

TO: SERVICE MANAGER  MECHANICS   
PARTS MANAGER

No. 89-5

**REVISED**  
**5-11-92**

## MERCURISER

### H.P. 465 SPECIFICATIONS

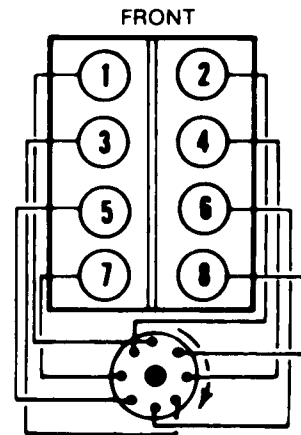
- A. Tune-Up Specifications
- B. Electrical Specifications
- C. Carburetor Specifications
- D. Internal Engine Specifications
- E. Torque Specifications
- F. Wiring Diagram
- G. Water Flow Chart

#### A. TUNE-UP SPECIFICATIONS

Horsepower (Kilowatts)	465 (347)
Displacement (Liters)	502 CID (8.2)
Engine Type and Number of Cylinders	V-8
Bore	4.468" (113.48mm)
Stroke	4.00" (101.6mm)
Compression Ratio	8.75:1
Compression Pressure	175 PSI (.1035 kPa)
Ignition	Thunderbolt IV
Spark Plug Type	AC - MR43T or Champion RV8C
Spark Plug Gap	.035" (.9mm)
Timing at Idle RPM	18° BTDC
Maximum RPM at Wide-Open-Throttle	4800 - 5200
Idle RPM in Forward Gear	800 - 850
Firing Order	1-8-4-3-6-5-7-2
Fuel Required	87 Octane Minimum (Average Octane Rating)
Fuel Pump Pressure	3-7 PSI (10-48 kPa)

Electrical System	12-Volt Negative Ground
Alternator Rating	55 Amperes
Recommended Battery Rating	Min. 450 Amps Cold Cranking Amperage
Crankcase Oil Capacity with New Filter*	8 Qts. (7.5 Litres)
Oil Pressure at 2000 RPM	30-70 PSI (207-483 kPa)
Valve Lash	1/4 to 1/2 Turns Down From Zero Lash
Thermostat	143° (62° C)
*Stern Drive Unit Oil Capacity (Approx.)	Bravo: 2 Qts. (1.95 Liters) TRS: 3 Qts. (2.8 Liters)
*Transmission Oil Capacity (Approx.)	2.5 Qts. (2.4 Liters) (TRS Only)

\* 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

<b>Engine Model</b>	<b>HP 465</b>
Spark Plug Type	AC - MR43T Champion RV8C
Spark Plug Gap	.035" (0.9mm)
Timing	18° BTDC

### Starter Motor Specifications

Identification Number	No Load Test					Brush Spring Tension
	Volts	Min. Amps	Max. Amps	Min. RPM	Max. RPM	
50-17293A1 (Delco-Remy) 10455603	10.6	70	120	5400	10,800	56 - 105 oz. (1588 - 2976 g.)

## C. CARBURETOR SPECIFICATIONS

All Measurements are  $\pm 1/64"$  (0.4mm)

Make (Model)	Holley (4150)
Part No. Mercury (Holley)	13549A4 (9022)
Float Adjustment	Bottom of Sight Plug Hole $\pm 1/32"$ (.8mm)
Primary Jets	No. 77
Secondary Jets	Port No. 87 STBD No. 96
Accelerator Pump	.015" (.4mm)
Choke Setting	Index Marks Aligned
Idle Mixture Screw Preliminary Setting	2-Turns

**UNIT OF MEASUREMENT**  
In. (mm)

**D. INTERNAL ENGINE SPECIFICATIONS**

**Cylinder Bore:**

Diameter		4.467" - 4.469" (113.46 - 113.51)	
Out of Round	Production	.001" (.025) Max.	
	Service	.002" (.05) Max.	
Taper	Production	Thrust Side	.005" (.0127) Max.
		Relief Side	.001 (.025) Max.
	Service	.001 (.025) Max.	

**Piston: See Note (1)**

Clearance	Production	.010" (.254) Max.
	Service	.010" (.254) Max.

**Piston Ring: (1) HI Production Limit**

Compression	Groove Side Clearance	Production	Top	.0025" - .0035" (.064) - (.089)
			2nd	.0025" - .0035" (.064) - (.089)
		Service	.005" (.0127) Max.	
	Gap	Production	Top	.011" - .021" (.279 - .533)
			2nd	.016" - .026" (.406 - .660)
		Service	.016" - .026" (.406 - .660)	
Oil	Groove Side Clearance	Production	.0025" - .0045" (.0635 - .1143)	
		Service	.006" (.152) Max.	
	Gap	Production	.015" - .055" (.381 - 1.397)	
		Service	.015" - .055" (.381 - 1.397)	

**Piston Pin:**

Diameter		.98945" - .98965" (25.132 - 25.137)	
Clearance	Production	.00045" - .00065" (.01143 - .01651)	
	Service	.001" (.025) Max.	
Fit in Rod		.0008" - .0021" (.0203 - .0533) Interference	

**Crankshaft:**

Main Journal	Diameter	No. 1	2.7481" - 2.7490" (69.802 - 69.825)	
		No. 2, 3, 4	2.7481" - 2.7490" (69.802 - 69.825)	
		No. 5	2.7476 - 2.7486 (69.789 - 69.814)	
	Taper	Production	.0002" (.0050)	
		Service	.001" (.025)	
	Out of Round	Production	.0002" (.0050)	
Service		.001" (.025)		
Main Bearing Clearance	Production	No. 1	.0013" - .0025" (.033 - .0635)	
		No. 2, 3, 4	.0013" - .0025" (.033 - .0635)	
		No. 5	.0024" - .0040" (.0609 - .1016)	
	Service	No. 1	.0010" - .0025" (.025 - .0635)	
		No. 2, 3, 4	.0010" - .0025" (.025 - .0635)	
		No. 5	.0025" - .0040" (.0635 - .1016)	
Crankshaft End Play			.006" - .010" (.152 - .254)	
Connecting Rod Journal	Diameter		2.1990" - 2.2000" (55.855 - 55.880)	
	Taper	Production	.0005" (.0127)	
		Service	.001" (.025)	
	Out of Round	Production	.0005" (.0127)	
Service		.001" (.025)		
Rod Bearing Clearance	Production	.0009" - .0025" (.0229 - .0635)		
	Service	.0009" - .0030" (.0229 - .0762)		
Rod Side Clearance			.013" - .023" (.330 - .584)	
Crankshaft Runout			.003" (.076)	

**NOTES:**

(1) Measure piston diameter right below oil ring groove 90° from the piston pin.

**Camshaft and Drive:**

Lobe Lift ± .002" (.051mm)	Intake	.329" (8.36)
	Exhaust	.340" (8.64)
Journal Diameter	1.948" - 1.949" (49.48 - 49.51)	
Journal Out-of-Round	.001" (.025)	
Camshaft Run-Out	.0015" (.038)	
Timing Chain Deflection	.500" (12.7)	

**Valve System:**

Lifter Type	Hydraulic		
Rocker Arm Ratio	1.7:1		
Valve Lash (Intake & Exhaust)	1/4 - 1/2 Turns Down From Zero Lash		
Face Angle (Intake & Exhaust)	45°		
Seat Angle (Intake & Exhaust)	46°		
Seat Runout (Intake & Exhaust)	.002" (.050)		
Seat Width	Intake	.060" - .090" (1.52 - 2.29)	
	Exhaust	.060" - .090" (1.52 - 2.29)	
Stem Clear- ance	Production	Intake	.0010" - .0027" (.025 - .069)
		Exhaust	.0012" - .0029" (.030 - .074)
	Service	Intake	.0010" - .0037" (.025 - .094)
		Exhaust	.0010" - .0039" (.025 - .099)
Valve Spring	Free Length		2.20 (55.88)
	Pressure Lbs. @ In (Note)	Closed @ 1.950" (49.5)	120 lb. (162 N.m)
		Open @ 1.370" (34.7)	350 lb. (475 N.m)
	Installed Height		1.875" (47.6)

NOTE: Test springs as a complete assembly with dampner.

**Cylinder Head:**

Gasket Surface Flatness	.010" (.254) Overall Max.
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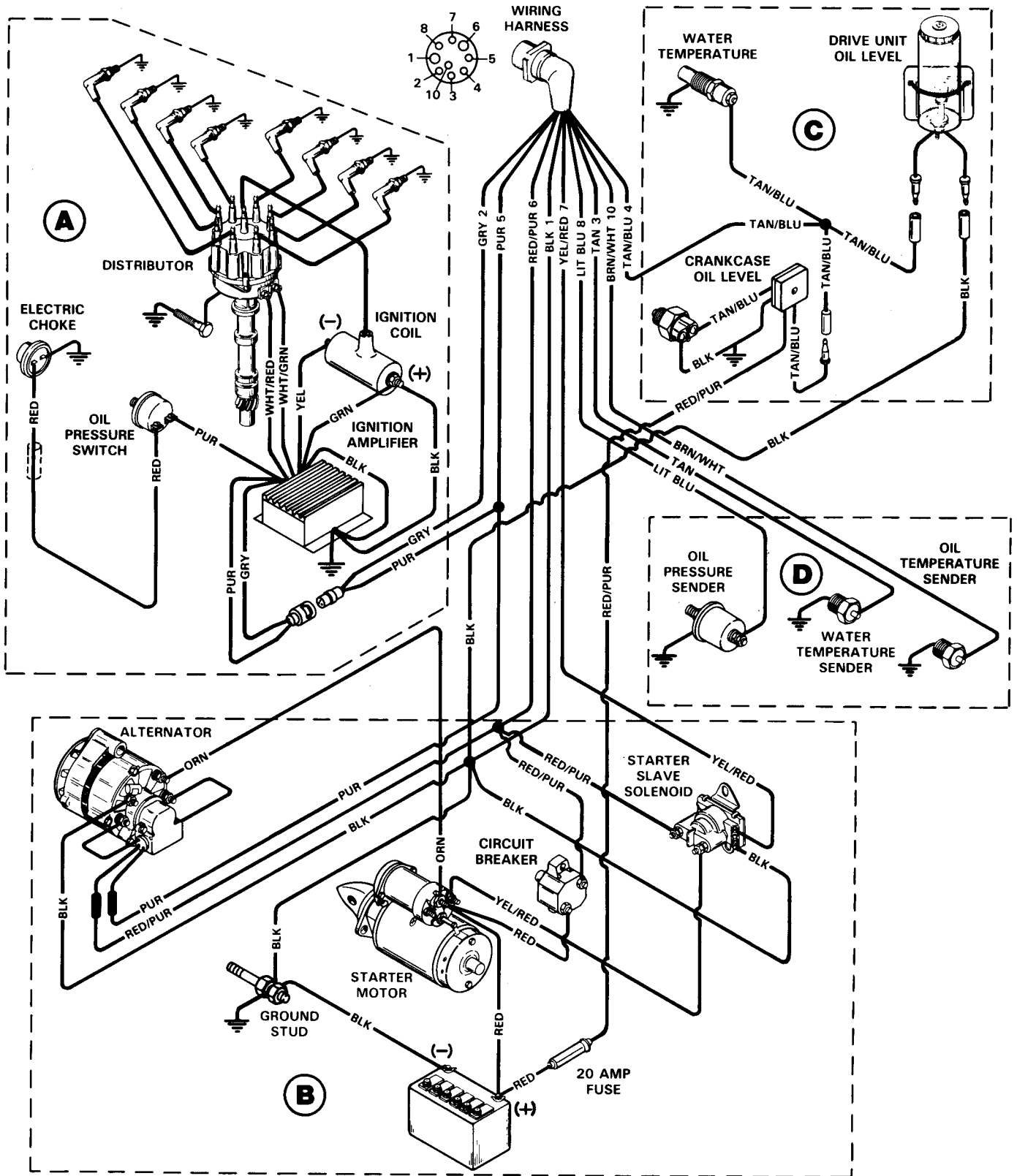
**Flywheel:**

Runout	.010" (.254) (Face Area)
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**E. TORQUE SPECIFICATIONS**

Camshaft Sprocket/Gear	25 lb. ft. (34 N.m)
Conn. Rod Cap	65 lb. ft. (88 N.m)
Crankcase Front Cover	80 lb. in. (9 N.m)
Cylinder Head	80 lb. ft. (109 N.m)
Distributor Clamp	25 lb. ft. (34 N.m)
Exhaust Manifold (Bolts)	30 lb. ft. (41 N.m)
Flywheel	65 lb. ft. (88 N.m)
Flywheel Drive Plate	35 lb. ft. (48 N.m)
Flywheel Housing	30 lb. ft. (41 N.m)
Intake Manifold	35 lb. ft. (48 N.m)
Main Bearing Cap	110 lb. ft. (149 N.m)
Oil Filter	25 lb. ft. (34 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	65 lb. ft. (88 N.m)
Oil Pump Cover	80 lb. in. (9 N.m)
Rocker Arm Cover	50 lb. in. (5.5 N.m)
Spark Plug	180 lb. in. (20 N.m)
Torsional Damper	85 lb. ft. (115 N.m)
Water Pump	30 lb. ft. (41 N.m)

**F. ENGINE ELECTRICAL SYSTEM WIRING DIAGRAM - HP 465  
(Engines Without Transmissions)**

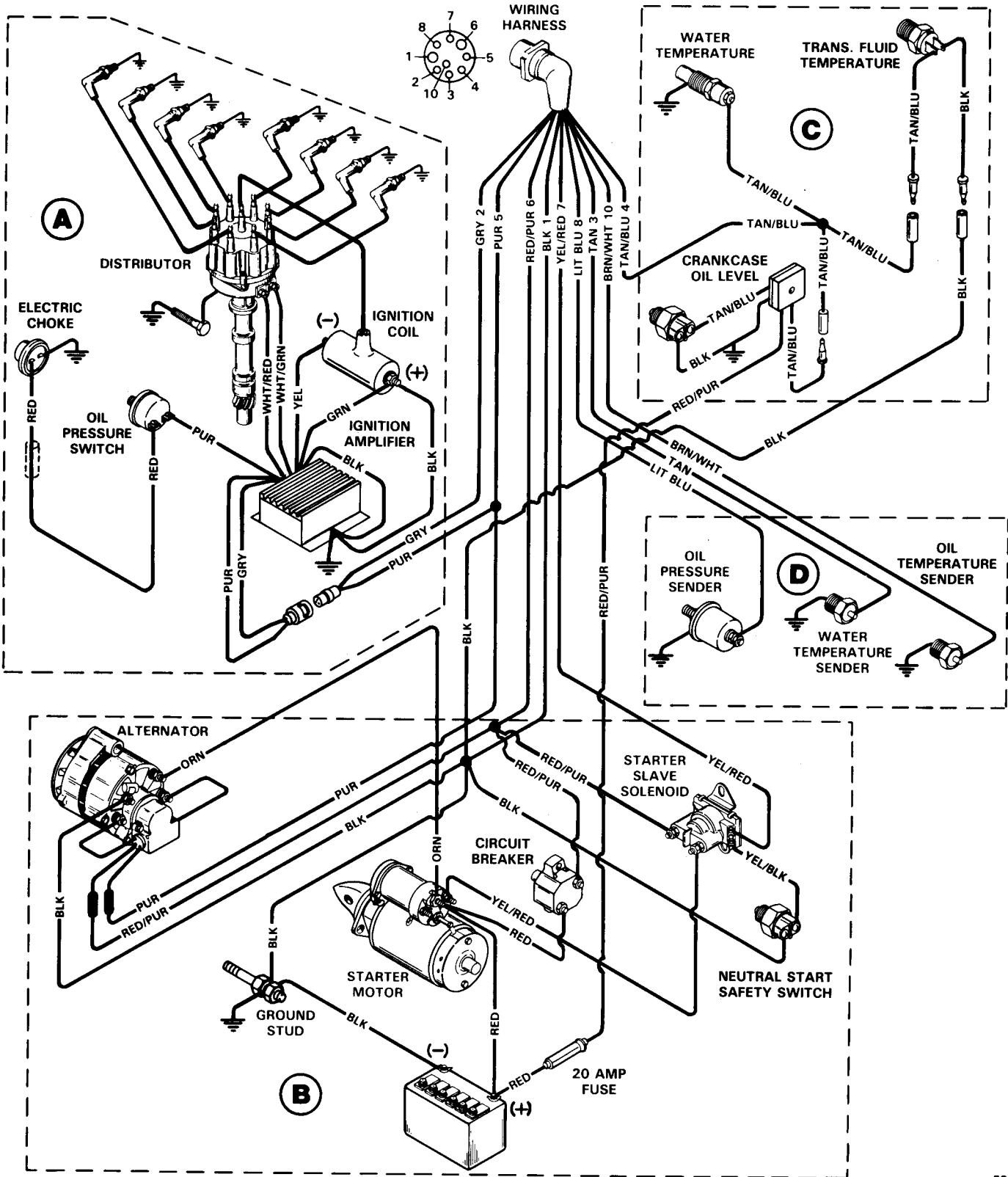


**A: Ignition and Choke System  
B: Starting and Charging System**

**C: Audio Warning System  
D: Instrumentation System**

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**ENGINE ELECTRICAL SYSTEM WIRING DIAGRAM - HP 465**  
**(Engines With Transmissions)**

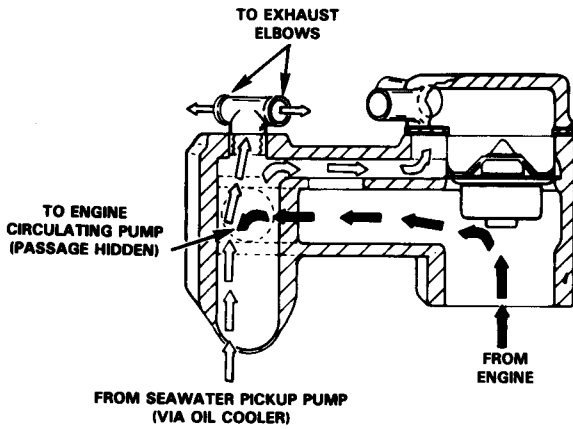
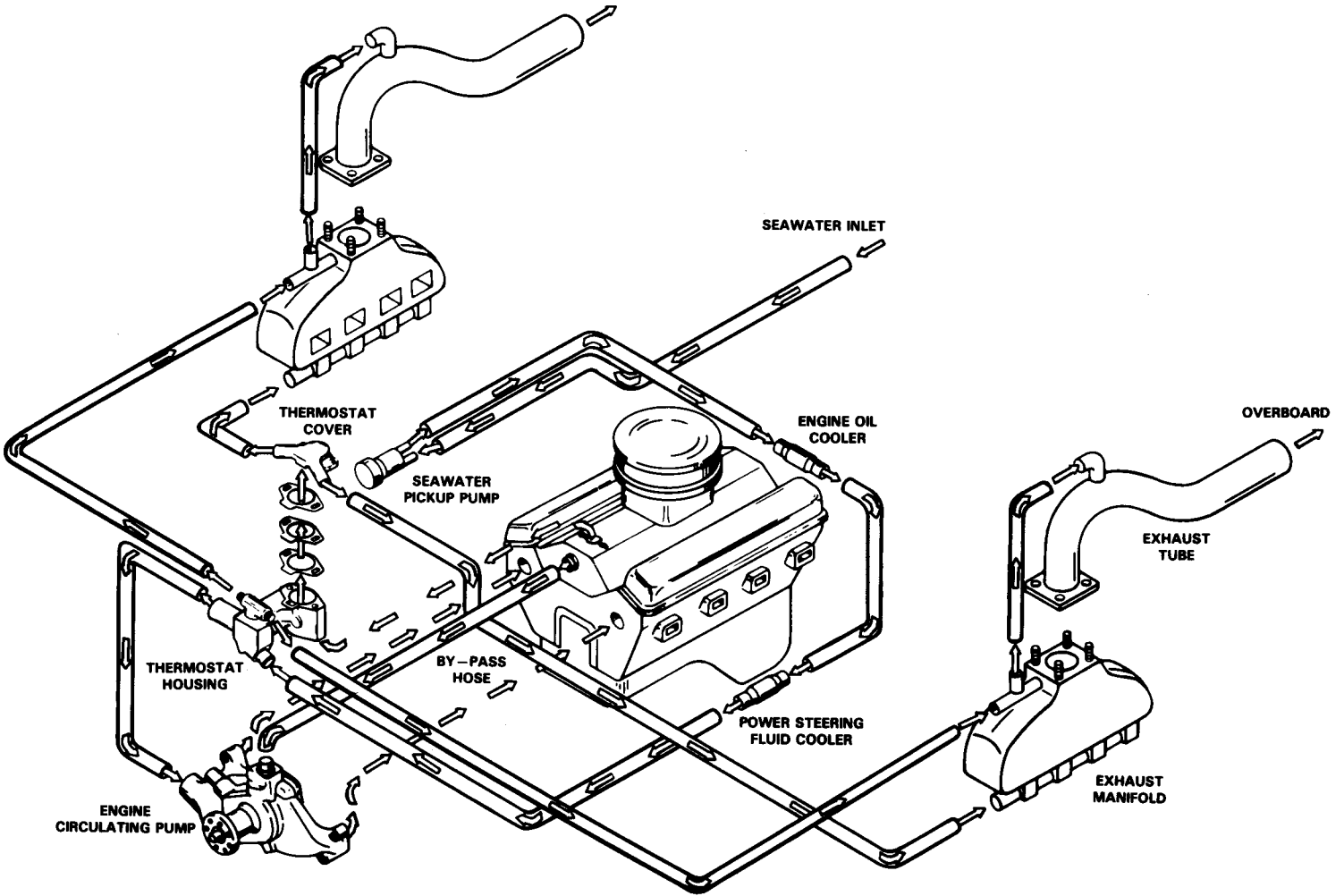


**A: Ignition and Choke System**  
**B: Starting and Charging System**

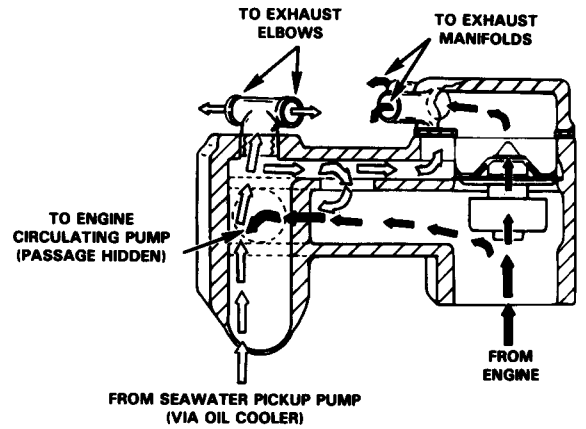
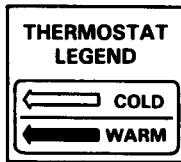
**C: Audio Warning System**  
**D: Instrumentation System**

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**G. COOLING SYSTEM WATER FLOW DIAGRAM - HP 465  
(Engines Without Transmission)**

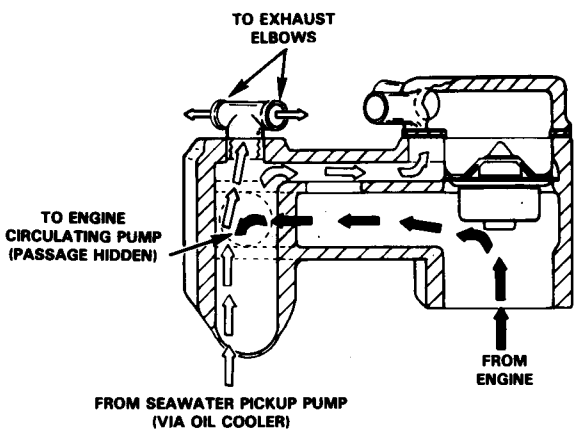
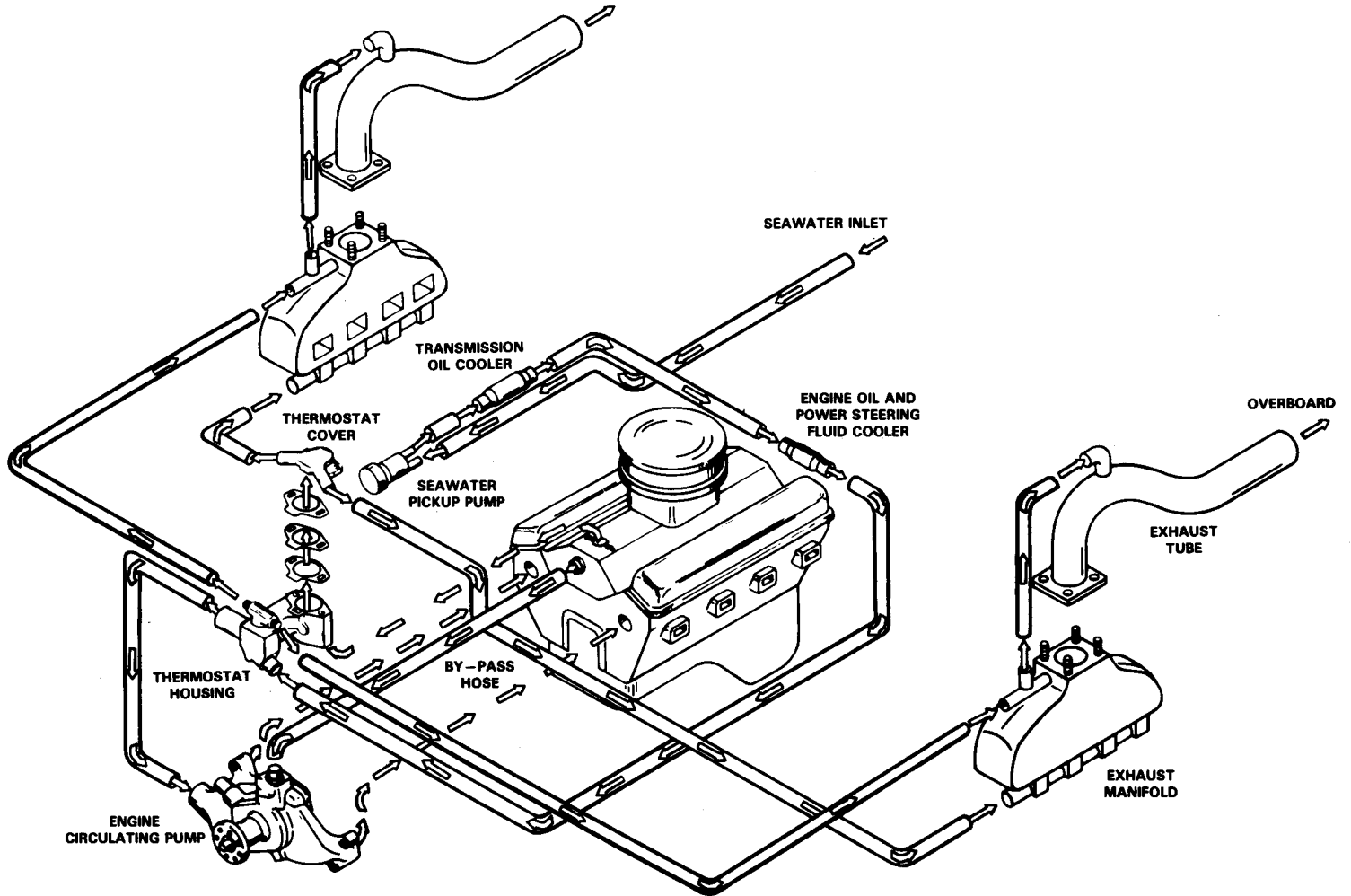


COOLANT FLOW THROUGH THERMOSTAT HOUSING WITH THERMOSTAT CLOSED

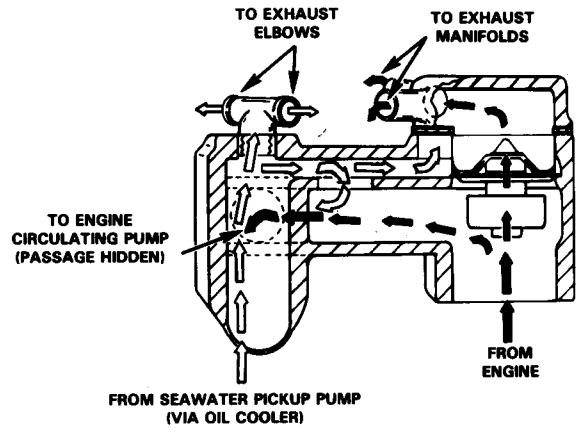
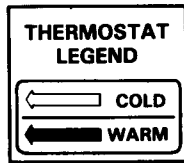


COOLANT FLOW THROUGH THERMOSTAT HOUSING WITH THERMOSTAT OPEN

**COOLING SYSTEM WATER FLOW DIAGRAM - HP 465  
(Engines With Transmission)**



**COOLANT FLOW THROUGH THERMOSTAT HOUSING WITH THERMOSTAT CLOSED**



**COOLANT FLOW THROUGH THERMOSTAT HOUSING WITH THERMOSTAT OPEN**

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