



POWERHEAD

Section 4B - Cooling

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Specifications

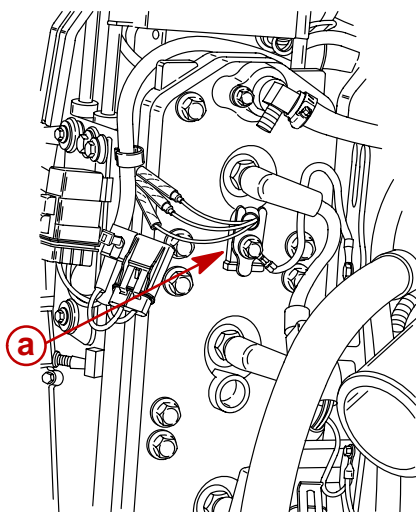
Water Pressure

1000 – 1100 (in Neutral)	1/2 – 1-1/2 PSI (3.4 – 10 kPa)
210 – 5500 (Boat on Plane)	10 – 15 PSI (69 – 103 kPa)
240 – 5800 (Boat on Plane)	13 – 17 PSI (90 – 117 kPa)

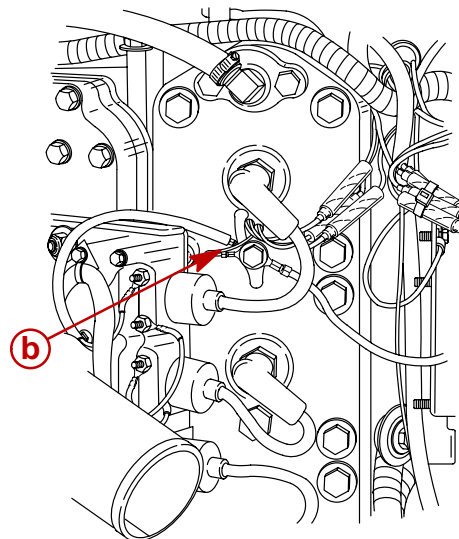


Temperature Sensor

Temperature Sensor(s)	
Between Black and each TAN/BLK wire.	No Continuity
Between each lead and ground	No Continuity



Model 240
a - Port Head

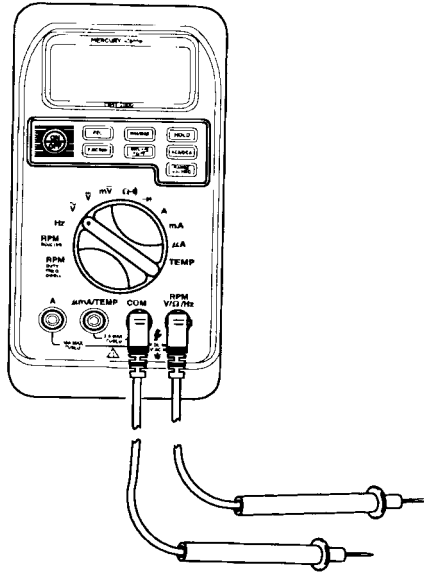


Model 210
b - Starboard Head

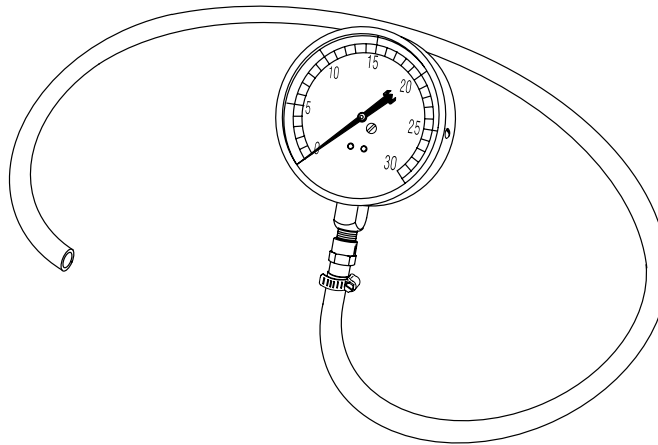


Special Tools

1. DMT 2000 Digital Tachometer Multi-meter P/N 91-854009A1



2. Water Pressure Gauge 91-79250A2



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Temperature Sensor

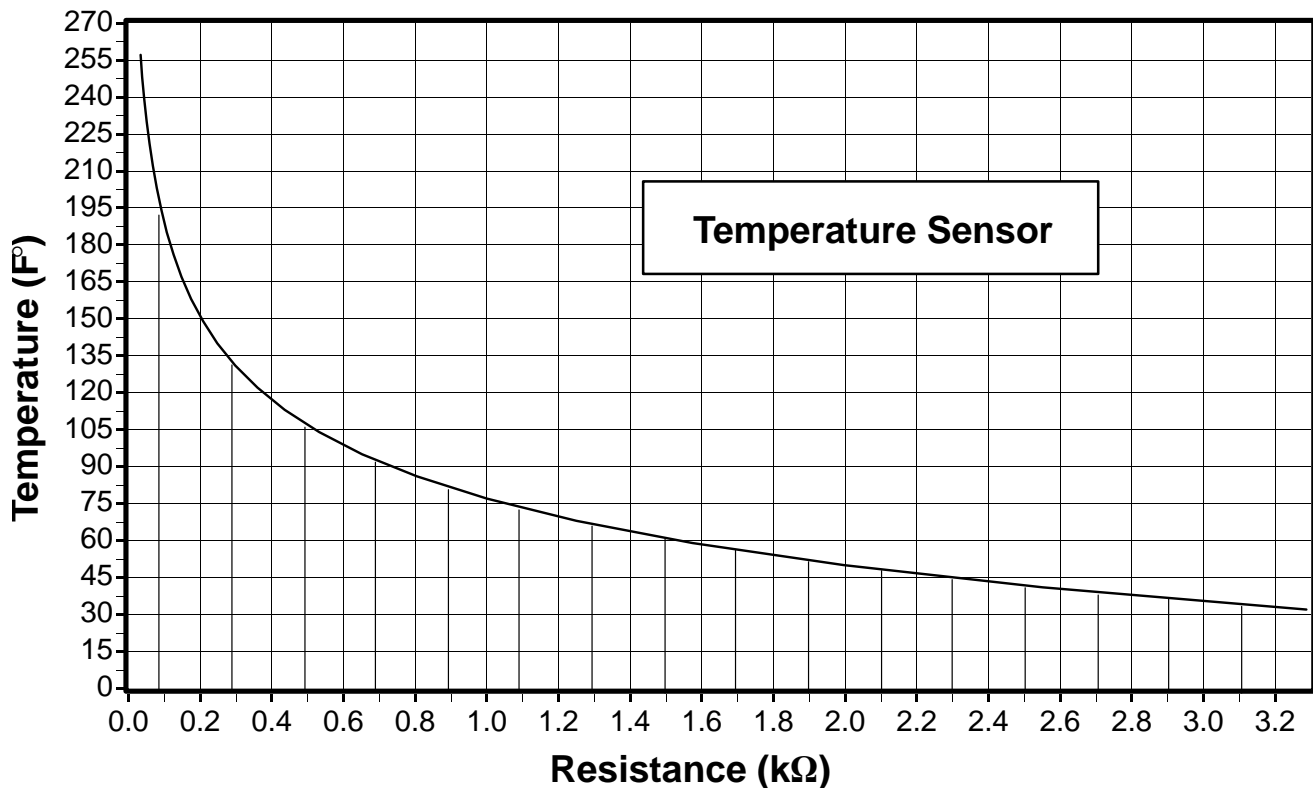
Two temperature sensors are used to provide cylinder head temperature information. On Model 240 EFI engines, the port temperature sensor provides the ECM signals related to determine the level of fuel enrichment during engine warm up. The ECM is receiving information at all engine temperatures but stops fuel enrichment at an engine temperature of 90° F (32° C). An open circuit on the temperature sensor will increase fuel flow up to 40% at lower engine speed but will have no effect on engine performance at high engine speed. If no change occurs when sensor is disconnected, sensor may not be functioning properly.

NOTE: If sensor does not make clean contact with cylinder head, a rich condition may exist.

An ohms test of the temperature sensor would be as follows:

Insert digital or analog ohmmeter test leads into both TAN/BLACK sensor leads. With engine at temperature (F°) indicated, ohm readings should be as indicated $\pm 10\%$.

NOTE: The Digital Diagnostic Terminal (DDT) can be used to monitor temperature readings from both temperature sensors.





Model 210/240 Water Flow

Description

Water is pumped up through the adaptor plate and into the powerhead by the jet pump impeller which is constantly turning whenever the engine is running. Water flows through the center of the block, around the cylinder sleeves and through the cylinder heads.

Water exits from the bottom of the block and into the adaptor plate flowing past the exhaust runners and into the expansion chamber. The water fills the expansion chamber and exits out the top of the chamber via a hose and back into the adaptor plate where is drawn out by the impeller.

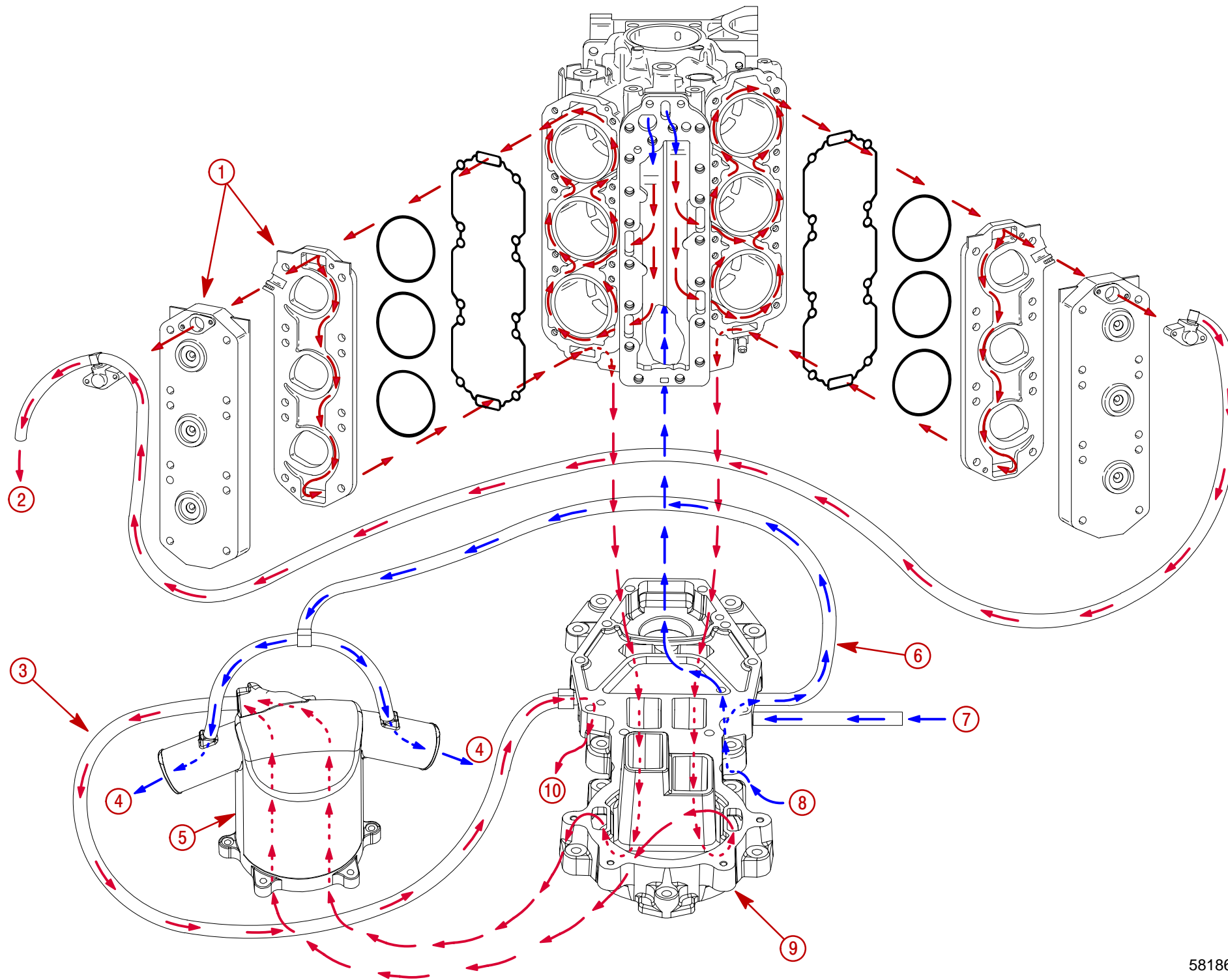
Water is also pumped from the starboard side of the adaptor plate via a hose to a t-fitting over the expansion chamber. The water is then sprayed into each exhaust pipe for cooling purposes.

To allow complete passage filling and to prevent steam pockets, all cooling passages are interconnected. Small passages are incorporated to allow the cooling system to drain.



Model 210/240 Water Flow Diagram

Cylinder Block, Expansion Chamber and Adaptor Plate



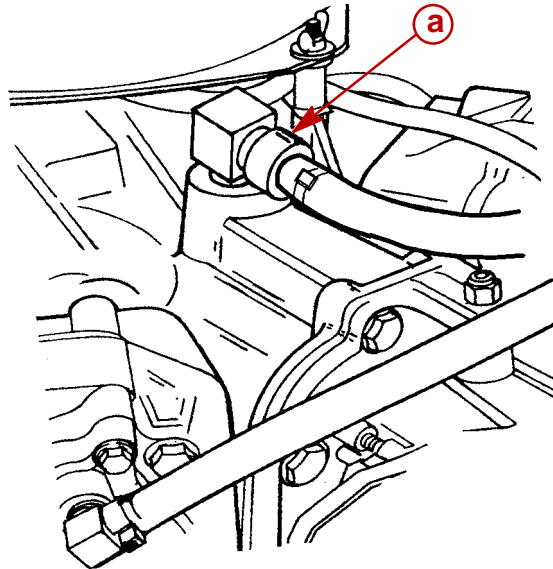
- 1 - Cylinder Head Cover – removed from head for illustration, normally part of head casting.
- 2 - Water Bypass – discharged outside of boat.
- 3 - Cooling water from expansion chamber is emptied back into adaptor plate.
- 4 - Cooling water for exhaust tubes is discharged with exhaust.
- 5 - Expansion Chamber Water Jacket
- 6 - Incoming cooling water is directed to expansion chamber exhaust pipes.
- 7 - Water inlet to flush powerhead.
- 8 - Inlet cooling water from jet pump for powerhead.
- 9 - Exhaust Adaptor Plate
- 10- Cooling water from expansion chamber is emptied into adaptor plate and through the jet tunnel.

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Water Pressure Check

NOTE: To perform these checks, a Water Pressure Gauge Kit P/N 91-79250A2 is recommended. Water pressure is taken at the top of the powerhead.



a - Water Pressure Taken At This Location

RPM	Water Pressure PSI (kPa)
1,000 - 1,100 (in Neutral)	1/2 - 1-1/2 (3.4 - 10)
210 HP - 5500 (Boat on Plane)	10 - 15 (69 - 103)
240 HP - 5800 (Boat on Plane)	13 - 17 (90 - 117)

Problem Diagnosis

Condition	Recommended Range	Possible Cause
Pressure below specification @ idle	1/2 - 1-1/2 psi (3.4 - 10kPa)	<ul style="list-style-type: none"> •Severe internal leak •Inlet restriction
Pressure above 5 psi (34.2kPa) @ idle	1/2 - 1-1/2 psi (3.4 - 10 kPa)	<ul style="list-style-type: none"> •Plugged tell-tale
Pressure is below minimum specification @ W.O.T. 210 HP - 5500 (Boat on Plane) 240 HP - 5800 (Boat on Plane)	10 psi (103 kPa) 13 psi (117 kPa)	<ul style="list-style-type: none"> •Inlet restriction •Configuration of boat bottom interfering with adequate flow of water to coolant inlets •Severe internal leak
Pressure higher than normal @ W.O.T., but engine still indicates overheat condition 210 HP - 5300 (Boat on Plane) 240 HP - 6000 (Boat on Plane)	Maximum pressure 15 (69 - 103) 17 (90 - 117)	<ul style="list-style-type: none"> •Outlet water passages restricted. •Steam pocket has formed at top of powerhead due to lack of cooling water