Hale Products, Inc. Service Bulletins

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Product Type Covered:	**Hale Pump**	X	**Class1**		**Godiva**		
Keywords:	Marine Pump Installation Notes						
Product Covered:	Marine Pumps 8FG, 8FK, DSD, AP, RSD, CSD						
Summary Statement:	**Standard Installation Guidelines can improve performance, and reliability, as well as reduce typical service time.**						
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Body of the Bulletin

Hale Pumps are used in a variety of Marine installations. The following installation tips can reduce problems and make service easier when required. These features should be included in the specification and design of marine pump installations. Hale provides these guidelines to help the designer and builder with the details of pump installation.

Installation Couplings:

All pump installations should have some form of flexible coupling between the piping and the pump discharge and intake connections. Just because the pump might have two flange connections does not imply that no flexible coupling is required. The pump volute is not designed to withstand exceptional stress that can be imparted by solid pump plumbing. Some pumps like the CSD, RSD, and DSD use a victaulic coupling integrated into the pump intake. A pair of Victaulic™ Type 77 or other equivalent groove type couplings usually provides adequate flexibility for most installations. Other rubber bellows or couplings can also be used to provide for alignment and flex of the mounting. This applies to both direct engine mounted pumps and to free standing driveline driven pumps.

Service Pipe:

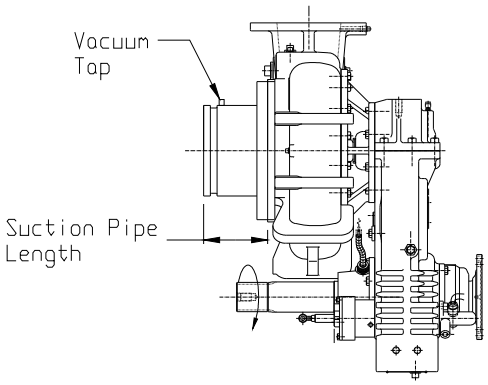
All Fire Pumps should have adequate service clearance. The typical Hale pump used in a boat is vertically split and has an integral speed increasing gearbox. This creates a compact pump with a flange for the discharge connection and a flange or Victaulic™ connection for the intake.

The vertically split pump design is very compact but has the drawback of possible service issues. The pump installation should have a section of pipe that is removable installed in the suction to allow the pump to be serviced in place more easily.

See table A below for the recommended length of suction pipe to allow pump service. A 1/8 NPT tap on this pipe is a good place for vacuum readings. This should be at the end of the pipe away from the pump.

Table A:

Pump Model	Pump Connection	Pipe Length(min)
DSD, RSD, CSD	6 Inch Groove Coupling	5 in (130mm)
8FG, 8FK	8 Inch ASA 125/150 Flange	6 in (155mm)
APS	5 Inch Groove Coupling	4 in (105mm)



Pump Cooling:

Pump installations should include a pump cooling line. A 3/8 OD Air Brake line connected from the pump discharge to discharge water overboard can help prevent overheating. Two 3/8 NPT check valves should be included in series off the pump discharge so pump priming is not affected.

A Hale TRV-L provides additional cooling capacity and a remote overheat indication at the pump operators station. If the cooling line and TRV are installed, the pump is well protected from overheating.

Gearbox coolers must be hooked up. The pump cooling line could be the same as the gearbox cooling line. The cooling water from the pump is routed thru the check valve(s) then thru the gearbox cooler and then overboard.

Pump Priming:

Installations that require pump priming should have an interlock that prevents the advancement of engine speed when the pump is not primed. This is easily accomplished with a 5 PSI pressure switch in the pump discharge wired into the pump interlock on a pump pressure governor. Running large pumps to high speeds while dry or only partially primed can cause significant pump damage.

Pumps should be primed from the pump suction or designated priming port. Priming from the discharge side of the pump should only be done when the pump is stopped.

Pump Plumbing Suction Capacity:
The final measure of pump installation restriction on the suction side is the vacuum reading on pump test. While the pump centerline might be at or even below water level, restrictive pump plumbing can cause cavitation, limited performance and even pump damage. Table B on the next page shows the typical vacuum readings at different flow rates that should be taken at the tap on the suction pipe.

The flows listed below are Marine installation performance and do not apply to truck mounted fire pumps. These are not NFPA ratings, but are typical performance. Properly installed marine applications for these pumps exceed the land based ratings. Ideally, vacuum during test should not exceed the values in the table to avoid cavitation.

Table B

Pump Model	Flow US GPM (LPM) / Vacuum In Hg (kPa)
8FGR / 8FKR	2000 (7575) / 14.6 (49.4)
	2500 (9465) / 12.2 (41.3)
	3000 (11360) / 10.6 (35.9)
8FGF / 8FKF	2000 (7575) / 14.6 (49.4)
	2500 (9465) / 12.2 (41.3)
	3000 (11360) / 10.6 (35.9)
	3500 (13250) / 2.5 (8.5)
RSD/DSD/CSD	1000 (3790) / 19.5 (62.6)
	1250 (4730) / 18.5 (53.2)
	1500 (5680) / 17.9 (60.6)
	1750 (6625) / 6.0 (20.3)
AP	350 (1325) / 16.1 (44.4)
	500 (1900) / 15.4 (52.2)
	700 (2650) / 7.0 (23.7)

The engineers, designers, and builders of fire fighting and multipurpose marine vessels have the final responsibility for the installation arrangement and these guidelines are provided to help make sure the installation has the performance, reliability and serviceability expected by the end user.