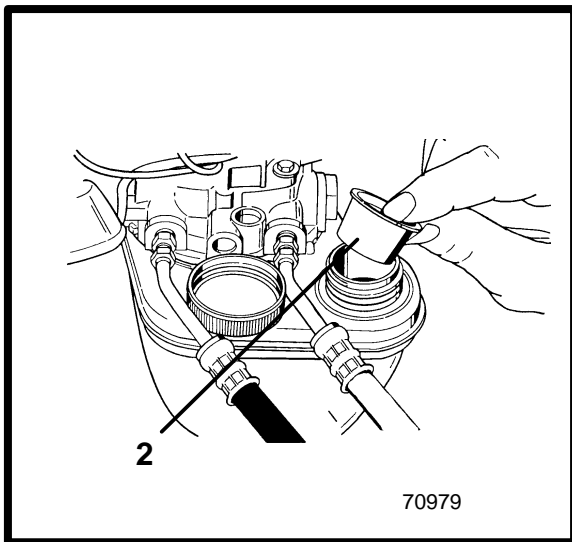
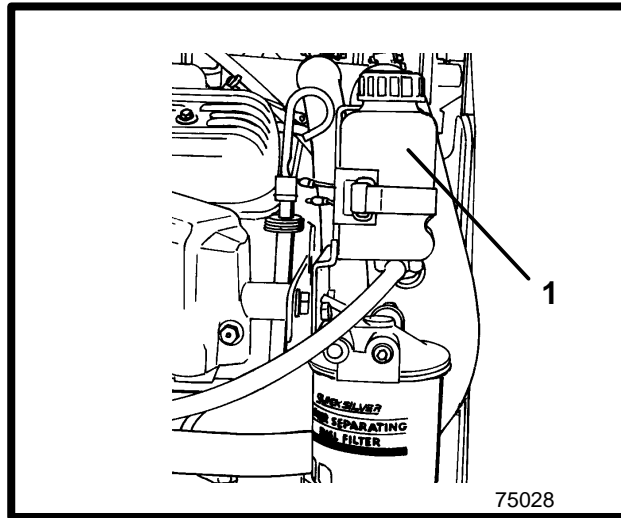
IMPORTANT: Do not overfill crankcase oil.

Checking Power Steering Pump Fluid

Check before starting a cold engine or after engine reaches operating temperature. If engine is at operating temperature, position drive unit straight-back and stop engine.

- 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.



Checking Drive Unit Oil

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

1 Check gear lube monitor oil level; keep oil level at or near “Fill” line. Check for water at bottom of monitor and/or if oil appears discolored, 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.

Checking Power Trim Pump Fluid

Place drive unit in full DOWN/IN position.

2 Check that “Cap Plug” has been removed from filler neck and discarded. Remove fill cap from reservoir and observe oil level. Level must be up to, but not over bottom of filler neck.

A 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.

B Fill cap is vented; frequently check that vent is open and unrestricted.

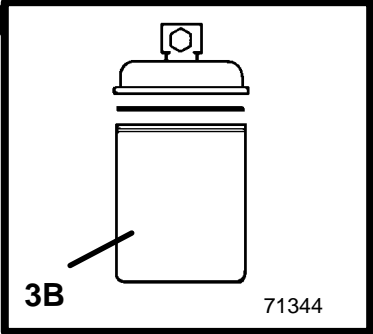
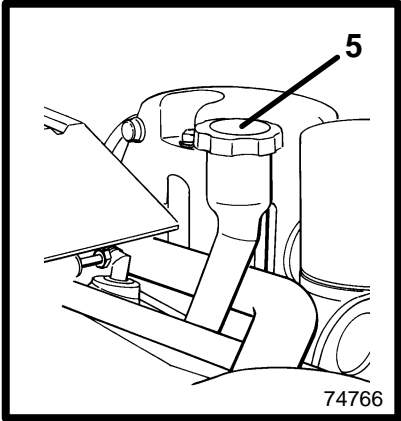
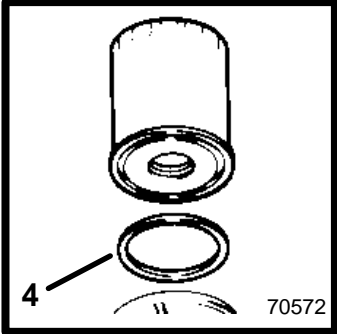
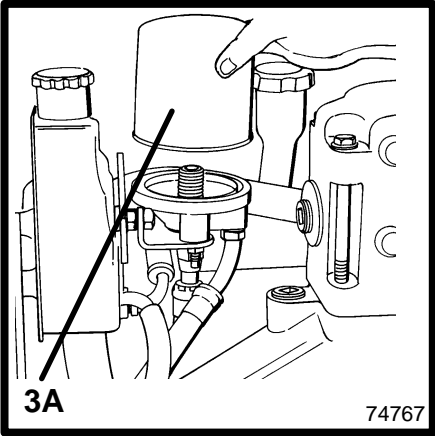
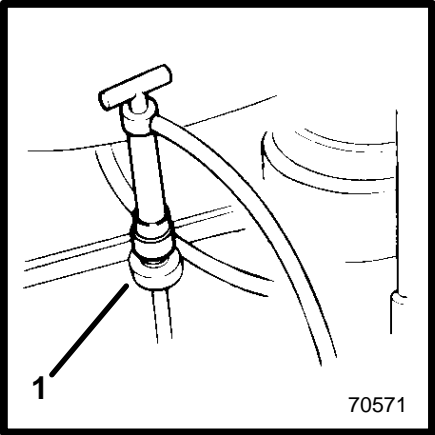
Checking Engine Coolant - Closed Cooled Models Only

WARNING

Do not remove coolant cap when engine is hot. Coolant may discharge violently.

3 Check coolant level in coolant recovery bottle. Refer to “Maintenance Aids” and add specified coolant as required.

4 Periodically remove cap from coolant reservoir to ensure that coolant recovery system is functioning properly. Coolant level must be at top of reservoir filler neck. If coolant is low, inspect gasket in cap for damage and replace if necessary. To have cap tested, contact your Authorized MerCruiser Dealer. Inspect coolant recovery system for leaks.



Changing Fluids

See MAINTENANCE SCHEDULE 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

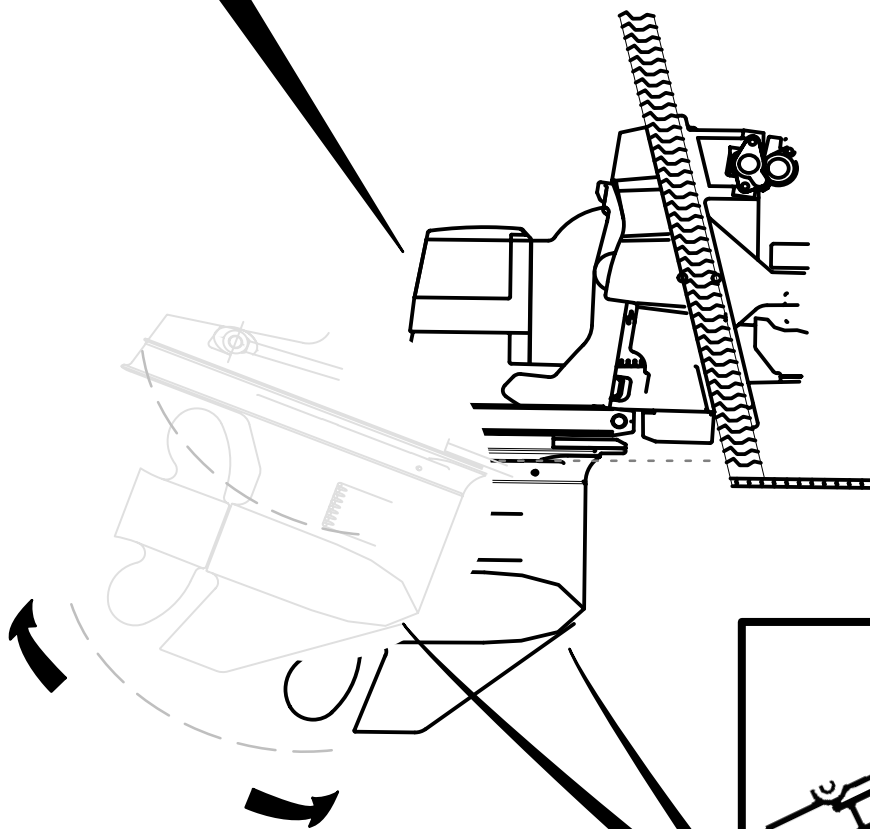
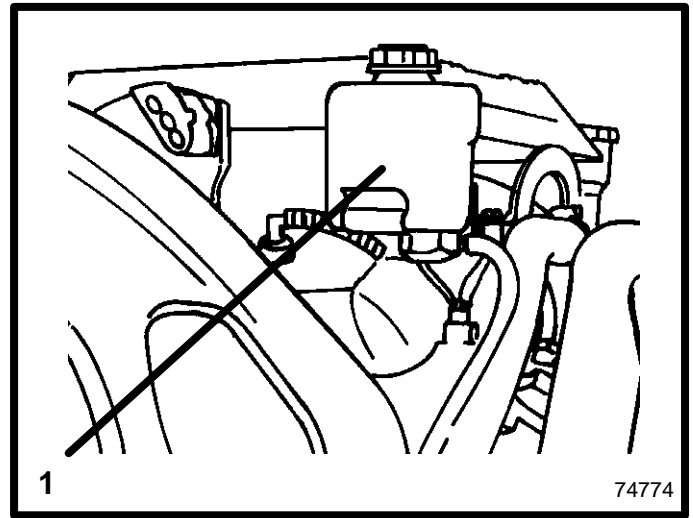
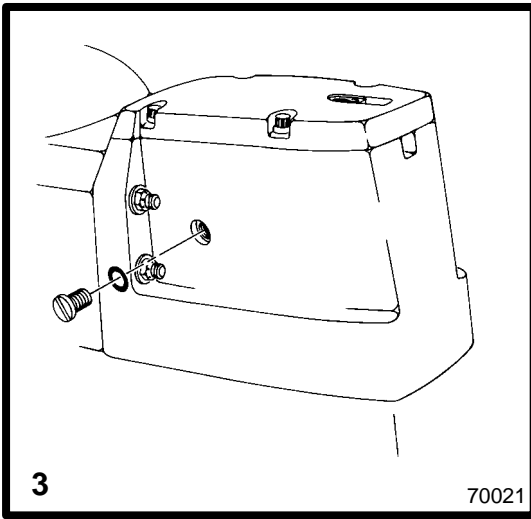
IMPORTANT: Change oil when engine is warm from operation. Warm oil flows more freely, carrying away more impurities. Use only recommended motor oil (see SPECIFICATIONS).

- 1 With engine at normal operating temperature, remove dipstick. Install Quicksilver Crankcase Oil Pump onto dipstick tube.
- 2 Insert hose end of crankcase oil pump into an appropriate container and using pump handle, pump until crankcase is empty. Remove crankcase oil pump.

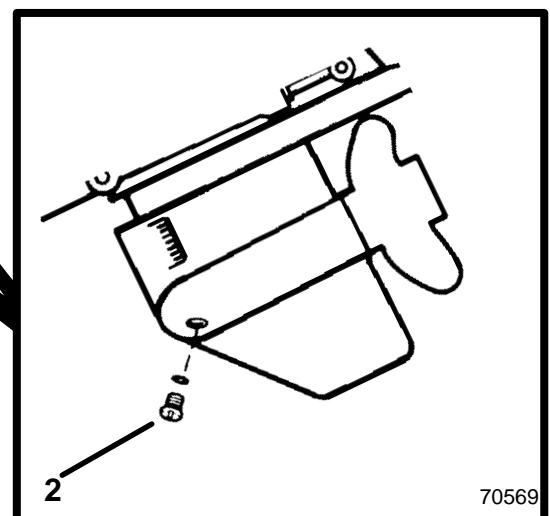
NOTE: Alternately the oil may be drained using the oil drain plug and a suitable container placed under the engine. Torque the oil pan drain plug to specifications upon installation.

- 3 Remove and discard old oil filter and old sealing ring.
 - A Models with remote oil filter.
 - B Models with side mounted oil filter.
- 4 Coat sealing ring on new filter with motor oil. Install new sealing ring and filter. Tighten filter securely. Hand tighten only, do not use a filter wrench. Do not overtighten.
- 5 Remove oil filler cap. Add correct type oil (see SPECIFICATIONS) to bring level up to, but not over FULL mark on dipstick.

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



74812



Changing Drive Unit Oil

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

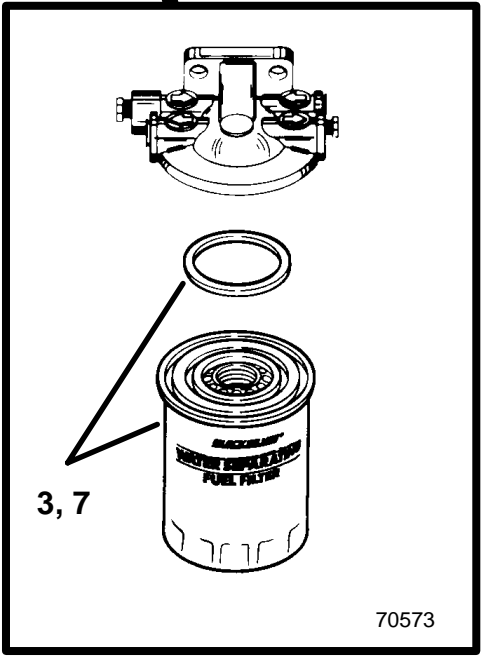
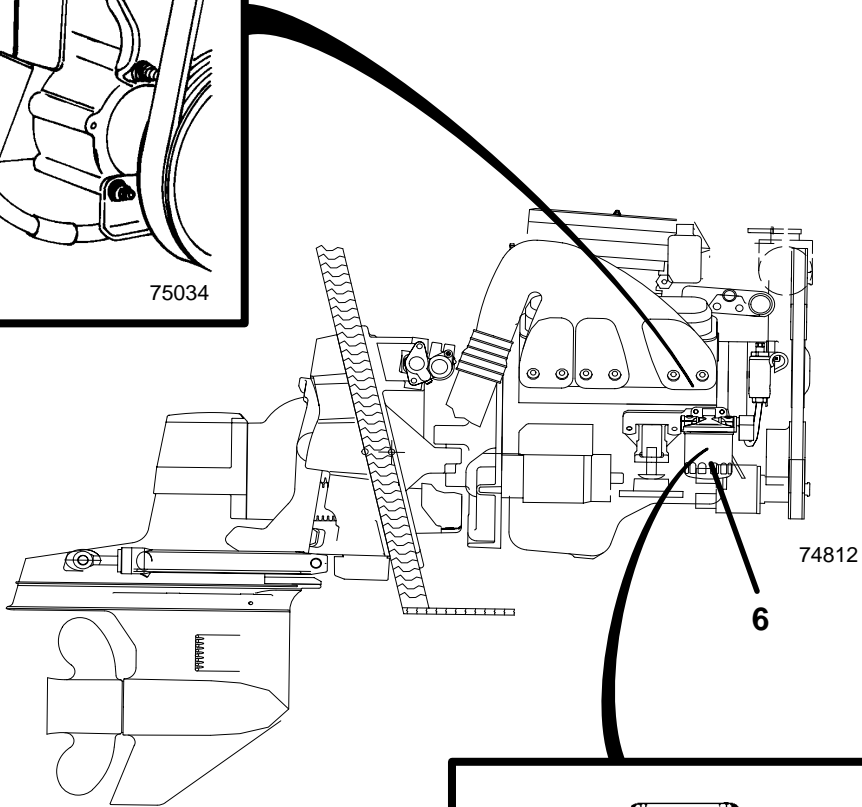
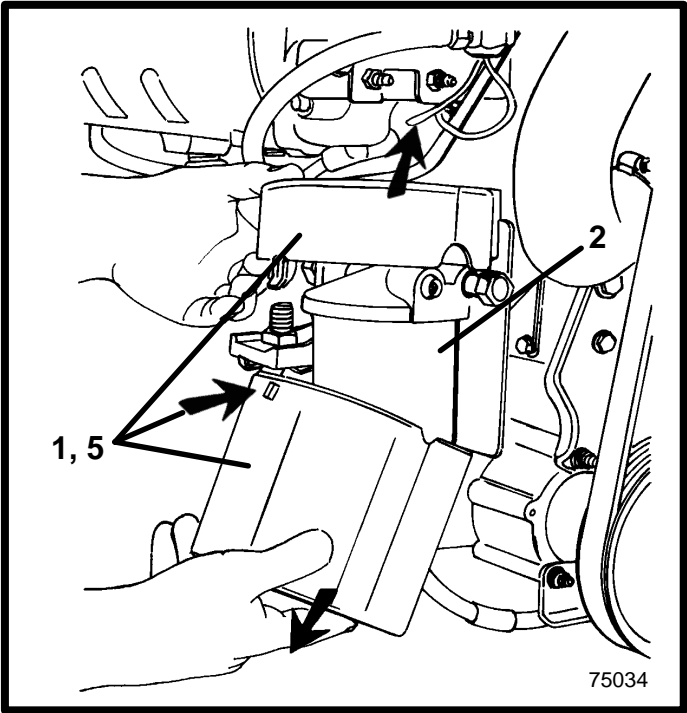
IMPORTANT: If any water drained from OIL FILL/DRAIN hole, or if oil appears discolored, drive unit is leaking and should be checked immediately by your Authorized MerCruiser Dealer.

- 4 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.

- 5 Install OIL VENT screw and sealing washer.
- 6 Continue to fill until gear lube appears in the gear lube monitor.
 - A Fill monitor to FULL mark. Lubricate O-ring on neck with sterndrive oil. Install cap; do not overtighten.
 - B Quickly install sealing washer and OIL FILL/DRAIN screw. Tighten securely.
- 7 Grease propeller shaft heavily, with specified lubricant (Refer to "Propeller Installation" if necessary). Reinstall propeller and torque nut to 55 lb. ft. (75 N·m) MINIMUM.
- 8 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.



Changing Water Separating Fuel Filter

⚠ WARNING

Be careful when changing water separating fuel filter. 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.

⚠ WARNING

Make sure no fuel leaks exist before closing engine hatch.

EFI Models

⚠ CAUTION

The electric fuel pump and factory installed water separating fuel filter have been carefully designed to function properly together. Do not install additional fuel filters and/or water separating fuel filters between fuel tank and engine.

The installation of additional filters may cause:

- Fuel Vapor Locking
- Difficult Warm-Starting
- Piston Detonation Due to Lean Fuel Mixture
- Poor Driveability

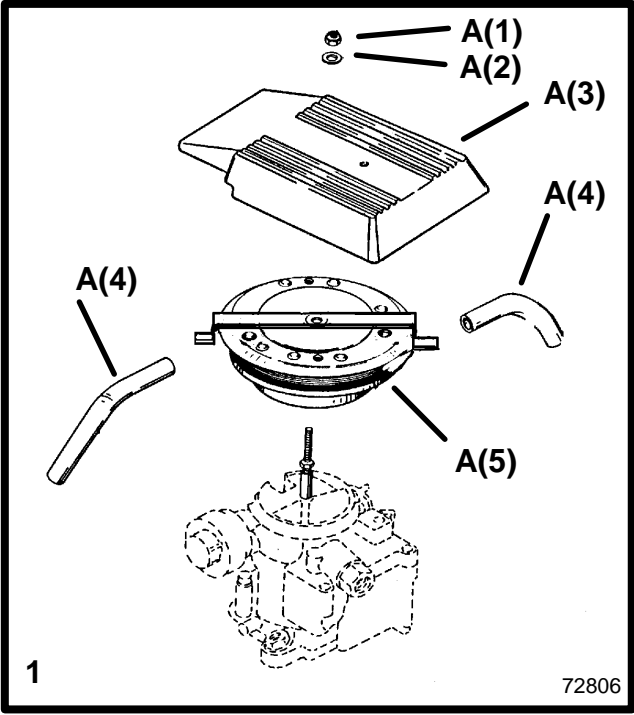
- 1 Unsnap latch and slide top and bottom cover pieces from around the water separating fuel filter and bracket.

NOTE: Top and bottom cover pieces are formed with a groove on each side that slides around the brackets outer edges.

- 2 Remove water separating fuel filter and sealing ring from mounting bracket and discard.
- 3 Coat sealing ring on new filter with motor oil. Thread filter onto bracket and tighten securely by hand. Do not use a filter wrench.
- 4 Start and run engine. Check filter connection for gasoline leaks. If leaks exist, recheck filter installation. If leaks continue, stop engine immediately and contact your Authorized MerCruiser Dealer.
- 5 Install cover pieces around fuel filter. Be certain top part of cover latches to lower part.

Carbureted Models

- 6 Remove water separating fuel filter and sealing ring from mounting bracket and discard.
- 7 Coat sealing ring on new filter with motor oil. Thread filter onto bracket and tighten securely by hand. Do not use a filter wrench.
- 8 Start and run engine. Check filter connection for gasoline leaks. If leaks exist recheck filter installation. If leaks continue stop engine immediately and contact your Authorized MerCruiser Dealer.



Cleaning Flame Arrestor and Related Components

WARNING

Avoid gasoline fire or explosion. Gasoline is extremely flammable and highly explosive under certain conditions. Be careful when cleaning flame arrestor and crankcase ventilation hoses: Be sure that ignition is OFF. DO NOT smoke or allow sources of spark or open flame in area when cleaning flame arrestor and crankcase ventilation hoses.

1 Models with this style flame arrestor:

A Remove flame arrestor and related components in the following order:

- (1)** Nut.
- (2)** Sealing washer.
- (3)** Flame arrestor cover (if equipped).
- (4)** Crankcase ventilation hoses from flame arrestor and rocker arm cover fittings.
- (5)** Flame arrestor.

B Clean flame arrestor in solvent. Blow dry with compressed air or allow to air dry completely.

WARNING

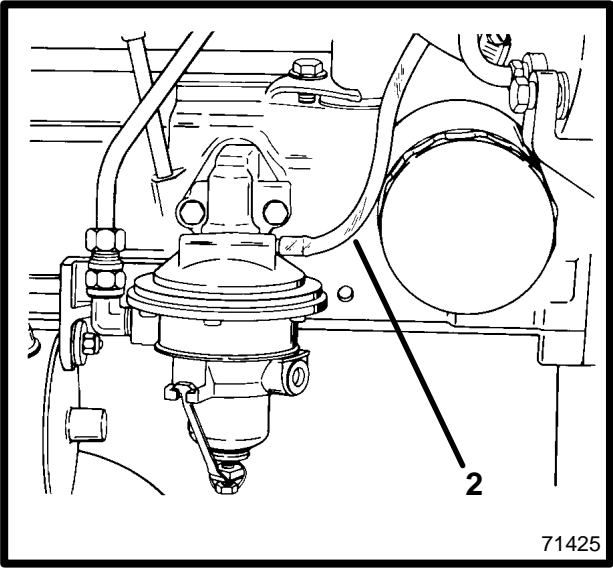
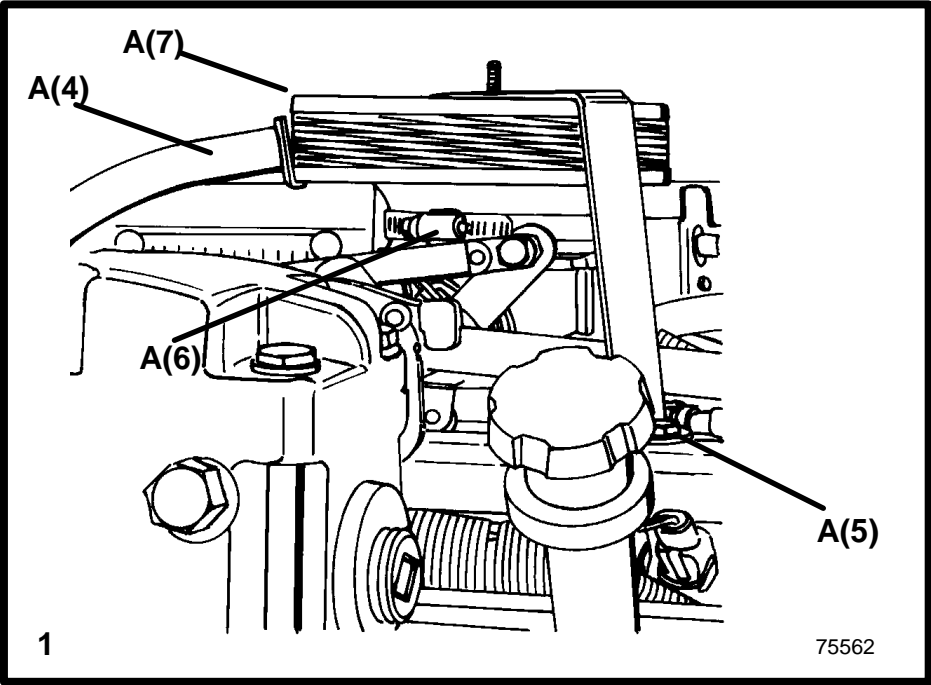
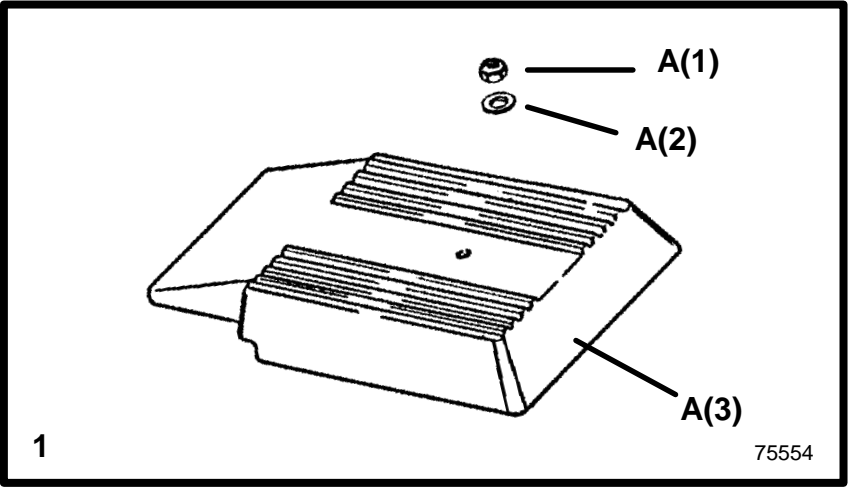
Avoid gasoline fire or explosion. Gasoline is extremely flammable and highly explosive under certain conditions. NEVER use gasoline as a cleaning solvent.

C Clean crankcase ventilation hoses in solvent. Blow dry with compressed air or allow to air dry completely.

D Inspect crankcase ventilation hoses for cracks or deterioration and replace if necessary.

E Reinstall flame arrestor and related components in reverse order.

F Tighten flame arrestor nut securely.



⚠ WARNING

Avoid gasoline fire or explosion. Gasoline is extremely flammable and highly explosive under certain conditions. NEVER use gasoline as a cleaning solvent.

1 Models with this style of flame arrestor:

A Remove flame arrestor and related components in the following order:

- (1) Nut.
- (2) Sealing washer.
- (3) Flame arrestor cover.
- (4) Crankcase ventilation hose.
- (5) Engine cover bracket (remove nutS only; do not disturb stud).
- (6) Loosen clamp.
- (7) Flame arrestor.

B Clean flame arrestor and crankcase ventilation hose in solvent. Blow dry with compressed air or allow to air dry completely.

C Inspect crankcase ventilation hose for cracks or deterioration and replace if necessary.

D Reinstall flame arrestor. Tighten clamp securely.

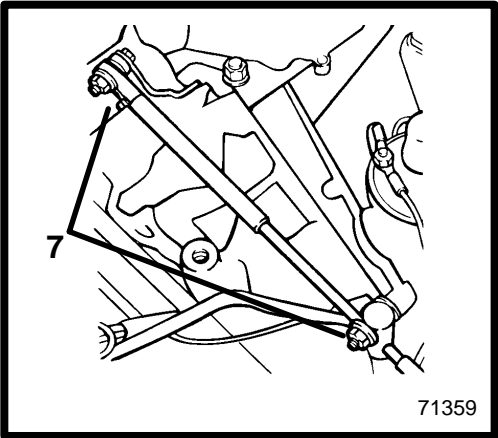
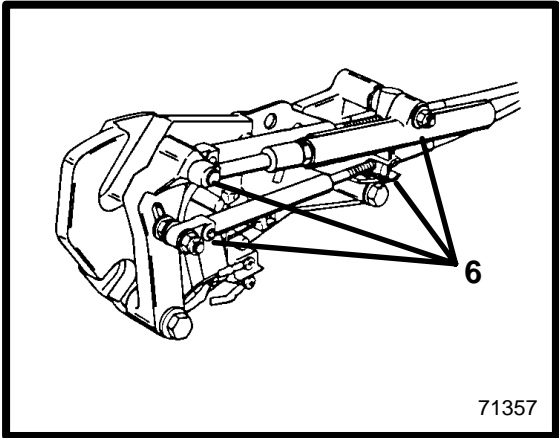
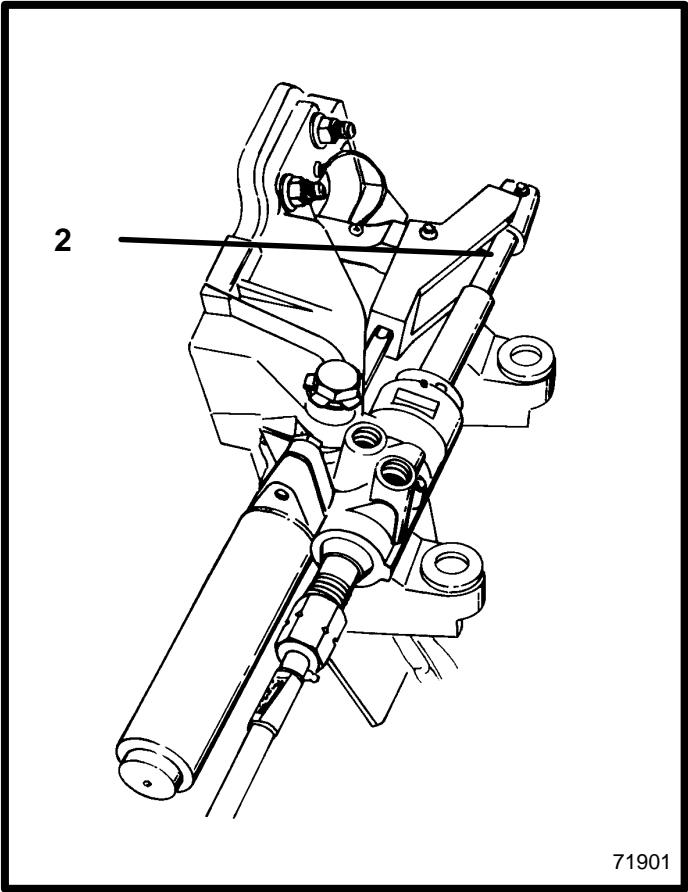
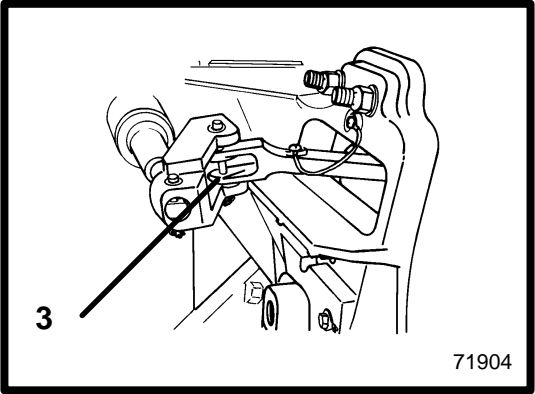
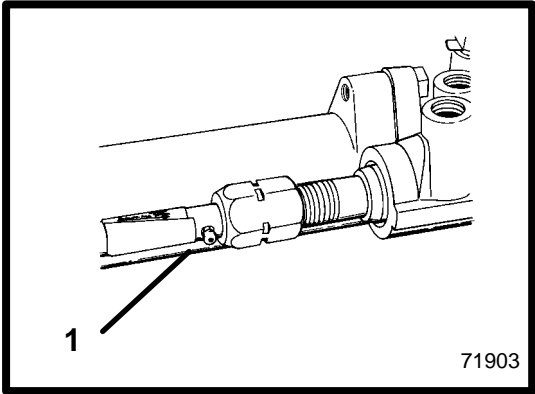
E Reinstall engine cover bracket. tighten nuts securely.

F Reinstall remaining components and tighten flame arrestor cover nut securely.

Fuel Pump Sight Tube Inspection

3.0L Models

2 The engine fuel pump is equipped with a sight tube which gives visible evidence of a ruptured fuel pump diaphragm. If fuel is visible in tube, fuel pump should be replaced by your Authorized MerCruiser Dealer immediately.



Lubrication

Steering System

1 If Steering Cable Has Grease Fittings: Turn steering until steering cable is fully retracted into cable housing. Apply approximately 3 pumps of grease from a typical hand-operated grease gun. Lubricate at fitting with 2-4-C Marine Lubricant with Teflon.

WARNING

Do not grease steering cable while extended. Hydraulic lock could occur and cause loss of steering control.

NOTE: *If steering cable does not have grease fitting, inner wire of cable cannot be greased.*

- 2** Turn steering until steering cable fully extended. Lubricate by applying a thin coat of Special Lubricant 101 on exposed part of cable.
- 3** Lubricate steering system pivot points with SAE 30W motor oil.
- 4** On dual engine boats: Lubricate all pivot points, including tie bar pivot points, with SAE 30W motor oil.
- 5** Upon first starting engine, turn steering wheel several times to starboard, and then port, to ensure that the steering system operates properly, before getting underway.

CA72

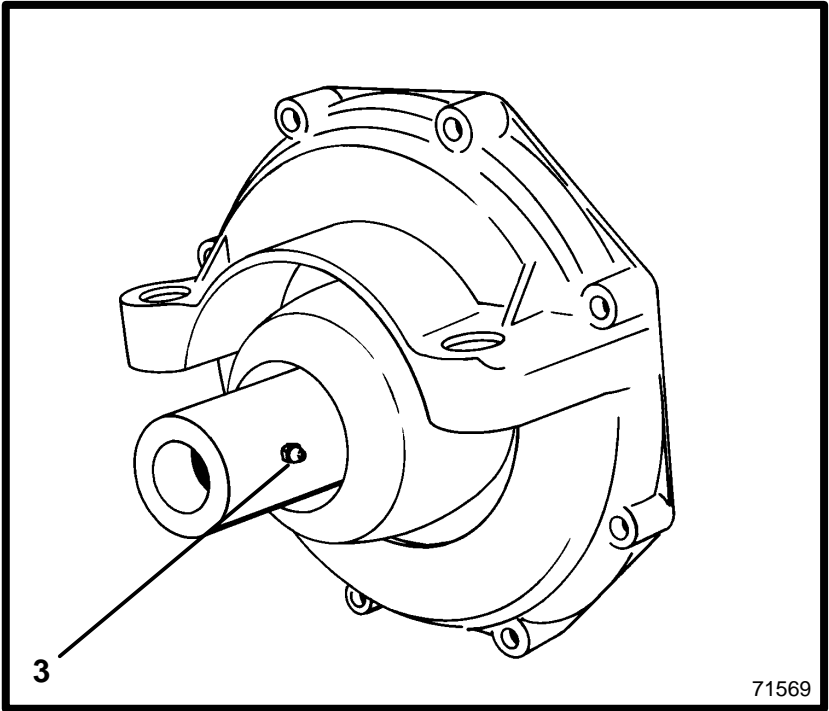
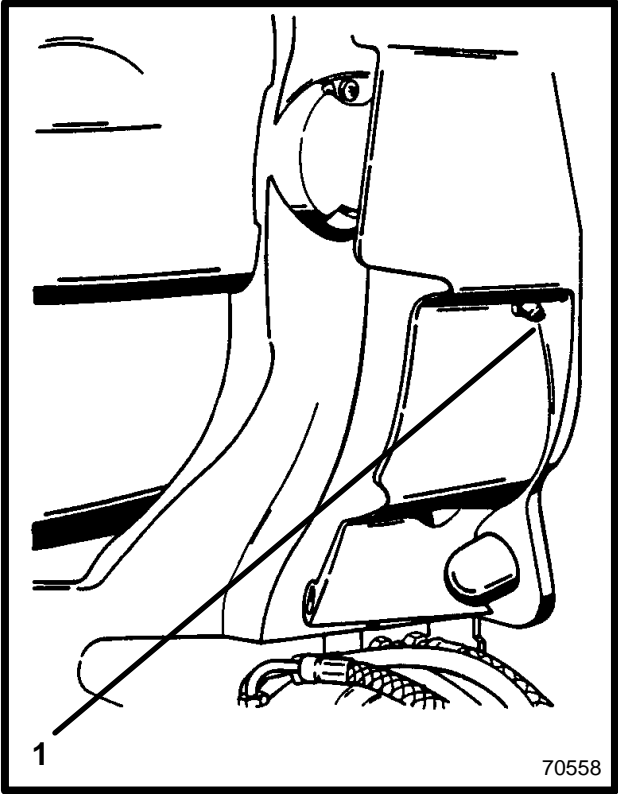
Shift Cable

- 6** Lubricate pivot points with SAE 30W motor oil.

CA73

Throttle Cable

- 7** Lubricate pivot points with SAE 30W motor oil.



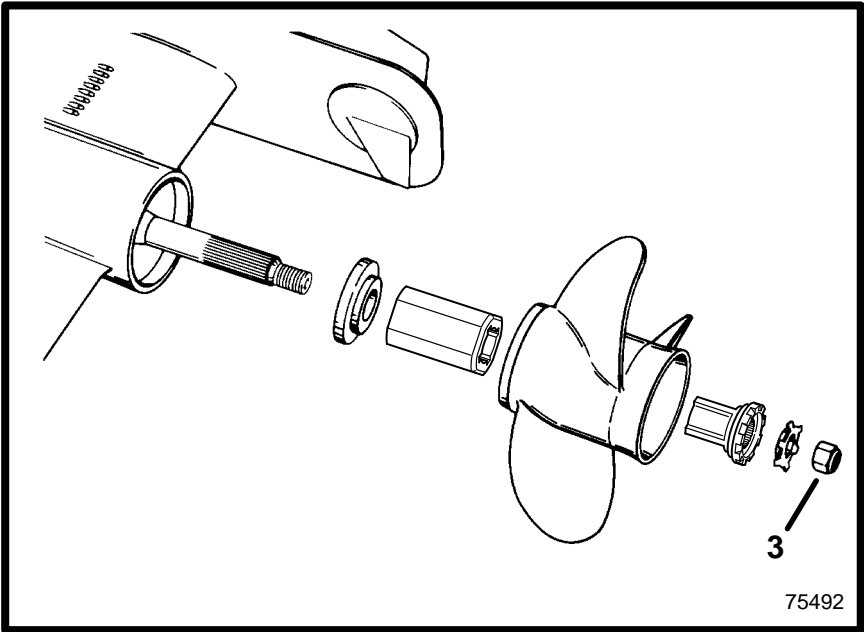
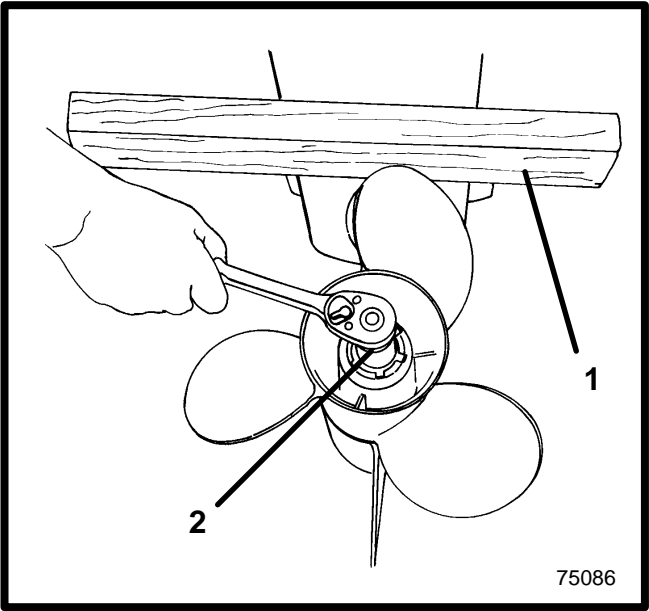
Drive Unit and Transom Assembly

- 1 Lubricate gimbal bearing by applying approximately 8-10 pumps of grease from a typical hand-operated grease gun using Quicksilver U-Joint and Gimbal Bearing Grease.
- 2 For propeller shaft lubrication, see PROPELLER.

Engine Coupler

- 3 Lubricate engine coupler splines through grease fitting on coupler by applying approximately 8-10 pumps of grease from a typical hand-operated grease gun using Quicksilver Engine Coupler Spline Grease.

NOTE: *Your engine is equipped with a sealed engine coupler and Perm-a-Lube U-joints. The sealed coupler and shaft splines can be lubricated without removing the drive unit. The Perm-a-Lube U-joints do not require lubrication.*



Propeller

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 lbs. ft. (75 N-m) torque is required.

CA78

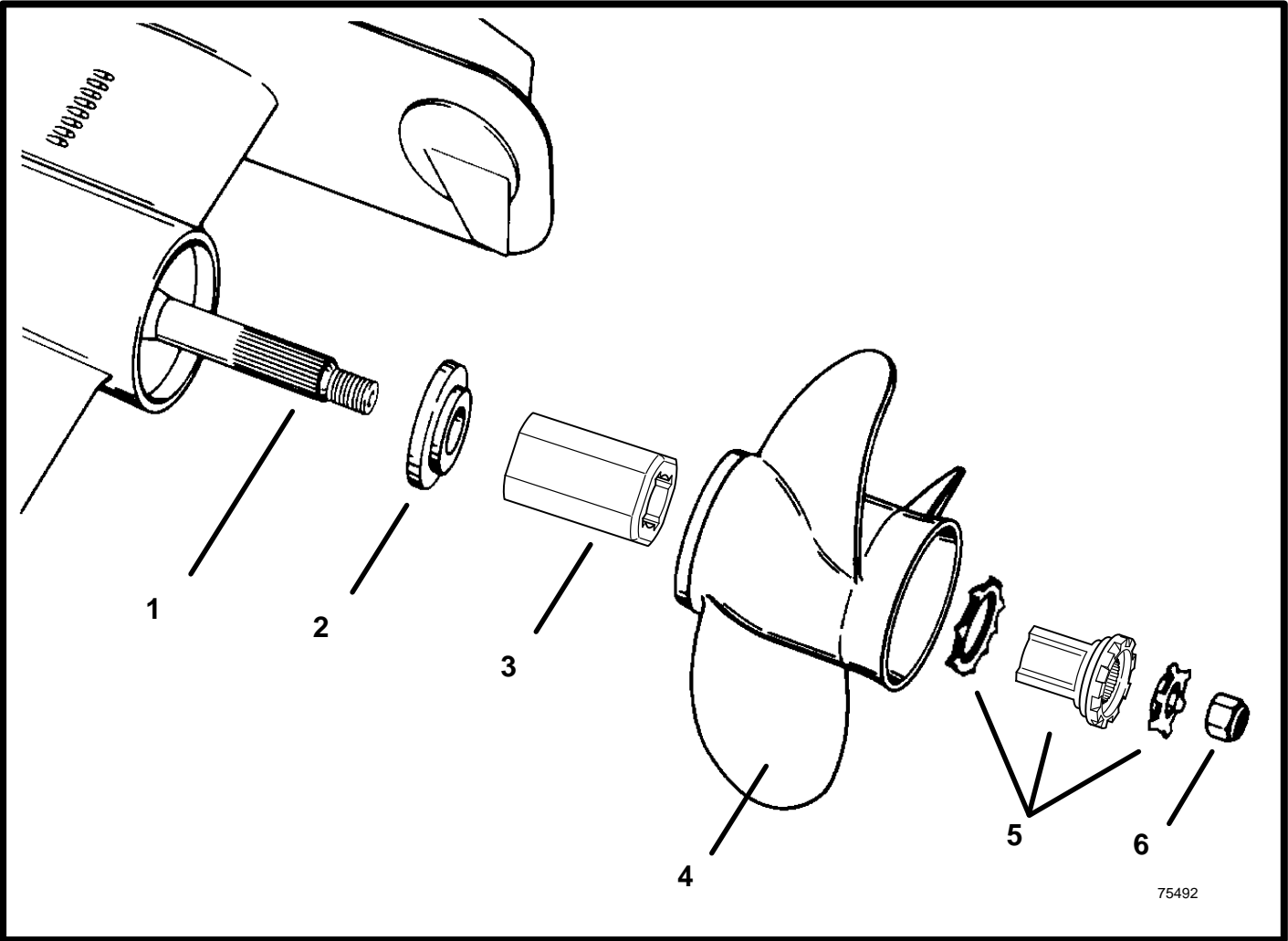
Removal

- 1 Place wood block between propeller blade and anti-ventilation plate to prevent rotation. Straighten bent tabs on tab washer.
- 2 Turn propeller shaft nut counterclockwise to remove nut.
- 3 Slide tab washer, spline washer, continuity washer, propeller and thrust hub off propeller shaft.

CA79

Repair

Some damaged propellers can be repaired. See your dealer.



Installation

- 1 Apply a liberal coat of one of the following Quicksilver lubricants to propeller shaft: Anti-Corrosion Grease, Special Lubricant 101, or 2-4-C Marine Lubricant with Teflon.
- 2 Slide thrust hub onto propeller shaft, with stepped side toward propeller hub.
- 3 Install Flo-Torque II Drive Hub into propeller.

NOTE: *The drive sleeve is tapered and will slide fully into the propeller as the nut is tightened and properly torqued.*

- 4 Align splines and place propeller on propeller shaft.

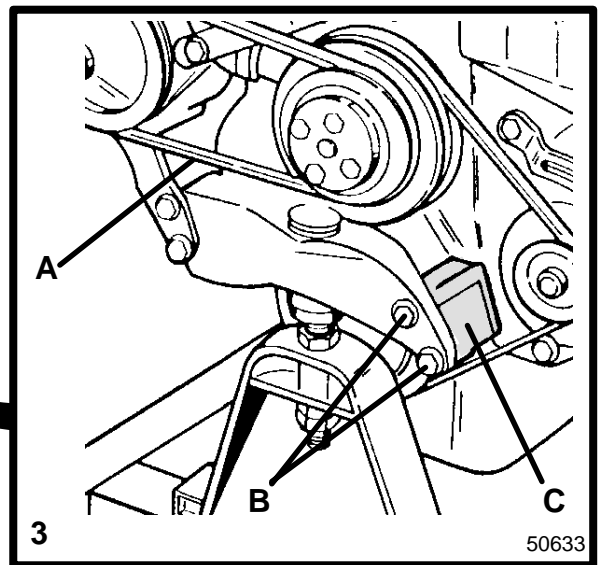
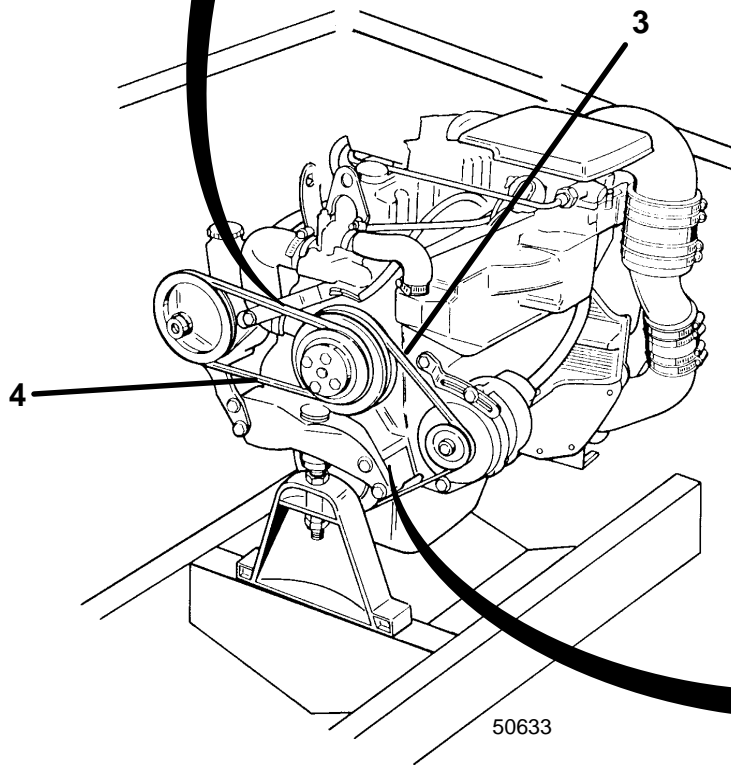
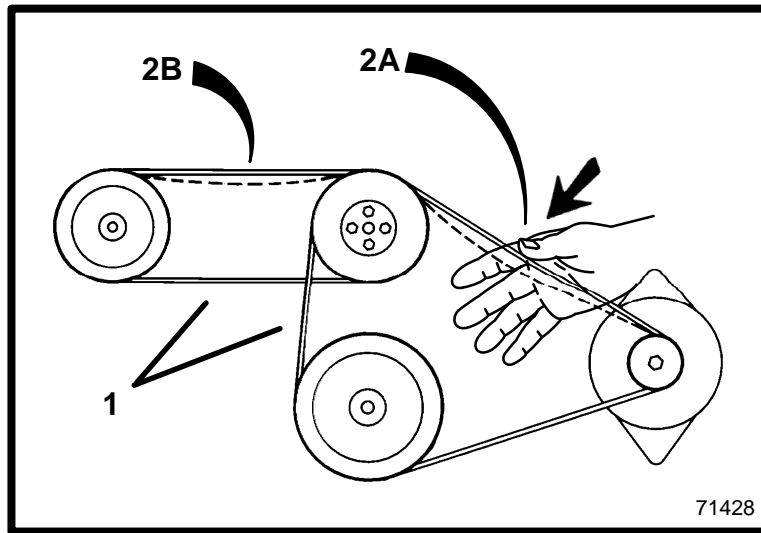
IMPORTANT: If reusing tab washer, carefully inspect tabs for cracks or other damage. Replace tab washer if condition is questionable.

- 5 Install continuity washer, drive sleeve adapter and locking tab washer.
- 6 Install propeller nut. Torque nut to a MINIMUM of 55 lbs. ft. (75 N·m).
- 7 Continue to tighten propeller nut until tabs on tab washer align with three grooves on spline washer, if not already aligned.
- 8 Bend three tabs on tab washer down into grooves on spline washer.
- 9 After first use, bend the three tabs straight, retighten propeller nut to minimum 55 lbs. ft. torque (75 N·m). Bend tabs back down into spline washer.
- 10 Check propeller at least every 20 hours of operation.

IMPORTANT: Installation is correct when at least 2 threads of propeller shaft are exposed through propeller nut.

CAUTION

Avoid loss of propeller (propulsion). Do not operate with a propeller nut that is improperly tightened.



Drive Belts

WARNING

Avoid possible serious injury. Make sure engine is shut off and ignition key is removed before inspecting belts.

V-Belts (3.0L Model)

CHECKING

- 1 Inspect the alternator and power steering pump drive belts for the following:
 - Excessive wear
 - Fraying
 - Cracks
 - Glazed surfaces
- 2 Check belt tension by depressing belts, with moderate hand pressure, at points shown.
 - A** Alternator Belt - Belt should depress 1/2 in. (13 mm).
 - B** Power Steering Pump Drive Belt (If So Equipped) - Belt should depress 1/4 in. (6 mm).

REPLACING

Alternator Belt

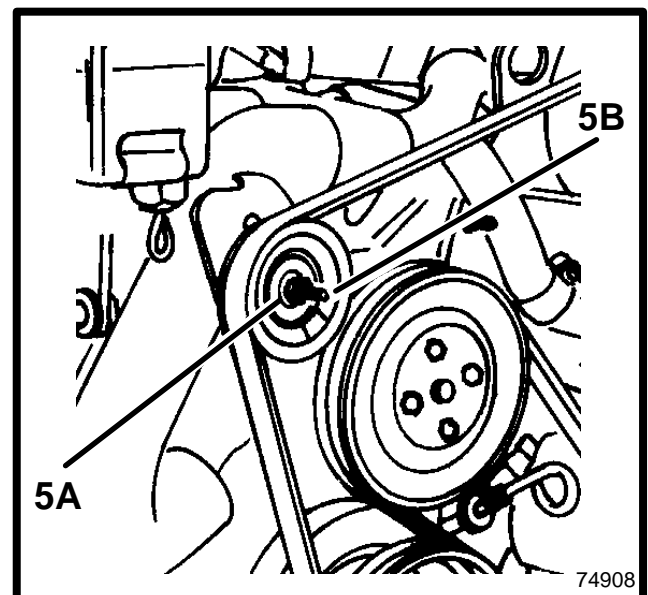
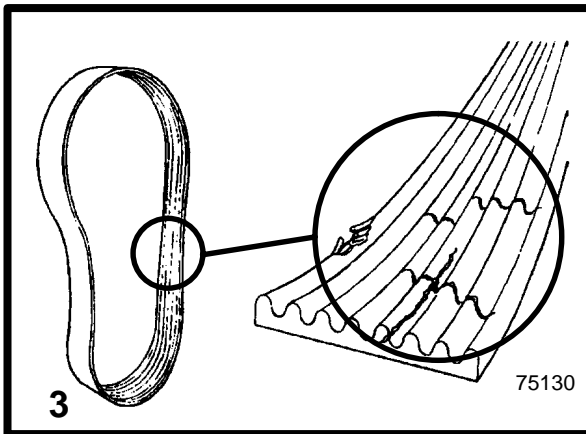
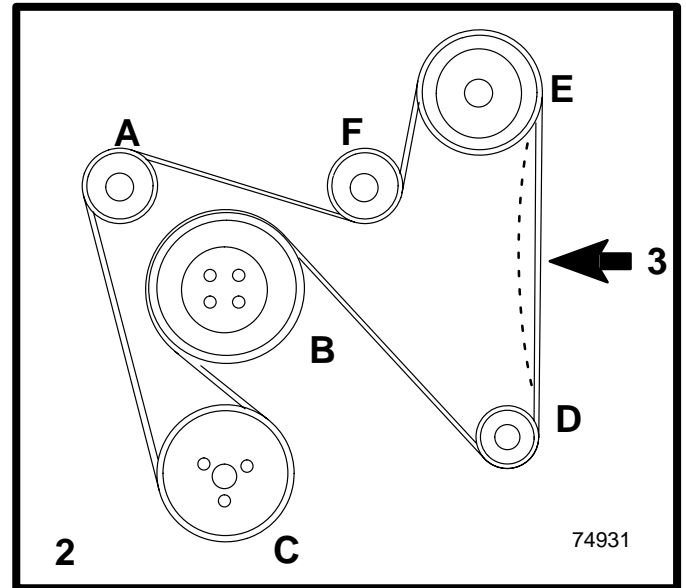
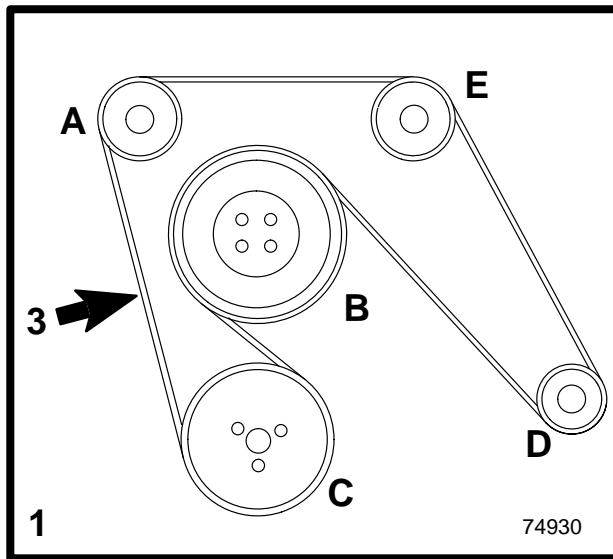
- 3 Remove as follows:
 - A** Remove power steering belt as outlined in the following.
 - B** Remove the two *port* side, front engine mount bracket assembly screws and washers.
 - C** Remove the spacer block between the bracket assembly and the engine block. It may be necessary to tap gently on the spacer to allow removal.
 - D** Loosen the alternator as outlined below. Remove and replace the alternator belt.
 - E** Replace the spacer block between the bracket assembly and the engine block. Install the two screws using the flat and lock washers removed previously. Torque the two screws to 21 lb. ft. (28 N·m).
 - F** Install power steering belt. Adjust tension of both drive belts as outlined in the following.

Power Steering Pump Drive Belt

- 4 Remove drive belt as follows:
 - A** Loosen power steering pump attaching bolts and mounting bolts.
 - B** Pivot power steering pump toward engine, as required, until belt can be removed.
 - C** Install new drive belt on pulleys. Adjust tension as outlined in the following.

Adjusting Tension - Alternator or Power Steering Pump Drive Belt

- 5 Loosen alternator or power steering pump attaching bolts and mounting bolts (if not already accomplished). Adjust tension as follows:
 - A** Pivot alternator or power steering pump, away from engine, as required, until the correct deflection of the belt is obtained at location specified above.
 - B** After obtaining correct tension, torque the alternator and/or power steering pump attaching bolts and mounting bolts to specifications. Refer to "Specifications".
- 6 Operate the engine for a short period of time. Recheck belt adjustment.



Serpentine Drive Belt (All Other Models)

WARNING

Avoid possible serious injury. Make sure engine is shut off and ignition key is removed before inspecting belt.

The following represent two different models:

- 1 With power steering.
- 2 With power steering, and equipped with closed cooling system.

In the two models above, the following are the various components, if equipped:

- | | |
|---|--------------------------------|
| A Idler Pulley (Adjustment Pulley) | D Alternator Pulley |
| B Circulating Pump | E Power Steering Pulley |
| C Crankshaft Pulley | F Idler Pulley |

CHECKING

- 3 Inspect drive belt for proper tension and for the following:

- Excessive wear
- Cracks

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.

- Fraying
- Glazed surfaces
- Proper tension - 1/4 in. (6 mm) deflection, with moderate thumb pressure, on the belt at location indicated by arrow and dashed lines.

CB701

REPLACING AND / OR ADJUSTING TENSION

IMPORTANT: If a belt is to be reused, it should be installed in the same direction of rotation as before.

- 4 Remove drive belt as follows:

NOTE: The upper, right (starboard) idler pulley is the belt adjustment pulley.

- A** Loosen 5/8 in. locking nut on adjustment stud.
- B** Turn adjustment stud and loosen belt. Remove belt.

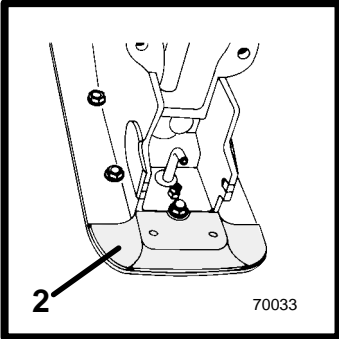
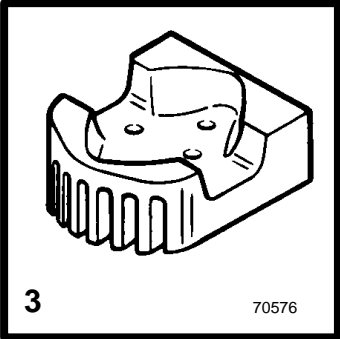
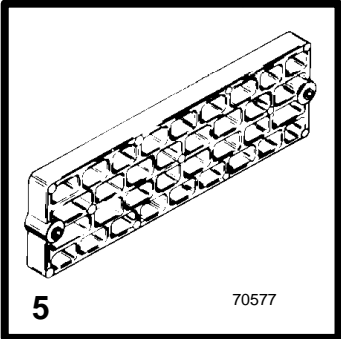
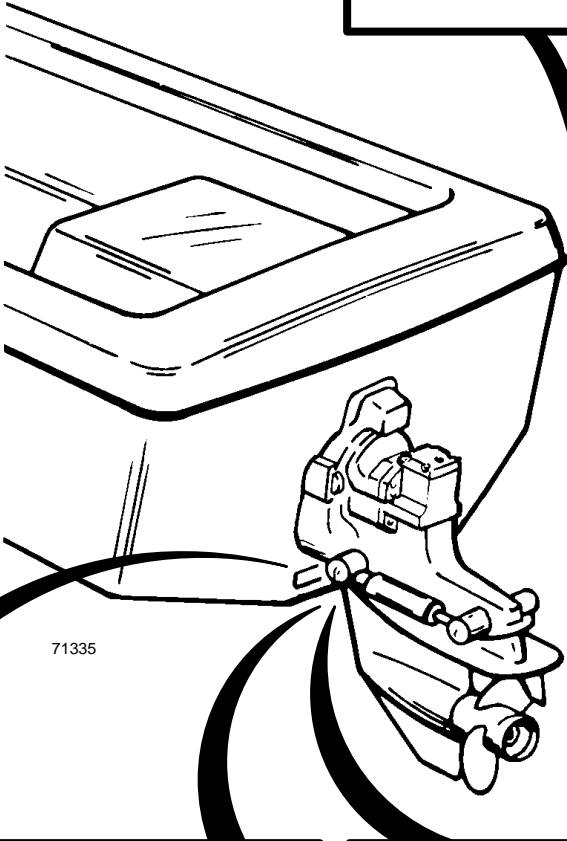
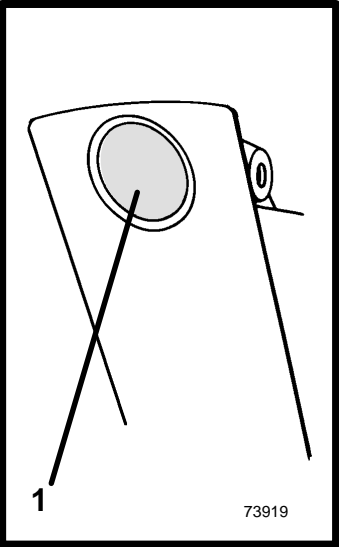
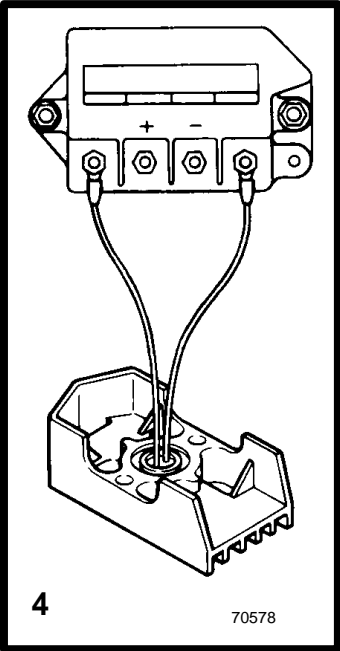
- 5 Install drive belt on pulleys and adjust tension as follows:

- A** Loosen 5/8 in. locking nut on adjustment stud. Leave wrench on adjustment stud.

NOTE: Belt deflection is to be measured on the belt at the location that has the longest distance between two (2) pulleys. Normally this location is between the power steering pump and the belt adjustment pulley. This location will be different on engines with closed cooling or models without power steering.

- B** Use 5/16 in. socket and tighten adjusting stud until the correct deflection of the belt is obtained at location specified above.
- C** While holding adjustment stud at the correct belt tension, tighten 5/8 in. locking nut.

- 6 Operate the engine for a short period of time. Recheck belt adjustment.



Corrosion And Corrosion Protection

Whenever two or more dissimilar metals (like those found on the sterndrive) are submerged in a conductive solution, such as saltwater, brackish 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.

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

1 Universal Anodic Plate - serves as a sacrificial anode.

Remove plug from drive shaft housing to access attaching screw and insert 1/2 inch socket. Unthread attaching screw and remove universal anodic plate. **Do not remove screw.** Clean or scrape mounting surfaces to bare metal for proper contact. Install new anodic plate and tighten screw securely. Install plug.

2 Anodic Plate - serves as a sacrificial anode. Unscrew both attaching screws and remove. Clean mounting surfaces to bare metal for proper contact. Install a new anodic plate and tighten securely.

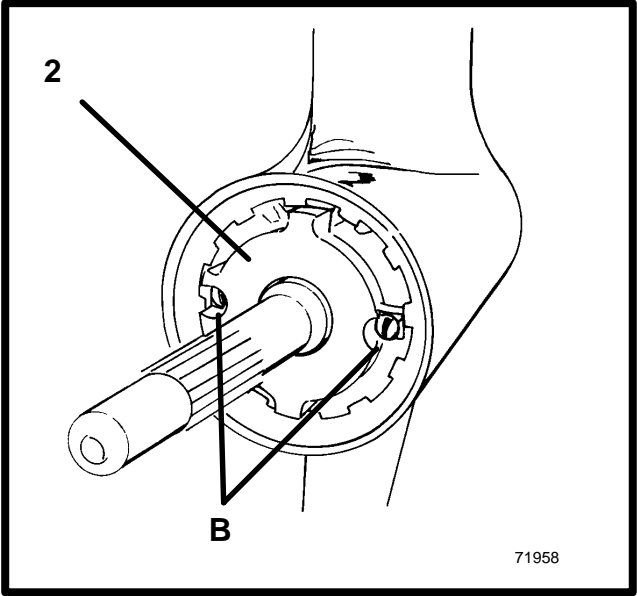
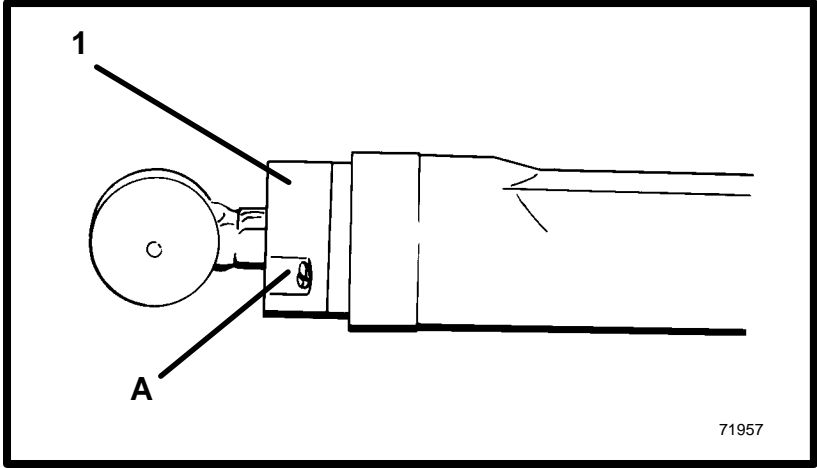
3 Block - Is mounted to underside of gimbal housing and serves as a sacrificial anode. Remove two bolts to change block. Clean mounting surfaces to bare metal for proper contact. Install a new anodic block and tighten securely.

4 MerCathode System (if equipped) - Electrode assembly replaces anodic block.

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.

5 Anode Kit (if equipped) - Mounted to boat transom. Acts as a sacrificial anode. Replace as required.



CA535

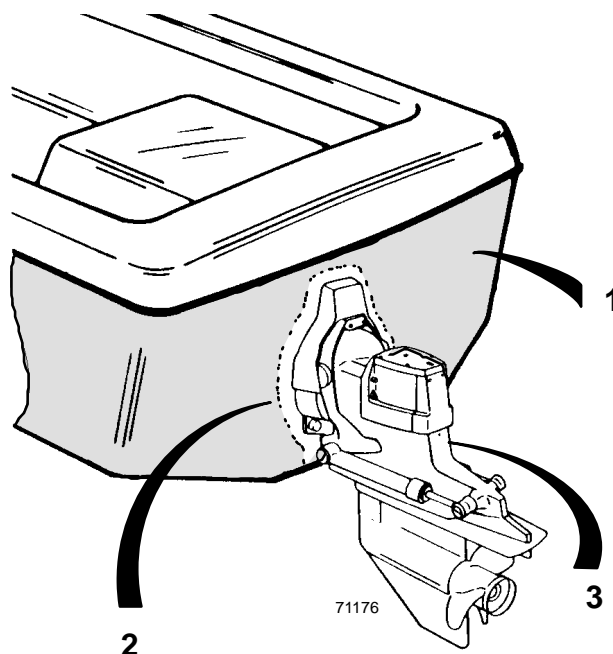
1 Trim Cylinder Anodes - are mounted on each trim cylinder. To replace the trim cylinder anodes:

- A** Remove two screws from each anode.
- B** Clean mounting surfaces down to bare metal for proper contact.
- C** Install new anodes and tighten securely.

CA536

2 Bearing Carrier 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:

- A** Remove propeller.
- B** Remove two screws from anode.
- C** Clean mounting surfaces down to bare metal for proper contact.
- D** Install new anode and tighten securely.
- E** Reinstall propeller.



CA537

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 anti-fouling paint will not be covered by the limited warranty.

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

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

IMPORTANT: If anti-fouling 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 anti-fouling 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 1-1/2 in. (40mm) UNPAINTED area on transom of the boat around these items.

3 Painting Drive Unit or Transom Assembly: Drive unit and transom assembly should be painted with a good quality marine paint or an anti-fouling 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 On the boat exterior surfaces, the use of certain mild household cleaners, used for the removal of mineral and lime deposits, can be helpful if the finish is dull or discolored. Such cleaners are particularly useful in the removal of the unsightly, white deposits on the driveshaft housing or transom.

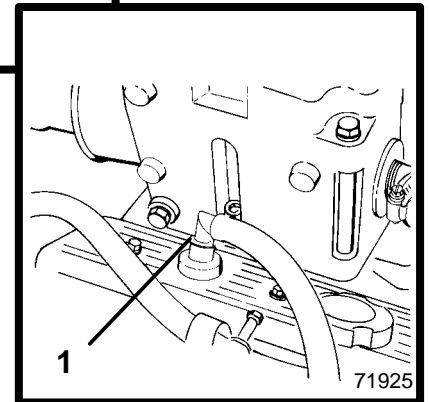
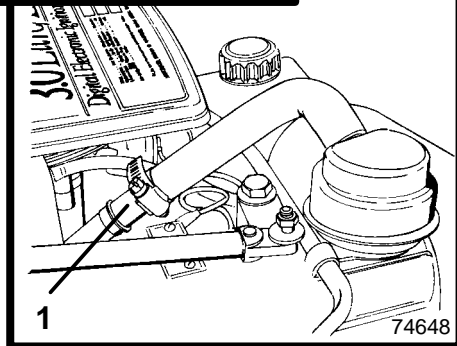
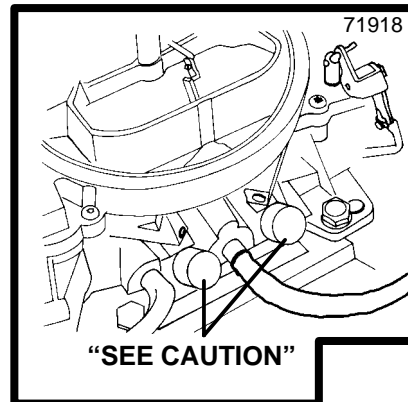
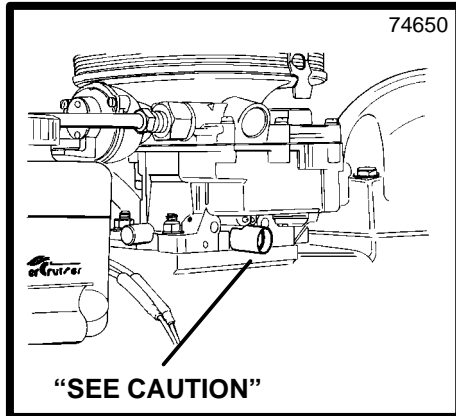
5 Spray power package components on inside of boat every 2-3 weeks with Quicksilver Corrosion Guard to protect finish from dulling and corrosion. External power package components may also be sprayed.

6 All lubrication points, especially steering system, shift and throttle linkages, should be kept well lubricated.

7 Flush raw water cooling system periodically, preferably after each use.

Emissions - European Models Only

CA570



CA399

The following information applies only to engines with a special emissions kit installed. If the kit has been installed, your engine complies with "Stage 1" Bodensee and Swiss Regulations.

CA398

Sealed Carburetor Mixture Screws

The carburetor on this engine has seals on the carburetor mixture screws. These seals prevent adjustment of the fuel mixture settings.

⚠ CAUTION

Do not remove mixture screw seals and/or attempt to adjust fuel mixture setting. Tampering with the mixture setting on this engine could affect the exhaust emissions level, thus voiding the emissions certification. These seals should only be removed by an authorized dealer or emissions testing agency.

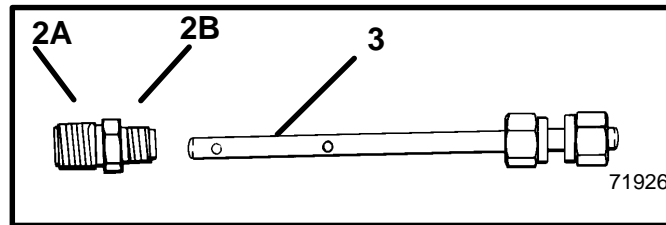
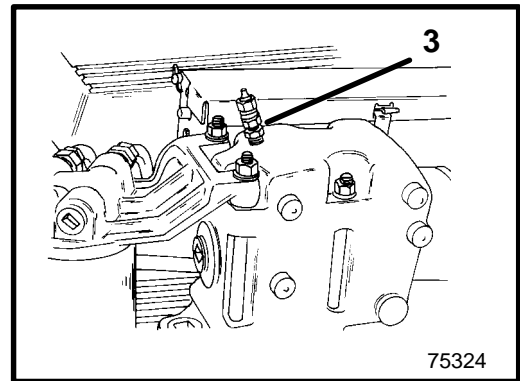
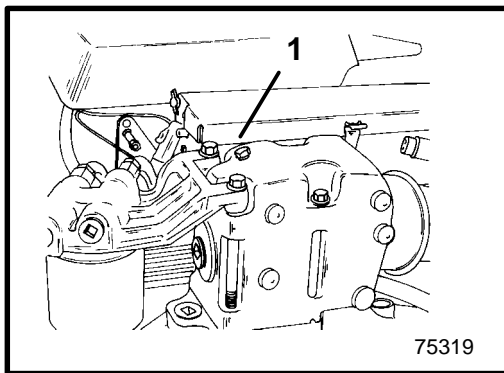
CA99

Changing Positive Crankcase Ventilation (PCV) 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.

1 Remove PCV valve from port valve cover. Disconnect it from the hose and discard valve. Install new PCV valve in valve cover and reconnect hose. Ensure valve is tightly seated in valve cover.

Use only MerCruiser replacement parts to ensure compliance with emission regulations.



Emissions - European Models Only (continued)

Emissions Testing

Your engine is equipped with special design features and special tuning to minimize the emission output from the engine. You should follow:

- Recommended maintenance schedules particularly as to the ignition system.
- Proper engine tuning procedures to ensure these features remain in good operating order.
- Proper steps to maintain the engine within specifications.

Installing Test Probes

IMPORTANT: The testing dealer or agency will be equipped with the appropriate test equipment and adapters for this engine. The test probes should be installed as follows:

- 1 Remove plugs from both exhaust elbows.
- 2 Install exhaust elbow adapter fittings as follows.
 - A Apply Loctite Pipe Sealant with Teflon to threads that go into elbow.
 - B Install fittings into elbows. Tighten fittings securely.
- 3 Insert exhaust probes into fittings and tighten securely.

The testing agency will connect their adapters and test equipment to the probes to conduct the test. Once the test is complete, they should remove the test probes and fittings, apply Quicksilver Perfect Seal to the threads of both plugs and reinstall them into elbows.

SECTION 4 - Tune-Up

Tune-Up

4

SECTION 4 - Tune-Up

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Lubricants/Sealers/Adhesives

DESCRIPTION	PART NUMBER
Quicksilver Ignition Coil Insulating Compound	92-823506--1
Acetone	Obtain Locally
Loctite 271	

Torque Specifications

DESCRIPTION	Lb. In.	Lb. Ft.	N·m
Distributor Hold Down Clamp (181 CID /3.0L Engine)		20	27
Distributor Hold Down Clamp (All Engines, Except 181 CID /3.0L Engine)		30	40
Spark Plugs (All Engines)		15	20

General Precautions for Tune-Up Procedures

CAUTION

Avoid personal injury and/or property damage. Listed below are some of the precautions, along with others listed throughout this manual, that you should observe to help ensure an accident-free maintenance experience:

- Always disconnect battery cables from battery **BEFORE** working on electrical system to prevent injury to yourself or damage to electrical system.
- Be sure that engine compartment is well ventilated and that no gasoline vapors are present, to avoid the possibility of fire.
- Be sure to keep hands, feet and clothing clear of moving parts.
- Do not touch or disconnect any ignition system parts while engine is running.
- Do not reverse battery cable connections. System is negative (–) ground.
- Do not disconnect battery cables while engine is running.
- When working on engine, spark plug holes, carburetor and/or intake manifold openings should be kept covered to prevent foreign objects from entering combustion chamber.
- Replace a component if there is any doubt as to the condition of the component.

EFI System Maintenance Precautions

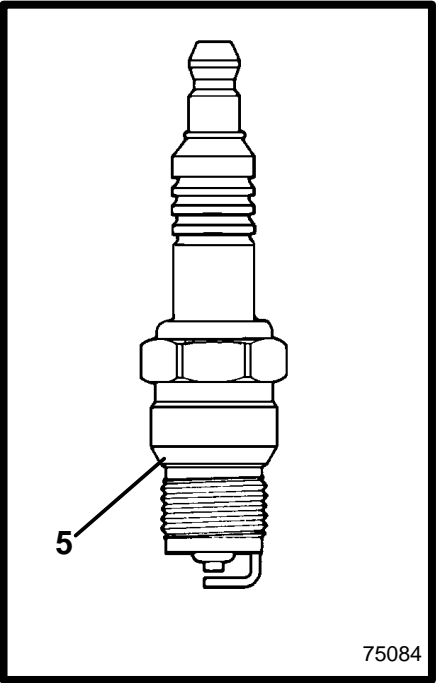
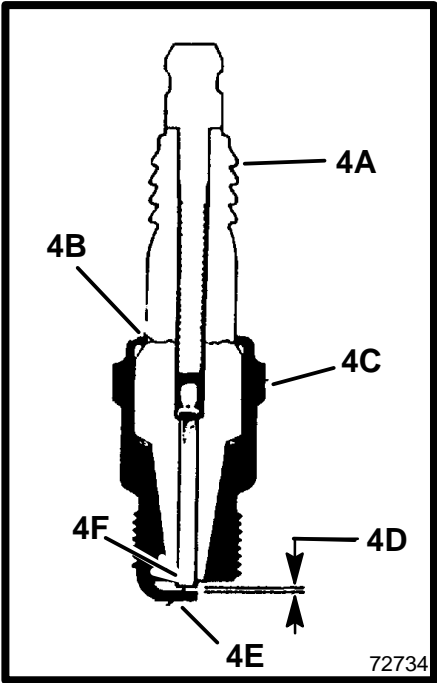
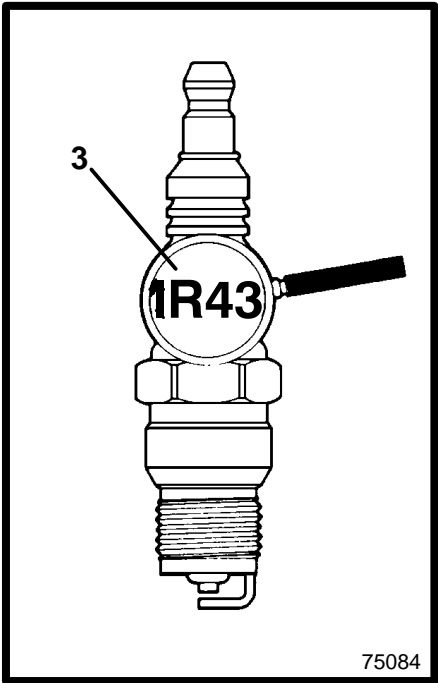
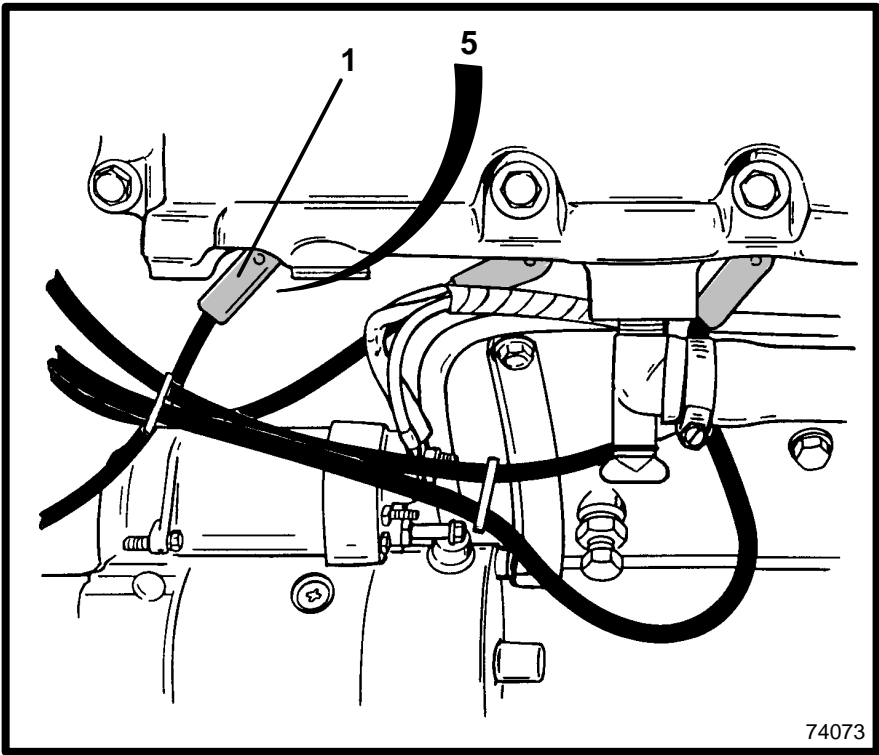
WARNING

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

CAUTION

Avoid damage to the EFI electrical system components: Refer to the following precautions when working on or around the EFI electrical harness, or when adding other electrical accessories:

- **DO NOT** tap accessories into engine harness.
- **DO NOT** puncture wires for testing (Probing).
- **DO NOT** reverse battery leads.
- **DO NOT** splice wires into harness.
- **DO NOT** attempt diagnostics without proper, approved Service Tools.



Spark Plugs

Checking

- 1 Disconnect spark plug wires (high tension leads) from spark plugs.

NOTE: Use care when removing spark plug wires and boots from spark plugs. Twist the boot 1/2 turn before removing. Firmly grasp and pull on the **boot** to remove the wire end.

- 2 Remove spark plugs.

NOTE: A “thin-walled” spark plug socket may be required.

- 3 Inspect each spark plug for manufacturer and spark plug number. All plugs must be from the same manufacturer and have the same spark plug number. Refer to “Specifications” section for spark plug numbers.

- 4 Inspect each plug individually for badly worn electrodes, glazed, broken or blistered porcelain and replace where necessary. Refer to Spark Plugs - “Examples of Spark Plug Conditions” .

- A Porcelain Insulator
- B Insulator - Cracks Often Occur at This Point
- C Shell
- D Proper Gap - Refer to “Specifications”.
- E Side Electrode (Bend to Adjust Gap)
- F Center Electrode (When Adjusting Gap - DO NOT Bend)

CA670

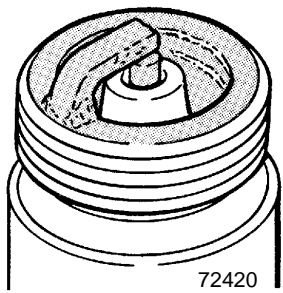
Replacing

IMPORTANT: Tapered seat spark plugs are not interchangeable with non-tapered (with gasket) spark plugs. Do not use gaskets on tapered seat plugs.

- 5 Clean the plug seating area on the cylinder heads. Clean the tapered seat area of each spark plug.
- 6 Adjust spark plug gap with a round feeler gauge. Bend side electrode to adjust gap. Refer to “Specifications” for correct spark plug gap.

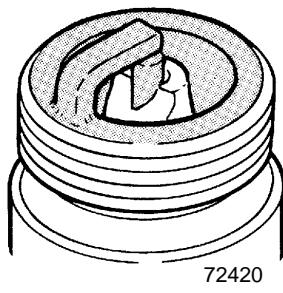
IMPORTANT: It is recommended that spark plugs be torqued to the amount specified. In the absence of a torque wrench or access problems to the plugs, the spark plugs should be hand tightened until the plug seats on the cylinder head. Then, securely tightened with appropriate wrench and socket. On tapered seat plugs, only slight rotation (approximately 1/8 or less of a full turn) after seating, is required to create a seal and secure the plug.

- 7 Install spark plugs and torque to specifications. Refer to “Torque Specifications”.
- 8 Install spark plug wires in proper order. Refer to “Engine Rotation and Firing Order” and/or “Spark Plug Wires”.



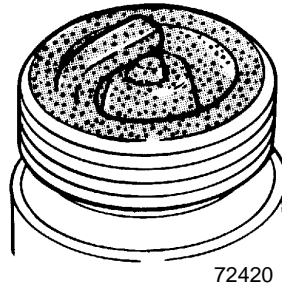
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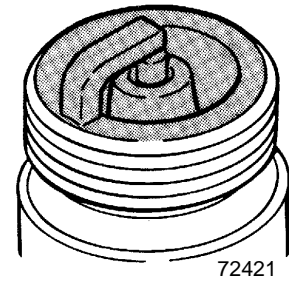
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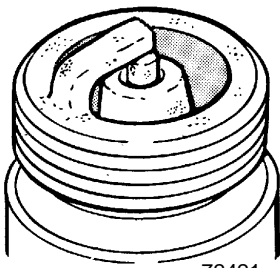
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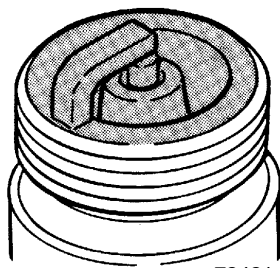
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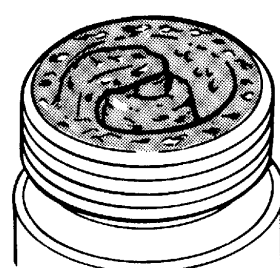
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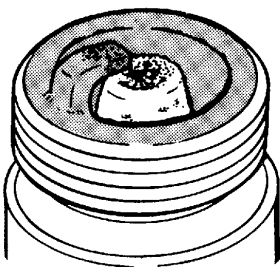
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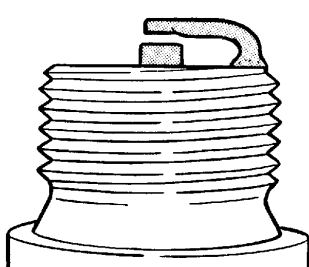
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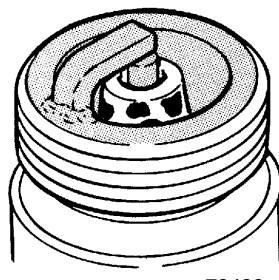
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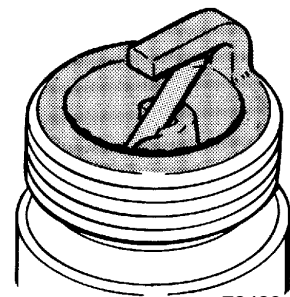
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Examples of Spark Plug Conditions

Visually examine the spark plugs as previously outlined, and compare your spark plug to the following information:

1 Normal Condition - Few deposits are present and probably will be light tan or gray in color. This plug shows that plug heat range is compatible with engine, and engine is electrically and mechanically in good running condition. With proper plug servicing (clean and re-gap), this plug can be reinstalled with good results.

2 Chipped Insulator - Chipped insulator usually results from careless plug re-gapping. Under certain conditions, severe detonation also can split insulator firing ends. Plug must be replaced.

3 Wet Fouling (Oil Deposits) - Plug becomes shorted by excessive oil entering combustion chamber, usually in engine with many hours of operation. Worn piston rings, cylinder walls, valve guides or valve stem seals are causes of oil entering combustion chamber. Only engine repairs will permanently relieve oil wet fouling.

IMPORTANT: New engines or recently overhauled engines may wet foul plugs before normal oil control is achieved with proper break-in procedures. Such fouled plugs may be serviced (clean and re-gap) and reinstalled.

4 Cold Fouling - Dry, black deposits indicate rich fuel mixture or weak ignition. Clogged flame arrestor, flooding carburetor, sticky choke or weak ignition components all are probable causes. If, however, only one or two plugs in set are fouled, check for sticking valves or bad ignition leads. After correcting cause, service (clean and re-gap) plugs and reinstall.

5 Overheating - Insulator is dull white or gray and appears blistered. Electrodes are eroded and there is an absence of deposits. Check that correct plug heat range is being used. Also check for over-advanced ignition timing, cooling system malfunction, lean fuel/air mixtures, leaking intake manifold or sticking valves. Replace spark plugs.

6 High Speed Glazing - insulator has yellowish, varnish-like color, indicating that temperatures suddenly have risen, usually during hard, fast acceleration under heavy load. Normal deposits do not get a chance to blow off. Instead, they melt and form a conductive coating. Replace plugs. If condition recurs, use colder heat range plug and service plugs more frequently.

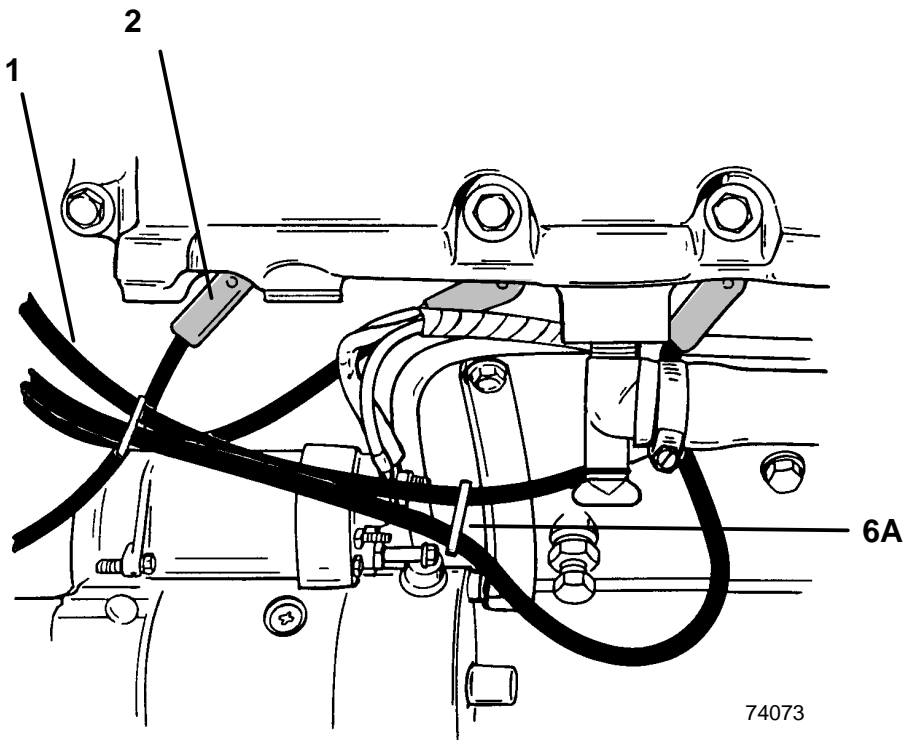
7 Scavenger Deposits - Powdery white or yellow deposits are built up on shell, insulator and electrodes. This is normal appearance with certain branded fuels. Accumulation on ground electrodes and shell areas may be unusually heavy, but may be easily chipped off. Plugs can be serviced (clean and re-gap) and reinstalled.

8 Pre-Ignition Damage - Pre-ignition damage is caused by excessive high temperatures. Center electrode melts first, followed by ground electrode. Normally, insulators are white but may be dirty if plug has been misfiring. Check for correct plug heat range, advanced ignition timing, lean fuel mixture, incorrect fuel used, malfunctioning cooling system, leaking intake manifold or lack of lubrication.

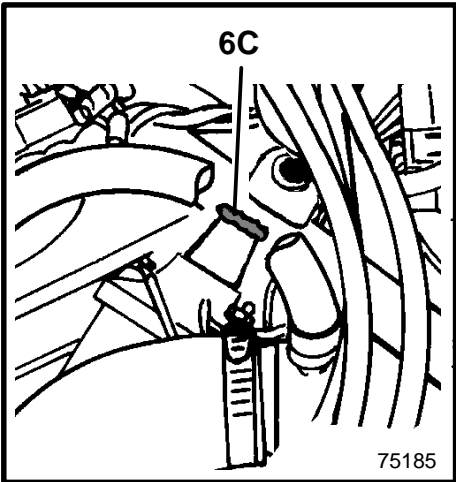
9 Reversed Coil Polarity - Concave erosion of ground electrode is an indication of reversed polarity. Center electrode will show only normal wear. Engine will misfire and idle rough. To correct, reverse primary coil leads. Replace spark plugs.

10 Splashed Deposits - Spotted deposits, which sometimes occur after long delayed tune-up, accumulate after a long period of misfiring. When normal combustion temperatures are restored, upon installation of new plugs, deposits loosen from top of piston and head and are thrown against hot insulator. Clean and re-gap plugs and reinstall.

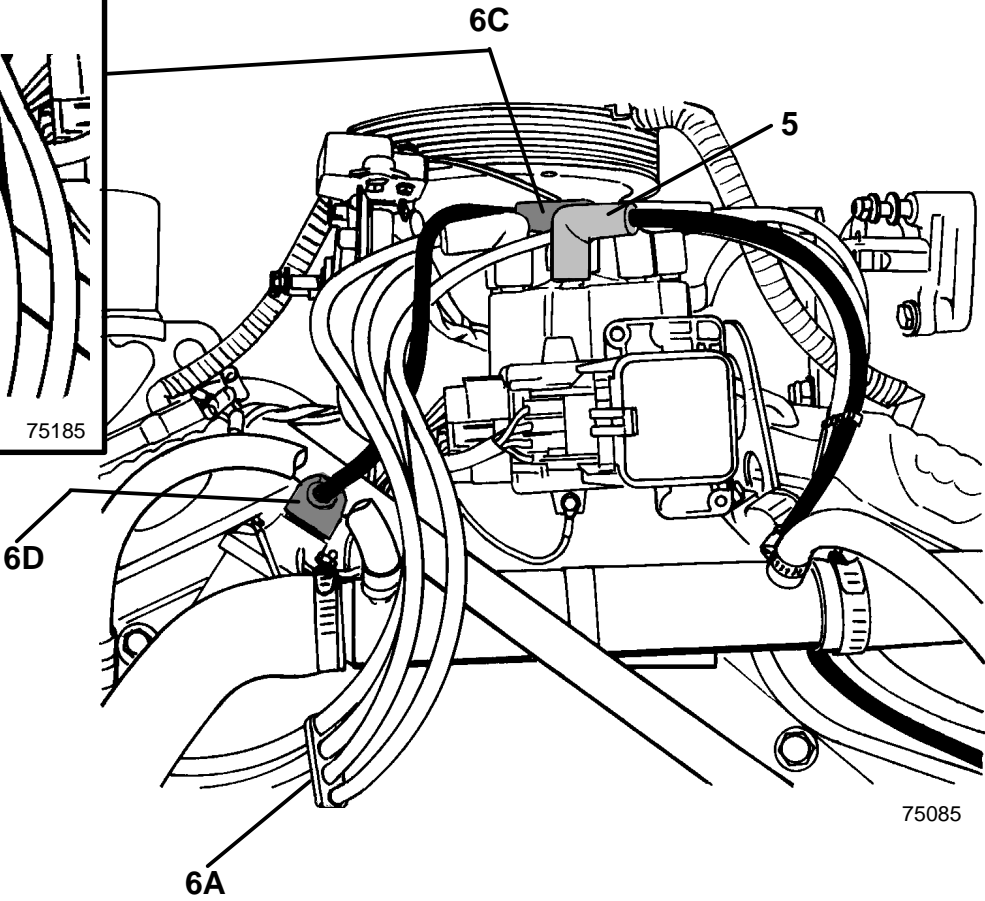
11 Mechanical Damage - Mechanical damage to spark plug firing end is caused by foreign object in combustion chamber. Because of valve overlap, small objects can travel from one cylinder to another. Check all cylinders, intake manifold and exhaust material to prevent further damage.



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Spark Plug Wires

Checking

- 1 Visually inspect spark plug wires for damage, such as being cracked, cut or oil soaked.
- 2 Visually inspect spark plug boots for damage.

NOTE: Use care when removing spark plug wires and boots from spark plugs. Twist the boot 1/2 turn before removing. Firmly grasp and pull on the **boot** to remove the wire end.

- 3 Check spark plug wires for continuity using a Multi-Meter, Digital/Volt/Ohm Meter, or similar. Replace any plug wires that do not show continuity from end to end.
- 4 Replace any damaged plug wires.

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Replacing

IMPORTANT: Use only spark plug wires recommended for Marine application.

- 5 Disconnect individual spark plug wires.

NOTE: To avoid confusion and possible improper placement of wires, you may desire to change the wires one at a time.

- 6 Install spark plug wires in proper order. Observe the following:

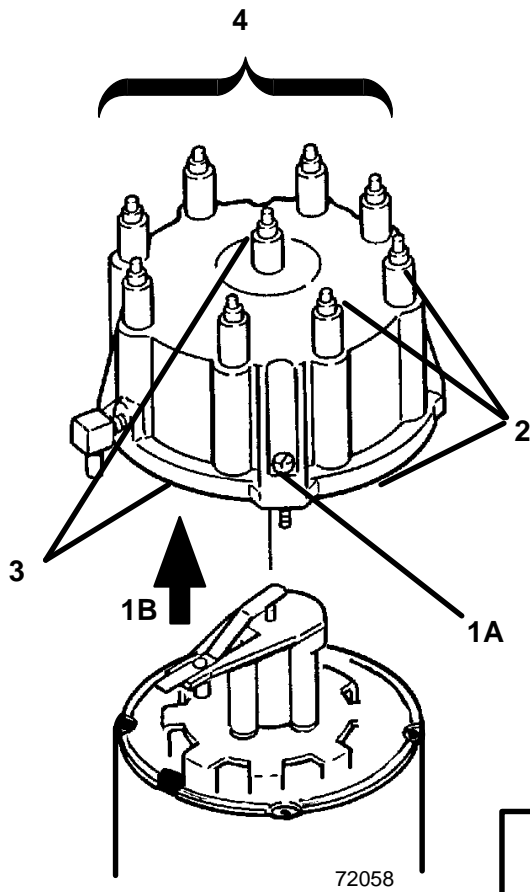
IMPORTANT: When replacing plug wires, route the wires correctly through the proper supports. Correct positioning of spark plug wires and supports is important to prevent cross-firing.

- A Position wires in spark plug wire supports and retainers, as provided.
- B Attach plug wires to appropriate spark plug and terminal on distributor cap. Each end should fit securely.

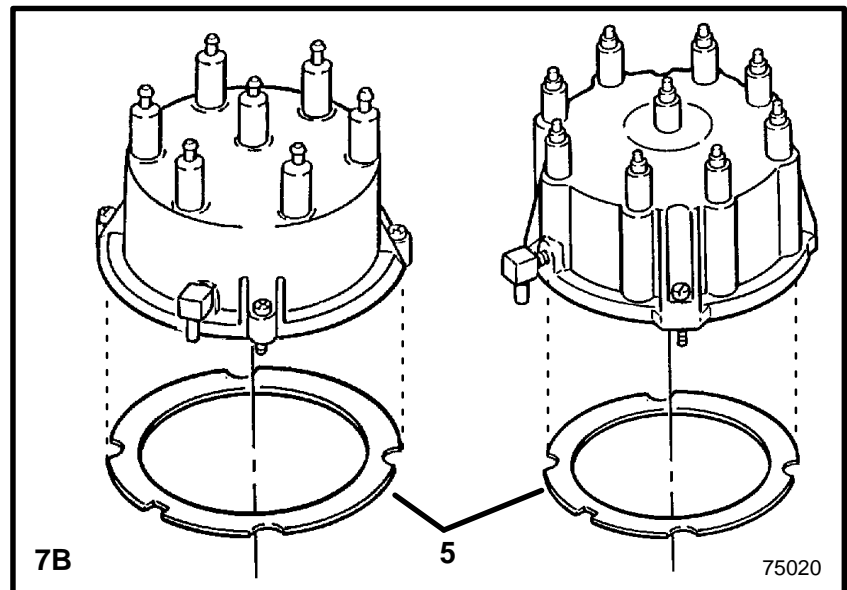
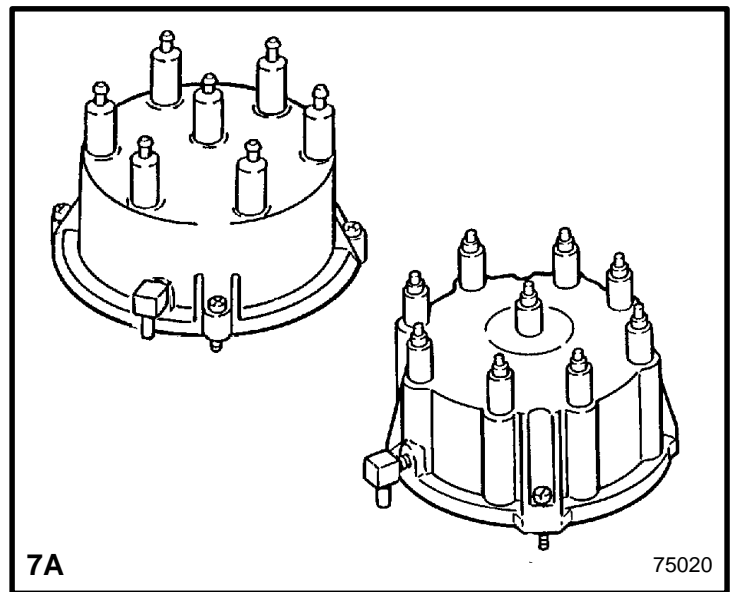
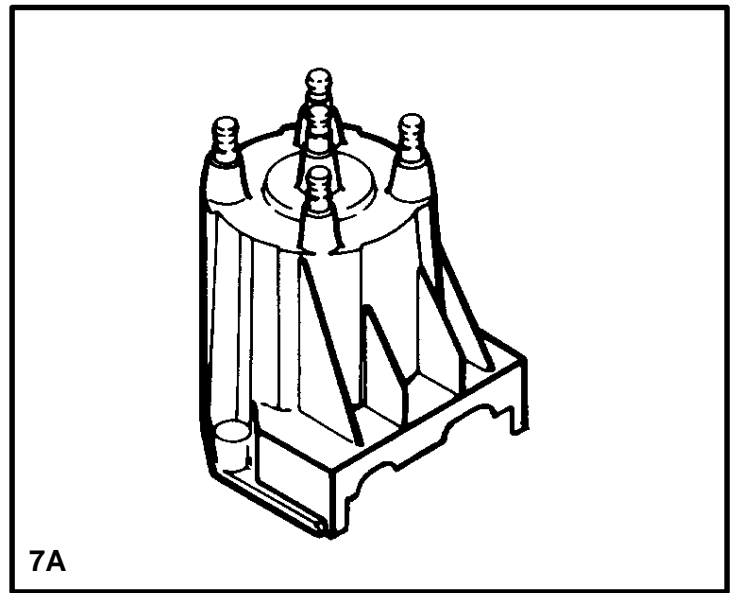
IMPORTANT: Before installing coil wire (high tension lead) to COIL, apply approximately 1/2 oz. of Quicksilver Ignition Coil Insulating Compound, an electrical insulating compound (Quicksilver 92-823506--1), around top of coil high tension lead tower. Do not apply to inside of tower hole.

- C Apply Quicksilver Ignition Coil Insulating Compound. Attach coil wire (high tension lead) to center terminal on distributor cap.
- D Push end of high tension wire into coil tower. Position boot over coil tower and wipe off excess insulating compound.

NOTE: Make sure boot does not come off of tower due to hydraulic air pressure inside boot, caused during installation.



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Distributor

Cap

CHECKING

- 1 To remove distributor cap:
 - A** Loosen the distributor cap retaining screws.
 - B** Lift cap away from distributor.
- 2 Check cap contacts for excessive burning or corrosion.
- 3 Check center contact for deterioration (worn down, burning or corrosion).
- 4 Visually check cap for cracks or carbon tracks (Thin, black lines. Generally inside the cap, near contacts.).
- 5 **Carbureted V-6 and V-8 Engines Only:** Inspect gasket between cap and distributor body. Replace if defective.
- 6 If cap is acceptable, clean cap with warm soap and water and dry with compressed air. Replace if defective.

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REPLACING

IMPORTANT: Use only a distributor cap recommended for Marine application.

- 7 Install distributor cap as follows:

WARNING

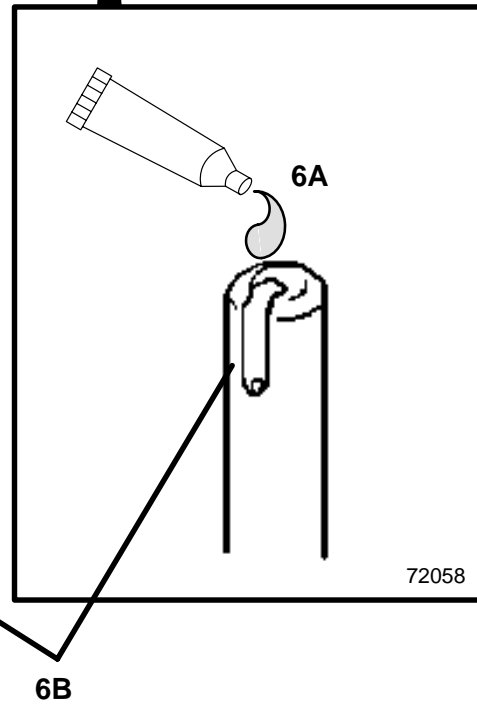
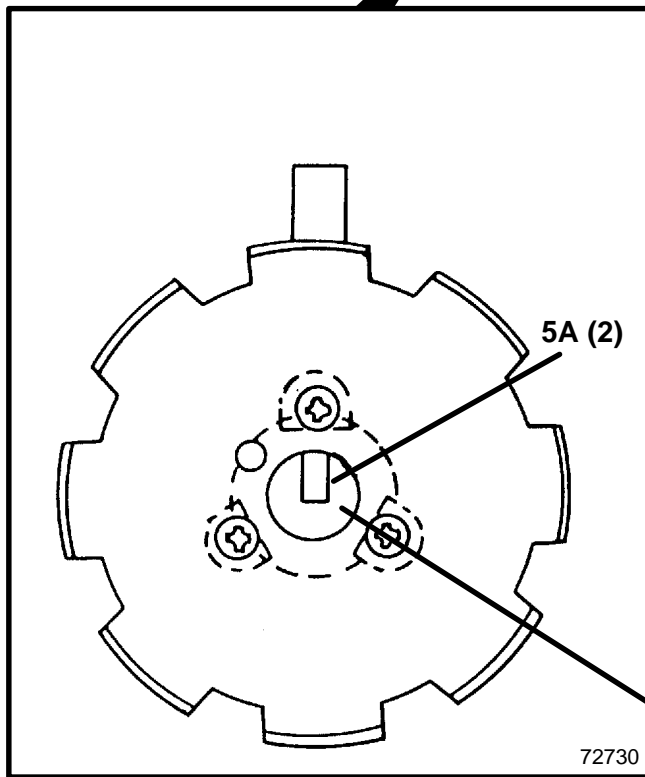
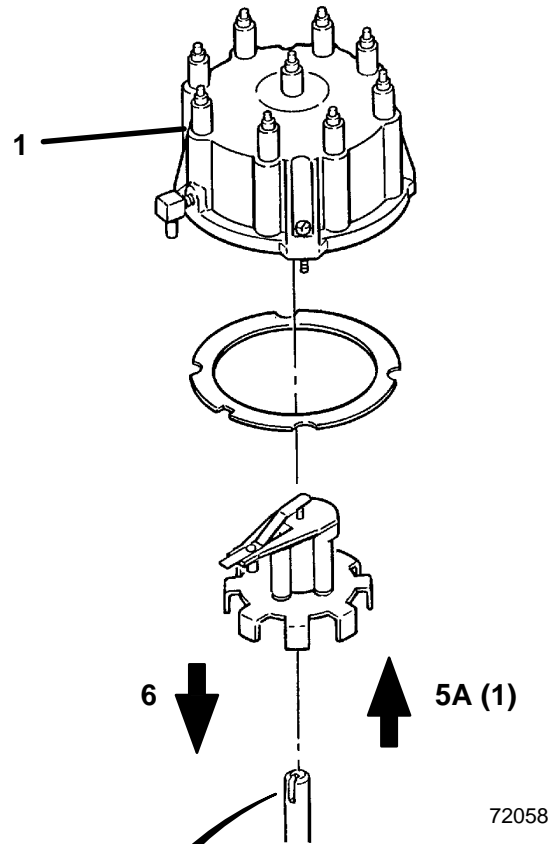
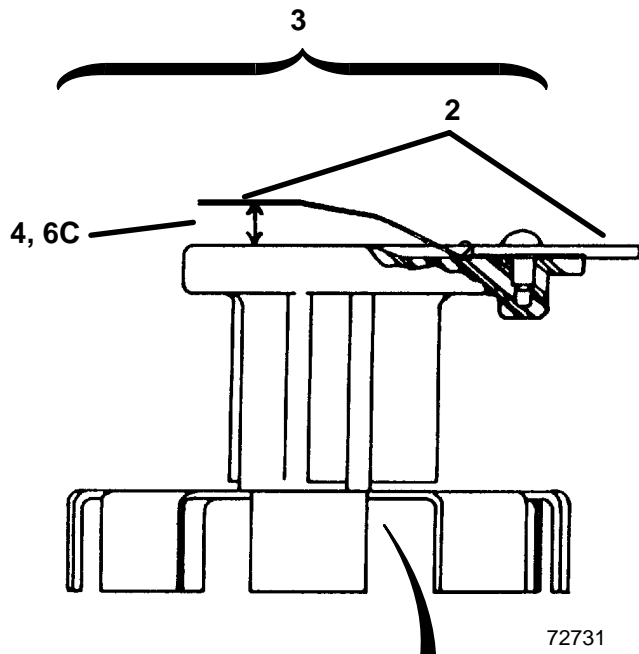
Avoid fire or explosion. A gasket, as provided on some engines, between the cap and distributor body helps prevent spark leakage out of the distributor. Always install the gasket, if so equipped, when installing the distributor cap.

- A On All 4-Cylinder Engines, and All V-6 and V-8 Engines With EFI** - No gasket is required. Align tab in distributor cap with notch on distributor body. Install distributor cap. Tighten the retaining screws.
- B On All Carbureted V-6 and V-8 Engines** - Verify gasket is in position on bottom of distributor cap, where cap fits onto distributor. Align notch in distributor cap with that of the distributor body. Install distributor cap. Tighten the retaining screws.

NOTE: Use care when removing spark plug wires and boots from distributor cap. Twist the boot 1/2 turn before removing. Firmly grasp and pull on the **boot** to remove wire end.

- 8 For best results, individually transfer spark plug wires to replacement cap in order of removal.

NOTE: Refer to "Spark Plug Wires" in this section, if all spark plug wires (high tension leads) were removed from cap.



Rotor / Sensor Wheel Assembly

CHECKING

- 1 Remove distributor cap, as previously outlined.
- 2 Visually check rotor for burned or corroded center contact.
- 3 Visually check rotor for cracks and carbon tracks.
- 4 Clearance between rotor and tang should be a distance of 1/4 in. (6 - 7 mm). This clearance can be adjusted by bending the tang. Refer to "Replacing" as outlined following.

NOTE: *At the factory the rotor and sensor wheel are secured to the shaft with Loctite.*

- 5 Check that rotor and sensor wheel assembly is *secure* on distributor shaft.

A If rotor and sensor wheel assembly is loose on distributor shaft, or in need of replacement:

- (1) Remove distributor rotor and sensor wheel assembly from distributor shaft.

NOTE: *Use two flat blade screwdrivers. The screwdrivers are positioned opposite each other with the blade tips on the underside of the rotor and sensor wheel assembly. Make sure blade tips are toward distributor shaft until they come in contact with shaft. A downward push on both screwdriver handles at the same time will pry off assembly. The use of a torch lamp will also aid in the removal of the rotor and sensor wheel assembly.*

- (2) With the rotor and sensor wheel assembly removed, inspect the locating key inside the rotor. The locating key will appear as a clean edged, 1/8 in. (3 mm) wide, sloped ramp at the bottom of the splined hole.

IMPORTANT: **If there are pieces of material shaved off the key, or if it appears to have been damaged by being forced down while misaligned with slot in distributor shaft, the rotor and sensor wheel assembly must be replaced.**

B If rotor and sensor wheel assembly is secure on distributor shaft, and does not need replacement: Proceed as appropriate.

REPLACING

- 6 If checks revealed the rotor and sensor wheel assembly is damaged, replace as follows:

IMPORTANT: **The rotor should fit very tight. It may be necessary to heat rotor with a torch lamp to properly install.**

NOTE: *Rotor and sensor wheel must be secured to the shaft with Loctite. Clean the distributor shaft and keyway with a non-oily solvent, such as acetone, and wipe clean.*

A Put 1 drop of Loctite 271 on top of distributor shaft. Allow a small amount to flow into keyway.

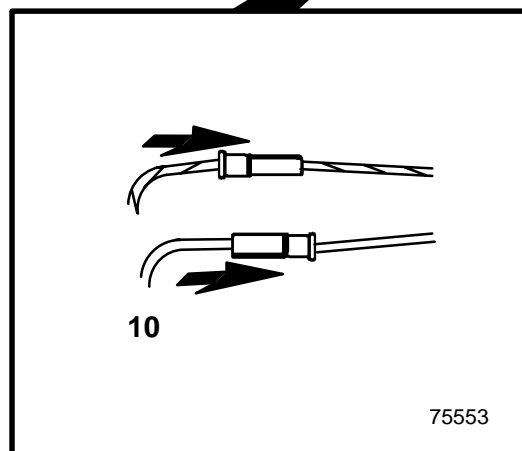
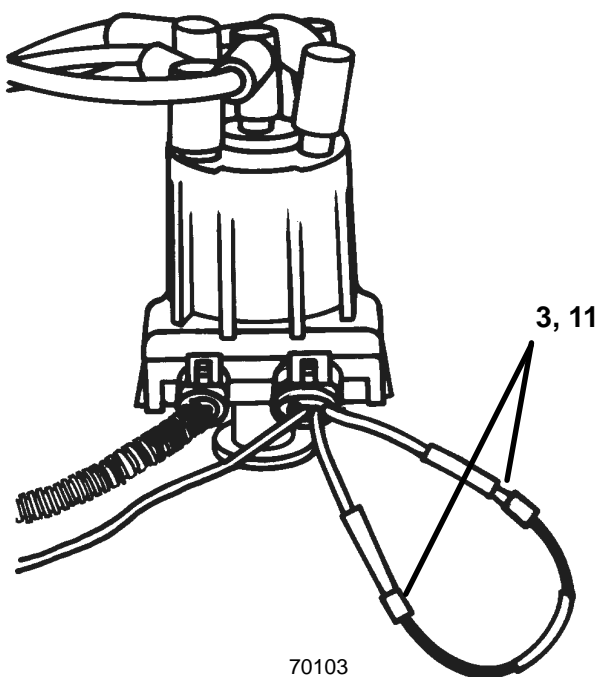
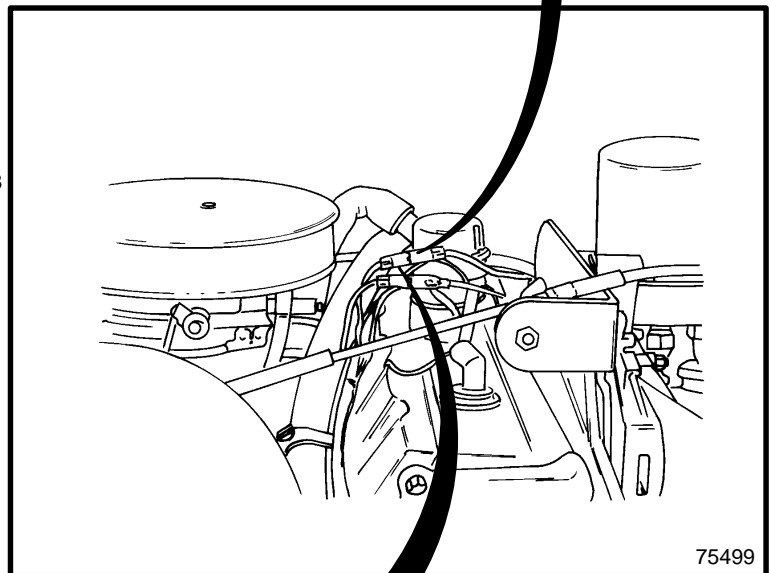
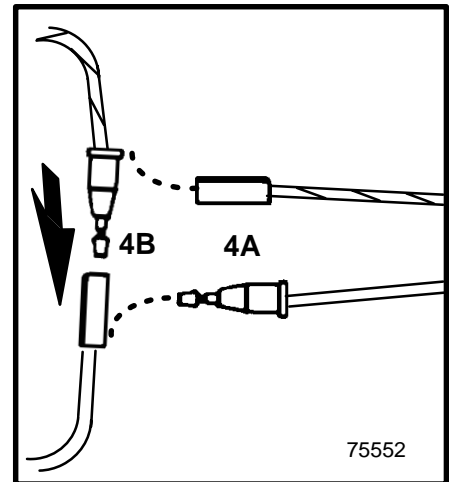
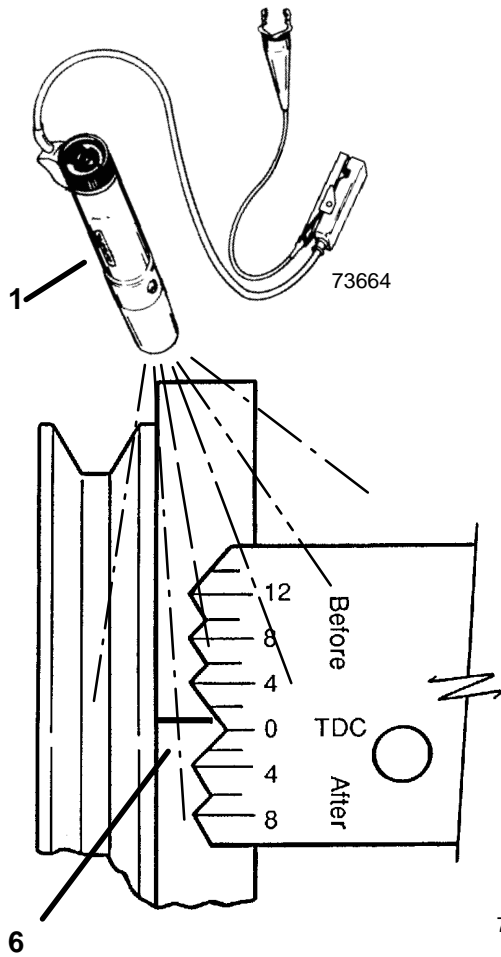
B Immediately install rotor assembly onto distributor shaft. Make sure rotor locating key is aligned with keyway in distributor shaft. With the palm of your hand, press the rotor all the way down on the shaft, until it stops.

⚠ CAUTION

DO NOT let any Loctite run down distributor shaft. Loctite could get into top distributor housing bushing and prevent proper shaft rotation.

C Bend carbon brush tang upward slightly, if necessary, until a distance of 1/4 in. (6 - 7 mm) is obtained between rotor and tang.

- 7 Install distributor cap on distributor. Refer to "Distributor Cap" in this section.



Engine Timing

IMPORTANT: Failure to follow these timing procedure instructions will result in improper timing causing performance problems and possible severe engine damage.

3.0L Models Only

- 1 Connect timing light (91-99379 or similar) to No. 1 spark plug wire. Connect power supply leads on light to 12 volt battery. Refer to Specifications - "Engine Rotation and Firing Order," for cylinder numbering and location.
- 2 Connect a shop tachometer to engine.

NOTE: Before starting engine make sure the timing tab and mark on damper are clean. Chalk or white paint on timing mark on damper may help visibility.

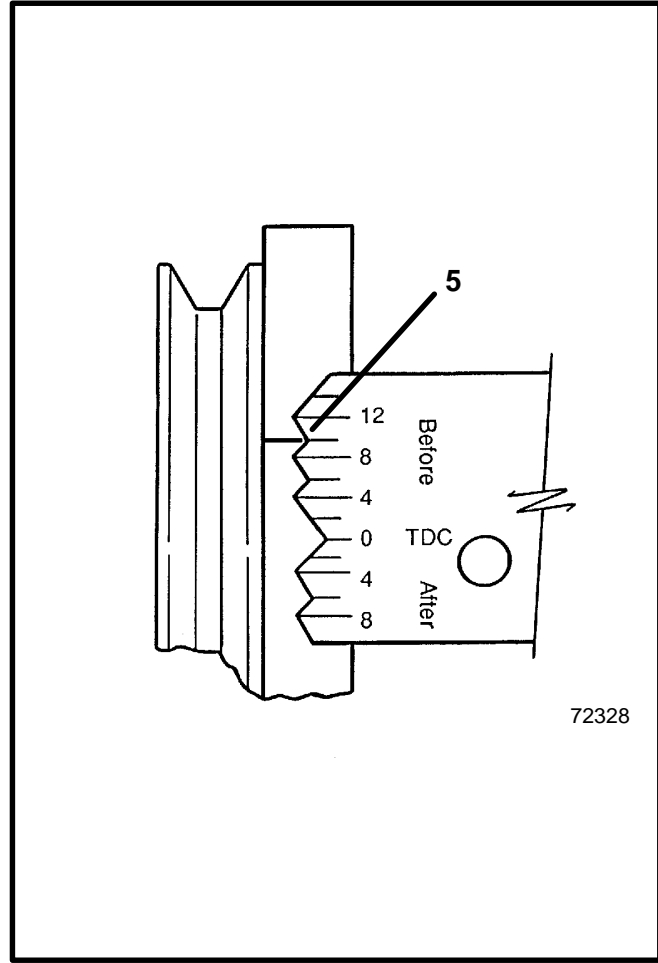
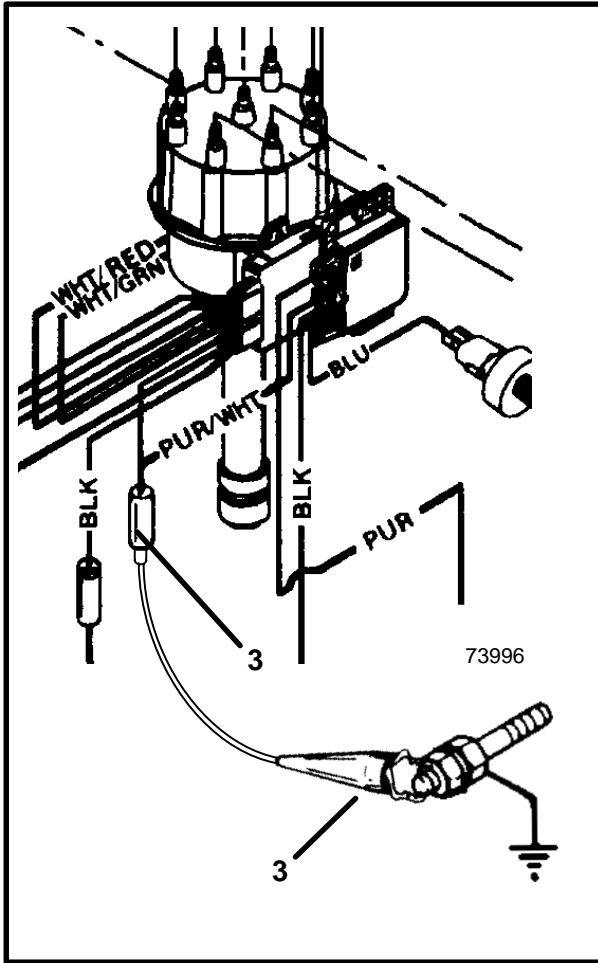
- 3 Install a jumper wire between the two WHITE leads on the distributor. Use Quicksilver 91-818812A1, or fabricate a jumper wire using a 6 in. (150 mm) section of 16 gauge wire with two male bullet terminal ends connected.
- 4 Bypass the shift interrupt switch, as follows:
 - A Disconnect wires at shift interrupt switch.
 - B Temporarily join the engine harness wires together.

IMPORTANT: Do not fail to reconnect these two wires to the shift interrupt switch when timing procedures are complete.

- 5 Start engine and run at normal idle speed.
- 6 Aim timing light at timing tab, located on the timing gear cover and crankshaft torsional damper. Check the timing. Refer to "Specifications".
- 7 Adjust timing by loosening distributor clamp and rotating distributor body as required until timing mark on damper or pulley lines up with the mark on tab specified in "Specifications." Tighten clamp and recheck location of timing mark.
- 8 Aim timing light at timing tab and recheck location of timing mark. Repeat Step 7 until timing is correct.
- 9 Stop the engine. Torque distributor hold down bolt to 20 lb. ft. (27 N·m).
- 10 Reconnect the two wires to the shift interrupt switch.

IMPORTANT: Be sure to remove jumper wire before returning engine to service, otherwise timing will not advance.

- 11 Remove jumper wire at distributor white leads.
- 12 With timing light still connected, start the engine and run at IDLE. Verify that timing did advance to 12° BTDC, plus or minus 2°. At 2400-2800 RPM maximum (total) advance is obtained and should be 27° BTDC (plus or minus 2°).
- 13 Stop the engine and remove the timing light.



Engine Timing

V6 and V8 Carbureted Models (Thunderbolt V Ignition)

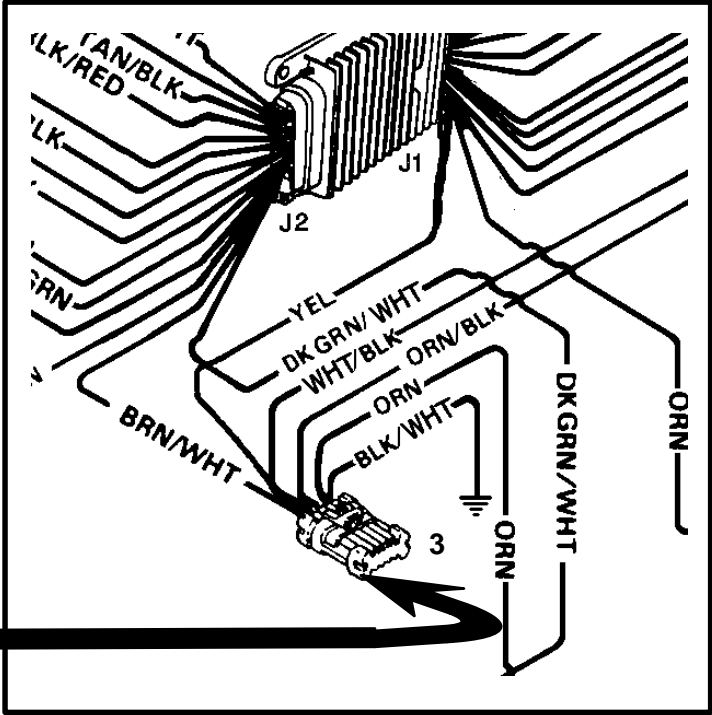
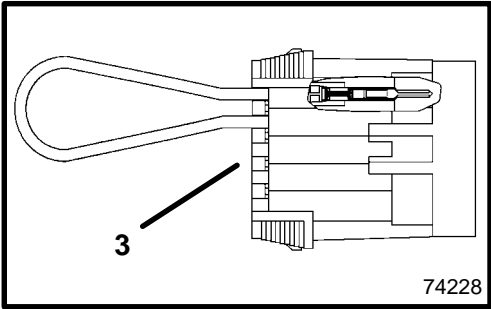
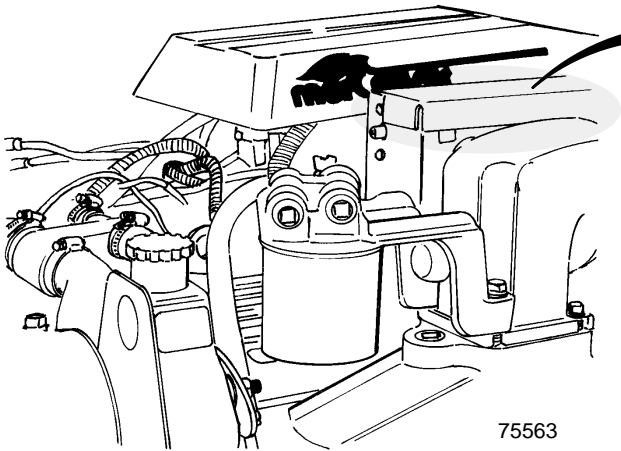
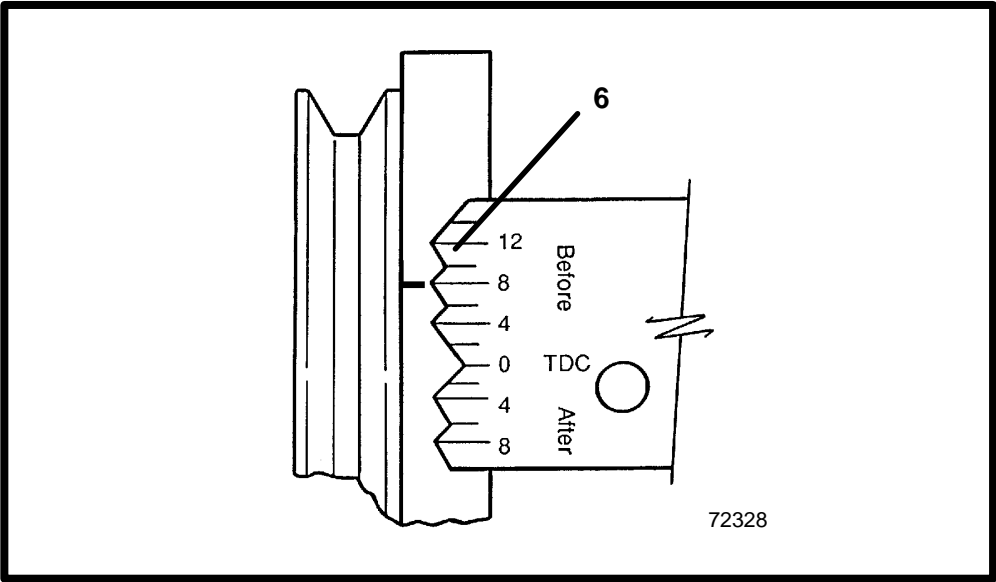
- 1 Connect timing light (91-99379 or similar) to No. 1 spark plug wire. Connect power supply leads, if applicable, on light to 12 volt battery. Refer to Specifications - "Engine Rotation and Firing Order" for cylinder numbering and location.
- 2 Connect a shop tachometer to engine.
- 3 Using a jumper wire, connect the ignition system timing lead (PUR/WHT wire) to a good engine ground (-). This locks the ignition module into the "Base Timing Mode".

NOTE: Before starting engine make sure the timing tab and marks on damper are clean. Chalk or white paint on timing marks may help visibility.

- 4 Start engine and run at normal idle speed. Allow engine to reach normal operating temperature.
- 5 Aim timing light at timing tab, located on the timing gear cover and crankshaft torsional damper.
- 6 If adjustment is required, adjust timing by loosening distributor clamp and rotating distributor body as required until timing mark on damper or pulley lines up with the mark on tab specified in "Specifications." Tighten clamp and recheck location of timing mark.
- 7 Make sure that the distributor has been tightened. Remove the jumper wire from the timing terminal.
- 8 Remove jumper wire between the timing lead (PUR/WHT wire) and ground (-).

IMPORTANT: Be sure to disconnect the jumper wire from between the ignition system timing lead and ground (-) before attempting to resume normal operations. If the jumper wire is left in place, the ignition module will operate in the "Base Timing Mode". This means that the additional timing advance features would not function.

- 9 Stop engine and remove timing light.



V6 and V8 EFI Models (EFI Ignition)

Two items of test equipment are required: an inductive pickup timing light and one of either a Scan Tool, Marine Diagnostic Code Tool or MerCruiser Special Timing Tool (Quicksilver 91-805747A1).

- 1 Connect timing light (91-99379 or similar) to No. 1 spark plug wire. Connect power supply leads, if applicable, on light to 12 volt battery. Refer to Specifications - "Engine Rotation and Firing Order," for cylinder numbering and location.
- 2 Connect a shop tachometer to engine.

NOTE: Before starting engine make sure the timing tab and mark, or marks, on crankshaft damper are clean. Chalk or white paint on timing marks may help visibility.

NOTE: If NOT Using MerCruiser Timing Tool: With engine running, set the scan tool or Marine Diagnostic Code Tool to the SERVICE MODE and follow manufacturer's instructions. On 350 Mag MPI Model, engine RPM will automatically increase to a higher RPM. You do not have to increase it manually, as stated in the following steps.

- 3 Connect the Timing Tool (or appropriate tool, as listed above) to the DLC connector (in the electrical box or on the electrical bracket) of the wiring harness.
- 4 Start the engine. Allow it to reach normal operating temperature.
- 5 **On all models except 350 Mag MPI:** Manually adjust the engine throttle to 1800 RPM.
- 6 Aim timing light at timing tab, located on the timing gear cover and crankshaft torsional damper. Check the timing. Refer to "Specifications."
- 7 Loosen the distributor clamp bolt enough to just be able to rotate the distributor *with some resistance*.
- 8 Aim timing light at timing tab and recheck location of timing mark. Slowly rotate the distributor clockwise or counterclockwise to adjust the timing to specified degrees.
- 9 Aim timing light at timing tab and recheck location of timing mark. Repeat Step 8 until timing is correct. Torque distributor hold down bolt to 30 Lb. Ft. (40 N·m).
- 10 Manually close the throttle to bring engine RPM back to idle.

IMPORTANT: Be sure to disconnect MerCruiser Special Timing Tool from the DLC connector, or set the tool to NORMAL MODE if using the Scan Tool or Marine Diagnostic Code Tool, before attempting to resume normal operations. If the MerCruiser Special Timing Tool is left in place or the setting of the tool remains in SERVICE MODE, the ignition system will operate only in the "Service Mode". This means that the additional timing advance features would not function.

11 Disconnect the MerCruiser Special Timing Tool from the DLC connector. If using the Scan Tool or Marine Diagnostic Code Tool, set the tool to NORMAL MODE. Disconnect the tool.

12 Stop the engine. Turn ignition key to OFF position.

13 Remove timing light.

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SECTION 5 - Miscellaneous Maintenance

Miscellaneous
Maintenance

5

SECTION 5 - Miscellaneous Maintenance

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Lubricants/Sealers/Adhesives

DESCRIPTION	PART NUMBER
Quicksilver Perfect Seal	92-34227--1
Quicksilver Flushing Attachment	44357A2
Quicksilver Touch Up Paint (Small Bottle w/Brush)	92-822886--12
Quicksilver Primer	92-78374--12
Quicksilver Spray Paint	92-78373--12
Quicksilver Corrosion Guard Spray	92-815869A12

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 precautions when handling a battery.

WARNING

Do not use jumper cables and a booster battery to start engine. Do not recharge a weak battery in the boat. Remove battery and recharge in a ventilated area away from fuel vapors, sparks or flames.

WARNING

Batteries contain acid which can cause severe burns-Avoid contact with skin, eyes and clothing. Batteries also 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.

Safety glasses and rubber gloves are recommended when handling batteries or filling with electrolyte. Hydrogen gases that escape from the battery during charging are explosive. When charging batteries, be sure battery compartment or area where batteries are located, is well-vented. 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.

Bottom Of Boat

General Information

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.

Anti-fouling Paints

See Anti-Fouling Paint recommendations and related information on previous pages.

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

Inspection And Maintenance

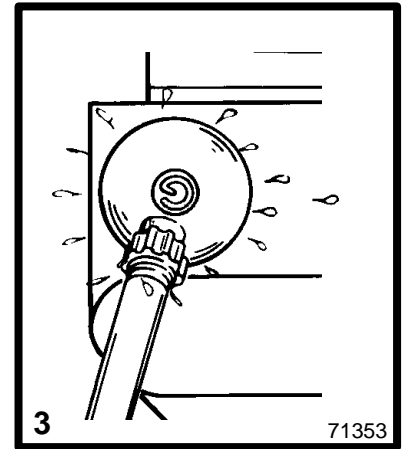
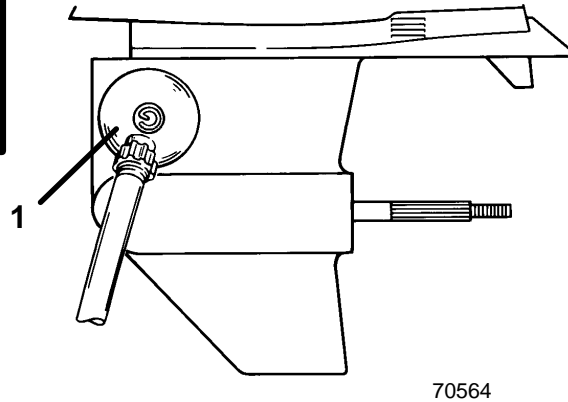
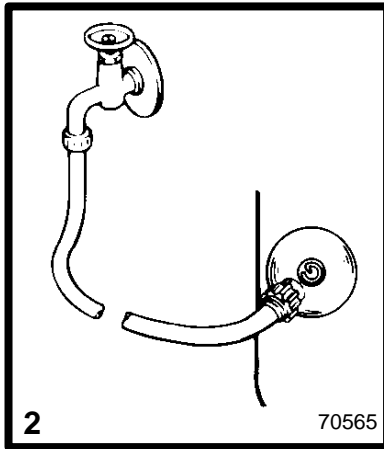
Inspect power package often, and at regular intervals, to help maintain its top operating performance, and correct potential problems before they occur. The entire power package should be checked carefully, including all accessible engine parts.

Check for loose, damaged or missing parts, hoses and clamps; tighten or replace as required.

Check plug leads and electrical leads for damage.

Remove and inspect propeller. If badly nicked, bent or cracked, see your dealer.

Repair nicks and corrosion damage on power package exterior finish. Use Quicksilver spray paints - see your Authorized MerCruiser Dealer.



Flushing Cooling System

⚠ WARNING

When flushing, be certain the area around propeller is clear, and no one is standing nearby. To avoid possible injury, 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.

⚠ CAUTION

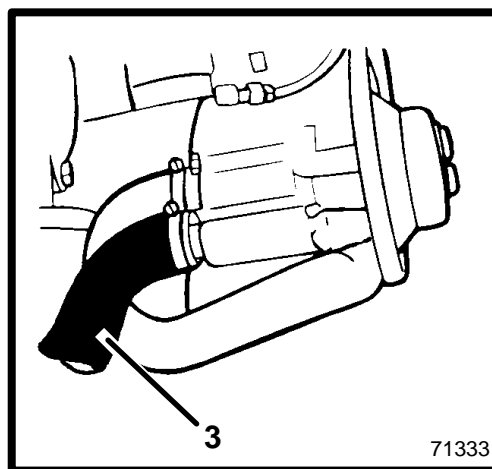
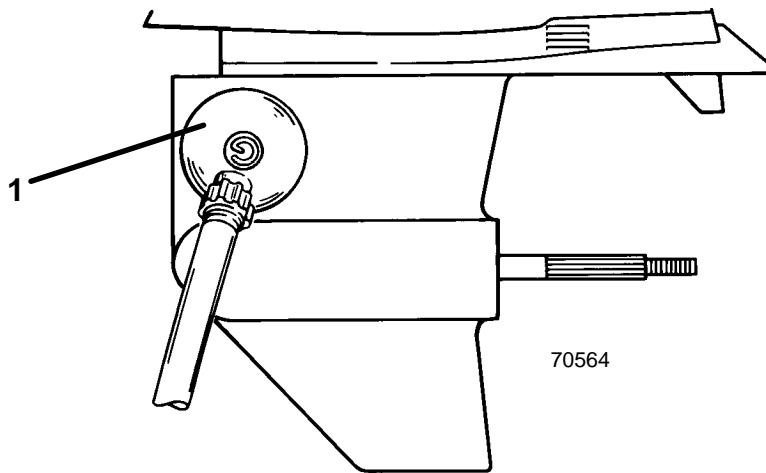
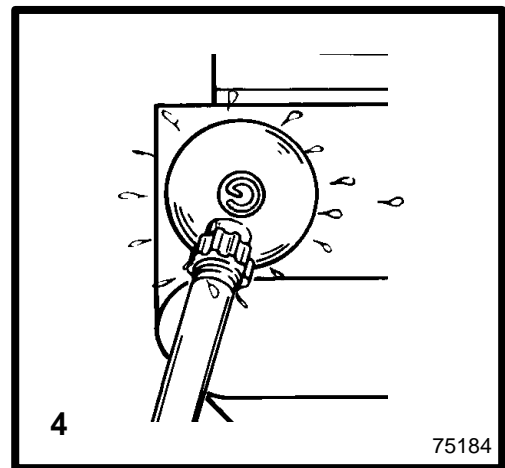
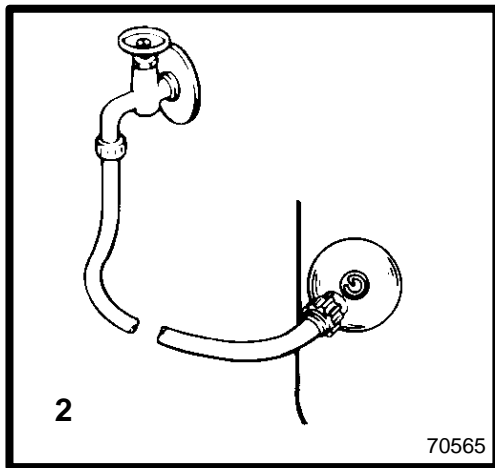
Watch temperature gauge on dash to ensure that engine does not overheat.

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

Seawater (Raw-Water) Cooled Models

If flushing cooling system with boat in water, raise drive unit to TRAILER position, install flushing attachment and lower drive unit to full DOWN/IN position.

- 1 Install Quicksilver flushing attachment (or equivalent) over water intake openings in gear housing.
- 2 Connect hose between flushing attachment and water tap.
- 3 With drive unit in normal operating position, partially open water tap (about 1/2 maximum). Place remote control in NEUTRAL, idle speed 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.



Closed Cooling (Coolant) Models

WARNING

When flushing, be certain the area around the propeller is clear, and no one is standing nearby. To avoid possible injury, remove the 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.

CAUTION

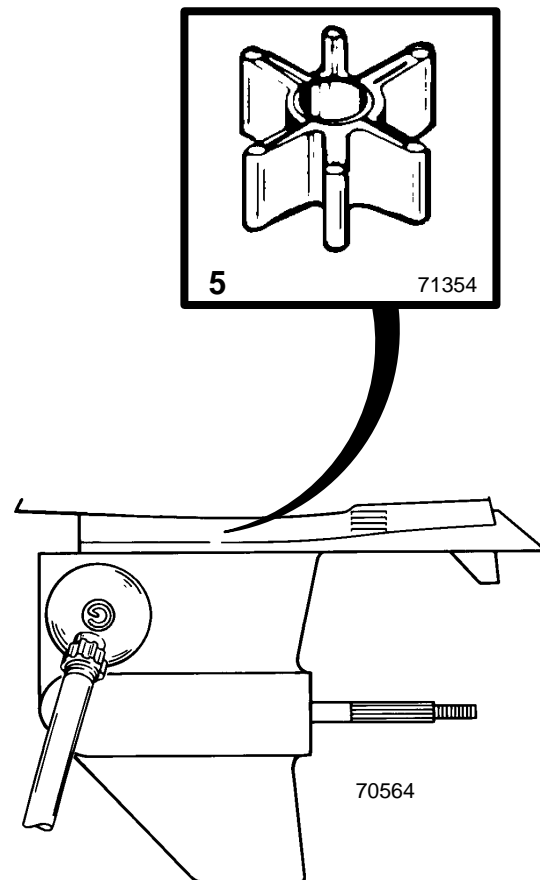
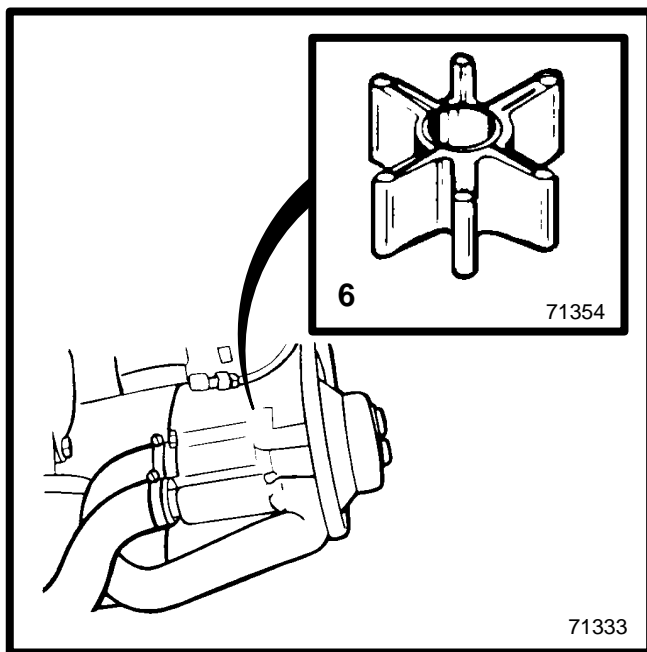
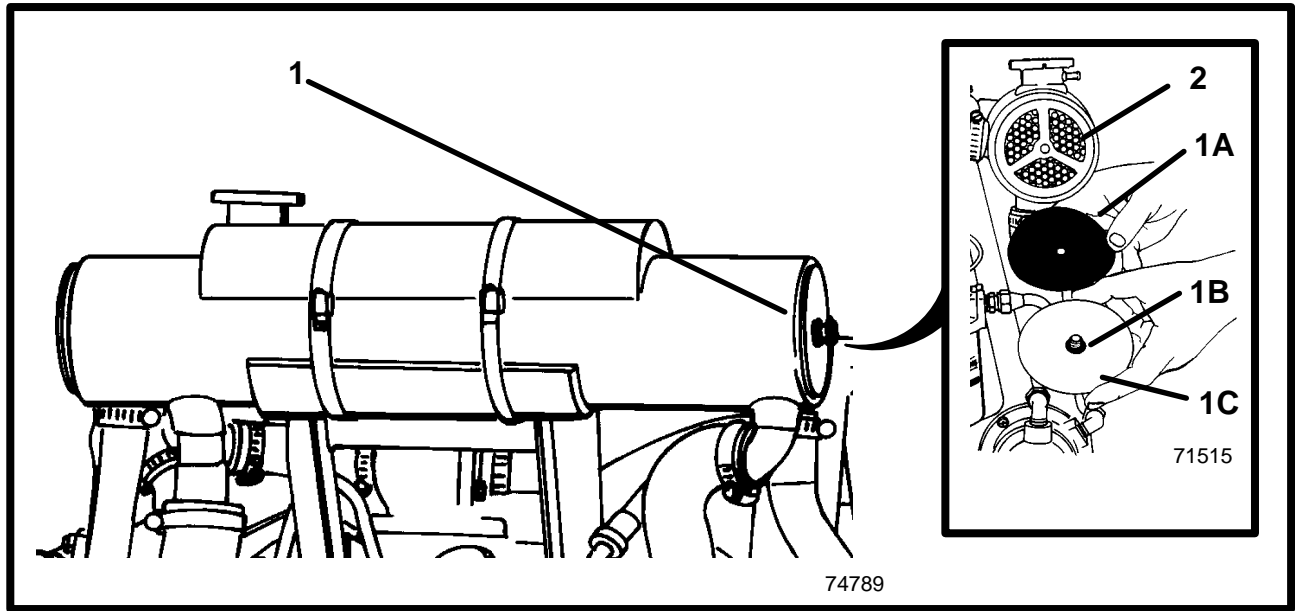
Watch temperature gauge on dash to ensure that engine does not overheat.

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

If flushing cooling system with boat in water, raise drive unit to TRAILER position, install flushing attachment and lower drive unit to full DOWN/IN position.

IMPORTANT: Water must be supplied to BOTH the drive unit and engine during flushing procedure. This ensures that drive unit does not overheat while flushing engine.

- 1 Install Quicksilver flushing attachment (or equivalent) over water intake openings in gear housing.
- 2 Connect hose between flushing attachment and water tap.
- 3 **On V-6 and V-8 Engines with Engine Mounted Seawater Pump:** Disconnect water inlet hose from aft end of seawater pickup pump. Using appropriate connector, connect another hose between connector and water tap.
- 4 With drive unit in normal operating position, start water flow to both flush devices.
- 5 Place remote control in NEUTRAL, idle speed 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, remove flushing connector from pump inlet and reconnect water inlet hose. Tighten seawater pickup pump hose clamp securely.



Cleaning Seawater Section Of Heat Exchanger - Closed Cooling (Coolant) Models Only

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

1 Remove bolts securing end plates to each end of heat exchanger. Remove end plates, sealing washers and gaskets. Discard sealing washers and gaskets and clean gasket material from end plates and heat exchanger.

A Gasket

B Sealing Washer

C End Plate

2 Clean water passages in heat exchanger by inserting a suitable size wire brush into each passage. Use compressed air to blow loose particles out.

3 Apply Quicksilver Perfect Seal to both sides of new end plate gaskets. Assemble new gaskets, new sealing washers and end plates onto heat exchanger. Install bolts and tighten securely.

4 Start engine and inspect cooling system for leaks.

Seawater Pump Impeller

This maintenance should be performed by an Authorized MerCruiser Dealer.

5 Seawater Cooled Models

6 Closed Cooling Models (Except 3.0L)

Seawater pump impeller should be inspected whenever insufficient seawater flow is suspected (if operating temperature exceeds normal range).

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SECTION 6 - Cold Weather Or Extended Storage

Cold Weather Or
Extended Storage



SECTION 6 - Cold Weather Or Extended Storage

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Lubricants/Sealers/Adhesives

DESCRIPTION	PART NUMBER
Quicksilver Storage Seal	92-86145A12
Quicksilver 4-Cycle Marine Engine Oil	92-816096A12
Quicksilver Gasoline Stabilizer for Marine Engines	92-817529A12
Quicksilver 2-Cycle Outboard Oil	92-830249A24
Quicksilver Flushing Attachment	44357A2
Long Life Antifreeze	92-855378
SAE 20W Motor Oil	Obtain Locally
Propylene Glycol Antifreeze	
Battery Terminal Anti-Corrosion Agent	

Cold Weather Or Extended Storage

Power Package Lay Up

IMPORTANT: MerCruiser Strongly recommends that this service should be performed by an Authorized MerCruiser Dealer. Damage caused by freezing **IS NOT** covered by the MerCruiser Limited Warranty.

WARNING

Be sure engine compartment is well ventilated and no gasoline vapors are present during the following operation to prevent a potential fire hazard. Operate bilge blower for 2-3 minutes prior to starting engine.

WARNING

Fuel and gases from a battery are flammable and/or explosive. DO NOT smoke while working on the engine or related components.

CAUTION

DO NOT operate engine without water flowing through seawater pickup pump, as pump impeller may be damaged and subsequent overheating damage to engine or sterndrive unit may result.

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

CAUTION

Sterndrive 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.

1 Fill fuel tank(s) with fresh gasoline (that does not contain alcohol) and a sufficient amount of Quicksilver Gasoline Stabilizer for Marine Engines to treat gasoline. Follow instructions on container.

2 **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 as low as possible and Quicksilver Gasoline Stabilizer for Marine Engines added to any fuel remaining in the tank. Refer to “FUEL REQUIREMENTS” for additional information.

NOTE: If desired, a portable fuel tank can be used to perform the remainder of the power package lay up procedures. Be sure to add an appropriate amount of Gasoline Stabilizer to the portable tank.

3 Run engine sufficiently to bring it up to normal operating temperature and allow fuel with Quicksilver Gasoline Stabilizer to circulate through fuel system. Shut off engine.

4 Change oil and oil filter.

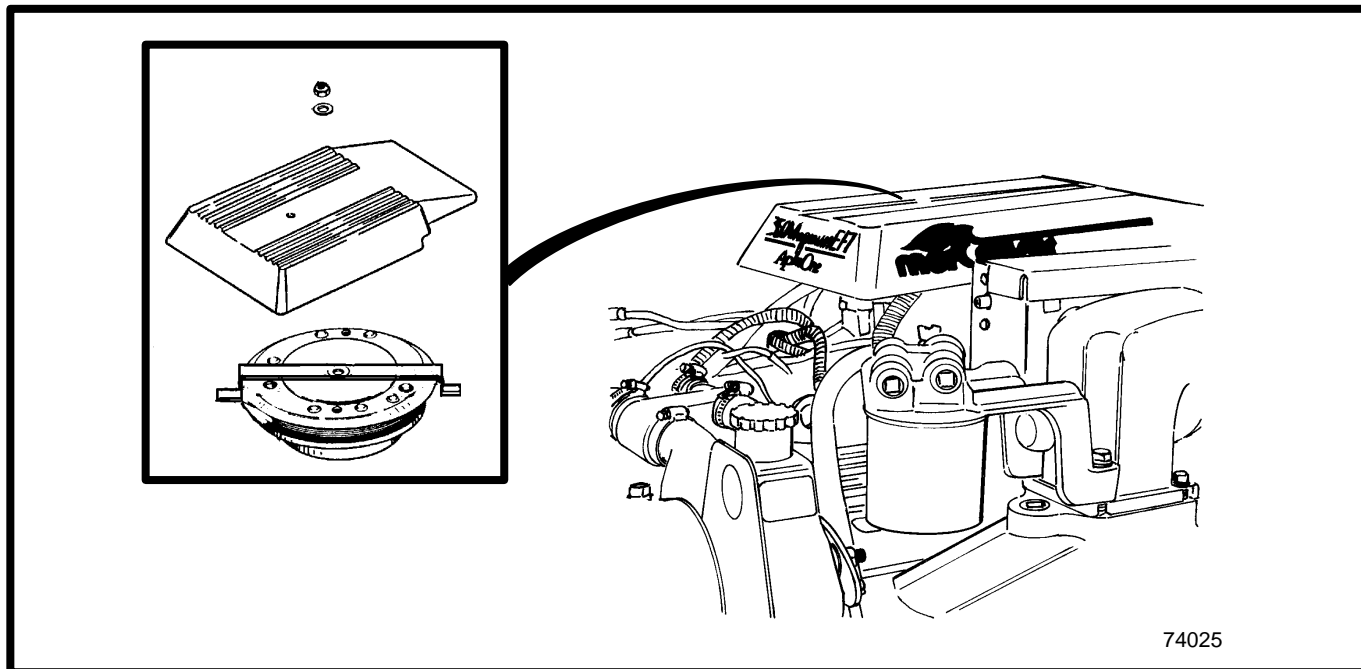
5 Change drive unit oil and check drive unit for water. (See Changing Drive Unit Oil earlier in this manual.) Water in the drive unit can cause damage to your drive unit and may indicate a water leak. If any water is present, contact your Authorized MerCruiser Dealer.

6 Flush cooling system. Refer to “Flushing Cooling System” procedure shown earlier in this manual.

7 Proceed to the following instructions appropriate for your model, for additional fuel system preparation.

Power Package Lay Up (continued)

CARBURETED MODELS



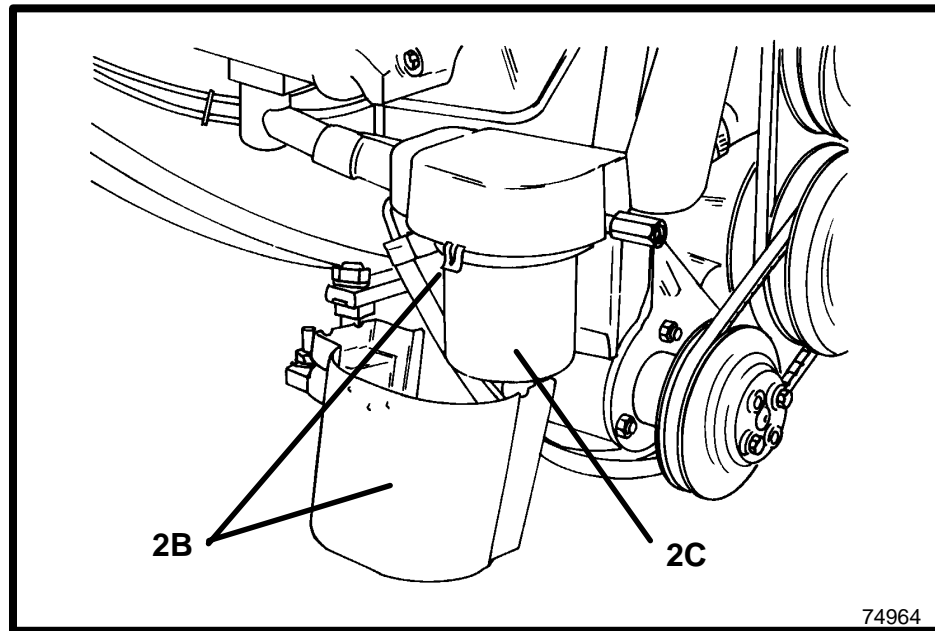
⚠ WARNING

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

- 1** Close the fuel shut-off valve, if so equipped. If no fuel shut off valve is present, a suitable method must be employed to STOP the flow of fuel from the fuel tank to the engine before proceeding.
- 2** Remove flame arrestor and start engine. While operating engine at fast idle (1000-1500 RPM), fog internal surfaces of engine by squirting approximately 8 ounces (227 g) of Quicksilver Storage Seal (or if not available, SAE 20W motor oil) into carburetor bores. Squirt the remaining 2 ounces (57 g) of Storage Seal (or oil) rapidly into carburetor, just as the engine begins to stall, due to lack of fuel. Allow engine to stop. Turn ignition key to OFF position.

Power Package Lay Up (continued)

EFI MODELS



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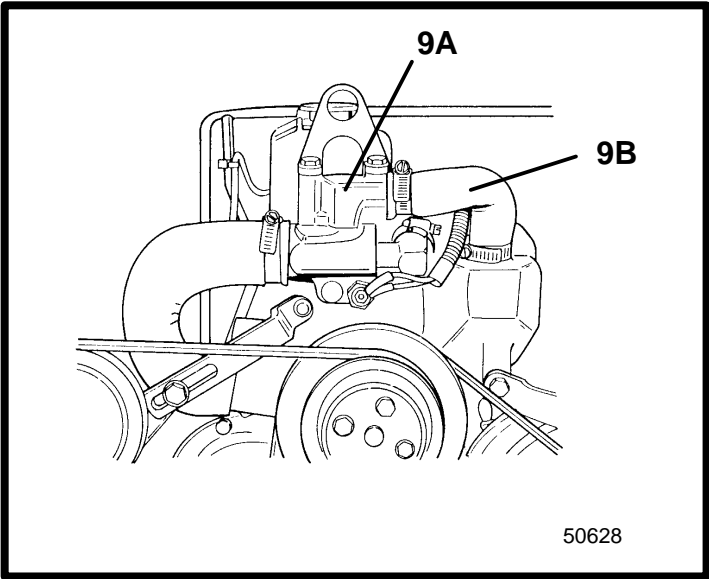
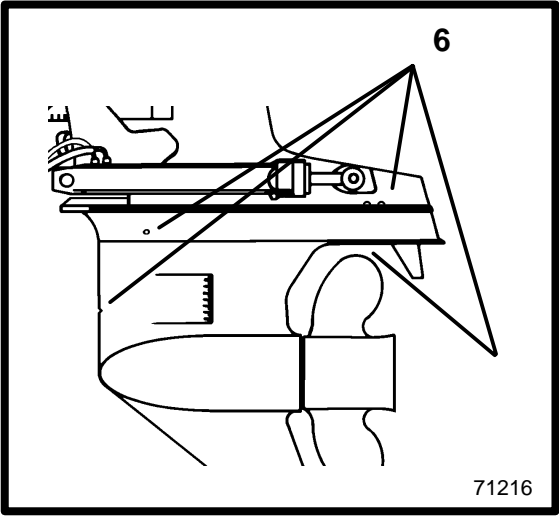
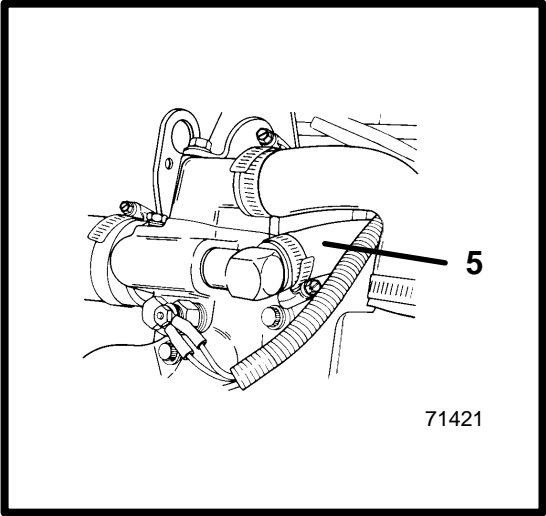
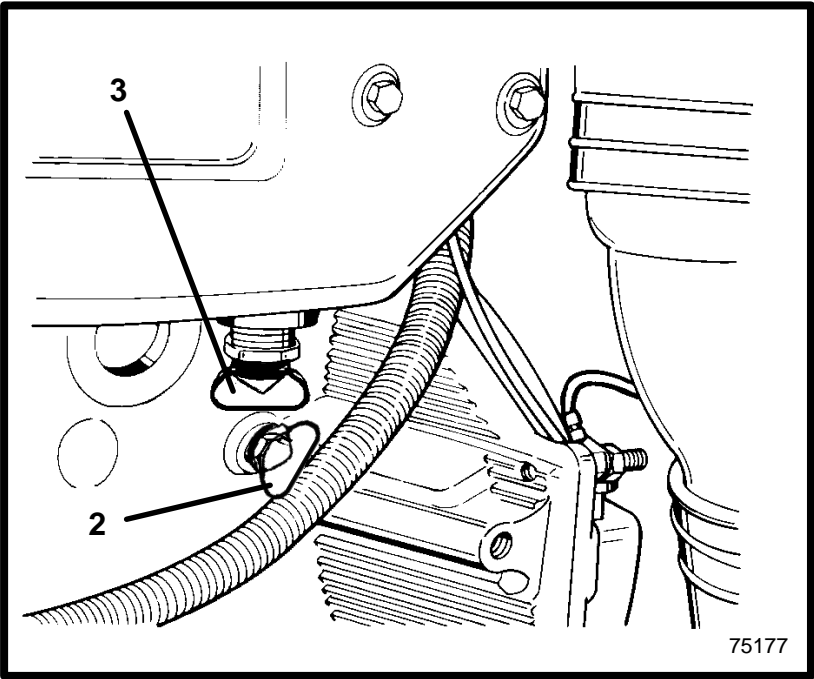
⚠ WARNING

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

⚠ WARNING

Avoid Fire or Explosion: Fuel injection system is pressurized during operation. Use care when removing water separating fuel filter. Fuel could spray on hot engine causing fire or explosion. Allow engine to cool down before attempting to remove the water separating fuel filter in the following procedure. Also, hold a clean shop towel over the water separating fuel filter when removing it to help avoid fuel spraying on the engine.

- 1 Close the fuel shut-off valve, if so equipped. If no fuel shut-off valve is present, a suitable method must be employed to STOP the flow of fuel from the fuel tank to the engine before proceeding.
- 2 Prepare fuel system for extended storage as follows:
 - A** Allow engine to cool down.
 - B** Depress latch and remove (slide down) the lower filter cover.
 - C** Remove the water separating fuel filter.
 - D** Pour out a small amount of fuel into a suitable container, then add approximately 2 fluid ounces (60 ml) of Quicksilver 2-Cycle Outboard Oil to fuel in the water separating fuel filter.
 - E** Install water separating fuel filter.
 - F** Start and run engine at idle speed until the water separating fuel filter and fuel injection system are empty and engine stops.
 - G** Remove and discard water separating fuel filter.
 - H** Install new filter.



Draining Instructions for Seawater (Raw-Water) Cooled Models

3.0L MODEL

⚠ CAUTION

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

IMPORTANT: Boat must be as level as possible to ensure complete draining of cooling system.

⚠ 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 exists. Failure to comply may result in trapped water causing freeze and/or corrosion damage to engine. Damage caused by freezing **IS NOT** covered by the MerCruiser Limited Warranty.

- 1 Ensure engine is as level as possible to ensure complete draining of cooling system.
- 2 Remove drain plug from port side of cylinder block.
- 3 Remove drain plug from bottom of exhaust manifold.
- 4 Repeatedly clean out drain holes using a stiff piece of wire. Do this until entire system is drained.

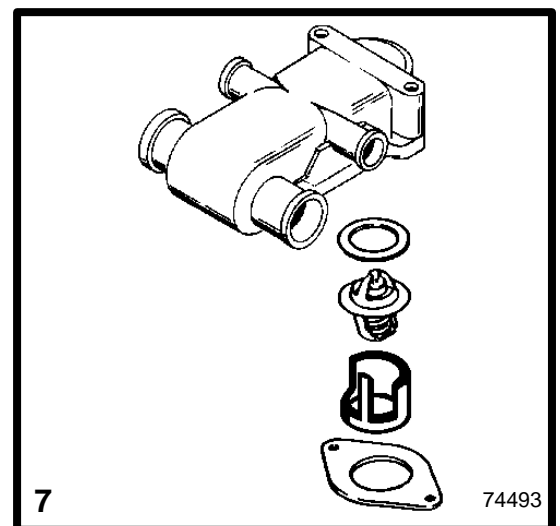
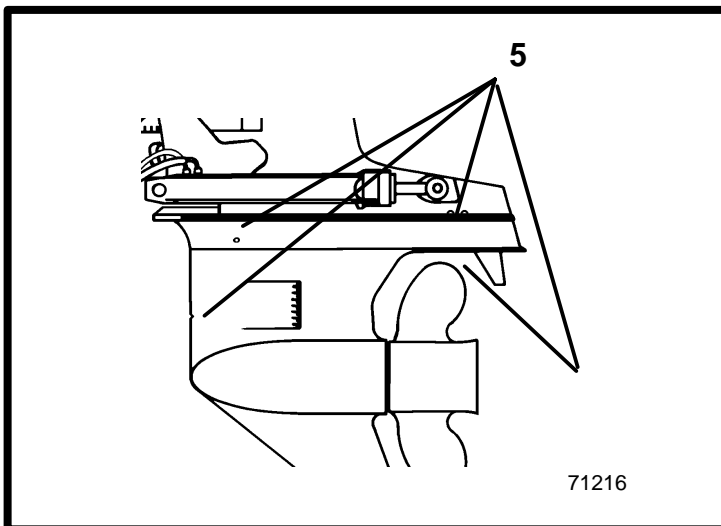
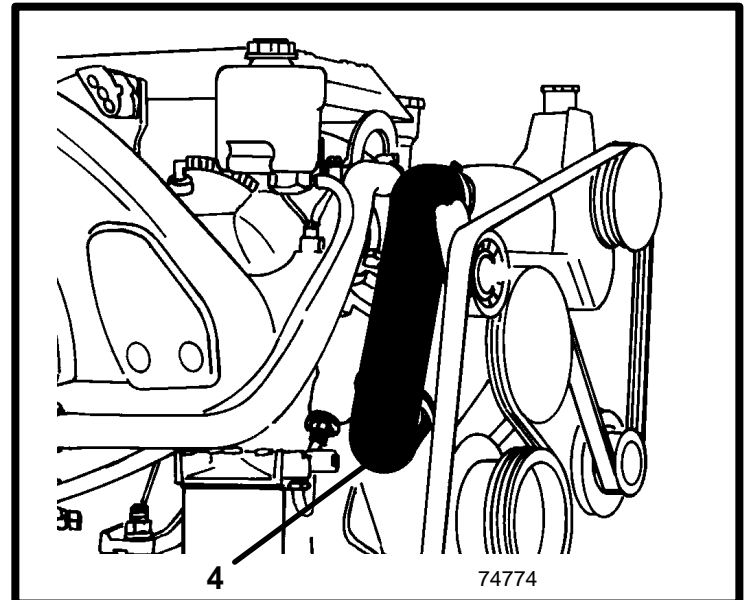
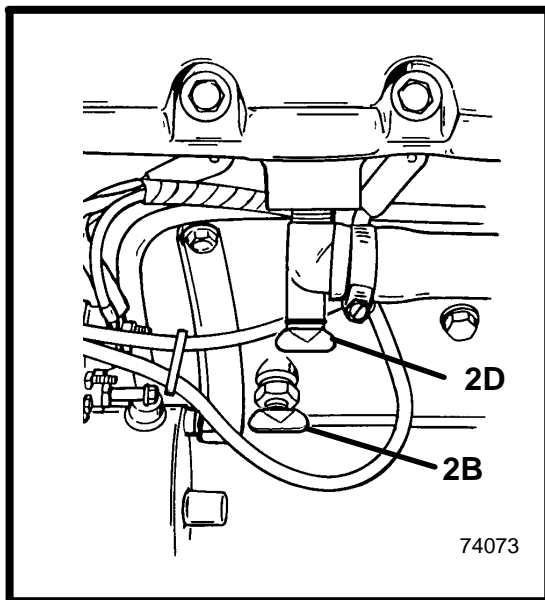
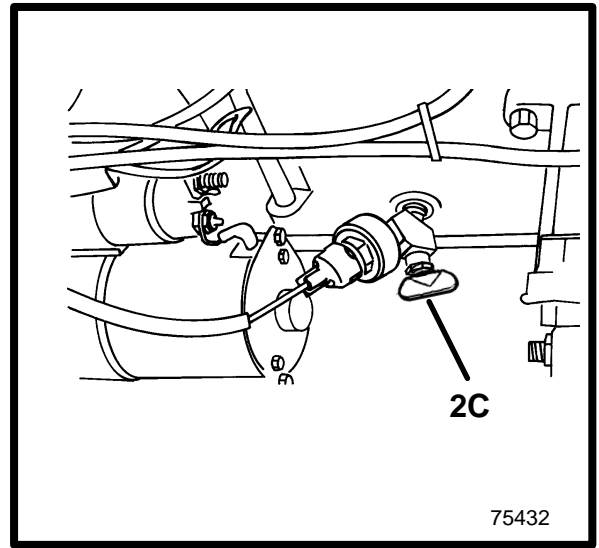
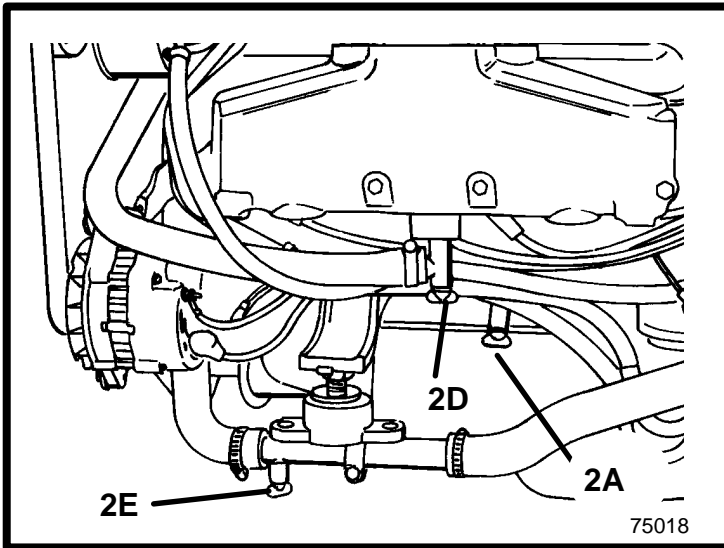
NOTE: *It may be necessary to lift or bend hoses to allow water to drain completely.*

- 5 Loosen hose clamps and disconnect hose from thermostat housing. Allow water to drain.
- 6 Make sure gear housing water vent and drain holes, speedometer pitot hole and trim tab cavity vent and drain holes are open and unobstructed.
- 7 Crank engine over slightly with starter motor to purge any water trapped in seawater pickup pump. Do not allow engine to start.
- 8 After cooling system has been drained completely, install drain plugs, reconnect hoses and tighten all hose clamps securely.

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.

- 9 For additional assurance against freezing and rust, fill the cooling system 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.
 - A** Remove thermostat housing or hose and fill with coolant until block and head are full. If thermostat housing was removed, reinstall and tighten cover bolts securely.
 - B** Remove water hose from exhaust manifold and fill manifold with coolant. Reinstall hose and tighten clamp securely.

Store boat with drive unit in full DOWN/IN position.



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Draining Instructions for Seawater (Raw-Water) Cooled Models (continued)

CARBURETED MODELS, EXCEPT 3.0L

⚠ CAUTION

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

IMPORTANT: Boat must be as level as possible to ensure complete draining of cooling system.

⚠ 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. Damage caused by freezing **IS NOT** covered by the MerCruiser Limited Warranty.

- 1 Ensure engine is as level as possible to ensure complete draining of cooling system.
- 2 Remove drain plugs from the following locations:
 - A Port Side - from cylinder block.
 - B Starboard Side - from cylinder block.

⚠ CAUTION

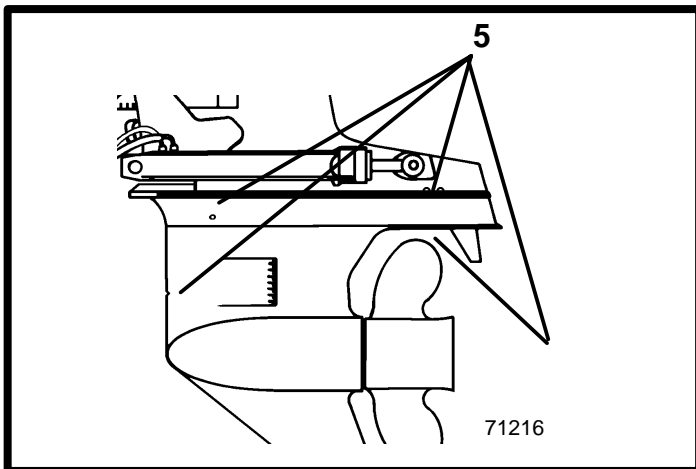
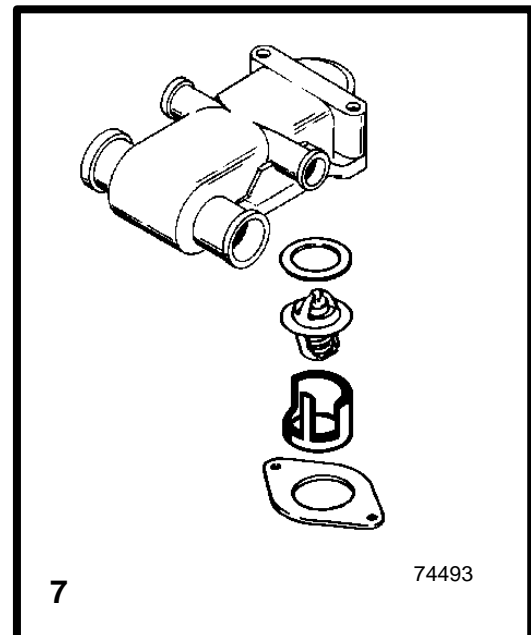
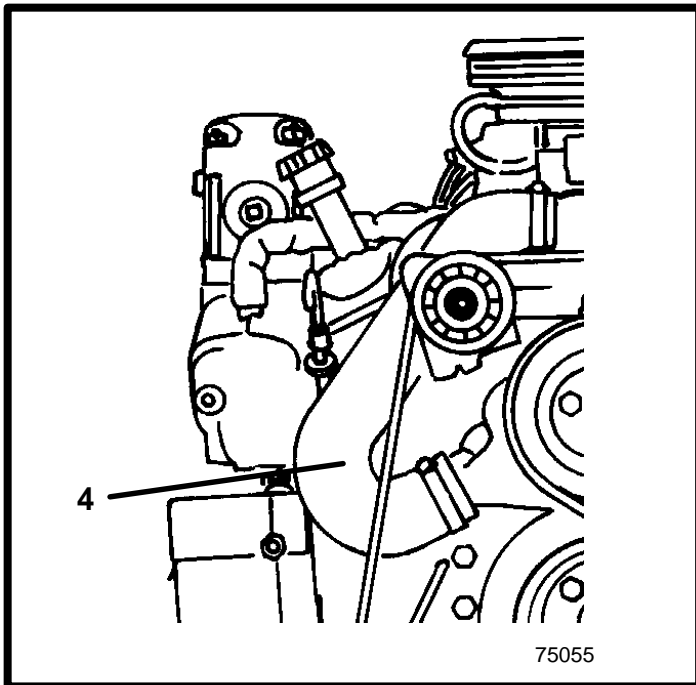
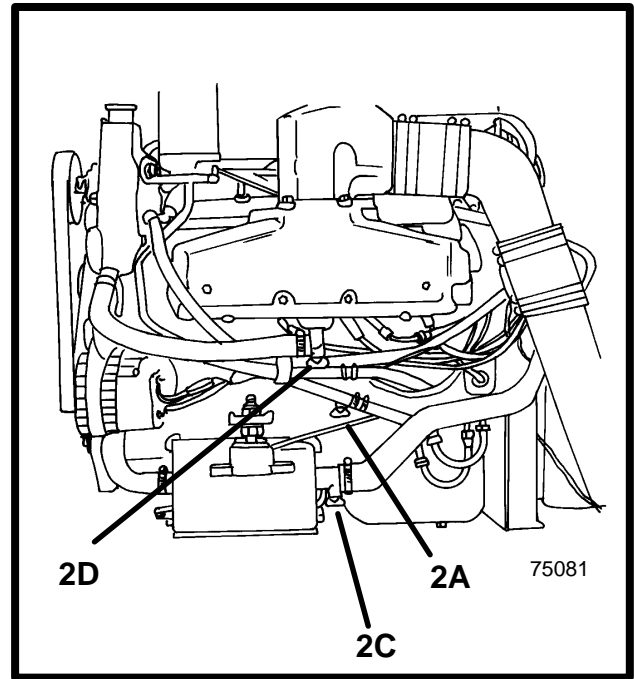
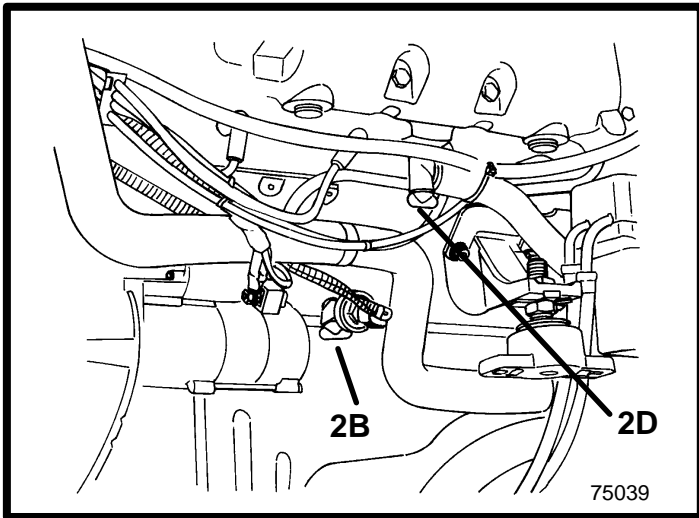
Avoid product damage. Do not disturb the Y-fitting when removing the drain plug. There is an ignition control "Knock Sensor" in the upper hole of the fitting. This sensor must not be loosened or removed. It is tightened to a critical specification at the factory.

- C Starboard Side With Y-Fitting, if so equipped - from Y-fitting.
 - D Bottom of exhaust manifolds (port and starboard).
 - E Port seawater pipe, if equipped.
- 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 hose from engine circulating pump.
- 5 Make sure gear housing water vent and drain holes, speedometer pitot hole and trim tab cavity vent and drain holes are open and unobstructed.
- 6 After cooling system has been drained completely, install drain plugs, reconnect hoses and tighten all hose clamps securely.

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.

- 7 For additional assurance against freezing and rust, remove the thermostat housing and thermostat. Fill the engine seawater cooling system with a mixture of propylene glycol mixed to protect engine to the lowest temperature to which it will be exposed during cold weather or extended storage. Using a new gasket, reinstall thermostat and cover. Tighten cover bolts securely.

Store boat with drive unit in full DOWN/IN position.



Draining Instructions for Seawater (Raw-Water) Cooled Models (continued)

EFI MODELS

⚠ CAUTION

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

IMPORTANT: Boat must be as level as possible to ensure complete draining of cooling system.

⚠ 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. Damage caused by freezing **IS NOT** covered by the MerCruiser Limited Warranty.

- 1 Ensure engine is as level as possible to ensure complete draining of cooling system.
- 2 Remove drain plugs from the following locations:
 - A Port Side - from cylinder block.

⚠ CAUTION

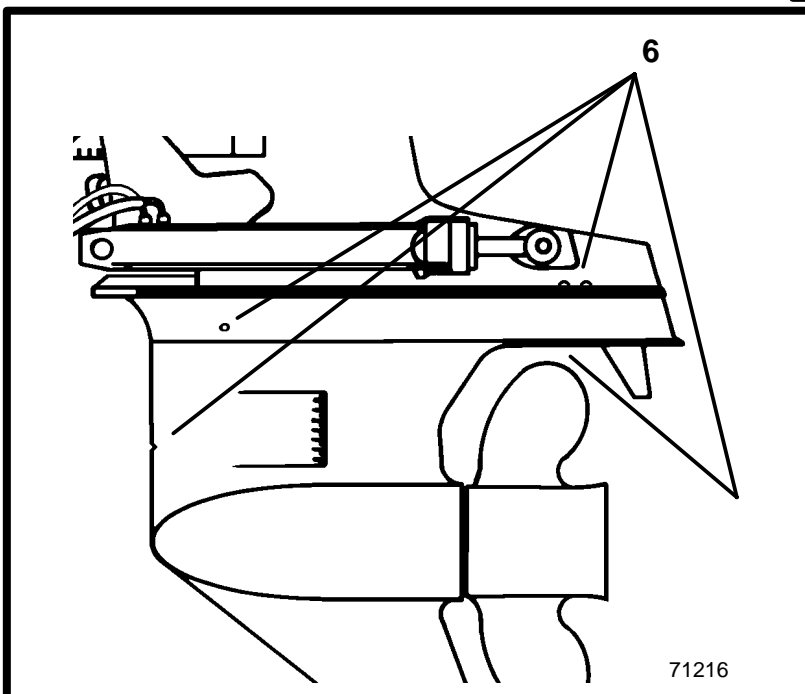
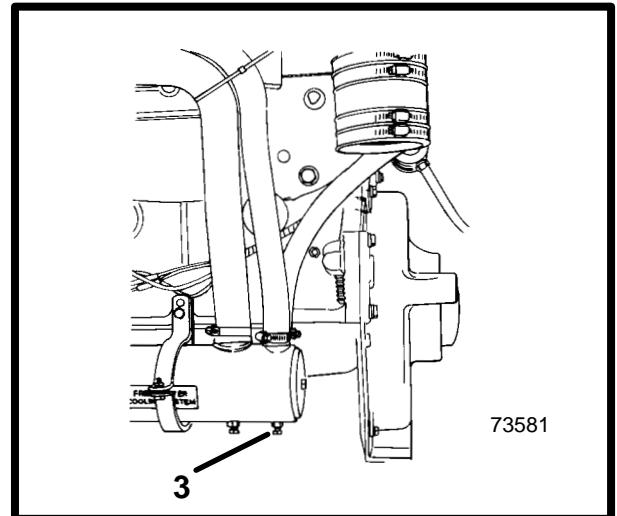
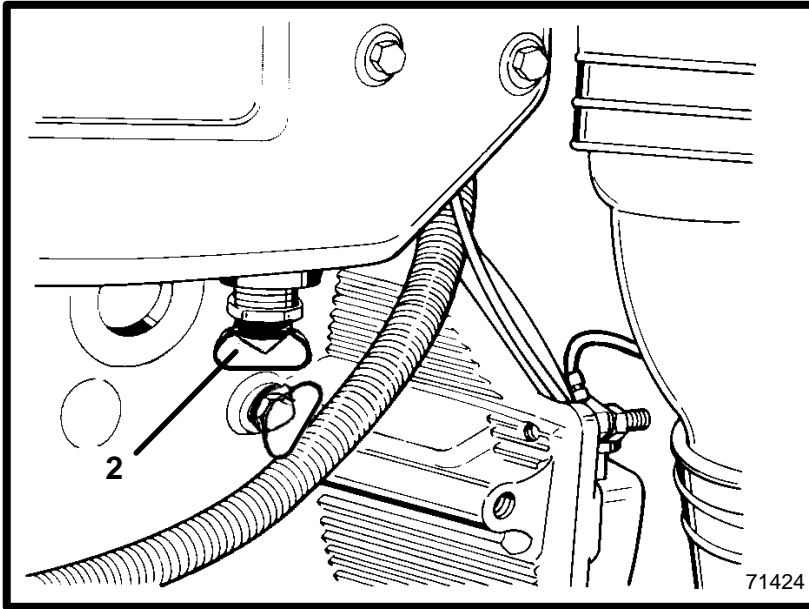
Avoid product damage. Do not disturb the Y-fitting when removing the drain plug. There is an ignition control "Knock Sensor" in the upper hole of the fitting. This sensor must not be loosened or removed. It is tightened to a critical specification at the factory.

- B Starboard Side - from Y-fitting.
 - C Fuel cooler.
 - D Bottom of exhaust manifolds (port and starboard).
 - 3 Repeatedly clean out drain holes using a stiff piece of wire. Do this until entire system is drained.
- NOTE:** It may be necessary to lift or bend hoses to allow water to drain completely. Crank engine over slightly to purge any water trapped in seawater pickup pump. Do not allow engine to start.
- 4 Loosen hose clamps and remove the hose from engine circulating pump.
 - 5 Make sure gear housing water vent and drain holes, speedometer pitot hole and trim tab cavity vent and drain holes are open and unobstructed.
 - 6 After cooling system has been drained completely, install drain plugs, reconnect hoses and tighten all hose clamps securely.

IMPORTANT: MerCruiser recommends that propylene glycol antifreeze (nontoxic and biodegradable, which makes it friendly to lakes and rivers) be used in 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.

- 7 For additional assurance against freezing and rust, remove thermostat cover and thermostat. Fill engine seawater cooling system with a mixture of propylene glycol mixed to protect engine to the lowest temperature to which it will be exposed during cold weather or extended storage. Using a new gasket, reinstall thermostat and cover. Tighten cover bolts securely.

Store boat with drive unit in full DOWN/IN position.



Draining Instructions for Closed Cooled (Coolant) Models

The following information outlines the procedures for draining the *seawater section* of the closed cooling systems.

3.0L MODELS

IMPORTANT: Drain seawater section of closed cooling system only.

⚠ CAUTION

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

IMPORTANT: Boat must be as level as possible to ensure complete draining of cooling system.

⚠ CAUTION

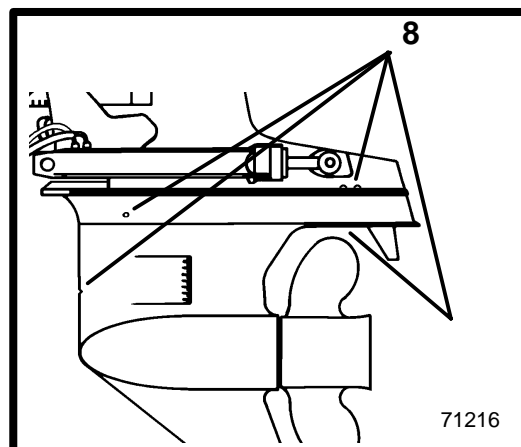
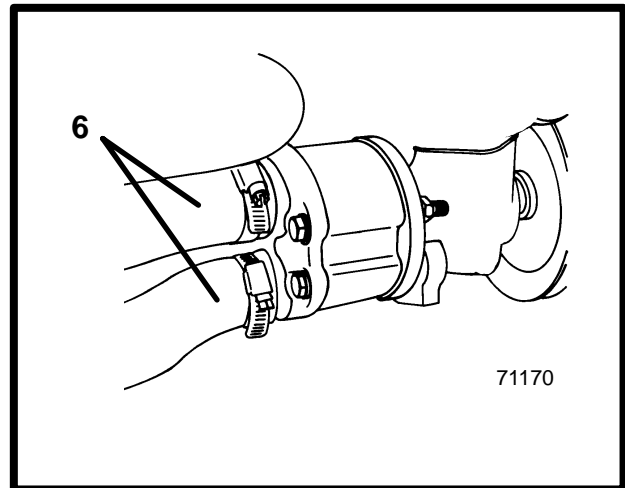
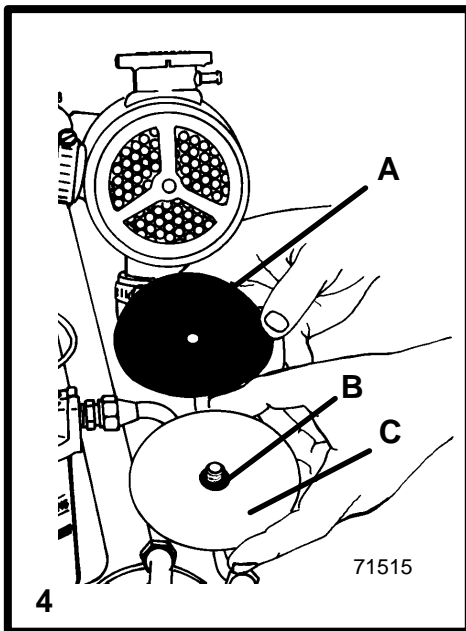
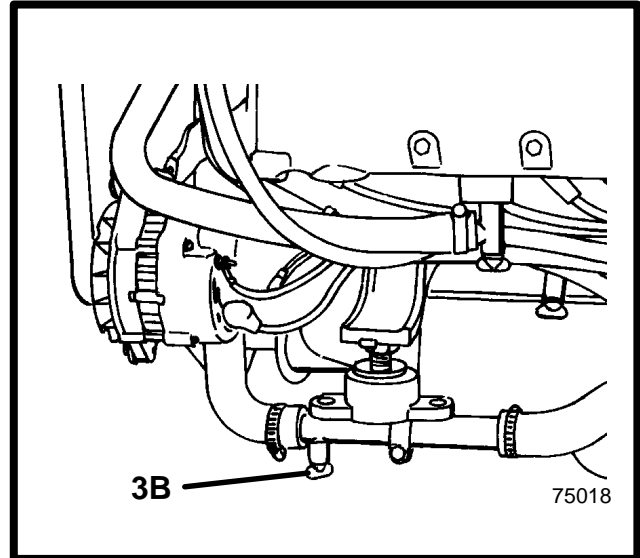
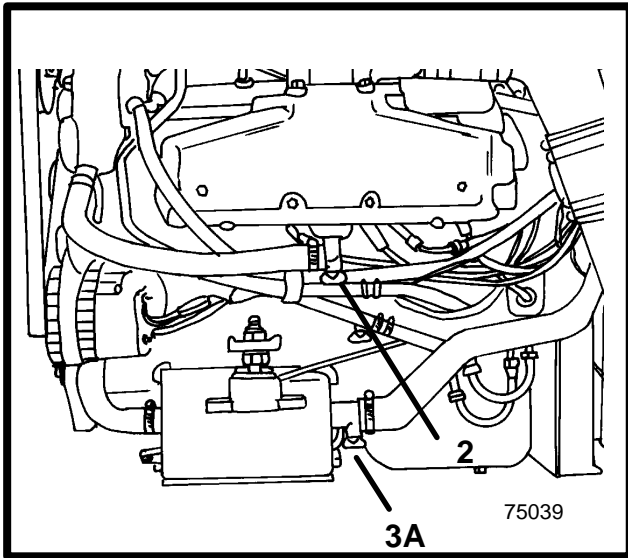
Seawater section of cooling system **MUST BE COMPLETELY** drained for winter storage or immediately after cold weather use if the possibility of freezing temperatures exist. Failure to comply may result in trapped water causing freeze and/or corrosion damage to engine. Damage caused by freezing **IS NOT** covered by the MerCruiser Limited Warranty.

IMPORTANT: Closed cooling section must be kept filled year-round with recommended coolant. If engine will be exposed to freezing temperatures, make sure closed cooling section is filled with an ethylene glycol antifreeze and water solution properly mixed to protect engine to lowest temperature to which it will be exposed. Quicksilver Premixed Marine Engine Coolant is already mixed.

IMPORTANT: Do not use Propylene Glycol Antifreeze in the closed cooling section of the engine.

- 1 Ensure engine is as level as possible to ensure complete draining of cooling system.
- 2 Remove drain plug from bottom of exhaust manifold.
- 3 Remove aft (rear) drain plug from heat exchanger.
- 4 Repeatedly clean out drain holes using a stiff piece of wire. Do this until entire system is drained.
- 5 Crank engine over slightly with starter motor to purge any water trapped in seawater pickup pump. **DO NOT** allow engine to start.
- 6 Make sure gear housing water vent and drain holes, speedometer pitot hole and trim tab cavity vent and drain holes are open and unobstructed.
- 7 After seawater section of cooling system has been drained completely, reinstall drain plugs. Reconnect all hoses and tighten hose clamps securely.

Store boat with drive unit in full DOWN/IN position.



Draining Instructions for Closed Cooled (Coolant) Models (continued)

The following information outlines the procedures for draining the *seawater section* of the closed cooling system.

CARBURETED AND EFI MODELS, EXCEPT 3.0L

IMPORTANT: Drain seawater section of closed cooling system only.

⚠ CAUTION

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

IMPORTANT: Boat must be as level as possible to ensure complete draining of cooling system.

⚠ 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. Damage caused by freezing **IS NOT** covered by the MerCruiser Limited Warranty.

IMPORTANT: Closed cooling section must be kept filled year-round with recommended coolant. If engine will be exposed to freezing temperatures, make sure closed cooling section is filled with an ethylene glycol antifreeze and water solution properly mixed to protect engine to lowest temperature to which it will be exposed. Quicksilver Premixed Marine Engine Coolant is already mixed.

IMPORTANT: Do not use Propylene Glycol Antifreeze in the closed cooling section of the engine.

1 Ensure engine is as level as possible to ensure complete draining of cooling system.

2 Remove drain plugs (port and starboard) from bottom of exhaust manifolds.

3 Remove drain plug from **A** or **B**, depending on model:

A Fuel cooler.

B Port seawater pipe, if equipped.

4 Remove end caps (C), sealing washers (B) and gaskets (A) from the heat exchanger.

IMPORTANT: Use compressed air to blow any remaining water from the tubes in the heat exchanger.

5 Repeatedly clean out drain holes using a stiff piece of wire. Do this until entire system is drained.

6 Loosen hose clamps and remove both hoses from seawater pickup pump.

7 Crank engine over slightly with starter motor to purge any water trapped in seawater pickup pump. **DO NOT** allow engine to start.

8 Make sure gear housing water vent and drain holes, speedometer pitot hole and trim tab cavity vent and drain holes are open and unobstructed.

9 After seawater section of cooling system has been drained completely, reconnect all hoses, reinstall heat exchanger end caps with new gaskets, and reinstall drain plugs.

Store boat with drive unit in full DOWN/IN position.

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.

CAUTION

When installing battery, be sure to connect POSITIVE (+) battery cable to POSITIVE (+) battery terminal and NEGATIVE (-) battery cable to NEGATIVE (-) 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 terminal connections with a battery terminal 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 Start engine and closely observe instrumentation to make sure that all systems are functioning correctly.
- 6 Carefully inspect engine for fuel, oil, fluid, water and exhaust leaks.
- 7 Check steering system, shift and throttle control for proper operation.
- 8 Check fuel pump sight tube (if so equipped) for evidence of fuel (indicating a ruptured fuel pump diaphragm).

SECTION 7 - Wiring Diagrams

SECTION 7 - Wiring Diagrams

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Wiring Diagrams

7

Quicksilver Instrumentation Wiring Diagram

Single Station Installation - Typical

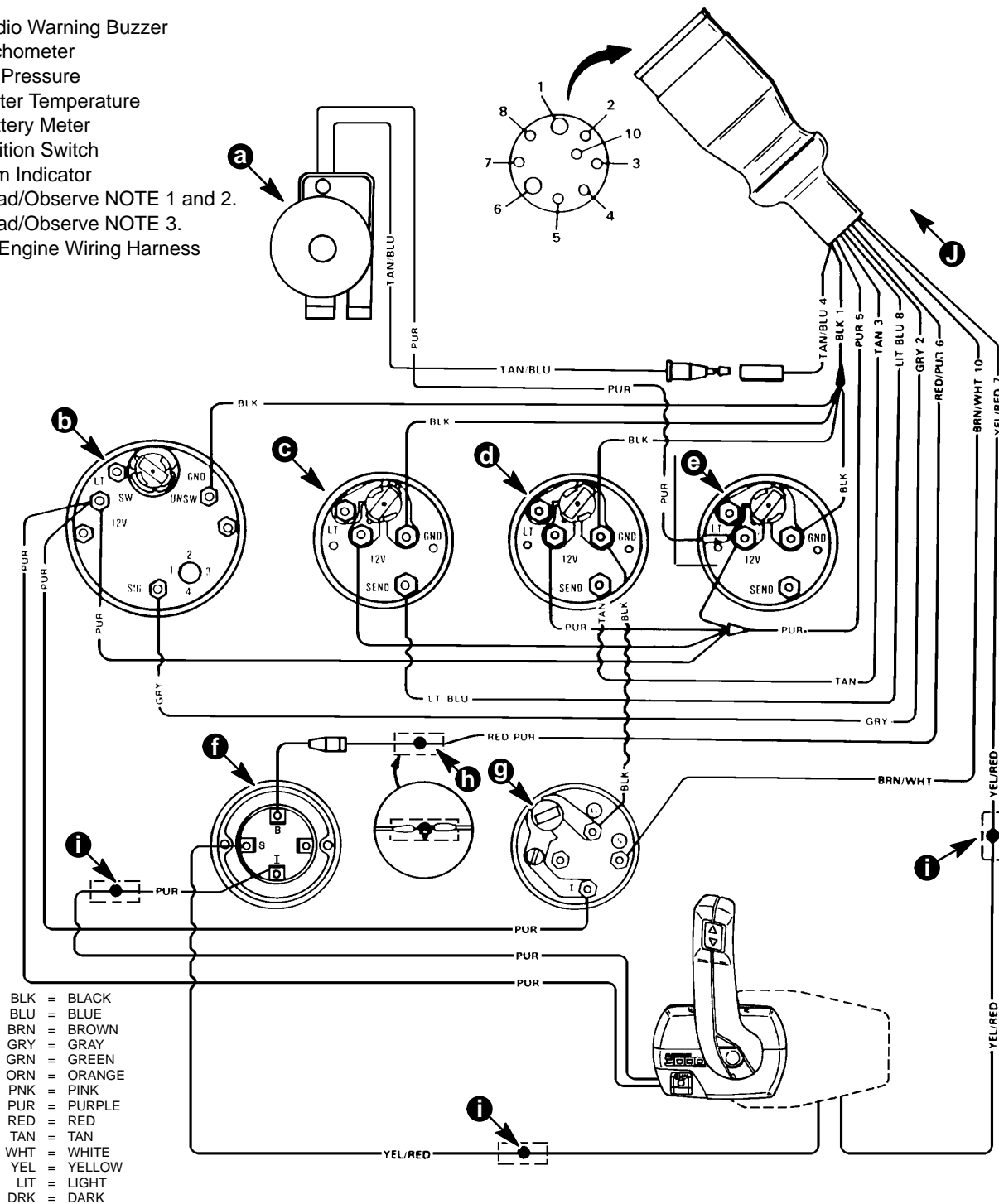
Refer to gauge manufacturer's instructions for specific connections.

NOTE 1: Connect Wires Together with Screw and Hex Nut; Apply Liquid Neoprene to Connection and Slide Rubber Sleeve over Connection.

NOTE 2: 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.

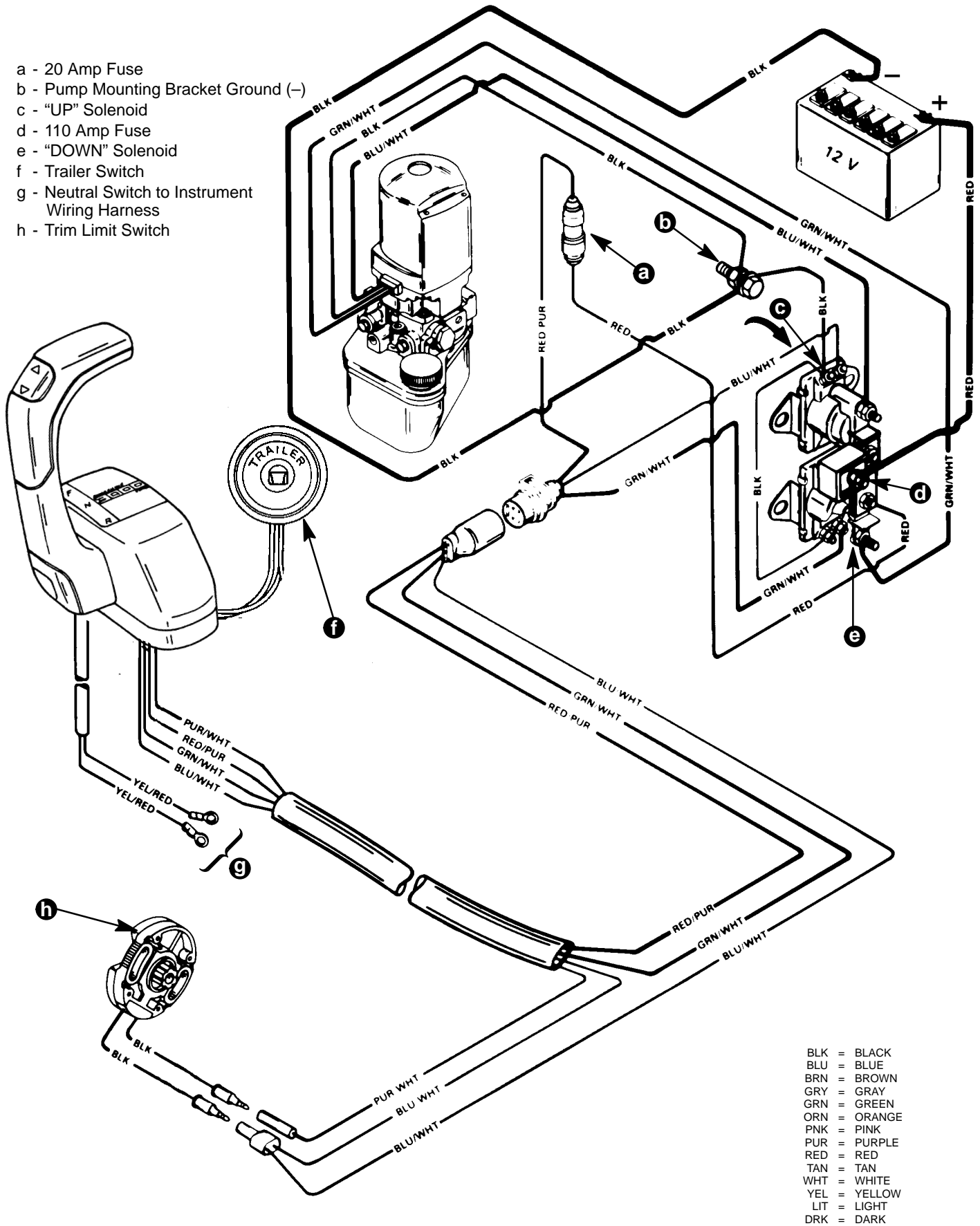
NOTE 3: Lanyard stop switch lead and neutral safety switch leads must be soldered and covered with shrink tube for a water proof connection. If an alternate method of connection is made, verify connection is secure and sealed for a water proof connection.

- a - Audio Warning Buzzer
- b - Tachometer
- c - Oil Pressure
- d - Water Temperature
- e - Battery Meter
- f - Ignition Switch
- g - Trim Indicator
- h - Read/Observe NOTE 1 and 2.
- i - Read/Observe NOTE 3.
- j - To Engine Wiring Harness



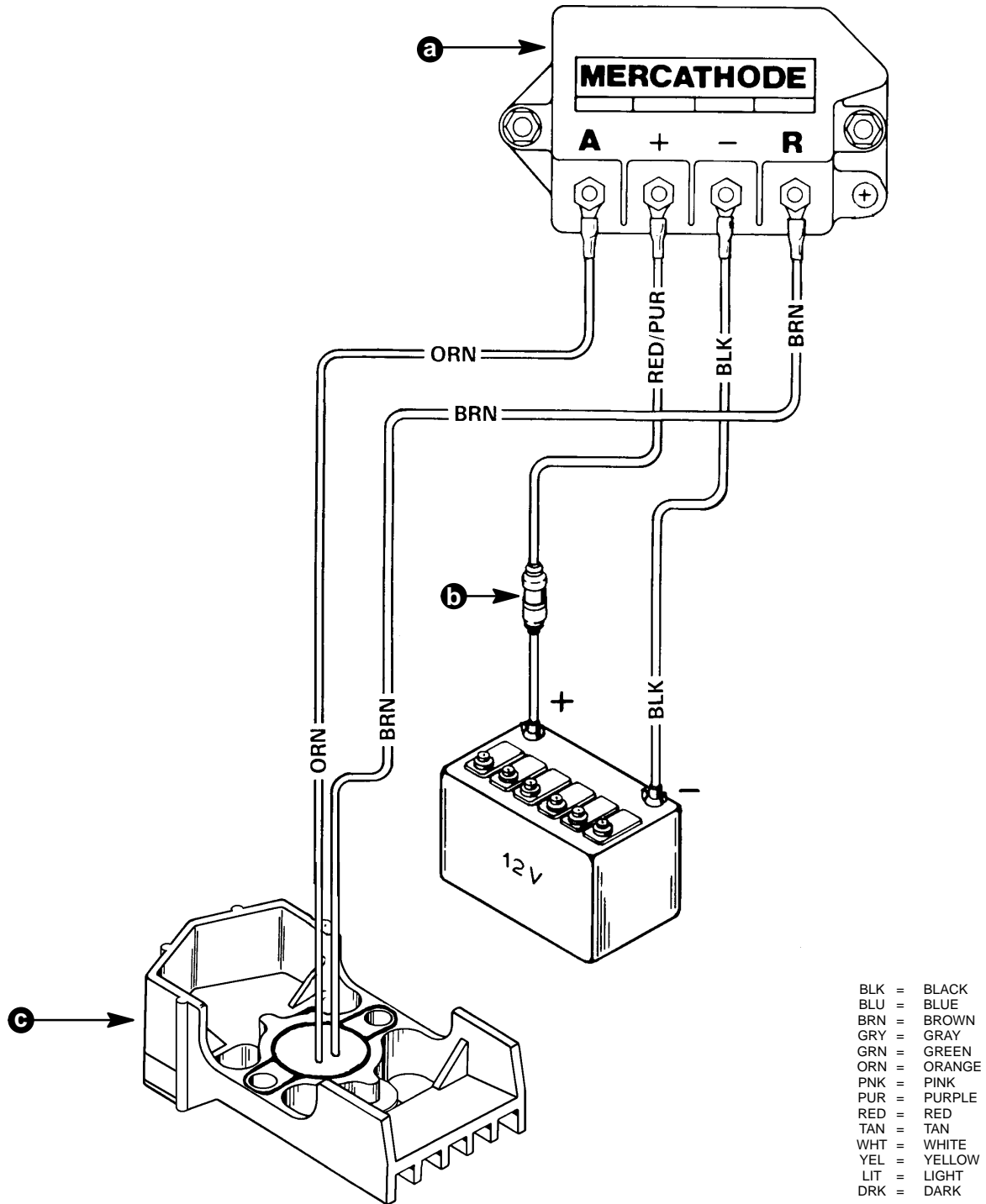
Power Trim System Wiring Diagram

- a - 20 Amp Fuse
- b - Pump Mounting Bracket Ground (-)
- c - "UP" Solenoid
- d - 110 Amp Fuse
- e - "DOWN" Solenoid
- f - Trailer Switch
- g - Neutral Switch to Instrument Wiring Harness
- h - Trim Limit Switch



MerCathode System Wiring Diagram

- a - Controller
b - 20 Amp Fuse
c - Electrode



MCM Gasoline Engine Wiring Diagrams

3.0L Engine

A - Ignition Components

- 1 - Distributor
- 2 - Ignition Coil
- 3 - Shift Cutout Switch

B - Starting Charging and Choke Components

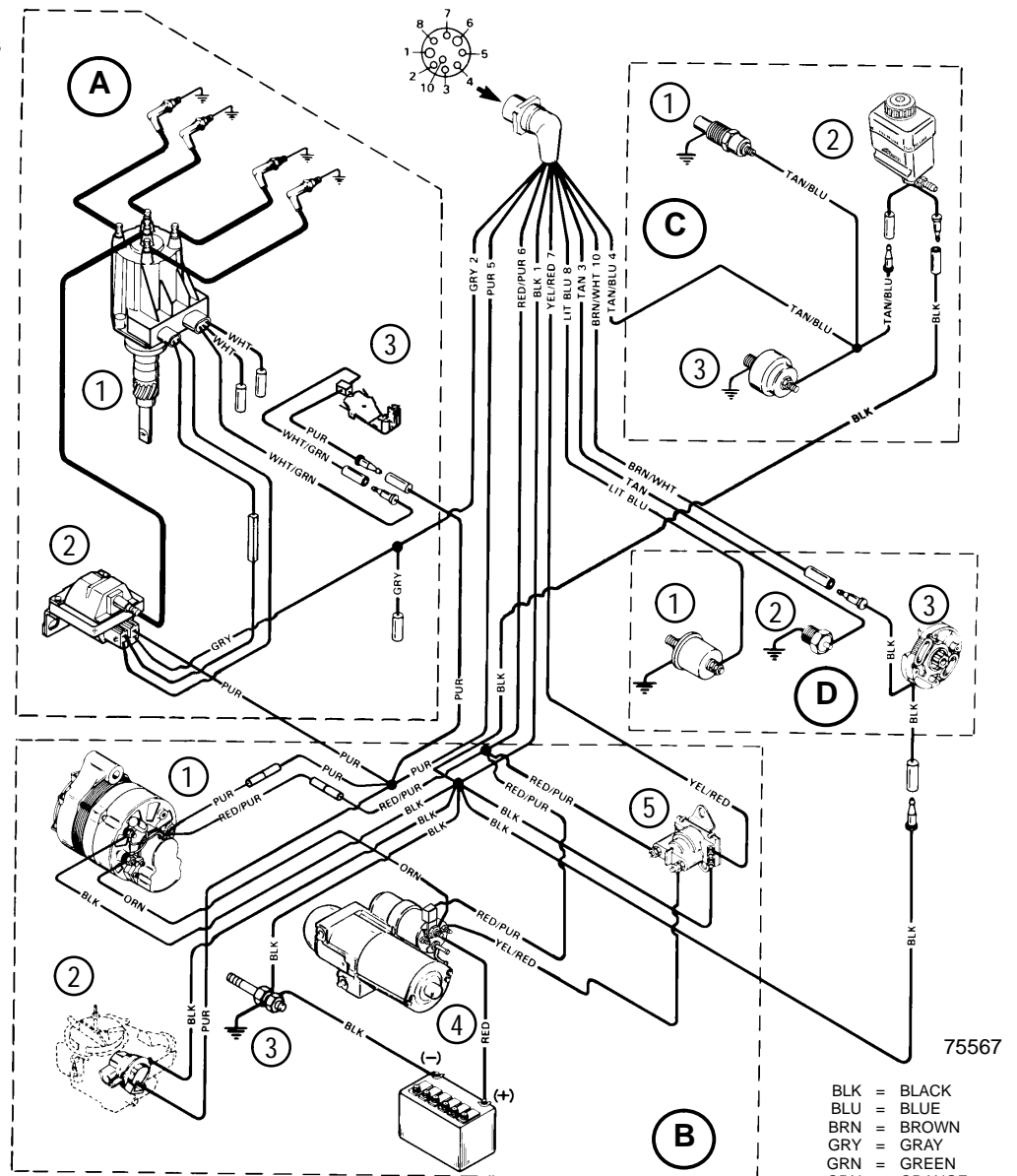
- 1 - Alternator
- 2 - Electric Choke
- 3 - Ground Stud
- 4 - Starter Motor
- 5 - Starter Slave Solenoid

C - Audio Warning Components

- 1 - Water Temperature
- 2 - Drive Unit Gear Lube Monitor
- 3 - Oil Pressure Switch

D - Instrumentation Components

- 1 - Oil Pressure Sender
- 2 - Water Temperature Sender
- 3 - Trim Sender



NOTE 1: GRAY lead for use with Service Tachometer.

MCM 4.3L Alpha Engines

A - Ignition Components

- 1 - Distributor
- 2 - Timing Lead
- 3 - Shift Cutout Switch
- 4 - Ignition Coil

B - Starting, Charging and Choke Components

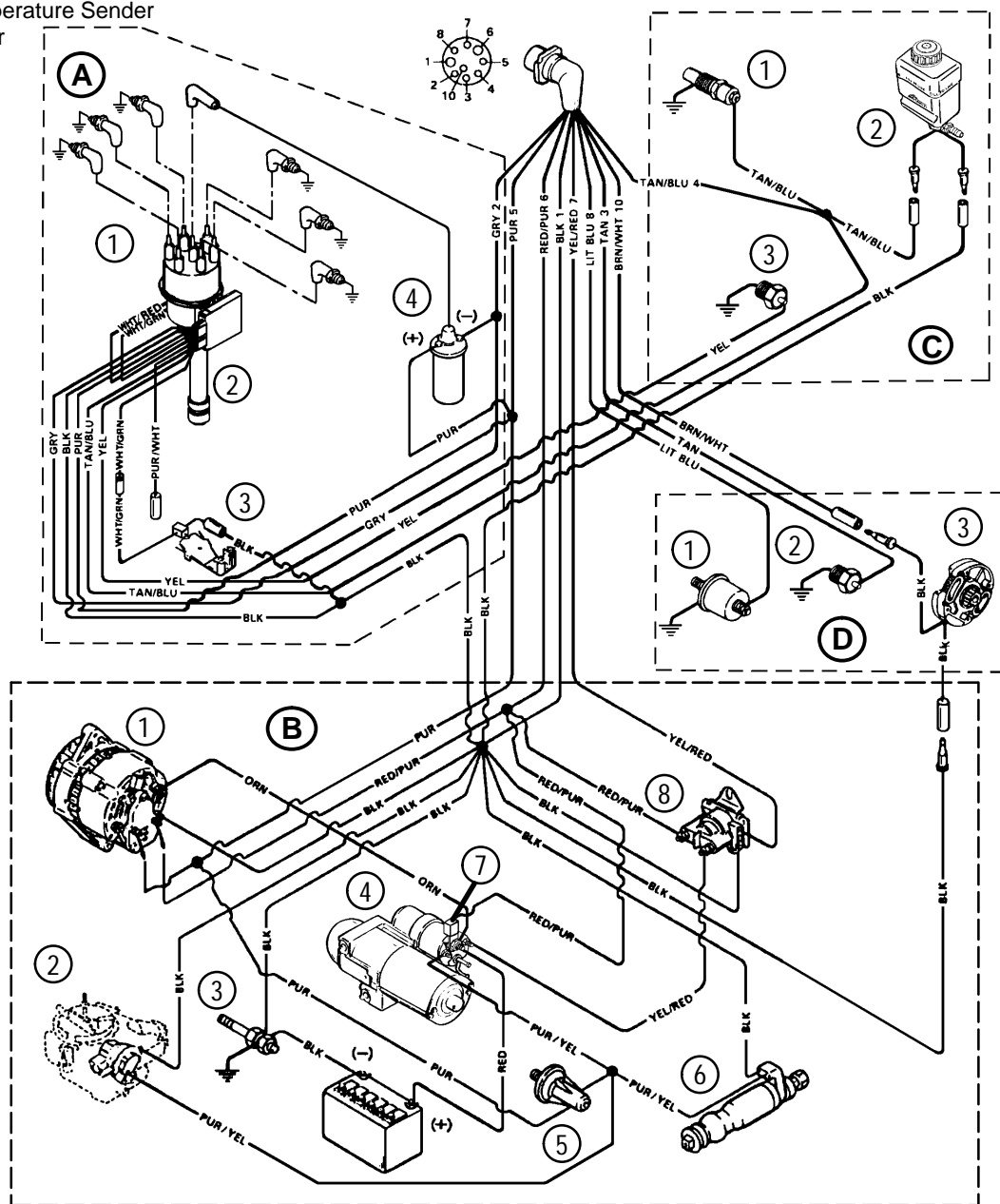
- 1 - Alternator
- 2 - Electric Choke
- 3 - Ground Stud
- 4 - Starter Motor
- 5 - Oil Pressure Switch
- 6 - Fuel Pump
- 7 - Fuse
- 8 - Starter Slave Solenoid

C - Audio Warning Components

- 1 - Oil Pressure Switch
- 2 - Drive Unit Gear Lube Monitor
- 3 - Water Temperature Sender

D - Instrumentation Components

- 1 - Oil Pressure Sender
- 2 - Water Temperature Sender
- 3 - Trim Sender



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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

MCM 4.3LH Alpha Engines

A - Ignition Components

- 1 - Distributor
- 2 - Timing Lead
- 3 - Shift Cutout Switch
- 4 - Ignition Coil

B - Starting, Charging and Choke Components

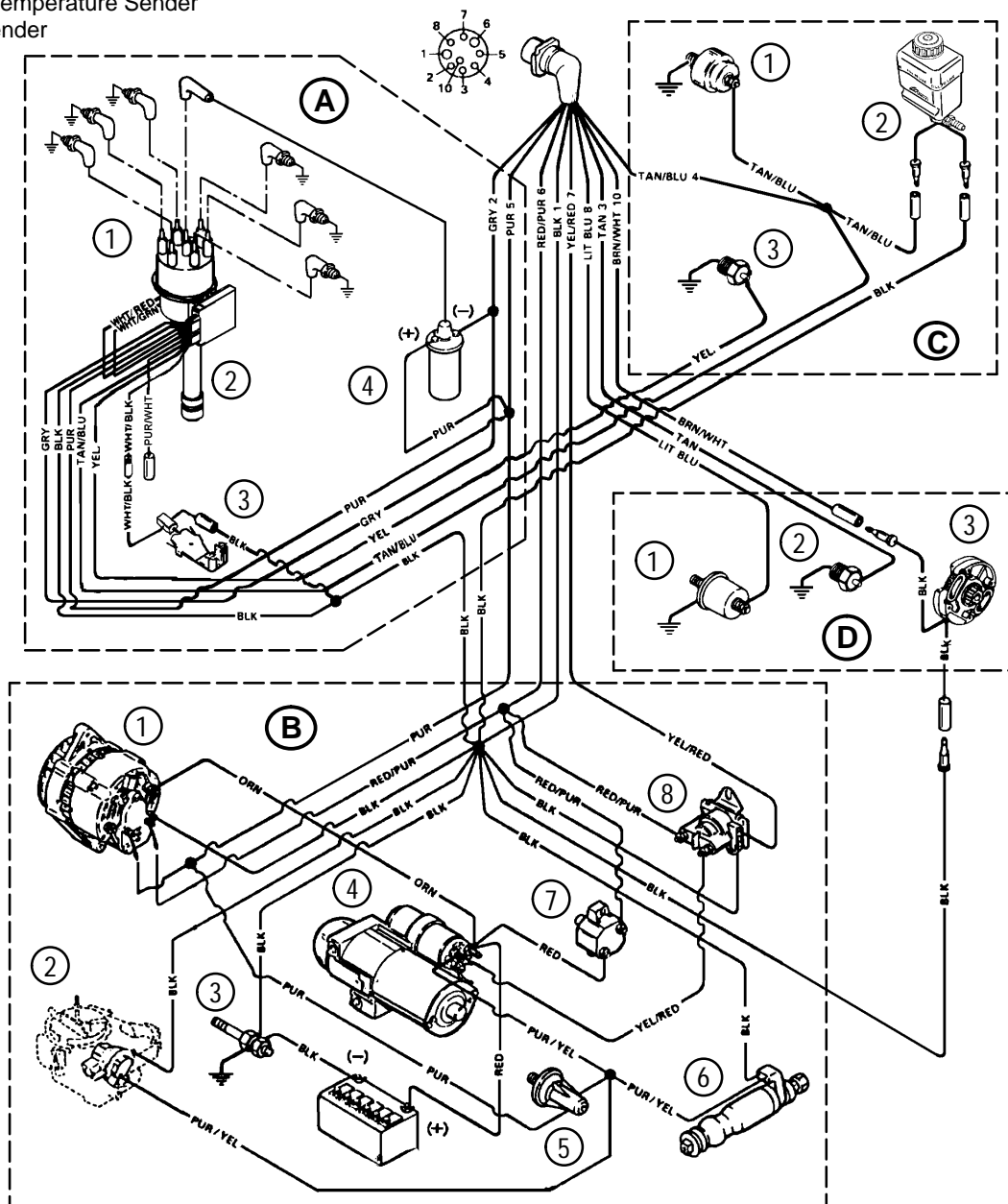
- 1 - Alternator
- 2 - Electric Choke
- 3 - Ground Stud
- 4 - Starter Motor
- 5 - Oil Pressure Switch
- 6 - Fuel Pump
- 7 - Circuit Breaker
- 8 - Starter Slave Solenoid

C - Audio Warning Components

- 1 - Oil Pressure Switch
- 2 - Drive Unit Gear Lube Monitor
- 3 - Water Temperature Sender

D - Instrumentation Components

- 1 - Oil Pressure Sender
- 2 - Water Temperature Sender
- 3 - Trim Sender



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MCM 5.0L Alpha Engines

A - Ignition Components

- 1 - Distributor
- 2 - Timing Lead
- 3 - Ignition Coil
- 4 - Shift Interrupt Switch

B - Starting, Charging and Choke Components

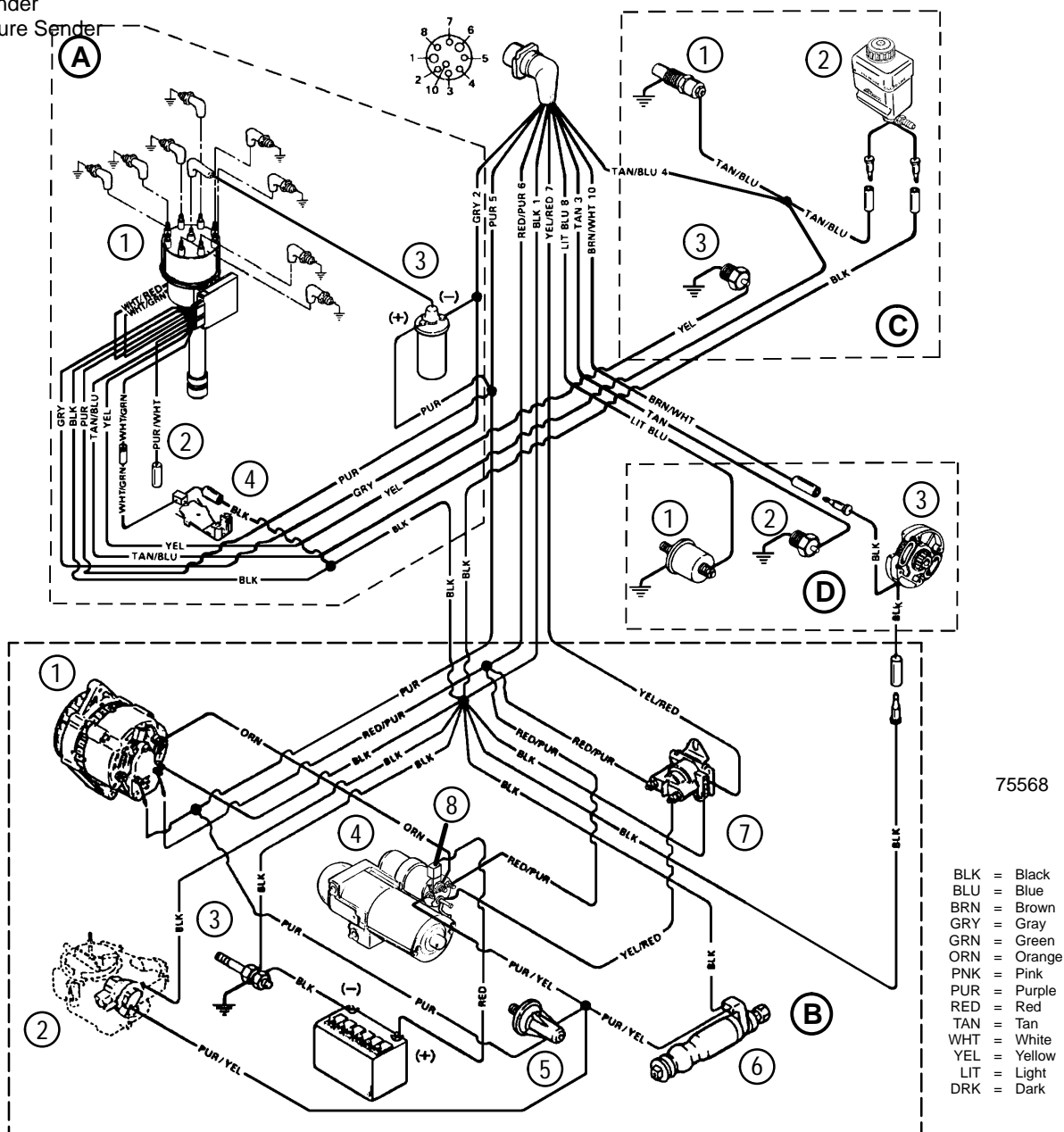
- 1 - Alternator
- 2 - Electric Choke
- 3 - Ground Stud
- 4 - Starter Motor
- 5 - Oil Pressure Switch
- 6 - Fuel Pump
- 7 - Starter Slave Solenoid
- 8 - Fuse

C - Audio Warning Components

- 1 - Oil Pressure Switch
- 2 - Gear Lube Monitor
- 3 - Water Temperature Switch

D - Instrumentation Components

- 1 - Oil Pressure Sender
- 2 - Water Temperature Sender
- 3 - Trim Sender



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- 1 - Distributor
- 2 - Timing Lead
- 3 - Knock Sensor
- 4 - Ignition Coil
- 5 - Shift Interrupt Switch

- 1 - Alternator
- 2 - Electric Choke
- 3 - Ground Stud
- 4 - Starter Motor
- 5 - Oil Pressure Switch
- 6 - Fuel Pump
- 7 - Circuit Breaker
- 8 - Starter Slave Solenoid

- 1 - Oil Pressure Switch
- 2 - Gear Lube Monitor
- 3 - Water Temperature Switch

1 - Oil Pressure Sender
2 - Water Temperature Sender
3 - Trim Sender



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

MCM 4.3L EFI - Starting and Charging System Harness

A - Audio Warning Components

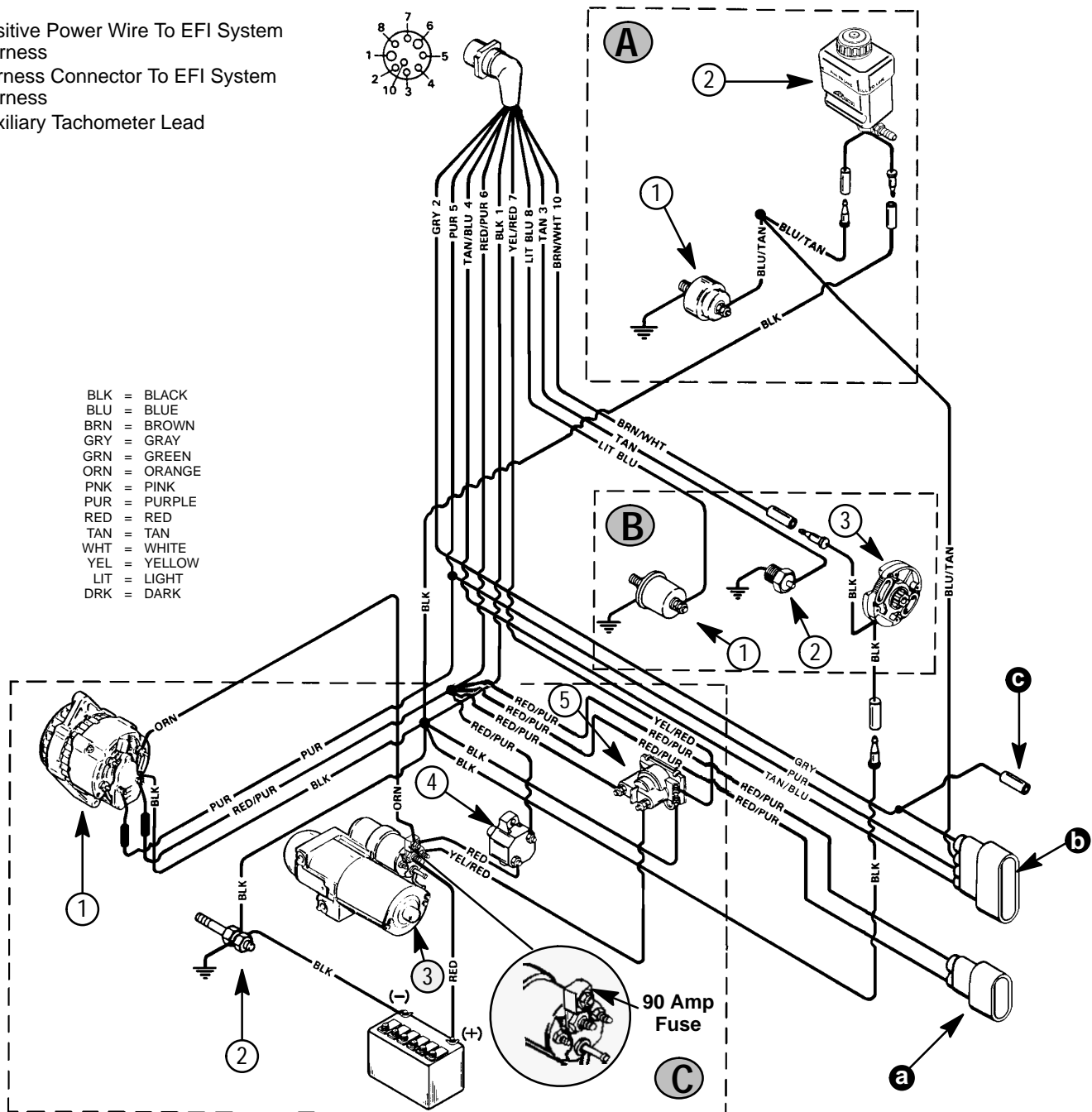
- 1 - Oil Pressure Switch
- 2 - Drive Unit Oil Level

B - Instrumentation Components

- 1 - Oil Pressure Sender
- 2 - Water Temperature Sender
- 3 - Trim Sender

C - Charging and Starting Components

- 1 - Alternator
 - 2 - Ground Stud
 - 3 - Starter
 - 4 - Circuit Breaker
 - 5 - Starter Slave Solenoid
- a - Positive Power Wire To EFI System Harness
b - Harness Connector To EFI System Harness
c - Auxiliary Tachometer Lead



MCM 5.0L EFI, 5.7L EFI and 350 Mag MPI- Starting and Charging System Harnesses

A - Audio Warning Components

- 1 - Oil Pressure Switch
- 2 - Drive Unit Oil Level

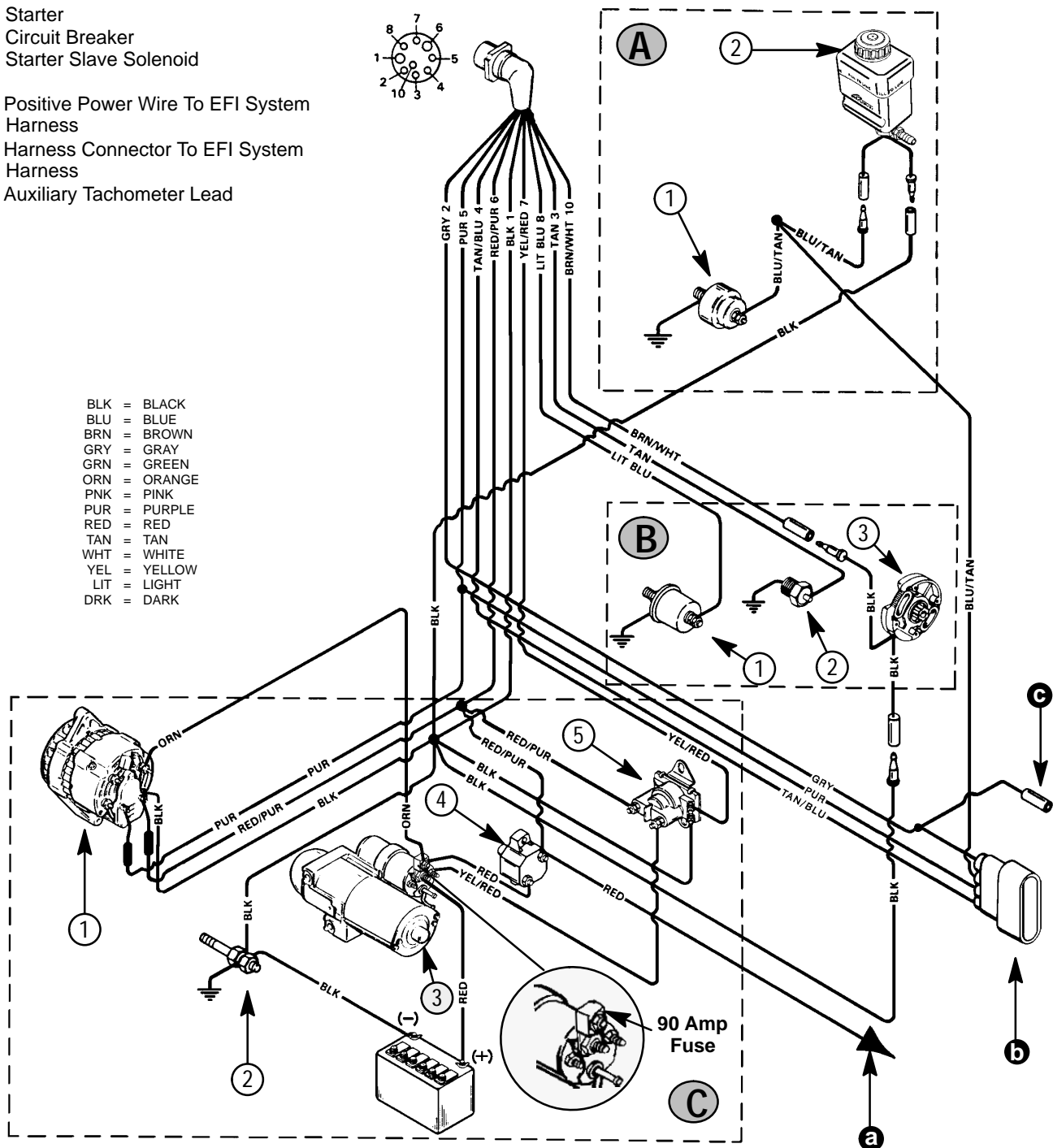
B - Instrumentation Components

- 1 - Oil Pressure Sender
- 2 - Water Temperature Sender
- 3 - Trim Sender

C - Charging and Starting Components

- 1 - Alternator
- 2 - Ground Stud
- 3 - Starter
- 4 - Circuit Breaker
- 5 - Starter Slave Solenoid

- a - Positive Power Wire To EFI System Harness
b - Harness Connector To EFI System Harness
c - Auxiliary Tachometer Lead



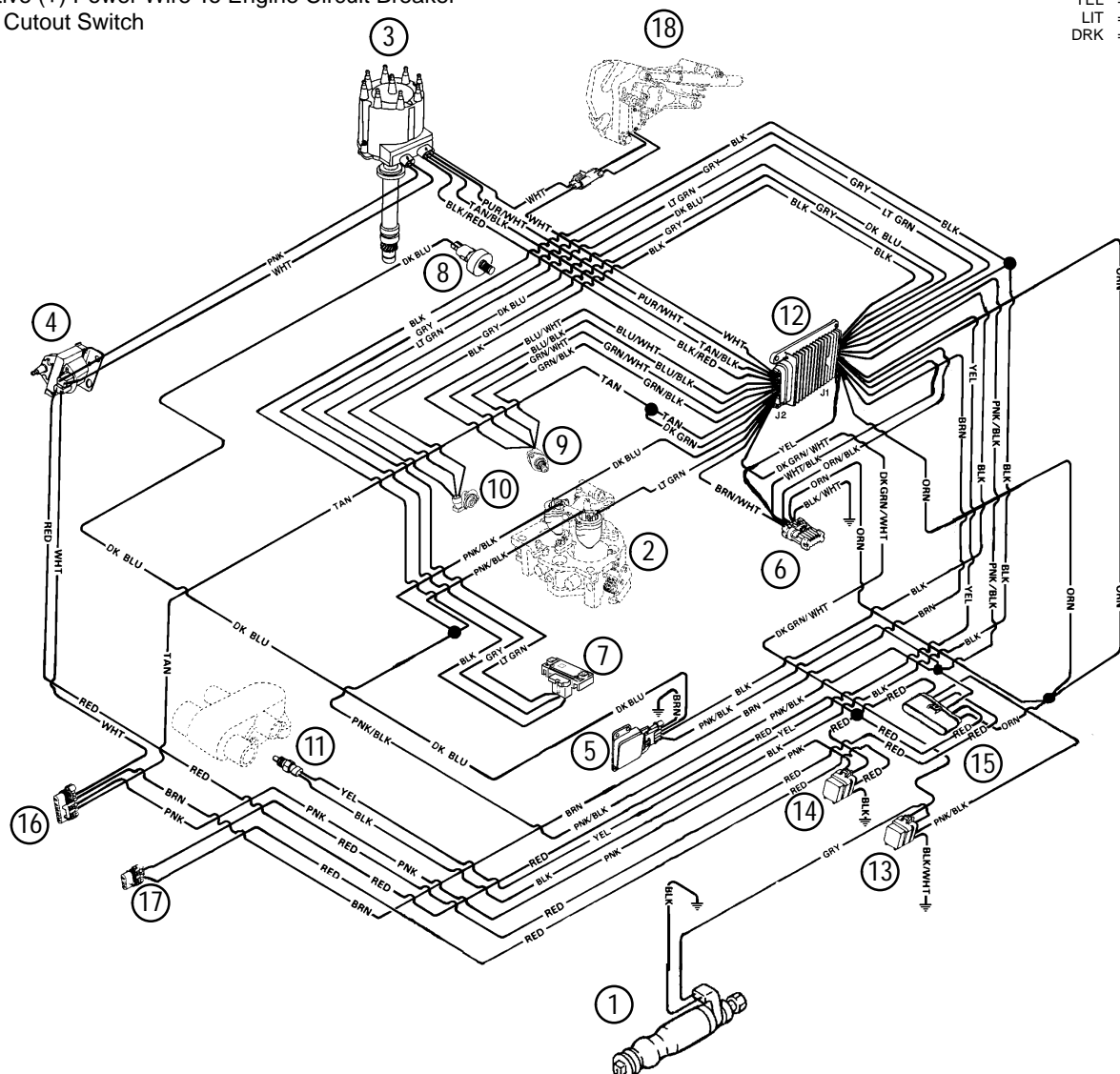
MCM 4.3L EFI Alpha - Fuel and Ignition System Harness

NOTE: All BLACK wires with a ground symbol are interconnected within the EFI system harness.

NOTE: Component position and orientation shown is arranged for visual clarity and ease of circuit identification.

- 1 - Fuel Pump
- 2 - Throttle Body
- 3 - Distributor
- 4 - Coil
- 5 - Electronic Spark Control (KS) Module
- 6 - Data Link Connector (DLC)
- 7 - Manifold Absolute Pressure (MAP) Sensor
- 8 - Knock Sensor
- 9 - Idle Air Control (IAC)
- 10- Throttle Position (TP) Sensor
- 11- Engine Coolant Temperature (ECT) Sensor
- 12- Electronic Control Module (ECM)
- 13- Fuel Pump Relay
- 14- Ignition/System Relay
- 15- Fuse (15 Amp) Fuel Pump
Fuse (15 Amp) ECM/DLC/Battery
Fuse (10 Amp) ECM/Injector/Ignition/Knock Module
- 16- Harness Connector To Starting/Charging Harness
- 17- Positive (+) Power Wire To Engine Circuit Breaker
- 18- Shift Cutout Switch

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ORN = ORANGE
PNK = PINK
PUR = PURPLE
RED = RED
TAN = TAN
WHT = WHITE
YEL = YELLOW
LIT = LIGHT
DRK = DARK



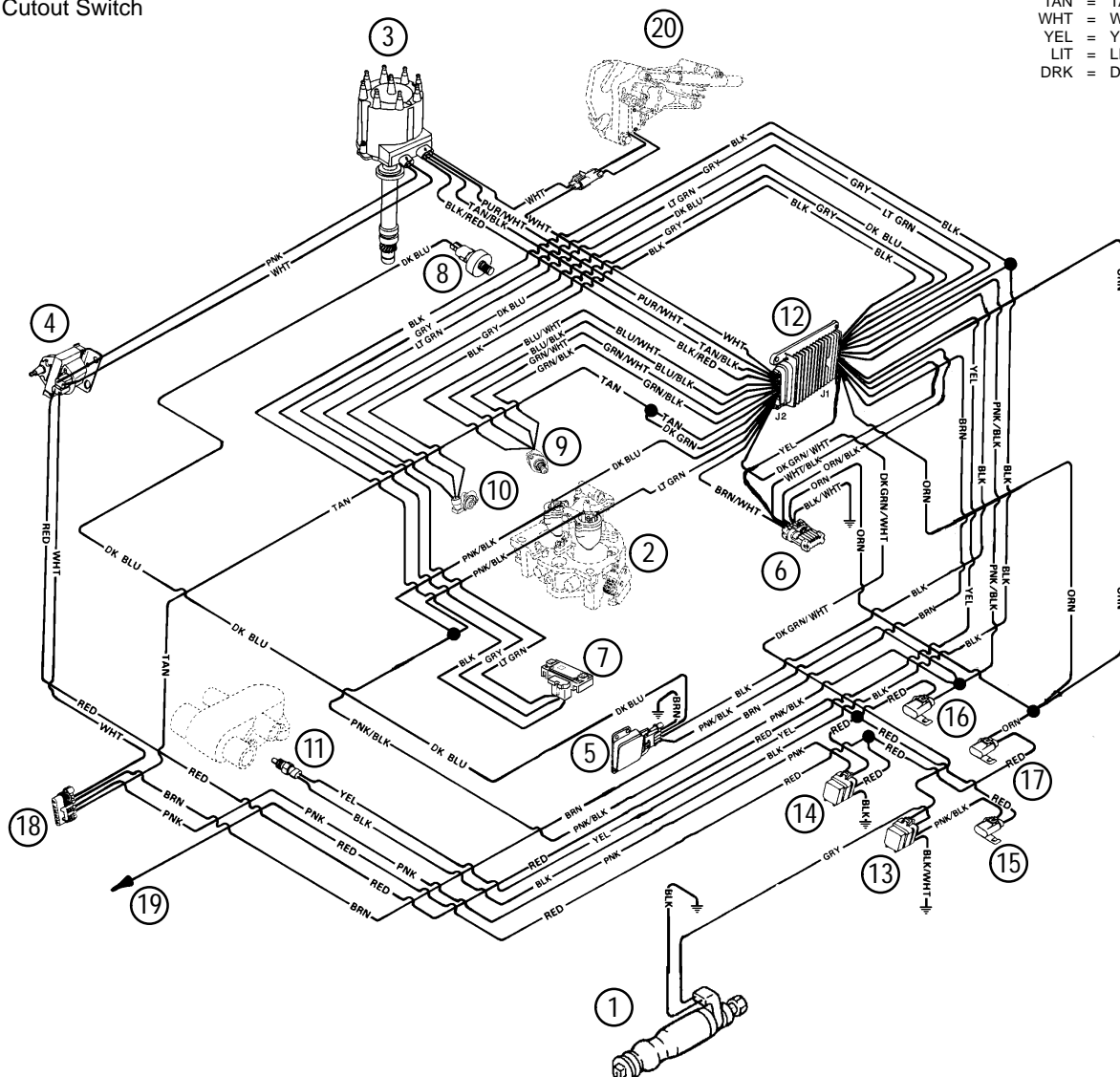
MCM 5.0L EFI and 5.7L EFI Alpha - Fuel and Ignition System Harness

NOTE: All BLACK wires with a ground symbol are interconnected within the EFI system harness.

NOTE: Component position and orientation shown is arranged for visual clarity and ease of circuit identification.

- 1 - Fuel Pump
- 2 - Throttle Body
- 3 - Distributor
- 4 - Coil
- 5 - Electronic Spark Control (KS) Module
- 6 - Data Link Connector (DLC)
- 7 - Manifold Absolute Pressure (MAP) Sensor
- 8 - Knock Sensor
- 9 - Idle Air Control (IAC)
- 10- Throttle Position (TP) Sensor
- 11- Engine Coolant Temperature (ECT) Sensor
- 12- Electronic Control Module (ECM)
- 13- Fuel Pump Relay
- 14- Ignition/System Relay
- 15- Fuse (15 Amp) Fuel Pump
- 16- Fuse (15 Amp) ECM/DLC/Battery
- 17- Fuse (10 Amp) ECM/Injector/Ignition/Knock Module
- 18- Harness Connector To Starting/Charging Harness
- 19- Positive (+) Power Wire To Engine Circuit Breaker
- 20- Shift Cutout Switch

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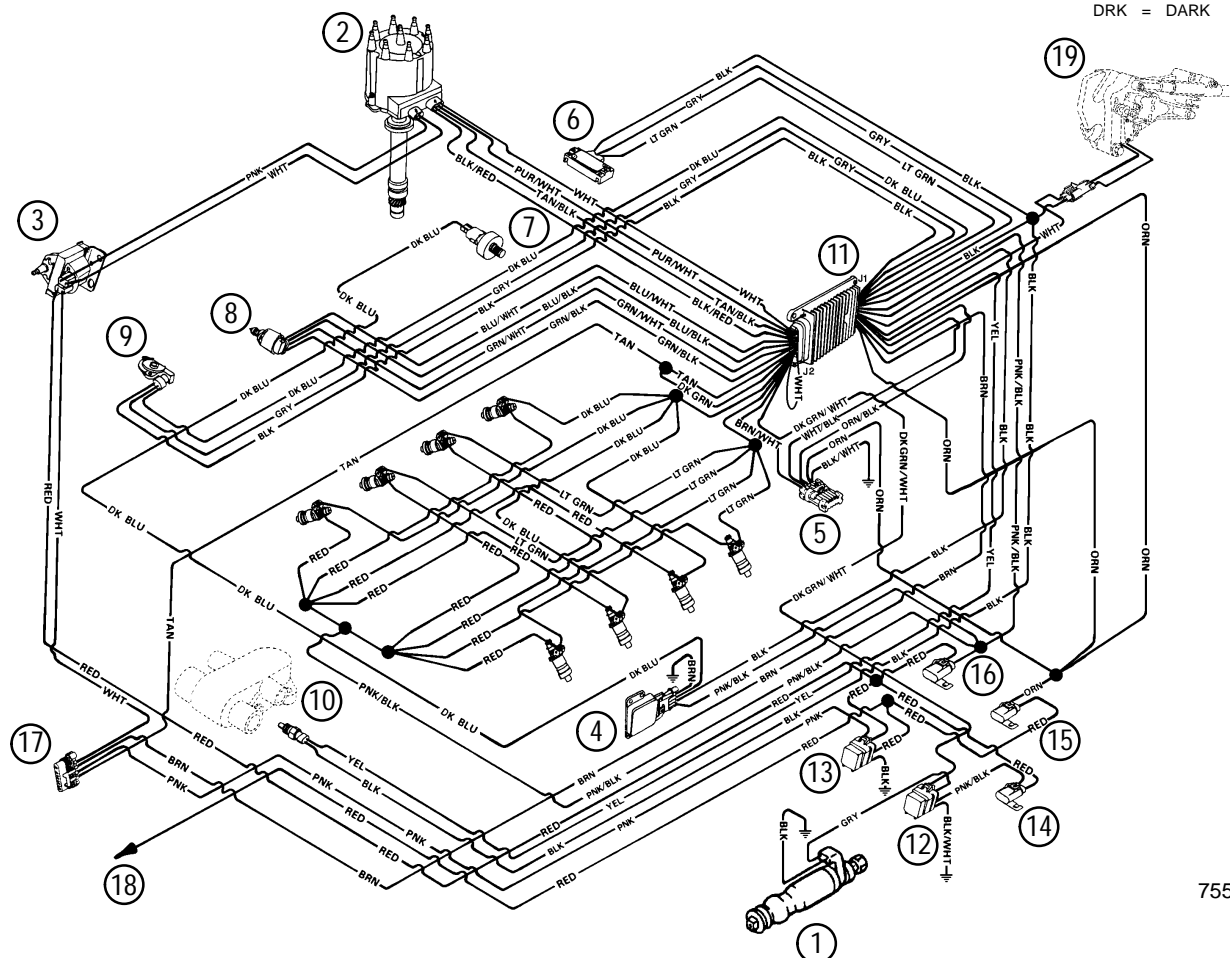
MCM 350 Mag MPI Alpha-Fuel and Ignition System Harness

NOTE: All BLACK wires with a ground symbol are interconnected within the EFI system harness.

NOTE: Component position and orientation shown is arranged for visual clarity and ease of circuit identification.

- 1 - Fuel Pump
- 2 - Distributor
- 3 - Coil
- 4 - Electronic Spark Control (KS) Module
- 5 - Data Link Connector (DLC)
- 6 - Manifold Absolute Pressure (MAP) Sensor
- 7 - Knock Sensor
- 8 - Idle Air Control (IAC)
- 9 - Throttle Position (TP) Sensor
- 10- Engine Coolant Temperature (ECT) Sensor
- 11- Electronic Control Module (ECM)
- 12- Fuel Pump Relay
- 13- Ignition/System Relay
- 14- Fuse (15 Amp) Fuel Pump
- 15- Fuse (15 Amp) ECM/DLC/Battery
- 16- Fuse (10 Amp) ECM/Injector/Ignition/Knock Module
- 17- Harness Connector To Starting/Charging Harness
- 18- Positive (+) Power Wire To Engine Circuit Breaker
- 19- Shift Plate Cutout Switch

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 GRN = GREEN
 ORN = ORANGE
 PNK = PINK
 PUR = PURPLE
 RED = RED
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SECTION 8 - Water Flow Diagrams

SECTION 8 - Water Flow Diagrams

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V6 Engines - Seawater (Raw Water)	
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Water Flow Diagrams



Water Flow Diagrams

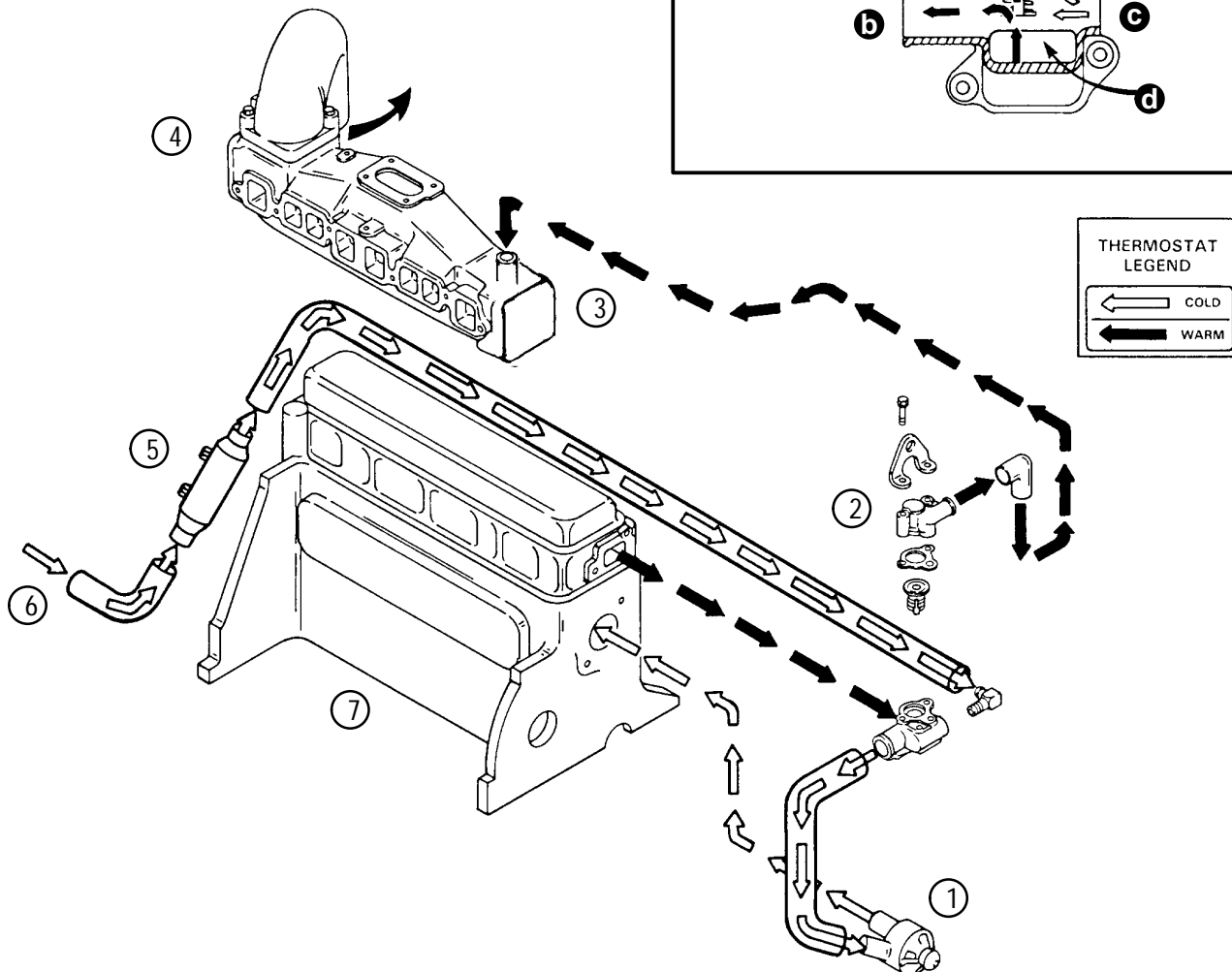
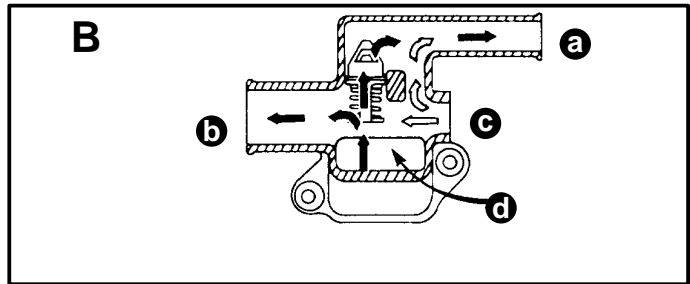
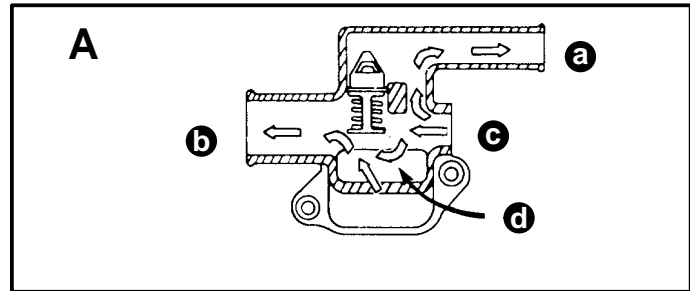
3.0L Engines - Seawater (Raw Water) Cooling System

- 1 - Engine Circulating Pump
- 2 - Thermostat Housing
- 3 - Intake and Exhaust Manifold
- 4 - Exhaust Elbow
- 5 - Power Steering Cooler (If Equipped)
- 6 - Seawater Intake (From Sterndrive)
- 7 - Engine Block and Cylinder Head Assembly

“A” Water Flow With Thermostat Closed

“B” Water Flow With Thermostat Open

- a - To Exhaust Manifold
- b - To Engine Circulating Pump
- c - Inlet From Sterndrive
- d - From Block and Cylinder Head

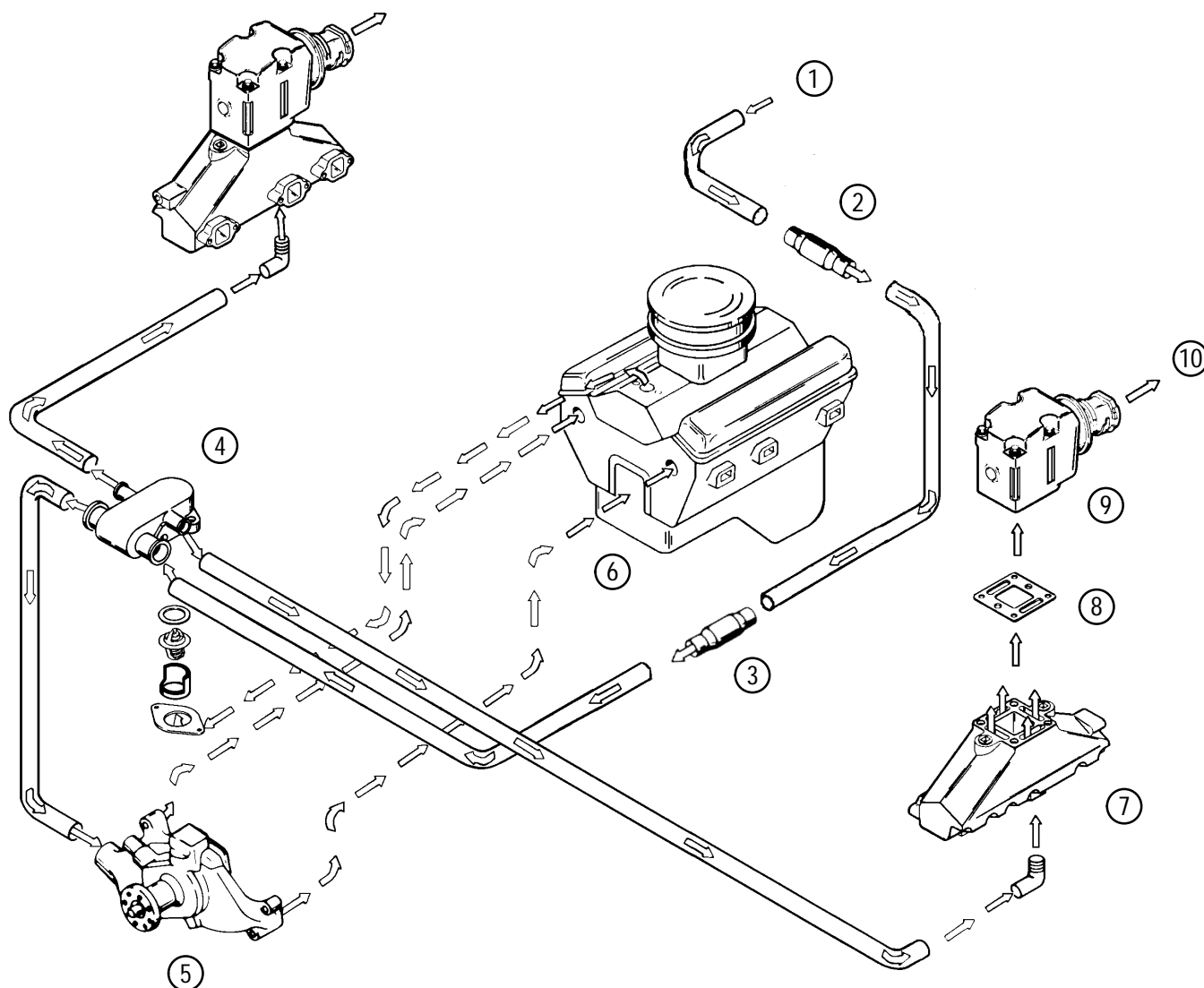


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V6 Engines - Seawater (Raw Water) Cooling System

NOTE: Certain components in the following diagram may look different than on your particular power package, but the water flow paths remain similar on all engines.

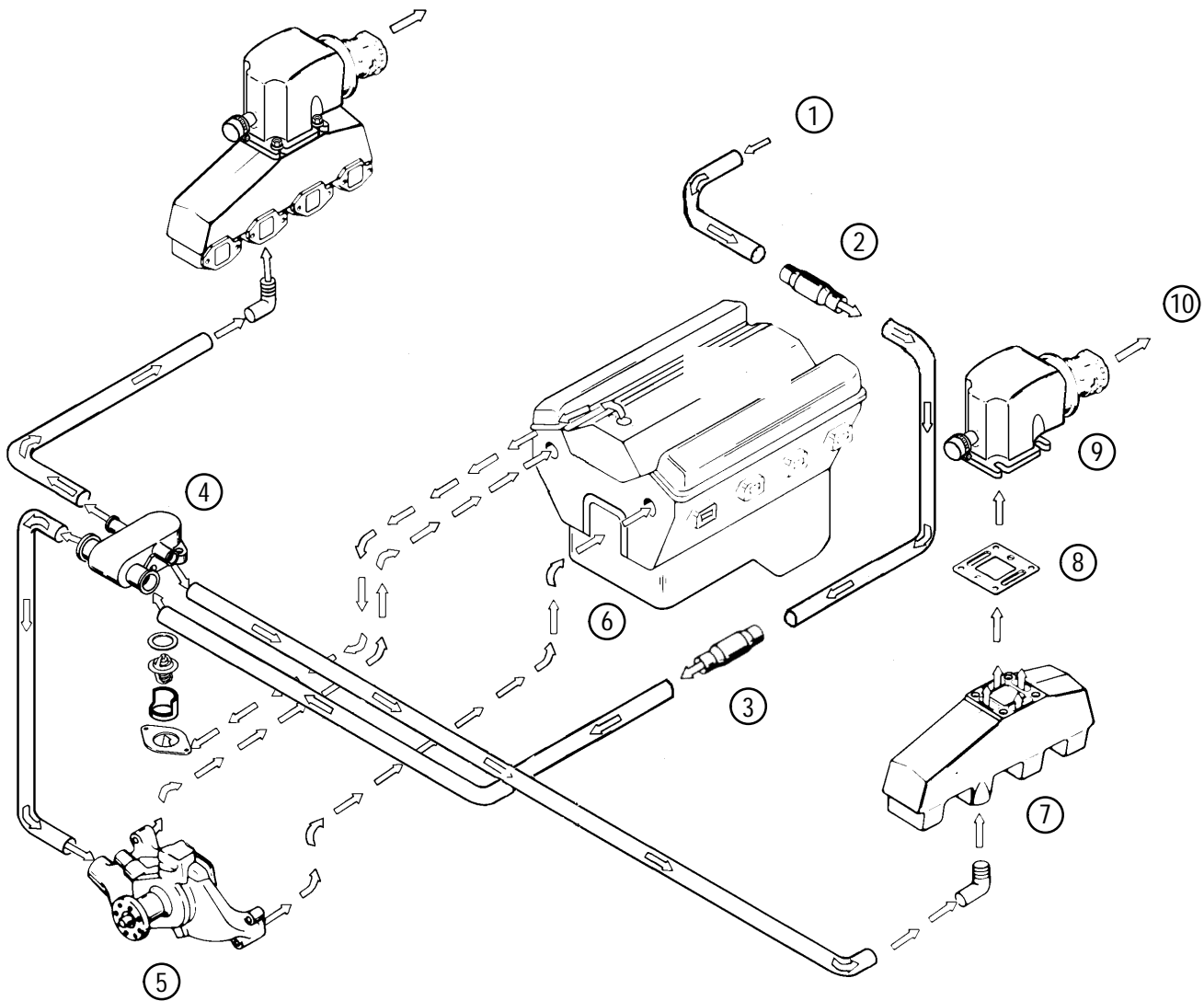
- 1 - Seawater Intake (From Sterndrive)
- 2 - Power Steering Cooler, If So Equipped
- 3 - Fuel Cooler (EFI Models)
- 4 - Thermostat Housing and Cover Assembly
- 5 - Engine Water Circulating Pump
- 6 - Engine Block and Cylinder Head Assembly
- 7 - Exhaust Manifold, Typical
- 8 - Restrictor Gasket
- 9 - Exhaust Elbow Assembly, Typical
- 10- Water Flow Overboard



V8 Engines - Seawater (Raw Water) Cooling System

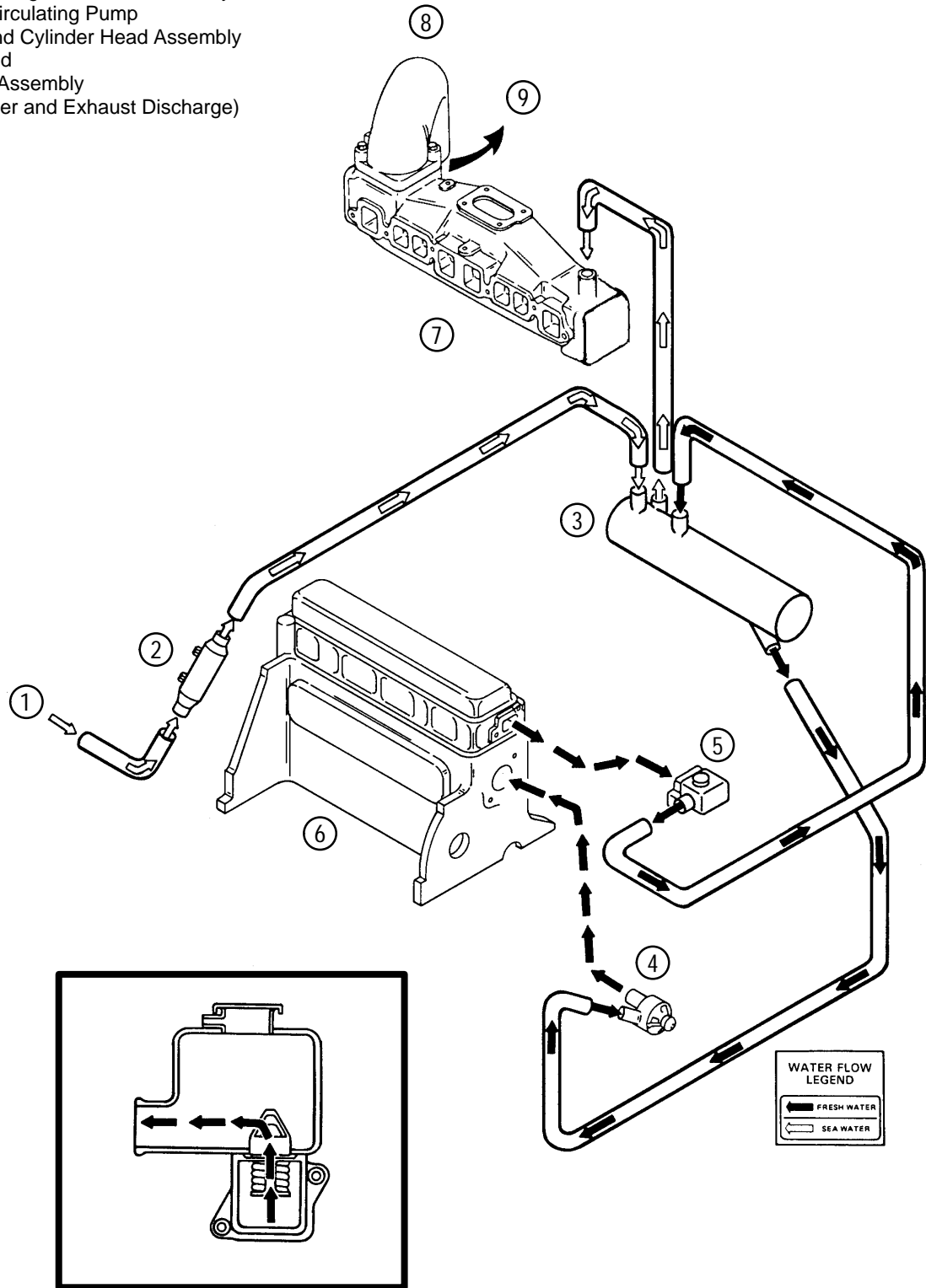
NOTE: Certain components in the following diagram may look different than on your particular power package, but the water flow paths remain similar on all engines.

- 1 - Seawater Intake (From Sterndrive)
- 2 - Power Steering Cooler
- 3 - Fuel Cooler (EFI and MPI Models)
- 4 - Thermostat Housing and Cover Assembly
- 5 - Engine Water Circulating Pump
- 6 - Engine Block and Cylinder Head Assembly
- 7 - Exhaust Manifold, Typical
- 8 - Restrictor Gasket
- 9 - Exhaust Elbow Assembly, Typical
- 10- Water Flow Overboard



3.0L Engines - Closed (Coolant) Cooling System

- 1 - Seawater Intake (From Sterndrive)
- 2 - Power Steering Cooler, If So Equipped
- 3 - Heat Exchanger
- 4 - Thermostat Housing and Cover Assembly
- 5 - Engine Water Circulating Pump
- 6 - Engine Block and Cylinder Head Assembly
- 7 - Exhaust Manifold
- 8 - Exhaust Elbow Assembly
- 9 - Overboard (Water and Exhaust Discharge)

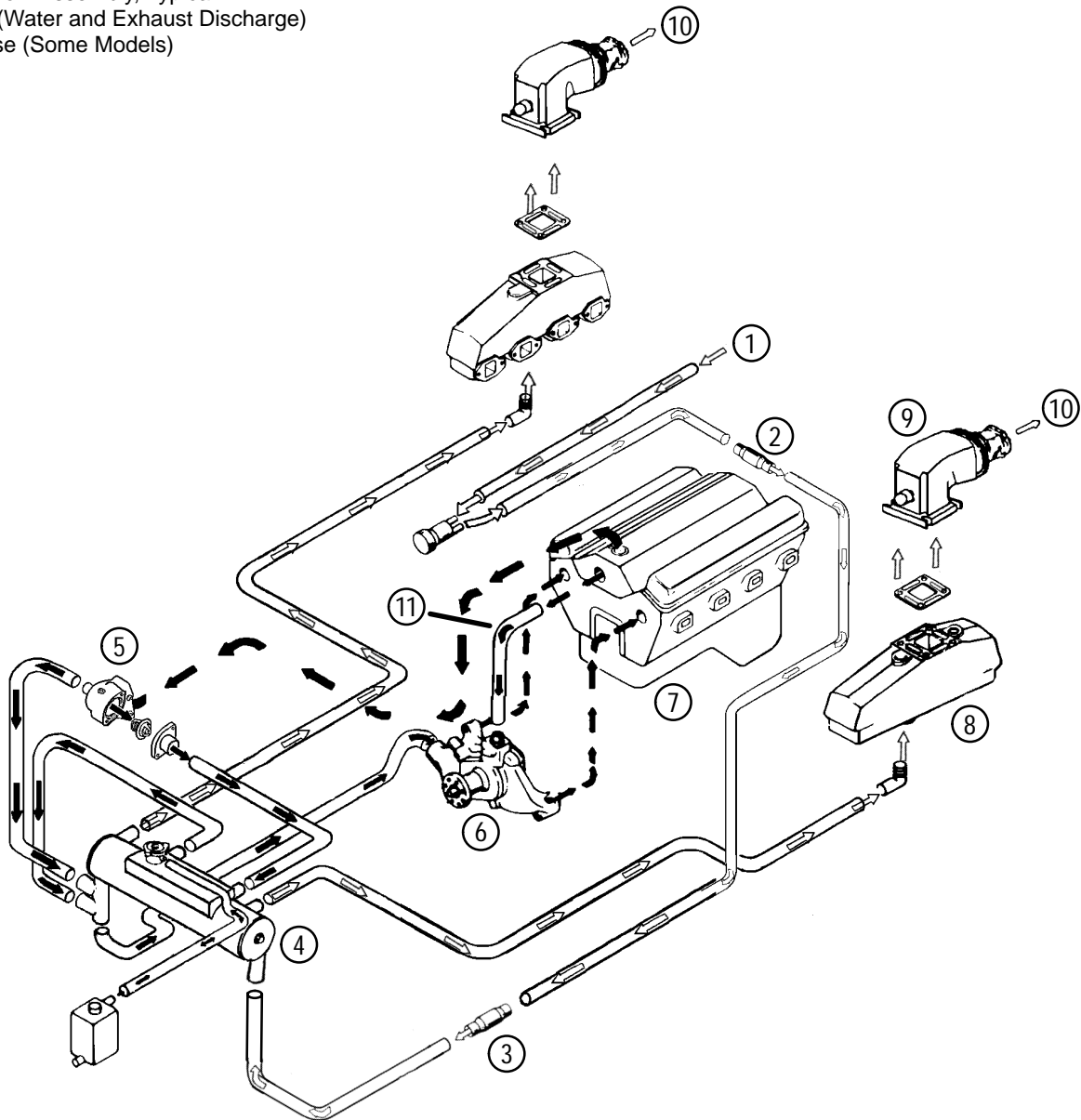


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V6 and V8 Engines - Closed (Coolant) Cooling System

NOTE: Certain components in the following diagram may look different than on your particular power package, but the water and coolant flow paths remain similar on all engines.

- 1 - Seawater Intake (From Sterndrive)
- 2 - Power Steering Cooler
- 3 - Fuel Cooler, If So Equipped
- 4 - Heat Exchanger, Typical
- 5 - Thermostat Housing and Cover Assembly
- 6 - Engine Water Circulating Pump
- 7 - Engine Block and Cylinder Head Assembly
- 8 - Exhaust Manifold, Typical
- 9 - Exhaust Elbow Assembly, Typical
- 10- Overboard (Water and Exhaust Discharge)
- 11- Bypass Hose (Some Models)



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SECTION 9 - Troubleshooting

SECTION 9 - Troubleshooting

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Troubleshooting

9

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.

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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.
Faulty fuel pump.	3.0L Models: Check sight tube for fuel. Have Authorized MerCruiser Dealer replace pump, if fuel is present.
Choke not operating properly.	Carburetor Models: Check choke linkages for freedom of movement.
Engine Flooded.	Do not attempt to start engine for at least 5 minutes. Refer to Starting Procedures.
Faulty ignition system component.	Service ignition system.
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.
EFI System Fault	Have EFI System checked by an Authorized MerCruiser Dealer.

Engine Runs Rough, Misses And/Or Backfires

Possible Cause	Remedy
Idle speed too low	EFI Models: Have EFI system checked by an Authorized MerCruiser Dealer.
Choke not operating properly.	Carburetor Models: Check choke linkages for binding or an obstruction.
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.
EFI System fault.	Have EFI System checked.

Poor Performance

Possible Cause	Remedy
Throttle not fully open	Inspect throttle cable and linkages for proper operation.
Damaged or 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.
EFI System fault.	Have EFI System checked.

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.
Coolant level low in closed cooling section. (If Equipped)	Check for cause of low coolant level and repair. Fill system with proper coolant solution.
Heat Exchanger Cores plugged with foreign material (If Equipped).	Clean Heat Exchanger.
Loss of pressure in closed cooling section (If Equipped).	Check for leaks. Clean, inspect, and test pressure cap.
Faulty seawater pickup pump.	Repair.
Seawater discharge restricted or plugged.	Clean exhaust elbows.

Insufficient Engine Temperature

Possible Cause	Remedy
Faulty Thermostat	Replace.

Low Engine Oil Pressure

Possible Cause	Remedy
Insufficient oil in crank case.	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, bad fuel pump, etc.).
Diluted or improper viscosity oil.	Change oil and oil filter, using correct grade and viscosity oil. Determine cause for dilution (excessive idling, faulty fuel pump, etc.).

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

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 linkages	Check all throttle 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.

Steering Wheel Turns Hard Or Jerky

Possible Cause	Remedy
Low power steering pump fluid level.	Refill system with fluid.
Drive belt loose or in poor condition.	Replace and/or adjust.
Insufficient lubrication on steering 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.

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 connection. Repair or replace wiring.

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

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

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SECTION 10 - General Maintenance Parts

SECTION 10 - General Maintenance Parts

General Maintenance
Parts

10

General Maintenance Parts

Engine Parts

Part	3.0L
Oil Filter	14957
Spark Plug	816336
Distributor Cap	811635
Ignition Coil	817378T
Spark Plug Wire Set	84-816761A14
Thermostat	59078
Thermostat Gaskets	27-47590--1
Alternator Belt	57-64032A1
Power Steering Belt	57-65607T
Water Pump Belt	57-64032A1
Quicksilver Motor Oil	92-816096A12
Storage Seal	92-86145A12
Gasoline Stabilizer for Marine Engines	92-817529A12
Fuel System Cleaner	92-17885A12
Corrosion Guard Spray	92-815869A12

Engine Parts

Part	4.3L	4.3LH
Oil Filter	41815	41815
Spark Plug	816336	816336
Distributor Cap	815407A2	815407A2
Ignition Coil	392-805570A2	392-805570A2
Spark Plug Wire Set	84-816761A16	84-816761A16
Thermostat (160° F)	807252--2	807252--2
Thermostat Gaskets	27-33179--2 27-53045--1	27-33179--2 27-53045--1
Serpentine Belt With Power Steering ¹	57-807755--2	57-807755--2
Serpentine Belt Without Power Steering ¹	57-807755--5	57-807755--5
Water Separating Filter	35-807172	35-807172
Quicksilver Motor Oil	92-816096A12	92-816096A12
Storage Seal	92-86145A12	92-86145A12
Quicksilver Valve Lubricant	92-826259A12	92-826259A12
Gasoline Stabilizer for Marine Engines	92-817529A12	92-817529A12
Fuel System Cleaner	92-17885A12	92-17885A12
Corrosion Guard Spray	92-815869A12	92-815869A12

¹ The belt listed is for a standard production engine. For other versions, such as Closed Cooled models or models without power steering, ask your Authorized MerCruiser Dealer for assistance.

Engine Parts

Part	4.3L EFI
Oil Filter	41815
Spark Plug	33-816336
Distributor Cap	850484
Ignition Coil	392-805570A2
Spark Plug Wire Set	84-816761A16
Thermostat (160° F)	807252--2
Thermostat Gaskets	27-33179--2, 27-53045--1
Serpentine Belt With Power Steering ¹	57-807755--2
Serpentine Belt Without Power Steering ¹	57-807755--5
Quicksilver Motor Oil	92-816096A12
Storage Seal	92-86145A12
Quicksilver Valve Lubricant	92-826259A12
Gasoline Stabilizer for Marine Engines	92-817529A12
Fuel System Cleaner	92-17885A12
Corrosion Guard Spray	92-815869A12

¹ : The belt listed is for a standard production engine. For other versions, such as Closed Cooled models, ask your Authorized MerCruiser Dealer for assistance.

Engine Parts

Part	5.0L	5.7L
Oil Filter	14957	14957
Spark Plug	33-59571	33-59571
Distributor Cap	805759A2	805759A2
Ignition Coil	392-805570A2	392-805570A2
Spark Plug Wire Set	84-816761A17	84-816761A17
Thermostat (160° F)	807252--2	807252--2
Thermostat Gaskets	27-33179--2, 27-53045--1	27-33179--2, 27-53045--1
Serpentine Belt With Power Steering ¹	57-807755--2	57-807755--2
Serpentine Belt Without Power Steering ¹	57-807755--5	57-807755--5
Quicksilver Motor Oil	92-816096A12	92-816096A12
Storage Seal	92-86145A12	92-86145A12
Gasoline Stabilizer for Marine Engines	92-817529A12	92-817529A12
Fuel System Cleaner	92-17885A12	92-17885A12
Corrosion Guard Spray	92-815869A12	92-815869A12

¹ : The belt listed is for a standard production engine. For other versions, such as Closed Cooled models or models without power steering, ask your Authorized MerCruiser Dealer for assistance.

Engine Parts

Part	5.0L EFI	5.7L EFI	350 Magnum MPI
Oil Filter	14957	14957	14957
Spark Plug	33-59571	33-59571	816336
Distributor Cap	808483	808483	808483
Ignition Coil	806673	806673	806673
Spark Plug Wire Set	816608A68	816608A68	816608A68
Thermostat (160° F)	807252--2	807252--2	807252--2
Thermostat Gaskets	27-47510 27-53045--1	27-47510 27-53045--1	27-47510 27-53045--1
Serpentine Belt With Power Steering ¹	57-807755--2	57-807755--2	57-807755--2
Serpentine Belt Without Power Steering ¹	57-807755--5	57-807755--5	57-807755--5
Water Separating Filter	35-807172	35-807172	35-807172
Quicksilver Motor Oil	92-816096A12	92-816096A12	92-816096A12
Storage Seal	92-86145A12	92-86145A12	92-86145A12
Gasoline Stabilizer for Marine Engines	92-817529A12	92-817529A12	92-817529A12
Fuel System Cleaner	92-17885A12	92-17885A12	92-17885A12
Corrosion Guard Spray	92-815869A12	92-815869A12	92-815869A12

¹ : The belt listed is for a standard production engine. For other versions, such as Closed Cooled models, ask your Authorized MerCruiser Dealer for assistance.

Drive Parts

Part	Alpha One Gen. II
Propeller Nut	11-52707A1
Rear Propeller Washer	12-31211A2
Tab Washer	14-816629
Grounding Washer	13-42351--1
Thrust Hub	12-835467
Decal Set (Standard Rotation)	37-861432A98
Decal Set (Counter Rotation)	37-861446A98
Anodic Assembly	76214A5
Trim Cylinder Anodic Assembly	806189A1
Bearing Carrier Anode	806105A1
Drain Screw	22-67892A1
Drain Screw Washer	12-19183
Vent Screw	10-79953A2
Vent Screw Washer	12-19183
Drive Mounting Gasket	27-94996A2
Drive Mounting O-ring	27-35982
Trim Pump 20 Amp Fuse	88-79091
Trim Pump 10 Amp Fuse	88-79023A10
Water Pump Impeller	47-43026--4
Water Pump Cover Gasket	27-817277
Water Pump Base Gasket	27-43033--1
Water Pump Face Plate	817276
2-4-C Marine Lubricant with Teflon	92-825407A3
U-Joint and Gimbal Bearing Grease	92-828052A2
Engine Coupler Spline Grease	92-816391A4
Special Lubricant 101	92-13872A1
High Performance Gear Lube	92-816026A2
Touch Up Spray Paint	92-78373-12

SECTION 11 - Owner / Operator Logbook

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Logbook

11

Owner/Operator Logbook

Date	Maintenance and Repair	Operating Hours

Owner/Operator Logbook

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Date	Maintenance and Repair	Operating Hours