MARINER OUTBOARDS

MERCURY OUTBOARDS

SERVICE MANUAL

MODELS
225 • 225 EFI • 250 EFI • 3.0 Litre
Marathon • 3.0 Litre SeaPro

With Serial Numbers

United States . . . 0D280813 and Above

Printed in U.S.A.

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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

DANGER - Immediate hazards which WILL result in severe personal injury or death.

⚠ WARNING

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 the servicing procedures of these products, or like or similar products manufactured and marketed by Mercury Marine, that they have been trained in the recommended servicing procedures of these products which includes 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 service trade of all conceivable procedures by which a service might be performed and of the possible hazards and/or results of each method. We have not undertaken any such wide evaluation. 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 by the service procedure selected.

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.

It should be kept in mind, while working on the product, that the electrical system and ignition system are 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.

Cleanliness and Care of Outboard Motor

A marine power product is a combination of many machined, honed, polished and lapped surfaces with tolerances that are measured in the ten thousands of an inch./mm. When any product component is serviced, care and cleanliness are important. Throughout this manual, it should be understood that proper cleaning, and protection of machined surfaces and friction areas is a part of the repair procedure. This is considered standard shop practice even if not specifically stated.

Whenever components are removed for service, they should be retained in order. At the time of installation, they should be installed in the same locations and with the same mating surfaces as when removed.

Before raising or removing and outboard engine from a boat, the following precautions should be adhered to:

1. Check that flywheel is secured to end of crankshaft with a locknut and lifting eye is threaded into flywheel a minimum of 5 turns.
2. Connect a hoist of suitable strength to the lifting eye.

In addition, personnel should not work on or under an outboard which is suspended. Outboards should be attached to work stands, or lowered to ground as soon as possible.

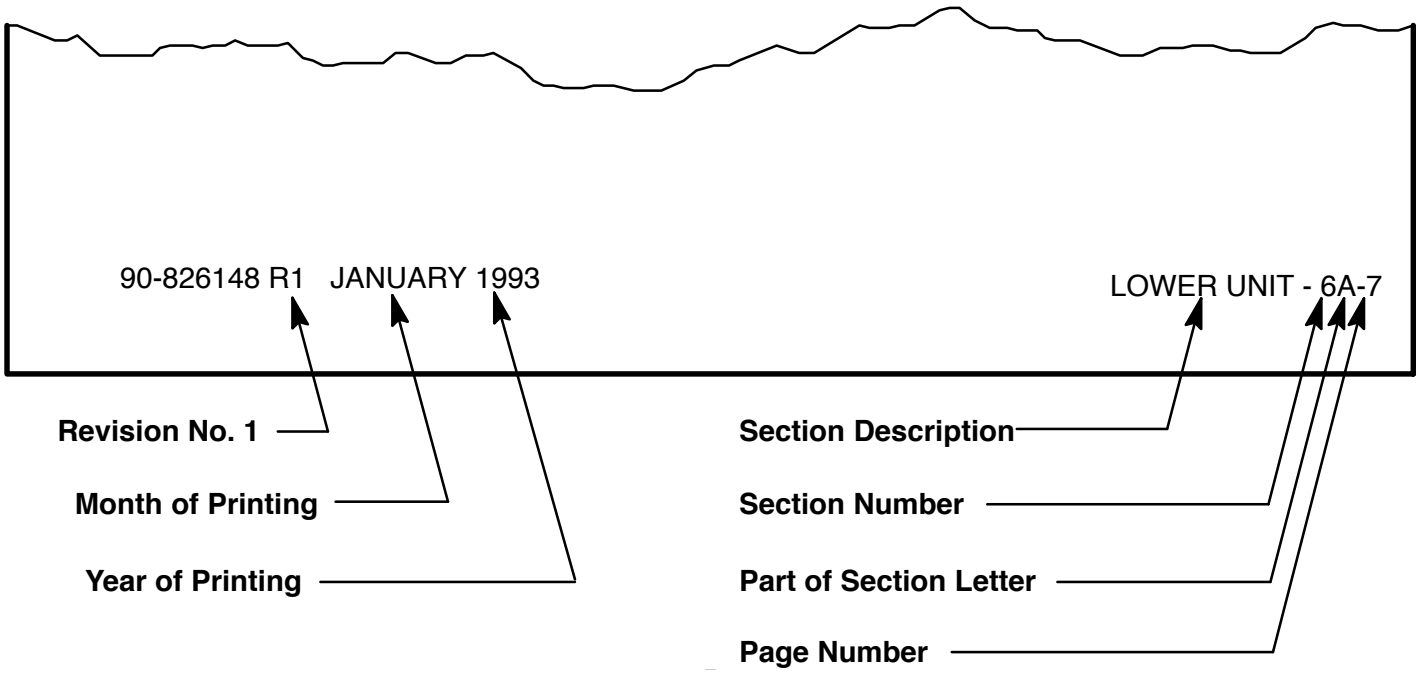
We reserve the right to make changes to this manual without prior notification.

Refer to dealer service bulletins for other pertinent information concerning the products described in this manual.

Page Numbering

Two number groups appear at the bottom of each page. The example below is self-explanatory.

EXAMPLE:



Service Manual Outline

IMPORTANT INFORMATION

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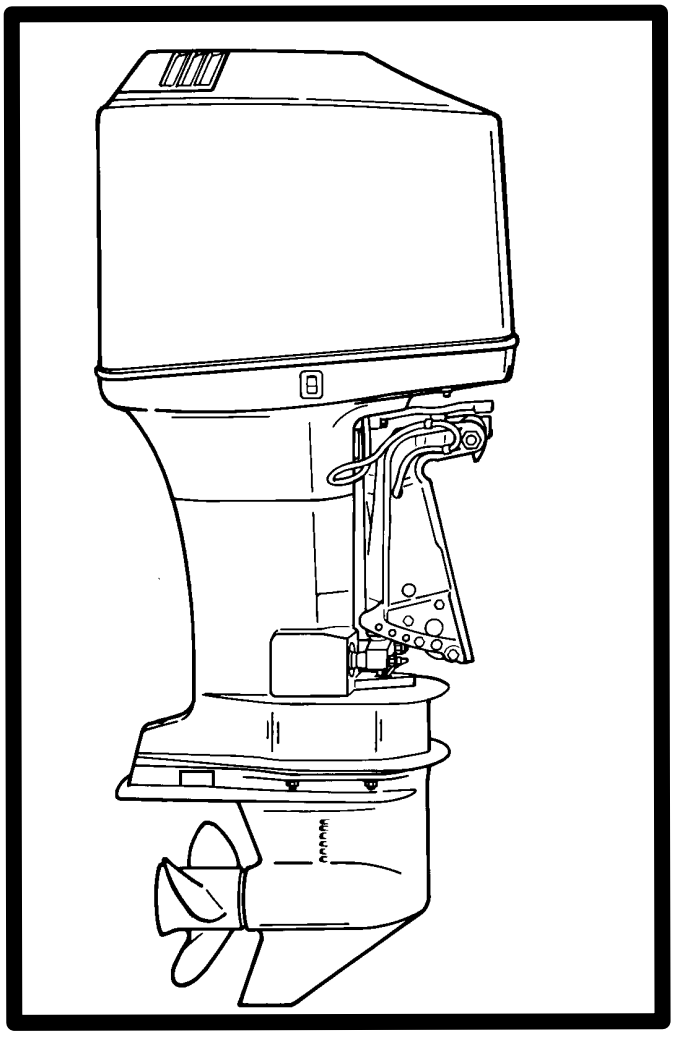

SPECIFICATIONS

Table of Contents

Master Specifications

Model 3 Litre Work/225 Carb/225 EFI/250EFI		
HORSEPOWER (KW)	**Model 3 Litre** **Model 225 Carb** **Model 225 EFI** **Model 250 EFI**	225 (167.8) 225 (167.8) 225 (167.8) 250 (186.5)
OUTBOARD WEIGHT	**3 Litre/225 Carb** **– 20 in. (50.8cm) Shaft** **– 25 in. (63.5cm) Shaft** **– 30 in. (76.2cm) Shaft** **225 EFI/250 EFI** **– 20 in. (50.8cm) Shaft** **– 25 in. (63.5cm) Shaft** **– 30 in. (76.2cm) Shaft**	 440.0 lbs. (199.8kg) 445.0 lbs. (202.0kg) 461.0 lbs. (209.3kg) 450.0 lbs. (204.1kg) 455.0 lbs. (206.4kg) 471.0 lbs. (213.6kg)
CYLINDER BLOCK	**Type** **Displacement**	V–6 Cylinder, Two Cycle, Loop Charged 185.9 cu. in. (3047cc)
STROKE	**Length (All Models)**	3.00 in. (76.2mm)
CYLINDER BORE	**Diameter (Std)** **Taper/Out of Round/Wear Maximum** **Bore Type**	3.6265 in. (92.1131mm) 0.003 in. (0.076mm) Cast Iron
PISTON	**Piston Type** **Standard**	Aluminum 3.621 in. ± .0005 in. (91.973mm ± 0.0127mm)
COMPRESSION	**All Models – Using a fully charged battery, throttle shutters wide open and cylinder block warm**	90 – 110 psi (616.3 – 753.5 kPa) Variance between cylinders should not exceed 15 psi (102.7 kPa)
REEDS	**Reed Stand 0pen (Max.)**	0.020 in. (0.50mm)
MID SECTION	**Power Trim (Total Tilt Range)** **Power Trim (Tilt Range)** **Steering Pivot Range** **Tilt Pin Adjustment Positions** **Allowable Transom Thickness**	75° 20° 60° 5 2-3/8 in. (6.03cm) Maximum

Model 3 Litre Work/225 Carb/225 EFI/250EFI		
GEAR HOUSING	**Gear Ratio** **1994 Standard Ratio All Models** **1995/1996 Gear Ratios All Models** **Optional High Altitude Ratio (Right Hand Rotation)** **3 Litre Work (All Shaft Lengths)** **225 Carb (20 in. Shaft Length)** **225 Carb (25 in./30 in. Length)** **225 EFI (All Shaft Lengths)** **250 EFI (All Shaft Lengths)** **Gearcase Capacity** **Pinion Height** **Forward Gear Backlash** **– 1.75:1/1.87:1** **Reverse Gear Backlash** **– Standard Rotation** **– Counter Rotation** **Water Pressure @ RPM** **– @ Idle** **– @ 5000 RPM**	 1.64:1 17/28 Teeth Service Replacement Ratio for 1.64:1 is 1.62:1 13/21 Teeth 1.87:1 15/28 Teeth 1.75:1 12/21 Teeth 1.75:1 1.75:1 1.75:1 1.75:1 28.0 fl. oz. (828.0ml) 0.025 in. (0.64mm) . 0.017 in. – 0.028 in. (0.43mm – 0.71mm) 0.028 in. to 0.052 in. (0.71mm to 1.32mm) 0.040 in. – 0.060 in. (1.0mm – 1.52mm) 1-1/2 – 4-1/2 psi (10.3 – 30.8kPa) 8 – 10 psi (54.8 – 68.5kPa) Minimum
FUEL SYSTEM	**Fuel** **Recommended Gasoline** **Recommended Oil** **Gasoline/Oil Ratio** **Fuel Pressure – @ Idle** **– @ WOT**	Gasoline w/Oil Injection Unleaded 87 Octane Minimum Quicksilver TC-W3 2 Cycle Outboard Oil 50:1 2 psi (13.7kPa) 8 psi (54.8kPa)
STARTING SYSTEM	**Manual Start – All Models** **Electric Start – All Models** **Starter Draw (Under Load)** **Starter Load (No Load)** **Minimum Brush Length** **Battery Rating**	Emergency Start Rope 165 Amperes 25 Amperes 0.25 in. (65.4mm) 630 Marine Cranking Amps (MCA) or 490 Cold Cranking Amps (CCA)
IGNITION SYSTEM	**Type** **Spark Plug Type** **1994 – 1996 S/N 0D280813 - 0G437999 3 Litre Work/225 Carb** **1997 S/N 0G438000 and UP** **3 Litre Work/225 Carb** **1994/95/96/97 225 EFI/250EFI** **Spark Plug Gap** **NGK BPZ8H-N-10** **Champion QL77CC**	Capacitor Discharge NGK BPZ8H-N-10 Champion QL77CC Champion QL77CC 0.040 in. (1.0mm) 0.035 in. (0.89mm)
CHARGING SYSTEM	**Alternator Output (Regulated)** **Brush Length**	30 Amperes @ 750 RPM 60 Amperes @ 2000 RPM Std. Exposed Length: 0.413 in. (10.5mm) Min. Exposed Length: 0.059 in. (1.5mm)

Model 3 Litre Work/225 Carb/225 EFI/250EFI		
F U E L I N J E C T I O N	**Idle RPM – Model 225 EFI/250 EFI Wide Open Throttle (WOT) RPM – Model 225 EFI – Model 250 EFI Float Adjustment (Vapor Separator) Float Level Injectors – All Models (Quantity) – Fuel ECU Receives Signal from: – #2 Primary Ignition Circuit – #4 Primary Ignition Circuit – #6 Primary Ignition Circuit Line Pressure @ Injectors**	 650 ± 50 5000 – 5800 5000 – 5800 Preset @ Factory 6 #1 and #2 Injectors (WHITE Lead) #3 and #4 Injectors (DARK BLUE Lead) #5 and #6 Injectors (YELLOW Lead) 34 psi – 36 psi (234kPa – 248kPa)
OIL INJECTION	**Recommended Oil Oil Tank Capacity (in boat) Approx. Time – Model 225/250 Reserve Capacity/Approx. Time Output @ 1500 RPM for 3 Minutes with Pump @ Full Open**	Quicksilver TC-W3 3 gal. (11.4Liter) 6.0 hrs. Approx. 1.5 qt. (1.45 Liter) 30 – 35 min. 31.5cc @ 1500 RPM

Model 3 Litre Work/225 Carb/225 EFI/250EFI

CARBURETOR	**Model 3 Litre Work**	
	Idle RPM	650 ± 50
	Wide Open Throttle (WOT) RPM	5000 – 5500
	Idle Mixture Screw Adjustment	1-1/2±1/4
	Float Adjustment	Float is Level with top of Bowl w/Bowl Inverted
	WMV 6	
	– Cylinder #1	
	– Main Jet	.078
	– Idle Jet	.042
	– Vent Jet	.080
	– Cylinder #2	
	– Main Jet	.078
	– Idle Jet	.042
	– Vent Jet	.080
	– Cylinder #3	
	– Main Jet	.080
	– Idle Jet	.056
	– Vent Jet	.080
	– Cylinder #4	
	– Main Jet	.078
	– Idle Jet	.018
	– Vent Jet	.080
	– Cylinder #5	
	– Main Jet	.088
	– Idle Jet	.056
	– Vent Jet	.080
	– Cylinder #6	
	– Main Jet	
	– Idle Jet	.078
	– Vent Jet	.018
		.080

Model 3 Litre Work/225 Carb/225 EFI/250EFI

CARBURETOR	**Model 3 Litre Work**	
	Idle RPM	650 ± 50
	Wide Open Throttle (WOT) RPM	5000 – 5500
	Idle Mixture Screw Adjustment	1-1/2±1/4
	Float Adjustment	Float is Level with top of Bowl w/Bowl Inverted
	WMV 11	
	– Cylinder #1	
	– Main Jet	.082
	– Idle Jet	.040
	– Vent Jet	.080
	– Cylinder #2	
	– Main Jet	.082
	– Idle Jet	.046
	– Vent Jet	.080
	– Cylinder #3	
	– Main Jet	.082
	– Idle Jet	.058
	– Vent Jet	.080
	– Cylinder #4	
	– Main Jet	.086
	– Idle Jet	.048
	– Vent Jet	.080
	– Cylinder #5	
	– Main Jet	.082
	– Idle Jet	.054
	– Vent Jet	.080
	– Cylinder #6	
	– Main Jet	.082
	– Idle Jet	.048
	– Vent Jet	.080

Model 3 Litre Work/225 Carb/225 EFI/250EFI		
CARBURETOR	**Model 225**	
	Idle RPM	650 ± 50
	Wide Open Throttle (WOT) RPM	5000 – 5500
	Idle Mixture Screw Adjustment	1-1/2±1/4
	Float Adjustment	Float is Level with top of Bowl w/Bowl Inverted
	WMV 7	
	– Cylinder #1	
	– Main Jet	
	– Idle Jet	.086
	– Vent Jet	.038
		.080
	– Cylinder #2	
	– Main Jet	
	– Idle Jet	.086
	– Vent Jet	.038
		.080
	– Cylinder #3	
	– Main Jet	
	– Idle Jet	.088
	– Vent Jet	.070
		.080
	– Cylinder #4	
	– Main Jet	
	– Idle Jet	.088
	– Vent Jet	.020
		.080
	– Cylinder #5	
	– Main Jet	
	– Idle Jet	.088
	– Vent Jet	.070
		.080
	– Cylinder #6	
	– Main Jet	
	– Idle Jet	.088
	– Vent Jet	.032
		.080

Model 3 Litre Work/225 Carb/225 EFI/250EFI		
CARBURETOR	**Model 225**	
	Idle RPM	650 ± 50
	Wide Open Throttle (WOT) RPM	5000 – 5500
	Idle Mixture Screw Adjustment	1-1/2±1/4
	Float Adjustment	Float is Level with top of Bowl w/Bowl Inverted
	WMV 13	
	– Cylinder #1	
	– Main Jet	.084
	– Idle Jet	.046
	– Vent Jet	.082
	– Cylinder #2	
	– Main Jet	.082
	– Idle Jet	.060
	– Vent Jet	.082
	– Cylinder #3	
	– Main Jet	.084
	– Idle Jet	.054
	– Vent Jet	.086
	– Cylinder #4	
	– Main Jet	.086
	– Idle Jet	.052
	– Vent Jet	.086
	– Cylinder #5	
	– Main Jet	.084
	– Idle Jet	.058
	– Vent Jet	.082
	– Cylinder #6	
	– Main Jet	.082
	– Idle Jet	.052
	– Vent Jet	.082
TIMING	**Idle Timing**	4° – 8° ATDC
	Maximum BTDC	
	@ W.O.T (5000 RPM or Above)	
	MODEL 3 LITRE WORK/225 CARB	19° BTDC @ 5000 RPM 24° BTDC @ 5500 RPM
	MODEL 225 EFI	24° BTDC @ 5000 RPM 24° BTDC @ 5800 RPM
	MODEL 250 EFI	24° BTDC @ 5000 RPM 28° BTDC @ 5800 RPM

NOTE: *Timing specifications listed are for 1998 model year engines. Refer to timing decal on engine for previous model year timing specifications.*