



HI-PERFORMANCE SERIES

service bulletin

TO: SERVICE MANAGER MECHANICS
PARTS MANAGER

No. 97-2

H.P. 500 (540 cid - Bulldog) Specifications - Serial No. 0K000248 & Up

- A. TUNE-UP SPECIFICATIONS
- B. ELECTRICAL SPECIFICATIONS
- C. CARBURETOR SPECIFICATIONS
- D. INTERNAL ENGINE SPECIFICATIONS
- E. TORQUE SPECIFICATIONS
- F. WIRING DIAGRAM
- G. WATER FLOW CHART

A. TUNE-UP SPECIFICATIONS

Horsepower (Kilowatts)	500 (373)
Displacement (Liters)	540 CID (8.9L)
Engine Type and Number of Cylinders	V8
Bore	4.440 in. (112.7mm)
Stroke	4.375 in. (111.1mm)
Compression Ratio	8.75:1
Compression Pressure	150 psi (1035 kPa)
Ignition	Thunderbolt V
Spark Plug Type-P/N	NGK BR6FS P/N 33-59571, Champion RV8C or AC-MR43T
Spark Plug Gap	.035 in. (0.9mm)
Timing at Idle RPM	14° BTDC
Maximum Advance @ 4500 RPM	34° BTDC
Maximum RPM at Wide-Open-Throttle	4800-5200
Idle RPM in Neutral	800-850
Firing Order	1-8-4-3-6-5-7-2
Fuel Required	87 Octane {(R+M)÷2} or 92 RON **
Fuel Pump Pressure	5-7 psi (34-48 kPa)

Electrical System	12-Volt Negative Ground
Alternator Rating	55 Amperes
Recommended Battery Rating	Min. 550 CCA or 120 Amp/Hrs.
Crankcase Oil Capacity with New Filter***	9 Qts. (8.5Liters)
Oil Pressure at 2000 RPM	30 - 70 psi (207-483 kPa)
Thermostat	143° F (62° C)
Cooling System Capacity	20 U.S. Qts. (19.3L)
Stern Drive Unit Oil Capacity (Approx.)	Bravo W/Monitor 2.8 U.S. Qts. (2.7L)

**Without alcohol whenever possible.

***Approximate, ALWAYS use dipstick to determine exact quantity of oil required.

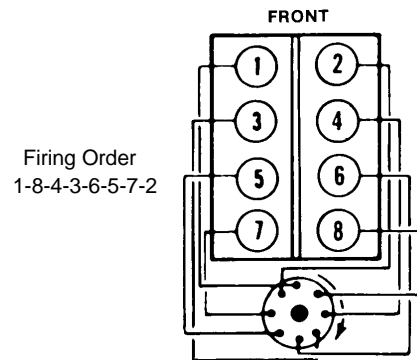


Figure 1. L.H. Rotation

B. ELECTRICAL SPECIFICATIONS

Ignition Specifications

Timing	34° BTDC @ 4500 RPM
Coil	Part No. 392-805570A2
Coil Primary Resistance (Ohms) Minimum	.60
Coil Primary Resistance (Ohms) Maximum	.80
Coil Secondary Resistance (Ohms)	9.400-11.700

Starter Motor Specifications

Mercury Marine Part No.	50-806962A1			
Delco Remy Part No.	9000819			
No Load Test				
Volts	Amps. (Min.)	Amps. (Max.)	RPM (Min.)	RPM (Max.)
11.5	64	95	2825	3275

C. CARBURETOR SPECIFICATIONS

Make (Model)	Holley (4150)
Mercury Part No.	13549A18
Float Adjustment	Bottom of Sight Plug Hole $\pm 1/32$ " (.8 mm)
Primary Jets	No. 77
Secondary Jets	No. 88
Accelerator Pump	.015" (.4 mm)
Choke Setting	Index Marks Aligned
Idle Mixture Screw Preliminary Setting	1-1/2 turns out

D. INTERNAL ENGINE SPECIFICATIONS

UNIT OF MEASUREMENT in. (mm)
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Cylinder Bore:

Diameter	4.440 - 4.442 (112.776 - 112.826)	
Out of Round	Production	.001 (0.0254)
	Service	.002 (0.0508)
Taper	Production	.0005 (0.0127)
	Service	.001 (0.025)

Piston: See Note

Clearance	Production & Ser- vice	.0045-.0065 (0.1143-1.1651)
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NOTE: Measure piston 1.300 in. (33.02 mm) down from lower oil ring groove and 90° from piston pin bore.

Piston Ring:

COMPRESSION RINGS

Groove Side Clearance		
Production	Top & 2nd	.0017-.0032 (0.0439-0.08138)
Service	Top & 2nd	.0027 - .0042 (0.06868-0.10678)
End Gap		
Production	Top & 2nd	.020 - .024 (0.51 - 0.61)
Service	Top & 2nd	.020-.030 (0.508-0.762)

OIL RINGS

Groove Side Clearance	
Production	.0005-.0065 (0.0127-0.1651)
Service	.0015-.0075 (0.0381-0.1905)
End Gap	
Production	.015 - .055 (0.381 - 1.397)
Service	.025-.065 (0.635-1.651)

Piston Pin:

Diameter		.990 (25.146)
Clearance	Production	.0008-.001 (0.0203-0.0254)
	Service	.001-.0012 (0.0254-0.0305)
Fit to Rod		.0010 - .0015 (0.0254 - 0.0381)

Crankshaft:**MAIN JOURNAL**

Diameter	No. 1,2,3,4	2.748-2.749 (69.8195-69.8246)
	No. 5	2.745-2.748 (69.723-69.799)
Taper & Out of Round	Production	.0005 (0.0127)
	Service	.001 (0.0254)

CONNECTING ROD JOURNAL

Diameter		2.1980-2.1990 (55.8292-55.8546)
Taper & Out of Round	Production	.0005 (0.0127)
	Service	.001 (0.0254) max.

MAIN BEARING CLEARANCES

Production	No. 1,2,3,4	.0025-.003 (0.0635-0.0762)
	No. 5	.0035-.004 (0.0889-0.1016)
Service	No. 1,2,3,4	.0025-.0035 (0.0635-0.0889)
	No. 5	.0035-.0045 (0.0889-0.1143)
Crankshaft End Play		.007-.010 (0.1778 - 0.2540)
Crankshaft Run Out		.0005 - .0015 (0.0127 - 0.0381)

ROD BEARING CLEARANCES

Rod Bearing Clearance	.0025-.0035 (0.0635-.0889)
Rod Side Clearance	.018-.025 (.46-.64)

Camshaft and Drive:

Lobe Lift ± .002 (0.051)	Intake	.329 (8.36)
	Exhaust	.340 (8.64)
Journal Diameter		1.948-1.949 (49.48-49.51)
Journal Out-of-Round		.001 (0.0254)
Camshaft Run-Out		.0015 (0.0381)
Timing Chain Deflection		.500 (12.7)

Valve System:

Lifter Type	Hydraulic	
Rocker Arm Ratio	1.7:1	
Valve Lash (Int. & Exh.)	1/2-5/8 Turns Down from Zero Lash	
Face Angle (Int. & Exh.)	45°	
Seat Angle (Int. & Exh.)	45°	
Seat Run Out (Int. & Exh.)		.002 (0.0508)
Seat Width	Intake	.060-.080 (1.52-2.03)
	Exhaust	.080-.100 (2.03-2.54)
Stem Clearance		
Production	Intake	.001 (0.0254)
	Exhaust	.0015 (0.0381)
Service	Intake	.002 (0.0508)
	Exhaust	.0025 (0.0635)
Valve Spring		
Free Length		2.20 (55.88)
Pressure Lbs. @ Inches (mm) (See Note)	Closed @ 1.950 (49.5)	120 lbs. (162 Nm)
	Open @ 1.370 (34.7)	350 lbs. (475 Nm)
Installed Height		1.905-920 (48.4-48.8)

NOTE: Test springs as a complete assembly with dampener.

Cylinder Head:

Gasket Surface Flatness	.002 (.050) in 6" (152) .005" (.127) Overall
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Flywheel:

Run Out on Face Area	.008 (.20)
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E. TORQUE SPECIFICATIONS

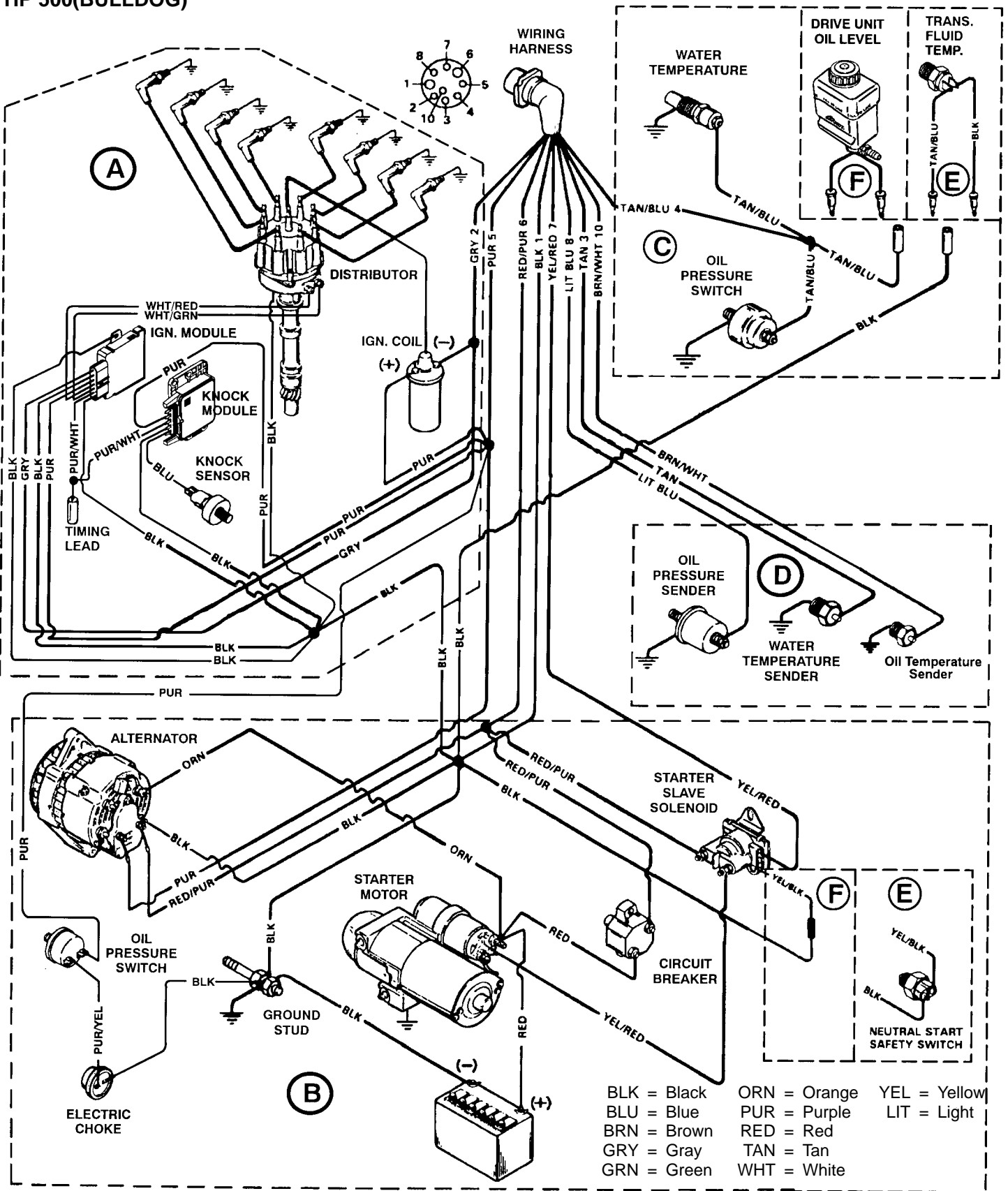
Camshaft Sprocket/Gear (NOTE 1)	25 lb.ft. (34 N·m)
Conn. Rod Cap (NOTE 2)	80 lb. ft. (109 N·m)
Crankcase Front Cover	80 lb. in. (9 N·m)
Cylinder Head (NOTE 3)	80 lb. ft. (109 N·m)
Distributor Clamp	15 lb. ft. (20 N·m)
Exhaust Manifold (Bolts)	25 lb. ft. (34 N·m)
Flywheel (NOTE 1)	70 lb. ft. (95 N·m)
Flywheel Drive Plate (NOTE 1)	35 lb. ft. (42 N·m)
Flywheel Housing	30 lb. ft. (41 N·m)
Intake Manifold	30 lb. ft. (41 N·m)
Main Bearing Cap	110 lb. ft. (149 N·m)
Oil Pan to Crankcase (5/16-18)	165 lb. in. (19 N·m)
Oil Pan to Crankcase (1/4-20)	80 lb. in. (9 N·m)
Oil Pan Drain Plug	20 lb. ft. (27 N·m)
Oil Pump (NOTE 1)	70 lb. ft. (95 N·m)
Oil Pump Cover	80 lb. in. (9 N·m)
Rocker Arm Stud (NOTE 1)	70 lb. ft. (95 N·m)
Rocker Arm Cover	72 lb. in. (8.1 N·m)
Spark Plug	15 lb. ft. (20 N·m)
Torsional Damper	110 lb. ft. (149 N·m)
Water Pump	30 lb. ft. (41 N·m)

NOTE: 1 Use Loctite 271 (P/N 92-32609-1) on threads.

NOTE: 2 Apply moly lube on washer and under bolt head as well as on the threads.

NOTE: 3 Apply moly lube under bolt head, and Teflon pipe thread sealant (like Loctite sealant #592) on threads.

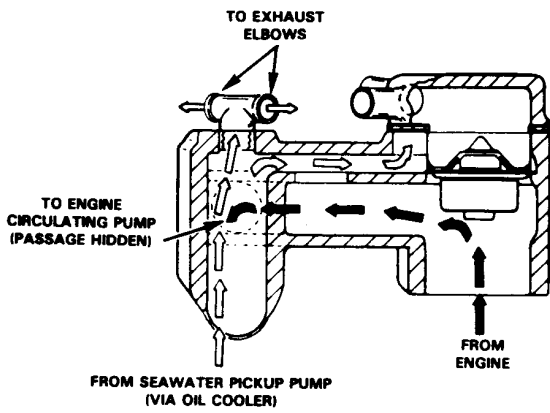
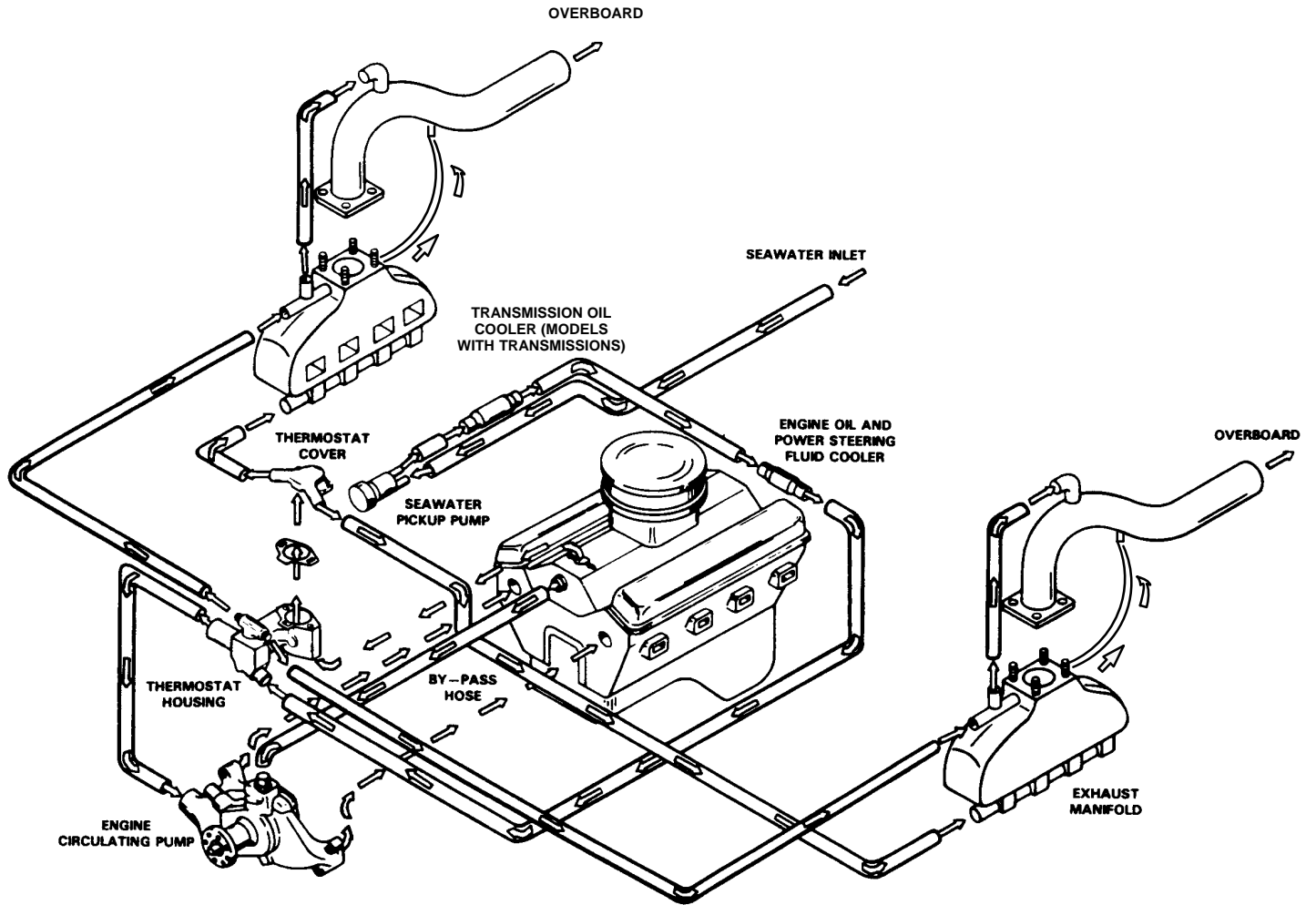
**F. ENGINE WIRING DIAGRAM
HP 500(BULLDOG)**



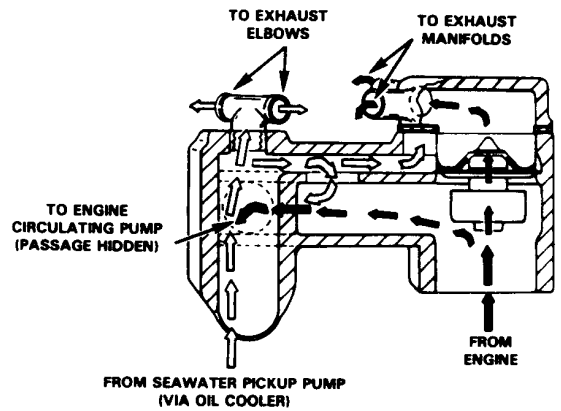
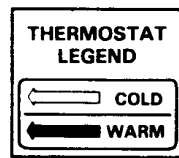
**A: Ignition and Choke System
B: Starting and Charging System
C: Audio Warning System**

**D: Instrumentation System
E: Use on engines with Transmissions
F: Use on engines without Transmissions**

**G. COOLING SYSTEM WATER FLOW DIAGRAM
HP-500 (BULLDOG) (STANDARD EXHAUST)**



COOLANT FLOW THROUGH THERMOSTAT HOUSING WITH THERMOSTAT CLOSED



COOLANT FLOW THROUGH THERMOSTAT HOUSING WITH THERMOSTAT OPEN

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