Service Manual Outline

Notice

Throughout this publication, Dangers, Warnings and Cautions (accompanied by the International HAZARD Symbol ⚠) are used to alert the mechanic 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 to these special instructions when performing the service, plus common sense operation, are major accident prevention measures.

⚠ DANGER

Immediate hazards which will result in severe personal injury or death.

⚠ WARNING

Hazards or unsafe practices which could result in severe personal injury or death.

⚠ CAUTION

Hazards or unsafe practices which could result in minor personal injury or product or property damage.

Notice to Users of This Manual

This service manual has been written and published by the Service Department of Mercury Marine to aid our dealers' mechanics and company service personnel when servicing the products described herein.

It is assumed that these personnel are familiar with marine product servicing procedures. Furthermore, it is assumed that they have been trained in the recommended service procedures of Mercury MerCruiser product, including the use of mechanics' common hand tools and the special Mercury Marine or recommended tools from other suppliers.

We could not possibly know of and advise the marine trade of all conceivable procedures and of the possible hazards and/or results of each method. Therefore, anyone who uses a service procedure and/or tool, which is not recommended by the manufacturer, first must completely satisfy himself that neither his nor the products safety will be endangered.

All information, illustrations and specifications contained in this manual are based on the latest product information available at the time of publication. As required, revisions to this manual will be sent to all dealers contracted by us to sell and/or service these products.

We reserve the right to make changes to this manual without prior notification.

Refer to dealer service bulletins, operation maintenance and warranty manuals and installation manuals for other pertinent information concerning the products described in this manual.

It should be kept in mind, while working on the product, that the electrical system is capable of violent and damaging short circuits or severe electrical shocks. When performing any work where electrical terminals could possibly be grounded or touched by the mechanic, the battery cables should be disconnected at the battery.

Any time the intake or exhaust openings are exposed during service they should be covered to protect against accidental entrance of foreign material which could enter the cylinders and cause extensive internal damage when the engine is started.

It is important to note, during any maintenance procedure replacement fasteners must have the same measurements and strength as those removed. Numbers on the heads of the metric bolts and on the surfaces of metric nuts indicate their strength. American bolts use radial lines for this purpose, while most American nuts do not have strength markings. Mismatched or incorrect fasteners can result in damage or malfunction, or possibly personal injury. Therefore, fasteners removed should be saved for reuse in the same locations whenever possible. Where the fasteners are not satisfactory for re-use, care should be taken to select a replacement that matches the original.

Engine Mechanical Components

Many of the engine mechanical components are designed for marine applications. Unlike automotive engines, marine engines are subjected to extended periods of heavy load and wide open throttle operation and, therefore, require heavy-duty components. Special marine engine parts have design and manufacturing specifications that are required to provide long life and dependable performance. Marine engine parts also must be able to resist the corrosive action of salt or brackish water that will rust or corrode standard automotive parts within a short period of time.

Failure to use recommended Mercury / Quicksilver service replacement parts can result in poor engine performance and/or durability, rapid corrosion of parts subjected to salt water and possibly complete failure of the engine.

Replacement Parts

Use of parts other than the recommended service replacement parts, will void the warranty on those parts that are damaged as a result.

⚠ WARNING

Electrical and fuel system components on Mercury MerCruiser Engines and Stern Drives 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 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 and fuel systems, it is extremely important that all components are properly installed and tightened. If not, any electrical component opening would permit sparks to ignite fuel vapors from fuel system leaks, if they existed.

Models Covered in This Manual

Sterndrive (MCM)	Serial Number
D2.8L D-Tronic	0K000001 and Above
D4.2L D-Tronic	0K000001 and Above

Inboard (MIE)	Serial Number
D2.8L D-Tronic	0K000001 and Above
D4.2L D-Tronic	0K000001 and Above

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1 A

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NOTICE
For information and procedures on Troubleshooting, refer to SECTION 1C.

NOTICE
Refer to appropriate Sterndrive Service Manual for transom assembly and sterndrive unit repair.

Introduction

This comprehensive overhaul and repair manual is designed as a service guide for the models previously listed. It provides specific information, including procedures for disassembly, inspection, assembly and adjustment to enable dealers and service mechanics to repair and tune these engines.

Before attempting repairs, it is suggested that the procedure first be read through to gain knowledge of the methods and tools used and the cautions and warnings required for safety.

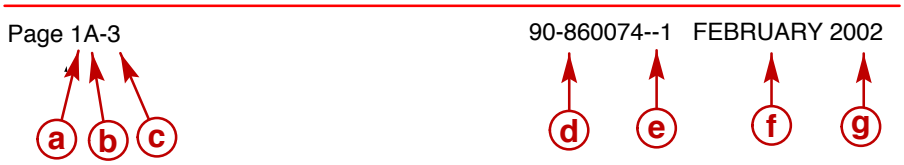
How to Use This Manual

This manual is divided into sections that represent major components and systems.

Some sections are further divided into parts that more fully describe the component.

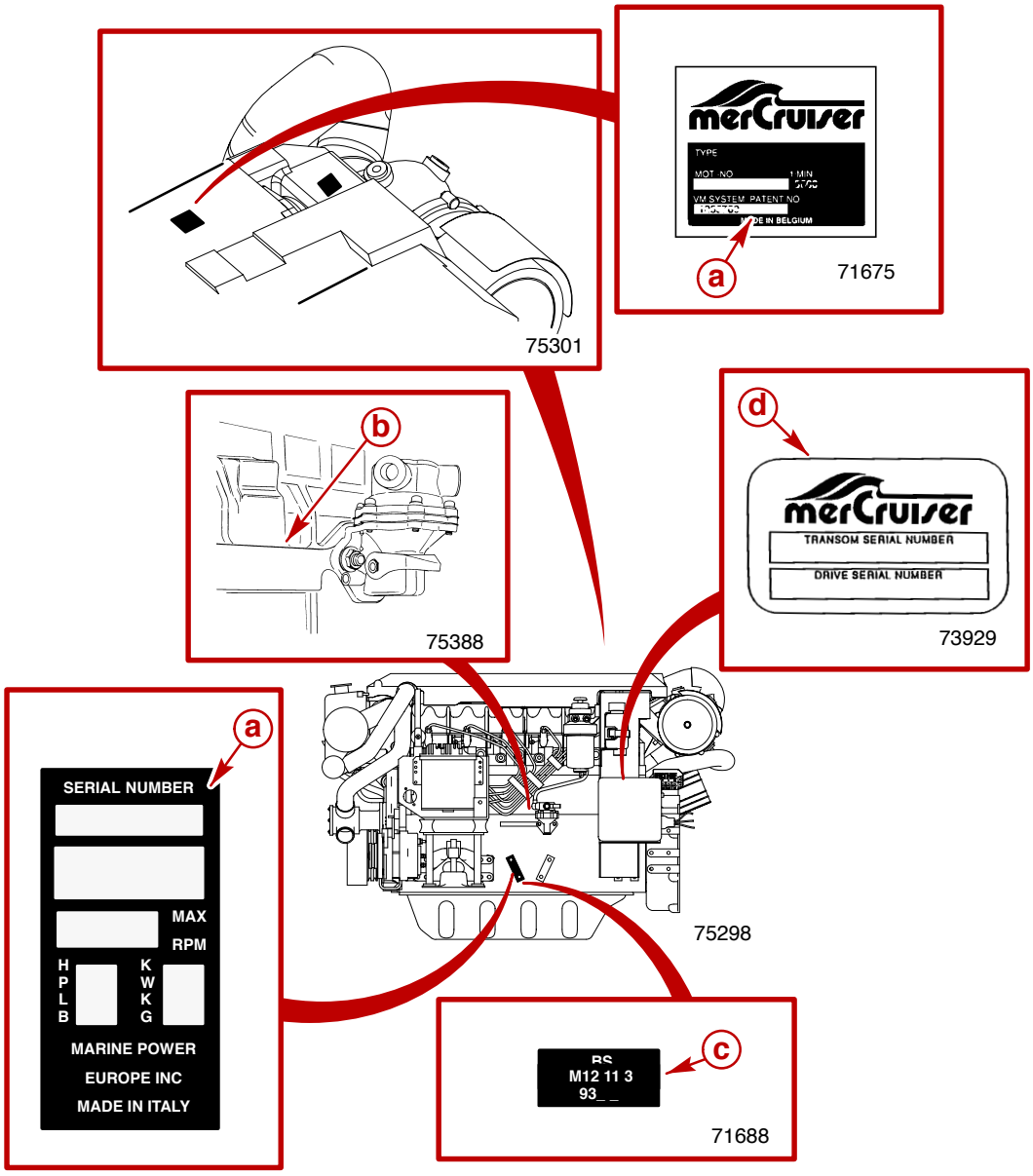
Page Numbering

Two number groups appear at the bottom of each page. The following is an example and description.



a - Section Number
b - Section Part
c - Page Number
d - Manual Number
e - Revision Number 1
f - Month Printed
g - Year Printed

Engine Serial Number / Decal Locations



Typical Sterndrive (MCM) Engine Shown - Inboard (MIE) Similar

- **a** - Serial Number Plate
- **b** - Manufacturer's Serial Number (Stamped in Block)
- **c** - Exhaust Gas Emissions Certificate Number (Example)
- **d** - MerCruiser Specification Decal

Operation / Duty Cycle

It is the operator's responsibility to operate within the following specified operational capability, or duty cycle, as applicable to engine and installation:

NOTE:
Pleasure duty rating applies to recreational planing craft used exclusively for pleasure and recreation.

Light duty rating applies to planing boats where the use of full rated power at maximum rated rpm is limited (as stated above). Examples of Light Duty applications include, but are not limited to: search and rescue craft, fast patrol boats, fire boats, dive boats, and limited season fishing boats such as sport-fish charter boats. Application to common commercial crafts having full-displacement or semi-displacement hulls exceeds the recommended operational capability, or duty cycle.

IMPORTANT: Damage caused by improper application or failure to operate within the operational capability, or duty cycle, will not be covered by the Mercury MerCruiser Diesel Limited Warranty.

PLEASURE DUTY RATING / DUTY CYCLE

D2.8L D-Tronic and D4.2L D-Tronic	
Specified Operating RPM Range	3600 - 3800
Wide Open Throttle (WOT) Operation	Limited to short periods of time.

LIGHT DUTY RATING / DUTY CYCLE

D2.8L D-Tronic and D4.2L D-Tronic	
Specified Operating RPM Range	3600-3800
Wide Open Throttle (WOT) Operation	Limited to less that 10% of operating time.
Continuous cruising RPM	Limited to 90% or less of wide open throttle RPM
Annual operating time	Not to exceed 500 hours

Engine Break-In

Initial Break-In Procedure

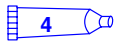
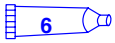
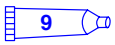
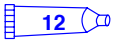
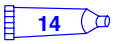
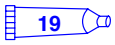
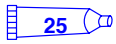
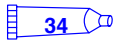
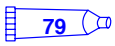
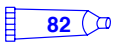
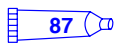
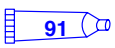
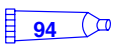
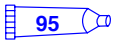
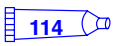
The following procedure must be used on new and rebuilt diesel engines. This break-in procedure allows the proper seating of the pistons and rings, which greatly reduces the likelihood of problems.

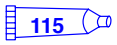
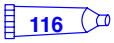
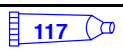
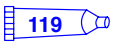
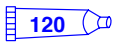
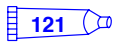
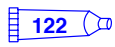
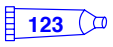
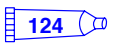
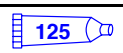
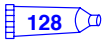
IMPORTANT: It is recommended that the boat not be accelerated hard until this procedure has been completed.

IMPORTANT: Never operate the starter motor longer than 15 seconds at a time, to avoid overheating the starter motor. If engine does not start, wait 1 minute to allow the starter motor to cool; then, repeat starting procedure.

1. Refer to appropriate Starting, Shifting and Stopping section in the Operation, Maintenance and Warranty Manual provided with the product and start the engine. Allow the engine to idle until it has reached normal operating temperature.
2. Operate the engine in gear for 3 minutes at each of the following rpms: 1200 rpm, 2400 rpm and 3000 rpm.
3. Operate the engine in gear for 3 minutes at each of the following rpms: 1500 rpm, 2800 rpm and 3400 rpm.
4. Operate the engine in gear for 3 minutes at each of the following rpms: 1800 rpm, 3000 rpm and WOT.

Mercury/Quicksilver Lubricants, Sealants And Adhesives

Tube Ref. #	Description	Container Size	Mercury Part Number	Quicksilver Part Number
	Needle Bearing Assy. Lubricant	8 oz (226.8 g) tube	N/A	92-802868A1
	Dielectric Grease	8 oz (226.8 g) can	N/A	92-823506-1
	Loctite 271 - Thread Locker	10 ml tube	N/A	92-809819
	Loctite 567 PST Pipe Sealant	50 ml tube	N/A	92-809822
	Loctite Master Gasket Kit		N/A	92-12564-2
	2 Cycle Premium Outboard Oil	1 US qt (0.94 L)	92-802813A1	92-802813Q1
	Perfect Seal	16 oz (0.45 kg) can	N/A	92-34227-1
	Liquid Neoprene	8 oz (226.8 g) can	N/A	92-25711-3
	Bellows Adhesive	1.5 oz (42.5 g) tube	N/A	92-86166Q1
	Loctite 680 Retaining Compound	10 ml tube	N/A	92-809833
	Special Lubricant 101	8 oz (226.8 g) tube	92-802865A1	92-802865Q1
	U-Joint and Gimbal Bearing Grease		92-802870A1	92-802870Q1
	Loctite 222 Thread Locker	10 ml tube	N/A	92-809818
	Loctite 242 Thread Locker	10 ml tube	N/A	92-809821
	4 Cycle 25W40 Engine Oil		92-802837A1	92-802837Q1
	Premium Gear Lubricant	1 US qt (0.94 L)	92-802846A1	92-802846Q1
	High Performance Gear Lube	1 US qt (0.94 L)	92-802854A1	92-802854Q1
	Engine Coupler Spline Grease	14 oz (0.39 kg) cartridge	92-802869A1	92-802869Q1
	Anti-Corrosion Grease	8 oz (226.8 g) tube	92-802867A1	92-802867Q1
	2-4-C with Teflon	8 oz (226.8 g) tube	92-802859A1	92-802859Q1
	4 Stroke 10W30 Outboard Oil	1 US qt (0.94 L)	92-802833A1	92-802833Q1
	Power Trim & Steering Fluid	8 oz (226.8 g)	92-802880A1	92-802880Q1

Tube Ref. #	Description	Container Size	Mercury Part Number	Quicksilver Part Number
	Premium Plus 2 Cycle TC-W3 Outboard Oil	1 US qt (0.94 L)	92-802824A1	92-802824Q1
	RTV 587 Silicone Sealer	3 oz (85.05 g)	N/A	92-809825
	Loctite 7649 Primer N	4.5 oz (127.57 g)	N/A	92-809824
	Storage Seal Rust Inhibitor	12 oz (325 ml) spray can	92-802878-56	92-802878Q56
	Corrosion Guard	12 oz (325 ml) spray can	92-802878 55	92-802878Q55
	15W40 4-cycle Diesel Engine Oil	1.06 US gal.(4 L)	92-877695K1	92-877695Q1
	Extended Life Antifreeze/Coolant	1 US gal. (3.78 L)	92-877770K1	92-877770K1
	Marine Engine Coolant	1.33 US gal. (5 L)	N/A	92-813054A2
	Fuel System Treatment and Stabilizer Concentrate	16 oz (437 ml)	92-802876A1	92-802876Q1
	Heat Transfer Compound	1.5 oz (42.5 g) tube	N/A	92-805701 1
	Liquid Gasket		N/A	92-808137
	T442 Sealant		N/A	92-862258
	Loctite 5900 Ultra Black RTV Silicone Sealant	13 oz (371 g) tube	N/A	92-809826
	Loctite Gasket Remover	18 oz (532 ml) spray can	N/A	92-809828 1
	Sealer Kit, Two Part Epoxy		N/A	92-65150 1
	Dexron III Automatic Transmission Fluid		Obtain Locally	Obtain Locally
	Loctite 592		Obtain Locally	Obtain Locally
	Loctite Quick Tite		Obtain Locally	Obtain Locally
	Isopropyl Alcohol		Obtain Locally	Obtain Locally
	Hot Glue		Obtain Locally	Obtain Locally
	Loctite 609		Obtain Locally	Obtain Locally
	Loctite 405		Obtain Locally	Obtain Locally
	Cyanacrylate Adhesive		Obtain Locally	Obtain Locally
	3M Permabond #3M08155		Obtain Locally	Obtain Locally
	Loctite 262		Obtain Locally	Obtain Locally