

OPERATION AND PARTS MANUAL



MODELS **ST2037F** **ST2040TF** **SUBMERSIBLE PUMP** **WITH FLOAT SWITCH**

Revision #2 (04/11/16)

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THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.

ST2037F/ST2040TF Submersible Pump with Float Switch

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NOTICE

Specifications and part numbers are subject to change without notice.

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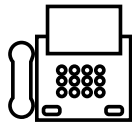
If you have an MQ Account, to obtain a Username and Password, E-mail us at: parts@multiquip.com.

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|---|--|
| <input type="checkbox"/> Dealer Account Number | <input type="checkbox"/> Specify Preferred Method of Shipment: |
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| <input type="checkbox"/> Return Fax Number | <input type="checkbox"/> Ground |
| <input type="checkbox"/> Applicable Model Number | <input type="checkbox"/> Next Day |
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NOTICE

All orders are treated as *Standard Orders* and will ship the same day if received prior to 3PM PST.

WE ACCEPT ALL MAJOR CREDIT CARDS!



SAFETY INFORMATION

Do not operate or service the equipment before reading the entire manual. Safety precautions should be followed at all times when operating this equipment. Failure to read and understand the safety messages and operating instructions could result in injury to yourself and others.



SAFETY MESSAGES

The four safety messages shown below will inform you about potential hazards that could injure you or others. The safety messages specifically address the level of exposure to the operator and are preceded by one of four words: **DANGER**, **WARNING**, **CAUTION** or **NOTICE**.

SAFETY SYMBOLS

! **DANGER**

Indicates a hazardous situation which, if not avoided, **WILL** result in **DEATH** or **SERIOUS INJURY**.

! **WARNING**

Indicates a hazardous situation which, if not avoided, **COULD** result in **DEATH** or **SERIOUS INJURY**.

! **CAUTION**

Indicates a hazardous situation which, if not avoided, **COULD** result in **MINOR** or **MODERATE INJURY**.

NOTICE

Addresses practices not related to personal injury.

Potential hazards associated with the operation of this equipment will be referenced with hazard symbols which may appear throughout this manual in conjunction with safety messages.

Symbol	Safety Hazard
	Burn hazards
	Electric shock hazards
	Rotating parts hazards
	Pressurized fluid hazards

SAFETY INFORMATION

GENERAL SAFETY

CAUTION

- **NEVER** operate this equipment without proper protective clothing, shatterproof glasses, respiratory protection, hearing protection, steel-toed boots and other protective devices required by the job or city and state regulations.



- Avoid wearing jewelry or loose fitting clothes that may snag on the controls or moving parts as this can cause serious injury.
- **NEVER** operate this equipment when not feeling well due to fatigue, illness or when under medication.
- **NEVER** operate this equipment under the influence of drugs or alcohol.



- **ALWAYS** clear the work area of any debris, tools, etc. that would constitute a hazard while the equipment is in operation.
- No one other than the operator is to be in the working area when the equipment is in operation.
- **DO NOT** use the equipment for any purpose other than its intended purposes or applications.

NOTICE

- This equipment should only be operated by trained and qualified personnel 18 years of age and older.
- Whenever necessary, replace nameplate, operation and safety decals when they become difficult read.
- Manufacturer does not assume responsibility for any accident due to equipment modifications. Unauthorized equipment modification will void all warranties.
- **NEVER** use accessories or attachments that are not recommended by Multiquip for this equipment. Damage to the equipment and/or injury to user may result.
- **ALWAYS** know the location of the nearest **fire extinguisher**.
- **ALWAYS** know the location of the nearest **first aid kit**.
- **ALWAYS** know the location of the nearest phone or **keep a phone on the job site**. Also, know the phone numbers of the nearest **ambulance, doctor and fire department**. This information will be invaluable in the case of an emergency.



SAFETY INFORMATION

PUMP SAFETY

DANGER

- **NEVER** operate the equipment in an explosive atmosphere or near combustible materials. An explosion or fire could result causing severe **bodily harm or even death.**



WARNING

- Accidental starting can cause severe injury or death. **ALWAYS** place the ON/OFF switch in the OFF position.
- **DO NOT** place hands or fingers inside pump when pump is running.
- **NEVER** disconnect any **emergency or safety devices.** These devices are intended for operator safety. Disconnection of these devices can cause severe injury, bodily harm or even death. Disconnection of any of these devices will void all warranties.
- **Risk of Electric Shock** - Do not enter the pool or spa if the pump is operating.



CAUTION

- Be careful of discharge hose whipping under pressure.
- **ALWAYS** check pump oil level only when pump is cool. Expansion due to heat may cause hot oil to spray from the oil plug when the oil plug is removed. The possibility of severe scalding may exist.

NOTICE

- **ALWAYS** place the pump in an upright position on a platform before using. The platform will prevent the pump from burrowing itself on soft sand or mud.
- **NEVER** operate pump on its side.
- **DO NOT** allow the pump to freeze in water.
- **NEVER** leave an open pump chamber unattended.
- **ALWAYS** keep the machine in proper running condition.
- **DO NOT** attempt to thaw out a frozen pump by using a torch or other source of flame. Application of heat in this manner may heat the oil in the seal cavity above the critical point, causing pump damage.

- **DO NOT** pump water with a temperature greater than 140°F (60°C).
- **DO NOT** pump liquids containing acid or alkali.
- **ALWAYS** check strainer before pumping. Make sure strainer is not clogged. Remove any large objects, dirt or debris from the strainer to prevent clogging.
- **ALWAYS** use a large basket strainer when pumping water that contains large debris.
- **ALWAYS** flush pump (clean) after use when pumping water concentrated with heavy debris. It is very important to always flush the pump before turning it off to prevent clogging.
- Fix damage to machine and replace any broken parts immediately.
- **ALWAYS** store equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of the reach of children and unauthorized personnel.
- **NEVER** lubricate components or attempt service on a running machine.
- **NEVER** run pump *dry*.
- **ALWAYS** allow the machine a proper amount of time to cool before servicing.
- Keep machine in proper running condition.

ELECTRICAL SAFETY

DANGER

- The electrical voltage required to operate pump can cause severe injury or even death through physical contact with live circuits. **ALWAYS** disconnect electrical power from pump before performing maintenance on pump.



WARNING

- To reduce the risk of electric shock, connect to a circuit protected by a Ground-Fault Circuit-Interrupter (GFCI).
- **Risk of Electric Shock** - This pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle.

SAFETY INFORMATION

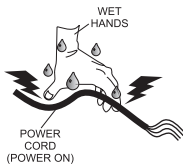
NOTICE

- **ALWAYS** make certain that the voltage supplied to the pump is correct. Always read the pump's nameplate to determine what the power requirements are.

Power Cord/Cable Safety

⚠ DANGER

- **NEVER** stand in water while AC power cord is connected to a live power source.
- **NEVER** use **damaged** or **worn** cables or cords. Inspect for cuts in the insulation.
- **NEVER** grab or touch a live power cord or cable with wet hands. The possibility exists of **electrical shock, electrocution or death.**



- Make sure power cables are securely connected to the motor's output receptacles. Incorrect connections may cause electrical shock and damage to the motor.

⚠ WARNING

- **NEVER** attempt to use the power cord as a lifting or lowering device for the pump.

NOTICE

- **ALWAYS** make certain that proper power or extension cord has been selected for the job. See Cable Selection Chart in this manual.

Grounding Safety

⚠ DANGER

- **ALWAYS** make sure pump is grounded.
- **NEVER** use gas piping as an electrical ground.
- **ALWAYS** make sure that electrical circuits are properly grounded to a suitable earth ground (ground rod) per the National Electrical Code (NEC) and local codes before operating generator. **Severe injury or death by electrocution** can result from operating an ungrounded motor.

Control Box Safety

⚠ DANGER

- **ALWAYS** have a qualified electrician perform the control box installation. The possibility exists of electrical shock or electrocution.

NOTICE

- **ALWAYS** mount control box in a vertical position protected from harsh environmental elements.

LIFTING SAFETY

⚠ CAUTION

- When raising or lowering of the pump is required, always attach an adequate rope or lifting device to the correct lifting point (handle) on the pump.

NOTICE

- **NEVER** lift the equipment while the electric motor is running.

TRANSPORTING SAFETY

NOTICE

- **ALWAYS** shut down pump before transporting.
- **ALWAYS** tie down equipment during transport.

ENVIRONMENTAL SAFETY/DECOMMISSIONING

- **DO NOT** pour waste or oil directly onto the ground, down a drain or into any water source.
- Contact your country's Department of Public Works or recycling agency in your area and arrange for proper disposal of any electrical components, waste or oil associated with this equipment.
- When the life cycle of this equipment is over it is recommended that the pump casing and all other metal parts be sent to a recycling center



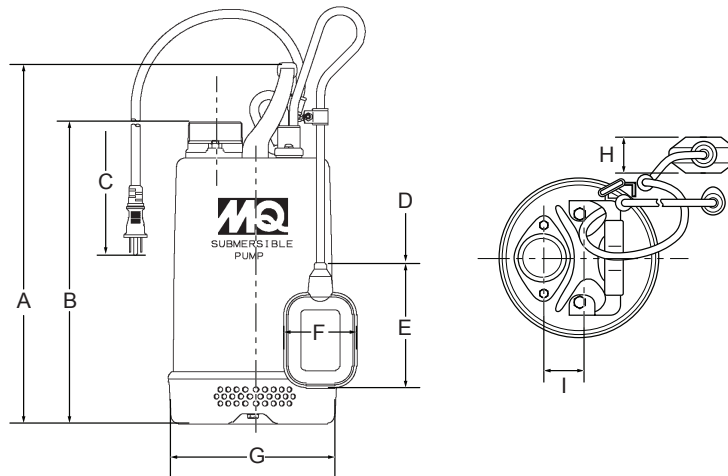
Metal recycling involves the collection of metal from discarded products and its transformation into raw materials to use in manufacturing a new product.

Recyclers and manufacturers alike promote the process of recycling metal. Using a metal recycling center promotes energy cost savings.

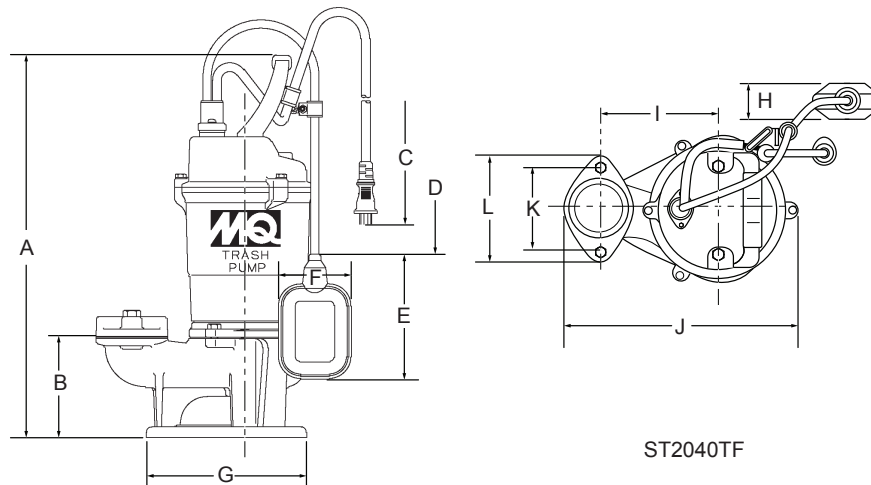
SPECIFICATIONS

Table 1. Specifications (Pump)		
Model	ST2037F	ST2040TF
Type	Centrifugal Submersible Pump	Centrifugal Submersible Pump
Impeller	Nitorile Rubber over Steel	Nitorile Rubber over Steel
Suction & Discharge Size	2.00 in. (50 mm)	2.00 in. (50 mm)
Maximum Pumping Capacity	73 gallons/minute (272 liters/minute)	79 gallons/minute (299 liters/minute)
Max Head	37 ft. (10.6 meters)	40 ft. (11.4 meters)
Power	1 HP (0.75 kW)	1 HP (0.75 kW)
Voltage Phase	1Ø 115V	1Ø 115V
Starting Amps	25	25
Running Amps	6.9	6.8
Thermal Overload Protection	YES	YES
Rotation	CCW (Note 1)	CCW (Note 1)
Mechanical Seal Oil Capacity	120 cc. (Note 2)	133 cc. (Note 2)
Check Frequency	Monthly (300 hrs.)	Monthly (300 hrs.)
RPM (Speed)	3390 +/- 30	3390 +/- 30
Power Cable Length	25 FT. (7.6 m.)	25 FT. (7.6 m.)
Dry Net weight	31 lb (14 kg)	33 lb (15 kg)

1. **Motor Rotation** — Upon start-up, the pump "kicks" in the opposite direction of motor rotation. The correct rotation is counterclockwise (CCW) as viewed from the impeller end of the pump.
2. **Mechanical Seal Oil** — Use a good grade 10 weight non-detergent hydraulic oil (i.e. Shell Turbo 32 or equivalent). Fill oil cavity 75% to 85% full (allow air space for expansion).



ST2037F



ST2040TF

Figure 1. Dimensions

Table 2. Dimensions

	ST2037F	ST2040TF
A	15.82 in. (402 mm)	16.8 in. (427 mm)
B	13.26 in. (337 mm)	4.37 in. (111 mm)
C	25 ft. (7.6 m)	7.08 in. (180 mm)
D	15.74 in. (400 mm)	15.74 in. (400 mm)
E	5.51 in. (140 mm)	5.51 in. (140 mm)
F	3.23 in. (82 mm)	3.23 in. (82 mm)
G	7.48 in. (190 mm)	7.08 in. (180 mm)
H	1.63 in. (41.5 mm)	1.63 in. (41.5 mm)
I	1.65 in. (42 mm)	5.11 in. (130 mm)
J	—	10.03 in. (255 mm)
K	—	3.54 in. (90 mm)
L	—	4.52 in. (115 mm)

GENERAL INFORMATION

The Multiquip Model ST2037F and ST2040T submersible pumps with a float switch are designed to pump water automatically. They are used for the draining (dewatering) of well casings construction sites, cofferdams, manholes, transformer vaults and excavations and are acceptable for indoor and outdoor use.

A Nitorile rubber over steel impeller is attached to the output shaft of a 1HP electric motor which provides adequate power for general purpose pumping. This submersible pump is supplied completely with an electric power cable which is equipped with a float switch and a discharge port located on top or on one side of the pump which accepts a 2-inch hose.

This pump is ideal for portability because of its light weight and carrying handle. For reliability and long life, a mechanical seal provides shaft sealing, with an oil chamber separating the pump section from the motor.

The pump when in use, should be installed as free standing (upright position) on its strainer base. A 2-inch discharge hose (not supplied) should be connected to the discharge port located on top or one side of the pump. The discharge hose should be adequately supported to avoid stress on the pump.

For maximum water flow, the discharge hose should be kept as short as possible, and with minimum elevation above the pump.

Remember, as the length and/or height of the discharge hose is increased, the flow of water will be reduced. Also any reduction in the hose size, and any fittings such as valves or outlet nozzles, will restrict the water flow.

To avoid back-siphonage when the pump is switched off, ensure that the end of the discharge hose is installed above the water level at the final discharge point.

When the pump is switched off, the water remaining in the hose will run back through the pump. This can be avoided by placing a non-return valve in the hose nearest the pump.

NEVER use this submersible pump to pump flammable liquids or operate in a explosive or flammable environment.

Avoid using this pump in conditions where mud, grit, silt or other debris are present. These conditions could cause blockage and cause excessive pump wear.

DO NOT install the pump directly into an area where there is a heavy buildup of mud, grit, silt, or debris. If this condition

is present, install the pump on a platform before operating.

This pump must always be positioned on a platform in an upright position. **NEVER** operate the pump by a suspended rope. To prevent large solids from entering the pump, install a wire mesh screen or similar barrier around the pump.

If the pump was used to pump water containing mud, silt, use clean water to flush out the pump after each use.

DO NOT allow the pump to run dry, as this will damage the pump. During maintenance, dry running is permissible but only for a few seconds.

NEVER lift the pump by its electrical power cord. **ALWAYS** lift the pump by its carrying handle or attach a rope to the carrying handle.

A pump fully submerged pump in liquid will not freeze, unless the liquid freezes. **DO NOT** allow a partially submerged pump to freeze. The expansion of water freezing in the volute may crack the pump, causing expensive repairs. If there is any danger of the pump being subjected to freezing temperatures, lift the pump from water and allow it to drain thoroughly.

If the pump jams or the pump rotor locks for any reason, disconnect the pump from the power source immediately.

Allowing the pump motor to cycle ON and OFF under an overload condition can burn out the motor.

When replacement of nuts and bolts is required, use only recommended parts as referenced in the parts section of this manual. This pump uses metric threads. **DO NOT** use English measurement threads.

Failure to follow the above referenced precautions could result in serious injury or death! Replace pump cord immediately if cord becomes damaged or severed. This pump must be installed in accordance with National Electric Code ANSI/NFPA 70 so as to prevent moisture from entering or accumulating with the boxes, conduit bodies fittings, float housing or cable.

WARNING



Explosion or Fire Hazard exists if this pump is used with flammable liquids. **DO NOT** use this pump with flammable liquids. **DO NOT** install this pump in hazardous locations as defined by the National Electrical Code, ANSI/NFPA 70.

PUMP COMPONENTS

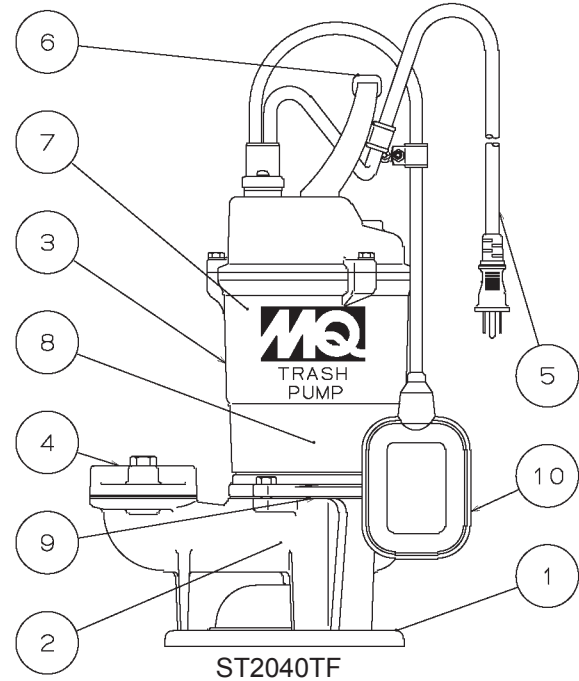
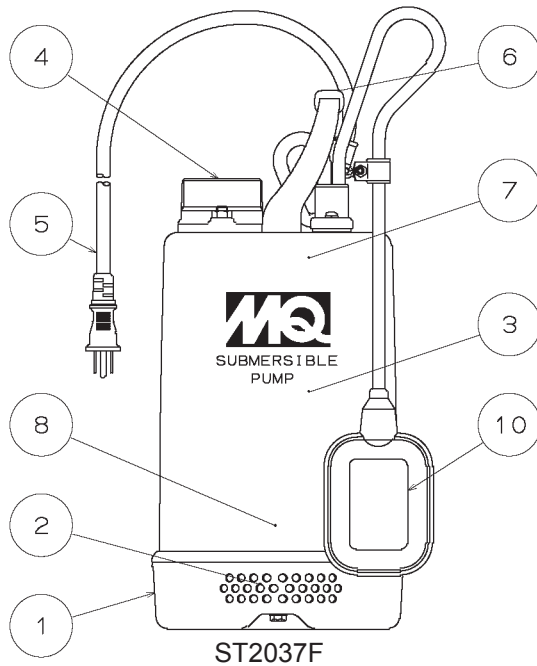


Figure 2. ST2037F/ST2040TF Pump Components

Figure 2 shows the location of the basic components, for the ST2037F and ST2040TF submersible pumps with a float switch.

Listed below is a brief explanation of each component.

- 1. Strainer Base** — This strainer base is made of electrocoating steel which is resistant to hardware corrosion. **DO NOT** pump large objects or debris with this pump. This pump is for pumping water only. For dewatering purposes, always place the strainer base on a platform.
- 2. Volute/Impeller** — Impellers are constructed of Nitorile Rubber to minimize wear and prolong service life.
- 3. Electric Motor** — These submersible pumps utilize a 60 Hz, single-phase, 115 VAC, 1 HP electric motor. Consult with a licensed electrician before connecting motor to a power source. Observe all city and local safety codes.
- 4. Discharge Port** — Connect a 2-inch hose to this port. Remember to adequately support the discharge hose to avoid stress on the pump.
- 5. AC Power Cable** — This unit is supplied with a 25 ft. (7.6 meters) AC power cable which is equipped with a float switch. Always check the cable for signs of wear **NEVER** use a defective power cable. Replace the cable immediately if the cable is worn or defective.
- 6. Carrying Handle** — Always carry the submersible pump by its handle. **NEVER** carry the pump by its power cord. Carrying or lifting the pump by the power cord, will cause undue stress on the cord, and ultimately the cord will become dislodged from the pump.
- 7. Thermal Overload Protection** — This pump is equipped with a thermal overload protection device that will shut down the motor in the event of high operating temperatures. The motor will automatically restart once the temperature returns to an acceptable operating temperature.
- 8. Mechanical Seal Oil** — This oil filled seal provides lubrication when running the pump dry. **NEVER** run the pump dry. Running the pump dry will cause severe damage to the pump.
- 9. Mechanical Seal Oil Plug** — Remove this plug to check and add hydraulic oil (Shell 32 or equivalent) to the oil cavity. This oil protects the mechanical seal. Oil cavity should be full enough to cover seal spring.
- 10. Float Switch** — This float switch employs a micro-type switch for the switching operation. Be certain that the float switch cannot hang up or foul in its swing.

FLOAT SWITCHES

FLOAT SWITCH THEORY

The float switch allows the pump to start and stop automatically when a prefixed liquid (water) level has been reached. A multiple closure device makes it highly reliable. This is the most universally-used float switch in the world for the automation of pumps.

HOW IT WORKS

This float switch is an economical chamber design float-type, liquid level switch that uses a microswitch for switching operation. As the liquid level (water) rises or falls, the float changes its angle until the microswitch makes or breaks the pump. The maximum switch angle range is 90 degrees. See Figure 3 below.

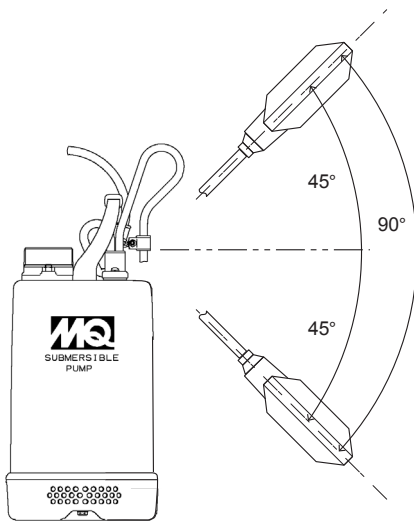


Figure 3. Switch Angle Range

DESIGN FEATURES

The float switch employs a microswitch and a latching ball for the switching operation. The latching ball design provides excellent resistance to nuisance trips due to fluid turbulence. The case and cable are hermetically sealed via re-injection molding.

- Suitable for most liquid environments.
- Hermetically sealed.
- Thick-walled non-corrosive Polypropylene enclosure.
- Max depth level, 1bar
- Micro switch mechanical life - 10,000,000 operations

PUMPING RANGE

The pumping range of the pump is determined by the float switch tether cord. The length of the float switch tether code is set to 150 mm at the factory. Please set the tether length to within 150 mm to prevent an improper operation.

Refer to Figure 4 for the pumping range of the ST2037F and ST2040TF. The minimum submergence level should never be less than 150 mm for the ST2037F or 160 mm for the ST2040TF above the pump bottom.

Pumping ranges are based on non-turbulent conditions. Range may vary due to water temperature and cord shape.

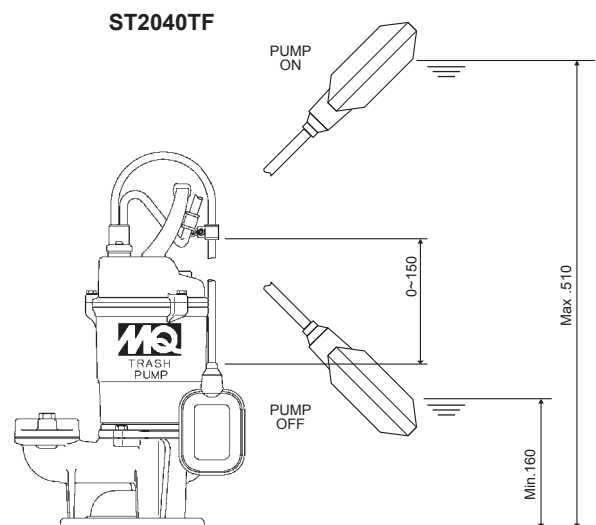
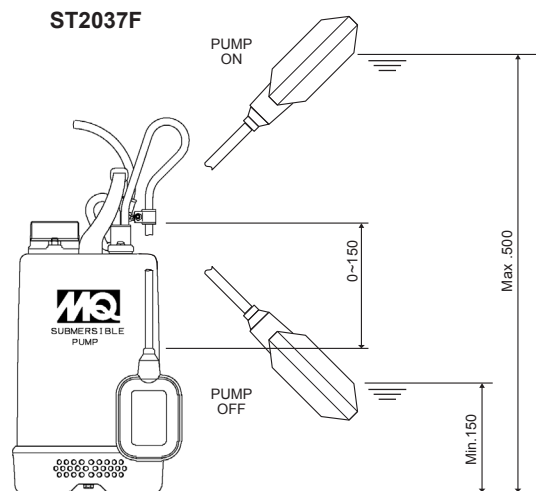


Figure 4. Pumping Range (Float Switch)

ADJUSTING FLOAT SWITCH

1. Determine the required cord tether length as shown in Figure 4.
2. Loosen a screw, cord clamp and float cord band on the float switch.
3. Shift the float cord band to the required cord tether length, then tighten the screw, cord clamp and float cord band.

CAUTION

When installing the float switch, keep enough space around the float switch to avoid an improper operation.

CAUTION

Applying incorrect power (voltage phasing) to the submersible pump can cause severe damage to the pump.

Make sure that the correct voltage and phase are transferred to the pump at all times.

POWER CORD REQUIREMENTS

When routing the 115 VAC, 60 Hz., single phase power via a power cord, **ALWAYS** use the correct wire size. Refer to Table 3 to determine the correct wire size. Incorrect wire size can adversely affect the performance of the pump.

SINGLE-PHASE POWER INSTALLATION (INPUT)

1. All submersible pumps referred to in this manual require 115 VAC, 60 Hz., single-phase power for normal operation.
2. If you cannot determine what your pump's power requirements are, look at the vendor supplied identification name tag attached to the pump or contact Multiquip's Technical Support Department.

Table 3. Cord Length and Wire Size

AMPS	50 FT	100 FT	150 FT
6	16 AWG	16 AWG	14 AWG
8	16 AWG	14 AWG	12 AWG
10	16 AWG	14 AWG	12 AWG
12	14 AWG	14 AWG	12 AWG
14	14 AWG	12 AWG	10 AWG
16	12 AWG	12 AWG	10 AWG

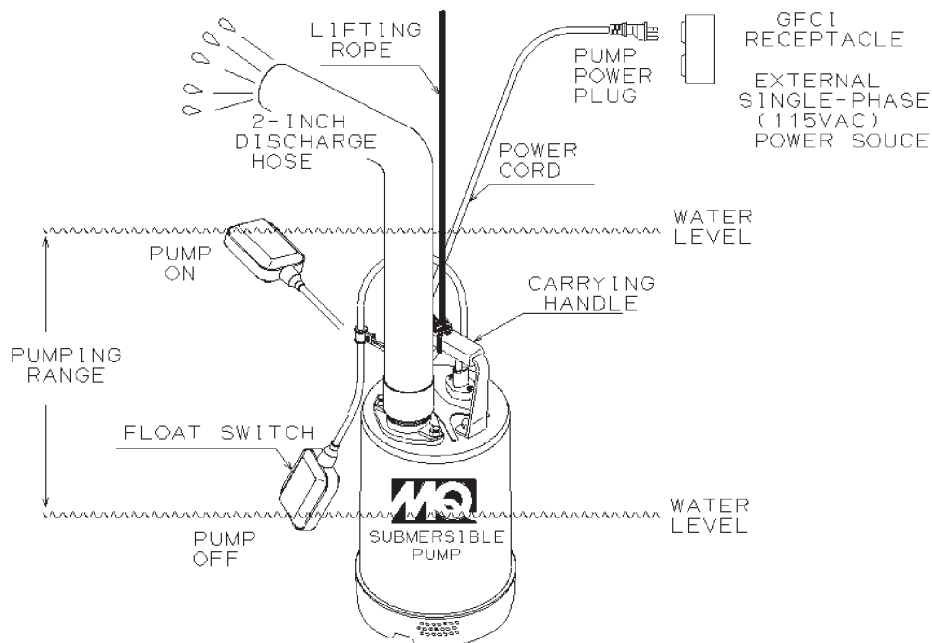


Figure 5. Application Diagram

HOSE CONNECTIONS

1. Connect a 2-inch hose to the discharge port on the pump as shown in Figure 6. Make sure that the hose is attached correctly to the discharge port.

ATTACHING LIFTING ROPE

1. Attach a suitable lifting cable (rope) to the carrying handle (Figure 6) on the pump and lower the pump into place. For applications where there is an excessive amount of mud, grit or silt, the use of a support platform is desirable. When pumping water from applications where there is little or no debris, the support platform is not required.

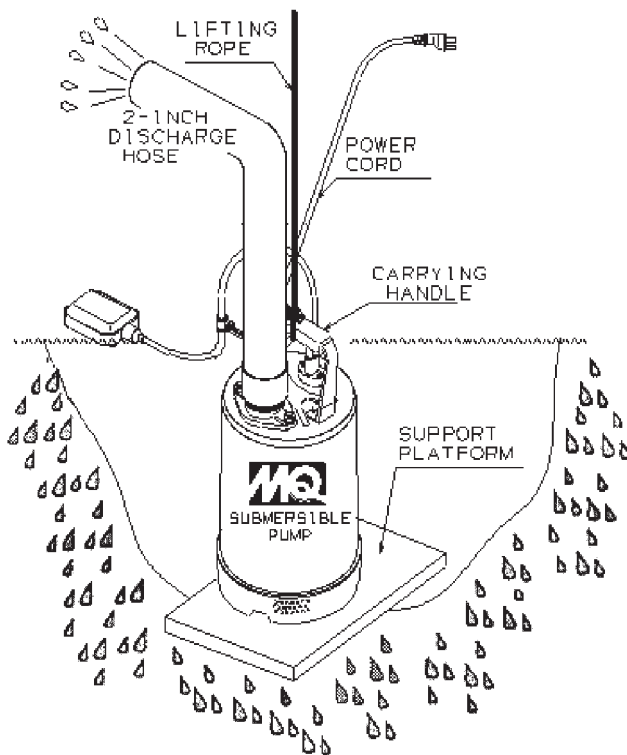


Figure 6. Submersible Pump Upright Position(Correct)

2. Make sure the pump is always placed in an upright position, not tilted (Figure 7). Never position the pump directly on a soft, loose bottom. Remember to attain maximum pumping capacity and prevent excessive wear, position the pump so it will not burrow itself into sand or clay.

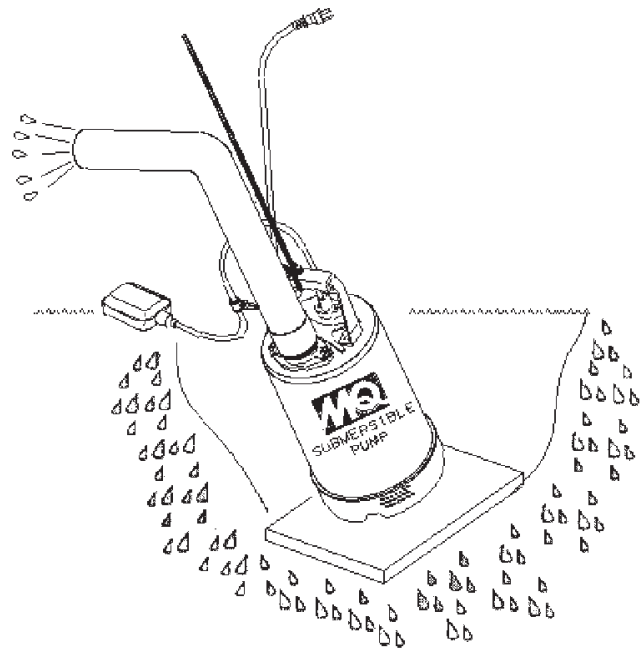



Figure 7. Submersible Pump Upright Position (Incorrect)

3. If all of the pump's electrical requirements have been met, place the circuit breaker or power ON/OFF switch in the ON position.
4. Wait a few seconds and water should begin to flow from the discharge hose.
5. If water is not flowing from the discharge hose or not flowing freely after a few minutes, remove the power from the pump and check the system for leaks.
6. To stop the pump from pumping, place the circuit breaker or ON/OFF switch in the OFF position.

⚠ DANGER



NEVER grab or touch a live power cord. **DO NOT** stand in water when connecting the pump's power cord into a voltage source. The possibility exists of electrical shock, electrocution and possibly death!

PUMP SHUT-DOWN/CLEAN-UP

1. Remove the power from the pump by turning off the circuit breaker or switch that provides power to the pump. Remember to make sure that hands are dry (not wet), and feet are not standing in water when removing disconnecting power from the pump.
2. Using the lifting rope, lift the pump up from its current position. Remove the discharge hose from the discharge port on the pump.
3. Remove all power cables. Place cables and float switches in a suitable container where they will not get damaged.
4. If the pump was used to pump mud, grit or silt, flush vigorously with clean water.
5. Remove the pump from the water. Wipe off any mud or debris that might have attached itself to the pump.
6. Store pump in a clean dry place away from dirt and debris.

DISASSEMBLY

To check the oil level of the mechanical seal, perform the following disassembly procedure then perform oil check. Refer to Figure 11 for location of parts to be removed.

For Model ST2040TF:

1. Position pump upside down.
2. Remove casing.
3. Remove the pump impeller.
4. Remove the oil plug and packing.

For Model ST-2037F:

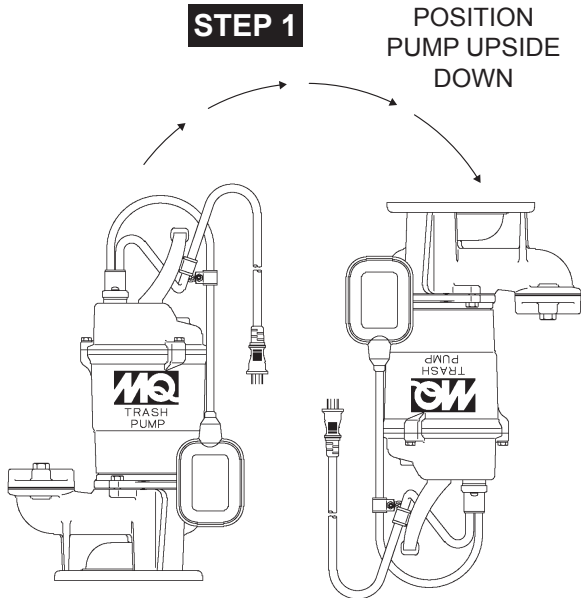
1. Position pump upside down.
2. Remove strainer.
3. Remove casing.
4. Remove the pump impeller.
5. Remove the liner.
6. Remove the oil plug and packing.

OIL CHECK

1. Check pump oil at oil cavity plug (Figure 8). Check every 300 hours and change hydraulic oil every 6 months (1,000 hours) or as needed.
2. While checking the hydraulic oil level, also check the condition of the hydraulic oil in the seal cavity. Discolored milky oil indicates a failure of the water seal. If this occurs, replace water seal.
3. If oil level is low fill with SAE 10 weight non-detergent hydraulic oil (i.e. Shell Turbo 32 or equivalent). Fill oil cavity 75% to 85% full (allow air space for expansion). See Table 1 for mechanical seal oil capacity.

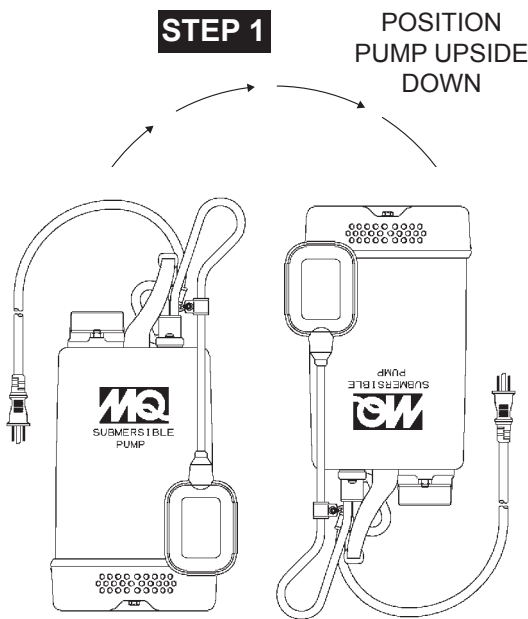
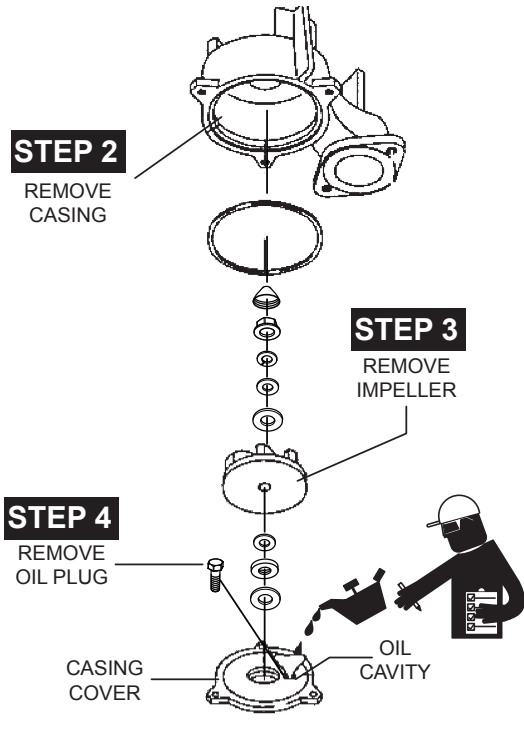
IMPELLER

1. If impeller is defective or badly worn, replace impeller immediately.



ST-2040TF

- REMOVE FILL PLUG, AND VISUALLY INSPECT THAT OIL CAVITY IS FULL ENOUGH TO COVER SEAL SPRING.
- CHECK HYDRAULIC OIL EVERY 300 HOURS. CHANGE EVERY 6 MONTHS OR AS NEEDED.
- FILL TO 75-80% CAPACITY SEE TABLE 1 FOR FILLING CAPACITY.
- DISCOLORATION OF OIL (MILKY) INDICATES A LEAKING PUMP WATER SEAL.
- FILL WITH 10 WEIGHT NON-DETERGENT HYDRAULIC OIL. USE SHELL TURBO 32 OR EQUIVALENT.



ST-2037F

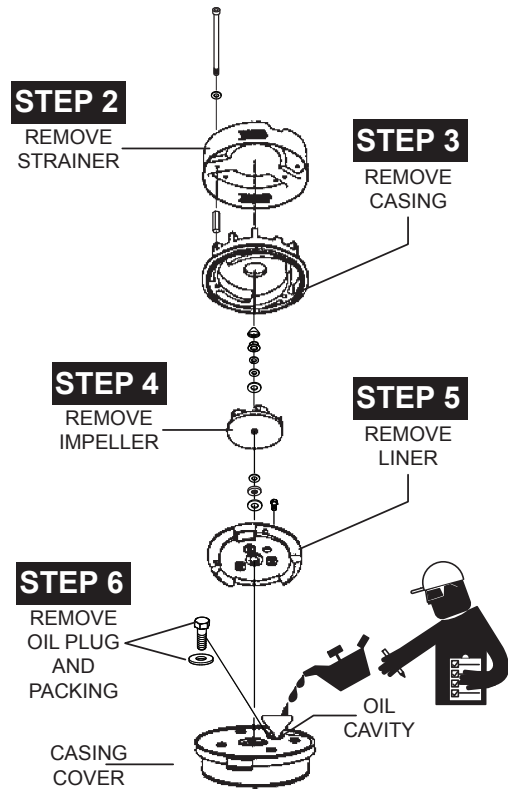


Figure 8. Checking Hydraulic Oil

TROUBLESHOOTING

Troubleshooting (Pump)		
Symptom	Possible Problem	Solution
Pump Fails To Start	Incorrect voltage/amps?	Check that proper voltage (115VAC, 60 Hz, single-phase) is being supplied to the pump. Also check that there is an adequate amount of current (amps) to run the pump. Check power source circuit breaker.
	Malfunction in float switch?	Check that the movement of the float switch is not obstructed. Inspect float switch and power cord.
	Blown power fuse?	Replace fuse. Check cause of blown fuse.
	Impeller locked?	Disconnect power cord and check for clogging. Unclog pump. Check overload protection device.
	Wet motor windings?	Use multimeter to check motor insulation. Insulation resistance must be greater than 15 megaohms. If resistance is low, disassemble pump motor and bake windings to dry them.
	Defective motor and pump bearings?	Check for excessive bearing wear. If worn, replace bearings. Replace motor if defective.
Pump Fails to Deliver Full Output	Twisted or restricted discharge hose?	Lay hose flat unkinked. Remove clog from hose line.
	Clogged pump strainer?	Clean strainer.
	Low voltage?	Use a voltmeter to check voltage while pump is energized. Voltage must be within $\pm 10\%$. Check power source (no load and load). If an extension cord is used, make sure it has adequate current-carrying capacity for the required length.
	Impeller worn?	Replace impeller.
Water in Seal Oil	Defective water seal?	Replace water seal.
	Loose Oil Fill Plug?	Tighten securely.
Pump Fails to Stop	Malfunction in Float Switch?	Check that the movement of the float switch is not obstructed.

PERFORMANCE CURVE/ WIRING DIAGRAM

PERFORMANCE CURVES

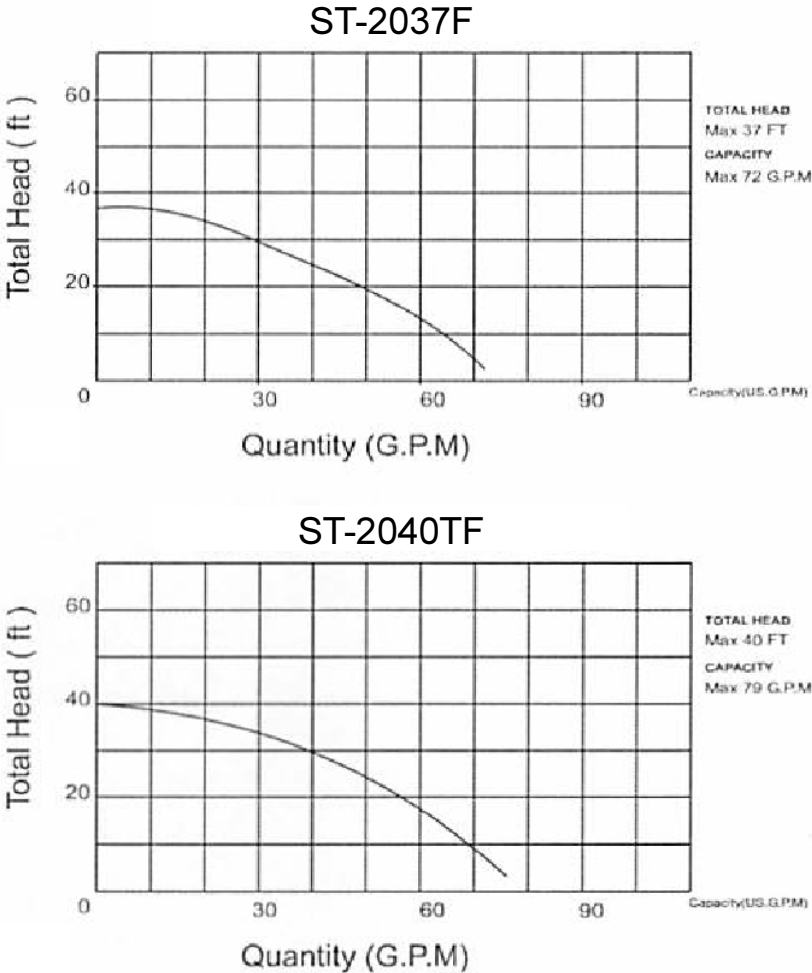
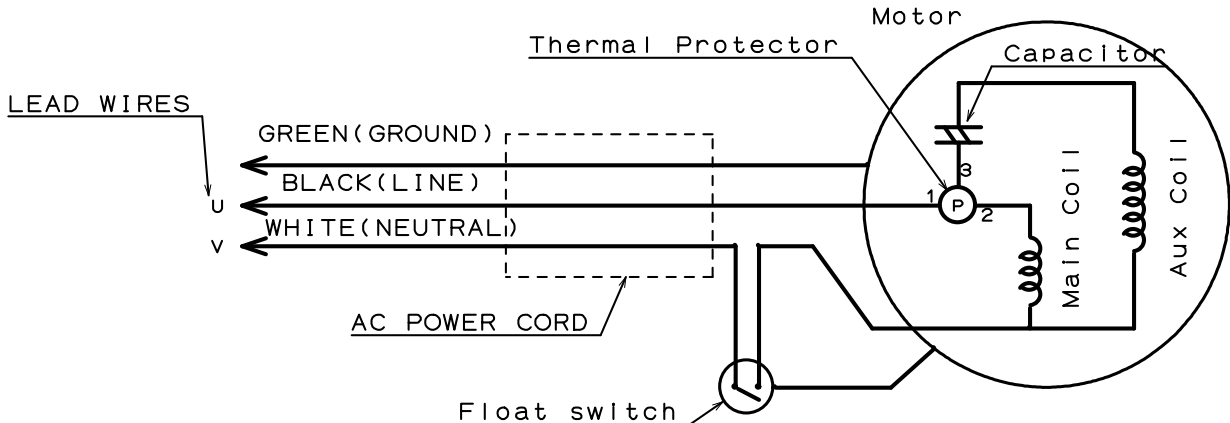


Figure 11. Pump Performance Curves

WIRING DIAGRAM

115 VAC, 60Hz, ELECTRIC MOTOR



EXPLANATION OF CODE IN REMARKS COLUMN

The following section explains the different symbols and remarks used in the Parts section of this manual. Use the help numbers found on the back page of the manual if there are any questions.

NOTICE

The contents and part numbers listed in the parts section are subject to change **without notice**. Multiquip does not guarantee the availability of the parts listed.

SAMPLE PARTS LIST

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	12345	BOLT	1	INCLUDES ITEMS W/%
2%		WASHER, 1/4 IN.		NOT SOLD SEPARATELY
2%	12347	WASHER, 3/8 IN. ...	1	MQ-45T ONLY
3	12348	HOSE	A/R	MAKE LOCALLY
4	12349	BEARING	1	S/N 2345B AND ABOVE

NO. Column

Unique Symbols — All items with same unique symbol (@, #, +, %, or >) in the number column belong to the same assembly or kit, which is indicated by a note in the “Remarks” column.

Duplicate Item Numbers — Duplicate numbers indicate multiple part numbers, which are in effect for the same general item, such as different size saw blade guards in use or a part that has been updated on newer versions of the same machine.

NOTICE

When ordering a part that has more than one item number listed, check the remarks column for help in determining the proper part to order.

PART NO. Column

Numbers Used — Part numbers can be indicated by a number, a blank entry, or TBD.

TBD (To Be Determined) is generally used to show a part that has not been assigned a formal part number at the time of publication.

A blank entry generally indicates that the item is not sold separately or is not sold by Multiquip. Other entries will be clarified in the “Remarks” Column.

QTY. Column

Numbers Used — Item quantity can be indicated by a number, a blank entry, or A/R.

A/R (As Required) is generally used for hoses or other parts that are sold in bulk and cut to length.

A blank entry generally indicates that the item is not sold separately. Other entries will be clarified in the “Remarks” Column.

REMARKS Column

Some of the most common notes found in the “Remarks” Column are listed below. Other additional notes needed to describe the item can also be shown.

Assembly/Kit — All items on the parts list with the same unique symbol will be included when this item is purchased.

Indicated by:

“INCLUDES ITEMS W/(unique symbol)”

Serial Number Break — Used to list an effective serial number range where a particular part is used.

Indicated by:

“S/N XXXXX AND BELOW”

“S/N XXXX AND ABOVE”

“S/N XXXX TO S/N XXX”

Specific Model Number Use — Indicates that the part is used only with the specific model number or model number variant listed. It can also be used to show a part is NOT used on a specific model or model number variant.

Indicated by:

“XXXXX ONLY”

“NOT USED ON XXXX”

“Make/Obtain Locally” — Indicates that the part can be purchased at any hardware shop or made out of available items. Examples include battery cables, shims, and certain washers and nuts.

“Not Sold Separately” — Indicates that an item cannot be purchased as a separate item and is either part of an assembly/kit that can be purchased, or is not available for sale through Multiquip.

SUGGESTED SPARE PARTS

ST2037F SUBMERSIBLE PUMP

1 to 3 units

Qty.	P/N	Description
1	.....0202037F120	..... AC CORD WITH GLAND
1	.....020S500UL060	..... MECHANICAL SEAL
1	.....0201503A103	..... PACKING

ST2040TF SUBMERSIBLE PUMP

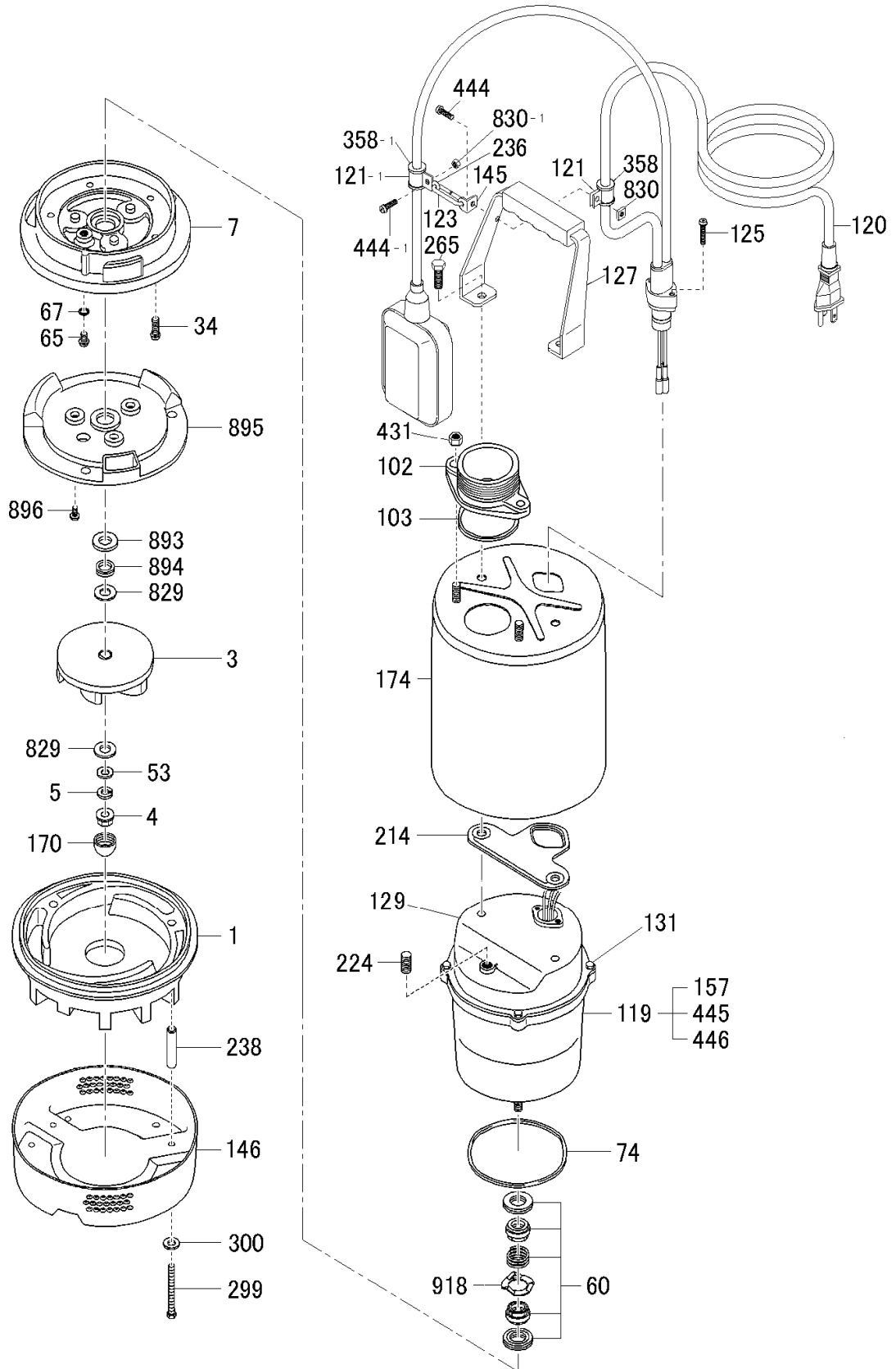
1 to 3 units

Qty.	P/N	Description
1	.....0201503UL120	..... AC CORD WITH GLAND
1	.....020S500UL060	..... MECHANICAL SEAL
1	.....0202005T024	..... PACKING

NOTICE

Part numbers on this Suggested Spare Parts list may supersede/replace the part numbers shown in the following parts lists.

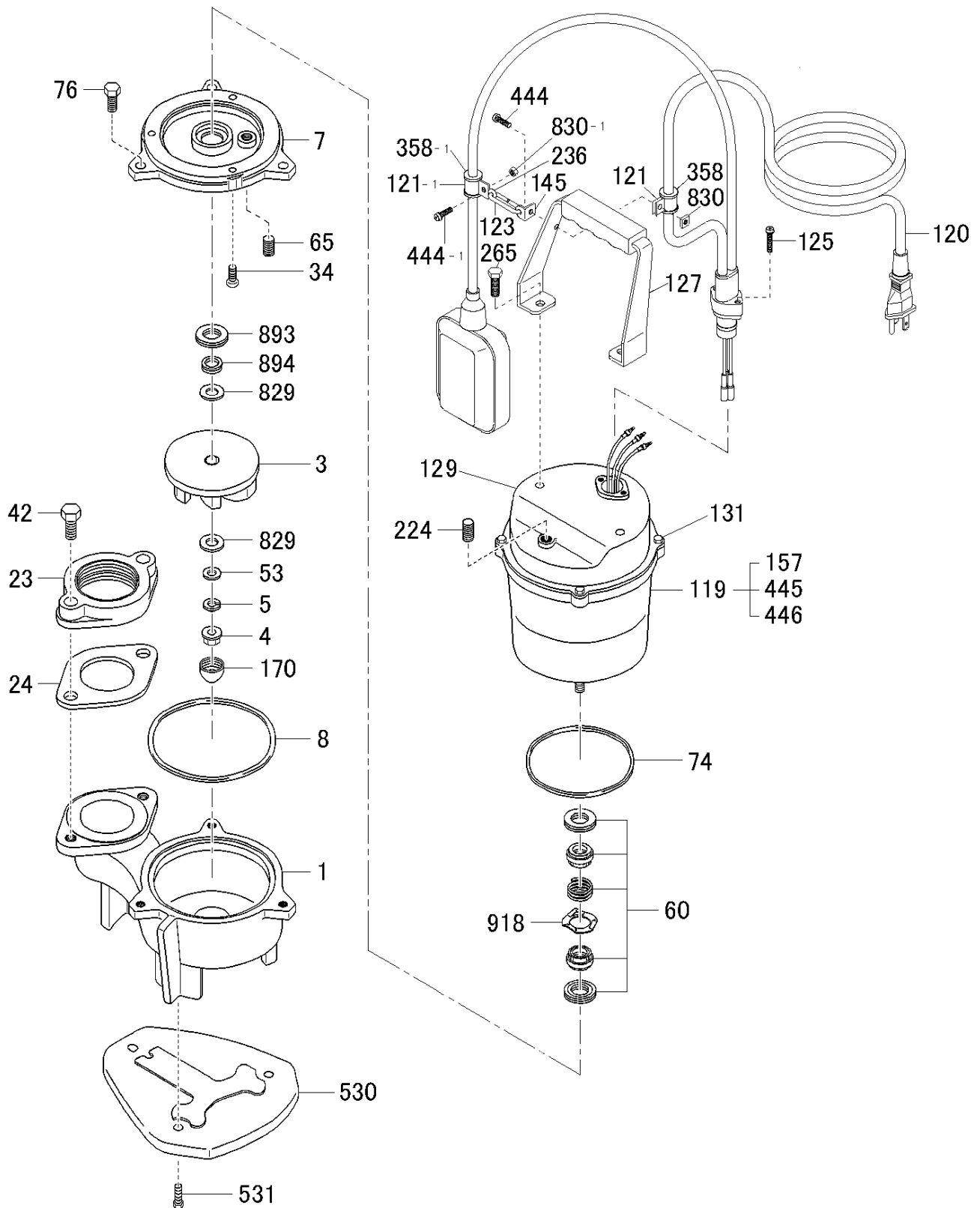
ST2037F PUMP ASSEMBLY



ST2037F PUMP ASSEMBLY

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	020S500UL001	CASING	1	
3	020S500UL003	IMPELLER	1	
4	020S500UL004	IMPELLER NUT	1	
5	020S500UL005	SPRING WASHER	1	
7	020S500UL007	CASING COVER	1	
34	020S2037034	SCREW	3	
53	020S500UL053	WASHER	1	
60	020S500UL060	MECHANICAL SEAL	1	
65	020S500UL065	PLUG	1	
67	020S500UL067	PACKING	1	
74	020S500UL074	PACKING	1	
102	0202005A102	DISCHARGE PORT	1	
103	0201503A103	PACKING	1	
119	020S2047119	MOTOR.....	1	INCLUDES ITEMS W/ \$
120	0202037F120	AC CORD W/CORD GLAND	1	W/ FLOAT SWITCH
121	0201503A121	CORD CLAMP	1	REPLACES P/N 0201503121
121-1	0202037F1211	CORD CLAMP	1	
123	0202037F123	CHAIN	1	
125	0201503A125	SCREW.....	2	REPLACES P/N 0201503125
127	0202037F127	CARRYING HANDLE	1	
129	020S2047129	FRAME COVER	1	
131	020S2047131	BOLT	3	
145	0202037F145	SET PIECE	1	
146	020S500UL146	STRAINER	1	
157\$	020S2047157	PACKING	1	
170	020S500UL170	IMPELLER NUT CAP	1	
174	020S2037174	OUTER PIPE	1	
214	020S500UL214	PACKING	1	
224	0201503A224	PLUG	1	REPLACES P/N 0201503224
236	0202037F236	S-TIP	1	
238	020S500UL238	SPACER	3	
265	011008020	BOLT	2	REPLACES P/N 020S500UL265
299	020S500UL299	BOLT	3	
300	020S500UL300	WASHER	3	
358	020S500UL358	AC CORD BAND	1	
358-1	020S500UL358	FLOAT CORD BAND	1	
431	020S500UL431	NUT	2	
444	020S500UL444	SCREW	1	
444-1	0202037F4441	SCREW.....	1	INCLUDES ITEMS W/ #
445\$	020S2047445	CAPACITOR	1	
446\$	020S2047446	THERMAL PROTECTOR	1	
829	020S500UL829	WASHER	2	
830#		NUT	1	
830-1#		NUT	1	
893	020S500UL893	SEAT	1	
894	020S500UL894	V-RING	1	
895	020S500UL895	LINER	1	
896	020S500UL896	SCREW	3	
918	020S500UL918	STIRRER	1	

ST2040TF PUMP ASSEMBLY



ST2040TF PUMP ASSEMBLY

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	020S2040T001	CASING	1	
3	020S500UL003	IMPELLER, NITRILE RUBBER	1	
4	020S500UL004	IMPELLER NUT	1	
5	020S500UL005	SPRING WASHER	1	
7	020S2040T007	CASING COVER	1	
8	0202005T008	CASING PACKING	1	
23	020S2040T023	COMPANION FLANGE	1	
24	0202005T024	PACKING	1	
34	020S2037034	SCREW	3	
42	020S2040T042	BOLT	2	
53	020S500UL053	WASHER	1	
60	020S500UL060	MECHANICAL SEAL	1	
65	020S2040T065	PLUG	1	
74	020S500UL074	PACKING	1	
76	020S2040T076	BOLT	3	
119	020S2047119	MOTOR.....	1.....	INCLUDES ITEMS W/ \$
120	0201503UL120	AC CORD W/ CORD GLAND	1	
121	0201503A121	CORD CLAMP	1.....	REPLACES P/N 0201503121
121-1	0202037F1211	CORD CLAMP	1	
123	0202037F123	CHAIN	1	
125	0201503A125	SCREW.....	2.....	REPLACES P/N 0201503125
127	020S500UL127	CARRYING HANDLE	1	
129	020S2047129	FRAME COVER	1	
131	020S2047131	BOLT	3	
145	020237F145	SET PIECE	1	
157\$	020S2047157	PACKING	1	
170	020S500UL170	IMPELLER NUT CAP	1	
224	0201503A224	PLUG	1.....	REPLACES P/N 0201503224
236	02037F236	S-TIP	1	
265	020S2040T265	BOLT	2	
358	020S500UL358	AC CORD BAND	1	
358-1	020S500UL358	FLOAT CORD BAND	1	
444	020S500UL444	SCREW	1	
444-1	0202037F4441	SCREW.....	1.....	INCLUDES ITEMS W/ #
445\$	020S2047445	CAPACITOR	1	
446\$	020S2047446	THERMAL PROTECTOR	1	
530	0202005T530	BOTTOM PLATE	1	
531	011106015	BOLT	3.....	REPLACES P/N 0202005T531
829	020S500UL829	WASHER	2	
830#	0202037F441	NUT	1	
830-1#	0202037F441	NUT	1	
893	020S2040T893	SEAT WITH PACKING	1	
894	020S500UL894	V-RING	1	
918	020S500UL918	STIRRER	1	

TERMS AND CONDITIONS OF SALE — PARTS

PAYMENT TERMS

Terms of payment for parts are net 30 days.

FREIGHT POLICY

All parts orders will be shipped collect or prepaid with the charges added to the invoice. All shipments are F.O.B. point of origin. Multiquip's responsibility ceases when a signed manifest has been obtained from the carrier, and any claim for shortage or damage must be settled between the consignee and the carrier.

MINIMUM ORDER

The minimum charge for orders from Multiquip is \$15.00 net. Customers will be asked for instructions regarding handling of orders not meeting this requirement.

RETURNED GOODS POLICY

Return shipments will be accepted and credit will be allowed, subject to the following provisions:

1. A Returned Material Authorization must be approved by Multiquip prior to shipment.
2. To obtain a Return Material Authorization, a list must be provided to Multiquip Parts Sales that defines item numbers, quantities, and descriptions of the items to be returned.
 - a. The parts numbers and descriptions must match the current parts price list.
 - b. The list must be typed or computer generated.
 - c. The list must state the reason(s) for the return.
 - d. The list must reference the sales order(s) or invoice(s) under which the items were originally purchased.
 - e. The list must include the name and phone number of the person requesting the RMA.
3. A copy of the Return Material Authorization must accompany the return shipment.
4. Freight is at the sender's expense. All parts must be returned freight prepaid to Multiquip's designated receiving point.

5. Parts must be in new and resalable condition, in the original Multiquip package (if any), and with Multiquip part numbers clearly marked.
6. The following items are not returnable:
 - a. Obsolete parts. (If an item is in the price book and shows as being replaced by another item, it is obsolete.)
 - b. Any parts with a limited shelf life (such as gaskets, seals, "O" rings, and other rubber parts) that were purchased more than six months prior to the return date.
 - c. Any line item with an extended dealer net price of less than \$5.00.
 - d. Special order items.
 - e. Electrical components.
 - f. Paint, chemicals, and lubricants.
 - g. Decals and paper products.
 - h. Items purchased in kits.
7. The sender will be notified of any material received that is not acceptable.
8. Such material will be held for five working days from notification, pending instructions. If a reply is not received within five days, the material will be returned to the sender at his expense.
9. Credit on returned parts will be issued at dealer net price at time of the original purchase, less a 15% restocking charge.
10. In cases where an item is accepted, for which the original purchase document can not be determined, the price will be based on the list price that was effective twelve months prior to the RMA date.
11. Credit issued will be applied to future purchases only.

PRICING AND REBATES

Prices are subject to change without prior notice. Price changes are effective on a specific date and all orders received on or after that date will be billed at the revised price. Rebates for price declines and added charges for price increases will not be made for stock on hand at the time of any price change.

Multiquip reserves the right to quote and sell direct to Government agencies, and to Original Equipment Manufacturer accounts who use our products as integral parts of their own products.

SPECIAL EXPEDITING SERVICE

A \$35.00 surcharge will be added to the invoice for special handling including bus shipments, insured parcel post or in cases where Multiquip must personally deliver the parts to the carrier.

LIMITATIONS OF SELLER'S LIABILITY

Multiquip shall not be liable hereunder for damages in excess of the purchase price of the item with respect to which damages are claimed, and in no event shall Multiquip be liable for loss of profit or good will or for any other special, consequential or incidental damages.

LIMITATION OF WARRANTIES

No warranties, express or implied, are made in connection with the sale of parts or trade accessories nor as to any engine not manufactured by Multiquip. Such warranties made in connection with the sale of new, complete units are made exclusively by a statement of warranty packaged with such units, and Multiquip neither assumes nor authorizes any person to assume for it any other obligation or liability whatever in connection with the sale of its products. Apart from such written statement of warranty, there are no warranties, express, implied or statutory, which extend beyond the description of the products on the face hereof.

Effective: February 22, 2006

OPERATION AND PARTS MANUAL

HERE'S HOW TO GET HELP

PLEASE HAVE THE MODEL AND SERIAL
NUMBER ON-HAND WHEN CALLING

UNITED STATES

Multiquip Corporate Office

18910 Wilmington Ave.
Carson, CA 90746
Contact: mq@multiquip.com

Tel. (800) 421-1244
Fax (310) 537-3927

Service Department

800-421-1244
310-537-3700

Fax: 310-537-4259

Technical Assistance

800-478-1244

Fax: 310-943-2238

MQ Parts Department

800-427-1244
310-537-3700

Fax: 800-672-7877
Fax: 310-637-3284

Warranty Department

800-421-1244
310-537-3700

Fax: 310-943-2249

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