mercruiser HI-PERFORMANCE SERIES

service bulletin

TO: SERVICE MANAGER ☐ MECHANICS ☐
PARTS MANAGER ☐

No. 95-1

H.P. 500 (540 cid - Bulldog) S/N OD763968 & UP

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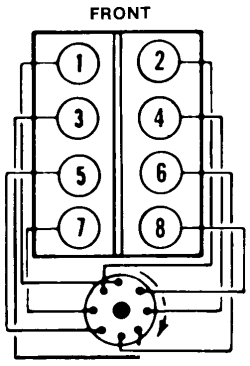
A. TUNE-UP SPECIFICATIONS

Horsepower (Kilowatts)	500 (373)
Displacement (Liters)	540 CID (8.9L)
Engine Type and Number of Cylinders	V-8
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 IV
Spark Plug Type-P/N	AC 33-59660 NGK 33-813421
Spark Plug Gap	.035 in. (0.9mm)
Timing at Idle RPM	10° BTDC
Maximum Advance @ 3000 RPM	30° BTDC
Maximum RPM at Wide-Open-Throttle	4600-5000
Idle RPM in Forward Gear	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

*NOTE: ** Without alcohol whenever possible.*

Alternator Rating	55 Amperes
Recommended Battery Rating	Min. 550 Amps Cold Cranking Amperage
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) III SSM 9.5 Qts. (8.9L) V SSM 6.75 Qts.(6.4L) III&V SSM WITH SPACERS 1 in. (25 mm) 7.5 Qts. (7.1L) 2 in. (51 mm) 8.25 Qts. (7.8L) 3 in. (76 mm) 9 Qts. (8.5L)
*Transmission Oil Type F Capacity (Approx.)	2.5 Qts. (2.4 Liters)

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



Firing Order
1-8-4-3-6-5-7-2

Figure 1. L.H. Rotation

B. ELECTRICAL SPECIFICATIONS

Ignition Specifications

Timing	30° BTDC @ 3000 RPM
Coil	Part No. 392-7803A4
Coil Primary Resistance (Ohms) Minimum	.60
Coil Primary Resistance (Ohms) Maximum	.80
Coil Secondary Resistance (Ohms)	9.400-11.700

Starter Motor Specifications

Engines with transmissions

Mercury Marine Part Number			50-76965A-3	
Delco Remy Part Number			1109485	
Brush Spring Tension			56-105 OZ (1588-2976 g)	
No Load Test				
Volts	**Amps. (Min.)**	**Amps. (Max.)**	**RPM (Min.)**	**RPM (max.)**
10.6	65	115	6400	10,800

Engines without transmissions

Mercury Marine Part Number			50-822330A-1	
Delco Remy Part Number			9000789	
No Load Test				
Volts	**Amps. (Min.)**	**Amps. (Max.)**	**RPM (Min.)**	**RPM (max.)**
10.6	92	95	2750	3250

C. CARBURETOR SPECIFICATIONS

All measurements are ± 1/64 in. (0.4mm).

Make (Model)	Holley (4150)
Part No. Mercury(Blue) Mercury(Black) (Holley)	13549A10 13549A 4 (9022)
Float Adjustment	Bottom of Sight Plug Hole ± 1/32” (.8 mm)
(Blue Carburetor) Primary Jets Secondary Jets	 No. 81 No. 92
(Black Carburetor) Primary Jets Secondary Jets	 No. 79 No. 90
Accelerator Pump	.015” (.4 mm)
Choke Setting	Index Marks Aligned
Idle Mixture Screw Preliminary Setting	2 turns out

D. INTERNAL ENGINE SPECIFICATIONS

UNIT OF MEASUREMENT
in. (mm)

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 & Service	.0045-.0065 (0.1143-1.1651)

NOTE: Measure piston 1.300 (33.02 mm) down from lower oil ring groove and 90° from piston pin bore.

Piston Ring: (1)HI Production Limit

Compression	Groove Side Clearance	Production	Top	.0017-.0032 (0.0439-0.08138)
			2nd	.0017-.0032 (0.0439-0.08138)
		Service		.0027 - .0042 (0.06868 - 0.10678)
	Gap	Production	Top	.020 - .024 (0.51 - 0.61)
			2nd	.020 - .024 (0.51 -0.61)
		Service		.020-.030 (0.508-0.762)
Oil	Groove Side Clearance	Production		.0005-.0065 (0.0127-0.1651)
		Service		.0015-.0075 (0.0381-0.1905)
	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 in Rod		.0010 - .0015 (0.0254 -0 .0381)

Crankshaft:

Main Bearing Clearance 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)
	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)

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.
Rod Bearing Clearance			.0025-.0035 (0.0635-.0889)
Rod Side Clearance			.018-.025 (.46-.64)
Crankshaft Runout			.0005 - .0015 (0.0127 - 0.0381)

Camshaft and Drive:

Lobe Lift ± .002 (0.051 mm)	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 (Intake & Exhaust)	1/2-5/8 Turns Down from Zero Lash
Face Angle (Intake & Exhaust)	45°
Seat Angle (Intake & Exhaust)	45°
Seat Runout (Intake & Exhaust)	.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.@ In (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 dampner.

Cylinder Head:

Gasket Surface Flatness	.002 (.050) in 6” (152) .005” (.127) Overall

Flywheel:

Runout	(Face Area)
Engines with transmissions	.005 (.13)
Engines without transmissions	.008 (.20)

E. TORQUE SPECIFICATIONS

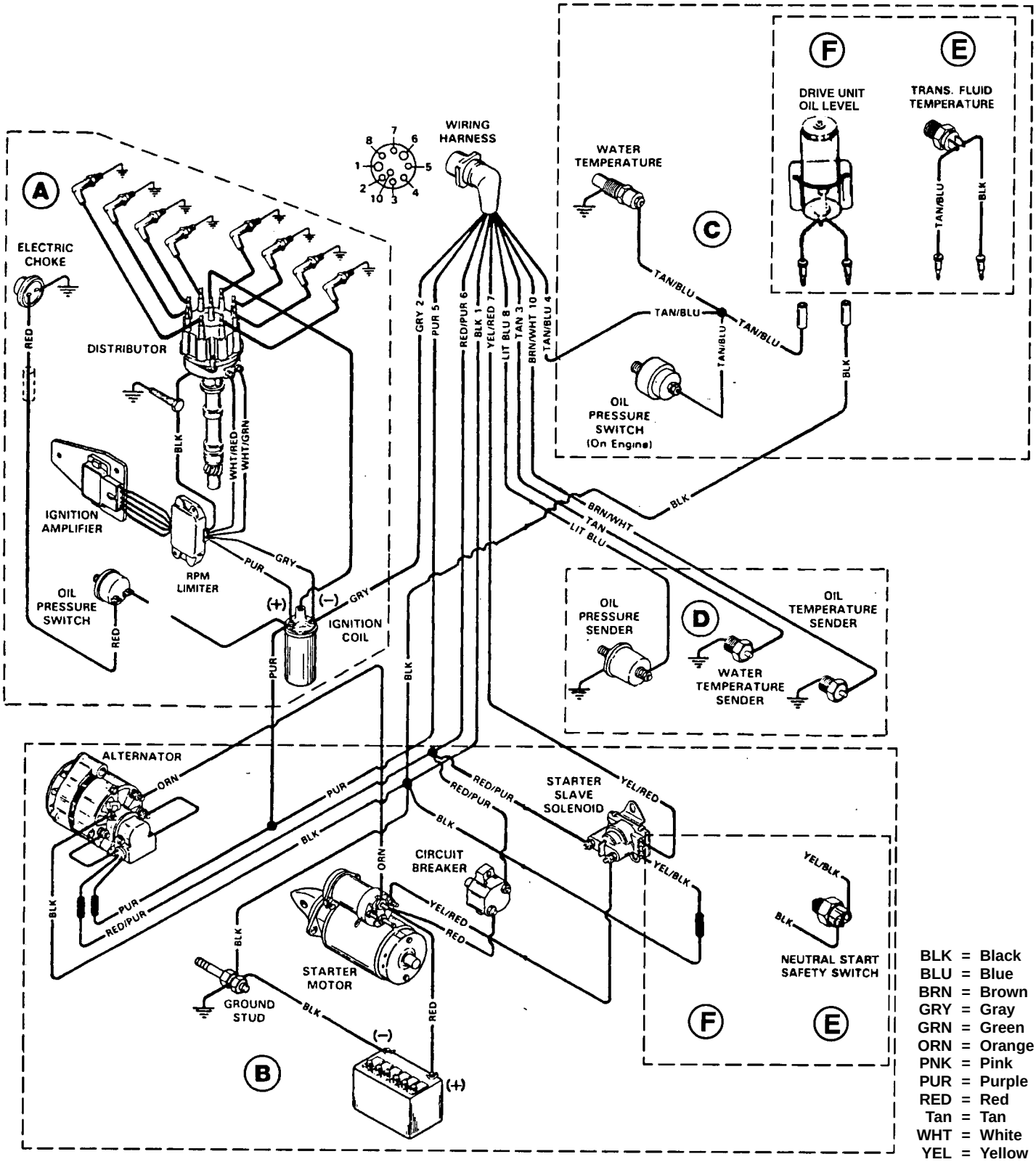
Camshaft Sprocket/Gear (NOTE 1)	25 lb.ft. (34 N·m)
Conn. Rod Cap (NOTE 2)	80 lb. ft. (109 N·m)
Crankcase Front Cover	80 lb. in. (9 N·m)
Cylinder Head (NOTE 3)	80 lb. ft. (109 N·m)
Distributor Clamp	15 lb. ft. (20 N·m)
Exhaust Manifold (Bolts)	25 lb. ft. (34 N·m)
Flywheel (NOTE 1)	70 lb. ft. (95 N·m)
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.

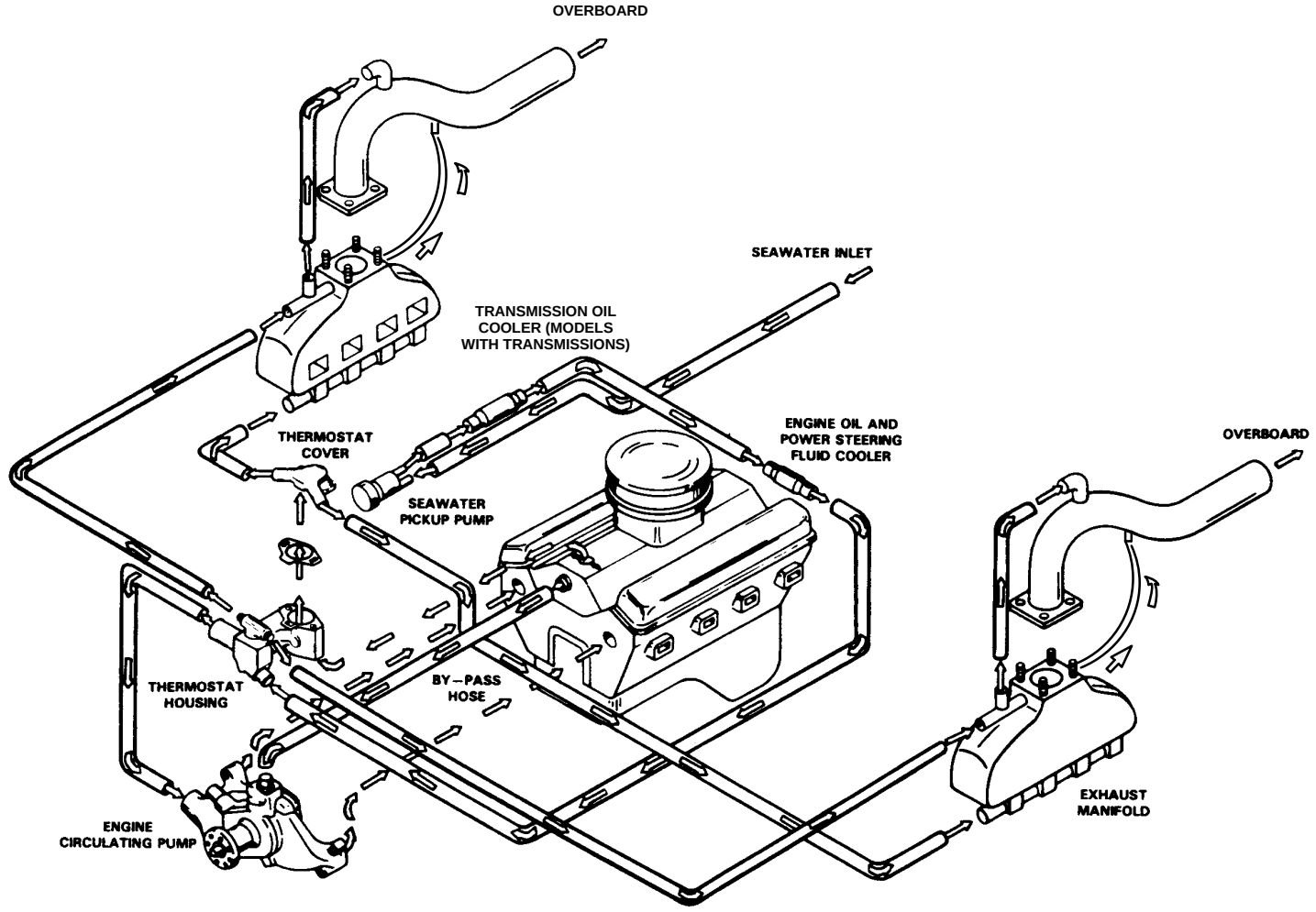
F. ENGINE WIRING DIAGRAM
HP 500(BULLDOG)

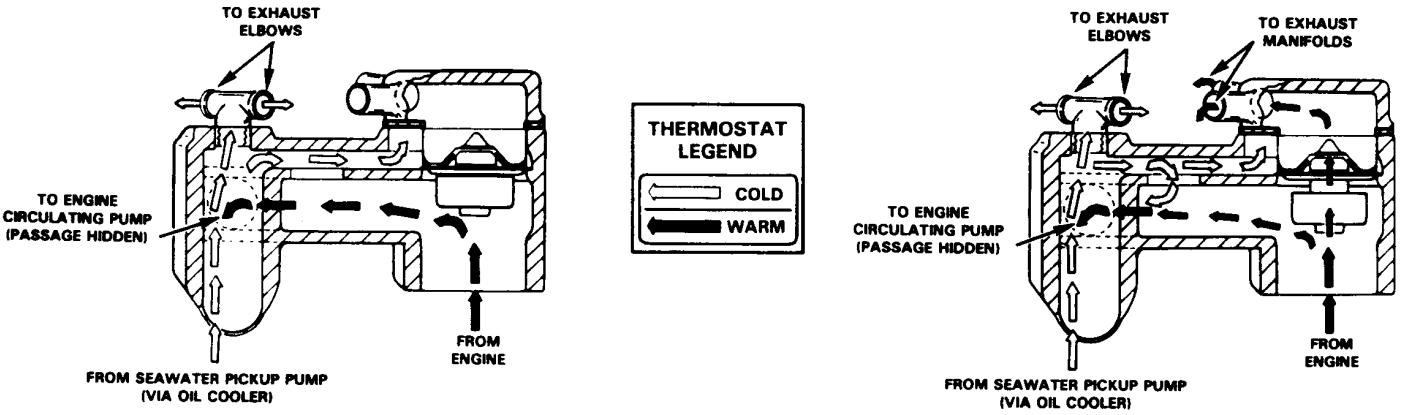


BLK	= Black
BLU	= Blue
BRN	= Brown
GRY	= Gray
GRN	= Green
ORN	= Orange
PNK	= Pink
PUR	= Purple
RED	= Red
Tan	= Tan
WHT	= White
YEL	= Yellow
LIT	= Light
DRK	= Daek

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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