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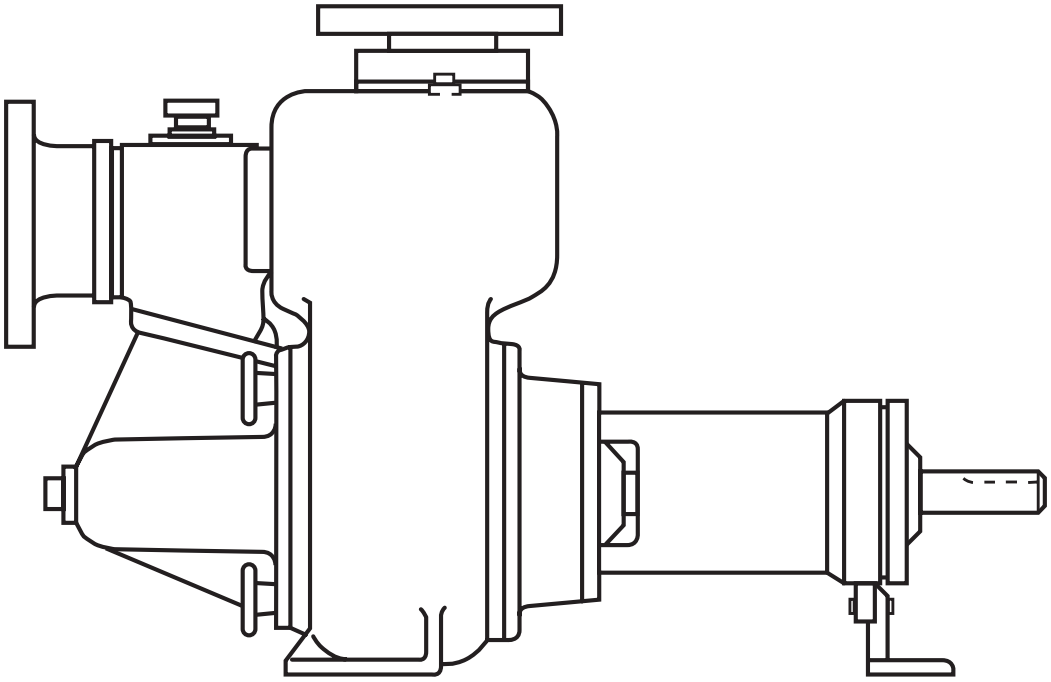

MODELS MMP/MMPH/MP/MPH
SELF-PRIMING SEWAGE AND TRASH PUMPS

INSTALLATION AND SERVICE MANUAL

NOTE! To the installer: Please make sure you provide this manual to the owner of the equipment or to the responsible party who maintains the system.

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General Information

The MMP/MMPH/MP/MPH self-priming centrifugal pump has a semi-open impeller and suction flap valve. Pump is designed to handle raw unscreened sewage, mild industrial waste and slurries containing entrained solids. The material of construction is a cast iron volute case and bearing frame, ductile iron impeller and wear plate.

General Information:

This manual contains important information for the safe use of this product. Read this manual completely before using this product and refer to it often for continued safe product use.

Unpacking Pump:

Remove pump from pallet. When unpacking unit, check for concealed damage. Claims for damage must be made at the receiving end through the delivery carrier. Damage claims cannot be processed from the factory. Check for and tighten all loose attaching hardware. Check oil levels and lubricate as necessary.

WARNING: Before handling these pumps and controls, always disconnect the power first. Do not smoke or use sparkable electrical devices or flames in a septic (gaseous) or possible septic area.

CALIFORNIA PROPOSITION 65 WARNING:

⚠WARNING This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Pump Not Operating or in Storage:

If pump is not put into service immediately, it must be properly stored to prevent damage. Store unit in a dry warm location. Never store unit in the open even if it is protected with plastic or other covering. The bearing housing and motor will draw moisture, which may result in pump failure after being put in operation.

While in storage pumps with carbon ceramic seals must have impellers manually rotated (6 to 12 revolutions) after setting non-operational for 3 months or longer and prior to electrical start-up.

Pumps with tungsten carbide seals must have impellers manually rotated (6 to 12 revolutions) after setting non-operational for 3 weeks or longer and prior to electrical start-up.

Motors:

Pump unit may be shipped less the motor for customer to supply and mount.

Motor Types:

Pumps can be driven by standard drip-proof, totally enclosed fan-cooled, totally enclosed hazardous location or drip-proof motor with encapsulated windings for moisture protection. If motor is to operate in the open or in a dusty location, a totally enclosed fan-cooled motor must be used. If pump is to operate in a damp location, a motor with encapsulated winding should be used. Motors are to be sized so that no overload will exist in the operating range of the pump.

Note: When pump units are mounted at the factory, the driver and pump are aligned before shipment. During transit and handling of pump and components, misalignment may occur. Before operation the drive alignment should be checked.

Shaft Couplings:

We recommend using Wood's flexible coupling to prevent misalignment and noise that can be caused by other couplings. The extra cost of the coupling is easily saved in installation and field service that can result from coupling problems.

V-belt Drive:

Where V-belts are used, keep belts tight by adjusting motor base screws. Belts should run cool. If belts heat up, it indicates slipping. The V-belts should be fiddle-string tight.

CAUTION: Belt guards and coupling guards must be properly installed before operating pump unit.

Electrical Starting Equipment:

If electrical starting equipment is not furnished with pump, certain precautions must be observed in selecting motor starter.

Type of Starter:

For three phase power a magnetic starter with 3-leg overload protection is recommended to prevent motor burnout that can occur from single phasing or transformer faults on three phase systems. For single-phase motors a standard starter with 2-leg overload protection is recommended.

Electrical:

1. For motor overload protection the magnetic starter trip amp rating should not be more than 1.25 times the full load amps of the motor. Hydromatic® recommends a rating of 1.15 times the full load amps of the motor.

2. Always use fused disconnect switch or circuit breaker ahead of magnetic starter for short circuit protection. When duplex pumps are used and are operated from single disconnect switch, be sure disconnect switch is large enough to withstand the starting current of both pumps coming on at once. This can occur after a power failure. This is important as a blown fuse or tripped circuit breaker can make both pumps and an alarm system inoperative, resulting in flooding or other damage.

Ground:

Connect a ground wire to motors, control box and other related controls. Ground wire is to be sized to the National Electric Code article 250-95. Ground wire must be connected to a driven ground stake or to a ground wire from the supply service. If a ground stake is used, it must be driven at least 8 feet into the ground.

Codes:

All local wiring codes must be observed, and any exceptions to data given must be followed in accordance with the local code. Consult the local inspector before installation to avoid costly delays.

Pump Installation

Pump Installation Foundation:

Pump frame or base should be installed on a concrete floor with proper shims and grout. Use hardwood tapered shims to drive under base to level. Base should be about 1 to 1 1/2" off the floor. Build form around the base and fill base inside cavity with grout. Foundation bolts can be set in the grout or set in the concrete floor with expansion bolts.

Grout should be made with 1 part cement and 2 parts sand. Mixture should be fluid enough to run under base. Wood shim blocks can be removed after grout has set and holes filled with quick set cement.

Piping:

All piping to suction and discharge openings of pump must be supported to remove stress from the pump case and bearing frame.

Suction Pipe:

1. Suction pipe should be the same size as pump opening. Do not use larger suction pipe as priming time will be increased and velocity may not be high enough to properly carry solids.

2. Pump should be installed as close to the liquid being pumped as possible with a minimum of elbows or fittings.

3. To avoid air pockets, suction pipe must be as short and direct as possible. Suction pipe must always slope upward to the pump from the source of the liquid being pumped.

4. The suction pipe should be installed at a distance equal to 1 1/2 times the diameter of the suction pipe from the wall of the wet well, minimum.

5. The suction pipe should be installed at a distance equal to one half the diameter of the suction pipe or 3" from the floor of the wet well, minimum.

6. If more than one suction pipe is to be installed in the same wet well, a distance equal to at least 3 times the diameter of the suction pipe should separate them, minimum.

7. Submergence of the suction pipe is critical to efficient pump operations. Submergence may be reduced by installing a standard pipe increaser fitting at the end of the suction pipe. The larger opening size will reduce the inlet velocity and required submergence.

Vertical Suction Lift:

Vertical lift should not be more than 25 feet for MMP/MMPH models and not more than 15 feet for MP/MPH models. This is for starting level only. After pump primes, level can be pumped down to 26 to 27 feet for MMP/MMPH models or 18 to 20 feet for MP/MPH models, if desired. But sump level must rise up to the original level for restart. All suction line joints must be airtight as a leak in the suction pipe can cause the pump to lose prime or not prime at all. Always check NPSH calculations for available atmosphere pressure before applying pump.

Discharge Lines:

If the discharge line ends at level lower than the liquid being pumped, a siphon breaker must be installed in the discharge line. Otherwise, siphoning action may cause damage to the pump.

The discharge line should include a system check valve, with outside weight or spring, to protect the pump from excessive shock pressure and reverse rotation when pump is stopped. Do not depend on the check valve at pump suction to hold discharge pressure. The discharge line should include an isolation valve, plug valve or gate valve, to isolate the pump from the discharge line. This will allow maintenance to be performed on the pump or check valve without draining the discharge line.

Air Bleed Pipe:

A 3/4" or 1" bleed line with ball valve or gate valve must be installed between the pump discharge flange and discharge check valve. The bleed line should be installed as close to the discharge check valve as possible, the end extending a minimum of 6" below low water offset point in the wet well. The valve in the bleed line is to be fully open at initial start-up of pump. After initial start-up the valve is to be left partially open at all times. This will allow any trapped air or gas to be vented back to the wet well. Be sure vent line is under water at all times. This is important. Self-priming pumps will not compress air to any extent. Pump may not prime if the bleed line is not used or closed and may not reprime if pump loses prime after discharge line is full of water and a discharge check valve is used.

Drain Line from Pump Case:

A pipe should be installed in the lower drain tapping of volute case and be piped back to the wet well. Install a shut-off valve, ball valve or gate valve in this line. This will permit draining of pump case if necessary to remove suction elbow/plate to clean impeller or perform maintenance on the pump.

Electrical Connections:

Connect power lines to motor from magnetic starter. Turn pump shaft by hand to be sure it is free before attempting to start motor. Turn power on and off quickly to check rotation. If motor is three phase, interchanging any two lines to motor can reverse rotation. If motor is single-phase, consult literature supplied with the motor for specific instructions. Correct pump rotation is clockwise when looking at pulley or coupling end (power end) of pump. Direction arrow is cast on bearing housing.

Priming:

For initial prime, remove priming cap from suction inlet casting and fill pump housing with water. Fully open the air bleed valve in the bleed line. Replace cap, being sure gasket is in place and that seat is clean. Start motor and allow sufficient timing for priming. Priming time is dependent on pump speed, impeller diameter and vertical suction lift.

Cleaning Impeller:

If impeller gets clogged at any time, suction elbow/plate can be removed by unscrewing 4 hand knobs or nuts. Drain pump case before removing suction elbow/plate. Tap on knobs with hammer to loosen. Be sure O-ring gaskets are in place before replacing suction elbow/plate. Use grease on machined faces to make removal easier at a later date. Tap on hand knobs with hammer to retighten.

Adjusting Impeller Clearance:

Impeller face vanes must be within .015" of suction wear plate for most efficient operation.

When wear plate or impeller wears, it can be readjusted to proper clearance from the outboard bearing end without the use of shims or disturbing the pump case or piping. Loosen the three screws with the jam nuts. Tighten the other three screws evenly until the impeller just drags on the suction wear plate when the shaft is turned by hand. Back off the three screws and place a .015" shim under the head of the screw. Turn screw up against the shim, then remove shim. Repeat this operation on each of the three pushing screws. Now retighten the three screws with jam nuts, pushing the housing up against the three adjusting screws. Retighten the jam nuts and pump is ready to operate with the impeller face .015" from suction wear plate.

This clearance should be checked at least once a year and more often if water containing abrasives is being pumped. When impeller face wear exceeds 1/8", impeller, wear plate and volute lip plate should be replaced.

Flapper Valve, Suction Inlet, Priming Port Housing:

When the pump is empty, the flapper valve rests loosely against the inlet flange of the suction inlet. Before the initial start, the priming port/cap is opened and the pump filled with water. The discharge should be vented and water should fill both suction and discharge chambers. When completely full, the suction flap valve will press against the suction inlet flange and no water should leak down into the sump.

Just before the pump is engaged and turned for the first time:

1. Both suction and discharge chambers are filled with clean fresh water.
2. The suction flap valve is pressed tightly against the inlet flange with the water that now fills the priming port housing.
3. The vacuum gauge registers zero.
4. The suction pipe into the wet well is empty.

Just after the pump turns on and the impeller has revolved 8–15 times, some of the water in the pump has been:

1. Pumped into the discharge pipe and possibly through the discharge check valve.
2. Vented through a ¾ inch discharge vent, back into the sump.
3. Internally recirculated back to suction.

As the pump continues to run, air is vented and water recirculated, and a partial vacuum is generated.

The function of the flapper valve, therefore, is to vent the partial vacuum created in the suction volute to the suction line. This allows atmospheric air pressure to push sump water up through the suction line into the pump.

Pump Lubricating

Shaft Seals:

All Hydromatic self-priming sewage pumps use two shaft seals with an oil chamber between the seals. The oil in the seal chamber should be checked every six months or every three months if water containing abrasives is being pumped. Remove hex head plug from top of seal chamber and loosen hex plug at bottom of seal chamber. Place a container under the lower plug, then remove lower plug and allow oil to drain into container. After all oil is removed, pour used oil into a glass container so that it can be observed. If the oil is clean it will indicate seals are in good condition. If a small amount of water shows in the oil, this will also indicate satisfactory seal operation. If considerable water and some dirt show in the oil, it will indicate the inboard seal is worn and should be replaced before outboard seal is damaged. If seals are in good order, refill the seal chamber with #30 non-detergent automotive oil. About 2 1/2 quarts are required for MMP/MMPH models and about 1 quart for MP/MPH models. Fill with funnel or tube so that the air can escape. Oil chamber must have a 1" air gap; do not overfill oil chamber.

Pump Bearings Grease Lubricated:

Bearings should be lubricated every six months or more often if pump is operated 24 hours a day. Do not overgrease bearings as heat will build up that can damage the bearings. Bearing housing is fitted with grease gun pressure fittings at both bearing locations and grease relief fittings. Add grease until a small amount comes from relief fitting. The same basic instructions apply to lubricating motor bearings, but consult motor manufacturer's data on lubricating bearings. Use high quality ball bearing grease or high temperature grease. Bearings can run quite hot to the hand without damage to the bearing. Outside temperature of the housing should not exceed 130° F for long bearing life.

Pump Maintenance

Replacing Impeller and Volute Lip Plate:

Disconnect power from the motor before attempting to work on pump. Drain pump volute case and oil from seal chamber. Remove suction elbow/plate with wear plate attached. Clean any trash out of pump volute, clean all machined surfaces and wipe all ports clean.

The following pertains to the 3" and 4" pumps. Remove stainless steel socket head impeller screw that locks impeller to the shaft. This screw has a right-hand thread. Remove impeller lock washer with pin. Block impeller vane with a piece of hardwood and unscrew impeller by turning pump shaft counterclockwise. Impeller shaft has a right-hand thread. Use large crescent wrench or strap wrench on shaft, pulling against the key. A pipe wrench can be used if care is used not to damage shaft. It may be necessary to tap on impeller vanes with hammer to break impeller loose, especially if pump has been in service for a long period of time.

If impeller is held to the shaft with a taper fit, remove the stainless steel nut on the end of shaft, then remove washer. A taper fit shaft can be identified by the key that drives the impeller. To remove impeller, loosen 3 holding screws at outboard bearing cap and tighten up on back-off screws. This will pull the impeller loose from the shaft. After impeller is removed, retighten screws to bring bearing cap back to original position. It will be necessary to readjust the impeller clearance after impeller is reinstalled.

After impeller is removed, unscrew 3 or 4 stainless steel socket head screws that hold volute lip plate in place. Tap on plate to loosen and remove through volute case inlet opening. The inboard seal now can be removed for inspection by sliding sleeve from pump shaft. If faces are worn, the seal should be replaced.

Clean pump casing thoroughly, removing any rust or dirt from all machined surfaces.

Install lip plate with lip in the one o'clock position. Use a pipe compound on all machined faces.

The following pertains to the 3" and 4" pumps. Use Permatex®* on the three stainless steel screws that hold volute lip plate in place. Reinstall the lip plate and tighten the screws. Install seal on shaft and place seal spring in place. Block impeller vane with a piece of hardwood and screw impeller on by turning pump shaft clockwise. Use large crescent wrench or strap wrench on shaft, pulling against key to retighten. A pipe wrench can be used if care is used not to damage shaft. Replace impeller lock washer with pin and stainless lock screw.

All 6", 8" and 10" pumps, use a taper fit impeller shaft. Use Permatex® on the four stainless steel screws that hold volute lip plate in place. Reinstall the lip plate and tighten the screws. Install seal on shaft and place seal spring in place, then install key and impeller. Caution must be taken to be sure impeller is seated on the shaft and not on the key. Replace impeller lock washer and stainless lock bolt.

Replace suction elbow/plate with wear plate attached. Check impeller clearance and adjust if necessary as described under Adjusting Impeller Clearance. Refill seal chamber as described under lubricating instructions.

Replacing Inboard Seal:

Use all steps outlined under impeller removal. Slide seal and shaft sleeve from shaft. It may be necessary to tap on sleeve with plastic hammer to loosen. After rotating part of seal is removed, use wire hook and pull stationary seal seat from casting. Wipe seal pocket clean, then install new stationary seat. Use grease on rubber cap and push in place with fingers, then wipe the seal face clean. Place new rotating seal part on sleeve and to push sleeve onto shaft. Be sure O-ring gasket is in place at end of stainless steel shaft sleeve.

Reinstall volute lip plate, put seal spring in place and install impeller. Install impeller washer, impeller lock screw or nut, and suction elbow/plate. Check impeller clearance, and adjust if necessary as described under adjusting instructions. Refill seal chamber with #30 nondetergent automotive oil.

Replacing Both Inboard and Outboard Seals:

When it is necessary to replace both seals, which will be indicated by water leaking from the seal chamber, it is recommended that the complete rotating assembly be removed so that it can be worked on more easily.

Drain pump and seal chamber as described above. Then loosen or remove the pump coupling or remove V-belt components, if belt driven. Remove motor bolts and move motor to one side. Remove bolts in bearing bracket support foot and remove six nuts from studs in seal housing. Tap on housing with hammer to loosen, then pull complete assembly from case. Remove impeller and lip plate; see Replacing Impeller and Lip Plate. Remove inboard seal by sliding sleeve from shaft. Use two screws in tapped holes of seal plate and pry out plate with pinch bar under heads of pull bolts. Remove snap ring from shaft and pull outboard rotating assembly from shaft. Use wire hooks to pull ceramic stationary seal seat from housing. It may be necessary to break the ceramic seal ring. Ceramic ring can be easily broken by tapping with screwdriver. Ring is broken only if worn and needs to be replaced.

Wipe housing clean and replace ceramic stationary ring. Use grease on rubber cap to push into housing. Push in stationary seal seat with fingers only, then wipe the seal face clean. Push new rotating seal part onto shaft. Replace seal spring and holding washer, then install snap ring.

Replace seal plate. Be sure O-ring is in place and that flat rubber gasket is in place on backside of seal plate. Use grease on O-ring and push plate into position in seal housing.

Replace the three socket head stainless steel screws. Use Permatex on bolt threads. Replace new inboard stationary seal face. Now replace rotating seal part mounted on shaft sleeve. Replace volute lip plate with the three or four socket head stainless screws. Use Permatex on screw threads. Install seal spring and then screw impeller onto shaft. Lock impeller on with washer and stainless steel socket head screw. If shaft has a taper fit, be sure key is in place and in notch of shaft sleeve. Unit is now ready to reinstall in casing. Use a pipe compound on machine faces and be sure case O-ring is in place on flange. Replace nuts and bearing bracket support foot. Reset motor and connect coupling or reinstall belts if unit is belt driven. Refill seal chamber with #30 nondetergent automotive grade oil. Replace top fill plugs.

Replacing Shaft Bearings:

Both inboard and outboard shaft bearings are single row type and are the same size for any given pump. Grease lubricated bearings are single shield.

To replace bearings, remove the impeller, seal plate and seals as described previously. Remove holding screws from outboard bearing cap and pull shaft and bearing assembly from housing. It may be necessary to tap on end of shaft with plastic or rubber hammer to loosen shaft bearings from housing. After shaft is removed take snap ring off end bearing cap and push shaft and bearing from housing.

Use arbor press to press bearings from shaft. Always support or press on inner face of bearing. Never press on outer face as this can damage the bearing. Be sure housing and all parts are thoroughly cleaned before installing new bearings. Use care in pushing shaft through lip seals that seal shaft in bearing housing and bearing cap. Clean all old grease from housing and cap and pack bearing level full with grease before reinstalling. Do not add any extra grease to housing after assembly, as this grease pack is sufficient for at least 6 months usage. After shaft is reassembled, install seals and impeller and adjust clearance of impellers as described previously.

Pump Troubleshooting

WARNING: If pump has overheated, allow pump to cool before servicing. Do not remove plates, cover, gauges or fittings from an overheated pump. Liquid inside the pump case can reach the boiling point, and vapor pressure within the pump case may cause parts to be ejected with great force. Drain pump case only after pump has been allowed to cool. Use care to prevent personnel from touching the hot liquid.

Pump will not prime:

1. Pump discharge does not have air bleed line installed. See pump installation instructions for air bleed line.
2. Vertical suction lift is too high. Vertical lift for priming should not be more than 20 feet (MMP/MMPH) and 15 feet (MP/MPH).
3. Allow sufficient time for priming. On high lifts and at low pump speeds priming time may take 5 minutes or longer.
4. Suction line has an air leak. Install a vacuum gauge at pump suction flange and start pump. After a vacuum is established, stop pump and see if gauge holds. If gauge hand drops, it will indicate an air leak at some connection below the gauge tap.
5. Check pump rotation. Pump must turn clockwise when looking at the power end of pump.
6. Not enough liquid in pump casing; add water to the case. Pump needs water in the pump case to prime.
7. Suction check valve damaged or contaminated; replace check valve.
8. Leaking or worn seal or pump gasket; check pump case vacuum; replace leaking or worn seals or gaskets.

Pump primed OK initially but occasionally loses prime and will not reprime without adding water:

IMPORTANT: Drain pump case and close discharge gate valve before removing the inspection cover.

1. Air bleed line is not installed properly as specified or is plugged.
2. Check priming port for plugging. Remove inspection cover on right side of case when facing power end of pump. Check priming port hole in case below inspection plate for plugging.
3. Impeller may be worn, leaving too much clearance between impeller face and suction wear plate. Adjust impeller as described under adjusting instructions. If impeller and volute lip plate are worn, they must be replaced to regain original priming efficiency.

Pump makes a loud crackling noise when operating:

1. If pump has been operating satisfactorily and this noise suddenly starts, it may indicate that some large object is lodged in the suction check valve, suction elbow/plate or impeller causing the pump to be noisy. Remove debris from these areas of the pump.
2. If noise exists when suctioning pipe, check to see if valve and suction elbow are clear. It may indicate too high a capacity is being delivered for a given suction lift, causing suction cavitation. If pump is allowed to operate under these conditions, the impeller will be damaged. Using a smaller impeller or reducing the pump speed if a belt drive is used may alleviate the cavitation. Consult factory for recommendations.
3. If cracking noise is pronounced when pump is operating at low capacity it may indicate pump is operating too near the shut-off head. Increasing the impeller diameter or increasing pump speed may alleviate this condition. Consult factory for recommendations.

4. Performance curves show maximum / minimum capacity that the pump will deliver at a given condition point and the allowable suction lift without cavitation. Use vacuum gauge at pump suction to check total suction lift when pump is operating. Use discharge pressure gauge at pump discharge to check discharge head. Total the two-gauge reading to determine the total dynamic head the pump must operate against.

5. Entrained air may be present and is being pumped. Find source of air and eliminate.

6. Pump or drive not securely mounted. Retighten all components.

Pump does not deliver rated capacity:

1. Total head may be higher than calculated. Pump capacity is based on total head. Total dynamic head is arrived at by adding the suction gauge reading, in feet, to the discharge gauge reading, in feet. These readings should be taken at the suction flange and at the pump discharge flange connections. Reading should be taken as close to the flange fittings and pump case as possible. To convert psi, pressure per square inch, to feet, multiply the total psi readings by 2.31. This will equal total dynamic head in feet.

2. Pump impeller may be worn on the vane faces or the clearance between the impeller and wear plate may be greater than .015". Adjust impeller to wear plate clearances for proper clearance as described under Adjusting Impeller Clearance. If impeller, suction wear plate and volute lip plate are badly worn, they must be replaced.

3. Pump speed may be too slow. Check drive assembly, V-belts or coupling, for slippage.

4. Possible air leak in the suction piping; eliminate the leak.

5. Suction head may be too high. Reduce lift by raising on/off levels in the wet well or reduce friction losses due to suction piping arrangement.

6. Suction line not submerged at proper levels; correct suction pipe submergence.

7. Blockage in the suction pipe or discharge pipe; remove blockage. Where the blockage is can be determined by gauge readings.

8. Impeller clogged; remove debris.

Motor starter overload trips after pump has operated for a short period:

1. Rags or trash may be caught in the impeller, causing extra load. Remove suction elbow/plate and clean impeller. Pump shaft must turn freely by hand after cleaning impeller.

2. Overload heater may be too small. Check heater size with full load amps of motor.

3. Total head may be lower than calculated, causing extra load on the motor. Reducing impeller diameter or reducing speed if belt driven, will lower motor load. Consult factory for recommendations.

4. Pump may be pumping a liquid heavier than water or a liquid with higher viscosity than water, such as heavy oil. Consult factory for power required to pump oils or liquids other than water.

5. Bearings may be damaged, causing excessive motor load.

6. Pump speed may be too high. Check drive output to see if they are sized properly.

Pump clogs frequently:

1. Liquid solution being pumped is too thick; dilute if possible.

2. Discharge velocity too slow. Open discharge valves to fully open and increase pump speed.

Bearing running too hot:

1. Drive misaligned; realign drive.

2. Low or incorrect lubricant; use proper type and level of lubricant.

3. Suction and/or discharge pipe not supported properly. Check piping installation for proper support and take strain off the pump case and bearing frame.

30MMP Parts List

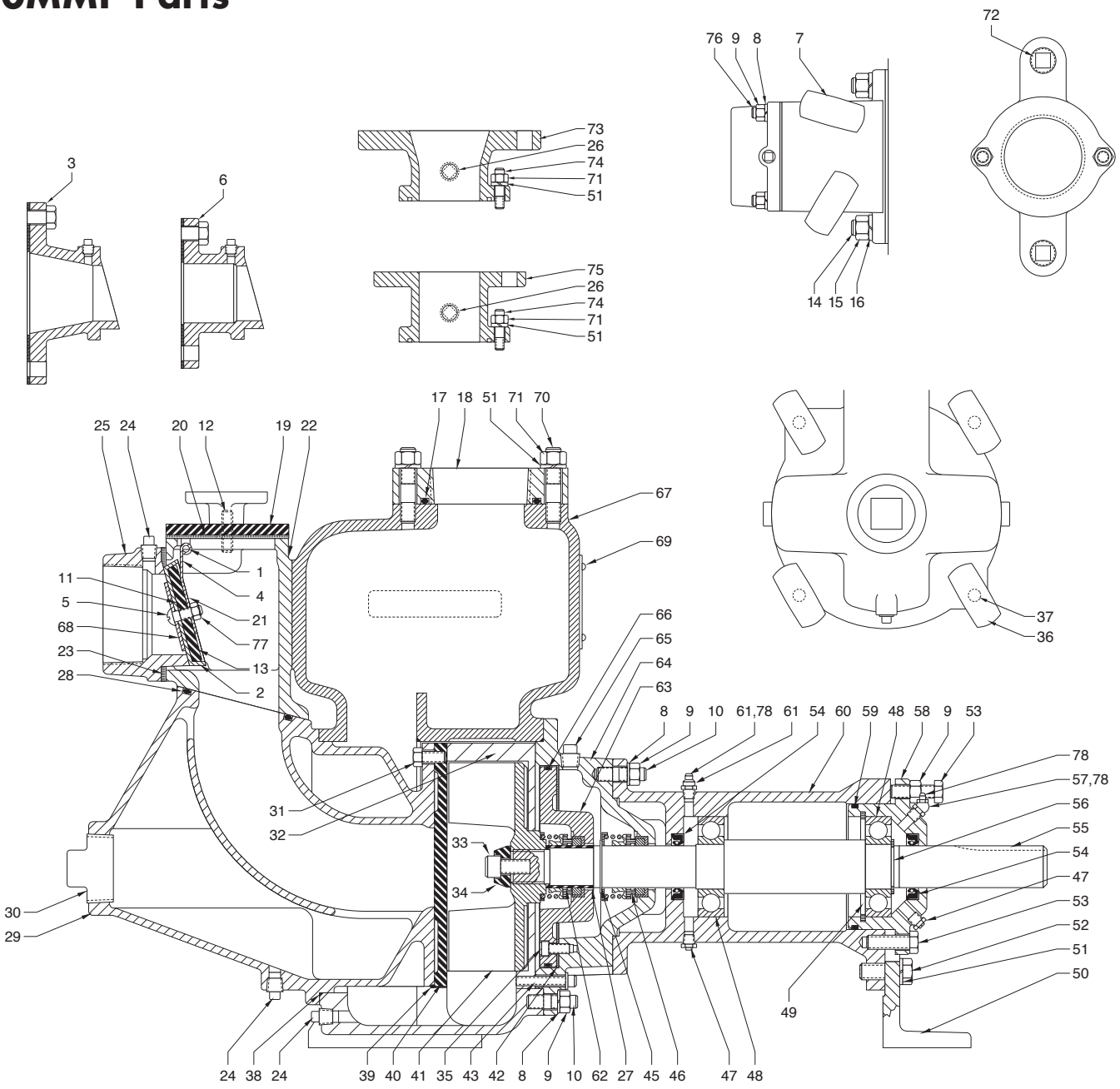
Item	Eng. No.	Part Description		Qty.
1	134840001	Sleeve		2
2	120140011	Piston Cup	SC	1
3	020490002	Suction Flange 3" x 4"		1
4	120110001	Bracket, Flap		1
5	131230021	Screw		1
6	013420002	Suction Flange 3" x 3"		1
7	009050022	Clamp Handle		2
8	05454A005	Lockwasher		14
9	010850011	Nut		17
10	010790021	Stud		10
11	120110105	Flap Valve Assy – Piston Cup		1
12	010270021	Stud		2
13	010750012	Weight		1
14	010300081	Stud		2
15	127-058011-243	Nut – Hex 5/8-11		2
16	05454A011	Lockwasher		2
17	002410061	O-ring	SC	1
18	041270002	Discharge Flange		1
19	120090003	Priming Cover		1
20	120150001	Cover Gasket	SC	1
21	001560471	Washer		1
22	119990002	Suction Box		1
23	120130001	Gasket	SC	1
24	001190011	Pipe Plug		3
25	010770002	Suction Flange		1
26	001200011	Pipe Plug		1
27	000790071	O-ring	SC	1
28	002410041	O-ring	SC	1
29	045120002	Inlet Elbow		1
30	025830011	Pipe Plug		1
31	19101A003	Bolt		2

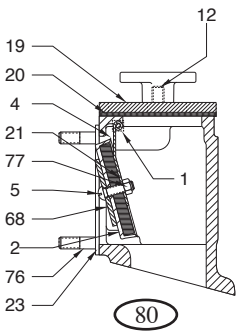
Item	Eng. No.	Part Description		Qty.
32	057600002	Lip Plate 8-13/32" Dia Imp		1
	042280032	Lip Plate 7-7/8" Dia Imp		1
	042280022	Lip Plate 7-1/2" Dia Imp		1
	042280012	Lip Plate 7" Dia Imp		1
	032430032	Lip Plate 6-1/2" Dia Imp		1
	032430022	Lip Plate 6-1/4" Dia Imp		1
33	005680021	Impeller Bolt		1
34	010390001	Impeller Washer		1
35	001780011	Capscrew		3
36	009050002	Clamp Handle		4
37	010240011	Stud		4
38	001500231	O-ring	SC	2
39	001500211	O-ring	SC	1
40	010600002	Wear Plate		1
41***	010610042	Impeller 8-13/32" Dia		1
	010610052	Impeller 8-3/16" Dia		1
	010610062	Impeller 7-7/8" Dia		1
	010610072	Impeller 7-1/2" Dia		1
	011720032	Impeller 7" Dia		1
	011720042	Impeller 6-1/2" Dia		1
	011720052	Impeller 6-1/4" Dia		1
	011720132	Impeller 6-3/4" Dia		1
42	011330011	Gasket	SC	3
43	001780061	Capscrew		3
44	029220011	Stat-O-Seal	SC	3
45	009750031	Snap Ring		1
46	009200011	Seal (Ceramic) Std.	SC	2
	009200041	Seal (Carbide) Opt.	C	1
47	013450001	Relief Fitting		2
48	000650071	Bearing		2
49	009740021	Snap Ring		1

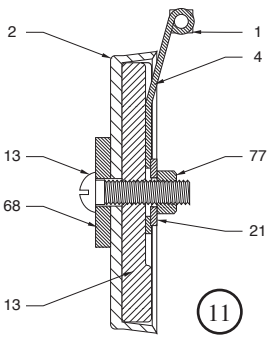
Item	Eng. No.	Part Description		Qty.
50	010650013	Support Foot		1
51	05454A004	Lockwasher		4
52	100-012112-273	Bolt		2
53	19102A012	Bolt		6
54	010900011	Lip Seal	SC	2
55	041300001	Shaft		1
56	009750041	Snap Ring		1
57	062050001	Grease Fitting		1
58	010660002	Bearing Cap		1
59	001500131	O-ring	SC	1
60	010640002	Bearing Housing		1
61	052180001	Grease Fitting Straight		1
62	015090021	Shaft Sleeve	SC	1
63	009010002	Seal Plate		1
64	010630012	Seal Housing		1
65	016640011	Pipe Plug		2
66	001500191	O-ring	SC	1
67	041230002	Volute Case		1
68	001560591	Washer		1
69	045800011	Drivescrews		4
70	010240051	Stud		2
71	19109A030	Nut		2
72	001180011	Pipe Plug		2
73	041290002	Discharge Flange 3" x 4"		1
74	010240021	Stud		2
75	041280002	Discharge Flange 3" x 3"		1
76	010790091	Stud		4
77*	19109A013	Nut		1
78	052190001	Grease Fitting Cap		2
79	001560491	Washer		3
80	517280005	Flap Valve Box Assy		1
	517000387	Seal Kit		1
	517003387	Carbide Seal Kit		1

Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit *Consult Factory
***Impellers cannot be trimmed. Trim sizes must come from the factory.

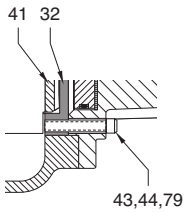
30MMP Parts







Flat back plate used with full dia. impeller



40MMP Parts List

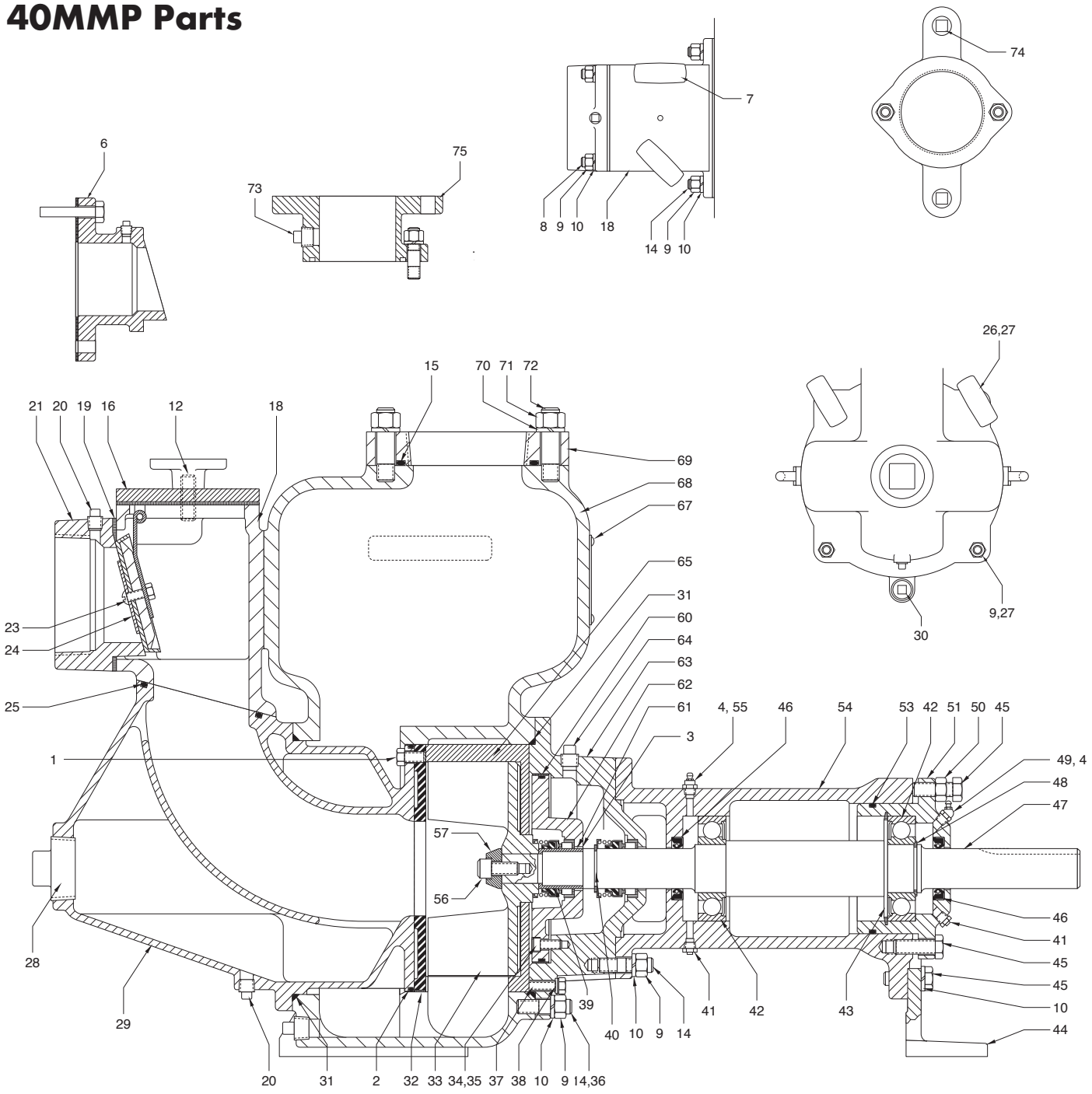
Item	Eng. No.	Part Description		Qty.
1	19101A003	Cap Screw		2
2	001500231	O-ring		1
3	000790071	O-ring		1
4	052190001	Grease Fitting Cap		2
5	134840011	Sleeve		2
6	013090002	Suction Flange, 4"		1
7	009050012	Clamp Handle		2
8	010240031	Stud		4
9	19109A030	Nut		23
10	05454A004	Lockwasher		20
11*	120120001	Flapper Bracket		1
12	010790021	Stud		2
13*	120180011	Flap Disc Gasket	SC	1
14	010240021	Stud		14
15	006260011	O-ring	SC	1
16	120100003	Priming Cover		1
17	120160001	Cover Gasket	SC	1
18	120000002	Suction Box		1
19	120170001	Front Gasket	SC	1
20	001190011	Pipe Plug		2
21	009020002	Suction Flange, Threaded		1
22*	009030012	Weight		1
23*	131230021	Bolt		1
24*	001560191	Washer		1
25	002410071	O-ring	SC	1
26	009050002	Clamp Handle		2
27	010240011	Stud		4
28	025830011	Pipe Plug		1
29	060320005	Inlet Elbow w/Handles		1

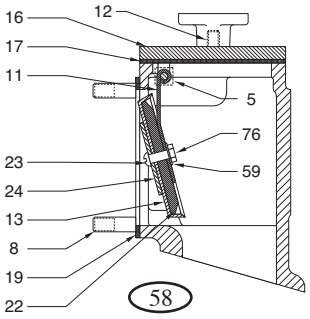
Item	Eng. No.	Part Description		Qty.
30	009240011	Pipe Plug		1
31	001500241	O-ring	SC	2
32	008910002	Wear Plate		1
33***	008880042	Impeller 9-1/8" Dia		1
	008880062	Impeller 8-1/2" Dia		1
	010880082	Impeller 8" Dia		1
	010880092	Impeller 7-1/2" Dia		1
	010880102	Impeller 7" Dia		1
34	001780011	Setscrew		3
35	011330011	Gasket	SC	3
36	002390031	Bolt		2
37	001010111	Setscrew		3
38	001560491	Washer	SC	3
39	009200011	Seal (Ceramic), Std.	SC	2
	009200041	Seal (Carbide), Opt.	C	1
40	009750031	Snap Ring		1
41	013450001	Relief Fitting		2
42	000650051	Bearing		2
43	009740031	Snap Ring		1
44	009450033	Support Foot		1
45	100-012112-273	Bolt		8
46	010900011	Lip Seal	SC	2
47	009460031	Shaft		1
48	009750051	Snap Ring		1
49	062050001	Grease Fitting		1
50	008520021	Jam Nut		3
51	008990002	Bearing Cap		1
52	120120105	Flap Valve Assembly – Piston Cup		1
53	001500141	O-ring	SC	1

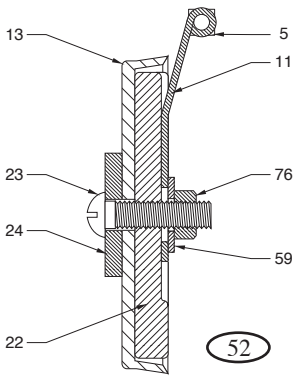
Item	Eng. No.	Part Description		Qty.
54	008980002	Bearing Housing		1
55	052180001	Grease Fitting Straight		1
56	005680041	Impeller Bolt		1
57	010390001	Impeller Washer		1
58	517290005	Flap Valve Box Assembly		1
59	001560471	Washer		1
60	001500191	O-ring	SC	1
61	015090021	Sleeve	SC	1
62	009010002	Seal Plate		1
63	009000022	Seal Housing		1
64	016640011	Pipe Plug		2
65	054420002	Lip Plate, 9-1/8" Imp Dia		1
	042220032	Lip Plate, 8-1/2" Imp Dia		1
	042220002	Lip Plate, 8" Imp Dia		1
	040250042	Lip Plate, 7-1/2" Imp Dia		1
	040250002	Lip Plate, 7" Imp Dia		1
66	029220011	Seal	SC	3
67	045800011	Drive Screw		4
68	041240002	Volute		1
69	008930002	Discharge Flange, Threaded		1
70	05454A011	Lockwasher		2
71	127-058011-243	Nut		2
72	010300031	Stud		2
73	001200011	Pipe Plug		2
74	001180011	Pipe Plug		2
75	013080002	Discharge Flange 4"		1
76	001140021	Nut		1
	517000417	Seal Kit		1
	517003417	Carbide Seal Kit		1

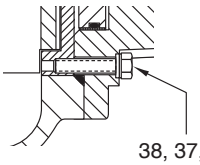
Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit *Consult Factory
***Impellers cannot be trimmed. Trim sizes must come from the factory.

40MMP Parts









Flat back plate used with full dia. impeller

40MMPH Parts List

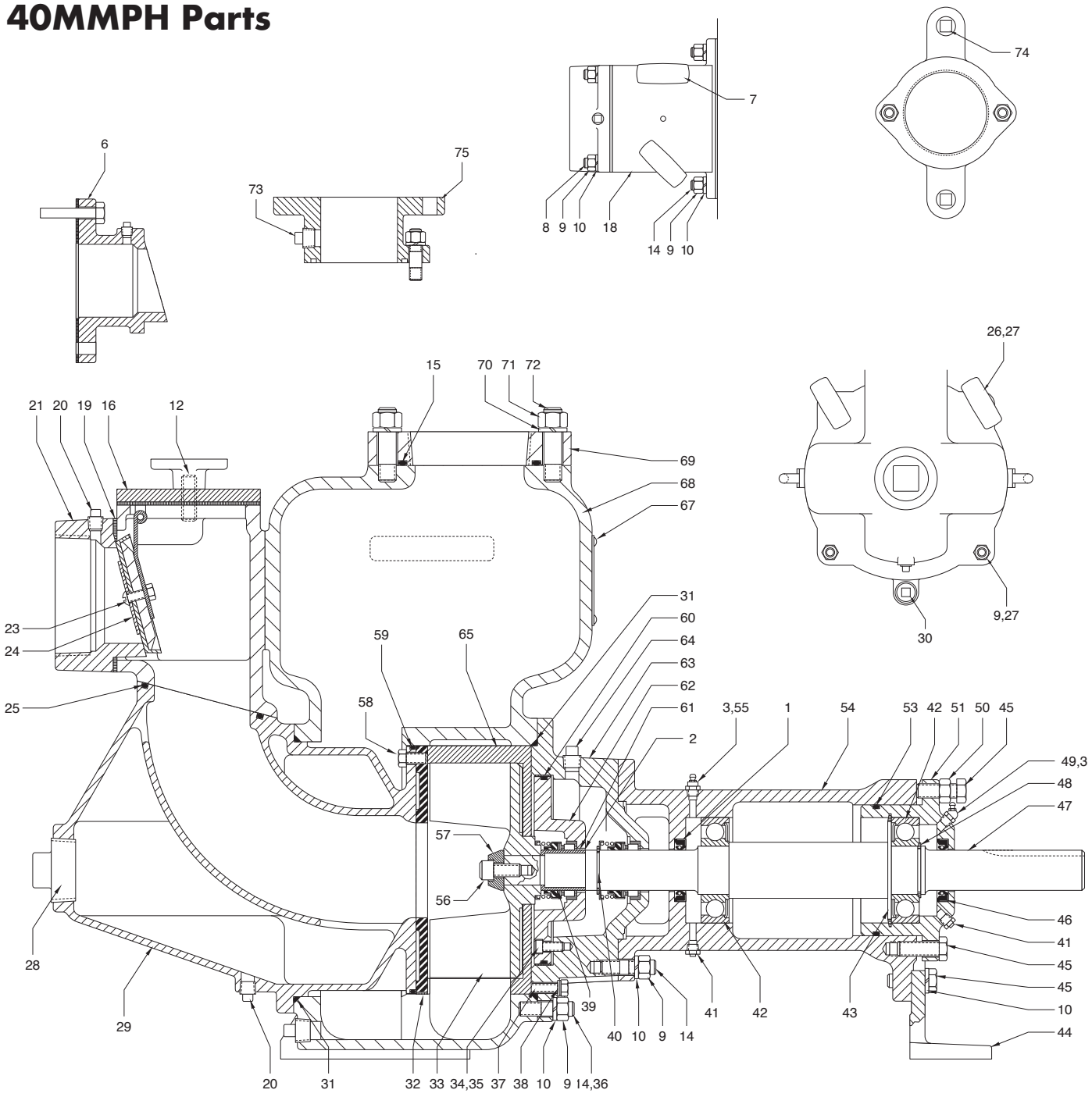
Item	Eng. No.	Part Description		Qty.
1	010900021	Lip Seal	SC	1
2	000790091	O-ring		1
3	052190001	Grease Fitting Cap		2
4*	134840011	Sleeve		2
5*	001560471	Washer		1
6	013090002	Suction Flange, 4"		1
7	009050012	Clamp Handle		2
8	010240031	Stud		4
9	19109A030	Nut		23
10	05454A004	Lockwasher		20
11*	120120001	Flapper Bracket		1
12	010790021	Stud		2
13*	120180011	Flap Disc Gasket	SC	1
14	010240021	Stud		14
15	006260011	O-ring	SC	1
16	120100003	Priming Cover		1
17	120160001	Cover Gasket	SC	1
18	120000002	Suction Box		1
19	120170001	Front Gasket	SC	1
20	001190011	Pipe Plug		2
21	009020002	Suction Flange, Threaded		1
22*	009030012	Weight		1
23*	131230021	Bolt		1
24*	001560191	Washer		1
25	002410071	O-ring	SC	1
26	009050002	Clamp Handle		2
27	010240011	Stud		4

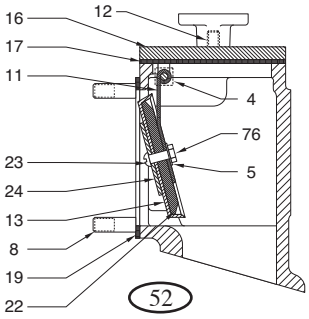
Item	Eng. No.	Part Description		Qty.
28	025830011	Pipe Plug		1
29	060320005	Inlet Elbow w/Handles		1
30	009240011	Pipe Plug		1
31	001500241	O-ring	SC	2
32	008910002	Wear Plate		1
33	008880072	Impeller 9-1/8" Dia		1
34	001780011	Setscrew		3
35	011330011	Gasket		3
36	002390031	Bolt		2
37	001010111	Setscrew		3
38	120120105	Flap Valve Assembly – Piston Cup		1
39	019570001	Seal (Ceramic), Std.	SC	2
	019570021	Seal (Carbide), Opt.	C	1
40	009750061	Snap Ring		1
41	013450001	Relief Fitting		2
42	000650051	Bearing		1
	071670021	Bearing		1
43	009740031	Snap Ring		1
44	009450033	Support Foot		1
45	100-012112-273	Bolt		8
46	010900011	Lip Seal	SC	1
47	009460021	Shaft		1
48	009750051	Snap Ring		1
49	062050001	Grease Fitting		1
50	008520021	Jam Nut		1
51	008990002	Bearing Cap		1
52	517290005	Flap Valve Box Assembly		1

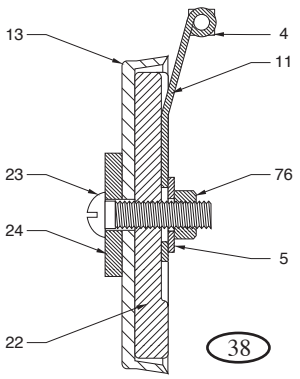
Item	Eng. No.	Part Description		Qty.
53	001500141	O-ring	SC	1
54	008980012	Bearing Housing		1
55	052180001	Grease Fitting Straight		1
56	029190021	Impeller Bolt		1
57	038280005	Impeller Washer		1
58	19101A003	Bolt		2
59	001500231	O-ring	SC	1
60	001500191	O-ring	SC	1
61	038040005	Sleeve	SC	1
62	051240002	Seal Plate		1
63	051230012	Seal Housing		1
64	016640011	Pipe Plug		2
65	054420012	Lip Plate, 9-1/4" Imp Dia		1
66	029220011	Seal	SC	3
67	045800011	Drive Screw		4
68	041240002	Volute		1
69	008930002	Discharge Flange, Threaded		1
70	05454A011	Lockwasher		2
71	127-058011-243	Nut		2
72	010300031	Stud		2
73	001200011	Pipe Plug		2
74	001180011	Pipe Plug		2
75	013080002	Discharge Flange 4"		1
76	19109A013	Nut		1
	517000437	Seal Kit		1
	517003437	Carbide Seal Kit		1

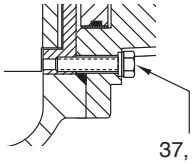
Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit *Consult Factory

40MMPH Parts









Flat back plate used with full dia. impeller

60MMPH Parts List

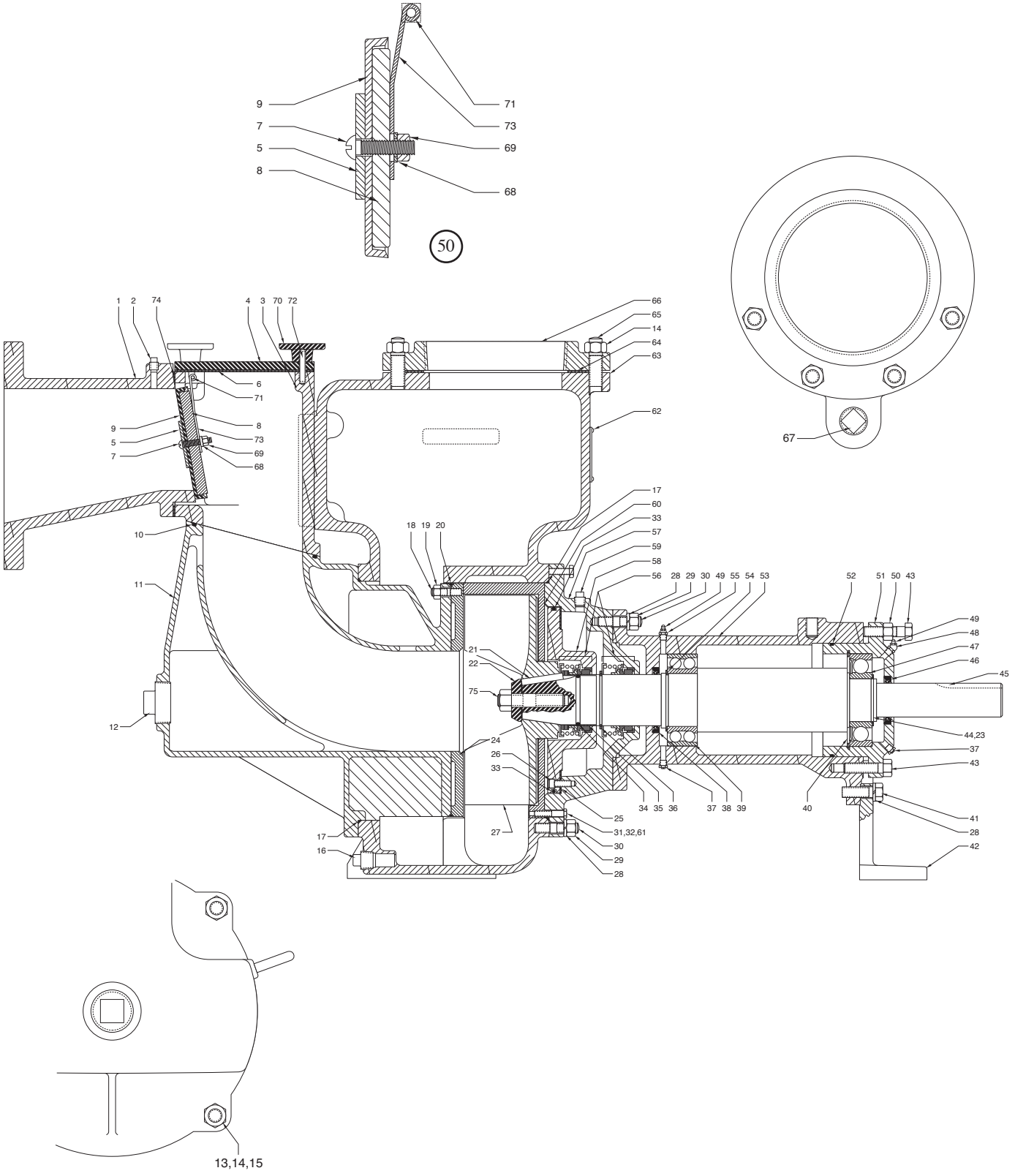
Item	Eng. No.	Part Description		Qty.
1	052420002	6" Suction Flange		1
	092820002	8" Suction Flange		1
2	001190011	Pipe Plug		1
3*	126480002	Body, Flap Valve		1
4*	126490003	Priming Cover		1
5*	001560191	Washer		1
6*	126500001	Gasket	SC	1
7*	131230031	Capscrew, SST		1
8*	126520003	Weight, Flap Valve		1
9*	120180031	Flap Valve	SC	1
10	006260061	O-ring	SC	1
11	052400015	Suction Elbow w/Handles		1
12	025830011	Pipe Plug	C	1
13*	023240021	Stud		12
14	023680011	Nut		20
15	001770121	Lockwasher		12
16	001200011	Pipe Plug		1
17	001500281	O-ring	SC	2
18	010240121	Stud		4
19	19109A084	Nut		4
20	001500271	O-ring	SC	1
21	028550011	Key		1
22	105840011	Washer		1
23	006280301	Shim		2
24	019340012	Wear Plate		1
25	011330021	Seal Plate Gasket	SC	3
26	06106A028	Screw		3
27***	023040132	Impeller, 12-3/4" Dia		1
	023040122	Impeller, 12-1/4" Dia		1
	023040112	Impeller, 11-3/4" Dia		1
	023040102	Impeller, 11" Dia		1

Item	Eng. No.	Part Description		Qty.
27***	023040172	Impeller, 10-1/4" Dia		1
	023040162	Impeller, 9-3/4" Dia		1
28	05454A011	Lockwasher		14
29	011240031	Nut		15
30	010300021	Stud		12
31	010370011	Stat-O-Seal	SC	4
32	001010111	Screw		4
33	002410161	O-ring	SC	1
34	000790101	O-ring	SC	1
35	023100023	Sleeve	SC	1
36	009750101	Snap Ring		1
37	013450001	Relief Fitting		2
38	010900031	Oil Seal	SC	1
39	071670031	Bearing		1
40	009740041	Snap Ring		1
41	005700051	Bolt		5
42	042420002	Foot Support		1
43	005700101	Bolt		6
44	009750081	Snap Ring		1
45	019421115	Shaft w/Stud		1
46	010900021	Oil Seal	SC	1
47	000650121	Bearing		1
48	062050001	Grease Fitting		1
49	052190001	Grease Cap		2
50	126530005	Flap Valve Assy		1
51	019400002	Bearing Cap		1
52	001500181	O-ring	SC	1
53	019390012	Bearing Housing		1
54	009750111	Snap Ring		1
55	052180001	Grease Fitting		1

Item	Eng. No.	Part Description		Qty.
56	037180001	Seal (Ceramic), Standard	SC	2
	037180011	Seal (Carbide), Opt.	C	1
57	019370012	Seal Housing		1
58	019380022	Seal Plate		1
59	016640011	Pipe Plug		2
60	042430032	Lip Plate, 12-3/4" Dia Imp		1
	019360092	Lip Plate, 12-1/4" Dia Imp		1
	019360082	Lip Plate, 11-3/4" Dia Imp		1
	019360072	Lip Plate, 11" Dia Imp		1
	019360142	Lip Plate, 10-1/4" Dia Imp		1
	019360282	Lip Plate, 9-3/4" Dia Imp		1
61	001560491	Washer		4
62	045800011	Drivescrew		4
63	042330032	Volute		1
64	024070041	Gasket		1
65	023240051	Stud		8
66	015950041	Discharge Flange, CI, 8"		1
	170040021	Discharge Flange, CI, 6"		1
67	001180011	Pipe Plug		2
68*	001560471	Washer		1
69*	19109A013	Nut		1
70*	009050022	Clamp Handle		3
71*	134840021	Sleeve		2
72*	010270021	Stud		3
73*	126510001	Bracket		1
74*	126540001	Gasket	SC	1
75	105250081	Cap Screw		1
	126550005	Flap Valve Box Assy		1
	517000477	Seal Kit		1
	517003477	Carbide Seal Kit		1

Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit *Consult Factory
***Impellers cannot be trimmed. Trim sizes must come from the factory.

60MMPH Parts



80MMP/100MMP Parts List

Item	Eng. No.	Part Description		Qty.
1	001180011	Pipe Plug		2
2	001190011	Pipe Plug		1
3	001780021	Cap Screw		4
4	023680011	Hex Nut		8
5	001770121	Lockwasher		16
6	023240021	Stud		2
7	002390081	Hex Head Screw		4
8	080970010	Cover		1
9	104320001	Gasket	SC	1
10	104330002	Flap Valve		1
11	104340001	Flap Gasket	SC	1
12	080980001	Gasket	SC	1
13	009050022	Hand Nut		2
14	010270091	Stud		2
15	001010211	Cap Screw		2
16	105470002	Suction Body		1
17	023240021	Stud		4
18	040060095	Weight Hinge Assy		1
19	001760051	Hex Head Screw		2
20	104360003	Weight		1
21	002410231	O-ring	SC	1
22	009050042	Hand Nut		4
23	023240101	Stud		2
24	104370002	Suction Elbow		1
25	002410151	O-ring	SC	1
26	104430002	Suction Pipe		1
27	002410221	O-ring	SC	3
28	001200041	Pipe Plug		1
29	19103A043	Hex Head Screw		4
30	001770181	Lockwasher		4
31	104440002	Wear Plate		1
32	114130011	Flat Head Screw (100MMP Only)		8

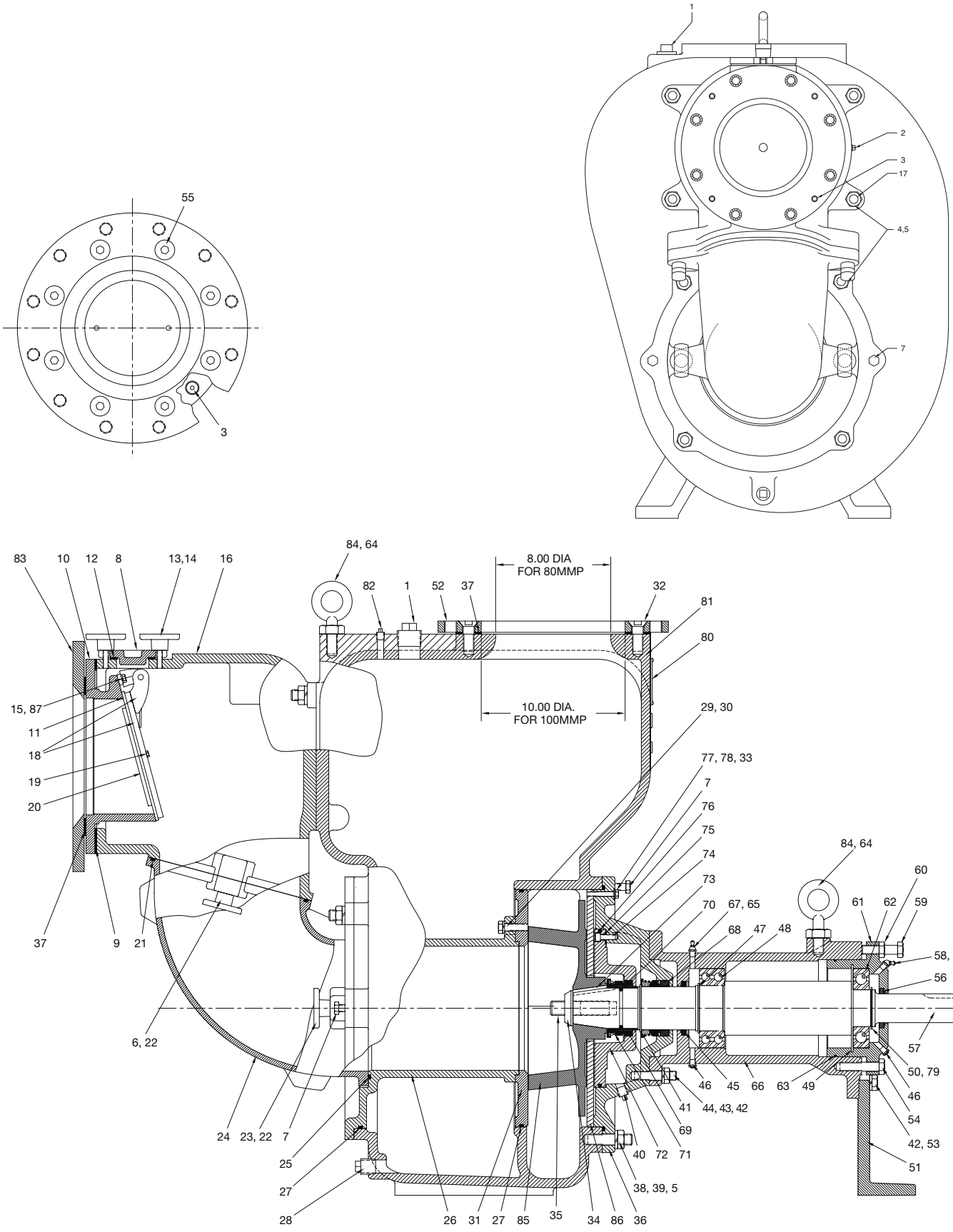
Item	Eng. No.	Part Description		Qty.
33	001560491	Washer		4
34	105840011	Washer		1
35	105250081	Cap Screw		1
36	104390002	Seal Plate		1
37	143630023	Gasket (100MMP Only)		2
38	023680011	Hex Nut		8
39	023240021	Stud		8
40	016640011	Pipe Plug		2
41	009750101	Snap Ring		1
42	05454A011	Lockwasher		6
43	127-058011-243	Hex Nut		4
44	010300021	Stud		4
45	010900031	Grease Seal	SC	1
46	013450001	Relief Fitting		2
47	009750111	Snap Ring		1
48	071670031	Bearing		1
49	009740041	Snap Ring		1
50	009750081	Snap Ring		1
51	104380002	Foot Support		2
52	143630003	Flange (100MMP Only)		1
53	005700051	Hex Head Screw		2
54	005700101	Hex Head Screw		3
55	114130031	Flat Head Screw (100MMP Only)		8
56	010900021	Grease Seal	SC	1
57	019421113	Shaft		1
58	062050001	Grease Fitting		1
59	005700101	Hex Head Screw		3
60	127-058011-243	Hex Nut		3
61	019400002	Bearing Retainer		1
62	000650121	Bearing		1
63	001500181	O-ring	SC	1
64	023680021	Hex Nut		2

Item	Eng. No.	Part Description		Qty.
65	052190001	Cap-Grease Fitting		2
66	019390012	Bearing Bracket		1
67	052180001	Grease Fitting		1
68	037180051	Shaft Seal	SC	2
69	023100023	Shaft Sleeve	SC	1
70	000790101	O-ring	SC	1
71	037180011	Seal, Carbide (Optional)	C	1
72	019380022	Seal Plate		1
73	028550011	Key		1
74	06106A028	Allen Head Screw		3
75	011330021	Gasket	SC	3
76	002410161	O-ring	SC	1
77	001010261	Cap Screw		4
78	029220011	Stat-O-Seal	SC	4
79	006280371	Shim		1
80	045800011	Drivescrew		4
81	104310002	Volute		1
82	001190011	Pipe Plug		1
83	143630013	Flange (100MMP Only)		1
84	21929A005	Lifting Eye		2
85***	104270002	Impeller, 15" Dia		1
	104270011	Impeller, 14-1/2" Dia		1
	104270022	Impeller, 14" Dia		1
	104270032	Impeller, 13-1/2" Dia		1
	104270042	Impeller, 13" Dia		1
86	109170003	Back Plate, Imp Dia 14-1/2" & 15"		1
	104490002	Lip Plate, Imp Dia 14"		1
	104490012	Lip Plate, Imp Dia 13-1/2"		1
	104490022	Lip Plate, Imp Dia 13"		1
87	05454A014	Lockwasher		2
	517000317	Seal Kit		1
	517003317	Carbide Seal Kit		1

Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit

***Impellers cannot be trimmed. Trim sizes must come from the factory.

80MMP/100MMP Parts



30MP Parts List

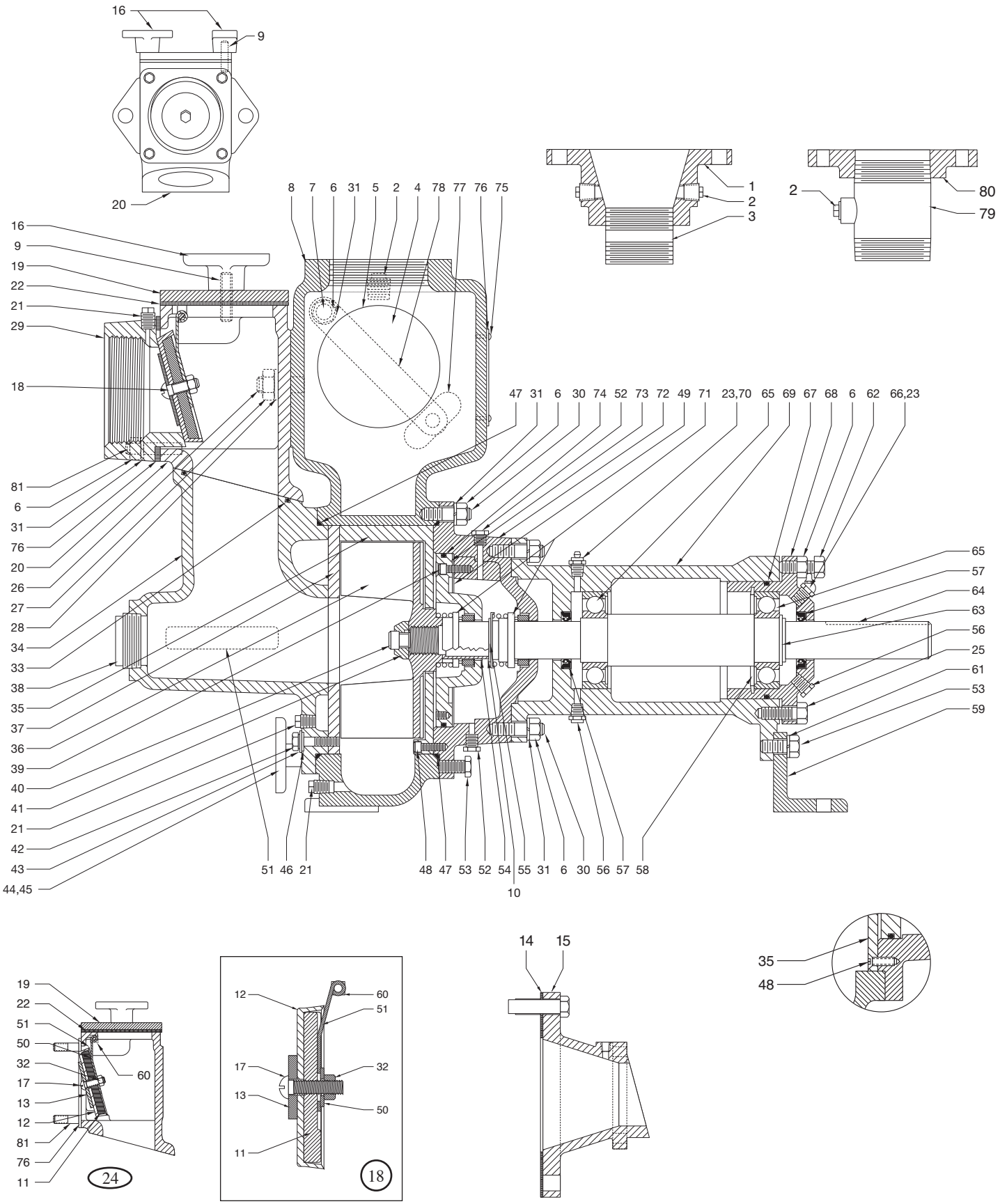
Item	Eng. No.	Part Description		Qty.
1	020500002	Dis. Flange (3"–4")		1
2	001200011	Pipe Plug		3
3	072870551	Pipe Nipple (3"x 3")		1
4	010680002	Inspection Cover		1
5	002410071	O-ring	SC	1
6	010850011	Nut		18
7	010790031	Stud		2
8	010570002	Volute		1
9	010270021	Stud		2
10	000790071	O-ring	SC	1
11	010750012	Weight		1
12	120140011	Piston Cup	SC	1
13	001560591	Flat Washer		1
14	024070021	Gasket, 4"		1
15	020490002	Suction Flange 4"		1
16	009050022	Clamp Handle		2
17	131230021	Screw		1
18	120110105	Flap Valve Assy – Piston Cup		1
19	120090003	Priming Cover		1
20	119990002	Flap Valve Housing		1
21	001190011	Pipe Plug		3
22	120150001	Cover Gasket	SC	1
23	052190001	Grease Fitting Cover		2
24	517280005	Flap Valve Box Assy		1
25	19102A002	Bolt		3
26	010300081	Stud		2
27	127-058011-243	Nut		2
28	05454A011	Lockwasher		2
29	010770002	Suction Flange (Threaded)		1
30	010790021	Stud		10
31	05454A005	Lockwasher		15
32	19109A013	Hex Nut		1

Item	Eng. No.	Part Description		Qty.
33	002410041	O-ring	SC	1
34	010590022	Inlet Elbow		1
35	020040002	Lip Plate (8-13⁄32" Imp Dia)		1
	012110022	Lip Plate (7-3⁄4" Imp Dia)		1
	012110052	Lip Plate (7-1⁄2" Imp Dia)		1
	013200012	Lip Plate (7" Imp Dia)		1
	013200022	Lip Plate (6-1⁄2" Imp Dia)		1
36**	010610002	Impeller 8-13⁄32" Dia		1
	010610082	Impeller 7-3⁄4" Dia		1
	010610122	Impeller 7-1⁄2" Dia		1
	011720032	Impeller 7" Dia		1
	011720042	Impeller 6-1⁄2" Dia		1
37	010600002	Wear Plate		1
38	025830011	Pipe Plug		1
39	001780011	Capscrew		3
40	005680021	Impeller Bolt		1
41	010390001	Impeller Washer w/Pin		1
42	002380081	Bolt		2
43	001560481	Washer		2
44	010240011	Stud		4
45	009050002	Clamp Handle		4
46	010370021	Stat-O-Seal 3⁄8"	SC	2
47	001500231	O-ring	SC	2
48	005170051	Setscrew (6-1⁄4"-7-1⁄8" Imp)		3
	011300071	Setscrew (7-5⁄32"-8-13⁄32" Imp)		3
49	011330011	Gasket	SC	3
50	001560471	Flat Washer		1
51	120110001	Flap Bracket		1
52	016640011	Pipe Plug		2
53	002390031	Bolt		4
54	015090021	Sleeve	SC	1
55	009750031	Snap Ring		1

Item	Eng. No.	Part Description		Qty.
56	013450001	Relief Fitting		2
57	010900011	Lip Seal	SC	2
58	009740021	Snap Ring		1
59	010650013	Support Foot		1
60	134840001	Sleeve (Drawing does not show sleeves over hinge pins on flap valve)		2
61	05454A004	Lockwasher		2
62	19102A012	Bolt		3
63	009750041	Snap Ring		1
64	041300001	Shaft		1
65	000650071	Bearing		2
66	062050001	Grease Fitting		1
67	001500131	O-ring	SC	1
68	010660002	Bearing Cap		1
69	010640002	Bearing Housing		1
70	052180001	Grease Fitting Straight		1
71	009200011	Seal (Ceramic) Std	S	2
	009200041	Seal (Carbide) Opt	SC	1
72	010630002	Seal Housing		1
73	009010002	Seal Plate		1
74	001500191	O-ring	SC	1
75	045800011	Drive Screw		4
76	120130001	Flap Valve Front Gasket	SC	1
77	009050012	Clamp Handle		1
78	010700002	Clamp Arm		1
79	064620005	Pipe Nipple/Cplg		1
80	015950011	Flange, 3"		1
81	010790091	Stud	SC	4
	517000387	Seal Kit		1
	517003387	Carbide Seal Kit		1
	013420002	Suction Flange 3"		1
	024070011	Gasket, 3"		1

Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit
**Impellers cannot be trimmed. Trim sizes must come from the factory.

30MP Parts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40MP Parts List

Item	Eng. No.	Part Description		Qty.
1	120170001	Gasket – Front	SC	1
2	001200011	Pipe Plug		3
3	010300031	Stud		2
4	127-058011-243	Nut		2
5	05454A011	Lockwasher		2
6	008930002	Dis. Flange (4" Threaded)		1
7	006260011	O-ring	SC	1
8	19109A030	Nut		22
9	120160001	Gasket – Cover	SC	1
10	134840011	Sleeve		2
11	131230021	Screw		1
12	120180011	Piston Cup	SC	1
13	120120001	Bracket		1
14	001190011	Pipe Plug		2
15	009030012	Weight		1
16	009020002	Suction Flange (Threaded)		1
17	001560471	Washer		1
18	001560191	Washer		1
19	013090002	Suction Flange 4"		1
20	19109A013	Nut		1
21	120120105	Flap Valve Assy – Piston Cup		1
22	120100003	Cover – Inspection		1
23	517290005	Flap Valve Box Assy		1
24	120000002	Housing – Flap Check Valve		1
25	05454A004	Lockwasher		21
26	010790021	Stud		2
27	002410071	O-ring	SC	1
28	010240021	Stud		14
29	008890022	Inlet Elbow		1
30	025830011	Pipe Plug		1
31	010240031	Stud		4
32	009050012	Handle – Plate Clamp		2
33	000790071	O-ring	SC	1
34	008910002	Wear Plate		1
35	009050002	Clamp Handle		5
36	002380081	Setscrew		2
37	001560481	Washer		2
38	010370021	Stat-O-Seal	SC	2
39	010240011	Stud		4
40	001500241	O-ring	SC	2
41	009240011	Pipe Plug		1
42	005680021	Bolt		1
43	010390001	Impeller Washer		1
44	015090021	Sleeve	SC	1
45	052190001	Cap – Grease Fitting		2
46	011300071	Setscrew (7-15/16" – 9-5/32" Imp)		3
	005170051	Setscrew (7" – 7-27/32" Imp)		3
47	013080002	Discharge Flange 4"		1
48	002390031	Bolt		4
49	016640011	Pipe Plug		2
50	011330011	Gasket	SC	3
51	009010002	Seal Plate		1
52	013450001	Relief Fitting		2
53	009450033	Support Foot		1
54	100-012112-273	Bolt		6
55	009740031	Snap Ring		1
56	008990002	Bearing Cap		1
57	009750051	Snap Ring		1
58	009460031	Shaft		1
59	010900011	Lip Seal	SC	2
60	000650051	Bearing		2
61	062050001	Grease Fitting 45 Degree		1
62	002410101	O-ring	SC	1
63	001500141	O-ring	SC	1
64	008980002	Bearing Housing		1
65	052180001	Grease Fitting		1
66	009200011	Seal (Ceramic) Std.	SC	2
	009200041	Seal (Carbide) Opt.	SC	1
67	009750031	Snap Ring		1
68	009000002	Seal Housing		1
69	001780011	Setscrew		3
70	001500191	O-ring	SC	1
71**	008880002	Impeller 9-5/32" Dia		1
	008880112	Impeller 8-1/2" Dia		1
	010880162	Impeller 8-5/32" Dia		1
	010880172	Impeller 7-3/4" Dia		1
	010880182	Impeller 7-3/16" Dia		1
72	020050002	Flat Plate 9-5/32" Dia Imp		1
	008920032	Lip Plate 8-1/2" Dia Imp		1
	013260022	Lip Plate 7-3/4" Dia Imp		1
	013260032	Lip Plate 7-3/16" Dia Imp		1
73	008940002	Inspection Cover		1
74	045800011	Drivescrews		4
75	008870002	Volute		1
76	010240041	Stud		2
77	008950002	Clamp Arm		1
	517000417	Seal Kit		1
	517003417	Carbide Seal Kit		1
	024070021	Gasket 4"		1

Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit

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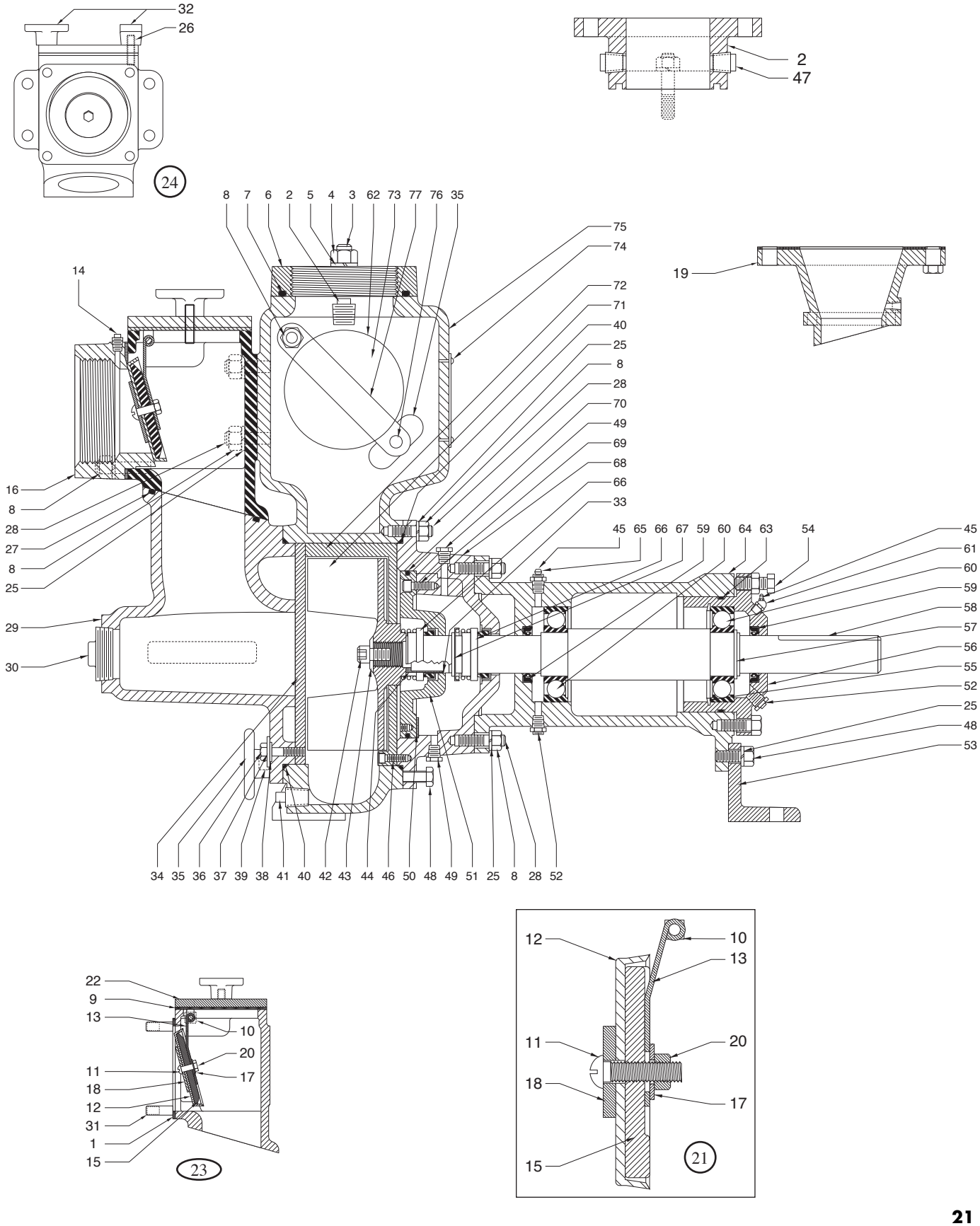
40MP Parts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40MPH Parts List

Item	Eng. No.	Part Description		Qty.
1	120170001	Gasket – Front	SC	1
2	001200011	Pipe Plug		3
3	010300031	Stud		2
4	127-058011-243	Nut		2
5	05454A011	Lockwasher		2
6	008930002	Dis. Flange (4" Threaded)		1
7	006260011	O-ring	SC	1
8	19109A030	Nut		22
9	120160001	Gasket – Cover	SC	1
10	134840011	Sleeve		2
11	131230021	Screw		1
12	120180011	Piston Cup	SC	1
13	120120001	Bracket		1
14	001190011	Pipe Plug		2
15	009030012	Weight		1
16	009020002	Suction Flange (Threaded)		1
17	001560471	Washer		1
18	001560191	Washer		1
19	013090002	Suction Flange 4"		1
20	19109A013	Nut		1
21	120120105	Flap Valve Assy – Piston Cup		1
22	120100003	Cover – Inspection		1
23	517290005	Flap Valve Box Assy		1
24	010240031	Stud		4
25	05454A004	Lockwasher		21
26	013080002	Discharge Flange 4"		1
27	002410071	O-ring	SC	1
28	010240021	Stud		14
29	008890022	Inlet Elbow		1
30	025830011	Pipe Plug		1
31	120000002	Housing – Flap Check Valve		1

Item	Eng. No.	Part Description		Qty.
32	010790021	Stud		2
33	009050012	Handle – Plate Clamp		2
34	008910002	Wear Plate		1
35	009050002	Clamp Handle		5
36	002380081	Setscrew		2
37	001560481	Washer		2
38	010370021	Stat-O-Seal		2
39	010240011	Stud		4
40	001500241	O-ring	SC	2
41	009240011	Pipe Plug		1
42	029190021	Impeller Bolt		1
43	038280005	Impeller Washer		1
44	038040011	Sleeve	SC	1
45	020050012	Flat Plate		1
46	011300071	Flat Head Screw 7-15/16"– 9-5/32"		3
	005170051	Flat Head Screw 7"– 7-27/32"		3
47	000790091	O-ring	SC	1
48	002390031	Bolt		2
49	016640011	Pipe Plug		2
50	011330011	Gasket	SC	3
51	051240002	Seal Plate		1
52	013450001	Relief Fitting		2
53	009450033	Support Foot		1
54	100-012112-273	Bolt		8
55	009740031	Snap Ring		1
56	008990002	Bearing Cap		1
57	009750051	Snap Ring		1
58	009460021	Shaft		1
59	010900011	Lip Seal	SC	1
	010900021	Lip Seal	SC	1

Item	Eng. No.	Part Description		Qty.
60	000650051	Bearing		1
	071670021	Bearing		1
61	062050001	Grease Fitting 45 Degree		1
62	052190001	Cap – Grease Fitting		2
63	001500141	O-ring	SC	1
64	008980012	Bearing Housing		1
65	052180001	Grease Fitting		1
66	019570001	Seal (Ceramic) Std.	SC	2
	019570021	Seal (Carbide) Opt.	C	1
67	009750061	Snap Ring		1
68	051230002	Seal Housing		1
69	001780011	Setscrew		3
70	001500191	O-ring	SC	1
71**	008880012	Impeller 9-5/32" Dia		1
	008880182	Impeller 8-1/2" Dia		1
	010881012	Impeller 7-3/4" Dia		1
	010881002	Impeller 7-3/16" Dia		1
72	008921032	Lip Plate, 8-1/2" Dia Imp		1
	013261012	Lip Plate, 7-3/4" Dia Imp		1
	013261002	Lip Plate, 7-3/16" Dia Imp		1
73	002410101	O-ring	SC	1
74	045800011	Drivescrews		4
75	008870002	Volute		1
76	010240041	Stud		2
77	008950002	Clamp Arm		1
78	008940002	Inspection Cover		1
	517000437	Seal Kit		1
	517003437	Carbide Seal Kit		1

Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit
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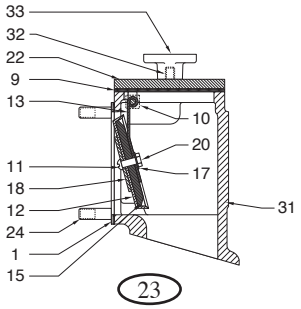
40MPH Parts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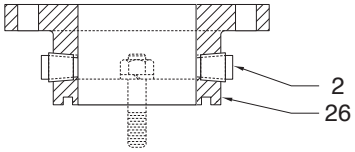
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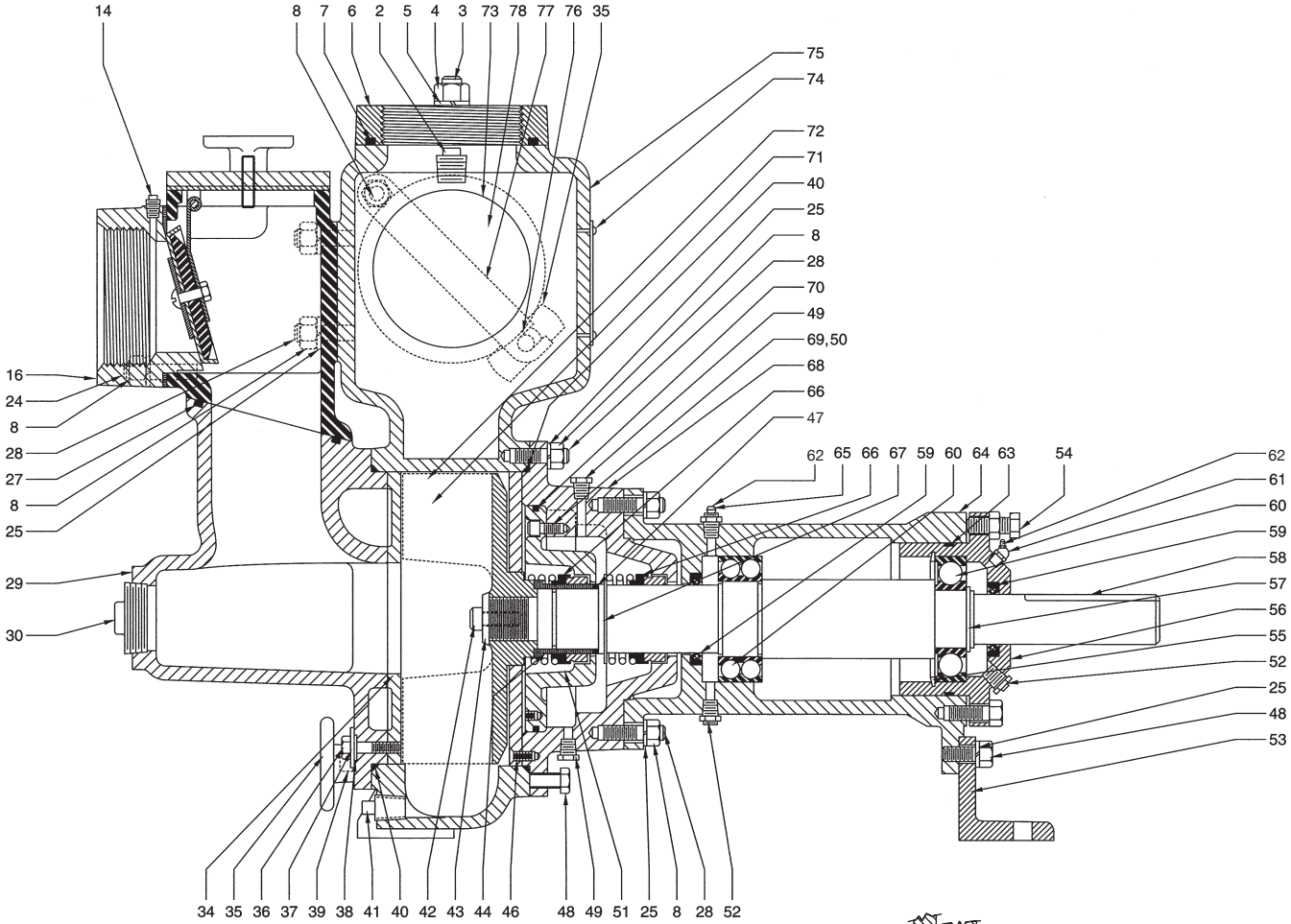
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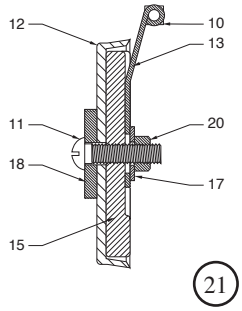
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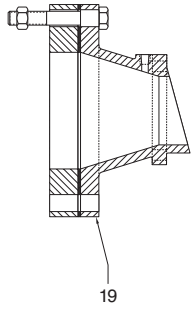
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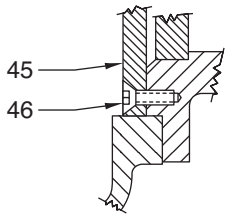
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60MP Parts List

Item	Eng. No.	Part Description		Qty.
1	023240021	Stud		20
2	001200011	Pipe Plug		2
3	015950021	Discharge Flange Threaded		1
4	024070031	Gasket, 6"		1
5	006280371	Shim		
6	131530001	Gasket – Front	SC	1
7	134840021	Sleeve		2
8	126090011	Bracket		1
9	19109A013	Nut		1
10	001560471	Washer		1
11	001190011	Pipe Plug		1
12	001770121	Lockwasher		12
13	023680011	Nut		20
14	019310002	Suction Flange, 6"		1
15	126100013	Weight		1
16	001560191	Washer		1
17	131230031	Screw		1
18	120180021	Piston Cup	SC	1
19	126120005	Flap Valve Assy		1
20	006260031	O-ring	SC	1
21	010370031	Stat-O-Seal	SC	4
22	002390091	Bolt		4
23	019280015	Inlet Elbow w/Handles		1
24	001500161	O-ring	SC	1
25	019560002	Inspection Plate		1
26	010240011	Stud		2
27	009050002	Clamp Handle		4
28	06106A028	Setscrew		3
29	019340002	Wear Plate		1
30	009240011	Pipe Plug		1
31	001500271	O-ring	SC	2

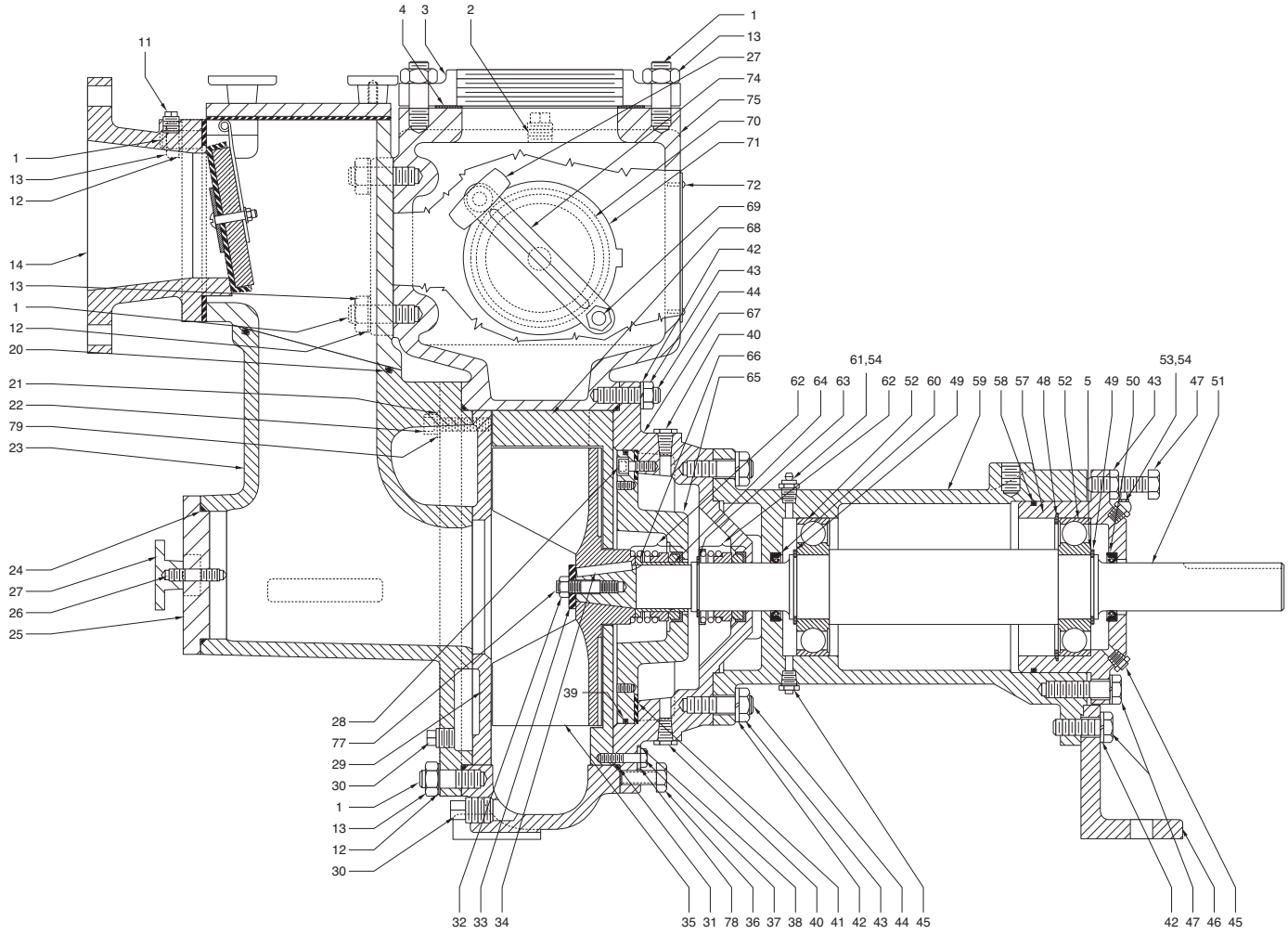
Item	Eng. No.	Part Description		Qty.
32	008520071	Locknut (Std.)		1
33	105850001	Washer (Std.)		1
34	028550011	Key		1
35**	023040412	Impeller 12-3/4" Dia		1
	023040422	Impeller 12-1/4" Dia		1
	023040432	Impeller 11-3/4" Dia		1
	023040442	Impeller 11-1/4" Dia		1
	023040462	Impeller 10-3/4" Dia		1
	023040472	Impeller 10-1/4" Dia		1
	023040482	Impeller 9-3/4" Dia		1
36	100-012112-273	Bolt		2
37	001010111	Bolt		4
38	029220011	Stat-O-Seal	SC	4
39	002410161	O-ring	SC	1
40	016640011	Pipe Plug		2
41	011330021	Gasket	SC	3
42	05454A011	Lockwasher		14
43	127-058011-243	Nut		15
44	010300021	Stud		12
45	013450001	Relief Fitting		2
46	019410002	Support Foot		1
47	005700051	Bolt		8
48	009740041	Snap Ring		1
49	009750081	Snap Ring		2
50	010900021	Lip Seal	SC	1
51	019420095	Shaft w/Stud		1
52	000650121	Bearing		2
53	062050001	Grease Fitting 45 Degree		1
54	052190001	Cover		2
55	023240021	Stud		4
56	126080001	Gasket – Top	SC	1
57	019400002	Bearing Cap		1
58	001500181	O-ring	SC	1

Item	Eng. No.	Part Description		Qty.
59	019390042	Bearing Housing		1
60	010900051	Lip Seal	SC	1
61	052180001	Grease Fitting Straight		1
62	080730002	Seal (Ceramic) Std.	SC	2
	080730011	Seal (Carbide) Opt.	SC	1
63	009750151	Snap Ring		1
64	000790121	O-ring	SC	1
65	019380032	Seal Plate		1
66	023100033	Sleeve	SC	1
67	019370022	Seal Housing		1
68	042430022	Lip Plate (12-3/4" Imp Dia)		1
	019360062	Lip Plate (12-1/4" Imp Dia)		1
	019360052	Lip Plate (11-3/4" Imp Dia)		1
	019360112	Lip Plate (11-1/4" Imp Dia)		1
	019360102	Lip Plate (10-3/4" Imp Dia)		1
	019360032	Lip Plate (10-1/4" Imp Dia)		1
	019360022	Lip Plate (9-3/4" Imp Dia)		1
69	010240041	Stud		4
70	002410101	O-ring	SC	2
71	008940002	Inspection Cover		2
72	045800011	Drive Screw		4
73	010270091	Stud		4
74	008950005	Clamp Arm		2
75	019190002	Volute Case		1
76	126070003	Inspection Plate		1
77	010240151	Stud		1
78	001560491	Washer		4
79	001560501	Washer		4
80	126110005	Suction Box Assy		1
81	126060012	Valve Box		1
82	009050022	Clamp Handle		4
	517000487	Seal Kit		1
	517003487	Carbide Seal Kit		1

Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit

**Impellers cannot be trimmed. Trim sizes must come from the factory.

60MP Parts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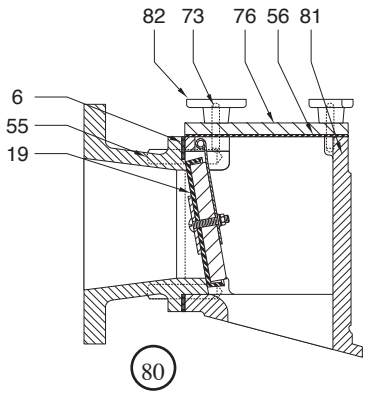
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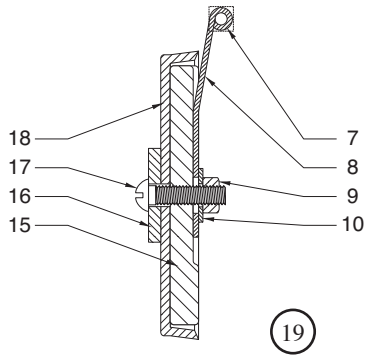
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60MPH Parts List

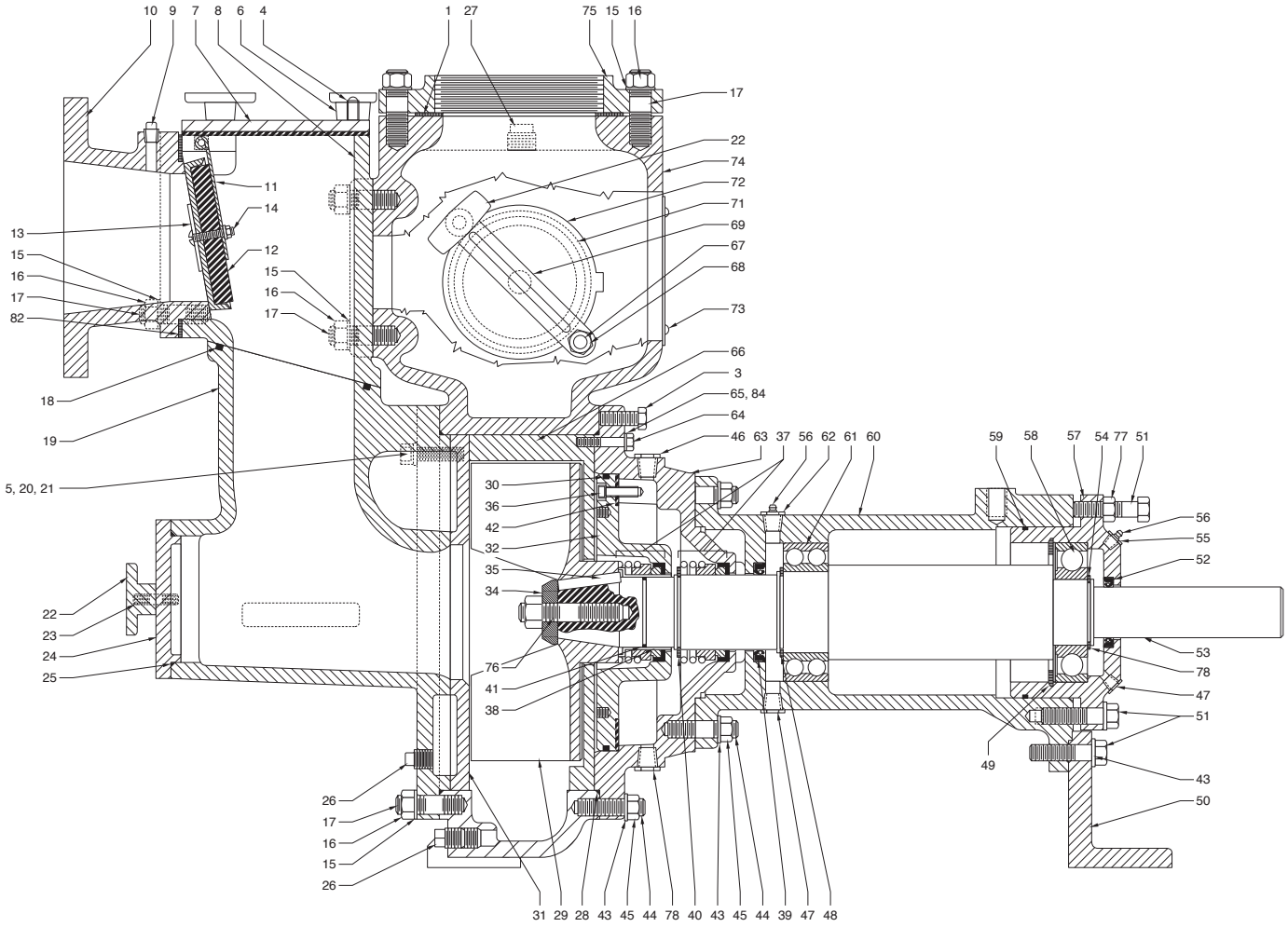
Item	Eng. No.	Part Description		Qty.
1	024070031	Gasket		1
2	126080001	O-ring	SC	1
3	100-012112-273	Capscrew		2
4	010270091	Stud		4
5	001560501	Washer		4
6	009050022	Clamp Handle		4
7	126070003	Priming Cover		1
8	126060012	Suction Box		1
9	001190011	Pipe Plug		1
10	019310002	Suction Flange 6"		1
11	120180021	Flap Valve	SC	1
12	126100013	Weight		1
13	001560191	Washer		1
14	131230031	Bolt		1
15	001770121	Lockwasher		12
16	023680011	Nut		20
17	023240021	Stud		20
18	006260031	O-ring	SC	1
19	019280015	Inlet Elbow w/Handles		1
20	002390091	Hex Head Screw		4
21	010370031	Stat-O-Seal	SC	4
22	009050002	Clamp Handle		4
23	010240011	Stud		2
24	019560002	Inspection Cover		1
25	001500161	O-ring	SC	1
26	009240011	Pipe Plug		1
27	001200011	Pipe Plug		2
28	001500271	O-ring	SC	2
29**	023040132	Impeller, 12-3/4" Dia		1
	023040122	Impeller, 12-1/4" Dia		1
	023040112	Impeller, 11-3/4" Dia		1
	023040192	Impeller, 11-1/4" Dia		1
	023040182	Impeller, 10-3/4" Dia		1
	023040172	Impeller, 10-1/4" Dia		1
	023040162	Impeller, 9-3/4" Dia		1

Item	Eng. No.	Part Description		Qty.
30	002410161	O-ring	SC	1
31	019340002	Wear Plate		1
32	019380022	Seal Plate		1
33	126110005	Flap Valve Box Assy		1
34	105840011	Impeller Washer		1
35	028550011	Key		1
36	06106A028	Socket Head Screw		3
37	037180051	Seal, (Ceramic) Standard	SC	2
	037180021	Seal, (Carbide) Optional	C	1
38	023100023	Sleeve	SC	1
39	010900031	Lip Seal	SC	1
40	009750101	Snap Ring		1
41	000790101	O-ring	SC	1
42	011330021	Gasket	SC	3
43	05454A011	Lockwasher		14
44	010300021	Stud		12
45	127-058011-243	Nut		15
46	016640011	Pipe Plug		2
47	013450001	Relief Fitting		2
48	009750111	Snap Ring		1
49	009740041	Snap Ring		1
50	019410002	Support Foot		1
51	005700051	Bolt		8
52	010900021	Lip Seal	SC	1
53	019421115	Shaft w/Stud		1
54	009750081	Snap Ring		1
55	062050001	Grease Fitting		1
56	052190001	Cover		2
57	019400002	Bearing Cap		1
58	000650121	Bearing		1
59	001500181	O-ring	SC	1
60	019390012	Bearing Housing		1
61	071670031	Bearing		1
62	052180001	Grease Fitting Straight		1
63	019370012	Seal Housing		1

Item	Eng. No.	Part Description		Qty.
64	001010111	Bolt		4
65	029220011	Stat-O-Seal	SC	4
66	042430032	Lip Plate, Imp Dia 12-3/4"		1
	019360092	Lip Plate, Imp Dia 12-1/4"		1
	019360082	Lip Plate, Imp Dia 11-3/4"		1
	019360122	Lip Plate, Imp Dia 11-1/4"		1
	019360132	Lip Plate, Imp Dia 10-3/4"		1
	019360142	Lip Plate, Imp Dia 10-1/4"		1
67	010240041	Stud		4
68	19109A030	Nut		2
69	008950002	Clamp Arm		2
70	126120005	Flap Valve Assy		1
71	002410101	O-ring	SC	2
72	008940002	Inspection Cover		2
73	045800011	Drive Screw		4
74	019190002	Volute		1
75	015950021	Discharge Flange 6" Threaded		1
76	105250081	Cap Screw		1
77	011240021	Jam Nut		3
78	006280371	Shim		1
79	19109A013	Nut		1
80	001560471	Washer		1
81	126090011	Hinge – Flap Valve		1
82	131530001	Gasket – Suction Flange		1
83	134840021	Sleeve		2
84	001560491	Washer		4
	517000497	Seal Kit		1
	517003497	Carbide Seal Kit		1

Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit
**Impellers cannot be trimmed. Trim sizes must come from the factory.

60MPH Parts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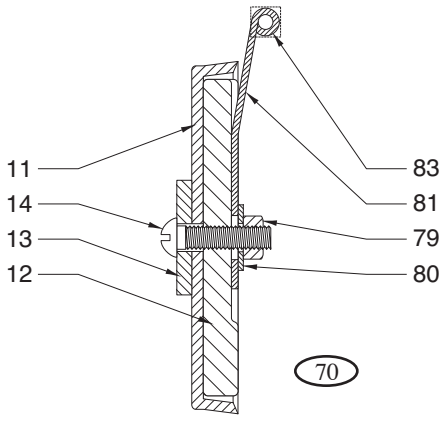
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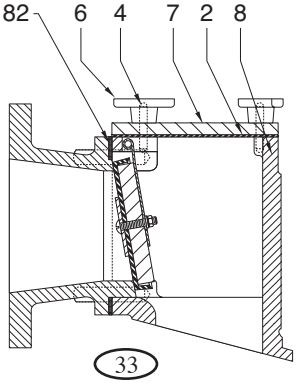
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Pentair Hydromatic® warrants its products against defects in material and workmanship for a period of 12 months from the date of shipment from Pentair Hydromatic or 18 months from the manufacturing date, whichever occurs first – provided that such products are used in compliance with the requirements of the Pentair Hydromatic catalog and technical manuals for use in pumping raw sewage, municipal wastewater or similar, abrasive-free, noncorrosive liquids.

During the warranty period and subject to the conditions set forth, Pentair Hydromatic, at its discretion, will repair or replace to the original user, the parts that prove defective in materials and workmanship. Pentair Hydromatic reserves the right to change or improve its products or any portions thereof without being obligated to provide such a change or improvement for prior sold and/or shipped units.

Start-up reports and electrical schematics may be required to support warranty claims. Submit at the time of start up through the Pentair Hydromatic website: http://forms.pentairliterature.com/startupform/startupform.asp?type=h. Warranty is effective only if Pentair Hydromatic authorized control panels are used. All seal fail and heat sensing devices must be hooked up, functional and monitored or this warranty will be void. Pentair Hydromatic will cover only the lower seal and labor thereof for all dual seal pumps. Under no circumstance will Pentair Hydromatic be responsible for the cost of field labor, travel expenses, rented equipment, removal/reinstallation costs or freight expenses to and from the factory or an authorized Pentair Hydromatic service facility.

This limited warranty will not apply: (a) to defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with the printed instructions provided; (b) to failures resulting from abuse, accident or negligence; (c) to normal maintenance services and parts used in connection with such service; (d) to units that are not installed in accordance with applicable local codes, ordinances and good trade practices; (e) if the unit is moved from its original installation location; (f) if unit is used for purposes other than for what it is designed and manufactured; (g) to any unit that has been repaired or altered by anyone other than Pentair Hydromatic or an authorized Pentair Hydromatic service provider; (h) to any unit that has been repaired using non factory specified/ OEM parts.

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