VERTICAL PUMP MANUAL

for

STINGRAY

PARTS WASHER

Carver
Creating Value.

TABLE OF CONTENTS

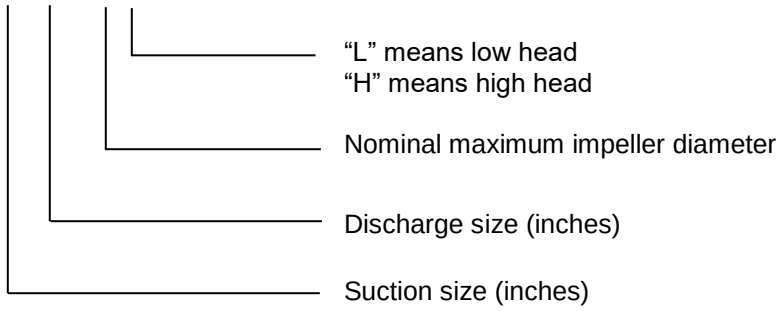
I. GENERAL DESCRIPTION AND SAFETY PRECAUTIONS.

A. GENERAL DESCRIPTION. The Vertical Pump is designed for the industrial washer application.

The pump is flexible coupled to a constant speed motor. The pump and motor are mounted on a structural steel baseplate. The pump end consists of a casing, shaft, impeller, backhead, suction head, column, baseplate, discharge piping, bearing frame, and bearings. The bearing frame supports the bearings above the solution tank, thereby preventing contamination of the bearings. Bearings are also protected from fluid and vapors by bearing cap and lip seals.

B. PUMP IDENTIFICATION. Use the following example for identifying information about your pump model number.

3 X 2 X 10H



C. NAMEPLATE. A nameplate is attached to each pump. The data on the nameplate should be recorded and filed for easy reference. Nameplate data should be furnished when ordering replacement parts or requesting information. Record pump serial number and model number on the lines below.

Pump Serial Number _____

Model Number _____

D. SAFETY PRECAUTIONS. This manual contains descriptions and instructions, which are the results of carefully conducted engineering and research efforts. The manual is designed to provide adequate instructions for the safe and efficient installation, operation, or maintenance of the pump. Failure or neglect to properly install, operate, or maintain the pump may result in personal injury, property damage, or unnecessary damage to the pump.

Observe all caution or danger tags attached to the equipment or included in this manual.

CAUTION

IMPORTANT SAFETY NOTICE

Various federal, state, and local laws and the regulations concerning OSHA affect installation, use, and operation of pumping equipment. Compliance with such laws relating to the proper installation and safe operation of pumping equipment is the responsibility of the equipment owner. All necessary steps should be taken by the owner to assure compliance with such laws before operating the equipment.

II. INSPECTION AND STORAGE.

A. INSPECTION. Upon receipt of the shipment, unpack and inspect the pump, motor assemblies, and individual parts to insure none are missing or damaged. Carefully inspect all boxes and packing material for loose parts before discarding them. Immediately report to the factory and to the transportation company if there are any missing or damaged parts incurred during shipment and file a "damage and/or lost in shipment" claim with the carrier.

B. STORAGE OF PUMP. If the pumping unit and/or parts are not immediately installed and operated, store the equipment in a clean, dry, well-ventilated place, free from vibrations, moisture, and rapid or wide variations in temperature.

Grease Lubricated Pump. Rotate the shaft for several revolutions at least once per month to coat the bearings with lubricant, retard oxidation and corrosion, and prevent possible false brinelling.

Consider a unit to be in storage when:

1. The pump has been delivered to the job site and is waiting to be installed.
2. The pump has been installed but operation is delayed pending completion of construction.
3. There are long (30 days or more) periods between operating cycles.
4. The plant (or department) is shut down for periods of longer than 30 days.

NOTE

Storage requirements vary depending on climatic environment, length of storage, and equipment. For storage periods of three months or longer, contact a representative from Carver Pump Company for specific instructions. Improper storage will damage equipment and will require non-warranty restoration and/or non-warranty product failures.

III. INSTALLATION.

Personnel who possess general training in the operation and maintenance of centrifugal pumps should install the pump. The pumps should be installed in accordance with good safety and machinery practices. Faulty installation will result in operating troubles and premature wear of parts.

After ascertaining the unit has suffered no damage in transit, the pumping unit can be installed. Proceed as follows:

CAUTION

To lift pumping unit, use a hoist or device with suitable lifting capacity. Do not pick up the complete unit by the motor or pump shaft. The motor alone may be lifted using the motor lifting eyes.

1. Make sure the mounting frame is level and clean and free of debris. Install pump into reservoir and bolt to mounting frame. Rotate the shaft by hand to verify that the pump rotates freely.
2. Connect piping. Extreme care should be taken when connecting new piping to ensure that no foreign matter such as dirt, chips, tools, etc., is in the piping, tank, or return piping as this will cause debris to draw into the pump and cause excessive damage. Any debris caught in the pump passageways will throw the pumping unit out of balance.

CAUTION

Ensure piping does not strain pump. Strain may cause misalignment. To ensure proper alignment, check pump shaft for freedom of rotation after installing and tightening piping.

3. Connect any necessary auxiliary piping and gauge lines.
4. Since the pumping unit is shipped with bearings greased, initial greasing is not necessary unless pumping unit has been in storage for an extended period of time.
5. Install motor on pump intermediate and install shaft coupling to connect pump shaft and motor shaft. Turn pump and motor shafts by hand to ensure free rotation. Attach coupling guard. Do NOT operate pump without guard in place.
6. Connect wiring to motor. Due to high voltage required to operate the pumping unit, personnel working with the equipment should be familiar with electrical safety practices and modern methods of resuscitation. Methods of modern resuscitation may be obtained from the Bureau of Medicine and Surgery.
7. Connect electrical power supply to motor.
8. Open system valves, if supplied.

IV. ALIGNMENT.

A flexible coupling connects the pump and motor. The pump intermediate (#61) motor bracket aligns the pump shaft and motor shaft.

V. OPERATION.

A. PRE-START CAUTIONS.

1. Before starting or operating the pump, read this entire manual, especially the following instructions.
2. Before starting the pump, rotate shaft by hand to assure all moving parts are free.
3. Before starting the pump, install closed guards around all exposed rotating parts.
4. Observe all caution or danger tags attached to the equipment.
5. Never run pump dry because the close running fits within the pump are liquid lubricated. Dry running may result in pump seizure.

B. STARTING THE PUMP. Once system valves have been adjusted to the specified pumping conditions, the pumping unit will operate without operator intervention. If problems occur while starting the pump, refer to Table 1, Troubleshooting.

1. Make sure no one is working on the pumping unit.
2. If the pumping unit has been idle for a period of time, make sure the unit is firmly attached to its mounting frame.

CAUTION

Check level of liquid in reservoir to ensure pump casing is under liquid level.

4. Jog starter switch on motor to check that direction of rotation is clockwise when viewed from the top looking downward. Direction of rotation must agree with the arrow stamped on the pump frame or base.
5. Start the pumping unit in accordance with the machine operating directions.
6. If excessive vibration or noise occurs during operation, shut the pump down and consult a representative from STINGRAY Parts Washers or MART Tech Services.
6. Pumping unit is now in full operation.
7. Check amperage draw of motor and compare to the motor nameplate in order to verify proper operation.

C. STOPPING THE PUMP.

1. Stop the pumping unit in accordance with the machine operating directions.
2. The pumping unit is now in the “off” position.

VI. MAINTENANCE.

A. BACKHEAD. The backhead is equipped with a throttle bushing. The inside diameter of the throttle bushing will increase with wear. If the pump is not equipped with a shaft sleeve, the throttle bushing requires replacement if the inside diameter is 1.644 inches (4.176 cm) or greater. If the pump is equipped with a shaft sleeve, the throttle bushing requires replacement if the inside diameter is 1.905 inches (4.839 cm) or greater.

B. BEARING TEMPERATURE. Bearing temperature should be monitored periodically. Normal operating temperatures are 120°F (49°C) to 160°F (71°C), depending on the ambient temperature. Bearings may appear to run hot when pump is first started. The lip seal, not the bearing, causes this to happen. When the seal is seated, temperature should drop to normal.

Check bearing temperature by placing a pyrometer against the bearing frame while pump is running. A temperature above 180°F (82°C) indicates possible damage or wear. The most common cause of high bearing temperature is over greased bearings.

C. BEARING LUBRICATION. Lubrication frequency depends on operating conditions. Normal duty calls for relubrication every 1000 hours of operation or every 6 months. Bearings are lubricated at Carver Pump Company with Mobilith Grease XHP222, which is a lithium complex soap type grease. Only Mobilith Grease XHP222 should be used. On the pump bearing frame, both bearings require grease.

To relubricate bearings, use the following procedure:

CAUTION

Over greasing creates heat and can damage the bearings. Do NOT over grease.

1. Never relubricate pump bearings while unit is running. If necessary, shut down pump in accordance with section V, Operation.

CAUTION

Care must be taken to avoid excess pressure which may damage the lip seal.

2. Remove bearing frame and cap plugs opposite of the fittings prior to lubricating.
3. Using a hand-operated grease gun on grease fittings, add approximately one ounce of fresh grease for each bearing until grease exits plug hole on opposite side of fitting. Reinstall For new bearings see Paragraph VIII.C.2 on page 9.
4. Reinstall plugs and fitting caps after lubrication is completed.

Bearing temperature may rise above normal immediately after lubrication, but should stabilize within 4 to 8 hours of operation.

VII. TROUBLESHOOTING.

If you have followed the installation and starting procedures outlined in this manual, the pump should provide reliable service and long life. However, if operating problems occur, significant time and expense will be saved if Table 1, Troubleshooting, is used to eliminate the most common causes of those problems.

Symptom	Probable Cause	Remedy
Failure to deliver liquid.	1. Discharge valve closed. 2. Discharge head above shutoff. 3. Impeller or suction partially clogged. 4. No power. 5. Liquid level in tank too low.	1. Check discharge valve. 2. Call StingRay Customer Care at 888-720-7222 3. Inspect impeller and suction pipe and clean. 4. Check power connection to motor. Check overloads 5. Add liquid to system.
Reduced capacity and/or pressure.	1. Discharge valve closed. 2. Damaged impeller. 3. Impeller or suction pipe partially clogged. 4. Liquid level in tank too low. 5. Total head too high. 6. Wrong rotation. 7. Speed too low. 8. Discharge piping loose. 9. Worn throttle bushing. 10. Worn swivel joint.	1. Check discharge valve. 2. Replace impeller. 3. Inspect impeller and suction pipe and clean. 4. Add liquid to system. 5. Call StingRay Customer Care at 888-720-7222. 6. Switch power connections to motor. 7. Wrong RPM Motor. 8. Check, inspect, tighten. 9. Check, inspect, replace 10. Check, inspect, replace.
Pump surges.	1. Liquid level in tank too low. 2. Solution is too hot. 3. Solution is too viscous.	1. Add liquid to system. 2. Lower solution temperature. 3. Drain and clean machine.
Pump loses prime after starting.	1. Liquid level in tank too low. 2. Solution is too hot.	1. Add liquid to system 2. Lower solution temperature.
Overload on motor.	1. Head lower than that for which pump is designed. 2. Mechanical defects of pump or motor such as bent shaft, binding or rubbing rotating element. 3. Liquid handled of higher specific gravity or lower viscosity than intended application. 4. Excess liquid being pumped. 5. Worn nozzles. 6. Worn throttle bushing. 7. Worn swivel joint.	1. Call StingRay Customer Care at 888-720-7222. 2. Replace defective parts or replace pump or motor. 3. Clean out and Change solution. 4. Call StingRay Customer Care at 888-720-7222. 5. Check, inspect, replace. 6. Check, inspect, replace. 7. Check, inspect, replace.
Insulation failure.	1. Oil or water soaked windings. 2. Excessive vibration.	1. Disassemble motor, clean and dry windings. 2. Refer to “vibrates or is noisy.”

Table 1: Troubleshooting

Symptom	Probable Cause	Remedy
Insulation failure. (cont.)	3. Wrong voltage.	3. Check voltage at motor terminals.
Vibrates or is noisy.	1. Insufficient or insecure pump mounting. 2. Mechanical defects of pump or motor such as bent shaft, binding rotating element, or warped impeller. 3. Foreign matter in pump impeller. 4. Strain due to piping or improper piping supports. 5. Misalignment. 6. Damaged bearings. 7. Throttle bushing is worn. 8. Impeller loose. 9. Cavitation.	1. Check reservoir pump mounting frame and bolt tightness. 2. Replace defective parts or replace pump or motor. 3. Disassemble pump. Clean and replace damaged parts. 4. Check piping alignment and remove piping weight from pump with proper supports. 5. Align pump and motor as outlined in section IV of this manual. 6. Replace bearings. 7. Replace throttle bushing. 8. Disassemble pump in accordance with section VIII. Inspect parts and replace damaged parts. 9. Clean suction screen or reduce operating temperature, if problem persists disassemble pump and inspect.
Rapid wear of coupling spider.	1. Misalignment. 2. Bent shaft.	1. Align pump and motor as outlined in section IV, Alignment. 2. Replace shaft.

Table 1: Troubleshooting (cont.)

VIII. DISASSEMBLY AND REASSEMBLY.

After extended operation, it may be difficult to separate some components. Rust solvent may be used and suitable extricating tools where possible. Use hammers with plastic or rubber heads; hammers with metal heads can damage the pump. Hoisting equipment should be used for lifting heavy parts. It is recommended that safety shoes and safety glasses be worn while working on this equipment.

A. DISASSEMBLY. During disassembly, match mark parts so they can be replaced in their original position and orientation.

1. Disconnect, lock out, and tag electrical power supply to motor. Disconnect motor wiring at motor.
2. Drain reservoir. As necessary, flush pump to remove corrosive or toxic liquids.
3. Disconnect discharge piping.
4. Remove hex bolts, nuts, and washers securing guard plates to intermediate (61). Remove guard plates.
5. Disconnect shaft coupling (70).
6. Remove bolts (65) attaching motor. Remove motor.

CAUTION

Use a hoist or suitable lifting device with adequate lifting capacity to lift motor. Do not pick up the complete pump and motor unit by the motor or pump shaft. The motor alone may be lifted using the motor lifting eyes.

7. Remove nuts, washer, and mounting bolts from the pump mounting plate. Lift the pump and mounting plate out of the tank and place in a suitable work area.

CAUTION

To lift pumping unit, use a hoist or device with suitable lifting capacity. Do not pick up the complete pump by the pump shaft.

8. Remove nuts (64) and capscrews (63) securing intermediate (61) to bearing frame (30). Remove intermediate (61).
9. Remove capscrews (10) and washers (38) securing suction head (3) to casing (2). Remove suction head (3). Remove suction head gasket (5).
10. Remove impeller capscrew (A4) and impeller washer (A1).
11. Remove impeller (1) from end of shaft (33) by hand. If impeller does not come off easily try using two pry bars and **gently** prying on inside of suction eye. Warning: If you pry too hard you can break the impeller. If the impeller does not come off easily then remove capscrews (35) and washers (37) from backhead (6) and tap backhead (6) gently to drive impeller (1) off shaft (33). Remove impeller key (A2). DO NOT HIT IMPELLER WITH A HAMMER - IT WILL BREAK.
12. Remove capscrews (10) and washers (38) securing backhead (6) to casing (2). Remove casing (2) from pumping unit.
13. Remove capscrews (35) and washers (37) securing column (31) to backhead (6). Remove backhead (6). Remove backhead o-ring (G16).
14. Remove shaft sleeve (34), if equipped.

NOTE

If throttle bushing (B3) is METAL, locking ring (B1) and capscrews (B4) are required. Setscrews (B5) are not required. (Note: Drawing shows (B5) pointing to cap screws – Drawing needs updating)

15. If METAL throttle bushing (B3) needs to be replaced, remove capscrews (B4) securing locking ring (B1) to backhead (6). If equipped with NON-METAL remove capscrews (B4) securing locking ring (B1) to backhead (6) remove locking ring (B1) remove setscrews (B5) and separate throttle bushing (B3) from locking ring (B1).
16. Loosen, but do not remove, setscrews (B6) in slinger (B2). Remove slinger (B2).
17. Remove capscrews (G9) securing bearing cap (G1) to bearing frame (30).
18. Pull shaft (33) and bearings from inboard side (motor coupling side/top side) of pumping unit.
19. Loosen set screws in coupling hub (70) and using a puller, remove hub from shaft (33). Remove coupling key (G11).
20. Remove bearing cap (G1) from shaft (33).
21. Un-crimp bearing lockwasher (G13). Un-screw bearing locknut (G4) and remove bearing lockwasher (G13).
22. Using a bearing press or bearing puller, remove radial bearing (G3) and thrust bearing (G2) from shaft (33).
23. Remove lip seals (G5) from ring (71) and bearing frame (30). Remove lip seal (G6) from bearing cap (G1).

B. PARTS INSPECTION.

1. After disassembly, all parts should be thoroughly cleaned and inspected. Damaged or worn parts should be replaced with new ones. All sealing faces should be perfectly clean. It is

recommended that lip seals, bearings, gaskets, and o-rings be replaced with new components.

2. Inspect inside diameter of the throttle bushing (B3). The inside diameter of the throttle bushing (B3) will increase with wear. If the pump is not equipped with a shaft sleeve, the throttle bushing requires replacement if the inside diameter is 1.644 inches (4.176 cm) or greater. If the pump is equipped with a shaft sleeve, the throttle bushing requires replacement if the inside diameter is 1.905 inches (4.839 cm) or greater.
3. If pump is not equipped with shaft sleeve, inspect the shaft diameter in the throttle bushing area. If the shaft diameter is 1.605 inches (4.077 cm) or less, replace the shaft. If the pump is equipped with shaft sleeve, inspect outside diameter of sleeve. If shaft sleeve outside diameter is 1.855 inches (4.712 cm) or less, replace shaft sleeve. On new components both the shaft sleeve and the shaft have a constant diameter everywhere in the throttle bushing area.
4. On the impeller, check the clearance as follows:
    a. Measure outside diameter of impeller (1) eye wear surface in three locations 120 degrees apart. The impeller eye is the ring on the suction end of the impeller opposite of the shaft hub. It is sometimes referred to as the “nose".
    b. Measure inside diameter of suction head (3) wear surface in three locations 120 degree apart.
    c. If difference between high reading of inside diameter of the suction head (3) and low reading of outside diameter of impeller (1) wear surface exceeds double the maximum clearances given in Table 2, replace suction head (3) and impeller (1).
    5. On bearing column (30) measure the inside diameter at the lower bearing (G3) location. Replace column if diameter exceeds .003” greater than outside diameter of new bearing
    6. Measure inside diameter of upper bearing G12 cartridge replace if greater than 3.5438 inches (9.001 cm). (This may differ for our HD pump--please call for specs)
    7. Measure inside diameter of bearing frame at upper bearing cartridge – replace if frame diameter exceeds 4.312 inches (10.952 cm). (This may differ for our HD pump--please call for specs)
    8. Inspect shaft at bearing locations. Replace shaft if inner race of bearings have “spun” on shaft. New bearings will not have sufficient press fit if bearings have spun on shaft.

Model(Suction x Discharge x Maximum Impeller Diameter)	FACTORY STANDARD DIAMETRIC CLEARANCE BETWEEN IMPELLER SUCTION CONE OD VS SUCTION HEAD ID	
	Minimum (inches)	Maximum (inches)
3 x 2 x 10H	0.012	0.017
5 x 4 x 11	0.016	0.021

Table 2: Enclosed Impeller Clearance

C. REASSEMBLY OF PUMP. During reassembly, return parts to their original position. Tighten nuts and bolts to the values listed in Table 5, Recommended Torque Values.

1. Install new lip seals (G5) in column (31) and bearing frame (30). Install new lip seals (G6) in bearing cap (G1).
2. Pack new bearings half full with Mobilith Grease XHP222. Press new radial bearing (G3) on shaft (33). Press thrust bearing (G2) in bearing cartridge (G12). Note: the amount of lubricant required is about 3 ounces for the upper bearing and 1-1/2 ounces for the lower bearing by weight.
3. Install bearing lockwasher (G13). Install and tighten bearing locknut (G4). Re-crimp bearing lockwasher (G13).
4. Install bearing cap (G1) and secure with capscrews (G9).
5. Install coupling key (G11). Install coupling hub.
6. Install shaft (33) through bearing frame (30).

CAUTION

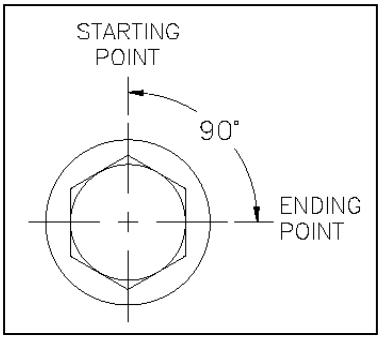
Take special care to avoid damaging seals. Lubricate seal lips and shaft before sliding shaft through seals. If seals are damaged, replace with new seals.

7. Install slinger (B2) on shaft (33) and secure with setscrews (B6).

8. If throttle bushing (B3) was removed, press new throttle bushing (B3) into backhead with a hydraulic press until the throttle bushing (B3) is flush with backhead (6).
9. Install locking ring (B1). If equipped with non-metal throttle bushing, use a ¼-20 NC-2 tap to tap drill through setscrew (B5) holes and tap throttle bushing (B3).
10. If equipped with non-metal bushing, insert setscrews (B5) through locking ring (B1) into throttle bushing (B3).
11. Install shaft sleeve (34), if equipped.
12. Install new backhead o-ring (G16) on backhead (6). Install backhead (6) on column (31) and secure with capscrews (35) and washers (37).
13. Lubricate the edge of the casing and Install casing (2) past o-ring and secure to backhead (6) with washers (38) and capscrews (10).
14. Install impeller key (A2). Install impeller (1) and secure with impeller washer (A1) and impeller capscrew (A4). Tighten capscrew to torque value shown in Figure 1. Proper torque is critical – if the capscrew is not properly torqued, the impeller may come loose and do severe damage to the pump. Use a strap wrench or a crescent wrench over the keyway to hold the shaft while tightening. Do not use a pipe wrench or try to jam the impeller with a screw driver while tightening. Holding the impeller by the vanes may break it.

Torque the impeller cap-screw as shown below.

Impeller Cap Screw & Washer



Torque Capscrew – ¼ turn

Fig 1: Impeller Cap Screw Torque Method

Follow these instructions for installation of the impeller cap-screw

1. Install the flange head capscrew with washer into the shaft with Loctite 262. Hand-tighten the screw until it is snug in the shaft and clamps the impeller washer tightly. Then, tighten the capscrew ¼ turn (90°), approximately 80-90 ft-lbs.
2. To ensure proper seating, loosen the capscrew, re-snug and retighten the capscrew ¼ turn (90°).

Use Loctite 262 Red when installing capscrew

NOTE

Use Loctite 262 Red when installing capscrew.

15. Install new suction head gasket (5) on suction head (3). Install suction head (3) and secure to casing (2) with lock washers (38) and capscrews (10).
16. Remove lifting eyes from casing (2). Install pipe plugs (11).

CAUTION

Use a hoist or suitable lifting device with adequate lifting capacity to lift motor and intermediate.

17. Install pumping unit into reservoir. Secure base to reservoir frame with lockwashers, nuts and capscrews.
18. Install intermediate (61) and motor on pumping unit. Secure intermediate (61) to bearing frame (30) with nuts (64) on capscrews (63).
19. Reconnect coupling.
20. Install guard plates and secure to intermediate (61) with capscrews and washers.

CAUTION

To lift pumping unit, use a hoist or device with suitable lifting capacity. Do not pick up the complete unit by the motor or pump shaft. The motor alone may be lifted using the motor lifting eyes.

21. Reconnect discharge piping.

CAUTION

Ensure discharge piping does not put strain on pump. Strain may cause misalignment. To ensure proper alignment, check pump shaft for freedom of rotation after installation of discharge piping.

23. Reconnect wiring to motor. Reconnect electrical power supply to motor. Fill machine with water and pump start pump.
24. Check for proper rotation direction of pump.
25. Rotate pump and motor by hand to ensure there is no binding or rubbing.

IX. STINGRAY PUMP 20-70HP PARTS LIST.

A. PARTS ORDERING. When ordering parts, please provide the following information:

1. Serial number of pump (located on nameplate).
2. Size of pump (2 X 3 X 10 or 4 x 5 x 11)
3. Part description (located on parts list on the following pages).
4. Part number (located on parts list).
5. Quantity of parts needed.

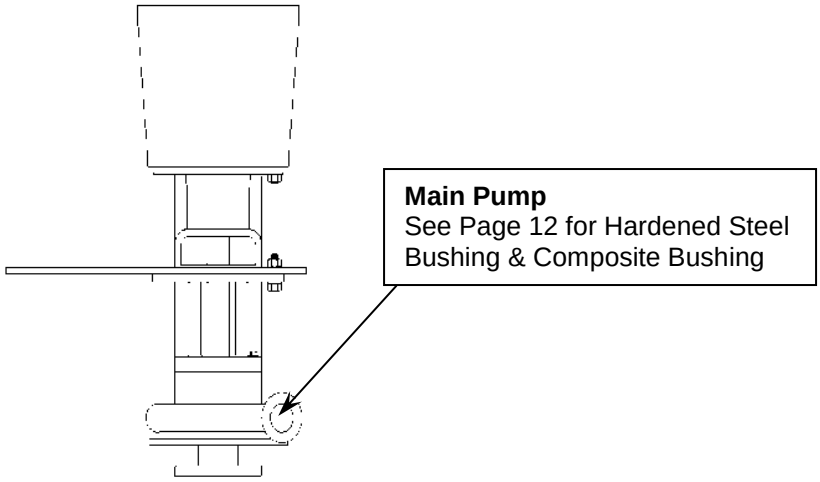
For replacement parts contact:

StingRay Customer Care
2450 Adie Road
Maryland Heights, MO, 63043
www.marttechservices.com

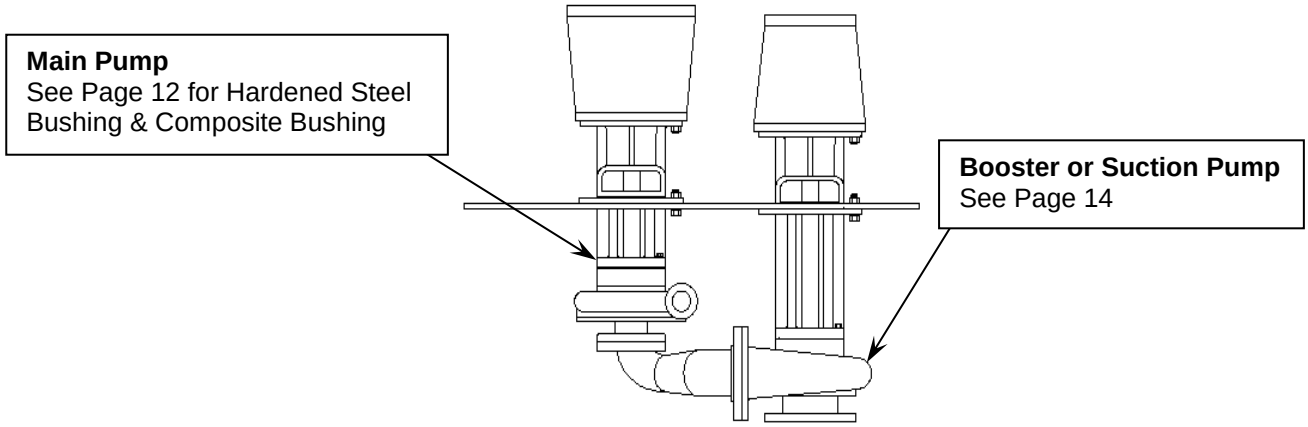
Toll-free: 888-720-7222
Switchboard: 314-567-3705
Fax: 314-567-6318
Email: patrickl@marttechservicers.com

If motor or motor parts are required, please specify name of manufacturer, horsepower, and frame size from motor nameplate.

B. PARTS DESCRIPTIONS & DRAWINGS. To determine the proper drawing to reference, determine if you have a simplex pump (single wash pump) or a duplex pump (suction pump feeding main wash pump). Refer to the following figures:



Simplex (Single) Pump System



Duplex (Dual) Pump System

In some applications, the pump may have been upgraded to fit your cleaning needs. These options may include:

- 1531 Frame Heavy-duty Main Pump
- 1530 Frame Chemical Pump w/ SS Shafts and Viton seals for corrosive chemical applications such as CEEBEE 300LF

Please use the following drawings to identify the parts except for the bearing frame, cartridges, caps, shafts, seals, and bearings. Please call StingRay Customer Care at 888-720-7222 for information on these parts.

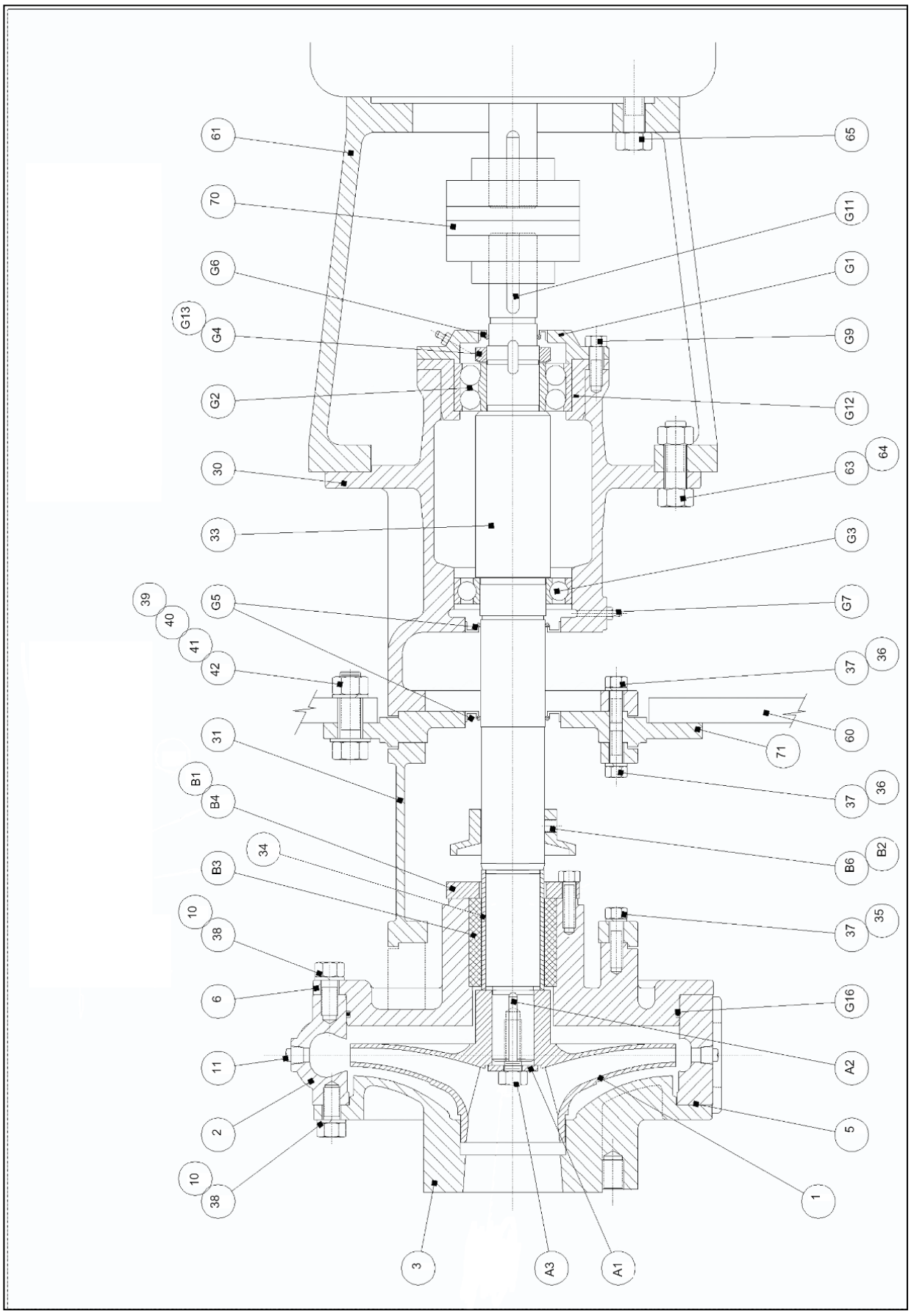


Fig. 2 3x2x10 Main Pump Cut Away 1530 Frame Hardened Steel Throttle Bushing

3x2x10 Main Pump 1530 Frame Hardened Steel/Composite Throttle Bushing w/Sleeve				
Sym	**Part #**	**PART DESCRIPTION**	**Part #**	**Kit**
			30220	“A” Kit
1	“A” Kit	Impeller	30281	“B” Kit STL
2		Volute	85170	“B” Kit COM
3	“A” Kit	Suction head	51173	“C” Kit
4	“A” Kit	Gasket (suction head)		
6	53037	Backhead		
10		½”-13 Capscrew (suction head and backhead-Volute)		
11		Plug (casing)		
30	30300	Bearing frame 1530 (Call for 1531 HD Pump)		
31	52306	Column		
33	53203	Shaft (Call for 1531 HD & SS Pump)		
34	“B” Kit	Shaft sleeve		
35		3/8”-16 Capscrew (column-backhead)		
36		3/8”-16 Capscrew (frame-column)		
37		3/8” Lockwasher (column-backhead, column-base)		
38		½” Lockwasher (suction head and backhead-Volute)		
39		¾”-10Capscrew (column-base)		
40		¾” Hex nut (column-base)		
41		¾” Washer (column-base)		
42		¾” Lockwasher (column-base)		
60		Baseplate		
61	52395	Intermediate 15HP-20HP		
	52390	Intermediate 30HP		
	52392	Intermediate 40HP-50HP		
63		¾”-10 Hex head bolt (frame-intermediate)		
64		¾”-10 Hex nut (frame-intermediate)		
65		¾”-10 Hex head bolt (motor-intermediate)		
70	71919	Coupling 30HP		
70	72556	Coupling 40-50HP		
71		Ring		
A1	“A” Kit	Impeller washer		
A2	“A” Kit	Impeller key		
A5	“A” Kit	5/8”-11Impeller Bolt		
B1	“B” Kit	Locking ring		
B2	“B” Kit	Slinger		
B3	“B” Kit	Throttle bushing		
B4	“B” Kit	3/8”-16 Capscrew (locking ring-backhead)		
B6	“B” Kit	Setscrew (slinger)		
G1	53044	Bearing cap (Call for 1531 HD Pump)		
G2	"C" Kit	Thrust bearing (Call for 1531 HD Pump)		
G3	"C" Kit	Radial bearing (Call for 1531 HD Pump)		
G4	“C” Kit	Bearing locknut (Call for 1531 HD Pump)		
G5	“C” Kit	Lip seal (frame) (Call for 1531 HD & SS Pump)		
G6	"C" Kit	Lip seal (bearing cap) (Call for 1531 HD Pump)		
G7		Grease zerk		
G9		3/8”-16 Hex head bolt (bearing cap-frame)		
G10		Plug		
G11		Coupling key		
G12	53045	Bearing cartridge (Call for 1531 HD Pump)		
G13		Bearing lockwasher		
G16	46790	O-ring		

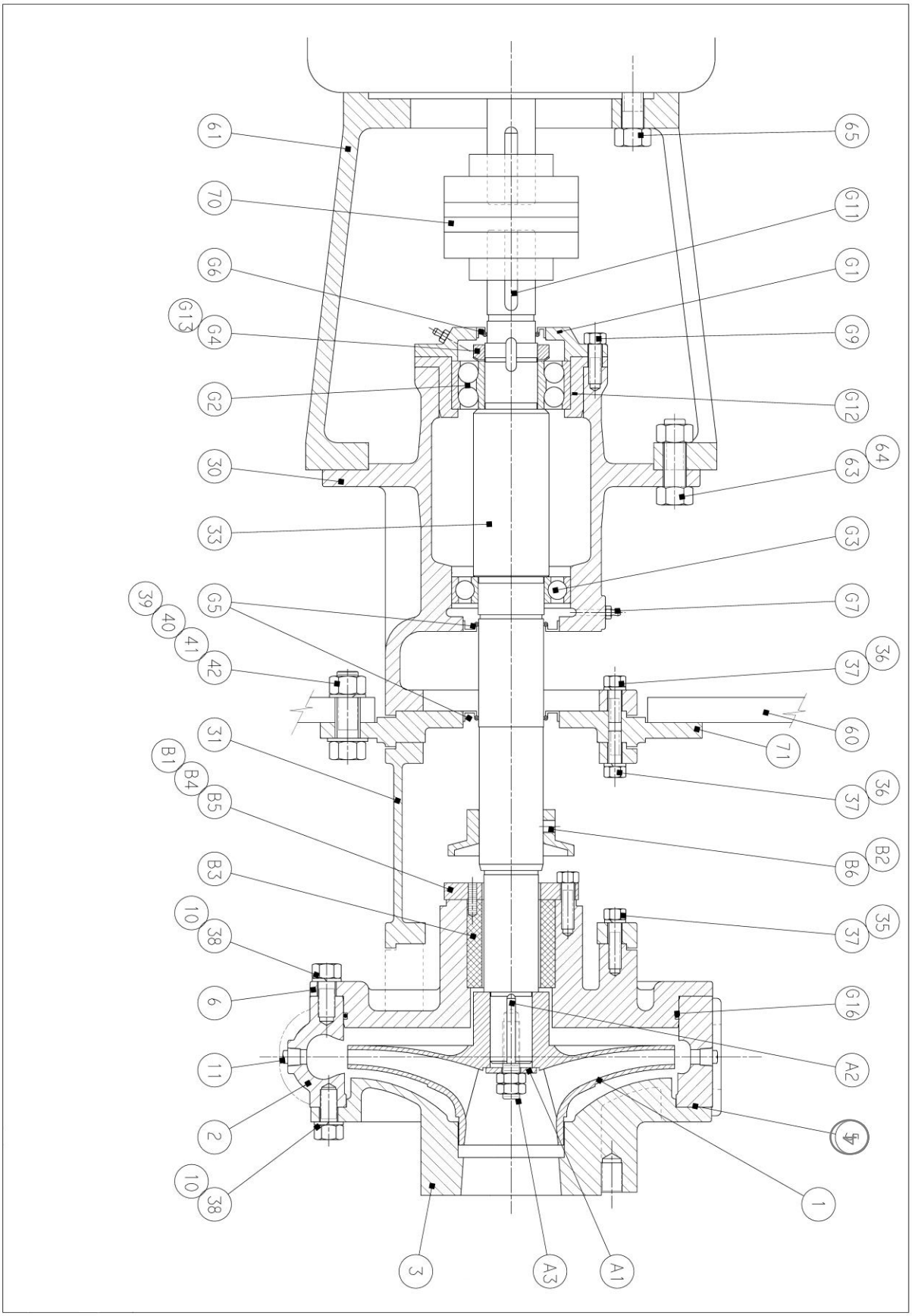


Fig. 3: 4x5x11 Booster Pump Cut Away 1530 Frame Composite Throttle Bushing

4x5x11Booster Pump 1530 Frame Composite Throttle Bushing w/o Sleeve		
Sym	**Part #**	**PART DESCRIPTION**
1	“A” Kit	Impeller
2		Volute/ Backhead
3	“A” Kit	Suction head
4	“A” Kit	Gasket (suction head)
10		½”-13 Capscrew (suction head--volute/backhead)
11		Plug (casing)
30	30300	Bearing frame
31	52306	Column
33	51174	Shaft
35		3/8”-16 Capscrew (column-backhead)
36		3/8”-16 Capscrew (frame-column)
37		3/8” Lockwasher (column-backhead, column-base)
38		½” Lockwasher (suction head -Volute)
39		¾”-10Capscrew (column-base)
40		¾” Hex nut (column-base)
41		¾” Washer (column-base)
42		¾” Lockwasher (column-base)
60		Baseplate
61	52395	Intermediate 15HP-20HP
	52390	Intermediate 30HP
	52392	Intermediate 40HP-50HP
63		¾”-10 Hex head bolt (frame-intermediate)
64		¾”-10 Hex nut (frame-intermediate)
65		¾”-10 Hex head bolt (motor-intermediate)
70	72555	Coupling
71		Ring
A1	“A” Kit	Impeller washer
A2	“A” Kit	Impeller key
A5	“A” Kit	5/8”-11Impeller Bolt
B1	“B” Kit	Locking ring
B2	“B” Kit	Slinger
B3	“B” Kit	Throttle bushing
B4	“B” Kit	3/8”-16 Capscrew (locking ring-backhead)
B5	“B” Kit	Setscrew (locking ring-bushing,)
B6	“B” Kit	Setscrew (slinger)
G1	53044	Bearing cap
G2	"C" Kit	Thrust bearing
G3	"C" Kit	Radial bearing
G4	“C” Kit	Bearing locknut
G5	“C” Kit	Lip seal (bearing frame, column)
G6	"C" Kit	Lip seal (bearing cap)
G7		Grease zerk
G9		3/8”-16 Hex head bolt (bearing cap-frame)
G10		Plug
G11		Coupling key
G12	53045	Bearing cartridge
G13		3/8” Bearing lockwasher

Part #	**Kit**
30230	“A” Kit
30280	“B” Kit
51173	“C” Kit
52238	Gasket Kit

Optional Upgrade:	
Harden Steel Bushing	
30281	“B” Kit
51804	Shaft

Bolt Size	Material Torque Value ft-lbs	
	Steel (or otherwise noted)	*316 Stainless Steel*
¼”-20	5	7
5/16”-18	11	12
3/8”-16	18	21
½”-13	39	45
5/8”-11	83	97
¾”-10	105	132
7/8”-9	160	203
1”-8	236	300

Table 3: Recommended Torque Values (except for impeller capscrew)

STINGRAY Pump Repair Kits & Application Upgrades

Please reference the appropriate exploded view drawing to verify the correct part number for your application.

A Kit Main Pump 20-50 hp
Impeller (1) trimmed to size
Suction Head (1)
Volute Gasket (1)
Bolts (8)
Impeller Bolt (1)
Impeller Washer (1)
Impeller Key (1)
O-Ring (1)

1530-30220

B Kit Main Pump 15-50 hp
Composite Throttle Bushing (1)
Shaft Sleeve SS (1)
Step Key SS (1)
Locking Ring (1)
Slinger (1)
Hex Bolts (2)
Set Screws (2)

1530-85170

B Kit Main Pump 15-50 hp
Throttle Bushing Hardened Steel (1)
Shaft Sleeve SS (1)
Step Key SS (1)
Locking Ring (1)
Slinger (1)
Hex Bolts (2)
Set Screws (2)

1530-30281

C Kit Main Pump 15-50 hp
Oil Seal (1)
Viton Seal (2)
Radial Bearing (1)
Thrust Bearing (1)
Bearing Locking Nut (1)

1530-51173
1531 HD-85240

Main Pump 20-50 hp Shaft s are available in several different options of material and use. W/ indicates the use of a shaft sleeve in the application.

1530 w/ -53203
1530 w/o-50489
1530 SS w/-30334
1531 HD w/-85241

A Kit Booster Pump 15-20 hp
Impeller (1) trimmed to size
Suction Head (1)
Volute Gasket (1)
Bolts (12)
Impeller Bolt (1)
Impeller Washer (1)
Impeller Key (1)
O-Ring (1)

1530-30230

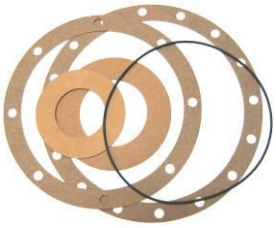
B Kit Booster Pump 15-50 hp
Composite Throttle Bushing (1)
Step Key (1)
Locking Ring (1)
Slinger (1)
Locking Ring Set Screw (2)
Hex Bolts (2)
Set Screws (2)

1530-30280

1530-51174

Booster Pump 15-20 hp Shaft

1530-30335



Duplex Gasket Kit

1530-52238

Viton Lip Seals
Stainless Steel Housing

1530 SS-30425

STINGRAY Pump Motor Couplings

Assy,Pump Coupling,15&20hp
1 Coupling 1-3/8
1 Coupling 1-5/8
1 Insert

72555

Assy,Pump Coupling,30hp,Simplex
1 Coupling 1-3/8
1 Coupling 1-5/8
1 Insert
1 Collar

71919

Assy,Pump Coupling,40&50hp
1 Coupling,1-3/8
1 Coupling,1-7/8
1 Coupling,Body

72556

Assy,Pump Coupling,40&50hp HD
1 Coupling,1-7/16
1 Coupling,1-7/8
1 Coupling,Body

72551

1-7/16 Pump Side Coupling for Heavy-Duty Pump System.

1531 HD-54706

2450 Adie Road
Maryland Heights, MO 63043
Tele: 888-720-7222 Fax: 314-567-6318
Website: www.marttechservices.com