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Engine Coupler/U-Joint Shaft Splines 1B-34 Drive Shaft Extension Models 1B-35. Engine Noise 1C-16. WARNING Hazards or unsafe practices which COULD result in severe personal injury or death. 1b-ft Oil Filter Top Piece 25 18 Nut, Exhaust Elbow-To-Turbocharger Clamp 10 89 Lubricants / Sealants / Adhesives Description Where Used Method of Use Part Number Perfect Seal Vent and drain plugs Thread length 92-34277-1 2-4-C Marine Lubricant With Teflon Sealing cable, hinge pins Grease fitting 92-802850Q1 Special Lubricant 101 Steering cable (extended) Coat exposed surfaces 92-802850Q1 U-Joint and Gimbal Bearing Grease Gimbal bearing, sterndrive shaft bearings and U-joints, Grease fittings 92-828052A2 Engine Coupler Spined Grease Engine coupler spines Grease fitting, coat surfaces 92-816391A4 Loctite 242 Sacrificial anode to plug Thread length Obtain Locally Power Trim and Steering Fluid Power trim or steering fluid Fill reservoir 92-802880Q1 Dexron III - Automatic Transmission Fluid Power steering fluid Fill reservoir Obtain Locally Liquid Neoprene Exposed terminals and connections Light coating on surfaces 92-25711-3 Perfect Seal Engine mounting nuts and bolts Coat surfaces 92-34227-1 Premixed Marine Engine Coolant Closed cooling system Fill system 92-813054A2 Fleetguard Complete (Product 91-50663 With DCA4 Additive) Closed cooling system Fill system Obtain Locally Corrosion Guard Engine Coat Surfaces 92-802878 55 Tools Description Part Number Hose / Oil Pump Adapter 32-863642 Crankcase Oil Pump 802889A1 Flushing Attachment 91-4435702 23. 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It provides specific information, including procedures for disassembly, inspection, assembly and adjustment to enable dealers and service mechanics to repair and tune these engines. 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. 5. Cleaning and Inspection 6A-23. Starter Removal 4A-12. Exploded View - Fuel Filter and Related Parts 5A-5. Inspection 5A-10. Specifications 5C-4. MAINTENANCESERVICE MANUAL NUMBER 29 90-863016 MARCH 2001 Page 1B-7 Scheduled Maintenance (Continued) After First 50 hours Every 100 hours or Annually z Every 200 hours or Annually z Every 300 hours or 3 years z Every 500 hours or 5 years z Every 1000 hours or 5 years z Touch-up paint power package and spray with corrosion guard. Filling and Bleeding 1B-38. Testing Voltage 4A-9. Testing 5B-13. High Oil Pressure 1C-20. Cleaning 3A-114. Installation 5C-18. Panels 4D-3. Removal 5A-7. Filling 1B-40. Therefore, fasteners removed should be saved for re-use in the same locations whenever possible. Lubricants / Sealants 6A-3. Before attempting repairs or tune-up, 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. Cleaning and Inspection 7A-6. Crankshaft Area 1C-18. If engine does not start, wait 1 minute to allow the starter motor to cool, then repeat starting procedure. Stop Switch 4D-17. REMOVAL AND INSTALLATION Section 2A - MCM (Sterndrive) Models Torque Specifications 2A-2. Engine Wiring 4E-4. Removal 4C-9. Description 7C-7. Lighting Options 4D-3. Exploded View 3A-86. Inspection 3A-115. Thermostat 6A-4. Removal 4C-5. General Information 7C-7. Oil Pressure 1C-19. Draining 5A-6. Number 29 Printed in U.S.A. 90-863016 MARCH 2001 ©2000, Mercury Marine D1.7L DTI (OM055001 & ABOVE) SERVICE MANUAL 2. Port 3A-130. Inspection 4C-9. GENERAL INFORMATIONSERVICE MANUAL NUMBER 29 90-863016 MARCH 2001 Page 1A-5 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: Pleasure Duty Rating / Duty Cycle - D1.7L DTI Specified Operating RPM Range 4000 - 4400 Wide Open Throttle (WOT) Operation Limited to short periods of time. Cooling System Flow Diagram 6A-10. Checking 5C-8. Checking Level 1B-26. . GENERAL INFORMATION SERVICE MANUAL NUMBER 29 Page 1A-4 90-863016 MARCH 2001 Engine Serial Number / Decal Locations 74677 COLOR CODE SERIAL NUMBERS Serial Number MARINE POWER EUROPE, INC. D z Whichever Occurs First 27. Freezing Temperature and Cold Weather Operation 1B-48. Following is an example and description. Section 5C - Injection Pump Identification 5C-3. Quicksilver Instrument Tachometer 4D-9. Hydraulic Fluid Hoses 8A-10. Engine Rotation 3A-29. Installation 3A-109. Blue 1C-12. D Replace fuel filter. Reassembly 3A-109. Testing 6A-24. Installation 7B-11. D z Whichever Occurs First * Lubricate engine coupler every 50 hours if operated at idle for prolonged periods of time. IMPORTANT: Never operate the starter motor longer than 15 seconds at a time to avoid overheating the starter motor. Inspection 5B-13. D Replace timing belt. Cleaning and Inspection 4B-16. Poor Boat Performance and/or Poor Maneuverability 1C-4. Replacement Parts 4A-3. D If operating in salt, brackish or polluted waters, flush cooling system after each use. Page vi 90-863016 MARCH 2001 IMPORTANT INFORMATION Section 1A - General Information Introduction 1A-3. Alternator Circuit Diagram 4B-6. Special Tools 3A-23. Cleaning 5A-8. Removal 4A-13. Installation 8A-15. Stop Switch 4D-23. Rear Oil Seal 3A-122. D1.7L DTI - Quicksilver Instrumentation Package 4E-10. 2. Customary bolts use radial lines for this purpose, while most customary nuts do not have strength markings. Precautions 5B-8. 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Numbers on the heads of the metric bolts and on surfaces of metric nuts indicate their strength. Removal 5A-10. Air Cleaner 1B-46. Disassembly 3A-75. Cleaning 4C-6. Battery Isolator Diagram 4B-7. Any time the intake or exhaust openings are exposed they should be covered to prevent foreign material from entering the cylinders and damaging the engine. Test Solenoid Switch 4A-14. Charging System Inoperative 1C-8. Coolant Temperature Sender 4D-27. Use of replacement electrical or fuel system components that do not comply to these rules and regulations could result in a fire or explosion hazard and should be avoided. However, individual operating habits and personal maintenance preferences can have an impact on the suggested intervals. Special Tools 8A-2. 3. Strict compliance to these special instructions when performing the service, plus Common Sense operation, are major accident prevention measures. Battery 1B-47. Power Steering Pump, Brackets and Fasteners 8A-4. Installation 4C-9. Page viii 90-863016 MARCH 2001 ENGINE Section 3A-D1. 7L DTI Engine Mechanical Identification 3A-3. Connecting Rod / Piston Assembly 3A-73. Exploded Views 6A-6. Power Steering Fluid Cooler 8A-14. MAINTENANCESERVICE MANUAL NUMBER 29 90-863016 MARCH 2001 Page 1B-5 Routine Maintenance Each Day Start Each Day End Weekly Every Two Months Check crankcase oil (interval can be extended based on experience). Special Tools (continued) 3A-26. Testing 7C-15. Propeller Installation 2A-29. MCM (Sterndrive) Exhaust Pipe and Related Components 7B-6. Testing 5A-14. Removal 3A-132. Cleaning 3A-127. Replacement fasteners must have the same measurements and strength as those removed. 6. 21. Unlike automotive engines, marine engines are subjected to extended periods of heavy load and wide open throttle operation and, therefore, require heavy-duty components. Specifications 4B-4. Boost Pressure Control / Wastegate 7C-15. Anodes 6A-4. Power Steering 1C-26. Installation 7C-12. Alternator Bracket 4B-16. 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D Inspect sterndrive unit anodes and replace if 50 percent eroded. Installation 8A-9. Testing 4C-10. Installation 3A-137. Injection Pump Timing 5C-4. Inspection 4C-6. We have not undertaken any such wide evaluation. Engine Installation / Alignment 2A-6. Starboard Side and Front View 1B-10. Specifications 4C-4. Inspection 3A-119. Inspection 7C-10. Cleaning and Inspection 6A-14. Draining 1B-27. Exploded View - Turbocharger and Related Parts 7C-5. D Check battery connections and fluid level. D Check valve clearance. Engine 1B-9. Installation 7B-8. CAUTION Hazards or unsafe practices which COULD result in minor personal injury or product or property damage. Maintenance Intervals Maintenance intervals and the tasks to be performed are generally based on an average boating application and environment. 19. Inspection 4A-10. Engine Oil 1B-12. Tools 2A-2. Installation 5A-11. Fuel Injectors 5B-10. Intercoler Draining 1B-46. Replacement Parts Failure to use recommended 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. Cleaning 3A-137. Injection Pump Repair and Service 5C-5. Ignition Key Switch 4D-15. D Check sterndrive unit oil level, trim pump oil level, and power steering pump fluid level, if equipped. D Lubricate drive shaft U-joints and tailstock input and output bearings. Removal 3A-34. Fuel System 5A-13. DANGER Immediate hazards which WILL result in severe personal injury or death. 90-863016 MARCH 2001 Page xi FUEL SYSTEM Section 5A - Fuel Filter Specifications 5A-3. Miscellaneous 1C-7. Exploded View 3A-39. Diesel Fuel In Cold Weather 1B-19. Valve Adjustment 3A-7. 1 A GENERAL INFORMATIONSERVICE MANUAL NUMBER 29 90-863016 MARCH 2001 Page 1A-1 IMPORTANT INFORMATION Section 1A - General Information Table of Contents Introduction 1A-3. 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Maintenance Schedules 1B-4. Heat Exchanger and Related Components 6A-6. D Drain any water from fuel filter after each use (if operating in freezing temperatures). Installation 3A-57. Injection Pump Timing Adjustment 5C-12. Engine External Views 1B-10. Low 1C-14. Excessive Oil Consumption 1C-21. Crankshaft 3A-9. Engine Specifications (continued) 3A-9. Injector Test (Engine Misfiring) 5B-9. Glow Plug Testing 4C-5. Engine Cranks Over But Will Not Start Or Starts Hard 1C-6. Testing 4B-11. Tools 1B-3. Valve Clearance 3A-48. Checking Shift Operation 2A-33. General Information 4E-3. ELECTRICAL SYSTEM Section 4A - Starting System Identification 4A-3. Injector 5B-4. Oil Pump 3A-105. Test MerCathode/ unit output, if equipped. Precautions 6A-5. Inspection 3A-88. Removal 3A-111. Removal 2A-4. Engine Specifications (continued) 3A-6. IMPORTANT: It is recommended that the boat be accelerated gradually until this procedure has been completed. Exploded Views 8A-4. Tools 4A-4. Identification 4A-8. Exploded View - Fuel Injector and Related Parts 5B-6. Coolant Requirement 6A-4. Piston Rings 3A-4. Kent-Moore Special Tools 3A-27. Lubricants / Sealants / Adhesives 8A-2. RPM Too High 1C-5. Installation 6A-17. Starter Motor 4A-9. Cleaning 3A-42. 90-863016 MARCH 2001 Page iii Engine Mechanical Components Many of the engine mechanical components are designed for marine applications. Poor Fuel Economy 1C-11. Boost Pressure Control / Wastegate 7C-7. Therefore, anyone who uses a service procedure and/or tool, which is not recommended by the manufacturer, first must be completely satisfied that neither their own nor the product's safety will be endangered. 4. Valve Cover 3A-34. Installation 8A-8. Cold Weather or Extended Storage 1B-49. Intake Manifold 3A-56. MAINTENANCESERVICE MANUAL NUMBER 29 Page 1B-4 90-863016 MARCH 2001 Maintenance Schedules NOTE: Refer to appropriate Mercury MerCruiser Sterndrive Service Manual for information and procedures on sterndrive maintenance. Precautions 4B-5. High 1C-14. Cylinder Area 1C-16. Filter 5A-6. 14. Camshafts 3A-6. Exploded Views 7B-5. Torque 4C-4. Engine Runs Poorly At Idle 1C-9. 3. Valve Spring 3A-8. Run engine in gear for 3 minutes at each of the following: 1700 rpm, 3500 rpm and 4000 rpm. Filter Bracket 5A-10. D1.7L DTI Sterndrive (MCM) 4E-4. Lubricants / Sealants / Adhesives 4B-4. Section 5B - Fuel Injectors Identification 5B-3. Gauges 4D-3. Precautions 4D-7. Lubricants / Sealants / Adhesives 5B-4. D 25. Operation / Duty Cycle 1A-5. Thank you very much for your reading. D Lubricate hinge pins, gimbal bearing and engine coupler * D Check continuity circuit for loose or damaged connections. Low Pressure Hose (Control Valve To Fluid Cooler) 8A-13. Bosch Special Tools 5B-5. Recommended 1B-12. COOLING SYSTEM Section 6A - Closed Cooling Specifications 6A-3. Torque 7C-4. Piston 3A-4. Front Engine Mounts 3A-129. Water Temperature Switch 4C-10. Special Tools 5C-5. Removal 7C-8. Section 7B - Exhaust Torque Specifications 7B-3. 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Installation 4B-17. Removal 3A-118. Engine Smoking 1C-12. Standard Torque Values 3A-21. Lubricants / Sealants / Adhesives 1B-3. Piston Pin 3A-4. General Information 4A-6. Tools 4D-6. Installation 3A-123. Fluid Leaks 1C-27. Starter Installation 4A-16. Precautions 5A-4. Specified Torque Values 3A-10. Filter 5A-12. Miscellaneous 1C-18. D Lubricate propeller shaft and torque nut (if operating in only freshwater, this maintenance may be extended to every four months). Basic and Optional Instrument Panel Tachometer 4D-9. Cleaning 3A-119. Exploded View 3A-73. Where the fasteners are not satisfactory for re-use, care should be taken to select a replacement that meets the same specifications as the original. Audio Warning Test and Panel Light Switch 4D-19. Charging System Components 4B-6. Removal 4B-10. Removal 3A-105. Quicksilver Secondary Station Switches 4D-21. Inspection 3A-62. Connecting Rod Bushing 3A-9. Section 4E - Wiring Diagrams Wire Color / Abbreviations 4E-3. Turbocharger 1C-15. Precautions 8A-3. All information, illustrations and specifications contained in this manual are based on the latest product information available at time of publication. Mismatched or incorrect fasteners can result in damage, malfunction or possible personal injury. Torque Specifications 3A-10. Inspection 3A-54. GENERAL INFORMATIONSERVICE MANUAL NUMBER 29 Page 1A-2 90-863016 MARCH 2001 THIS PAGE IS INTENTIONALLY BLANK 16. Engine Break-In Initial Break-In Procedure The following procedure must be used on new and rebuilt diesel engines. Engine Serial Number Locations 1A-4. Inspection 3A-77. White 1C-13. Solenoid Switch 4A-13. Removal 3A-74. Please Click Here Then Get More Information. 24. Reassembly 3A-67. Glow Plug Circuit Diagram (Continued) 4C-13 Section 4D - Instrumentation Identification 4D-3. Engine Specifications (continued) 3A-5. Troubleshooting Alternator on Engine 4B-11 Charging System 4B-12. Remote Control / Neutral Start Safety Circuit 4D-35. When servicing the electrical and fuel systems it is extremely important that all components are properly installed and tightened. Battery Selection 4A-7. Testing Voltage Drop 4A-10. 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. Serpentine Drive Belt 4B-9. Battery Cables 4A-7. Cylinder Head 3A-5. Sections and section parts are listed on the Service Manual Outline page following the Models Covered in This Manual, page iv. Water Circulating Pump 6A-21. Fuel System 1C-6. Exhaust Manifold / Heat Exchanger 7B-9. Cooling System 1C-23. Battery Cables 2A-26. Engine Specifications 1B-8. 10. B4822 VERVIERS MADE IN BELGIUM a MAX RPM b c 77300 Sterndrive (MCM) a - Serial Number Plate b - Serialized Decal c - Emission Certificate Decal 18. We assume that these personnel have been trained in and are familiar with the recommended servicing procedures of these products or like or similar products manufactured and marketed by Mercury Marine. 13. 26. Flushing Seawater Section 1B-31. Specifications 5B-4. Oil Pressure Switch 4D-31. Inspection 3A-112. Pump Assembly 8A-7. Remote Control Shift Cable Adjustment (Sterndrive Unit Installed) 2A-18 Throttle Cable Installation and Adjustment 2A-24. Pressure Cap 6A-4. Removal 7B-9. Water In Fuel Warning System 5A-14. WARNING Electrical and fuel system components on Mercury MerCruiser Engines and Sterndrives are designed and manufactured to comply with U.S. Coast Guard Rules and Regulations to minimize risks of fire or explosion. 8. We reserve the right to make changes to this manual without prior notification. Replacement Parts Warning 4B-3. Lubricants / Sealants / Adhesives 7C-4. Installation 3A-55. Tools/Lubricants/Adhesives 4E-3. Engine Runs Poorly At High RPM 1C-10. NOTE: Pleasure Duty Rating applies to recreational planning craft used exclusively for pleasure and recreation. Cleaning 3A-88. Installation 6A-23. Engine Specifications 3A-4. Installation 4C-11. Page ii 90-863016 MARCH 2001 Notice to Users of This Manual This service manual has been written and published by Mercury Marine to aid our dealers, mechanics and company service personnel when servicing the products described herein. D Inspect U-joints, splines, and bellows. Power Steering Pump Pulley Replacement 8A-9. Alternator 4B-9. Special marine engine parts have design and manufacturing specifications that are required to provide long life and dependable performance. Cleaning 3A-76. Oil Pump 3A-5. Testing 4C-8. Drive 1B-9. Exploded View 4B-8. Tachometer Sensor 4D-24. Quicksilver Gauges 4D-11. Page xii 90-863016 MARCH 2001 INTAKE AND EXHAUST SYSTEM Section 7A - Intercoler Specifications 7A-2. Removal 6A-21. Exploded View 3A-113. Cleaning and Inspection 7B-10. 12. 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