Service Manual Outline

Notice

Throughout this publication, “Dangers”, “Warnings” and “Cautions” (accompanied by the International HAZARD Symbol ⚠) are used to alert the mechanic to special instructions concerning a particular service or operation that may be hazardous if performed incorrectly or carelessly. **OBSERVE THEM CAREFULLY!**

These “Safety Alerts” alone cannot eliminate the hazards that they signal. Strict compliance to these special instructions when performing the service, plus “Common Sense” operation, are major accident prevention measures.

⚠ DANGER

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.

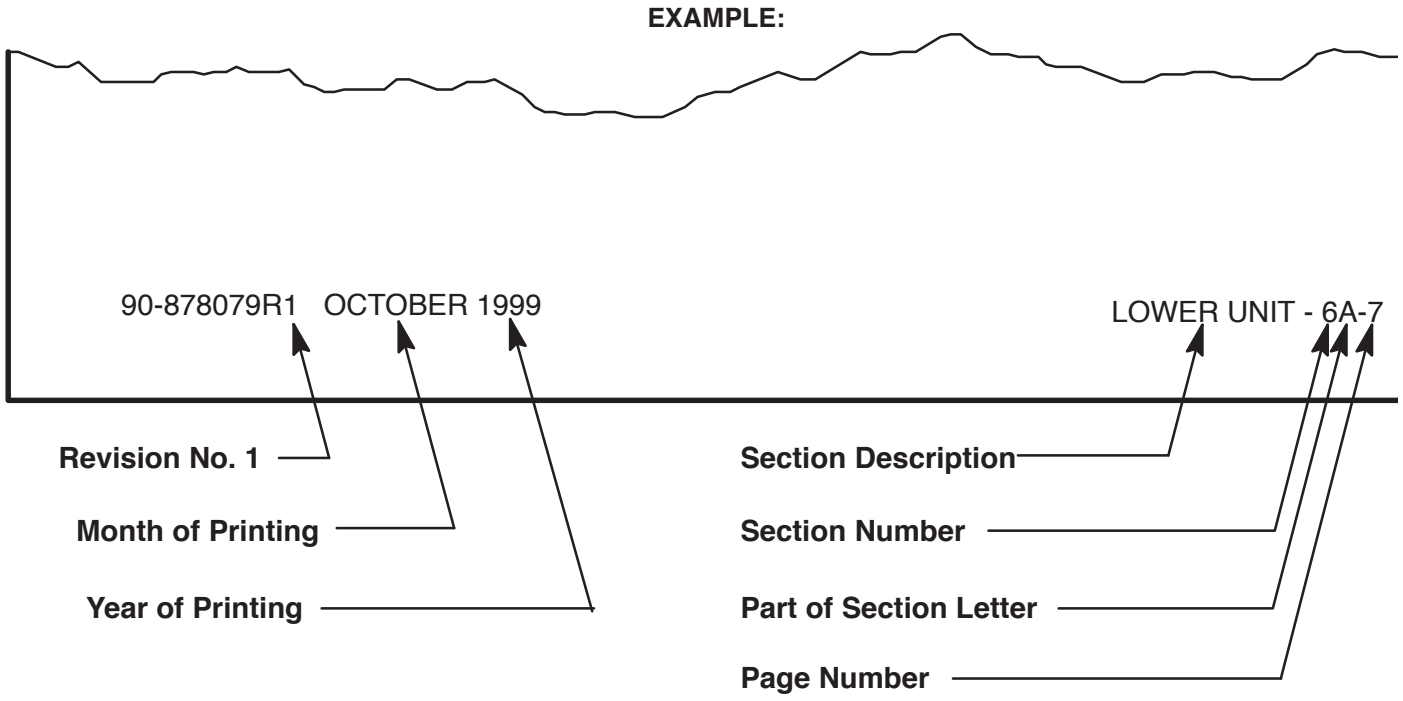
Personnel should not work on or under an outboard which is suspended. Outboards should be attached to work stands, or lowered to ground as soon as possible.

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.



IMPORTANT INFORMATION

Section 1A - Specifications

Table of Contents

Specifications

Model 135/XR6/MAGIII/200/150XRI/175XRI/200XRI		
HORSEPOWER (KW)	**Model 135** **Model 150XRI** **Model XR6/MAGIII** **Model 175XRI** **Model 200/200XRI**	135 (100.6) 150 (111.8) 150 (111.8) 175 (130.5) 200 (149.1)
OUTBOARD WEIGHT	**Model 135** **Model XR6/MAGIII/200** **Model 150XRI/175XRI/200XRI**	413.0 lbs. (188.0 kg) 406.0 lb (184.0 kg) 416.0 lb (189.0 kg)
CYLINDER BLOCK	**Model 135** **Type** **Displacement** **Thermostat** **Model XR6/MAGIII/200 150XRI/175XRI/200XRI** **Type** **Displacement** **Thermostat**	 V–6 Cylinder, Two Cycle, Loop Charged 121.9 cu. in. (1998cc) 143°F (61.7°C) V–6 Cylinder, Two Cycle, Loop Charged 153.0 cu. in. (2507cc) 143°F (61.7°C)
STROKE	**Length (All Models)**	2.650 in. (67.31 mm)
CYLINDER BORE	**Diameter (Std)** **– Models 135** **– Models XR6/MAGIII/200 150XRI/175XRI/200XRI** **Taper/Out of Round/Maximum Wear** **Bore Type**	 3.125 in. (79.375 mm) 3.501 in. (88.925 mm) 0.003 in. (0.076 mm) Cast Iron
CRANKSHAFT	**Maximum Runout**	0.006 (0.152 mm)

PISTON	**Piston Type** **Models 135** **Standard** **0.015 in. (0.381 mm) Oversize** **0.030 in. (0.762 mm) Oversize** **Models XR6/MAGIII/200 150XRI/175XRI/200XRI** **Standard** **0.015 in. (0.381 mm) Oversize**	Aluminum 3.115 in. ± 0.002 in. (79.121 mm ± 0.051 mm) 3.130 in. ± 0.002 in. (79.502 mm ± 0.051 mm) 3.145 in. ± 0.002 in. (79.883 mm ± 0.051 mm) 3.494 in. ± 0.001 in. (88.748 mm ± 0.025 mm) 3.509 in. ± 0.001 in. (89.129 mm ± 0.025 mm)
COMPRESSION	**All Models – Using a fully charged battery, throttle shutters wide open and cylinder block warm**	110 – 135 psi (753.3 – 924.5 kPa) Variance between cylinders should not exceed 15 psi (102.7 kPa)
REEDS	**Model 135** **Model XR6/MAGIII/200** **Model 150XRI/175XRI/200XRI** **Reed Type** **Reed Stand 0pen (Max.)** **Reed Stop (Max.)**	 Steel 0.020 in. (0.50 mm) Not Adjustable
MID SECTION	**Power Trim (Total Tilt Range)** **Power Trim (Tilt Range)** **Maximum Allowable Leak down in 24 hrs.** **Tilt Pin Adjustment Positions** **Steering Pivot Range** **Allowable Transom Thickness**	75° 20° 1 in. (25.4 mm) 5 60° 2-3/8 in. (6.03 cm) Maximum
FUEL SYSTEM	**Fuel** **Recommended Gasoline** **Model 135** **Model XR6/MAGIII/200** **Model 150XRI/175XRI/200XRI** **Recommended Oil** **Model 135** **Model XR6/MAGIII/200** **Model 150XRI/175XRI/200XRI** **Gasoline/Oil Ratio** **Fuel Pressure Pulse Driven Pump** **– @ Idle** **– @ WOT**	Gasoline with Oil Injection Unleaded 87 Octane Minimum TC-W3 2 Cycle Outboard Oil Only 50:1 (25:1 Break-In) 1 – 3 psi (6.8 – 20.5 kPa) 12 psi (82.1 kPa) Minimum
STARTING SYSTEM	**Manual Start – All Models** **Electric Start – All Models** **Starter Draw (Under Load)** **Starter Load (No Load)** **Battery Rating**	Emergency Start Rope 175 Amperes 40 Amperes Min. 630 Marine Cranking Amps (MCA) or 490 Cold Cranking Amps (CCA)

IGNITION SYSTEM	**Type** **Spark Plug Type** **Spark Plug Gap** **Firing Order**	Capacitor Discharge NGK BPZ8HS-10 0.040 in. (1.0 mm) 1-2-3-4-5-6
CHARGING SYSTEM	**Alternator Output (Regulated)** **Voltage Regulator Draw with Ignition Key in the Off Position**	40 Amperes @ 5000 rpm 0 – 4 Milliamperes Each (0 – 8 Milliamperes total system draw)

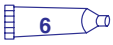
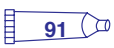
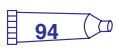
TIMING	**Idle Speed/Pickup Timing** **– 135 Carb Models** **– XR6/MAG III** **– 200 Carb** **– 150XRI/175 XRI Models** **– 200 XRI Model**	 0° – 9° ATDC
	Maximum BTDC **– Model 135** **@ Cranking Speed** **@ WOT RPM**	 25° BTDC 19° BTDC
	– XR6/MAG III Carb/175 XRI **@ Cranking Speed** **@ WOT RPM**	 26° BTDC 20° BTDC
	– Model 150 XRI **@ Cranking Speed** **@ WOT RPM**	 22° BTDC 16° BTDC
	– Model 200 Carb **@ Cranking Speed** **@ WOT RPM**	 24° BTDC 18° BTDC
	– Model 200XRI **@ Cranking Speed** **@ WOT RPM**	 24° BTDC 18° BTDC

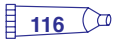
***NOTE:** Timing specifications listed are for 2000 model year engines. Refer to timing decal on engine for previous model year timing specifications.*

GEAR HOUSING	**Gear Ratio**	
	– Models 135	2.00:1 (14/28 teeth)
	– Models XR6/MAGIII/150XRI	1.87:1 (15/28 teeth)
	– Models 200/175XRI/200XRI	1.87:1 (15/28 teeth)
	Gear Ratio – High Altitude	
	– Models 135	2.30:1 (13/30 teeth)
	– Models XR6/MAGIII/175/200 150XRI/175XRI/200XRI	2.00:1 (14/28 teeth)
	Gearcase Capacity	
	– 1.87:1/2.00:1/2.30:1	22.5 fl oz (665.4 ml)
	Pinion Height	
	– All Models	0.025 in. (0.64 mm)
	Forward Gear Backlash	
	– 1.87:1 Ratio	0.018 in. – 0.027 in. (0.460 mm – 0.686 mm)
	– 2.00:1 Ratio	0.015 in. – 0.022 in. (0.381 mm – 0.558 mm)
	– 2.30:1 Ratio	0.018 in. – 0.023 in. (0.460 mm – 0.584 mm)
	Water Pressure @ rpm	12 psi Minimum @ 5500 rpm
OIL INJECTION	**Recommended Oil**	TC-W3
	Oil Tank Capacity	3 gal. (11.4 Liter)
	Approx. Time	
	– Model 135	8.7 hrs. Approx.
	– Model XR6/MAGIII/175/200	6.6 hrs. Approx.
	– Model 150XRI/175XRI/200XRI	6.6 hrs. Approx.
	Reserve Capacity/Approx. Time	.94 qt. (0.89 Liter) 30 – 35 min.
	Output @ 1000 RPM for 3 Minutes with Pump @ Full Open	
	– Model 135	12cc @ 1000 rpm
	– Model XR6/MAG III/200	15cc @ 1000 rpm
	– Model 150XRI/175XRI/200XRI	15cc @ 1000 rpm
FUEL INJECTION	**Idle RPM**	
	– All Models	650 ± 50
	Wide Open Throttle (WOT) RPM	
	– Model 150XRI/175XRI	5000 – 5600
	– Model 200XRI	5000 – 5800
	Float Adjustment (Vapor Separator)	
	Float Level	Preset @ Factory
	Injectors	
	– All Models (Quantity)	6
	– CDM # Controls:	
	– #1 Primary Circuit	#3 and #4 Injectors
	– #3 Primary Circuit	#5 and #6 Injectors
	– #5 Primary Circuit	#1 and #2 Injectors
	Line Pressure @ Injectors	34 psi – 36 psi (234 kPa – 248 kPa)

CARBURETOR	**Idle RPM**	
	– Model 135/200	650 ± 50
	– Model XR6/MAGIII	675 ± 50
	Wide Open Throttle (WOT) RPM	
	– Model 135/200	5000 – 5500
	– Model XR6/MAGIII	5000 – 5500
	Idle Mixture Screw Adjustment (Preset - Turns Out)	
	– Carburetor Model 135	1-1/2 ± 1/8
	– Carburetor Models 150/200	1-1/4 ± 1/8
	– All EFI Models	Not Adjustable
	Float Adjustment	
	Float Level	Float Even with Bowl Edge with Bowl Inverted
CARBURETOR	**WMV Carburetor Jets**	
	– Model 135 (WMV 15)	
	– Main Jet	.072 (all cylinders)
	– Idle Air Jet	Cyl. 2,4 – .040 Cyl. 1 – .036 Cyl. 3 - .030 Cyl. 6 - .048 Cyl. 5 - .038
	– Vent Jet	.086 (all cylinders)
	– Model XR6/MAGIII (WMV 16)	
	– Main Jet	.074 (all cylinders)
	– Idle Air Jet	Cyl. 1,2,3,4,5 – .044 Cyl. 6 – .048
	– Vent Jet	.082 (all cylinders)
	– Model 200 (WMV 18)	
	– Main Jet	Cyl 2,3 – .082 Cyl. 1,4 – .080 Cyl. 5 – .084 Cyl. 6 – .078
	– Idle Air Jet	Cyl. 2 – .038 Cyl. 1 – .042 Cyl. 3,4,5,6 – .028
	– Vent Jet	.086 (all cylinders)

Mercury/Quicksilver Lubricants and Sealants

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

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

Tube Ref. #	Description	Container Size	Mercury Part Number	Quicksilver Part Number
	Cyanacrylate Adhesive		Obtain Locally	Obtain Locally
	3M Permabond #3M08155		Obtain Locally	Obtain Locally
	Loctite 262		Obtain Locally	Obtain Locally
	Loctite 290		Obtain Locally	Obtain Locally

IMPORTANT INFORMATION

Section 1B - Maintenance

Table of Contents

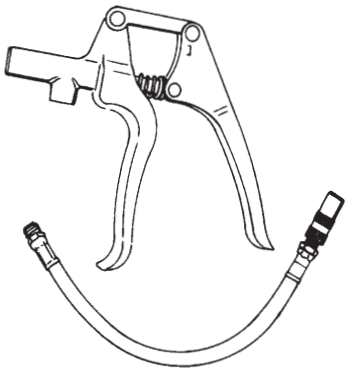
Specifications

Gear Case Lubricant Capacity

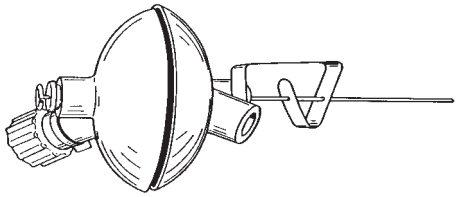
Gear Case Ratio	Capacity
1.87:1	22.5 fl. oz. (717 ml)
2.00:1	22.5 fl. oz. (717 ml)
2.30:1	22.5 fl. oz. (717 ml)

Special Tools

1. Grease Gun 91-37299A1



2. Flushing Attachment 44357A2



Mercury/Quicksilver Lubricants and Sealants

NOTE: *See Section 1A for lubricants and sealants chart.*

Inspection and Maintenance Schedule

Before Each Use

1. Check that lanyard stop switch stops the engine.
2. Visually inspect the fuel system for deterioration or leaks.
3. Check outboard for tightness on transom.
4. Check steering system for binding or loose components.
5. Visually check steering link rod fasteners for proper tightness.
6. Check propeller blades for damage.

After Each Use

1. Flush out the outboard cooling system if operating in salt or polluted water.
2. Wash off all salt deposits and flush out the exhaust outlet of the propeller and gear case with fresh water if operating in salt water.

Every 100 Hours of Use or Once Yearly, Whichever Occurs First

1. Lubricate all lubrication points. Lubricate more frequently when used in salt water.
2. Inspect and clean spark plugs.
3. Check engine fuel filter for contaminants – Carburetor models.
4. Replace water separating fuel filter – EFI models.
5. Replace compressor air intake filter.
6. Check corrosion control anodes. Check more frequently when used in salt water.
7. Drain and replace gear case lubricant.
8. Lubricate splines on the drive shaft and shift shaft.*
9. Check power trim fluid.
10. Inspect battery.
11. Check control cable adjustments.*
12. Check tightness of bolts, nuts, and other fasteners.
13. Replace water pump impeller (more often if overheating occurs or reduced water pressure is noted).*

* *These items should be serviced by an authorized dealer.*

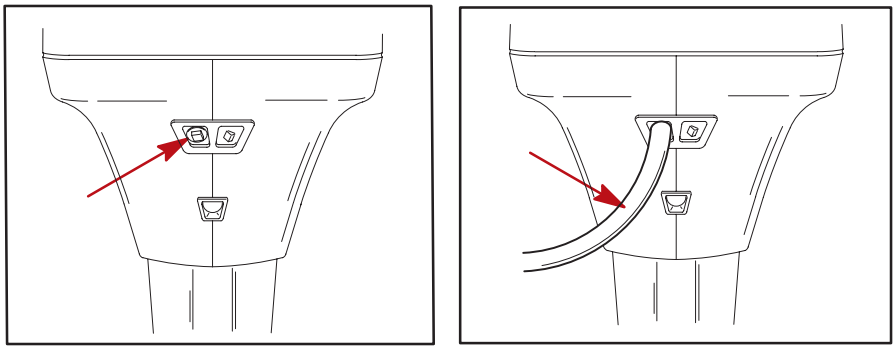
Flushing Engine

Flushing Cooling System – Using Cowl Flush Plug

Flush internal water passages of the outboard with fresh water after each use in salt, polluted or muddy water. This will help prevent a buildup of deposits from clogging the internal water passages.

NOTE: *Engine can be stopped or running at idle speed when flushing the cooling system. Do not flush engine using a water system that exceeds 45 psi.*

1. Remove the plug from fitting in the bottom cowl.



2. Attach a water hose to the fitting. Turn water on and flush for 3 to 5 minutes.

Flushing Cooling System – Using Flushing Attachment 44357A2

⚠ WARNING

When flushing, verify that area in vicinity of propeller is clear and that no person is standing nearby – to avoid possible injury. It is recommended to remove propeller as a precautionary measure.

1. Install Flushing Attachment 44357A2 (or equivalent tool) on the gear housing from the FRONT side, positioning the rubber cups over the water intake openings.
2. Connect hose [1/2 in. (12.7 mm) I.D. or larger] between flushing attachment and water tap.

IMPORTANT: To prevent water pump damage, do not start or run engine unless cooling water is flowing.

3. With the outboard in the normal operating position (vertical), partially open water tap (IT IS NOT NECESSARY to use full water pressure) and adjust water flow so that there is a significant water loss around the rubber cups.
4. Start engine and idle in NEUTRAL. Increase engine speed, not to exceed 2500 RPM.
5. Flush or service engine as required. Verify adequate cooling water is provided.
   a. Water must be discharged through “tell tale.”

IMPORTANT: Prevent engine overheating. If water flow is insufficient, stop engine and determine cause before continuing.

   b. Flush until discharge water is clear. In saltwater areas, run outboard 3 to 5 minutes.
   c. Stop engine before turning off water.
6. Stop engine, turn water off and remove flushing attachment from gear housing.

IMPORTANT: While and after flushing, keep outboard in upright position until all water has drained from drive shaft housing to prevent water from entering the powerhead via drive shaft housing and exhaust ports.