

B - Tiller Handle

Section 8 - Color Diagrams

Service Manual Outline Important Information Section 1 - Important Information A - Specifications B - Maintenance **Electrical** C - General Information D - Outboard Motor Installation **Section 2 - Electrical** A - Ignition **Electronic Fuel** B - Charging & Starting System Injection C - Timing, Synchronizing & Adjusting **Section 3 - Electronic Fuel Injection** A - Theory of Operation **Powerhead** B - Diagnostics and Troubleshooting C - Service Procedures D - Emissions Section 4 - Powerhead **Mid-Section** A - Cylinder Head B - Cylinder Block/Crankcase C - Lubrication **Lower Unit Section 5 - Mid-Section** A - Clamp/Swivel Brackets & Drive Shaft Housing B - Power Trim C - Manual Tilt Assist Attachments/ **Section 6 - Lower Unit Control Linkage** A - Non-Bigfoot Gear Housing B - Bigfoot Gear Housing Section 7 - Attachments/Control Linkage **Color Diagrams** A - Throttle/Shift Linkage

90-883065 APRIL 2001 Page iii



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.

A DANGER

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

A WARNING

WARNING - Hazards or unsafe practices which COULD result in severe personal injury or death.

A 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

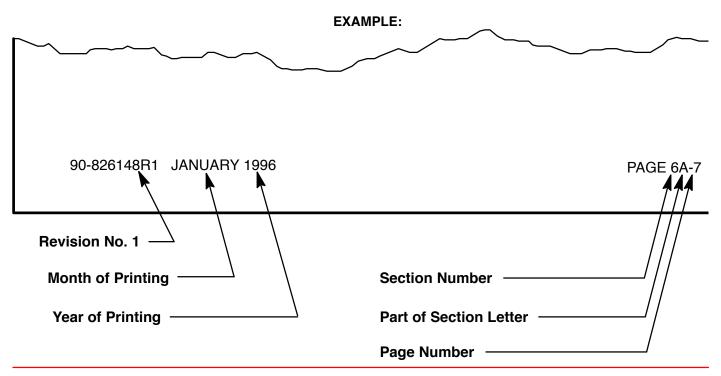
A marine power product is a combination of many machined, honed, polished and lapped surfaces with tolerances that are measured in the ten thousands of an inch/mm. When any product component is serviced, care and cleanliness are important. Throughout this manual, it should be understood that proper cleaning, 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 ii 90-883065 APRIL 2001



IMPORTANT INFORMATION

Section 1A - Specifications



Table of Contents

Specifications	1A-8
----------------	------

Specifications

	Models 40/50/60 EFI (4-Stroke)							
HORSEPOWER (kW)	Model 40 Model 50 Model 60	40 hp (29.8 Kw) @ 5750 rpm 50 hp (37.7 Kw) @ 5750 rpm 60 hp (44.7 Kw) @ 5750 rpm						
OUTBOARD WEIGHT	Electric 40/50/60 ELPT 40/50/60 ELPT BIGFOOT	248 lb (112.7 kg) 264 lb (119.9 kg)						
FUEL	RECOMMENDED GASOLINE	Automotive Unleaded with a Minimum Pump Posted Octane Rating of 87						
OIL	OIL FILTER OIL FILTER WRENCH ENGINE OIL CAPACITY ENGINE OIL SAE 25W-40 10W-30 +100 +40 +40 +40 +20 0 -7 -18	p/n 35-822626A2 p/n 91-802653Q1 Either 3 Quarts or 3 Liters SAE 10W-30 viscosity oil is recommended for use in all temperatures. SAE 25W-40 viscosity oil may be used at temperatures above 40° F (4° C). Use Quicksilver 4-Cycle Marine Oil with the proper viscosity for the expected temperature in your area (see range thermometer on left). If not available, use a premium quality 4-cycle engine oil, certified to meet or exceed anyone of the following American Petroleum Institute (API) service classifications SH, SG, SF, CF-4, CE, CD, CDII.						



Spark Plug: Type Gap Gap Hex Size Torque Hole Size Firing Order Ignition Timing: @ Idle @ 1500-1800 @ WOT (6000 rpm) Stator Resistance Internal Shielding Electronic Spark Trigger (EST) Secondary High Tension Lead/Boot Readings taken @ 68°F (20°C). BCM Low Oil Pressure Speed Control MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @ Idle Output Voltage @ WOT (6000) Stator Resistance CHARGING SYSTEM Readings taken @ 63°C (Pin B - Pin C) 3.0 - 7.0 kΩ (Pin A - Mounting Bracket) 8.5 - 12kΩ (Pin B - Pin C) 3.0 - 7.0 kΩ (Pin A - Coil Tower) 0.600 - 1.100 kΩ CHARGING SYSTEM Readings taken @ 6350 rpm Guardian System is activated. Power limit will vary with level of overheat. Gardian System is activated. Engine power is limited to 10% of maximum (Approximately 2000 RPM) See Graph Section 3B - EFI 1.0.0 - 13.5Ω Matricator Type: 20 Amp. Electric Alternator Output Stator Resistance Stator Resistance Stator Resistance Stator Resistance Stator Resistance Stator Resistance Charging System Stator Resistance Stator Resistance Charging Alternator Type: 20 Amp. Electric Alternator Output Stator Resistance Stator Resistance Charging Stator Stator Resistance Stator Resistance Charging Alternator Type: 20 Amp. Electric Alternator Output Stator Resistance Charging Stator Stator Resistance Controlled by ECM 1.3 mm 1.3-4-2 20 Controlled by ECM 1.4° B.T.D.C 2.20		Typo	Capacitor Discharge Ignition
Type Gap Champion RA8HC 0.040 in. (1.0 mm) 150 lb·in. (17 Nm) 12 mm 1-3-4-2 Ignition Timing: @Idle		Type	Capacitor Discharge Ignition
Gap Hex Size Torque Hole Size Firing Order Ignition Timing:		1 ·	Champion DAGUC
Hex Size Torque Hole Size 150 lb-in. (17 Nm) 150 lb-in. (17 Nm) 150 lb-in. (17 Nm) 12 mm 1-3-4-2 1-3-4-2		1	
Torque Hole Size Firing Order Ignition Timing: @ Idle @ 1500-1800 @ WOT (6000 rpm) Stator Resistance Crank Position Sensor (CPS) Resistance Internal Shielding Electronic Spark Trigger (EST) Secondary High Tension Lead/Boot Resistance ECM Engine Speed Limiter Fuel/Spark Cut-out on All Cylinders #2 and #3 Fuel/Spark Cut-out on All Cylinders ECM Overheat Speed Control MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistan		<u> </u>	,
Hole Size 12 mm 1-3-4-2			
Firing Order Ignition Timing: @ Idle @ 1500-1800 @ WOT (6000 rpm) 14° B.T.D.C 28° B.T.D		•	150 lb-in. (17 Nm)
Ignition Timing: ©Idle ©1500-1800 © WOT (6000 rpm) Stator Resistance Crank Position Sensor (CPS) Resistance Internal Shielding Electronic Spark Trigger (EST) Secondary High Tension Lead/Boot Resistance ECM Engine Speed Limiter Fuel/Spark Cut-out on Cylinders ECM Coverheat Speed Control ECM Low Oil Pressure Speed Control MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Fuel Injector Resistance CHARGING SYSTEM Readings taken © CHARGING SYSTEM Readings taken © CARCING CARCING CARCING CHARGING SYSTEM Readings taken © CARCING CARCING CHARGING SYSTEM Readings taken © CARCING CARCING CARCING CHARGING SYSTEM Readings taken © CARCING CARCING CHARGING SYSTEM Readings taken © CARCING CARCING CHARGING SYSTEM Readings taken © CARCING CARCING CARCING CARCING STEAM CARCING CARCING CARCING CARCING STEAM CARCING CARCING CARCING CARCING CARCING CARCING STEAM CARCING CARC		Hole Size	
(a) Idle Controlled by ECM (a) WOT (6000 rpm) 14° B.T.D.C (a) WOT (6000 rpm) 28° B.T.D.C Stator Resistance 0.20 - 0.30 Ω (YEL-YEL) Resistance Internal Shielding Electronic Spark Trigger (EST) Secondary 300 - 350 Ω (RED - WHT) High Tension Lead/Boot Resistance 8.5 - 12KΩ (Pin A - Mounting Bracket) ECM Engine Speed Limiter Fuel/Spark Cut-out on Cylinders #2 and #3 6225 rpm Feel/Spark Cut-out on All Cylinders 6225 rpm ECM Overheat Speed Control G350 rpm Guardian System is activated. Power limit will vary with level of overheat. ECM Low Oil Pressure Speed Control Guardian System is activated. Engine power is limited to 10% of maximum (Approximately 2000 RPM) See Graph Section 3B - EFI See Graph Section 3B - EFI Main Power Relay Idle Air Control (IAC) 81-99 Ω (Pin 85 - Pin 86) Throttle Position Sensor Typical Range 0.39-1.00 Volts Output Voltage @Idle Output Voltage @WOT (6000) 0.39-1.00 Volts Alternator Type: 20 App. Electric Alternator Output Single Phase (12 Pole) 12.6 V-20 Apps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)		Firing Order	1-3-4-2
(a) Idle Controlled by ECM (a) WOT (6000 rpm) 14° B.T.D.C (a) WOT (6000 rpm) 28° B.T.D.C Stator Resistance 0.20 - 0.30 Ω (YEL-YEL) Resistance Internal Shielding Electronic Spark Trigger (EST) Secondary 300 - 350 Ω (RED - WHT) High Tension Lead/Boot Resistance 8.5 - 12KΩ (Pin A - Mounting Bracket) ECM Engine Speed Limiter Fuel/Spark Cut-out on Cylinders #2 and #3 6225 rpm Feel/Spark Cut-out on All Cylinders 6225 rpm ECM Overheat Speed Control G350 rpm Guardian System is activated. Power limit will vary with level of overheat. ECM Low Oil Pressure Speed Control Guardian System is activated. Engine power is limited to 10% of maximum (Approximately 2000 RPM) See Graph Section 3B - EFI See Graph Section 3B - EFI Main Power Relay Idle Air Control (IAC) 81-99 Ω (Pin 85 - Pin 86) Throttle Position Sensor Typical Range 0.39-1.00 Volts Output Voltage @Idle Output Voltage @WOT (6000) 0.39-1.00 Volts Alternator Type: 20 App. Electric Alternator Output Single Phase (12 Pole) 12.6 V-20 Apps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)		Ignition Timing:	
## S.T.D.C ## S.			Controlled by ECM
## WOT (6000 rpm) Stator Resistance Crank Position Sensor (CPS) Resistance Ignition Coil Resistance: Internal Shielding Electronic Spark Trigger (EST) Secondary High Tension Lead/Boot Resistance ECM Engine Speed Limiter Fuel/Spark Cut-out on Cylinders #2 and #3 Fuel/Spark Cut-out on All Cylinders ECM Overheat Speed Control ### MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance ### MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Fuel Injector Resistance Fuel Injector Resistance Fuel Injector Resistance ### Alternator Type: 20 Amp. Electric Alternator Output Stator Resistance CHARGING SYSTEM Stator Resistance			I =
Stator Resistance Crank Position Sensor (CPS) Resistance Ignition Coil Resistance: Internal Shielding Electronic Spark Trigger (EST) Secondary High Tension Lead/Boot Readings taken ® 68°F (20°C). Beadings taken ® Readings tak			
Crank Position Sensor (CPS) Resistance: Internal Shielding Electronic Spark Trigger (EST) Secondary High Tension Lead/Boot Resistance ECM Engine Speed Limiter Fuel/Spark Cut-out on Cylinders #2 and #3 Fuel/Spark Cut-out on All Cylinders ECM Overheat Speed Control MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Fuel Resistance Fuel Resistance Fuel Now Oil Pressure Speed Control Guardian System is activated. Engine Fower is limited to 10% of maximum (Approximately 2000 RPM) See Graph Section 3B - EFI Fuel/Spark Cut-out on Cylinders F		· · · ·	
Resistance Ignition Coil Resistance: Internal Shielding Electronic Spark Trigger (EST) Secondary High Tension Lead/Boot Resistance ECM Engine Speed Limiter Fuel/Spark Cut-out on Cylinders #2 and #3 Fuel/Spark Cut-out on All Cylinders ECM Overheat Speed Control ECM Low Oil Pressure Speed Control MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Fuel Injector Resistance Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ Sestion Stator Resistance CHARGING SYSTEM Readings taken @ Stator Resistance Range Output Voltage Stator Resistance Internal Shielding 10 - 10.0 KΩ (Pin A - Mounting Bracket) 8.5 - 12KΩ (Pin B - Pin C) 3.0 - 7.0 kΩ (Pin A - Coil Tower) 0.600 - 1.100 KΩ 6225 rpm Guardian System is activated. Power limit will vary with level of overheat. Guardian System is activated. Engine power is limited to 10% of maximum (Approximately 2000 RPM) See Graph Section 3B - EFI 10.0 - 13.5Ω 81-99 Ω (Pin B - Pin C) 3.0 - 7.0 kΩ (Pin A - Mounting Bracket) 8.5 - 12KΩ (Pin A - Coil Tower) 0.600 - 1.100 KΩ Guardian System is activated. Power limit will vary with level of overheat. See Table Section 3B - EFI 10.0 - 13.5Ω 81-99 Ω (Pin B - Pin C) 3.0 - 7.0 kΩ (Pin A - Coil Tower) 0.600 - 1.100 KΩ Guardian System is activated. Power limit will vary with level of overheat. See Table Section 3B - EFI 10.0 - 13.5Ω 81-99 Ω (Pin B - Pin C) 3.0 - 7.0 kΩ (Pin A - Coil Tower) 0.600 - 1.100 KΩ Guardian System is activated. Power limit will vary with level of overheat. See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EF			0.20 - 0.30 Ω (YEL-YEL)
Ignition Coil Resistance: Internal Shielding Electronic Spark Trigger (EST) Secondary High Tension Lead/Boot Resistance ECM Engine Speed Limiter Fuel/Spark Cut-out on Cylinders #2 and #3 Fuel/Spark Cut-out on All Cylinders ECM Overheat Speed Control Guardian System is activated. Power Iimit will vary with level of overheat. Guardian System is activated. Engine power is limited to 10% of maximum (Approximately 2000 RPM) Sensor Resistance Fuel Injector Resistance Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) Alternator Type: 20 Amp. Electric Alternator Output Stator Resistance Output (PL-YEL) Outp		Crank Position Sensor (CPS)	
Ignition Coil Resistance: Internal Shielding Electronic Spark Trigger (EST) Secondary High Tension Lead/Boot Resistance ECM Engine Speed Limiter Fuel/Spark Cut-out on Cylinders #2 and #3 Fuel/Spark Cut-out on All Cylinders ECM Overheat Speed Control Guardian System is activated. Power Imit will vary with level of overheat. Guardian System is activated. Engine power is limited to 10% of maximum (Approximately 2000 RPM) Sensor Resistance Fuel Injector Resistance High Tension Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) Stator Resistance Output (Stator Resistance Output (Pin A - Mounting Bracket) 8.5 - 12KΩ (Pin B - Pin C) 3.0 - 7.0 kΩ (Pin A - Coil Tower) O.600 - 1.100 KΩ		Resistance	300 - 350 O (BED - WHT)
Internal Shielding Electronic Spark Trigger (EST) Secondary High Tension Lead/Boot Resistance ECM Engine Speed Limiter Fuel/Spark Cut-out on Cylinders #2 and #3 Fuel/Spark Cut-out on All Cylinders ECM Overheat Speed Control ECM Low Oil Pressure Speed Control MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ Readings taken @ SSEC (Pin A - Mounting Bracket) 8.5 - 12KΩ (Pin B - Pin C) 3.0 - 7.0 kΩ (Pin A - Mounting Bracket) 8.5 - 12KΩ (Pin B - Pin C) 3.0 - 7.0 kΩ (Pin A - Mounting Bracket) 8.5 - 12KΩ (Pin A - Mounting Bracket) 8.5 - 12KΩ (Pin A - Coil Tower) 9.50 - 1.00 kΩ 68°F (20°C). Guardian System is activated. Power limit will vary with level of overheat. Guardian System is activated. Power limit will vary with level of overheat. Guardian System is activated. Power limit will vary with level of overheat. Guardian System is activated. Power limit will vary with level of overheat. See Graph Section 3B - EFI 10.0 - 13.5Ω 81-99 Ω (Pin 85 - Pin 86) 24-30 Ω (Between Pins) Alternator Type: 20 Amp. Electric Alternator Output Stator Resistance Stator Resistance Stator Resistance		Ignition Coil Resistance:	300 - 330 az (11EB - W111)
Electronic Spark Trigger (EST) Secondary High Tension Lead/Boot Resistance ECM Engine Speed Limiter Fuel/Spark Cut-out on Cylinders ECM Overheat Speed Control Guardian System is activated. Power limit will vary with level of overheat. ECM Low Oil Pressure Speed Control Guardian System is activated. Power limit will vary with level of overheat. ECM Low Oil Pressure Speed Control Guardian System is activated. Power limit will vary with level of overheat. ECM Low Oil Pressure Speed Control Guardian System is activated. Engine power is limited to 10% of maximum (Approximately 2000 RPM) See Graph Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - E		1 9	0 100 KO (Pin A Mounting Procket)
IGNITION SYSTEM Readings taken @ 68°F (20°C). Secondary High Tension Lead/Boot Resistance ECM Engine Speed Limiter Fuel/Spark Cut-out on Cylinders #2 and #3 Fuel/Spark Cut-out on All Cylinders ECM Overheat Speed Control Guardian System is activated. Power limit will vary with level of overheat. ECM Low Oil Pressure Speed Control Guardian System is activated. Engine power is limited to 10% of maximum (Approximately 2000 RPM) See Graph Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω			
High Tension Lead/Boot Resistance CM Engine Speed Limiter Fuel/Spark Cut-out on Cylinders #2 and #3 Fuel/Spark Cut-out on All Cylinders ECM Overheat Speed Control Guardian System is activated. Power limit will vary with level of overheat.			
Readings taken @ 68°F (20°C). Resistance CM Engine Speed Limiter Fuel/Spark Cut-out on Cylinders #2 and #3 Fuel/Spark Cut-out on All Cylinders ECM Overheat Speed Control ECM Low Oil Pressure Speed Control MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Fuel Injector Resistance Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ Readings taken Readings taken @ Readings taken Readings taken @ Readings taken Readin			3.0 - 7.0 KΩ (Pin A - Coil Tower)
Readings taken @ 68°F (20°C). ECM Engine Speed Limiter Fuel/Spark Cut-out on Cylinders #2 and #3 Fuel/Spark Cut-out on All Cylinders ECM Overheat Speed Control ECM Low Oil Pressure Speed Control ECM Low Oil Pressure Speed Control MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Fuel Injector Resistance Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ 68°F (20°C) Readings taken @ 68°F (20°C). ECM Engine Speed Limiter Fuel/Spark Cut-out on Cylinders #6225 rpm Gazetic May 6350 rpm Guardian System is activated. Engine power is limited to 10% of maximum (Approximately 2000 RPM) See Graph Section 3B - EFI 10.0 - 13.5\Omega 81-99 \Omega (Pin 85 - Pin 86) 24-30 \Omega (Between Pins) Single Phase (12 Pole) 12.6 V-20 Amps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)			
Fuel/Spark Cut-out on Cylinders #2 and #3 Fuel/Spark Cut-out on All Cylinders ECM Overheat Speed Control ECM Low Oil Pressure Speed Control MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Fuel Injector Resistance Fuel Injector Resistance Fuel Injector Resistance Fuel Now Oil Pressure Speed Control Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ System Readings taken @ System Stator Resistance Fuel Now Oil Pressure Speed Control Guardian System is activated. Engine Guardian System is activated. Engine Four imit will vary with level of overheat. Guardian System is activated. Engine Four imit will vary with level of overheat. Guardian System is activated. Engine Four imit will vary with level of overheat. Guardian System is activated. Power Imit will vary with level of overheat. Guardian System is activated. Engine Four imit will vary with level of overheat. Guardian System is activated. Power Imit will vary with level of overheat. Guardian System is activated. Engine Four imit will vary with level of overheat. Guardian System is activated. Engine Four imit will vary with level of overheat. Guardian System is activated. Engine Four imit will vary with level of overheat. Guardian System is activated. Engine Four imit will vary with level of overheat. Guardian System is activated. Power Imit will vary with level of overheat. Guardian System is activated. Engine Four imit will vary with level of overheat. Guardian System is activated. Engine Four imit will vary with level of overheat. Guardian System is activated. Four imit will vary with level of overheat. Guardian System is activated. Four imit will vary with level of overheat.	SYSTEM		0.600 - 1.100 KΩ
#2 and #3 Fuel/Spark Cut-out on All Cylinders ECM Overheat Speed Control ECM Low Oil Pressure Speed Control MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ Readings taken @ Stator Resistance #2 and #3 Fuel/Spark Cut-out on All G350 rpm Guardian System is activated. Engine power is limited to 10% of maximum (Approximately 2000 RPM) See Graph Section 3B - EFI 10.0 - 13.5\Omega 81-99 \Omega (Pin 85 - Pin 86) 24-30 \Omega (Between Pins) Single Phase (12 Pole) 12.6 V-20 Amps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)	Readings taken @	ECM Engine Speed Limiter	
Fuel/Spark Cut-out on All Cylinders ECM Overheat Speed Control ECM Low Oil Pressure Speed Control MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ Readings taken @ Readings taken @ Readings taken @ SEC (202C) Figure 1	_		
Cylinders ECM Overheat Speed Control ECM Low Oil Pressure Speed Control MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ Readings taken @ Readings taken @ See Cape Core Of			6225 rpm
ECM Overheat Speed Control Guardian System is activated. Power limit will vary with level of overheat.			•
ECM Overheat Speed Control Guardian System is activated. Power limit will vary with level of overheat.		Cylinders	6350 rpm
Limit will vary with level of overheat.		ECM Overheat Speed Control	•
ECM Low Oil Pressure Speed Control Guardian System is activated. Engine power is limited to 10% of maximum (Approximately 2000 RPM) See Graph Section 3B - EFI See Table Section 3B - EFI 10.0 - 13.5Ω			_
MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) SYSTEM Readings taken @ SYSTEM Readings taken @ SYSTEM See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI See Table Section 3B - EFI See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI See			iiiiii wiii vary witir level of overfleat.
MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) SYSTEM Readings taken @ SYSTEM Readings taken @ SYSTEM See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI See Table Section 3B - EFI See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI See		FCM Low Oil Pressure Speed Control	Cuardian Custom is activated Engine
MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) Output Voltage @WOT (6000) SySTEM Readings taken @ SySTEM Stator Resistance Stator Resistance Stator Resistance (Approximately 2000 RPM) See Graph Section 3B - EFI 10.0 - 13.5Ω See Table Section 3B - EFI 10.		ECM Low Oil Pressure Speed Control	
MAT/ECT Temperature Sensor Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ Readings taken @ See Table Section 3B - EFI 10.0 - 13.5Ω 81-99 Ω (Pin 85 - Pin 86) 24-30 Ω (Between Pins) 0.39-1.00 Volts 3.66-4.80 Volts Single Phase (12 Pole) 12.6 V-20 Amps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)			•
Manifold Absolute Pressure (MAP) Sensor Resistance Fuel Injector Resistance Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ Readings taken @ See Table Section 3B - EFI 10.0 - 13.5Ω 81-99 Ω (Pin 85 - Pin 86) 24-30 Ω (Between Pins) O.39-1.00 Volts 3.66-4.80 Volts Single Phase (12 Pole) 12.6 V-20 Amps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)			, , , , , , , , , , , , , , , , , , , ,
Sensor Resistance Fuel Injector Resistance Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ Readings taken @ See Table Section 3B - EFI 10.0 - 13.5Ω 81-99 Ω (Pin 85 - Pin 86) 24-30 Ω (Between Pins) 0.39-1.00 Volts 3.66-4.80 Volts Single Phase (12 Pole) 12.6 V-20 Amps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)			See Graph Section 3B - EFI
Fuel Injector Resistance Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ Readings taken @ See (20°C) Fuel Injector Resistance 10.0 - 13.5Ω 81-99 Ω (Pin 85 - Pin 86) 24-30 Ω (Between Pins) 0.39-1.00 Volts 3.66-4.80 Volts Single Phase (12 Pole) 12.6 V-20 Amps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)		Manifold Absolute Pressure (MAP)	
Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ Readings taken @ Stator Resistance Main Power Relay 124-30 Ω (Pin 85 - Pin 86) 24-30 Ω (Between Pins) 124-30 Ω (Between Pins) Single Phase (12 Pole) 12.6 V-20 Amps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)		Sensor Resistance	See Table Section 3B - EFI
Main Power Relay Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ Readings taken @ Stator Resistance Main Power Relay 124-30 Ω (Pin 85 - Pin 86) 24-30 Ω (Between Pins) 124-30 Ω (Between Pins) Single Phase (12 Pole) 12.6 V-20 Amps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)		Fuel Injector Resistance	10.0 - 13.5Q
Idle Air Control (IAC) Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000)24-30 Ω (Between Pins)CHARGING SYSTEM Readings taken @ Sensor Typical Output Voltage @WOT (6000)0.39-1.00 Volts 3.66-4.80 VoltsCHARGING SYSTEM Readings taken @ Stator ResistanceSingle Phase (12 Pole) 12.6 V-20 Amps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)			
Throttle Position Sensor Typical Range Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ Readings taken @ Stator Resistance Throttle Position Sensor Typical 0.39-1.00 Volts 0.36-4.80 Volts Single Phase (12 Pole) 12.6 V-20 Amps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)			,
Range Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ Readings taken @ Stator Resistance Range Output Voltage @Idle 0.39-1.00 Volts 3.66-4.80 Volts Single Phase (12 Pole) 12.6 V-20 Amps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)			24-30 Ω (Between Pins)
Output Voltage @Idle Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ See (20°C) Output Voltage @WOT (6000) Alternator Type: 20 Amp. Electric Alternator Output Stator Resistance Output Voltage @Idle 0.39-1.00 Volts 3.66-4.80 Volts Single Phase (12 Pole) 12.6 V-20 Amps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)		1 · · · · · · · · · · · · · · · · · · ·	
Output Voltage @WOT (6000) CHARGING SYSTEM Readings taken @ Stator Resistance Output Voltage @WOT (6000) 3.66-4.80 Volts Single Phase (12 Pole) 12.6 V-20 Amps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)			
CHARGING SYSTEM Readings taken @ Section (20°C) Alternator Type: 20 Amp. Electric Alternator Output Single Phase (12 Pole) 12.6 V-20 Amps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)		Output Voltage @Idle	0.39-1.00 Volts
CHARGING SYSTEM Readings taken @ Stator Resistance 20 Amp. Electric Alternator Output 12.6 V-20 Amps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)		Output Voltage @WOT (6000)	3.66-4.80 Volts
CHARGING SYSTEM Readings taken @ Stator Resistance 20 Amp. Electric Alternator Output 12.6 V-20 Amps. (252 Watts) (Rectified/Regulated) 0.20 - 0.30 Ohms (YEL-YEL)		Alternator Type:	Single Phase (12 Pole)
Readings taken @ (Rectified/Regulated) Stator Resistance 0.20 - 0.30 Ohms (YEL-YEL)	CHARGING		
Readings taken @ 0.20 - 0.30 Ohms (YEL-YEL)	SYSTEM	20 Amp. Electric Alternator Output	
Stator Resistance U.20 - U.30 Offins (YEL-YEL)	Readings taken @	Ctates Decistores	` ,
VV 1 1=V VP	68°F (20°C).		
Quicksilver Tachometer Setting "6P" or "4"		Quicksilver lachometer Setting	"6P" or "4"
Electric Start:		Electric Start:	
Starter Type Bendix			Bendix
STARTING Output 1.1 kW	STARTING		
SYSTEM Ampere Draw Under:			1.1 1000
(Load) 174.0 Amps	O I O I LIVI	<u> </u>	174 0 Amns
(No Load) 23.7 Amps		(NO LOAU)	Zo.i Allips

Page 1A-2 90-883065 APRIL 2001



		T
	Battery Rating Minimum Requirement For operation below 32° F (0° C)	465 Marine Cranking Amps (MCA) or 350 Cold Cranking Amps (CCA) 1000 Marine Cranking Amps (MCA) or
BATTERY		775 Cold Cranking Amps (CCA)
	Ampere-Hours (Ah) Minimum	70
	For operation above 32° F (0° C)	105
	For operation below 32° F (0° C)	
	Fuel Pump Type	Mechanical Water Cooled (Plunger/Diaphragm)
FUEL SYSTEM	Fuel Pump: Pressure Fuel Tank Capacity	3-6 psi Accessory
FUEL INJECTION	Fuel Injector System Idle rpm (Out Of Gear) Idle rpm (In Forward Gear) Wide Open Throttle rpm (WOT) Range	Batch (1 & 4) - (2 & 3) 725 ± 25 rpm 725 ± 25 rpm 5500–6000
	Fuel Pump Pressure - Electric	42-44 psi (290-303 kPa)
CYLINDER BLOCK	Type Displacement Number of Cylinders	4 Stroke Cycle – Over Head Camshaft 60.8 cu. in. (995 cc) 4
STROKE	Length	2.953 in. (75 mm)
CYLINDER BORE	Diameter Standard Oversize-0.010 in. (0.25 mm) Oversize-0.020 in. (0.50 mm) Taper/Out of Round Maximum Bore Type	2.5591 in. (65 mm) 2.5689 in. (65.25 mm) 2.5787 in. (65.5 mm) 0.003 in. (0.08 mm) Cast Iron
PISTON	Piston Type O.D. at Skirt Standard Oversize-0.010 in. (0.25 mm) Oversize-0.020 in. (0.50 mm)	Aluminum 2.5570 - 2.5578 in. (64.950 - 64.965 mm) 2.5669 - 2.5675 in. (65.2 - 65.215 mm) 2.5768 - 2.5774 in. (65.450 - 65.465 mm)
PISTON CLEARANCE	Piston to Cylinder Clearance	0.00140026 in. (0.035 - 0.065 mm)
RINGS	Ring End Gap (Installed) Top Middle Bottom (Oil Ring) Side Clearance: Top Middle	0.006 - 0.012 in. (0.15 - 0.03 mm) 0.012 - 0.020 in. (0.30 - 0.50 mm) 0.008 - 0.028 in. (0.20 - 0.70 mm) 0.0008 - 0.0024 in. (0.02 - 0.06 mm) 0.0008 - 0.0024 in. (0.02 - 0.06 mm)
COMPRESSION RATIO	Compression Ratio Cylinder Compression* (Electric Models Only, Cold Engine @ W.O.T.)	9.7:1 180 - 210 psi (Peak)
PISTON PIN	Piston Pin Diameter	0.6285 - 0.6287 in. (15.965 - 15.970 mm)
CONNECTING ROD	Oil Clearance (Big End) Small End Inside Diameter	0.0008 - 0.0020 in. (0.020 - 0.052 mm) 0.6293 - 0.6298 in. (15.985 - 15.998 mm)



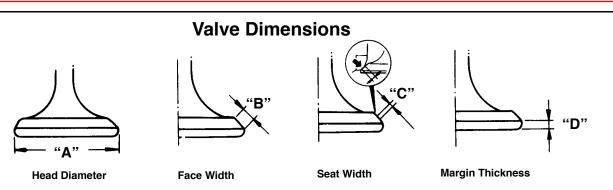
CRANKSHAFT	Main Bearing Clearance Crankshaft Run-out	0.0005 - 0.0017 in. (0.012 - 0.044 mm) 0.0018 in. (0.046 mm)
	Camshaft Dimensions Intake "A" Exhaust "A" Intake "B" Exhaust "B" Run-out Limit	1.214 - 1.222 in. (30.83 - 31.03 mm) 1.214 - 1.222 in. (30.83 - 31.03 mm) 1.020 - 1.028 in. (25.90 - 26.10 mm) 1.020 - 1.028 in. (25.90 - 26.10 mm) 0.0039 in. (0.1 mm)
CAMSHAFT	Camshaft Bearing Diameter "b"	1.4541 - 1.4549 in. (36.935 - 36.955 mm)
VALVE SPRING	Free Length "a" Tilt Limit "b" a	1.491-1.569 in. (37.85-39.85 mm) Less than 0.060 in. (1.7 mm)
	Compressed Pressure (Installed) Intake Exhaust Tilt Limit (Intake & Exhaust) Dir. of Winding (Intake & Exhaust)	19.8 - 22.0 lbs. (9.0 - 10.0 kg) 19.8 - 22.0 lbs. (9.0 - 10.0 kg) 0.043 in. (1.1 mm) Left Hand

Page 1A-4 90-883065 APRIL 2001



		SPECIFICATIONS			
	Warp Limit	0.004 in. (0.1 mm)			
	* Lines indicate straight edge measurement				
CYLINDER HEAD	Camshaft Bore Inside Diameter "a"	1.4567 - 1.4577 in.			
		(37.000 - 37.025 mm)			
	Valve/Valve Seat/Valve Guides: Valve Clearance (cold) Intake Exhaust Valve Dimensions:	0.006 - 0.010 in. (0.15 - 0.25 mm) 0.010 - 0.014 in. (0.25 - 0.35 mm)			
	"A" Head Diameter Intake Exhaust "B" Face Width	1.256 - 1.264 in. (31.9 - 32.1 mm) 1.020 - 1.028 in. (25.9 - 26.1 mm)			
	Intake Exhaust "C" Seat Width	0.079 - 0.124 in. (2.00 - 3.14 mm) 0.079 - 0.124 in. (2.00 - 3.14 mm)			
	Intake Exhaust "D" Margin Thickness	0.035 - 0.043 in. (0.9 - 1.1 mm) 0.035 - 0.043 in. (0.9 - 1.1 mm)			
VALVES	Intake Exhaust Stem Outside Diameter	0.020 - 0.035 in. (0.5 - 0.9 mm) 0.020 - 0.035 in. (0.5 - 0.9 mm)			
	Intake Exhaust Guide Inside Diameter	0.2156 - 0.2161 in. (5.475 - 5.490 mm) 0.2150 - 0.2156 in. (5.460 - 5.475 mm)			
	Intake Exhaust Stem To Guide Clearance	0.2165 - 0.2170 in. (5.500 - 5.512 mm) 0.2165 - 0.2170 in. (5.500 - 5.512 mm)			
	Intake Exhaust Stem Run-out Limit (max.)	0.0004 - 0.0015 in. (0.010 - 0.037 mm) 0.0010 - 0.0020 in. (0.025 - 0.052 mm) 0.0006 in. (0.016 mm)			





	Outside Diameter	0.6000 0.6000 in
ROCKER SHAFT	Outside Diameter	0.6288 - 0.6296 in. (15.971 - 15.991 mm)
ROCKER ARM	Inside Diameter of Bore	0.6299 - 0.6306 in. (16.000 - 16.018 mm)
THERMOSTAT	Valve Opening Temperature Full Open Temperature	118° F - 123° F (48° C - 51° C) 145° F (63° C)
LUBRICATION SYSTEM	Pump Type Engine Oil Pressure (Warm Engine) @ 3000 rpm Engine Oil Pan Capacity Oil Pump: Outer Rotor to Housing "a" Inner Rotor to Outer Rotor "b" Rotor to Housing "c"	Trochoid 30-40 psi (207-278 kPa) Either 3 Qts. or 3 Liters 0.0045 - 0.009 in. (0.11 - 0.23 mm) 0.005 in. (0.12 mm) 0.0015 - 0.003 in. (0.04 - 0.08 mm)
MID-SECTION	Transom Height: Long Shaft Steering Pivot Range: Tiller Remote Full Tilt Up Angle Allowable Transom Thickness	20 in. (51 cm) 90° 60° 71° 2-3/4 in. (69.8 mm)

Page 1A-6 90-883065 APRIL 2001



	Gear Ratio	1.83:1
	Gearcase Capacity	11.5 fl oz (340 mL)
	Lubricant Type	Quicksilver Gear Lube-Premium Blend
	Forward Gear	Quionoliver deal Eude i Terriarii Bieria
	Number of Teeth	22 Spiral/Bevel
	Pinion Gear	22 Spiral/Devel
		10 Chirol/Poyol
	Number of Teeth	12 Spiral/Bevel
	Pinion Height	0.025 in. (0.64 mm)
GEAR HOUSING		Pinion Gear Locating Tool
(1.83:1)		(91-817008A2)
	Forward Gear Backlash	0.011-0.017 in. (0.28-0.43 mm)
		Backlash Indicator Tool (91-196601)
		MARK #4 or 0.366 in. (9.3 mm)
	Water Pressure (Warm Engine)	
	@ 800 rpm	1–3 psi (7-21 kPa)
	@ 6000 rpm (WOT)	12–25 psi (83-172 kPa)
	Leak Test Pressure	10-12 psi (68-83 kPa)
		for 5 Minutes
	Gear Ratio	2.31:1
	Gearcase Capacity	24 fl oz (710 mL)
	Lubricant Type	Quicksilver Gear Lube-Premium Blend
	Forward Gear	adionolivor diodi Edeo i romiami Bioria
	Number of Teeth	30 Spiral/Bevel
	Pinion Gear	
	Number of Teeth	13 Spiral/Bevel
	Pinion Height	0.025 in. (0.64 mm)
GEAR HOUSING	Pinion Gear Locating Tool	91-12349A2
BIGFOOT	Flat Number	#8
(2.3:1)	Disc Number	#3
(2.5.1)	Forward Gear Backlash	0.012-0.019 in. (0.30-0.48 mm)
	Backlash Indicating Tool	91-78473
	Mark Number	#4
	Water Pressure	
	@ 800 rpm (Idle)	2-6 psi (14-41 kPa)
	@ 6000 rpm (WOT)	12-25 psi (83-172 kPa)
		' '
	Leak Test Pressure	10-12 psi (69-83 kPa)
		for 5 Minutes



Propeller Information Charts

Mercury/Mariner 40 EFI (4-Stroke) 1.83:1 Non-Bigfoot

Wide Open Throttle RPM: 5500-6000 Recommended Transom Heights: 20", 22.5"

Right Hand Rotation Standard

Gear Reduction: 1.83:1

Diameter	Pitch	No. of Blades	Material	Approx. Gross Boat Wgt. (lbs)	Approx. Boat Length	Speed Range (mph)	Propeller Part Number
10"	17"	3	Alum	Up to 800	Up to 15'	43-50	48-73144A40
10"	16"	3	Steel	800-1000	Up to 15'	39-46	48-91818A5
10"	16"	3	Alum	800-1000	Up to 15'	39-46	48-73142A40
10-1/8"	15"	3	Steel	900-1200	13-15'	36-43	48-855862A5
10-1/8"	15"	3	Alum	900-1200	13-15'	36-43	48-73140A40
10-1/4"	14"	3	Steel	1000-1200	14-16'	33-39	48-855860A5
10-1/4"	14"	3	Alum	1000-1200	14-16'	33-39	48-73138A40
10-3/8"	13"	3	Steel	1100-1400	14-17'	30-35	48-855858A5
10-3/8"	13"	3	Alum	1100-1400	14-17'	30-35	48-73136A40
10-5/8"	12"	3	Steel	1300-1600	15-17'	27-32	48-855856A5
10-5/8"	12"	3	Alum	1300-1600	15-17'	27-32	48-73134A40
11-5/8"	10.5"	3	Steel	1500-1900	16-18'	24-29	48-823478A5
10-7/8"	11"	3	Alum	1500-1900	16-18'	24-29	48-85632A40
11-5/8"	10-1/2"	3	Alum	1600-2000	16' +	21-25	48-827312A10
11-1/4"	10"	3	Alum	1700-2200	17' +	19-24	48-73132A40
12-1/4"	9"	3	Steel	2000+	pontoon	17-21	48-97868A10
12-1/4"	9"	3	Alum	2000+	pontoon	17-21	48-87818A10
12-1/2"	8"	3	Alum	2500+	Pontoon/ houseboat	1-18	48-42738A10
12-1/2"	8" Cup	3	Alum		pontoon		48-42738A12

Page 1A-8 90-883065 APRIL 2001



Mercury/Mariner 50 EFI (4-Stroke) 1.83:1 Non-Bigfoot

Wide Open Throttle RPM : 5500-6000 Recommended Transom Heights : 20", 22.5"

Right Hand Rotation Standard

Gear Reduction: 1.83:1

Diameter	Pitch	No. of Blades	Material	Approx. Gross Boat Wgt. (lbs)	Approx. Boat Length	Speed Range (mph)	Propeller Part Number
10"	19"	3	Alum	Up to 800	Up to 14'	49-58	48-73146A40
10"	17"	3	Alum	Up to 900	Up to 15'	43-50	48-73144A40
10"	16"	3	Steel	900-1300	Up to 15'	39-46	48-91818A5
10"	16"	3	Alum	900-1300	Up to 15'	39-46	48-73142A40
10-1/8"	15"	3	Steel	1000-1400	13-15'	36-43	48-855862A5
10-1/8"	15"	3	Alum	1000-1400	13-15'	36-43	48-73140A40
10-1/4"	14"	3	Steel	1100-1600	14-16'	33-39	48-855860A5
10-1/4"	14"	3	Alum	1100-1600	14-16'	33-39	48-73138A40
10-3/8"	13"	3	Steel	1300-1800	14-17'	30-35	48-855858A5
10-3/8"	13"	3	Alum	1300-1800	14-17'	30-35	48-73136A40
10-5/8"	12"	3	Steel	1400-2000	15-17'	27-32	48-855856A5
10-5/8"	12"	3	Alum	1400-2000	15-17'	27-32	48-73134A40
11-5/8"	11"	3	Steel	1700-2400	16-18'	24-29	48-823478A5
10-7/8"	11"	3	Alum	1700-2400	16-18'	24-29	48-85632A40
11-5/8"	10-1/2"	3	Alum	1900-2700	16' +	21-25	48-827312A10
11-1/4"	10"	3	Alum	2100-3000	17' +	19-24	48-73132A40
12-1/4"	9"	3	Steel	2500+	pontoon	17-21	48-97868A10
12-1/4"	9"	3	Alum	2500+	pontoon	17-21	48-87818A10
12-1/2"	8"	3	Alum	3000+	Pontoon/ houseboat	1-18	48-42738A10
12-1/2"	8" Cup	3	Alum		pontoon		48-42738A12



Mercury/Mariner 60 EFI (4-Stroke) 1.83:1 Non-Bigfoot

Wide Open Throttle RPM : 5500-6000 Recommended Transom Heights : 20", 22.5"

Right Hand Rotation Standard

Gear Reduction: 1.83:1

Diameter	Pitch	No. of Blades	Material	Approx. Gross Boat Wgt. (lbs)	Approx. Boat Length	Speed Range (mph)	Propeller Part Number
10"	19"	3	Alum	Up to 1000	Up to 14'	49-58	48-73146A40
10"	17"	3	Alum	Up to 1200	Up to 15'	43-50	48-73144A40
10"	16"	3	Steel	1200-1600	Up to 16'	39-46	48-91818A5
10"	16"	3	Alum	1200-1600	Up to 16'	39-42	48-73142A40
10-1/8"	15"	3	Steel	1300-1700	14-16'	36-43	48-855862A5
10-1/8"	15"	3	Alum	1300-1700	14-16'	36-43	48-73140A40
10-1/4"	14"	3	Steel	1400-2000	15-17'	33-39	48-855860A5
10-1/4"	14"	3	Alum	1400-2000	15-17'	33-39	48-73138A40
10-3/8"	13"	3	Steel	1600-2200	15-18'	30-35	48-855858A5
10-3/8"	13"	3	Alum	1600-2200	15-18'	30-35	48-73136A40
10-5/8"	12"	3	Steel	1800-2500	16-18'	27-32	48-855856A5
10-5/8"	12"	3	Alum	1800-2500	16-18'	27-32	48-73134A40
11-5/8"	11"	3	Steel	2300-3000	17-19'	24-29	48-823478A5
10-7/8"	11"	3	Alum	2300-3000	17-19'	24-29	48-85632A40
11-5/8"	10-1/2"	3	Alum	2500-3300	17' +	21-25	48-827312A10
11-1/4"	10"	3	Alum	2800-3600	18' +	19-24	48-73132A40
12-1/4"	9"	3	Steel	3300+	pontoon	17-21	48-97868A10
12-1/4"	9"	3	Alum	3300+	pontoon	17-21	48-87818A10
12-1/2"	8"	3	Alum	4000+	Pontoon/ houseboat	1-18	48-42738A10
12-1/2"	8" Cup	3	Alum		pontoon		48-42738A12

Page 1A-10 90-883065 APRIL 2001



Mercury/Mariner 40 EFI (4-Stroke) 2.3:1 Bigfoot

Special soft rubber hub propellers designed to reduce clutch rattle

Wide Open Throttle rpm: 5500-6000 Recommended Transom Heights: 20", 25"

Right Hand Rotation Standard Gear Reduction: 2.31:1

IMPORTANT: These specially designed rubber hub propellers are rated for 60 horse-

power MAXIMUM.

Diameter	Pitch	No. of Blades	Material	Approx. Gross Boat Wgt. (lbs)	Approx. Boat Length	Speed Range (mph)	Propeller Part Number
13-3/4"	15"	3	Alum	1200-1500	14-16'	27-32	48-77342A33
14"	13"	3	Alum	1500-2000	16-18'	22-27	48-77340A33
14"	11"	3	Alum	2000-3000	pontoon	17-21	48-77338A33
14"	10"	3	Alum	2500+	pontoon/work	14-19	48-854342A33
14"	9"	3	Alum	3500+	houseboat/ work	1-15	48-854340A33

Mercury/Mariner 50 EFI (4-Stroke) 2.3:1 Bigfoot

Special soft rubber hub propellers designed to reduce clutch rattle

Wide Open Throttle rpm: 5500-6000

Recommended Transom Heights: 20", 25"

Right Hand Rotation Standard Gear Reduction: 2.31:1

IMPORTANT: These specially designed rubber hub propellers are rated for 60 horse-power MAXIMUM.

Diameter	Pitch	No. of Blades	Material	Approx. Gross Boat Wgt. (lbs)	Approx. Boat Length	Speed Range (mph)	Propeller Part Number
13-3/4"	15"	3	Alum	1500-2000	14-16'	25-32	48-77342A33
14"	13"	3	Alum	1800-2600	16-18'	23-27	48-77340A33
14"	11"	3	Alum	2800-4000	pontoon	17-21	48-77338A33
14"	10"	3	Alum	3000+	pontoon/work	14-19	48-854342A33
14"	9"	3	Alum	5000+	houseboat/ work	1-16	48-854340A33



Mercury/Mariner 60 EFI (4-Stroke) 2.3:1 Bigfoot

Special soft rubber hub propellers designed to reduce clutch rattle

Wide Open Throttle rpm: 5500-6000 Recommended Transom Heights: 20", 25"

Right Hand Rotation Standard Gear Reduction: 2.31:1

IMPORTANT: These specially designed rubber hub propellers are rated for 60 horse-

power MAXIMUM.

Diameter	Pitch	No. of Blades	Material	Approx. Gross Boat Wgt. (lbs)	Approx. Boat Length	Speed Range (mph)	Propeller Part Number
13-3/4"	15"	3	Alum	2000-2500	16-18'	25-32	48-77342A33
14"	13"	3	Alum	2300-3200	17-20'	23-27	48-77340A33
14"	11"	3	Alum	3000-4300	pontoon	17-21	48-77338A33
14"	10"	3	Alum	3500+	pontoon/work	14-19	48-854342A33
14"	9"	3	Alum	5500+	houseboat/ work	1-16	48-854340A33

Page 1A-12 90-883065 APRIL 2001