

WARNING

THESE INSTRUCTIONS MUST BE FOLLOWED TO ENSURE SAFE AND PROPER INSTALLATION, OPERATION AND MAINTENANCE OF THE MOTOR. THEY SHOULD BE BROUGHT TO THE ATTENTION OF ALL PERSON WHO INSTALL, OPERATE OR MAINTAIN THIS EQUIPMENT.

FAILURE TO FOLLOW INSTRUCTIONS AND SAFE ELECTRICAL PROCEDURES COULD RESULT IN SERIOUS INJURY OF FATALITY. DISCONNECT ALL POWER BEFORE SERVICING. INSTALL AND GROUND PER LOCAL AND NATIONAL CODES. CONSULT QUALIFIED PERSONNEL WITH QUESTIONS OR IF REPAIRS ARE REQUIRED.

Instruction Bulletin - 25 MPC with Motors Overview:

These instructions pertain to the assembly and installation of a 25 MPC pump. Your 25 MPC pump includes a close-coupled electric motor driver that will hereafter be referred to as the driver.

CAUTION: 25 MPC pump are shipped with running clearance between the impeller and housing. 25 MPC pump impeller clearance can only be established after the pump has been secured to the driver. See Pump Assembly.

Pump Assembly: (pump end suitable for mounting to various drivers).

1. Loosen the drive sleeve clamp.
2. Lightly coat the driver shaft with an anti-seize compound.
3. Slide the pump onto the driver by hand. This should not require extreme force.
4. Install and tighten fasteners (4) into the pump adaptor securing the drive.
5. Tighten the drive sleeve clamp fastener to 20 to 26 foot pounds.
6. To establish impeller running clearance:
Loosen the two opposing nuts that fasten the suction chamber to the pump. Loosen the locknut of

one of the three jackscrews. Back-off the clean-out chamber by rotating the jackscrew clockwise 1/2 turn then retighten the locknut. Repeat this step for the other two jackscrews. Retighten the suction chamber fasteners.

7. Rotate the shaft to ensure that the pump rotates freely before putting the pump into service.

Installation:

Optimum performance can be attained by placing the pump as close to the liquid source as possible. Secure the pump by mounting it to a foundation or base plate. Hose or pipe can be used on the suction and discharge. The suction line must not be reduced in size. In hose is used, reinforced non-collapsible type is recommended. The discharge line must be rated to the maximum pressure developed by the pump.

Avoid kinks in the hose and unnecessary restrictions that may affect pump performance. All pipe connections must be sealed with adequate thread sealant. A small air leak in the suction line will affect priming performance. If a throttling valve is used to adjust the flow rate, it should be mounted to the discharge piping only - never in the suction. A large low restriction de-watering type strainer must be used whenever solids larger than 1.25" spheres are present in the liquid source.

Operation:

Fill the pump with liquid prior to starting through a fitting on the discharge piping. The pump housing should be completely full. If the pump has a discharge valve it must be fully open to expel air during priming at initial start-up. Long horizontal suction lines require extra time to prime, 2 additional minutes for every 10 feet of horizontal run.

Start the pump driver. The pump will prime the suction hose and establish flow in about 5 minutes, more or less, depending upon the lift distance and length of horizontal runs. After prime, the pump will perform to its full flow capability.

After the initial prime, the pump will retain liquid in the housing and may not need to be refilled after shutdown and restart even if the suction pipe has air in it.



Disassembly/Service:

To remove the clean-out chamber for the purpose of removing debris refer to instructions identified with an asterisk *.

Use the exploded parts view with these instructions and note recommended replacement parts for the rebuild process.

- *1. Disconnect power.
- *2. Remove drain plug and drain the pump.
3. Disconnect and remove the pumpak from the driver.
- *4. Remove the clean-out chamber fastening nuts. Use the jackscrews to back off the clean-out until the o-ring is visible, at this point the clean-out chamber should slide out by hand.
- *5. Inspect the wearplate for abrasive wear and replace if necessary using new screws.
6. Remove 4 nuts from the adaptor and disassemble the rotating assembly from the housing.
7. Removing the shaft clamp will allow the impeller/shaft assembly to be removed from the seal housing.
8. Remove the seal components and discard.
9. Inspect the impeller and sleeve for wear. If the edges of the impeller machined surfaces are not well defined replace the impeller.

Reassembly:

1. Replace o-ring on suction clean-out chamber.
2. Light coat the outside of the chamber and o-ring with a water-soluble lubricate.
3. Slide the clean-out into the pump housing. Tighten two fasteners.
4. Tighten clean-out jackscrews until they bottom out, then tighten the locknuts.
5. Install new seal seat into the adaptor with the pol-

ished side of the seat facing up by lubricating the adaptor and seat o-ring with a water-soluble lubricant. Install by hand using your thumbs to squarely locate the seats against the shoulder of the adaptors. Wipe the seal faces dry with a rag.

6. Lubricate the impeller sleeve and the seal rotary bellows inner diameters with a water-soluble lubricant.
7. Install the seal rotary onto the sleeve with spring toward the impeller.
8. Lay the pump housing down on a bench.
9. Place the impeller inside the pump housing.
10. Install the housing gasket over the housing studs and position it on the housing gasket face.
11. Slide the seal adaptor over the impeller and studs.
12. Tighten 4 nuts with lockwashers to 28 ft-lbs. with a crosswise pattern.
13. Slide the drive sleeve clamp assembly on the sleeve.

The pump can now be installed to the driver as a pumpak.

Caution: Impeller running clearance must be set. Refer to section titled Pump Assembly.

Set Running Clearance For Model 25 MPC

These instructions explain how to set the running clearance for the Metropolitan Pump Model 25 MPC. The running clearance is an important setting for proper pump operation.

The running clearance is the space between the impeller and the back of the clean-out. Note that the back of the clean-out serves as the wear plate.

When the instructions below are followed clearance should be .025".

When To Set The Clearance

The clearance must be set when first bolting the motor to the pump. The clearance must be reset (1) after any of the rotating elements of the pump (impeller, drive sleeve, seal, motor) are replaced, or (2) if the jacking screws are used to remove the clean-out.

To Re-Set Running Clearance

Instructions are provided below in summary and in detail

1. LOOSEN DRIVE SLEEVE CLAMP
2. BACK OUT ALL JACKING SCREWS
3. TIGHTEN DOWN CLEAN-OUT
4. TIGHTEN JACKING SLEEVE CLAMP
5. TIGHTEN JACKING SCREWS
6. LOOSEN CLEAN-OUT SCREWS
7. TURN JACKING SCREWS 1/2 TURN
8. TIGHTEN CLEAN-OUT NUTS
9. TIGHTEN JACK SCREW LOCKING NUTS

Clearance Instructions In Detail

1. Loosen Drive Sleeve Clamp
The clamp secures the motor shaft in the drive sleeve of the Pump. The sleeve and impeller should move freely if the impeller is not clogged. If the pump is clogged, pull out clean-out and remove any debris before proceeding.
2. Back Out All Jacking Screws
All three (3) Jacking Screws must be backed out of the clean-out so that they do not touch the pump housing when the clean-out is used all the way into the pump housing. The locking nut on each jacking screw should also be backed off so it can be freely tightened later.
3. Tighten Down Clean-Out
Within reasonable force, tighten down the two (2) nuts that hold the clean-out in place
4. Tighten Down Sleeve Clamp
Ensure that the key is seated in the motor shaft keyway. With reasonable force, tighten the two (2) bolts of the clamp around the shaft sleeve. Tighten the two (2) bolts evenly so that the distance between the two (2) halves of the clamp are approximately the same.
5. Tighten Jacking Screws
By hand, tighten the Jacking Screws up to the pump housing. Note that the locking nuts should be backed off so that screws are allowed to meet the housing.
6. Loosen Clean-Out Nuts
Loosen and back off at least 1/4" the two (2) holding the clean-out in the pump housing.

7. Turn Jacking Screws 1/2 Turn
Turn each Jacking Screw 1/2 turn clockwise. This may be accomplished by noting the position of the wrench and turning it clockwise 180 degrees.
8. Tighten Clean-Out Nuts
With reasonable force, tighten the two (2) nuts securing the clean-out.
9. Tighten Jack Screw Locking Nuts
With reasonable force, tighten the locking nuts on all.

Suction Line Check Valve

A suction line check valve is provided on the suction side. This valve comes into operation to prevent the loss of liquid in the volute during idle pump periods. A foot valve on the end of the suction pipe is not a necessity but can be used to advantage in some installations. In such cases one size larger than the suction hose is suggested.

The suction check valve is made up of weights mounted on a composition fabric flap, which acts as the hinge and seating surface. The valve hangs at nearly vertical angle, which prevents dirt from lodging on the seat.

To test the valve, stop the pump remove the suction line and fill the priming chamber with water. If the check valve is not seating properly water will run out of the pump inlet opening.

In the event that water is found to be coming from the check valve, take off the four bolts holding the body to the volute. Remove the check valve and inspect the flap fabric. If this is found to be damaged wither around the seat or at the hinge it should be replaced. Be sure seating face of body is clean and smooth to give a good seat for valve.

Priming

Fast priming is accomplished by violent recirculation of liquid in the volute through the priming passage to the impeller chamber. This action quickly removes the air in the suction line to prime the pump.

If this passage is plugged priming will be affected and the pump will take exceptionally long to prime.

To inspect and clean priming passage the volute must be removed. To do this remove the bolts that hold the volute to the support head. Remove the two bolts that secure the volute to the base. If the volute tends to stick to the support head, do not strike with a heavy blow from a hammer, instead screw a short 2 ft. length of pipe into the suction opening. Strike the pipe with a sharp blow downward. The priming passage can then be cleaned by back flushing through the opening in the impeller chamber.

On trash type pumps, to inspect and clean priming passage the suction end plate must be removed. To do this, remove the retainer bar and use it as a pry to remove suction end plate. The priming passage and impeller face will be exposed and can easily be cleaned of any debris.

Impeller

The impeller is screwed directly on to the projecting end of the engine crankshaft. The thread is right hand. To remove, the impeller must be turned counter clockwise.

To remove the impeller, first remove volute as outlined in priming port section. With the volute removed the impeller is exposed. Hold the crankshaft so it cannot turn by using a wedge between the flywheel and engine block. Place a piece of wood against the tip of the impeller and strike a sharp blow. This should loosen the impeller so it can be unscrewed. When replacing impeller always use a lubricant, white lead or commercial never seize, on impeller threads.

Seal Lubricant

Shaft Seal-The pump must be protected from water leaking out and air leaking in where the shaft enters the pump housing. The seal basically has two rings, one is sealed to the shaft, which rotates, and the other sealed to the pump housing which is stationary, these rings press against each other and this close running contact acts to seal the pump. There must be water to prevent destruction from friction and heat.

Priming The Pump

Remove the priming plug and fill the volute with water and replace the plug. This is a self-priming pump, however, at initial start the volute must be full. With the engine running the pump will reprime automatically as

required if operating conditions are correct and there is water in the volute.

NEVER OPERATE THE PUMP WITHOUT WATER IN THE VOLUTE AS THIS CAN CAUSE SEAL DAMAGE.

Support Head

To remove the support head, first take off the volute and the impeller as previously described, then remove the four cap screws, which hold the support head to the MTR.

Wearing Plate (clean out)

In the volute, there is a wearing that is held in place by two flat head stainless steel screws. To replace this wearing plate, remove the volute as outlined above and then remove the two flat head screws. Adjust clearance between impeller and wear plate by use of necessary gaskets, between volute and support head when reassembling pump.

The wearing plate on trash type pumps is on the suction end plate and is held in place by flat head stainless screws. To replace this wearing plate, remove the suction end plate as outlined above and then remove the flat head screws that secure the wear plate.

Trouble Shooting

If the pump fails to prime-check the following:

1. Pump casing or volute is not filled with water.
2. Leak in suction line or connections.
3. Pump seal worn or leaks air.
4. Pump is clogged.
5. Clearance between impeller and pump body too great.
6. Jet port clogged.
7. Check valve not seating and allowing water to leak from volute or casing.
8. Pump set too high above water.
9. Suction line clogged.
10. Pump running to slow.
11. Suction not completely under water.

To test the priming action, remove suction hose or pipe. Fill the volute with water, leave discharge open and start MTR. Cover or plug the suction inlet. If suction is working properly a strong suction will be noted within 30 to 45 seconds.

For accurate checking use a plug with a taped hole for a vacuum gauge. Install this in the suction inlet.

If no suction is noted, check gaskets at intake flange and seal on impeller shaft. If there is strong suction at the intake, the problem would be located in the suction hose fittings or the strainer is clogged or the pump is set too high above the water.

Seal Installation

To install the seal, remove impeller counter clockwise. Remove support head, clean shaft and seal chamber in support head. Install water slinger on shaft. Replace support head, insert seal in support chamber. Over shaft, use light lubricant. Reinstall impeller. Install gaskets and impeller shims as required to obtain approximately .015 clearance between impeller and support head and impeller and wear plate.

Motor Lubrication

Note: If lubrication instructions are shown on motor, they will supersede this general instruction. Motors are properly lubricated at the time of manufacture. It is not necessary to lubricate at time of installation unless the motor has been in storage for a period of 12 months or longer.

Recommended Relubrication Period

SPEED (RPM)	FRAME SIZE	STANDARD CONDITIONS	SEVERE CONDITIONS	EXTREME CONDITIONS
1200 RPM OR LESS	140-180	4.5 YEARS	18 MONTHS	9 MONTHS
	210-280	4.0 YEARS	16 MONTHS	8 MONTHS
	320-400	3.5 YEARS	14 MONTHS	7 MONTHS
	440-508	3.0 YEARS	12 MONTHS	6 MONTHS
	510	2.5 YEARS	12 MONTHS	6 MONTHS
1201 TO 1800 RPM	140-180	3.0 YEARS	12 MONTHS	6 MONTHS
	210-280	2.5 YEARS	10 MONTHS	5 MONTHS
	320-400	2.0 YEARS	9 MONTHS	4 MONTHS
	440-508	1.5 YEARS	8 MONTHS	4 MONTHS
	510	1.0 YEARS	6 MONTHS	3 MONTHS
OVER 1800 RPM	ALL	6 MONTHS	3 MONTHS	3 MONTHS

NOTE: FOR ROLLER BEARINGS: DIVIDE ABOVE TIMES BY 3.

Standard Conditions: Eight hours per day, normal or light loading, clean 100 degrees F maximum ambient.

Severe Conditions: Twenty-four hours per day operation, or shock loadings, vibration, or in dirt or dust, or at 100 to 150 degrees F ambient.

Extreme Conditions: Heavy shock or vibration, dirt or dust at 100 to 150 degrees F ambient.

To lubricate:

1. Stop motor. Disconnect power and lock out a service.
2. Wipe clean all grease fittings. (Fill and drain.)
3. Remove fills and drain plugs from the bearing hub.
4. Free drain hole of any hard grease (use a piece of wire if necessary.)
5. Add grease using a low-pressure grease gun. The amount and type of grease added is very important. The manufacturer's standard grease is Chevron SRI 2 or equivalent. Only enough grease should be added to replace the grease used by the bearing. Too much grease can be as harmful as insufficient grease. The grease cavity should be filled 1/3 to 1/2 full.
6. Start motor and let run for approximately 30 minutes.
7. Stop motor, wipe off any drained grease, replace filler and drain plugs.
8. Motor is ready for operation.

25 MPC Pumps Service Parts List 2"x2" and 3"x3"



PART NO.	ITEM NO.	DESCRIPTION	QTY.	PART NO.	ITEM NO.	DESCRIPTION	QTY.
41553	1	HEXNUT - 1/2-13	2	* 40815	16	GASKET - 145TC	1
41449	2	STUD - 1/2-13 X 2.25"	2	* 44175	16	GASKET - 184 / 215TC	1
43926	3	SET SCREW - 3/8 -16 X 1.5"	3	* 22417	17	HEX JAMNUT S.S. - 145TC	1
21268	4	HEXNUT S.S. - 3/8-16	7	* 29194	17	HEX JAMNUT S.S. - 184 / 215TC	1
21251	5	CAP SCREW S.S. - 3/8-16 X .875"	8	40015	18	IMPELLER - 5.82" for 145TC	1
21291	5	CAP SCREW S.S. - 3/8-16 X 1.13"	8	44172	18	IMPELLER - 5.88" for 184 / 215TC	1
21266	6	LOCKWASHER S.S. - 3/8	12	21260	19	STUD S.S. - 3/8-16 X 1.44"	4
43921	7	FLANGE - SUCTION 2"	1	* 43906	20	MECH. SEAL - 1.25" for 145TC	1
43934	7	FLANGE - SUCTION 3"	1	* 31374	20	MECH. SEAL - 1.5" for 184/215TC	1
* 23040	8	FLAPPER ASSEMBLY	1	43910	21	ADAPTOR 145TC	1
41484	9	PIPE PLUG - 1.5" NPT	1	44174	21	ADAPTOR 184 - 215TC	1
22372	10	FLANGE - DISCHARGE 2"	1	31235	22	CAP SCREW S.S. - 1/2-13 X 3/4"	4
22471	10	FLANGE - DISCHARGE 3"	1	* 43907	23	DRIVE SLEEVE S.S. 145TC	1
* 22358	11	GASKET - DISCHARGE	1	* 31094	23	DRIVE SLEEVE S.S. 184TC	1
43903	12	VOLUTE	1	* 31311	23	DRIVE SLEEVE S.S. 215TC	1
43905	13	CLEANOUT	1	43908	24	CLAMP .875" I.D.	1
* 41187	14	O-RING	1	31099	24	CLAMP 1.375" I.D.	1
41479	15	PIPE PLUG - 1/2" NPT	1	31312	24	CLAMP 1.5" I.D.	1
				21937	N/S	SQUARE KEY 145TC ONLY	1

*. RECOMMENDED REPLACEMENT PARTS