

OPERATION AND PARTS MANUAL

STOW

A DIVISION OF MULTIQUIP INC.

MODEL SS-233 SUBMERSIBLE PUMP

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Revision #2 (05/03/04)

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P/N 020954

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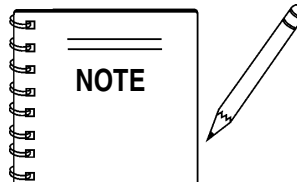
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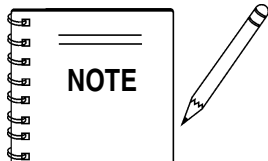
Specification and part number are subject to change without notice.

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STOW YELLOW SUB. PUMP — SAFETY MESSAGE ALERT SYMBOLS

FOR YOUR SAFETY AND THE SAFETY OF OTHERS!

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.



This Owner's Manual has been developed to provide complete instructions for the safe and efficient operation of the **STOW Model SS-233 Submersible Pump**. Before using this pump, ensure that the operating individual has read and understands all instructions in this manual.

SAFETY MESSAGE ALERT SYMBOLS

The three (3) 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 three words: **DANGER**,



DANGER: You **WILL** be **KILLED** or **SERIOUSLY** injured if you do not follow directions.



WARNING: You **CAN** be **KILLED** or **SERIOUSLY** injured if you do not follow directions.



CAUTION: You **CAN** be injured if you do not follow directions.

Potential hazards associated with the **STOW SS-233** submersible pump operation will be referenced with Hazard Symbols which appear throughout this manual, and will be referenced in conjunction with Safety Message Alert Symbols.

HAZARD SYMBOLS



Rotating Parts



NEVER operate equipment with covers, or guards removed. Keep fingers, hands, hair and clothing away from all moving parts to prevent injury.



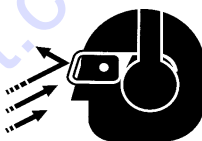
Accidental Starting



ALWAYS place the power source circuit breaker or ON/OFF switch in the **OFF** position, when the pump is not in use.



Sight and Hearing hazard



ALWAYS wear approved eye and hearing protection, if required.



Respiratory Hazard

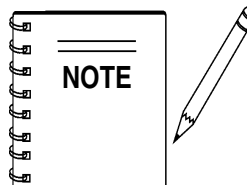


ALWAYS wear approved respiratory protection, if required.



Equipment Damage Messages

Other important messages are provided throughout this manual to help prevent damage to your submersible pump, other property, or the surrounding environment.



This submersible pump, other property, or the surrounding environment could be damaged if you do not follow instructions.

STOW SS-233 SUBMERSIBLE PUMP — RULES FOR SAFE OPERATION

CAUTION:



Failure to follow instructions in this manual may lead to serious injury or even death! This equipment is to be operated by trained and qualified personnel only! This equipment is for industrial use only.

The following safety guidelines should always be used when operating the **STOW Model SS-233** Submersible Pump:

GENERAL SAFETY

- **DO NOT** operate or service this equipment before reading this entire manual.



- This equipment should not be operated by persons under 18 years of age.

- **NEVER** operate this equipment without proper protective clothing, shatterproof glasses, steel-toed boots and other protective devices required by the job.



- **NEVER** operate this equipment when not feeling well due to fatigue, illness or taking medicine.



- **NEVER** operate this equipment under the influence or drugs or alcohol.



- **NEVER** use accessories or attachments, which are not recommended by Multiquip for this equipment. Damage to the equipment and/or injury to user may result.

- Manufacture does not assume responsibility for any accident due to equipment modifications.

- Whenever necessary, replace nameplate, operation and safety decals when they become difficult read.

- **ALWAYS** check the machine for loosened threads or bolts before starting.

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

- **ALWAYS** make sure submersible pump is grounded.

- **NEVER** use gas piping as an electrical ground.

- **DO NOT** place hands or fingers inside pump when pump is running.

- **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. This pump requires 115 VAC single-phase power.

- **DO NOT** restrict the flow of the discharge hose as it may cause overheating.

- Be careful of discharge whipping under pressure.

- **NEVER** handle pump's AC power cord with **wet hands**.

- **NEVER** let an extension cord or plug connection **lay in water**.

- **NEVER stand in water** while AC power cord is connected to a power source.

- **NEVER** use a pump with a defective, frayed power cord. Check the power cord on the pump for cuts in the insulation.

- **NEVER** use a extension cord that is frayed or damaged where the insulation has been cut.

- **ALWAYS** make certain that proper extension cord has been selected for the job See Table 2.

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

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

- **ALWAYS** place the pump in an up-right 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.

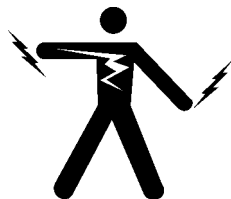
- The electrical voltage required to operate the pump can cause severe injury or even death through physical contact with live circuits. **ALWAYS** disconnect the electrical power from the pump before performing maintenance on the pump.

STOW SS-233 SUBMERSIBLE PUMP — RULES FOR SAFE OPERATION

- **ALWAYS** make sure that electrical circuits are properly **grounded** per the **National Electrical Code** (NEC) and local codes before operating pump. Severe injury or death by electrocution can result from operating an ungrounded pump.
- **ALWAYS** be sure the operator is familiar with proper safety precautions and operations techniques before using submersible pump.
- **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 greater than 104 degrees Fahrenheit. Also **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 contain 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.
- **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.
- **ALWAYS** read, understand, and follow procedures in Operator's Manual before attempting to operate equipment.

Maintenance Safety

- **NEVER** lubricate components or attempt service on a running machine.
- **ALWAYS** allow the machine a proper amount of time to cool before servicing.
- Keep the machinery in proper running condition.
- Fix damage to the machine immediately and always replace broken parts.
- **DANGER!** risk of **electrical shock** or **electrocution** exists if pump is used for de-watering of swimming pools. **DO NOT** use this pump for swimming pool de-watering applications.



Emergencies

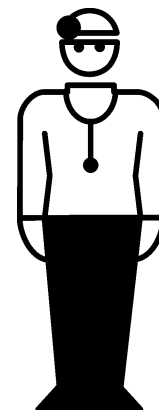
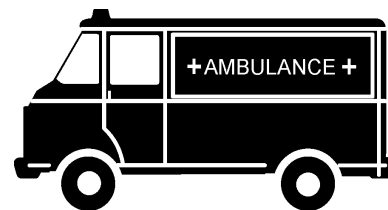
- **ALWAYS** know the location of the nearest **fire extinguisher**.



- **ALWAYS** know the location of the nearest **first aid kit**.



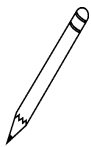
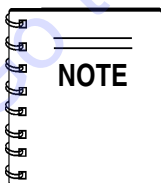
- In emergencies **always** know the location of the nearest phone or **keep a phone on the job site**. Also know the phone numbers of the nearest **ambulance, doctor** and **fire department**. This information will be invaluable in the case of an



STOW SS-233 SUBMERSIBLE PUMP — SPECIFICATIONS

TABLE 1. SPECIFICATIONS	
Model	SS-233
Type	Submersible Pump
Impeller	Plastic
Suction & Discharge Size	2.00 in. (50.8 mm)
Maximum Pumping Capacity	64 gallons/minute (238 liters/minute)
Discharge Height Above Pumping Level	5 ft (1.5 meters) 3,720 gallons/hr (14,082 liters) 10 ft (3.0 meters) 3,300 gallons/hr (12,492 liters) 15 ft (4.5 meters) 2,700 gallons/hr (10,221 liters) 20 ft (6.0 meters) 2,100 gallons/hr (7,950 liters)
Power	0.5 HP (0.37kw)
Voltage Phase	1Ø 115V
Starting Amps	30.0
Running Amps	2.3
Thermal Overload Protection	YES
Rotation	CCW
Power Cable Length	20 ft. (6.096 meters)
Dimensions (Dia x Height)	8.0 in. (20.3 cm.) x 14.5 in. (36.8 cm.)
Dry Net Weight (Shipping)	14.0 lbs. (6.35 Kg.)
Dry Net Weight	12.0 lbs. 5.44 Kg.)

- Motor Rotation** – Upon start-up, the pump "kicks" in the opposite direction of motor rotation. The correct rotation is counter-clockwise (CCW) as viewed from the impeller end of the pump.



Pumps with the "CSA" mark are tested to UL standard UL778 and certified to CSA standard C22.2 N0. 108.

STOW SS-233 SUBMERSIBLE PUMP — GENERAL INFORMATION

Introduction

The **STOW Model SS-233** submersible pumps is designed to pump water and is used for the draining (de-watering) of flooded rooms, drains and fill tanks, power fountains and waterfalls swimming pool covers, and flat roofs.

A plastic impeller is attached to the output shaft of a 1/2 HP electric motor which provides adequate power for general purpose pumping. This submersible pump is supplied complete with an electric power cable, and a discharge port located at the top of the pump which accepts a 2-inch hose.

This pump is ideal for portability because of its light weight and carrying handle. In addition this pump will pump dry to 1 inch. Built in overload protection protect the electric motor from overheating.

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 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 build-up 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 attached a rope to carrying handle.

A 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.

STOW SS-233 SUBMERSIBLE PUMP — COMPONENTS

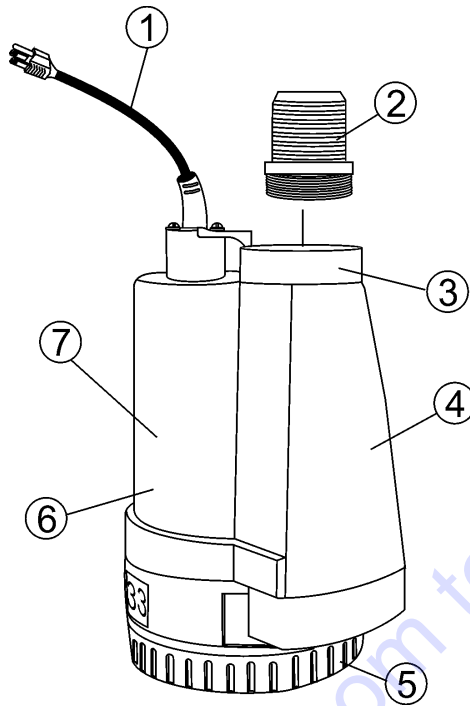


Figure 1. Submersible Pump Components

Figure 1 shows the location of the basic components, for the **STOW Model SS-233** submersible pump. Listed below is a brief explanation of each component.

- 1. AC Power Cable** – This unit is supplied with a 20 ft. (6.1 meters) AC power cable. 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.
- 2. 2-Inch NPT Fitting** – Install this fitting into the discharge port of the pump
- 3. Discharge Port** – Connect a 2" NPT hose to this port. Remember to adequately support the discharge hose to avoid stress on the pump.
- 4. Thermal Overload Protection** – This pump has an internal 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.
- 5. Strainer Base** – This strainer base is made of durable plastic. **DO NOT** pump large objects or debris with this pump. This pump is for pumping water only. For de-watering purposes, always place the strainer base on a platform.
- 6. Electric Motor** – This unit utilizes a single-phase, 115 V, 0.5 HP electric motor. Consult with a licensed electrician before connecting motor to a power source. Observe all city and local safety codes.
- 7. Volute/Impeller** – Impellers are constructed of thermo plastic to minimize wear and prolong service life.

STOW SS-233 SUBMERSIBLE PUMP — OPERATION

Operation

1. Attach a suitable lifting cable (rope) to the carrying handle (Figure 2) 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 swimming pool type applications where there is little or no debris, the support platform is not required.
2. Make sure the pump is always placed in an upright position, not tilted (Figure 3). 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.

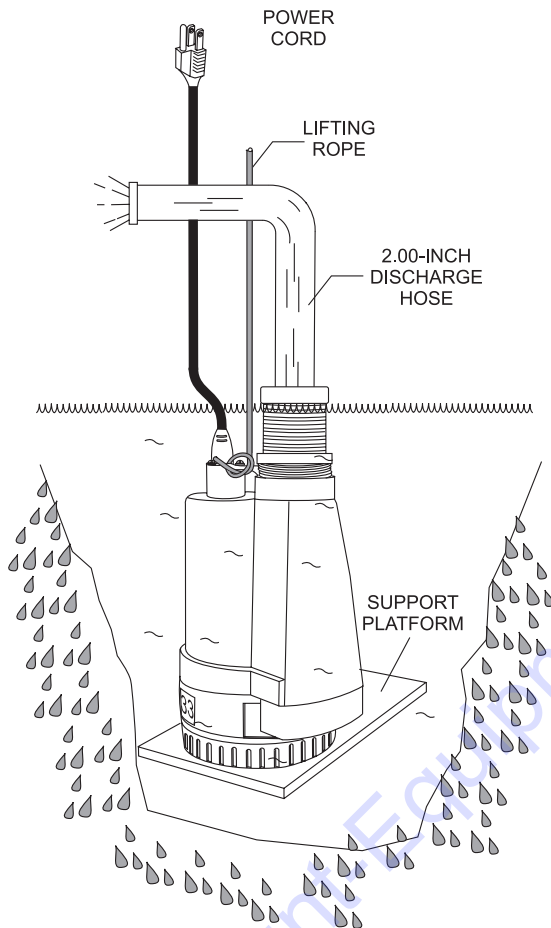


Figure 2. Submersible Pump Upright Position (Correct)

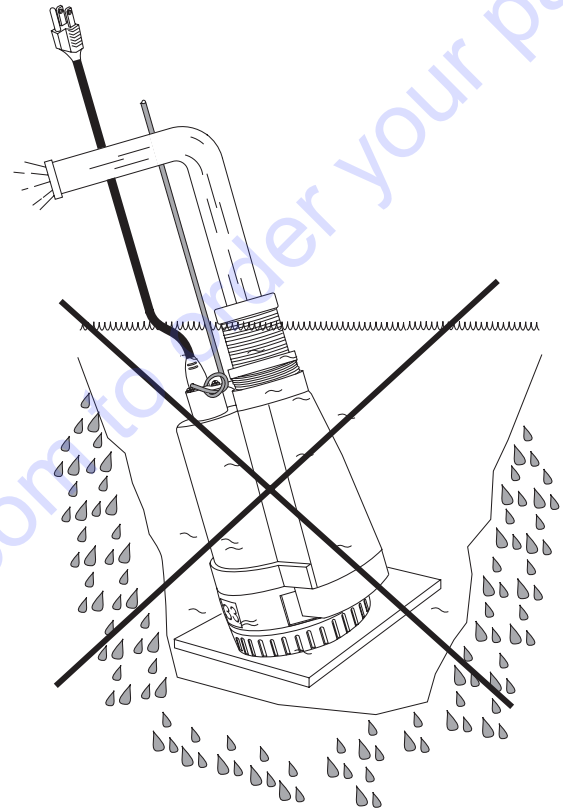


Figure 3. Submersible Pump Upright Position (Incorrect)

3. After the pump has been positioned correctly into place, power can be applied to the pump's electric motor.

STOW SS-233 SUBMERSIBLE PUMP — OPERATION

- NEVER!** grab or touch a live power cord (Figure 4) with wet hands, the possibility exists of **electrical shock**, **electrocution** and even **death**.

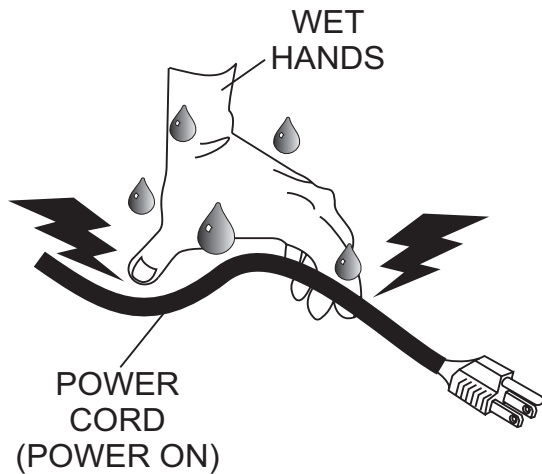


Figure 4. Power Cord (Wet Hands)

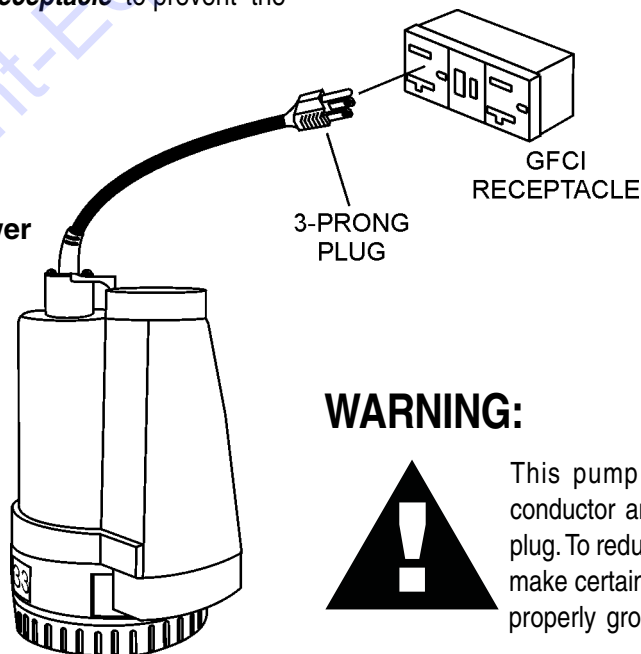
DANGER:



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 exist of electrical shock, electrocution and possibly **death!**

- If all of the pump's electrical requirements have been met, insert the power plug (Figure 5) on the pump into the power source receptacle. Make sure the extension cord is of proper size, see Table 3. It is **recommended** that the pump's power cord be plugged into a **GFCI receptacle** to prevent the possibility of **electrical shock**.

Figure 5. Conneting the Power



- Wait a few seconds and water should begin to flow from the discharge hose.
- 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.

Pump Shut-Down/Clean-up

- 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 or disconnecting power from the pump.
- Using the lifting rope, lift the pump up from its current position. Remove the discharge hose from the discharge port on the pump.
- If the pump was used to pump mud, grit or silt, flush vigorously with clean water.
- Remove the pump from the water. Wipe off any mud or debris that might have attached itself to the pump.
- Store pump in a clean dry place away from dirt and debris.

WARNING:



NEVER! **cut** or **remove** the ground prong from the pump's AC power cord.

WARNING:



This pump is supplied with a grounding conductor and a grounding-type attachment plug. To reduce the possibility of electric shock, make certain that pump is connected only to a properly grounded receptacle.

STOW SS-233 SUBMERSIBLE PUMP — TROUBLESHOOTING/CABLE

TABLE 2. PUMP TROUBLESHOOTING

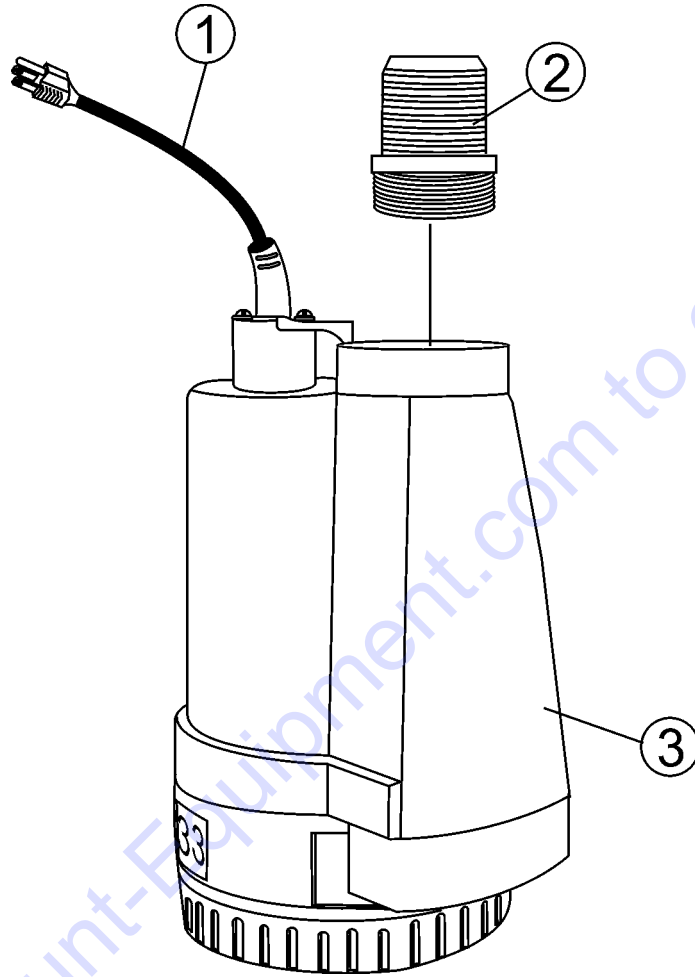
SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Pump Fails To Start	Incorrect voltage/amps?	Check that proper voltage (115 VAC 1Ø) is being supplied to the pump. Also check that there is an adequate amount of current (amps) to run the pump. Check power source circuit breaker.
	Check electrical connections?	Inspect power cord.
	Blown fuse or defective circuit breaker?	Replace fuse or circuit breaker. Check cause of blown fuse or tripped circuit breaker.
	Impeller locked?	Disconnect power cord and check for clogging and improper impeller clearance. Unclog pump. Check overload protection device.
Pump Fails to Deliver Full Output	Twisted or restricted discharge hose?	Lay hose flat un-kinked. 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.

Table 3. Cable Selection (60 Hz, Single Phase Operation)

Current in Amperes	Load In Watts	Maximum Allowable Cable Length			
		#10 Wire	#12 Wire	#14 Wire	#16 Wire
2.5	300	1000 ft.	600 ft.	375 ft.	250 ft.
5	600	500 ft.	300 ft.	200 ft.	125 ft.
7.5	900	350 ft.	200 ft.	125 ft.	100 ft.
10	1200	250 ft.	150 ft.	100 ft.	
15	1800	150 ft.	100 ft.	65 ft.	
20	2400	125 ft.	75 ft.	50 ft.	

CAUTION: Equipment damage can result from low voltage.

STOW SS-233 SUBMERSIBLE PUMP — PUMP ASSY.



STOW SS-233 SUBMERSIBLE PUMP — PUMP ASSY.

PUMP ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	020177	CABLE 20 FT	1	
2	020246	FITTING, 2" NPT	1	
3		SUBMERSIBLE PUMP	1	

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