SPXFLOW®

Johnson Pump®

INSTRUCTION MANUAL

Flexible Impeller Pumps

F35B-9, F4B-9, F5B-9, F6B-9, F7B-9, F75B-9, F8B-9, F9B-9, F95B-9, F98B-9

IB-527 R01 (06/2021)

ORIGINAL INSTRUCTIONS/TRANSLATION OF ORIGINAL INSTRUCTIONS READ AND UNDERSTAND THIS MANUAL PRIOR TO OPERATING OR SERVICING THIS PRODUCT

Johnson Pump®

INDEX - INDICE

EN: For more information about our worldwide locations, approvals, certifications, and local representatives, please visit www.spxflow.com. SPX FLOW, Inc. reserves the right to incorporate our latest design and material changes without notice or obligation. Design features, materials of construction and dimensional data, as described in this bulletin, are provided for your information only and should not be relied upon unless confirmed in writing.

Made by SPX FLOW Johnson Pump®

RELIABILITY ON BOARD
-SINCE 1968-

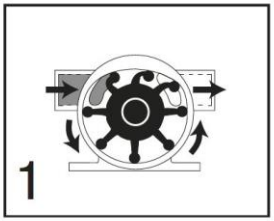
Typical applications
Engine cooling pump

Design features

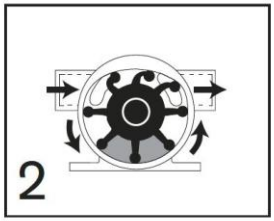
Pump body:	Brass
Bearing housing:	Cast iron
Impeller:	EPDM (MC97), Neoprene, Nitrile
Shaft:	Stainless steel.
Seal:	Lip seal or Mechanical seal
Cam:	Full or reduced
Connection:	3/8” to 2 ½”

Waste handling material recycling
At the products end of life, please dispose of the product according to applicable law. Where applicable, please disassemble the product and recycle the components.

Operating principle

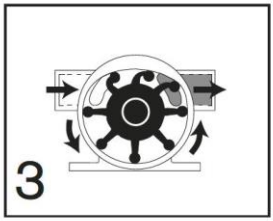


A vacuum is created as the flexible impeller vanes straighten upon leaving the cam, drawing liquid into the pump.



The rotating impeller carries liquid from the inlet to the outlet port.

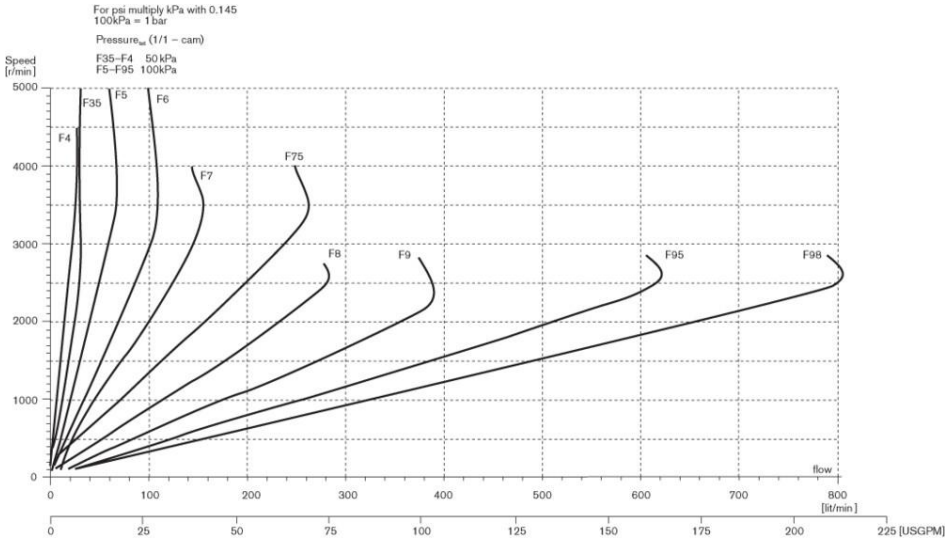
As a consequence of their design, flexible impeller pumps can pass fairly large solids.



When the flexible impeller vanes regain contact with the cam, they bend and the liquid is discharged from the pump in a uniform flow.

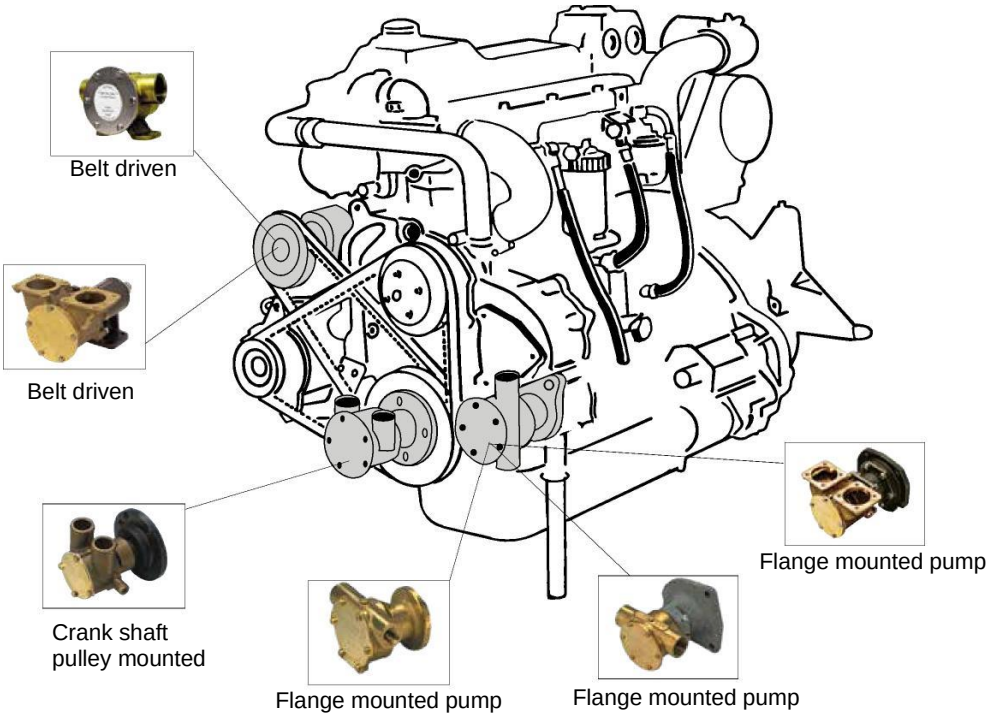
Liquids can be pumped in the opposite direction by reversing the rotation of the pump.

Capacity range for Flexible Impeller Pumps



Pump mounting options

The F-Series of engine cooling pumps are available in several different designs and sizes to satisfy different cooling system needs and mounting positions. Pump ports are available in sizes from 3/8" to $2^1/_2$".



Assembly of pump onto/into engine

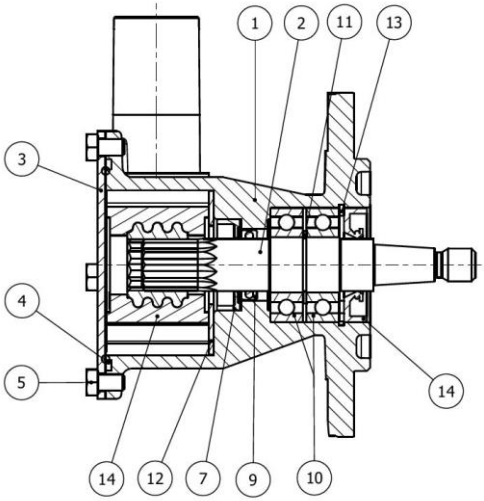
To make the assembly of the pump is smooth;

- *make sure of correct line-up of pump into engine.*
- *make sure of correct line-up of threaded port connections, do not over-tighten.*

Maintenance & Repair

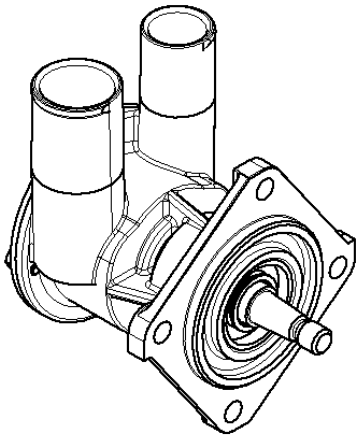
Johnson Pump Marine provides genuine spare part kits for maintenance and repair to ensure a safe function and required performance from the pump.
Contact authorised sales channels for further information or go to our website www.spxflow.com/johnson-pump-marine.

Pump components / parts list example



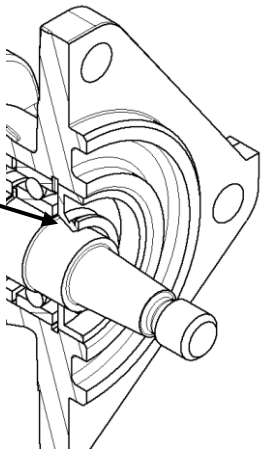
POS	QTY	DESICRIPTION
1	1	PUMP BODY
2	1	SHAFT
3	1	END COVER
4	1	O-RING
5	4	SCREW
6	1	IMPELLER
7	1	LIP SEAL
8	1	WASHER
9	1	O-RING
10	2	BALL BEARING
11	1	RETAIN. RING SHAFT
12	1	WEAR PLATE
13	1	RETAIN. RING BORE
14	1	LIP SEAL

Spare part kits examples

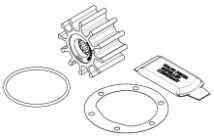


Warning:

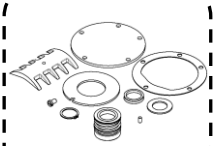
Lip seal assemble:
Ensure lip seal mounted according to picture



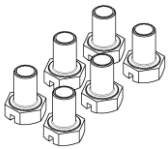
Impeller kit



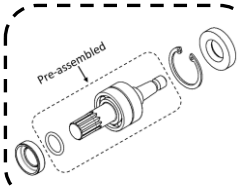
Wear kit

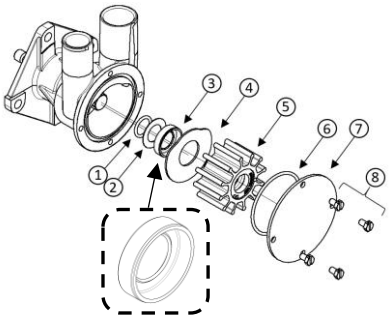


Screw kit

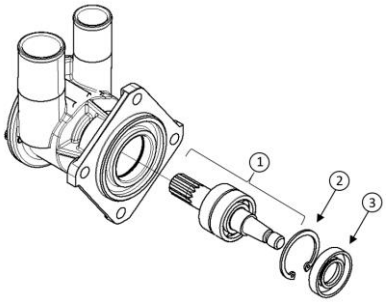


Shaft kit





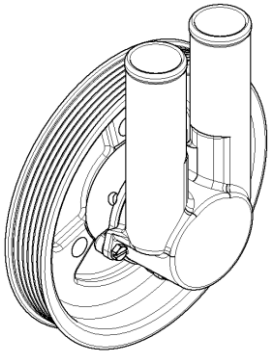
Mounting order 1 - 8



Mounting order 1 - 3

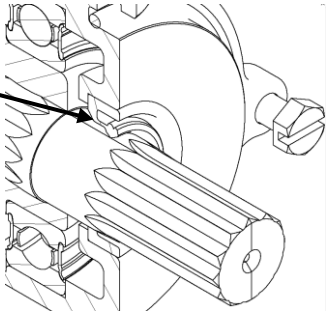
*The kits may contain more components than required for one pump (e.g., Gaskets and O-rings).

Example 2

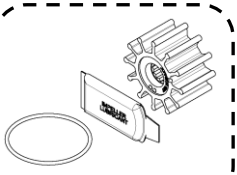


Warning:

Lip seal assemble:
Ensure lip seal mounted according to picture

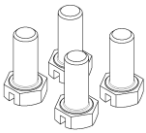


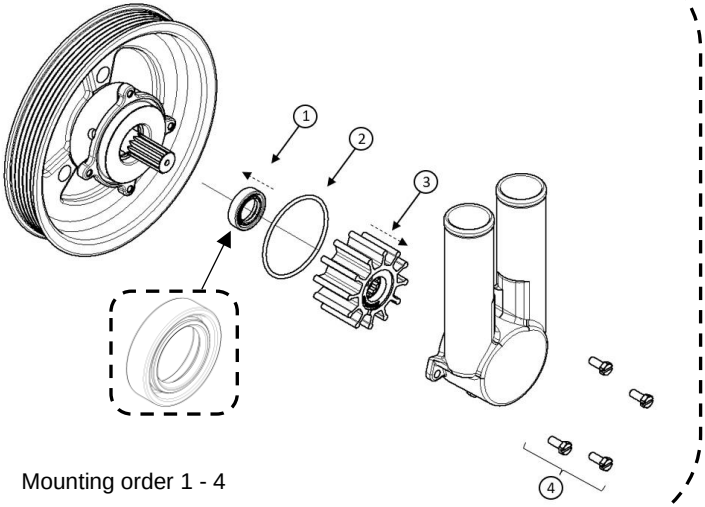
Impeller kit



Wear kit

Screw kit

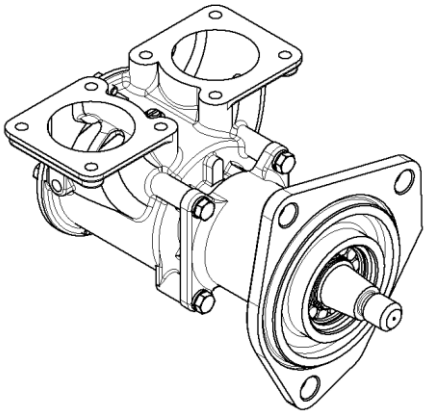




Mounting order 1 - 4

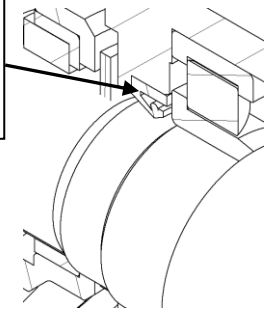
*The kits may contain more components than required for one pump (e.g., Gaskets and O-rings).

Example 3

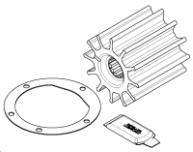


⚠ *Warning:*

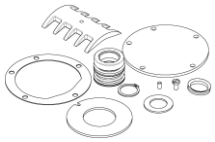
Lip seal assemble:
Ensure spring faced towards impeller



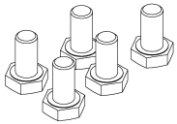
Impeller kit



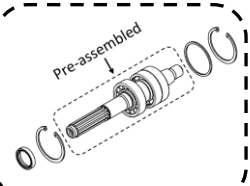
Wear kit

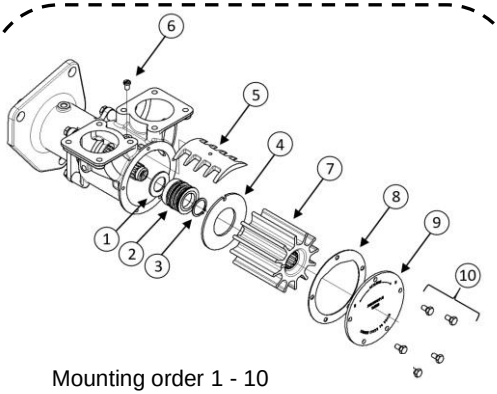


Screw kit

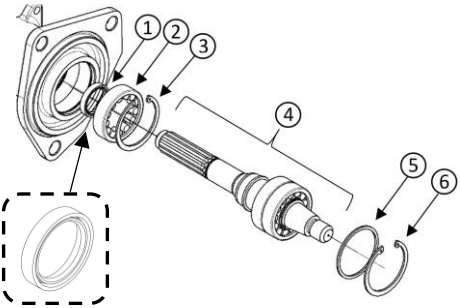


Shaft kit





Mounting order 1 - 10



Mounting order 1 - 6

*The kits may contain more components than required for one pump (e.g., Gaskets and O-rings).

Impeller kit

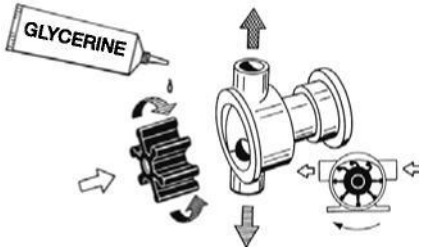
Impeller replacement instruction for impeller pump.

> ⚠ *Warning:*
> *Risk of water entry during impeller replacement.*
> *Check water siphoning into the boat from hoses or the pump before proceeding.*
> *Close sea cocks to stop water intrusion.*

1. Remove screws, end cover and gasket/or O-ring. (for pumps without end cover: Remove screws from pump body, and gasket/or O-ring).
2. Remove impeller using a slip joint pliers or a Johnson Impuller.
3. Remove eventual debris and check for wear. Replace wear-parts if needed. Various repair kits are available.

> ⚠ *Warning:*
> *Use only **JP impeller lubricant (glycerine based)** provided in the kit.*
> *Do **not use any petroleum-based products to lubricate** the pump interior as it may harm the impeller, which could lead to engine damage or fire.*

4. Lubricate inside pump with impeller lubricant provided in the kit.
5. Change the impeller shaft seal if one is included in the kit.
6. Lubricate the lip seal with glycerin (do not lubricate mechanical seal).
7. Mount new impeller into pump with a twisting movement in direction of rotation, please see illustration below.



8. Lubricate front end of impeller with impeller lubricant provided in the kit.
9. Mount new gasket/or O-ring, front cover and tighten screws. (for pumps without end cover: mount new gasket/or O-ring and tighten screws into pump body).

10. Connect a water supply to pump/engine. Open sea cock.

> ⚠ *Warning:*
> *Do not run engine when the impeller is dry.*
> *A water supply must be connected to pump/engine or else impeller will be damaged, which could lead to engine damage or fire.*

11. Start engine and run at 1000rpm for maximum 30 seconds to ensure prime.
12. Ensure pump is priming within 30 seconds or else **stop** engine and check for proper seal of the pump and eventual air-leaks at the intake side of the system. Correct if needed.

NOTE! – for increased suction ability, do not install impellers before long periods of storage.
NOTE! – only use impeller lubricant *(glycerine) to re-lubricate impeller.*
NOTE! – store spare part impeller: dark, cool and non-ventilated.

Wear kit

Wear part replacement.

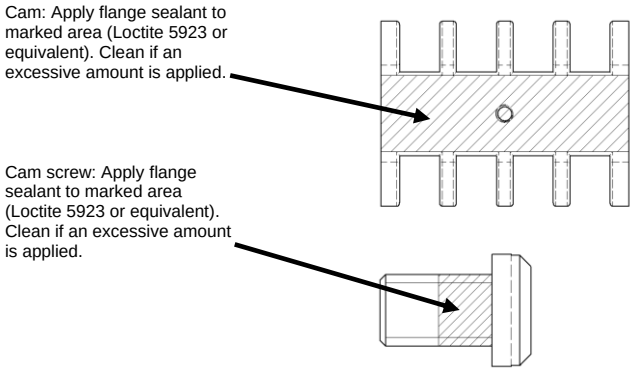
Disassembly

1. Remove end cover and gasket/or O-ring.
   (for pump example no.1: Remove screws on pump body).
2. Pull out the impeller using a Johnson Pump Impuller.
3. Remove the cam and wash away residual traces of sealing compound on the cam and inside the pump body.
   (for pump example no.1: Remove lip seal & wash away residual traces of sealing compound inside the pump body. Remove the wear plate).
4. Remove the retaining ring and washer holding the mechanical seal or remove lip seal and O-ring.
5. Lubricate the shaft in front of the mechanical seal with soapy water (5% soft soap) and press down the seal for easier removal from the shaft.

Assembly

1. Moisten the ceramic ring with soapy water (5% soft soap) and mount it in the pump body. Moisten the rotating ring with soapy water and press it in position on the shaft. Protect the sealing surfaces of the mechanical seal against grease and damages, as it will affect the seal function.
   For lip seal: Mount new O-ring & new lip seal (ensure lip seal is faced correctly).

2. Fit the washer and the retaining ring on the shaft.
3. Mount the wear plate in the pump body.
4. Apply sealing compound to the cam and cam screws. Fasten the cam.



5. Lubricate the impeller with JP Impeller Lubricant and fit it with a rotating movement in the intended direction of rotation.
6. For pump bodies that uses a gasket, moisten the gasket with water before fitting it in its position. For pump bodies that uses an O-ring, fit the O-ring in its position and apply JP Impeller Lubricant on the O-ring.

Shaft kit

Shaft kits comes with pre-mounted bearings.

Disassembly

1. Disassemble the pump from the wet end (see instructions from *wear part replacement*).
2. Remove the support ring. If a lip seal is covering the support ring, remove lip seal first.
3. Tap gently on the end of the shaft (on the impeller side) until the shaft and bearings comes loose.

Assembly

Example no.1

1. Press down the pre-assembled shaft with bearings into the correct position.
2. Lock shaft kit position by fitting the retaining ring.
3. Fit the lip seal.
4. Assemble remaining parts (see instructions from *wear part replacement*).

Example no.3

1. Assemble the lip seal into the bearing house (ensure the lip seal is faced correctly).
2. Remove the outer ring from the bearing (mounted on the pre-assembled shaft kit) and press it into the bearing house.
3. Fit the retaining ring. For pumps with a lubrication nipple make sure to mount the retaining ring faced upwards (otherwise the lubrication nipple will not fit).
4. Apply soapy water (5% soft soap) to the surface on the shaft for the mechanical seal.
5. Press down the pre-assembled shaft in its correct position.
6. Lock shaft kit position by fitting the support ring.
7. Assemble the remaining parts (see instructions from *wear part replacement*).

Pressure and capacity data (OBS! Reduced cam – 30-40% lower capacity. Nitrile impeller – adjust total head ca. 30% down)

F35B			700 rpm			900 rpm			1400 rpm			1750 rpm			2000 rpm			2500 rpm		
Bar	kPa	ft	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM
0.3	30	10.1	0.06	5.2	1.4	0.09	6.8	1.8	0.13	11.2	3.0	0.16	14.0	3.7	0.18	16.0	4.2	0.18	20.5	5.4
0.6	60	20.1	0.09	4.6	1.2	0.09	6.2	1.6	0.13	10.6	2.8	0.16	13.7	3.6	0.18	15.8	4.1	0.18	19.6	5.2
1.0	100	33.5	0.09	4.0	1.1	0.09	5.6	1.5	0.18	9.2	2.4	0.18	11.8	3.1	0.18	13.6	3.6	0.18	17.0	4.5

F4B			700 rpm			900 rpm			1400 rpm			1750 rpm			2000 rpm			2500 rpm		
Bar	kPa	ft	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM
0.3	30	10.1	0.06	12.0	3.2	0.09	15.0	4.0	0.13	23.0	6.0	0.17	27.0	7.1	0.18	30.5	8.1	0.18	34.5	9.1
0.6	60	20.1	0.09	11.0	2.9	0.09	14.0	3.7	0.13	21.0	5.4	0.17	25.0	6.6	0.18	28.0	7.4	0.18	33.0	8.7
1.0	100	33.5	0.09	9.0	2.4	0.09	11.0	2.9	0.18	18.0	4.8	0.18	22.0	5.8	0.18	25.0	6.6	0.18	29.5	7.8
1.5	150	50.3	0.09	4.5	1.2	0.09	7.0	1.8	0.18	13.5	3.6	0.18	17.0	4.5	0.18	20.0	5.3	0.2	25.0	6.6

F5B			700 rpm			900 rpm			1400 rpm			1750 rpm			2000 rpm		
Bar	kPa	ft	kW	l/min	GPM	kW	l/min	GPM	kW	l/min	GPM	kW	l/min	GPM	kW	l/min	GPM
0.3	30	10.1	0.13	16.0	4.2	0.18	21.0	5.5	0.37	33.0	8.7	0.37	41.0	10.8	0.37	46.0	12.2
0.6	60	20.1	0.13	15.0	4.0	0.18	20.0	5.3	0.37	32.0	8.5	0.37	39.5	10.4	0.37	45.0	11.9
1.0	100	33.5	0.13	14.0	3.7	0.18	19.0	5.0	0.37	30.0	7.9	0.37	37.0	9.8	0.37	42.0	11.1
1.5	150	50.3	0.13	13.0	3.4	0.18	17.0	4.5	0.37	27.0	7.1	0.37	33.5	8.9	0.37	38.0	10.0
2.0	200	67.1	-	-	-	-	-	-	0.37	22.0	5.8	0.37	28.5	7.5	0.37	33.0	8.07

F7B			700 rpm			900 rpm			1400 rpm			1750 rpm			2000 rpm		
Bar	kPa	ft	kW	l/min	GPM	kW	l/min	GPM	kW	l/min	GPM	kW	l/min	GPM	kW	l/min	GPM
0.3	30	10.1	0.37	36.0	9.5	0.37	46.0	12.2	0.75	74.0	19.6	0.75	98.0	25.9	0.75	107.0	28.3
0.6	60	20.1	0.37	34.0	9.0	0.37	44.0	11.6	0.75	72.0	19.0	0.75	96.0	25.4	0.75	104.0	27.5
1.0	100	33.5	0.37	29.0	7.7	0.37	40.0	10.6	0.75	67.0	17.7	0.75	87.0	23.0	0.75	98.0	25.9
1.8	180	60.4	0.37	21.0	5.5	0.37	30.0	7.9	0.75	57.0	15.1	0.75	73.0	19.3	0.75	84.0	22.2
2.5	250	83.8	-	-	-	-	-	-	0.75	37.0	9.8	1.1	52.0	13.7	1.1	63.0	16.6

F8B			700 rpm			900 rpm			1400 rpm			1750 rpm			2000 rpm		
Bar	kPa	ft	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM
0.3	30	10.1	0.37	87.0	23.0	0.75	114.0	30.1	1.1	188.0	50.0	1.5	241.0	63.7	1.5	279.0	73.7
0.6	60	20.1	0.37	80.0	21.1	0.75	107.0	28.3	1.1	180.0	47.6	1.5	233.0	61.6	1.5	270.0	71.3
1.0	100	33.5	0.37	73.0	19.3	0.75	101.0	26.7	1.1	177.0	46.8	1.5	228.0	60.2	1.5	264.0	69.7
1.8	180	60.4	-	-	-	1.1	70.0	18.5	1.1	148.0	39.1	2.2	203.0	53.6	2.2	242.0	63.4
2.5	250	83.8	-	-	-	-	-	-	1.1	108.0	28.5	2.2	166.0	43.9	2.2	208.0	55.0

F9B-5000 (08-802B)			700 rpm			900 rpm			1400 rpm			1750 rpm			2000 rpm		
Bar	kPa	ft	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM
0.3	30	10.1	0.75	129.0	34.1	0.75	170.0	44.9	1.5	268.0	70.8	1.5	331.0	87.5	2.2	388.8	102.7
0.6	60	20.1	0.75	124.0	32.8	0.75	161.0	42.5	1.5	260.0	68.9	2.2	323.0	85.3	2.2	383.1	101.2
1.0	100	33.5	0.75	118.8	31.4	1.1	156.0	41.2	1.5	255.6	67.5	2.2	315.2	83.3	3.0	379.2	100.2
1.8	180	60.4	1.1	105.0	27.7	1.1	140.0	37.0	1.5	235.0	62.1	2.2	286.1	75.6	3.0	351.3	92.8
2.5	250	83.8	1.1	83.7	22.1	1.5	102.0	26.9	2.2	208.0	55.2	3.0	266.0	70.3	3.0	304.1	80.3

F9B-5600 (08-814B – high pressure impeller)			700 rpm			900 rpm			1400 rpm			1750 rpm			2000 rpm		
Bar	kPa	ft	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM
0.3	30	10.1	0.75	129.0	34.1	1.1	170.0	44.9	1.5	270.0	71.3	1.5	331.0	87.5	2.2	376.0	99.3
0.6	60	20.1	0.75	126.0	32.8	1.1	165.0	43.6	1.5	266.0	70.3	2.2	323.0	85.3	2.2	368.0	97.2
1.0	100	33.5	0.75	123.0	32.5	1.1	161.1	42.6	2.2	260.0	68.7	2.2	314.0	83.3	3.0	361.0	95.4
1.8	180	60.4	0.75	110.0	29.1	1.5	153.0	40.4	2.2	242.0	63.9	2.2	291.0	76.9	3.0	340.0	89.8
2.5	250	83.8	1.1	90.0	23.8	1.5	130.0	34.3	2.2	218.0	57.6	3.0	269.0	71.1	3.0	312.0	82.4
3.0	300	100.6	1.5	61.0	16.1	2.2	102.0	26.9	3.0	190.0	50.2	3.0	242.0	63.9	3.5	284.0	75.0
3.5	350	117.4	-	-	-	-	-	-	3.0	160.0	42.3	3.5	205.0	54.2	3.5	235.0	62.1

F95B			700 rpm			900 rpm			1400 rpm			1750 rpm			2500 rpm		
Bar	kPa	ft	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM
0.5	50	16.8	0.75	182.6	48.2	1.1	236.5	62.5	1.5	384.2	101.5	2.2	483.6	127.8	4.0	626.7	165.5
1.0	100	33.5	1.1	172.7	45.6	1.1	231.3	61.1	1.5	372.0	98.3	3.0	472.9	124.9	5.5	617.9	163.2
1.5	150	50.3	1.1	160.1	42.3	1.5	214.5	56.7	2.2	350.4	92.6	3.0	444.1	117.3	5.5	583.8	154.2
2.0	200	67.1	1.1	132.3	35.0	1.5	181.0	47.8	3.0	315.4	83.3	3.5	406.2	107.3	5.5	553.1	146.1
2.5	250	83.8	1.5	79.5	21.0	2.2	137.8	36.4	3.0	267.6	70.7	4.0	361.3	95.5	7.5	506.4	133.8

F98B			700 rpm			900 rpm			1400 rpm			1750 rpm			2500 rpm		
Bar*	kPa	ft	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM	kW	L/min	GPM
+0,14/ -0,08	14	4.7	0,79	275	72.6	-	-	-	-	-	-	-	-	-	-	-	-
+0,26/ -0,1	26	8.7	-	-	-	1.12	354	93.5	-	-	-	-	-	-	-	-	-
+0,7/ -0,19	70	23.4	-	-	-	-	-	-	2.36	531	140.1	-	-	-	-	-	-
+1,04/ -0,25	104	34.8	-	-	-	-	-	-	-	-	-	3.65	620	163.8	-	-	-
+1,3/ -0,3	130	43.5	-	-	-	-	-	-	-	-	-	-	-	-	6.25	670	177

*Discharge pressure/Suction pressure

IMPORTANT!

- **Rotation direction**

The rotation of the impeller is determent by the driving source that the pump is connected to.

- **Airtight suction tubes & connections**

Make sure the suction tubes and its connections are airtight to achieve optimum suction for the pump. Max suction heads for an impeller pump is 4 to 5 meters. If the pump stands still for a long time, one should fill the suction tubes with l with Johnson Pump impeller lubricant. When the impeller is wet or oiled with JP impeller lubricant the pump primes without any problems

- **Impeller lubricant**

Warning: Do not use petroleum-based products to oil the impeller or pump it could damage the impeller and cause damage to the pump. Use only Johnson impeller lubricant.

- **Dry running**

Do not run the pump dry for more than 30 seconds. Dry running will damage the impeller and the seals inside the pump. In case of repeated dry running, change the impeller to ensure the function of the pump.

- **Pump liquid**

These pumps are only to be used with fresh & seawater for cooling purposes.

- **Maximum system pressure & operating temp.**

The pressure in the system should not exceed 2.0 to 2.5 bars and the pump temperature is +4 - +55 °C. Intermittent operation of the pump is capable of both higher pressure and temperature, but its life span decreases proportionately.

- **Spare part kits**

Always have a Johnson spare kit at hand (impeller, seals and gaskets) to avoid downtime. Keep rubber parts dark and cool.

- **Drainage & risk of water penetration**

At cold weather, loosen the screws to the end cover for drainage.

Warning: Risk of water penetration during the drainage of the pump. Please check siphoning into the boat from the hose or pump before drainage.

- **Belt tension**

If the pump is assembled with a pulley, ensure that tension of the belt is not overtensioned. The belt should be tightened so that it operates without skidding.

Flexible Impeller Pumps

F35B-9, F4B-9, F5B-9, F6B-9, F7B-9, F8B-9, F9B-9, F95B-9, F98B-9

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