

TO: SERVICE MANAGER  MECHANICS   
PARTS MANAGER

**REVISED**  
**11-15-94**

**No. 94-5**

## H.P. 525SC (454 cid) Specifications S/N D763746 & 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

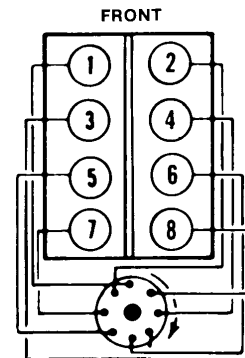
### A. TUNE-UP SPECIFICATIONS

Propshaft Horsepower (Kilowatts)	490 (365)
Displacement (Liters)	454 CID (7.4)
Engine Type and Number of Cylinders	V-8
Bore	4.250 in. (108mm)
Stroke	4.00 in. (101.6mm)
Compression Ratio	7.5:1
Compression Pressure	140 psi (965 kPa)
Ignition	Thunderbolt IV
Spark Plug Type	AC-MR41T, Champion V4C or NGK 33-813421
Spark Plug Gap	.035 in. (0.9mm)
Timing at Idle RPM (Note)	13° BTDC
Maximum Advance @ 4500 RPM	35° 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	92 Octane {(R+M)÷2} or 98 RON
Fuel Pump Pressure	3-7 psi (10-48 kPa)

*NOTE: Timing should be checked at 4500 RPM. At this RPM, timing should be 35° BTDC. Adjust initial timing to achieve 35° at 4500 RPM.*

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 Liters)
Oil Pressure at 2000 RPM	35-70 psi (241-483 kPa)
Thermostat	143° F (62° C)
Cooling System Capacity	20 U.S. Qts. (18.9L)
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)

\*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	35° BTDC @ 4500 RPM
Coil	Part No. 392-805570A2
Coil Primary Resistance (Ohms) Minimum	.60
Coil Primary Resistance (Ohms) Maximum	.80
Coil Secondary Resistance (Ohms)	9.4-11.7

### Starter Motor Specifications

<b>Mercury Marine Part Number</b>	50-99418A-2			
<b>Delco Remy Part Number</b>	10455603			
<b>Brush Spring Tension</b>	56-105 OZ (1588-2976 g)			
<b>No Load Test</b>				
<b>Volts</b>	<b>Amps. (Min.)</b>	<b>Amps. (Max.)</b>	<b>RPM (Min.)</b>	<b>RPM (max.)</b>
10.6	70	120	5400	10,800

## C. CARBURETOR SPECIFICATIONS

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

Make (Model)	Holley (4500 Dominator)
Part No. Mercury (Holley)	12377 A6 (8082)
Float Adjustment	Bottom of Sight Plug Hole ± 1/32" (.8 mm)
Primary Jets	PORT: No. 98 STBD: No. 98
Secondary Jets	PORT: No. 98 STBD: No. 98
Accelerator Pump	.020" (.5 mm)
Idle Mixture Screw Preliminary Setting	1-1/2 turns out from bottom
Power Valve	6.5 IN - HG 9860 Holley # 125 - 165

## D. INTERNAL ENGINE SPECIFICATIONS)

<b>UNIT OF MEASUREMENT in. (mm)</b>
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### Cylinder Bore:

Diameter		4.2500-4.2507 (107.950-107.968)	
Out of Round	Production	.001 (0.025) Max.	
	Service	.002 (0.05) Max.	
Taper	Production	Thrust Side	.0005 (0.0127) Max.
		Relief Side	.001 (0.025) Max.
	Service	.001 (0.025) Over production	

### Piston: See Note

Clearance	Production & Service	.005-.007 (0.127-0.178)
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*NOTE: Measure piston at wrist pin centerline and 90° from piston pin bore.*

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

Compression	Groove Side Clearance	Production	Top	.0017-.0032 (0.04-0.08)
			2nd	.0017-.0032 (0.04-0.08)
		Service	Hi Limit Production + .001 (0.025) Max.	
	Gap	Production	Top	.026-.028 (0.660-0.711)
			2nd	.024-.026 (0.610-0.660)
		Service	.020 (0.5)	
Oil	Groove Side Clearance	Production	.005-.0065 (0.13-0.15)	
		Service	High-Limit Production + .001 (0.02) Max.	
	Gap	Production	.020-.035 (0.5-0.85)	
		Service	High-Limit Production + .010 (0.25)	

### Piston Pin:

Diameter		.9895-.9898 (25.1333 - 25.1409)
Clearance to Piston	Production	.00025-.00035 (0.00635-0.00889)
	Service	.001 (0.025) Max.
Fit in Rod		.0008-.0016 (0.0203-0.0406) Interference

### Crankshaft:

Main Journal	Diameter	No. 1,2,3,4,5	2.7482-2.7489 (69.805-69.822)
	Taper & Out of Round	Production	.0002 (0.0050) Max.
		Service	.0002-.005 (0.001-0.02)
Main Bearing Clearance	Production	No. 1, 2, 3, 4	.002-.003 (0.0508-0.0762)
		No. 5	.003-.0040 (0.0762-0.1016)
	Service	No. 1, 2, 3, 4	.002-.003 (0.0508-0.0762)
		No. 5	.003-.0040 (0.0762-0.1016)
Crankshaft End Play			.006-.010 (0.152-0.254)
Connecting Rod Journal	Diameter		2.1985-2.1995 (55.8419-55.8673)
	Taper & Out of Round	Production	.0005 (0.0127) Max.
		Service	.001 (0.025) Max.
Rod Bearing Clearance	Production	.002-.0035 (0.05-0.018)	
	Service	.002-.0035 (0.05-0.018) Max.	
Rod Side Clearance			.013-.023 (0.35-0.58)
Crankshaft Runout @ #3 Main			.003 (0.076) Max

**Camshaft and Drive:**

Lobe Lift ± .002 (0.051 mm)	Intake	.312 (7.9248)
	Exhaust	.324 (8.2296)
Journal Diameter		1.948-1.949 (49.48-49.51)
Journal Out-of-Round		.0005-.001 (0.013-0.025)
Camshaft Run-Out		.0005-.001 (0.013-0.025)
Timing Chain Deflection		3/8"(10 mm) from taut 3/4"(19mm) total

**Valve System:**

Lifter Type		Hydraulic	
Rocker Arm Ratio		1.7:1	
Valve Lash (Intake & Exhaust)		1/2 to 5/8 Turns Down from Zero Lash	
Face Angle (Intake & Exhaust)		45°	
Seat Angle (Intake & Exhaust)		45°	
Seat Runout (Intake & Exhaust)		.002 (0.050) max.	
Seat Width		Intake	.080-.100 (0.79-1.59)
		Exhaust	.080-.100 (1.59-2.38)
Stem Clearance	Production	Intake	.001-.0027 (0.0254-0.0686)
		Exhaust	.0012-.0029 (0.0305-0.0737)
	Service	Intake	.0010-.003 (0.025-0.076)
		Exhaust	.0010-.003 (0.025-0.076)
Valve Spring	Free Length		2.12 (53.8)
	Pressure Lbs. @ In (NOTE)	Closed @ 1.875 (47.6)	130 lb. ft. (176 N.m)
		Open @ 1.375 (33.4)	325 lb. ft. (440 N.m)
	Installed Height		1.875 (47.6)

NOTE: Test springs as a complete assembly with retainer.

**Cylinder Head:**

Gasket Surface Flatness	.007 (0.178) Overall Max. .003 (0.076) Within a 6 in. (152 mm) span
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**Flywheel:**

Runout	.008 (0.203) Max. (Face Area)
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**E. TORQUE SPECIFICATIONS**

Camshaft Sprocket (NOTE 1)	25 lb. ft. (34 N·m)
Conn. Rod Cap (NOTE 2)	65 lb. ft. (99 N·m)
Crankcase Front Cover	120 lb. in. (14 N·m)
Cylinder Head (NOTE 3)	Step #1–20 lb. ft. (27 N·m) Step #2–50 lb. ft. (68 N·m) Step #3–75 lb. ft. (115 N·m)
Distributor Clamp	20 lb. ft. (27 N·m)
Exhaust Manifold (Bolts)	30 lb. ft. (41 N·m)
Flywheel (NOTE 1)	70 lb. ft. (95 N·m)
Flywheel Drive Coupler (NOTE 1)	35 lb. ft. (48 N·m)
Flywheel Housing	30 lb. ft. (41 N·m)
Intake Manifold (NOTE 4)	Step#1-15 lb. ft. (20 Nm.) Step#2-30 lb. ft. (41 Nm.)
Main Bearing Cap	110 lb. ft. (149 N·m)
Oil Pan to Crankcase (5/16-18)	165 lb. in. (19 N·m)
Oil Pan Drain Plug	15 lb. ft. (20 N·m)
Oil Pump (NOTE 1)	70 lb. ft. (95 N·m)
Oil Pump Cover (NOTE 1)	80 lb. in. (9 N·m)
Rocker Arm Stud (NOTE 1)	45 lb. ft. (61 N·m)
Rocker Arm Cover	96 lb. in. (11 N·m)
Spark Plug	15 lb. ft. (20 N·m)
Torsional Damper	90 lb. ft. (122 N·m)
Water Pump	35 lb. ft. (48 N·m)
Supercharger to intake manifold	10 lb. ft. (14 N·m)

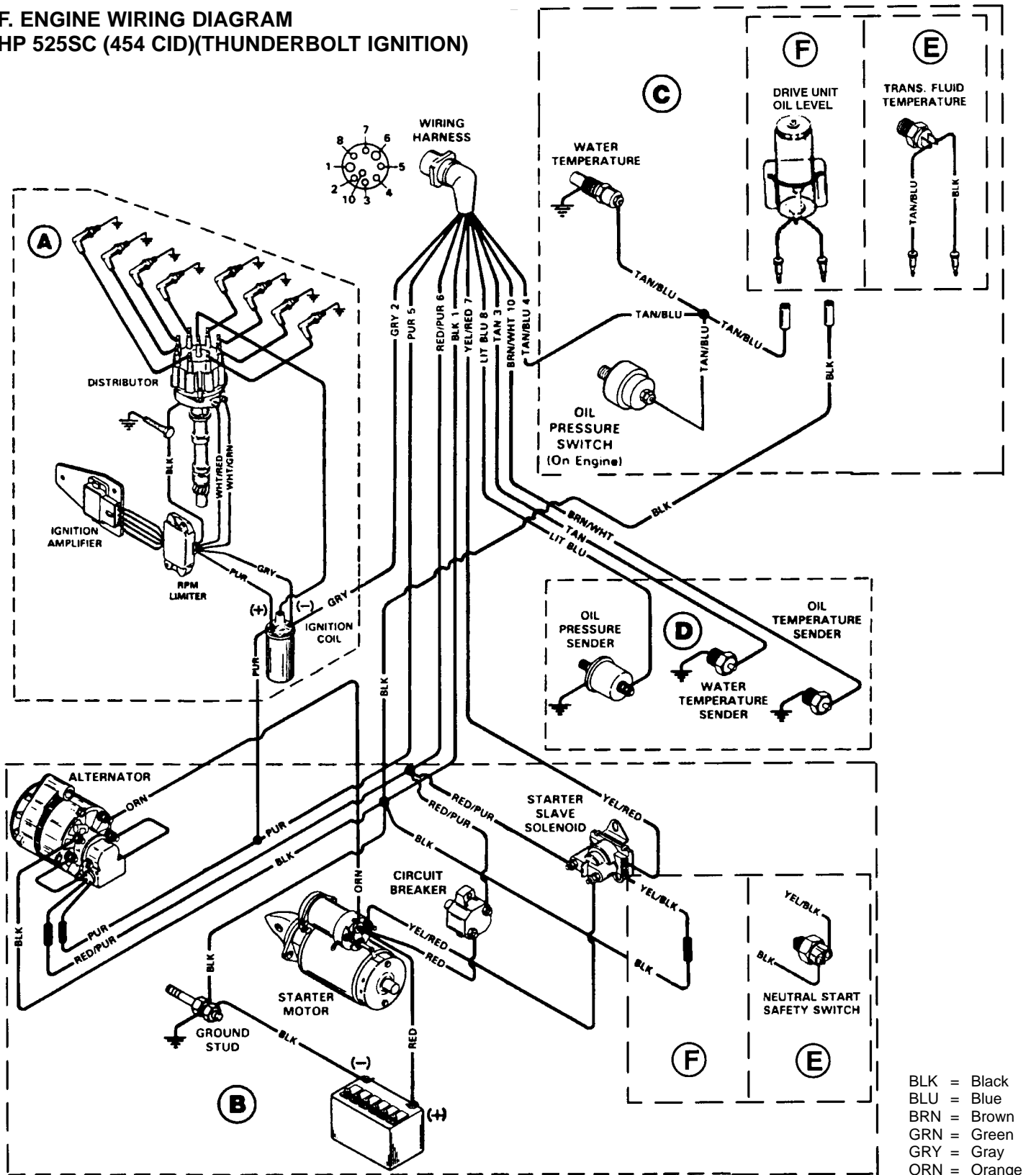
NOTE 1: Use Loctite 271 (P/N 92-32609-1) on threads.

NOTE 2: Apply engine oil to stud threads and contacting surface of nut.

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

NOTE 4: Use only Mercury gasket P/N 27-818188

**F. ENGINE WIRING DIAGRAM  
HP 525SC (454 CID)(THUNDERBOLT IGNITION)**

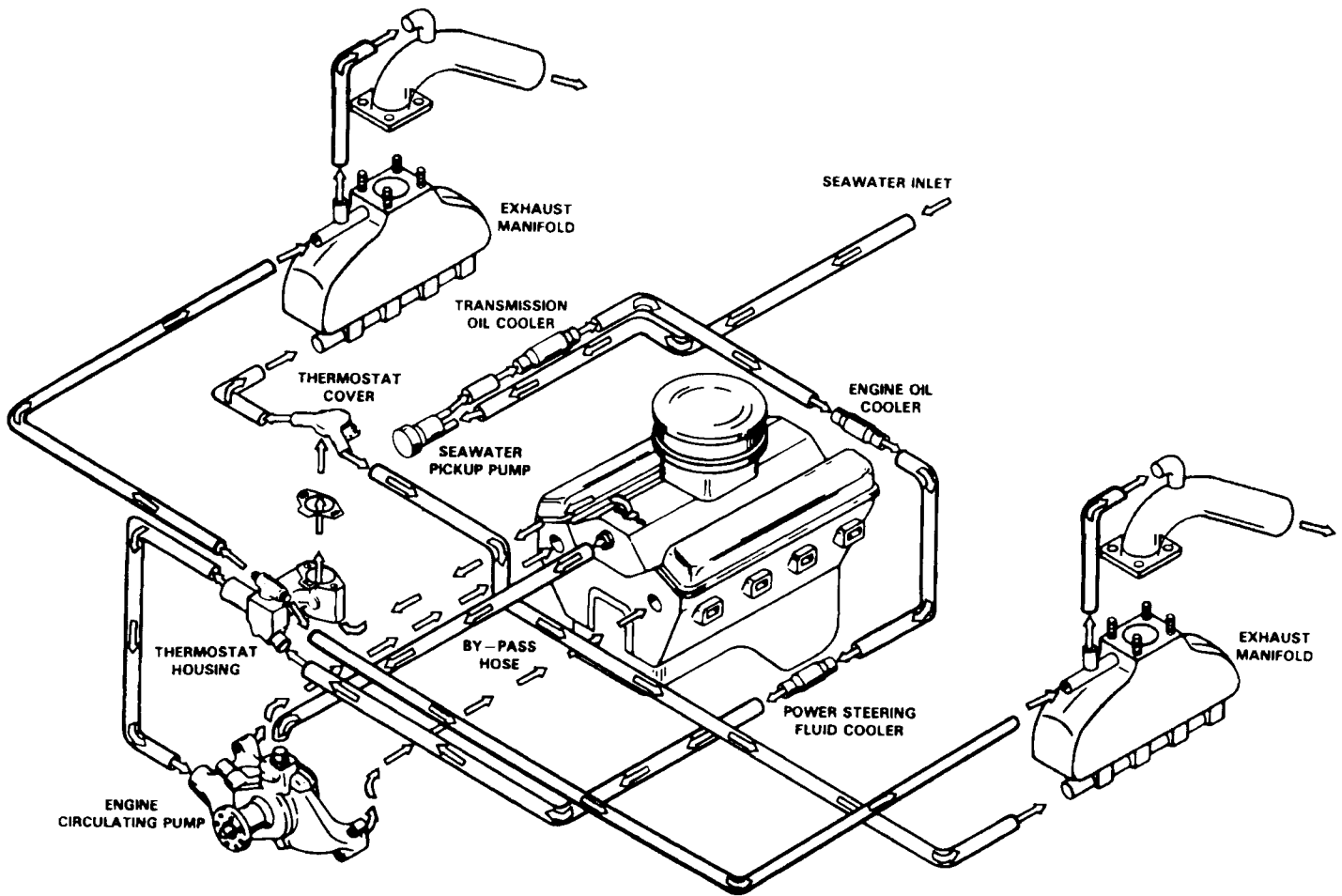


**A: Ignition and Choke System  
B: Starting and Charging System  
C: Audio Warning System**

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

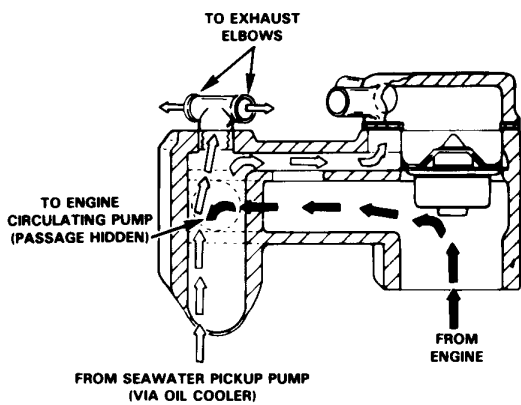
BLK = Black  
BLU = Blue  
BRN = Brown  
GRN = Green  
GRY = Gray  
ORN = Orange  
PNK = Pink  
PUR = Purple  
RED = Red  
TAN = Tan  
WHT = White  
YEL = Yellow  
LIT = Light  
DRK = Dark

**G. COOLING SYSTEM WATER FLOW DIAGRAM - HP 525SC (454 CID)**

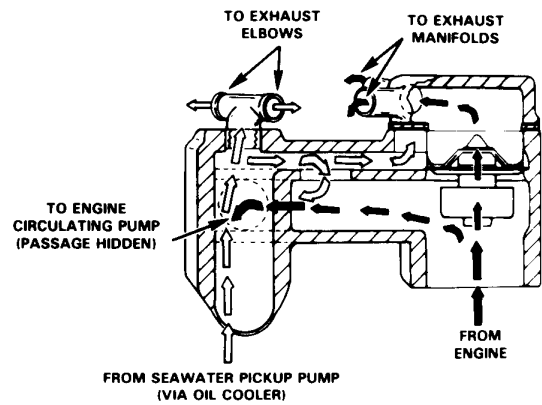
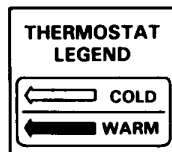


*Note: The by pass hose (between the engine block and circulating water pump) may not be on some engines.*

*Note: Transmission cooler not used with Bravo drive models.*



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



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