



BASE AND PARPAC ENGINE MANUAL

VERSION 1

1. Warranty

1. MARINE POWER (“the Company”) warranties each new MARINE POWER BASE or PARPAC engine properly registered with MARINE POWER to be free from defects in material and workmanship.
2. The warranty period for a MARINE BASE OR PARPAC engine is one (1) year parts AND BENCH LABOR (MAXIMUM LABOR \$500.00) only from the date of sale. Receipt of a properly completed Warranty Registration / Sea Trial form must be received by Marine Power for any warranty claim to be honored. All subsequent purchasers must inform MARINE POWER in writing and with a payment of a \$300.00 transfer fee, of the sale of the engine to continue the warranty. If notification is not received by MARINE POWER within fifteen (15) days of the resale; the warranty will be null and void.
3. In the case of commercial use, this Warranty shall be in effect for ninety (90) days from the date of startup, but no longer than six (6) months from the first date of retail purchase. MARINE BASE and PARPAC warranty claims will be for parts and BENCH labor only. Total labor charges cannot exceed \$500.00.
4. The Company’s obligation is limited to repairing or replacing those parts defective in material and workmanship only. At Marine Power’s option, it may replace such part with a part of equal quality as shall be necessary to remedy any malfunction

resulting from a defect in material or workmanship as covered in this Warranty. MARINE POWER will make all necessary repairs under this Warranty free of charge at the MARINE POWER factory. Optionally, MARINE POWER may provide for the repair or replacement of any defective part at the selling dealership or a service center of MARINE POWER’s choice. MARINE POWER will make payment reimbursements for labor to replace such part as previously provided in the then current flat rate manual.

5. MARINE POWER, distributor, or dealer must be advised in writing of any warranty related problem prior to the expiration of the Warranty.
6. This Warranty will not apply to:
 - A) Use of an accessories or parts not manufactured or sold by MARINE POWER.
 - B) Neglect, failure to follow maintenance schedules, accident, abnormal operations, misuse, negligence, improperly maintained, improperly operated or installed, racing, or engine modification. Problems arising from installation, application, exhaust to engine, fuel lines to the engine, propping, cooling to the engine or engine damage due to defective electrical hookups.
 - C) Rust, corrosion or effects of weather.
 - D) Damage caused by water entering engine via the

intake, exhaust or submersion.

- E) Detonation or operation with fuels, oils or lubricants which are not suitable for use with this product. Detonation causes: Poor fuel quality, overloading of engine, improper gear or propeller selection, engine overheating, excessive back pressure, incorrect ignition timing, excessive total timing.
 - F) Reimbursement for: haul-out, launch, towing, storage charges, rental charges of any type, inconvenience of any type, loss of time or income, expense of returning a MARINE POWER product to a service facility, towing, lodging, loss or damage to personal property.
 - G) Carburetor after the first five (5) hours of operation. Fuel, air and float adjustments are part of the installation.
7. Reasonable access must be provided to the product for warranty service. Removal and/or replacement of boat partitions or material because of boat design for necessary access to the product is not covered.
 8. Warranty service must be requested by delivering the product for inspection to the retailer from whom the product was purchased or any convenient marine service center.
 9. Proof of Warranty must be provided at time of

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request for warranty service. A properly completed Warranty Registration / Sea Trial form must be on file with MARINE POWER.

10. Distributors, dealers and service providers are not agents for MARINE POWER. The Company's obligation under this warranty is strictly and exclusively limited to the repair or replacement of defective parts and does not authorize any person to create for it any obligation of liability in connection with this product nor does the Company assume any obligation due to incorrect or defective installation by the dealer.
11. All incidental and/or consequential damages are excluded from this Warranty. Implied warranties are limited to the life of this Warranty. All implied warranties including merchantability, fitness for a particular purpose, or otherwise are disclaimed in their entirety after expiration of the appropriate one (1) year warranty period. This Warranty gives you specific rights, and you may also have other rights, which may vary from state to state. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.
12. MARINE POWER reserves the right to change or improve design of any product previously assembled without notice and without obligation.
13. In the event that a warranty claim is required

outside of the continental United States, with the exception of Alaska and Hawaii, there may be additional charges to the engine owner. Any/All litigation must be filed within the State of Louisiana, Parish of Tangipahoa. MARINE POWER will not warrant any engine sold outside the continental United States, with the exception of Alaska and Hawaii, unless competent and trained personnel and available to provide service to the engine as solely determined by Marine Power.

Note: Check flywheel ring gear position before installing in boat. Bottom mount starters require forward positioned ring gears. Top mount rear entry starters require rear positioned ring gears.

2. Engine Identification

	3.0L / 181 CID	5.7L / 350 CID (Carbureted)	5.7L / 350 CID (MPI)	7.4L / 454 CID (Std. Carbureted)
Engine Type	Inline 4	V8	V8	V8
Crankshaft Horsepower* (HP/KW)	140/104	315/235	325/342	330/246
Displacement (Liter/CID)	3.0L/181 CID	5.7L/350 CID	5.7L/350 CID	7.4L/454 CID
Bore & Stroke (Inches)	4.00 x 3.60	4.00 x 3.48	4.00 x 3.48	4.25 x 4.00
Compression Ratio	9.25:1	9.4:1	9.4:1	8.0:1
Maximum RPM @ Wide Open Throttle	4300 - 4600 RPM	4300 - 4600 RPM	4200 - 5000 RPM	4300 - 4600 RPM
Idle RPM in Forward Gear	650 - 800 RPM	650 - 800 RPM	650 - 800 RPM	650 - 800 RPM
Fuel Pump Pressure	4 - 7 PSI	4 - 7 PSI	4 - 7 PSI	4 - 7 PSI
Oil Pressure @ 2000 RPM	20 - 60 PSI	20 - 60 PSI	20 - 60 PSI	20 - 60 PSI
Minimum Oil Pressure @ Idle	10 PSI	10 PSI	10 PSI	10 PSI
Thermostat (Raw Water)	143° F (62° C)	143° F (62° C)	143° F (62° C)	143° F (62° C)
Thermostat (Fresh Water)	160° F (71° C)	160° F (71° C)	160° F (71° C)	160° F (71° C)
Spark Plug Type	AC 42 LT	AC MR43LTS	AC 41-101	AC MR43T
Spark Plug Gap	.035 IN (0.9MM)	.035 IN (0.9MM)	.060 IN (1.52MM)	.035 IN (0.9MM)
Timing @ Idle RPM	2° (ADTC)	8° (BDTC)	10° (BDTC)	0° (BDTC)
Total Max. Timing Advance @ 4000 RPM	19°	26°	29°	20°
Firing Order	1-3-4-2	1-8-4-3-6-5-7-2 (LH) 1-2-7-5-6-3-4-8 (RH)	1-8-4-3-6-5-7-2 (LH) 1-2-7-5-6-3-4-8 (RH)	1-8-4-3-6-5-7-2 (LH) 1-2-7-5-6-3-4-8 (RH)
Recommended Battery Rating	Min. 350 amps (CCA)	Min. 350 amps (CCA)	Min. 350 amps (CCA)	Min. 350 amps (CCA)
Crankcase Oil**	15W-40	15W-40	15W-40	15W-40
Crankcase Oil Capacity (Aluminum Pan)	Approximately 4 quarts	Approximately 6 quarts	Approximately 6 quarts	Approximately 10 quarts
Crankcase Oil Capacity (Sheet Metal Pan)		Approximately 5 quarts	Approximately 5 quarts	Approximately 8 quarts

* Rated by Marine Power, Inc. in accordance with SAE J607, Prop Shaft rating will vary according to drive used.

** Synthetic oil may be substituted.

2. Engine Identification

	7.4L / 454 CID (MPI)	7.4L / 454 CID (Premium HP)	8.2L / 502 CID (Carbureted)	8.2L / 502 CID (MPI)
Engine Type	V8	V8	V8	V8
Crankshaft Horsepower* (HP/KW)	340/253	380/282	400/298	420/313
Displacement (Liter/CID)	7.4L/454 CID	7.4L/454 CID	8.2L/502 CID	8.2L/502 CID
Bore & Stroke (Inches)	4.25 x 4.00	4.25 x 4.00	4.47 x 4.00	4.47 x 4.00
Compression Ratio	9.0:1	8.6:1	8.75:1	8.75:1
Maximum RPM @ Wide Open Throttle	4200 - 4600 RPM	4600 - 5000 RPM	4300 - 4800 RPM	4600 - 5000 RPM
Idle RPM in Forward Gear	650 - 800 RPM	650 - 800 RPM	650 - 800 RPM	650 - 800 RPM
Fuel Pump Pressure	39 PSI	-	4 - 7 PSI	39 PSI
Oil Pressure @ 2000 RPM	20 - 60 PSI	20 - 60 PSI	20 - 60 PSI	20 - 60 PSI
Minimum Oil Pressure @ Idle	10 PSI	10 PSI	10 PSI	10 PSI
Thermostat (Raw Water)	143° F (62° C)	143° F (62° C)	143° F (62° C)	143° F (62° C)
Thermostat (Fresh Water)	160° F (71° C)	160° F (71° C)	160° F (71° C)	160° F (71° C)
Spark Plug Type	AC MR43T	AC MR43T	AC MR43T	AC MR43T
Spark Plug Gap	.035 IN (0.9MM)	.035 IN (0.9MM)	.035 IN (0.9MM)	.035 IN (0.9MM)
Timing @ Idle RPM	0° (BDTC)	12° (BDTC)	12° (BDTC)	12° (BDTC)
Total Max. Timing Advance @ 4000 RPM	-	30°	30°	-
Firing Order	1-8-4-3-6-5-7-2 (LH) 1-2-7-5-6-3-4-8 (RH)	1-8-4-3-6-5-7-2 (LH) 1-2-7-5-6-3-4-8 (RH)	1-8-4-3-6-5-7-2 (LH)	1-8-4-3-6-5-7-2 (LH)
Recommended Battery Rating	Min. 350 amps (CCA)	Min. 350 amps (CCA)	Min. 350 amps (CCA)	Min. 350 amps (CCA)
Crankcase Oil**	15W-40	15W-40	15W-40	15W-40
Crankcase Oil Capacity (Aluminum Pan)	Approximately 10 quarts	Approximately 10 quarts	Approximately 10 quarts	Approximately 10 quarts
Crankcase Oil Capacity (Sheet Metal Pan)	Approximately 8 quarts	Approximately 8 quarts	Approximately 8 quarts	Approximately 8 quarts

* Rated by Marine Power, Inc. in accordance with SAE J607, Prop Shaft rating will vary according to drive used.

** Synthetic oil may be substituted.

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Water Can Enter the Engine Cylinders Through the Intake or Exhaust System.

Beware of these situations:

1. Following Wakes: Sudden slow-downs may cause the boat wake to flow over the transom of your boat. Most engine hatch covers are not watertight. Water spilling into the engine compartment can easily enter the air intake, especially if the engine is running.
2. Engine Shutdown: Sudden engine shutdown while the boat is moving may force water into the exhaust system.
3. Improper Installation: Refer to exhaust pipe section. An exhaust system without flappers and the specified incline increases the likelihood of water entering the engine.
4. Improper Hoisting: Operators are sometimes tempted to reduce hoisting time for propeller changes by hoisting only the boat stern. Such hoisting can cause residual water in the exhaust system to enter engine cylinders.

Water entering engine cylinders will cause the engine to lock because water does not compress. To remedy this situation, take the following steps:

1. Change engine oil and filters.
2. Remove all spark plugs.
3. Remove coil wire.
4. Crank engine for 15 seconds.
5. Replace spark plugs and reattach coil wire.

6. Start engine - if there are any abnormal sounds STOP ENGINE immediately and contact your MARINE POWER dealer.

Water Inversion

Water inversion is water that is pulled back into the exhaust which usually ends up in the piston cylinder. Most of the time this happens under the following conditions:

- Shutting off engine at high RPM's.
- Water comes up the exhaust after a quick slowdown.
- Long periods of idling.
- Exhaust drop not sufficient.

Usually the water is not found until the next time the boat is used. In some cases, this may not be for weeks. In the case of a salt water environment this is catastrophic due to the rusting.

To minimize the problem MARINE POWER requires the installation of flappers at the transom and in the exhaust hose just after the exhaust riser or elbow.

Detonation and/or Pre-Ignition

Detonation is most commonly known as "pinging", "spark knock" or "fuel knock". It is the abnormal combustion of the fuel which causes the fuel to explode severely within the combustion chamber.

In a four-cycle engine, normal combustion or burning starts at the spark plug and a wave of flames move across the

combustion chamber. This results in an even pressure rise in the combustion chamber which pushes the piston downward.

Detonation begins as normal combustion with the spark-ignited flame progressing across the combustion chamber while applying the heat and pressure to the unburned portion of fuel. Instead of continuing to burn evenly, the last portion of the fuel explodes violently which in turn causes overheating of the pistons, valves and spark plugs.

This may occur at any speed and is not often detected, serious and tragic engine damage may occur.

There are many causes of detonation, with the most common being the use of a low-octane gasoline or improperly timed ignition. Detonation may also occur when using the proper octane gasoline if engine maintenance has been neglected. Possible causes include:

1. Poor or improper fuel quality/octane.
2. Improper initial ignition timing setting.
3. Improper propeller selection.
4. Engine overload, such as operating twin-engine boat with only one engine.
5. Improper cooling operation resulting in engine overheating.
6. Fuel starvation or vapor lock resulting from poor fuel quality/lean out.
7. Malfunctioning carburetor causing lean mixture.
8. Operating engine that is out of proper tune, dead cylinder,

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defective distributor cap.

- Excessive exhaust backpressure by restricted exhaust mufflers or outlets.

Proper Engine Break-In

CAUTION First twenty-five (25) hours vary the RPM. Avoid sustained periods of wide open throttle. Some EFI engines will not reach WOT until engine is up to normal operating temperatures.

AT NO TIME SHOULD THE ENGINE BE OPERATED BEYOND THE SPECIFIED MAXIMUM RPM RATING. FAILURE TO ADHERE TO THESE RECOMMENDATIONS WILL VOID THE TERMS OF WARRANTY.

To insure maximum life of your MARINE POWER engine, the following engine break-in schedule is recommended:

First hour - Perform sea trial.

IMPORTANT! During the break-in period, pay close attention to the following steps.

- OIL LEVEL:** Check the oil level before each engine start up and every eight (8) hours of continuous operation. It should be understood that internal combustion engines will use a certain amount of oil during operation as a cooling and lubricating agent (especially during break-in period). Oil consumption should decrease after approximately 100 hours of operation.

IMPORTANT! The space between “FULL” and “ADD” marks on the dipstick represent one quart. It is not necessary to add

oil unless the level is at or below the “ADD” mark.

CAUTION Engine dipstick level may change due to the angle of installation. Ensure that “high” oil level is properly marked accordingly.

CAUTION When adding crankcase oil, DO NOT OVERFILL. If crankcase is overfilled, it will cause foaming or aeration of oil in the oil pan. This will effect oil pressure which may result in severe internal engine damage.

- VOLTMETER:** Normal reading is 13.0 - 14.5 volts at 2,000 RPM.
- OIL PRESSURE:** Not less than 10 PSI at idle.
- NORMAL OPERATING TEMP:** Raw water cooling - less than 165 degrees. Closed cooling - between 160 and 190 degrees.
- IDLE RPM:** Normal reading is 650 - 800 RPM in gear. Note: For Jetpac applications, normal reading is 800 - 1,000 RPM.
- THROTTLE AND SHIFT CONTROLS:** Check that movement is not constrictive. Verify that linkage is adjusted so that engine may reach Wide Open Throttle (WOT).
- EXHAUST, OIL, WATER AND FUEL SYSTEM:** Inspect for leaks. Be sure to check riser bolt tightness after 10 hours and every 50 hours of operation. Refer to Maintenance Schedule.

It is very important to re-tighten exhaust manifold riser bolts after 10 hours of operation. Failure to do so can cause

non-warrantable engine damage.

General Information

ENGINE ROTATION

Directional references used in this section are given as if standing behind the boat, looking forward:

- Front of boat is bow.
- Rear of boat is stern.
- Right side is starboard.
- Left side is port.

The raw water (or seawater) pump is located at the front of the engine on the crankshaft pulley. Engine rotation can be determined by looking at the stern end of the engine and observing the flywheel rotation. Do not assume engine rotation by looking at the propeller rotation; it may not be the same. This information is critical when ordering parts for your engine.

Left Hand Engines: CCW or Normal Rotation
Right Hand Engines: CW or Opposite Rotation.

PROPELLER WARNING

WARNING! MARINE POWER does not warranty items damaged due to detonation. The propeller selected should allow the engine to operate at or near the recommended wide open throttle RPM range with a normal load. Wide Open Throttle RPM range is listed in Engine Identification Section.

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WARNING! Using a propeller too large will not allow the engine to reach its rated RPM range which will create an overloaded condition and possible destructive detonation that can be harmful to the engine's performance and life.

PROPELLER INFORMATION

Diameter, pitch or coupling of a propeller will affect engine RPM and boat performance. Configuration of the blade also affects performance. Even propellers from different manufacturers with the same pitch and diameter will perform differently.

Testing for a correct propeller is accomplished by operating the boat (with an average load) at Wide Open Throttle (WOT) RPMs should be at the high end of the specified range and checked with an accurate tachometer. This will allow the engine not to fail below the RPM specified range under a heavy load condition. If the engine RPM is above or below the specified range, a change in the diameter and/or pitch of the propeller is required. Newly installed engines operating 100 - 300 RPM below wide open throttle is usually a propeller problem.

Delco EST Ignition

USING THE TIMING TOOL: Carbureted Engine.

For EFI Engines - Refer to original manufacturer's instructions but verify that engine is not timed outside of specifications noted in this manual.

The 3.0 liter (181CID) does not have to be timed unless the

distributor is moved during installation. It is timed at the factory. **IMPORTANT!** The 3.0 engine is timed at minus 2 degrees, raising the timing will cause the engine to detonate and blow cylinder head gaskets.

The timing tool is used in setting the initial engine timing on MARINE POWER carbureted engines. This connector by-passes the electronic spark timing of the engine and allows the initial timing to be adjusted by rotating the distributor. Use the following procedure (become familiar with entire procedure before beginning):

1. Connect a timing light to the number one (1) spark plug wire. Connect the timing light power lead to a 12 volt power source. **(DO NOT CONNECT TO 12 VOLTS ON ALTERNATOR.)**
 2. Start engine and allow to warm to operating temperature. Space linkage so that engine idles at 1,000 - 1,200 RPM.
 3. WHILE ENGINE IS RUNNING, install the timing tool supplied with your engine into the terminal connector on the distributor.
 4. Loosen distributor clamp just enough to rotate distributor in place.
- Note: An adjustable timing light is required to set initial and total timing.
5. Secure the bare wire end of the timing tool to battery positive (+) voltage (the most convenient location of this voltage is on the cranking motor solenoid.) If desired, a

suitable clip, such as an alligator clip may be permanently attached to the bare wire end of the timing tool to hold it in place. Once connected the engine idle will drop to approximately 600 RPM. It is important that the initial linkage spacing in Step 2 allows the engine to drop to around 600 with the timing tool connected to 12 volts. The step spacing may have to be adjusted so that the engine does settle at 600 RPM after connecting the tool.

6. Rotate distributor to set mechanical timing. REFER TO THE APPROPRIATE "**ENGINE IDENTIFICATION**" SECTION OF THIS MANUAL FOR CORRECT TOTAL AND INITIAL TIMING FOR YOUR ENGINE. **IMPORTANT: The 3.0 engine is timed at minus 2 degrees, raising the timing will cause the engine to detonate and blow cylinder head gaskets.**
7. Tighten distributor clamp to hold in position when initial timing is obtained.
8. Recheck timing.
9. Remove the timing tool from distributor.
10. Check total timing at 4,000 RPM. (See Engine Identification Section.)
11. Disconnect and remove the timing light.

Fuel Lines

IMPORTANT! In repower applications, inspect all fuel lines for possible restrictions. Fuel tanks should be installed

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below the height of the fuel system. It is recommended that an anti-siphon valve be included in the fuel tank.

A 3/8" minimum (inner-dimension) "Type A1" USCG Approved tubing is recommended for the fuel line from the tank to the engine for all 181/3.0L, 262/4.3L and 350/5.7L engines. All 7.4L and larger engines must be 1/2" minimum inner dimension. It should be adequately secured and provided with a flexible section near the engine to reduce vibration to the line. Fittings for the tubing should conform to current Coast Guard or American Boating & Yacht Council standards. It is also recommended that older copper fuel lines be replaced with an approved fuel line.

Fuel tanks should be of a size adequate with the full requirements and should be anchored securely and vented in such a manner to conform to Coast Guard regulations. The fuel tank filling arrangements should conform to all safety regulations, and must be outboard. The installation of an approved fuel shut off valve at the tank is mandatory.

Verify that carbureted engines have 5 - 7 psi fuel pressure. EFI engine fuel pressure should meet original manufacturers specifications. **WARNING: INADEQUATE FUEL PRESSURE WILL DESTROY A NEW ENGINE.**

Crankcase Ventilation

Open vent tubes maybe routed directly to flame arrestor. If PVC valves are used, they must be routed to a vacuum port on the carburetor base or intake manifold.

Exhaust Piping

IMPORTANT! The boat manufacturer or installing dealer (or individual) is responsible for properly locating the engine and installing the exhaust system. Improper installation may allow water to enter the exhaust manifolds and engine cylinders and severely damage the engine. Damage caused by water in the engine will not be covered by the MARINE POWER Warranty, unless this damage is a result of defective parts or workmanship by MARINE POWER.

ENPACS, SPORTPACS, and TOWPACS are equipped with a wet exhaust system in which exhaust is mixed with water in the exhaust risers. This water cools the exhaust and allows the use of heat resistant rubber hose on the riser outlets. Follow these general guidelines when designing and installing the exhaust system.

Use heat resistant hose that complies with specifications SAE J2006 or UL 1129 (ABYC standard). Exhaust hoses should be 4" on dual outlet systems. 8.2L and larger engines should use 5" on single outlet systems.

Sharp bends should be avoided.

Exhaust hoses should be connected straight on the riser outlets.

Exhaust back pressure test should be preformed to ensure that exhaust components are adequately sized. Exhaust back pressure should be between 1-3 psi. Some back pressure is necessary to prevent water intrusion. Do not go below 1 psi.

Exhaust risers must be the suggested distance above the water line. Install riser spacers if necessary.

A minimum of 18" of exhaust hose must be installed between the exhaust risers and the collector, Y-pipe, muffler or first angular fitting. This portion of the exhaust hose must have a downward slope of **1-1/4"/ft. for conventional inboards and a downward slope of 7/8"/ft. for V-drives.** Some OEM installations may differ from these specifications but these installations have been carefully evaluated by MARINE POWER and the OEM.

After the first 18" the exhaust system must have a drop of 1/2"/ft. Measure exhaust riser height as shown. Minimum exhaust riser height should be 15" on 7.4 and 8.2L engines. All others should be 13".

The slope in the exhaust hose and components must be routed so that no low point exists in the system where water may be retained. The muffler, collector and exhaust hoses must be adequately supported for proper routing and to prevent over-stressing the exhaust manifolds and risers.

Internal flappers may be required on naturally aspirated 7.4 and 8.2L engines.

Applications with through transom exhausts must be equipped with exhaust flappers to prevent the reverse flow of water into the engine. Exhaust outlets should be above the water line with the boat at rest to minimize engine back pressure.

Every exhaust connection should be secured with at least two hose clamps. The clamps should be stainless steel and at least 1/2" wide.

/// 4. Engine Maintenance

Scheduled Maintenance By Owner

Service	Engine Startup Each Day	After 10 Hours of Operation	Every 50 Hours of Operation	Every 100 Hours of Operation
Check Engine Oil Level *	✓			✓
Inspect Fuel Lines and Connections for Leaks	✓			✓
Check Coolant Level in Tank (If Equipped with Closed Cooling)	✓			✓
Inspect and Clean Sea Strainer (If Equipped)	✓			✓
Inspect Entire Power Package for Leaks (Water, Fuel, Oil, Exhaust, etc.)		✓	✓	✓
Inspect Belts for Tension and Wear		✓	✓	✓
Inspect Battery (Terminals and Fluid Levels)		✓	✓	✓
Check Battery Connection to Engine		✓	✓	✓
Touch Up Exterior Surface with Marine Power Paint		✓	✓	✓
Inspect Zinc Anodes in Heat Exchanger for Deterioration (If Equipped with Closed Cooling)		✓	✓	✓
Check Power Steering Fluid (If Equipped)				✓
Check Transmission Fluid Level	✓		✓	✓
Lubricate Starter Pinion and Shaft			✓	✓

* Engine Start-Up Each Day and Once Every Eight (8) Hours of Operation.

/// 4. Engine Maintenance

Scheduled Maintenance By Qualified Technician

Service	Engine Startup Each Day	After 10 Hours of Operation	Every 50 Hours of Operation	Every 100 Hours of Operation
Change Engine Oil and Filters	✓	✓		✓
Change Filter on Fuel/Water Separator		✓		✓
Check Engine Mounts (Tightness)	✓		✓	✓
Check Riser and Manifold Bolts for Tightness	✓	✓	✓	✓
Check for Loose, Damaged or Missing Engine Parts			✓	✓
Check Wire Harness Plugs for Corrosion and Connections			✓	✓
Inspect Distributor for Cracks or Deterioration			✓	✓
Check Condition of Spark Plugs (Replace if Necessary)			✓	✓
Inspect Hoses for Deterioration			✓	✓
Replace Impeller in Seawater Pump			✓	✓
Check Propeller and Shaft Alignment				✓
Check and Adjust Ignition Timing (Carbureted Engine Only)				✓
Check and Adjust Carburetor				✓
Clean and Inspect Flame Arrestor and Crank Case Vent Hose			✓	✓
Clean and Inspect Carburetor Filter			✓	✓
Change Transmission Fluid				✓
Change Coolant (If Equipped with Closed Cooling)				✓
Clean Seawater Section of Heat Exchanger				✓



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