
Service Manual Outline

Section 1 - Important Information

- A - General Information
- B - Maintenance
- C - Troubleshooting

Section 2 - Removal and Installation

- A - Sterndrive (MCM) Models
- B - Inboard (MIE) Models

Section 3 - Engine Mechanical

- A - D2.8L D-Tronic And D4.2L D-Tronic Engines

Section 4 - Electrical System

- A - Starting System
- B - Charging System
- C - Glow Plug System (If Equipped)
- D - Instrumentation
- E - Wiring Diagrams

Section 5 - Fuel System

- A - Description
- B - Fuel Delivery Pump and Fuel Filter
- C - Injectors
- D - Injection Pump
- E - EDI Diagnosis

Section 6 - Cooling System

- A - Seawater Cooling System
- B - Closed Cooling System

Section 7 - Intake And Exhaust System

- A - Intercooler
- B - Intake / Exhaust Manifold, Elbows and Risers
- C - Turbocharger

Section 8 - Drive System


- A - ZF / Hurth Transmissions
- B - Propeller Shaft Models

Section 9 - Power Steering System

- A - Pump And Related Components

Important Information	1
Removal And Installation	2
Engine Mechanical	3
Electrical System	4
Fuel System	5
Cooling System	6
Intake And Exhaust System	7
Drive System	8
Power Steering System	9

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

IMPORTANT INFORMATION

Section 1A - General Information

Introduction	1A-3	Engine Break-In	1A-6
How to Use This Manual	1A-3	Initial Break-In Procedure	1A-6
Page Numbering	1A-3	Mercury/Quicksilver Lubricants, Sealants And Adhesives	1A-7
Engine Serial Number / Decal Locations	1A-4		
Operation / Duty Cycle	1A-5		

IMPORTANT INFORMATION

Section 1B - Maintenance

Torque Specifications	1B-3	Throttle Cable	1B-39
Special Tools	1B-3	Shift Cable	1B-39
Tools	1B-3	Engine Coupler / U-joint Shaft Splines	1B-40
Lubricants / Sealants / Adhesives	1B-3	U-joints	1B-41
Engine Specifications	1B-4	Drive Shaft Extension Models	1B-42
Sterndrive (MCM) Engines	1B-4	Sterndrive Unit and Transom Assembly	1B-42
Inboard (MIE) Engines	1B-5	Continuity Circuit	1B-43
Capacities	1B-6	Continuity Circuit (continued)	1B-44
Engines	1B-6	MerCathode	1B-45
Drives	1B-6	Engine Mounts	1B-45
Transmissions	1B-6	Electrical System	1B-45
Maintenance Schedules	1B-7	Power Steering	1B-46
Maintenance Intervals	1B-7	Checking Fluid Level	1B-46
Sterndrive (MCM) Engines	1B-8	Filling and Bleeding	1B-48
Inboard (MIE) Engines	1B-11	Transmission	1B-49
Engine External Views	1B-13	Checking Fluid Level	1B-49
Starboard Side View	1B-13	Power Trim	1B-50
Front View	1B-14	Checking Fluid Level	1B-50
Port Side View	1B-15	Filling	1B-51
Rear View	1B-16	Gear Lube Monitor	1B-52
Engine Oil	1B-17	Checking Fluid Level	1B-52
Oil Level	1B-17	Filling	1B-52
Changing Engine Oil and Oil Filter	1B-19	Seawater Strainer	1B-53
Fuel	1B-21	Air Filter	1B-54
Precautions	1B-21	Removal	1B-54
General Information	1B-22	Inspection	1B-54
Diesel Fuel In Cold Weather	1B-22	Cleaning	1B-55
Fuel Filter	1B-23	Installation	1B-55
Closed Cooling System	1B-28	Drive Belts	1B-56
Coolant Requirement	1B-28	General Information	1B-56
Checking Level	1B-29	Inspection	1B-57
Draining	1B-30	Engine Water Circulating Pump Belt	1B-57
Filling	1B-32	Alternator Belt	1B-58
Sacrificial Anodes	1B-33	Power Steering Pump Belt	1B-60
Removal	1B-33	Vacuum Pump Belt	1B-62
Inspection	1B-33	Battery	1B-64
Disassembly	1B-34	Charging System	1B-64
Reassembly	1B-34	Corrosion and Corrosion Protection	1B-64
Installation	1B-34	Saltwater Operation	1B-64
Flushing Seawater System	1B-35	Freezing Temperature and Cold Weather Operation	1B-65
Sterndrive (MCM) Models	1B-35	Cold Weather or Extended Storage	1B-66
Inboard (MIE) Models	1B-36	Power Package Layup	1B-66
Inspect Water Pickups	1B-38	Draining	1B-67
Sterndrive Gear Housing	1B-38	Recommissioning	1B-73
Inboard Through the Hull Pickup	1B-38		
Lubrication	1B-39		

IMPORTANT INFORMATION

SECTION 1C - Troubleshooting

Precautions	1C-3	Turbocharger	1C-18
Poor Boat Performance and/or Poor Maneuverability	1C-5	Engine Noise	1C-19
Improper Full Throttle Engine RPM	1C-6	Valve Cover Area	1C-20
RPM Too High	1C-6	Cylinder Area	1C-20
RPM Too Low	1C-6	Camshaft Area	1C-21
Engine Cranks Over But Will Not Start Or Starts Hard	1C-7	Crankshaft Area	1C-22
Electrical	1C-7	Miscellaneous	1C-23
Fuel System	1C-7	Oil Pressure	1C-23
Miscellaneous	1C-9	Low Oil Pressure	1C-25
Engine Will Not Crank Over or Starter Inoperative	1C-9	High Oil Pressure	1C-25
Glow Plugs Inoperative	1C-10	Excessive Oil Consumption	1C-26
Charging System Inoperative	1C-11	Water / Coolant in Engine	1C-27
Noisy Alternator	1C-11	Important Information	1C-27
Engine Operates Poorly at Idle	1C-12	Water / Coolant In Crankcase Oil	1C-27
Engine Operates Poorly At High Rpm	1C-13	Water / Coolant On Top Pistons	1C-28
Poor Fuel Economy	1C-14	Engine Overheats	1C-29
Engine Smoking	1C-15	Cooling System	1C-29
Black Smoke	1C-15	Mechanical	1C-30
Blue Smoke	1C-16	Power Steering	1C-31
White Smoke	1C-16	Poor, Erratic or No Assist	1C-31
Exhaust Gas Temperature	1C-17	Noisy Pump	1C-32
High	1C-17	Fluid Leaks	1C-32
Low	1C-17	Insufficient Water Flow From Belt Driven Seawater Pump	1C-33
		ZF / Hurth Hydraulic Transmission	1C-34

REMOVAL AND INSTALLATION

Section 2A - Sterndrive (MCM) Models

Torque Specifications	2A-3	Throttle Cable Installation and Adjustment	2A-21
Special Tools	2A-3	Shift Cable Installation and Adjustment	2A-23
Lubricants / Sealants / Adhesives	2A-4	Troubleshooting Shift Problems	2A-28
Removal	2A-4	Battery Cables	2A-30
Installation	2A-7		
Engine Installation / Alignment	2A-7		
Engine Connections	2A-15		

REMOVAL AND INSTALLATION

Section 2B - Inboard (MIE) Models

Torque Specifications	2B-3	Engine Final Alignment	2B-11
Tools/Lubricants/Adhesives	2B-3	Engine Connections	2B-18
Removal	2B-4	Throttle Cable Installation and Adjustment	2B-21
Engine Removal	2B-4	Shift Cable Installation And Adjustment	2B-21
Installation	2B-7	Battery Cables	2B-21
Engine Installation and Initial Alignment	2B-7		

ENGINE

Section 3A - Engine Mechanical

Identification	3A-3	Installation	3A-34
Torque Specifications	3A-4	Water Manifold	3A-37
Tools	3A-6	Exploded Views	3A-37
Special Tools	3A-6	Removal	3A-38
Special Tools (continued)	3A-7	Cleaning	3A-38
Snap-On Tools	3A-8	Inspection	3A-38
Kent-Moore Tools	3A-8	Installation	3A-39
Lubricants/Sealants/Adhesives	3A-9	Cylinder Heads	3A-40
Engine Specifications	3A-10	Exploded Views	3A-40
Piston Rings	3A-10	Removal	3A-42
Cylinder Liner Diameter	3A-10	Disassembly	3A-44
Cylinder Liner Protrusion	3A-11	Cleaning	3A-44
Head Gaskets	3A-11	Inspection	3A-45
Cylinder Head	3A-11	Repair	3A-50
Oil Pump	3A-12	Expansion Plugs	3A-50
Camshaft	3A-12	Assembly	3A-52
Valve Lifter	3A-12	Installation -	
Rocker Arm	3A-13	Using Early Model Gaskets	3A-55
Valve Adjustment	3A-13	Installation -	
Valve	3A-13	Using Late Model Gaskets	3A-62
Valve Seat	3A-13	Rocker Arm	3A-71
Valve Guide	3A-14	Removal	3A-71
Valve Spring	3A-14	Cleaning	3A-71
Crankshaft	3A-15	Inspection	3A-71
Crankshaft (continued)	3A-16	Assembly	3A-72
Connecting Rods	3A-17	Installation	3A-73
Connecting Rod Crank Pin Bore	3A-17	Timing Gear Cover	3A-77
Connecting Rod Bushings	3A-17	Exploded View	3A-77
Pistons	3A-17	Removal	3A-78
Flywheel	3A-17	Cleaning	3A-78
Precautions	3A-18	Inspection	3A-78
General Information	3A-19	Installation	3A-79
Engine Rotation	3A-19	Oil Pump	3A-81
Engine Firing Order	3A-19	Removal	3A-81
Late Model Cylinder Head Gasket -		Cleaning	3A-81
Torque Sequence and Specifications	3A-20	Inspection	3A-82
Early Model Cylinder Head Gasket -		Reassembly	3A-83
Torque Sequence and Specifications	3A-25	Installation	3A-83
Lubrication System - All Models	3A-28	Oil Pressure Relief Valve	3A-84
Examples of Bearing Failures	3A-29	Removal	3A-84
Compression Testing Procedure	3A-30	Disassembly	3A-85
Engine Cover	3A-31	Cleaning	3A-85
Removal	3A-31	Inspection	3A-86
Cleaning	3A-31	Assembly	3A-86
Inspection	3A-31	Installation	3A-87
Installation	3A-31	Oil Pan and Oil Pick-Up Tube Assembly	3A-88
Valve Covers	3A-32	Removal	3A-88
Removal	3A-32	Cleaning	3A-89
Cleaning	3A-33	Inspection	3A-89
Inspection	3A-33	Installation	3A-89

ENGINE (continued)

Section 3A - Engine Mechanical (continued)

Adapter / Oil Thermostat	3A-91	Cleaning	3A-109
Removal	3A-91	Inspection	3A-109
Disassembly	3A-92	Assembly	3A-113
Cleaning and Inspection	3A-92	Installation	3A-114
Testing	3A-92	Rear Oil Seal	3A-116
Installation	3A-93	Removal	3A-116
Camshaft	3A-95	Installation	3A-117
Exploded View	3A-95	Crankshaft and Main Bearings	3A-118
Testing - Measuring Lobe Lift	3A-96	Removal	3A-118
Removal	3A-96	Cleaning	3A-123
Inspection	3A-98	Inspection	3A-124
Installation	3A-99	Installation	3A-127
Camshaft Bearings	3A-100	Cylinder Liners	3A-136
Inspection	3A-100	Removal	3A-136
Removal	3A-100	Identification	3A-137
Installation	3A-101	Cleaning and Inspection	3A-138
Valve Lifters	3A-102	Installation	3A-139
Removal	3A-102	Flywheel Housing, Coupler / Drive Plate And	
Cleaning	3A-103	Flywheel	3A-144
Inspection	3A-103	Exploded View	3A-144
Installation	3A-104	Flywheel Housing	3A-148
Valve Push Rods	3A-105	Sterndrive (MCM) Coupler / Inboard (MIE)	
Removal	3A-105	Drive Plate	3A-150
Cleaning	3A-105	Flywheel	3A-151
Inspection	3A-105	Engine Mounts	3A-152
Installation	3A-105	Front Mounts	3A-152
Connecting Rod / Piston Assembly	3A-106	MIE (Inboard) Transmission Mounts	3A-153
Measuring Rod Bearing Clearance	3A-106	Engine 20-Hour Break-In Period	3A-154
Removal	3A-107	After Break-in Period	3A-154
Disassembly	3A-108		

ELECTRICAL SYSTEMS

Section 4A - Starting System

Identification	4A-3	Testing Voltage	4A-6
Specifications	4A-3	Removal	4A-7
Torque Specifications	4A-3	Starter Motor	4A-7
Lubricants / Sealants / Adhesives	4A-3	Solenoid Switch	4A-8
Replacement Parts	4A-4	Installation	4A-9
Starting System Components	4A-4	Solenoid Switch	4A-9
Inspection	4A-6	Starter Motor	4A-10
Periodic Inspection	4A-6		

ELECTRICAL SYSTEMS

Section 4B - Charging System

Identification	4B-3	Circuitry Test	4B-10
Replacement Parts Warning	4B-3	Output Circuit	4B-11
Specifications	4B-4	Excitation Circuit	4B-12
Torque Specifications	4B-4	Sensing Circuit	4B-13
Special Tools	4B-5	Current Output Test	4B-14
Lubricants/Sealers/Adhesives	4B-5	Exploded View	4B-16
Wire Color Code Abbreviations	4B-5	Removal	4B-17
Precautions	4B-6	Alternator	4B-17
General	4B-6	Alternator Bracket	4B-17
Electronic Diesel Injection (EDI)		Installation	4B-18
Electrical System Precautions	4B-6	Alternator Bracket	4B-18
Battery Precautions - Multiple EDI		Alternator	4B-18
Engines	4B-7	Battery Isolators	4B-19
Charging System Components	4B-8	Dual Battery Charging Systems	4B-19
Inspection	4B-9	Battery Isolator Diagram	4B-20
Troubleshooting Tests (Alternator			
on Engine)	4B-10		

ELECTRICAL SYSTEMS

Section 4C - Glow Plug System

Identification	4C-3	Inspection	4C-7
Specifications	4C-3	Installation	4C-8
Torque Specifications	4C-4	Glow Plug Actuator Relay and Auxiliary	
Lubricants / Sealants / Adhesives	4C-4	Relay	4C-9
Special Tools	4C-4	Testing	4C-9
Description	4C-4	Removal	4C-10
Precautions	4C-4	Cleaning	4C-10
Glow Plug Testing (Prior to Removal)	4C-5	Inspection	4C-10
Removal	4C-6	Installation	4C-10
Cleaning	4C-7	Glow Plug Circuit Diagram	4C-11

ELECTRICAL SYSTEMS

Section 4D - Instrumentation

Identification	4D-3	Oil Pressure	4D-11
Gauges	4D-3	Water Temperature - Primary Station	4D-13
Panels	4D-3	Primary Station Switches	4D-15
Special Tools	4D-4	Ignition Key Switch	4D-15
Tools	4D-4	Audio Warning Test and Panel Light	
Lubricants / Sealants / Adhesives	4D-4	Switch	4D-17
Wire Color Abbreviations	4D-4	Audio Warning System	4D-19
Precautions	4D-5	Alarm	4D-19
General Information	4D-6	Oil Pressure Switch	4D-20
Special Information	4D-6	Water Temperature Switch / Sender	4D-21
Tachometer	4D-6	Transmission Fluid Temperature	
QSI Series Gauge Lighting Options	4D-7	Switch	4D-24
Gauges	4D-8	Second Station Extension Harness	4D-26
Removal	4D-8	Remote Control / Neutral Start Safety	
Testing	4D-8	Circuit	4D-29
Installation	4D-11	Primary Station	4D-29
Senders	4D-11	Secondary Station	4D-30

ELECTRICAL SYSTEMS

Section 4E - Wiring Diagrams

Wire Color Abbreviations	4E-3	MerCathode System Wiring Diagram .	4E-15
Tools	4E-3	Inboard (MIE) Models	4E-16
Lubricants / Sealants / Adhesives	4E-3	Engine Wiring - Starting and Charging	
General Information	4E-3	System	4E-16
Sterndrive (MCM) Models	4E-4	ECM and Fuel System Wiring	4E-20
Engine Wiring - Starting and Charging		Quicksilver Primary Instrumentation	
System	4E-4	Wiring	4E-22
ECM and Fuel System Wiring	4E-8	Models With Early Connectors	4E-26
Quicksilver Instrumentation Wiring . . .	4E-10	Models With 21-Pin Deutsch™	
Power Trim System Wiring Diagram . .	4E-14	Connector	4E-28

FUEL SYSTEM

Section 5A - Description

Introduction	5A-3	Analog Signals	5A-9
Precautions	5A-4	Analog Value Conditioning	5A-11
Testing Procedure	5A-5	Digital Signals	5A-13
General Information	5A-6	Engine Control Module (ECM)	5A-15
Basic Knowledge and Tools Required .	5A-6	Speed Density System	5A-17
Visual/Physical Inspection	5A-6	ECM Input and Sensor Descriptions . .	5A-18
Electrostatic Discharge Damage	5A-6	Fuel Management	5A-26
Diagnostic Information	5A-7	Control	5A-26
Terminology	5A-7	Modes Of Operation	5A-27
Electronic Control Module (ECM)		Diagnosis and Testing	5A-30
and Sensors	5A-9	ECM Reactions During Operation	5A-30
General Description	5A-9	ECM Self-Diagnostics	5A-30
Computers and Voltage Signals	5A-9		

FUEL SYSTEM

Section 5B - Fuel Delivery Pump and Fuel Filter

Identification	5B-3	Testing	5B-8
Specifications	5B-3	Removal	5B-10
Torque	5B-3	Installation	5B-11
Tools	5B-3	Water Separating Fuel Filter	5B-13
Lubricants / Sealants / Adhesives	5B-3	Removal	5B-13
Precautions	5B-4	Installation	5B-13
Exploded View	5B-6	Water Drain Valve Operation	5B-15
Fuel Delivery Pump, Fuel Filter		Purging Air From The Fuel System	5B-16
and Related Components	5B-6		

FUEL SYSTEM

Section 5C - Fuel Injectors

Identification	5C-3	Exploded View	5C-8
Specifications	5C-3	Injector Test (Engine Misfiring)	5C-9
Torque	5C-3	Removal	5C-10
Tools	5C-4	Inspection	5C-12
Bosch	5C-4	Testing	5C-12
Lubricants / Sealants / Adhesives	5C-4	Installation	5C-13
Precautions	5C-5	Purging Air From Fuel Injectors (Bleeding)	5C-16
Description	5C-6		
Fuel Injector (Cutaway View)	5C-7		

FUEL SYSTEM

Section 5D - Injection Pump

Identification	5D-2	Repair and Service	5D-7
Pump Code and Identification Number Location	5D-2	General Information	5D-7
Specifications	5D-2	Service Information	5D-7
Injection Pump	5D-2	Precautions	5D-9
Timing	5D-3	Exploded View	5D-10
Torque Specifications	5D-3	Fuel Injection Pump Removal	5D-11
Special Tools	5D-3	Fuel Injection Pump Installation	5D-16
Tools	5D-4	Installation With Engine Assembled ..	5D-16
Special EDI Tools	5D-4	Installation During Engine Reassembly	5D-19
Kent-Moore Tools	5D-4	Fuel Injection Pump Timing	5D-23
Lubricants / Sealants / Adhesives	5D-4	Checking	5D-23
Description	5D-5	Setting	5D-23
Fuel Ratings	5D-6	Starting Engine - After Fuel Injection Pump Installation and Timing	5D-28
Diesel Fuel in Cold Weather	5D-6		

FUEL SYSTEM

Section 5E - EDI Diagnosis

<p>General Information 5E-2</p> <p> Introduction 5E-2</p> <p> Basic Knowledge and Tools Required . 5E-2</p> <p> Visual/Physical Inspection 5E-3</p> <p> Electrostatic Discharge Damage 5E-3</p> <p> Special Tools 5E-4</p> <p> Special EDI Tools 5E-4</p> <p> Kent-Moore Tools 5E-4</p> <p> Service Precautions 5E-5</p> <p>Diagnostic Information 5E-7</p> <p> Abbreviations 5E-7</p> <p> ECM Self-Diagnosis 5E-8</p> <p> Malfunction Indicator Lamp 5E-9</p> <p> Intermittent Problems and Malfunction Indicator Lamp 5E-10</p> <p> Reading Codes 5E-10</p> <p> Clearing Codes 5E-13</p> <p> Diagnosis of Driveability Concerns ... 5E-14</p> <p>ECM Input and Sensor Diagram 5E-15</p> <p>ECM Connector Pin Layout 5E-16</p> <p>Connector Chart 5E-17</p> <p> MAP (Manifold Air Pressure) Sensor . 5E-20</p> <p> ECT (Engine Coolant Temperature) Sensor 5E-22</p> <p> Fuel Temperature Sensor 5E-24</p> <p> RPM (Engine Speed) Sensor 5E-26</p> <p> BARO (Atmospheric Pressure) Sensor 5E-28</p> <p> IAT (Intake Air Temperature) Sensor . 5E-30</p> <p> Instrumented Injector (Needle Movement Sensor) 5E-32</p> <p> Fuel Quantity Actuator (Pump Actuator) 5E-34</p> <p> Fuel Quantity Sensor (Control Sleeve Position Sensor) 5E-36</p> <p> Timing Fault (Timing Advance Regulation) 5E-38</p> <p> TP (Throttle Position) Sensor / Low Idle Switch 5E-40</p> <p> Battery Voltage 5E-42</p> <p> Battery (Switched K15) 5E-43</p> <p> Microcontroller Fault 5E-44</p> <p> ECM Reference Voltage (u_ref - 2.5v) 5E-45</p>	<p> Main Relay 5E-46</p> <p> Timing Actuator (Timing Solenoid Valve) 5E-48</p> <p> Glow Plug Main Relay (Glow Plug Relay Actuator), If Equipped 5E-50</p> <p> Glow Plug Auxiliary Relay, If Equipped 5E-52</p> <p> Glow Plug Lamp (Glow Plug Display) . 5E-54</p> <p> Glow Plug Lamp (Glow Plug Display) . 5E-56</p> <p> MIL [Malfunction Indicator Lamp (Diagnostic Lamp)] 5E-58</p> <p> MIL [Malfunction Indicator Lamp (Diagnostic Lamp)] 5E-60</p> <p> Fuel Shut Off Valve [EAB (Electrical Shut Off)] 5E-62</p> <p> EEPROM Fault (EEPROM and Configuration) 5E-64</p> <p> RPM Signal From Injector (Secondary Engine Speed Sensor) .. 5E-66</p> <p>Troubleshooting For EDI Systems 5E-68</p> <p> Trouble Codes 5E-68</p> <p> Display Terminology 5E-69</p> <p> Troubleshooting Charts 5E-74</p> <p>Repair Procedures 5E-93</p> <p> Service Precautions 5E-93</p> <p> Replacement Parts Warning 5E-94</p> <p> Torque Specifications 5E-95</p> <p> Lubricants / Sealants / Adhesives 5E-95</p> <p> System Components 5E-96</p> <p> Fuel Injection Pump Repair 5E-98</p> <p> Wiring Harness Service 5E-99</p> <p>Relay, Module and Sensor Servicing (On-Board Service) 5E-102</p> <p> Precautions 5E-102</p> <p> Main Relay 5E-102</p> <p> ECM (Electronic Control Module) ... 5E-104</p> <p> ECT (Engine Coolant Temperature) Sensor 5E-106</p> <p> MAP (Manifold Absolute Pressure) / IAT (Intake Air Temperature) Sensor 5E-108</p> <p> Throttle Position (TP) Sensor 5E-110</p> <p> Instrumented Injector 5E-112</p> <p> Engine RPM Speed Sensor 5E-112</p> <p> Idle Speed Setting Circuit 5E-113</p>
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COOLING SYSTEM

Section 6A - Seawater Cooling System

Torque Specifications	6A-3	Inspection	6A-18
Lubricants / Sealants / Adhesives	6A-3	Assembly	6A-19
Tools	6A-3	Installation	6A-25
Seawater (Raw Water) System		Seawater Strainer	6A-27
Specifications	6A-4	Exploded View	6A-27
Seawater Pump Delivery Rates	6A-4	Removal	6A-28
Seawater Pickup Connections	6A-4	Installation	6A-30
Precautions	6A-5	Oil / Power Steering / Transmission	
Seawater Pickup Connection	6A-5	Fluid Coolers	6A-31
Seacock	6A-6	General Information	6A-31
Seawater Strainer	6A-6	Exploded View	6A-32
Exploded View - Seawater Pumps	6A-7	Location of Coolers	6A-33
D2.8L D-Tronic	6A-7	Inspection Before Removal	6A-34
D4.2L D-Tronic	6A-8	Cleaning Without Removal	6A-34
Seawater Flow Diagram	6A-10	Engine Oil Cooler	6A-35
Seawater Pump	6A-12	Power Steering	6A-40
Removal	6A-12	Transmission Fluid Cooler	6A-42
Disassembly	6A-13	Installation	6A-43
Cleaning	6A-17		

COOLING SYSTEM

Section 6B - Closed Cooling System

Specifications	6B-4	Draining Closed Cooling System	6B-17
Capacity	6B-4	Cleaning Closed Cooling System	6B-19
Thermostats	6B-4	Using A Cleaner	6B-19
Pressure Cap	6B-4	Heat Exchanger and Cooler Cleaning	6B-19
Coolant	6B-4	Flushing The Closed Cooling System	6B-20
Torque Specifications	6B-5	Filling The Closed Cooling System	6B-21
Lubricants / Sealants / Adhesives	6B-5	Thermostats	6B-22
Tools	6B-5	Removal	6B-22
Special Tools	6B-5	Testing	6B-23
Tools	6B-5	Installation	6B-25
Diagrams and Exploded Views	6B-6	Heat Exchanger	6B-26
Coolant Flow Diagram	6B-6	Testing	6B-26
Heat Exchanger / Coolant Tank and Related Components	6B-8	Repair	6B-26
Engine Water Circulating Pump	6B-10	Removal	6B-27
Checking Coolant Level	6B-11	Cleaning and Inspection	6B-28
Testing Closed Cooling System	6B-12	Installation	6B-29
Testing Coolant for Alkalinity	6B-12	Water Circulating Pump	6B-31
Pressure Testing System	6B-12	Removal	6B-31
Testing for Cylinder Head		Cleaning and Inspection	6B-31
Gasket Leak	6B-14	Installation	6B-32
Testing Pressure Cap	6B-15	Coolant Manifold	6B-33
Coolant Change Interval	6B-17	Corrosion Protection	6B-33
Coolant Requirement	6B-17	Auxiliary Hot Water Heater Connections	6B-33

INTAKE AND EXHAUST SYSTEM

Section 7A - Intercooler

Torque Specifications	7A-3	Removal	7A-8
Lubricants / Sealants / Adhesives	7A-3	Disassembly	7A-11
Exploded Views	7A-4	Cleaning and Inspection	7A-13
D2.8L Intercooler	7A-4	Assembly	7A-14
D4.2L Intercooler	7A-6	Installation	7A-17
Intercooler	7A-8		

INTAKE AND EXHAUST SYSTEM

Section 7B - Manifolds, Elbows And Risers

Torque	7B-3	Locating And Installing The Inboard (MIE) Exhaust System	7B-9
Lubricants / Sealants / Adhesives	7B-3	Exhaust Pipe - Sterndrive (MCM)	7B-11
Description	7B-3	Removal	7B-11
Exploded Views	7B-4	Cleaning	7B-11
Typical Intake / Exhaust Manifold	7B-4	Installation	7B-12
Sterndrive (MCM) Exhaust Systems	7B-5	Intake / Exhaust Manifold	7B-13
Inboard (MIE) Exhaust Systems	7B-6	Removal	7B-13
Representative View of Complete Inboard Exhaust System	7B-7	Cleaning and Inspection	7B-14
Locating and Installing The Sterndrive (MCM) Exhaust System	7B-8	Installation	7B-15

INTAKE AND EXHAUST SYSTEM

Section 7C - Turbocharger

Identification	7C-3	Testing Turbocharger Boost Pressure	7C-9
Turbocharger Specifications	7C-3	Checking Turbine Bearings (Assembled)	7C-10
Torque Specifications	7C-4	Removal	7C-11
Lubricants / Sealants / Adhesives	7C-4	Disassembly	7C-15
Description	7C-5	Cleaning	7C-17
Turbocharger	7C-5	Inspection	7C-18
Wastegate	7C-5	Assembly	7C-19
Exploded Views	7C-6	Installation	7C-21
Turbocharger And Related Components	7C-6	Boost Pressure Control	7C-28
Boost Pressure Control (Wastegate) Components	7C-8	Exhaust Pipe	7C-28
Turbocharger	7C-9	Valve	7C-31
		Wastegate	7C-33

DRIVES

Section 8A - ZF/Hurth Transmissions

Identification	8A-3	Transmission Fluid Level	8A-8
Specifications	8A-4	Checking	8A-8
Operating Specifications	8A-4	Filling	8A-9
Ratios and Part Numbers	8A-4	Changing	8A-9
Fluid Specifications	8A-4	Transmission Removal	8A-12
Torque	8A-5	Transmission Inspection	8A-13
Tools	8A-5	Transmission Installation	8A-13
Lubricants / Sealants / Adhesives	8A-5	Shift Control And Cables	8A-15
Important Information	8A-6	Transmission Shift Lever And Shift	
Engine	8A-6	Cable Bracket	8A-15
Transmission	8A-6	Shift Cable Installation and	
Propeller	8A-6	Adjustment	8A-16
Transmission / Propeller Rotation	8A-7	Pressure And Temperature Tests	8A-21
		Transmission Repair	8A-21

DRIVES

Section 8B - Propeller Shaft Models

Lubricants / Sealants / Adhesives	8B-2	Checks Made with Propeller Shaft	
Checks Made with Boat In Water	8B-3	Removed from Boat	8B-7
Checks Made with Boat Out of Water		Strut	8B-7
and Shaft Installed	8B-5		

POWER STEERING

Section 9A - Pump And Related Components

Torque Specifications	9A-2	Power Steering Pump	9A-5
Lubricants / Sealants / Adhesives	9A-2	Removal	9A-5
Description	9A-2	Installation	9A-6
Exploded Views	9A-3	Checking Fluid Level	9A-8
Power Steering Pump	9A-3	Filling and Bleeding	9A-8
Related Components	9A-4		

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IMPORTANT INFORMATION

Section 1A - General Information

**1
A**

Table of Contents

Introduction	1A-3	Engine Break-In	1A-6
How to Use This Manual	1A-3	Initial Break-In Procedure	1A-6
Page Numbering	1A-3	Mercury/Quicksilver Lubricants, Sealants	
Engine Serial Number / Decal Locations .	1A-4	And Adhesives	1A-7
Operation / Duty Cycle	1A-5		

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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

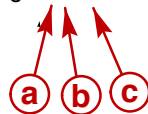
This manual is divided into sections that represent major components and systems.

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

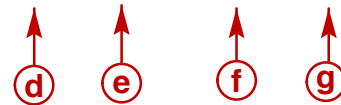
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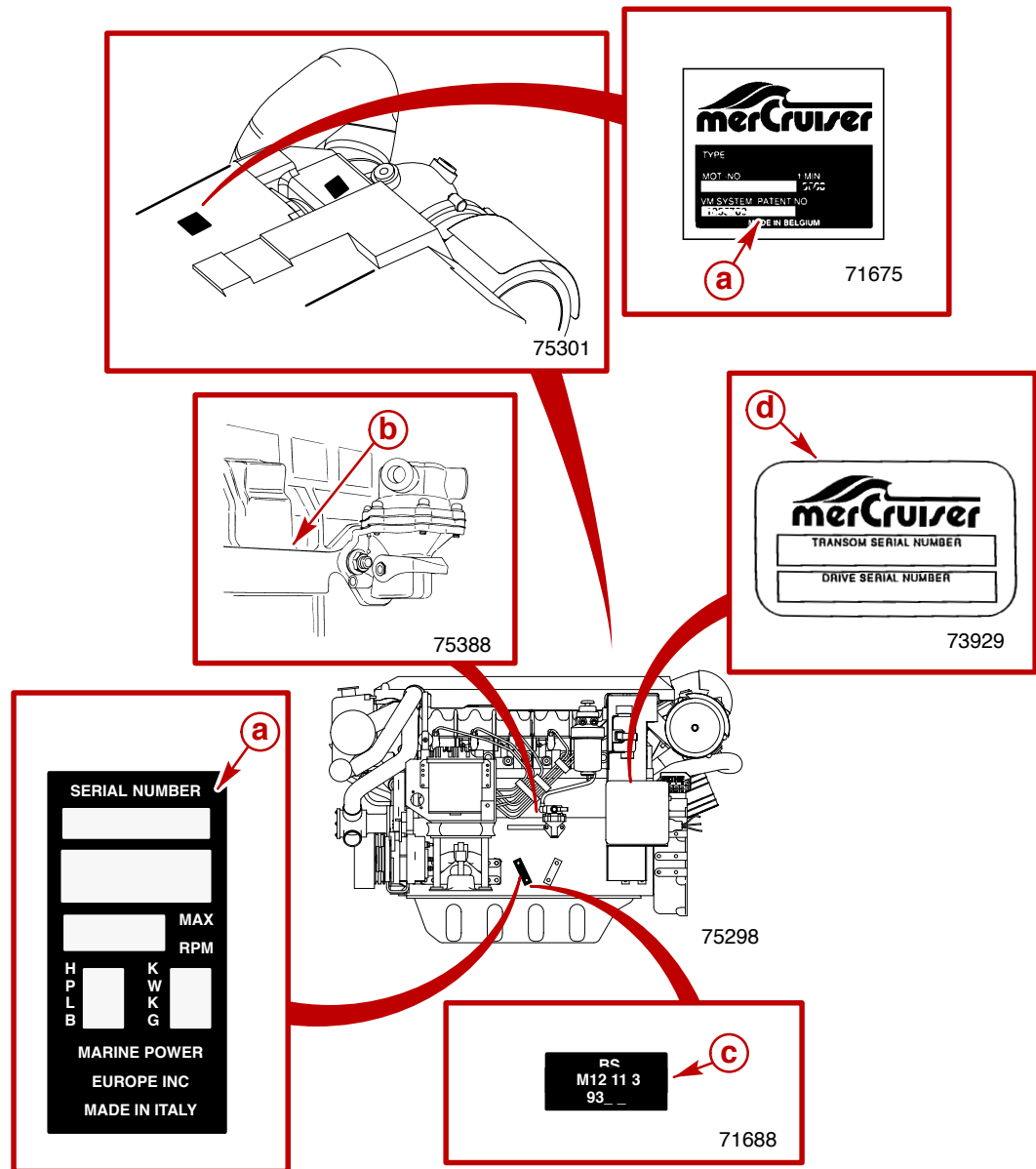


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- a** - Section Number
- b** - Section Part
- c** - Page Number
- d** - Manual Number
- e** - Revision Number 1
- f** - Month Printed
- g** - Year Printed

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

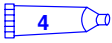
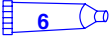
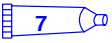
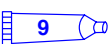
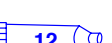


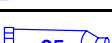
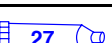

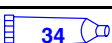
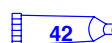
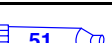



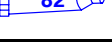
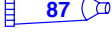
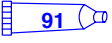
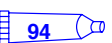

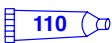
The following procedure must be used on new and rebuilt diesel engines. This break-in procedure allows the proper seating of the pistons and rings, which greatly reduces the likelihood of problems.

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
 4	Needle Bearing Assy. Lubricant	8 oz (226.8 g) tube	N/A	92-802868A1
 6	Dielectric Grease	8 oz (226.8 g) can	N/A	92-823506-1
 7	Loctite 271 - Thread Locker	10 ml tube	N/A	92-809819
 9	Loctite 567 PST Pipe Sealant	50 ml tube	N/A	92-809822
 12	Loctite Master Gasket Kit		N/A	92-12564-2
 14	2 Cycle Premium Outboard Oil	1 US qt (0.94 L)	92-802813A1	92-802813Q1
 19	Perfect Seal	16 oz (0.45 kg) can	N/A	92-34227-1
 25	Liquid Neoprene	8 oz (226.8 g) can	N/A	92-25711-3
 27	Bellows Adhesive	1.5 oz (42.5 g) tube	N/A	92-86166Q1
 33	Loctite 680 Retaining Compound	10 ml tube	N/A	92-809833
 34	Special Lubricant 101	8 oz (226.8 g) tube	92-802865A1	92-802865Q1
 42	U-Joint and Gimbal Bearing Grease		92-802870A1	92-802870Q1
 51	Loctite 222 Thread Locker	10 ml tube	N/A	92-809818
 66	Loctite 242 Thread Locker	10 ml tube	N/A	92-809821
 79	4 Cycle 25W40 Engine Oil		92-802837A1	92-802837Q1
 82	Premium Gear Lubricant	1 US qt (0.94 L)	92-802846A1	92-802846Q1
 87	High Performance Gear Lube	1 US qt (0.94 L)	92-802854A1	92-802854Q1
 91	Engine Coupler Spline Grease	14 oz (0.39 kg) cartridge	92-802869A1	92-802869Q1
 94	Anti-Corrosion Grease	8 oz (226.8 g) tube	92-802867A1	92-802867Q1
 95	2-4-C with Teflon	8 oz (226.8 g) tube	92-802859A1	92-802859Q1
 110	4 Stroke 10W30 Outboard Oil	1 US qt (0.94 L)	92-802833A1	92-802833Q1
 114	Power Trim & Steering Fluid	8 oz (226.8 g)	92-802880A1	92-802880Q1

Tube Ref. #	Description	Container Size	Mercury Part Number	Quicksilver Part Number
 115	Premium Plus 2 Cycle TC-W3 Outboard Oil	1 US qt (0.94 L)	92-802824A1	92-802824Q1
 116	RTV 587 Silicone Sealer	3 oz (85.05 g)	N/A	92-809825
 117	Loctite 7649 Primer N	4.5 oz (127.57 g)	N/A	92-809824
 118	Storage Seal Rust Inhibitor	12 oz (325 ml) spray can	92-802878-56	92-802878Q56
 119	Corrosion Guard	12 oz (325 ml) spray can	92-802878 55	92-802878Q55
 120	15W40 4-cycle Diesel Engine Oil	1.06 US gal.(4 L)	92-877695K1	92-877695Q1
 121	Extended Life Antifreeze/Coolant	1 US gal. (3.78 L)	92-877770K1	92-877770K1
 122	Marine Engine Coolant	1.33 US gal. (5 L)	N/A	92-813054A2
 123	Fuel System Treatment and Stabilizer Concentrate	16 oz (437 ml)	92-802876A1	92-802876Q1
 124	Heat Transfer Compound	1.5 oz (42.5 g) tube	N/A	92-805701 1
 125	Liquid Gasket		N/A	92-808137
 126	T442 Sealant		N/A	92-862258
 127	Loctite 5900 Ultra Black RTV Silicone Sealant	13 oz (371 g) tube	N/A	92-809826
 128	Loctite Gasket Remover	18 oz (532 ml) spray can	N/A	92-809828 1
 129	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