Engine Cooling – Raw Water Handling

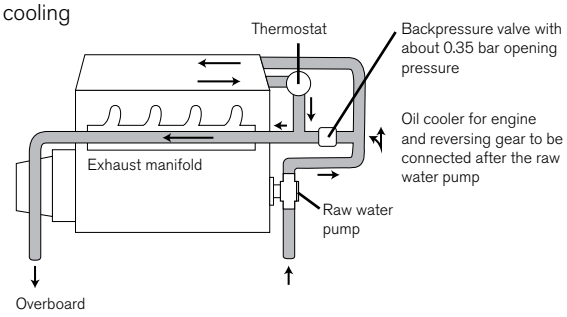
Flexible impeller pumps, F-series, provide an efficient solution to most raw water pumping needs. The primary advantage of a flexible impeller pump is its self-priming ability. As the vanes of the impeller are depressed and rebound, they create their own vacuum drawing fluid into the pump. A dry pump can lift water up to as much as 3 meters. Thus a flexible impeller pump being used for engine cooling needs not be located below the water line or manually primed. An added feature of flexible impeller pumps is that they can pass fairly large solids without clogging or damaging the pump. This reduces the need for filtering the incoming fluid.

For general raw or fresh water applications, the standard long lasting neoprene rubber impeller is used.

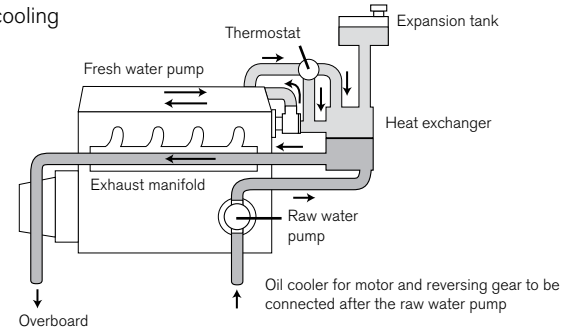
A general feature of all flexible impeller pumps is that they cannot be permitted to run dry for more than 30 seconds. Both the impeller and the seals depend upon the water for lubrication and will soon burn out if run dry. Wearing parts are easily replaceable, and service kits are available for all standard models.

Different types of cooling systems

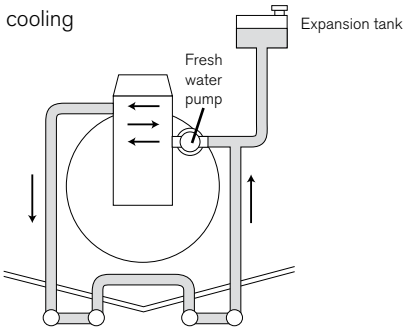
Direct cooling



Indirect cooling
Inter cooling

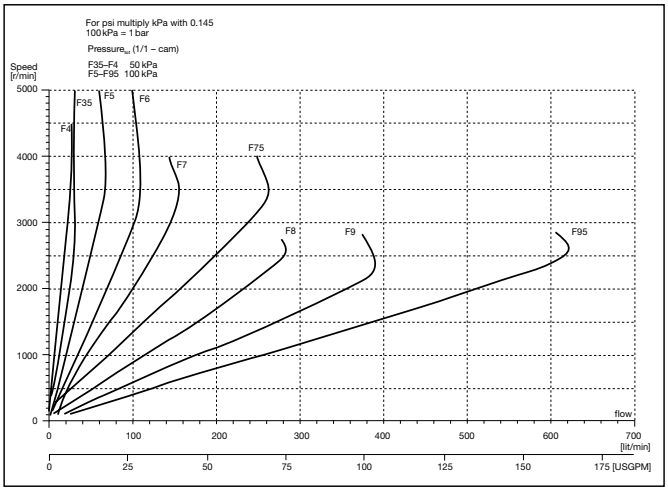


Keel cooling



Capacity Range

(based on water at 20˚C/68˚F)



Fresh Water Handling

For circulation of the internal, closed, fresh water circuit of the cooling system SPX Johnson Pump Marine can offer a number of alternatives in its DC driven CM- and C0-series (see page 21 for further information). It is also common to use a flexible impeller pump for this purpose if it is located on the cold side of the system (max. 55°C). Other types of belt-driven centrifugal pumps may also be useful. The closed circuit normally transfers heat from the engine to the heat exchanger. The liquid is water and anti-freeze.

Cooling Capacity

The required output of the cooling pump – raw water as well as fresh water handling – is related to

- engine size and type (gasoline or diesel)
- type of cooling system (size of heat exchanger)
- water cooled engine oil, reverse gear, exhaust system

Contact your local dealer for more information, or for indirect cooling systems your supplier of heat exchangers.

Pump Mounting

Engine cooling pumps, the F-series, are available in several different styles and sizes to satisfy different cooling system needs. Flanged pumps which mount directly to the engine and crank shaft pulley mounted pumps are available for a wide variety of engines. SPX Johnson Pump Marine is the original equipment pump supplier to the largest manufacturers world-wide of inboard engines. Both flange mounted and pulley driven pedestal pumps can be used to provide cooling with a maximum of ease and flexibility. Pump ports are available in sizes from ³/₈" to 2.½".

Flange Mounted Pumps

Flanged pumps are normal pumps produced in high volumes, customer designed for flange-mounting at a power take off of the engine. Different types of drives can be used but mainly gears or any type of driving members are used.

Crank Shaft Pulley Mounted

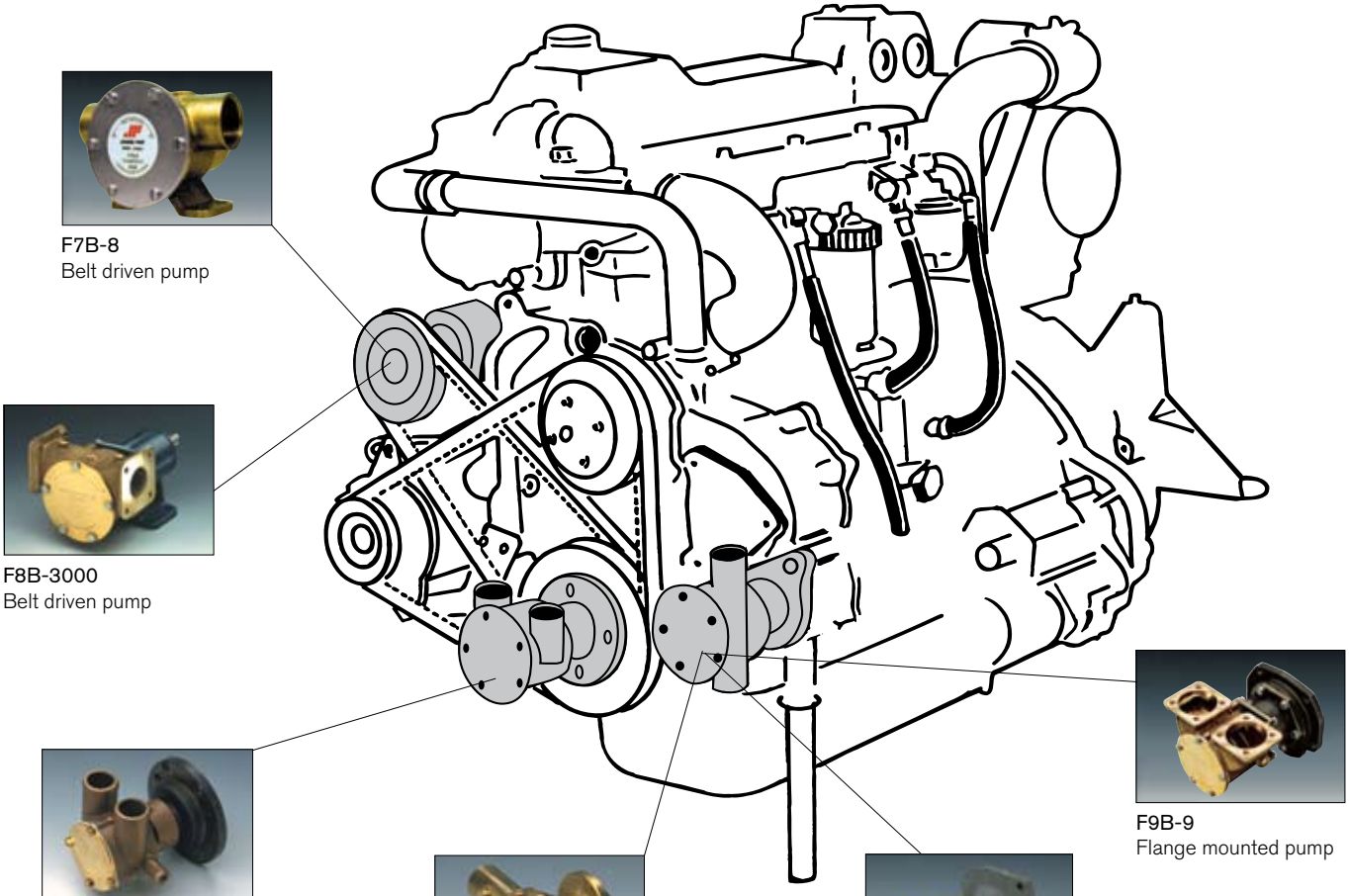
These pumps are designed for direct installation on the engine crank shaft pulley. Max. revs. 5.000 per minute. For some engines an adaptor kit for the engine crank shaft pulley is available.
To prevent the pump from rotating, a torque bracket from the fastening point on the pump body to a suitable point on the engine has to be used.

Pedestal Mounted Pumps

Pulley driven pedestal mounted pumps are used when a free driving pulley is available on the engine.
Two different types of pedestal mounted pumps are supplied:

FB-8
A range of bronze pumps in compact design. Ideal as cooling water pumps in marine engines. Available in sizes from 3/8" to 1.½", all with permanently lubricated double ball bearings and mechanical seal.

FB-3000
A range of extra heavy duty pedestal mounted pumps excellent for cooling purpose in commercial vessels. The design means separate bearing housings with permanently lubricated double ball bearings, mechanical shaft seal for extended service life. Wetted parts as wear plate, cam and endcover are easily replaceable.



F7B-8
Belt driven pump

F8B-3000
Belt driven pump

F6B-9
Crank shaft pulley mounted

F4B-9
Flange mounted pump

F7B-9
Flange mounted pump

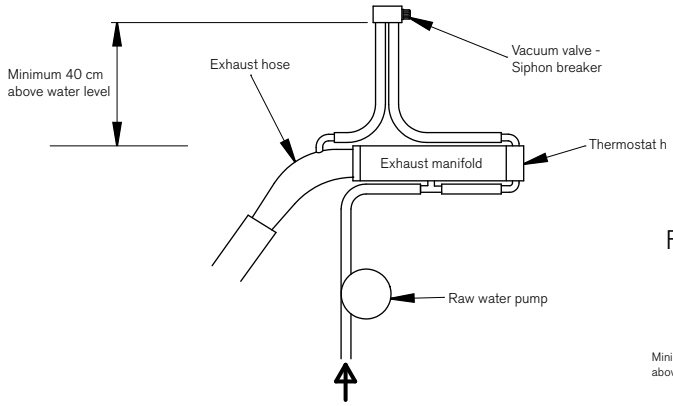
F9B-9
Flange mounted pump

Vacuum valve - Siphon breaker

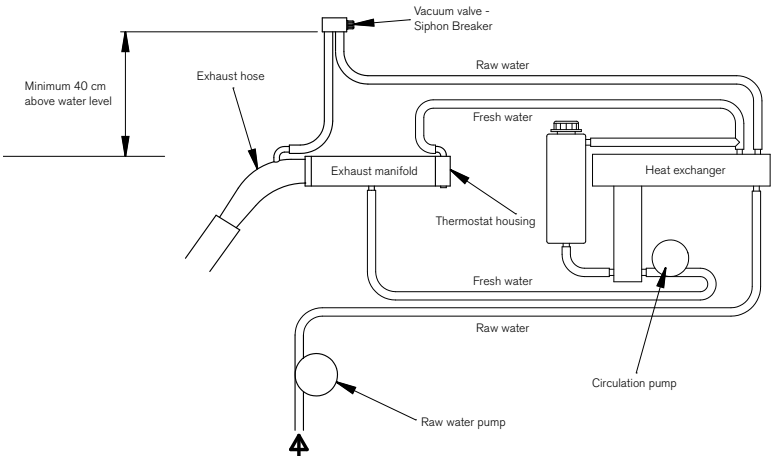
A vacuum valve is a cheap insurance against water intrusion in a engine with expensive repairs as a consequence.

Order No.	Description
09-47316-01	Siphon Breaker, Spud Size 12 mm
09-47316-02	Siphon Breaker, Spud Size 16 mm
09-47316-03	Siphon Breaker, Spud Size 19 mm
09-47316-04	Siphon Breaker, Spud Size 22 mm
09-47316-05	Siphon Breaker, Spud Size 25 mm
09-47316-06	Service Kit

Raw Water Cooled Engine



Fresh Water Cooled Engine



Take good care of the cooling system – change to a new impeller every year!

The impeller is a very important security device. Its task is to pump the water through the cooling system of the engine. But remember that the impeller should be replaced every year. And always make sure you get a Johnson Pump Brand original impeller. Then you'll know that it matches your pump exactly.

Remove the impeller with a slip joint plier or an Impuller.

Order No.	Description
09-950-9300	JP Impuller