

OPERATORS' GUIDE

REL-SP SERIES HYDRAULIC SUBMERSIBLE PUMP

The **REL-SP SERIES** Submersible Pumps are a light weight, efficient way to move large quantities of liquids *FAST*.

NOTICE

Sizes, weights and specifications listed in this manual are subject to change without notice. Please consult factory for information and updates.

SHOWN WITH
QUICK DISCONNECT
COUPLING SET



REL-SP3-500

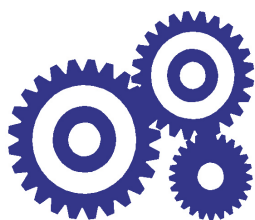
REL-SP2-275

WARNING



All information found in this guide must be read and understood before use or testing of tool.

Failure to read and understand warnings and safe handling instructions could result in severe personal injury and or death.



RELIABLE EQUIPMENT & SERVICE CO., INC.

REL-SP SERIES Manual 05-16

DISTRIBUTED BY



THIS SYMBOL INDICATES ITEMS OF EXTREME IMPORTANCE.

Obey all safety messages that follow this symbol to avoid possible injury or death. Safety of user and others may be in jeopardy if these instructions are not read and understood.



DANGER

This Safety Alert and Signal Word indicate a imminently hazardous situation which if not avoided, will result in death or serious injury.



WARNING

This Safety Alert and signal word indicate a imminently hazardous situation which if not avoided, could result in minor or moderate injury.



CAUTION

This Safety Alert and signal word indicate a imminently hazardous situation which if not avoided, may result in minor or moderate injury.

CAUTION

This Signal word indicate a imminently hazardous situation whic if not avoided, may result in Property Damage.

NOTICE

This Signal Word indicate a imminently hazardous situation whic if not avoided, will result in Damage to the Equipment.

IMPORTANT

This Signal word indicate a imminently hazardous situation whic if not avoided, may result in Damage to the Equipment.

Always observe these warnings to avoid tool damage, serious injury or death.



WARNING

The information in this manual is intended to guide the user in the use and application of this tool. It is not intended as a substitute for proper training and experience in safe work practices for this type of equipment.

Consult your supervisor or safety personnel if you have any questions regarding the safe operation of this tool.

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REGISTRATION

UPON RECEIPT OF THIS TOOL, COMPLETE THE REGISTRATION BELOW.

COMPANY _____

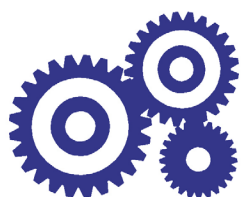
ADDRESS _____

PHONE _____ FAX _____

SERIAL NUMBER _____

DATE OF PURCHASE _____

DEALER NAME _____



RELIABLE EQUIPMENT & SERVICE CO., INC.

REL-SP2

2 INCH SUBMERSIBLE HYDRAULIC PUMP

The **REL-SP2** Submersible Pump is a light weight, efficient way to move large quantities of liquids *FAST*.

No priming required!

The **REL-SP2** is also able to pump petroleum products.

The **REL-SP2** is able to run all day without seal damage.

2" Compact, lightweight Submersible Pump

Operate on Open and closed center systems.

X-Long carry handle aids in placement.

High impact strainer housing.

Whip set and flush-face couplers included.

Can run dry without damage.

Specifications

Capacity: Up to 275 GPM

Flow Range: 5-8 GPM

Operating Pressure: 1200-2000 PSI

Intake Port: 1 15/16" (49mm)

Discharge Port: 2" NPFT (51mm)

Height: 14" (over handle)

Width: 8-1/2" x 9-1/2" diameter

Weight: 15 lbs.

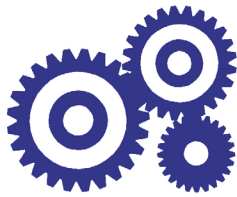


RELIABLE EQUIPMENT & SERVICE CO., INC.

301 Ivyland Road • Warminster, PA 18974

TOLL FREE: 800-966-3530 • FAX: 215-357-9193

Visit us on the web at www.Reliable-Equip.com

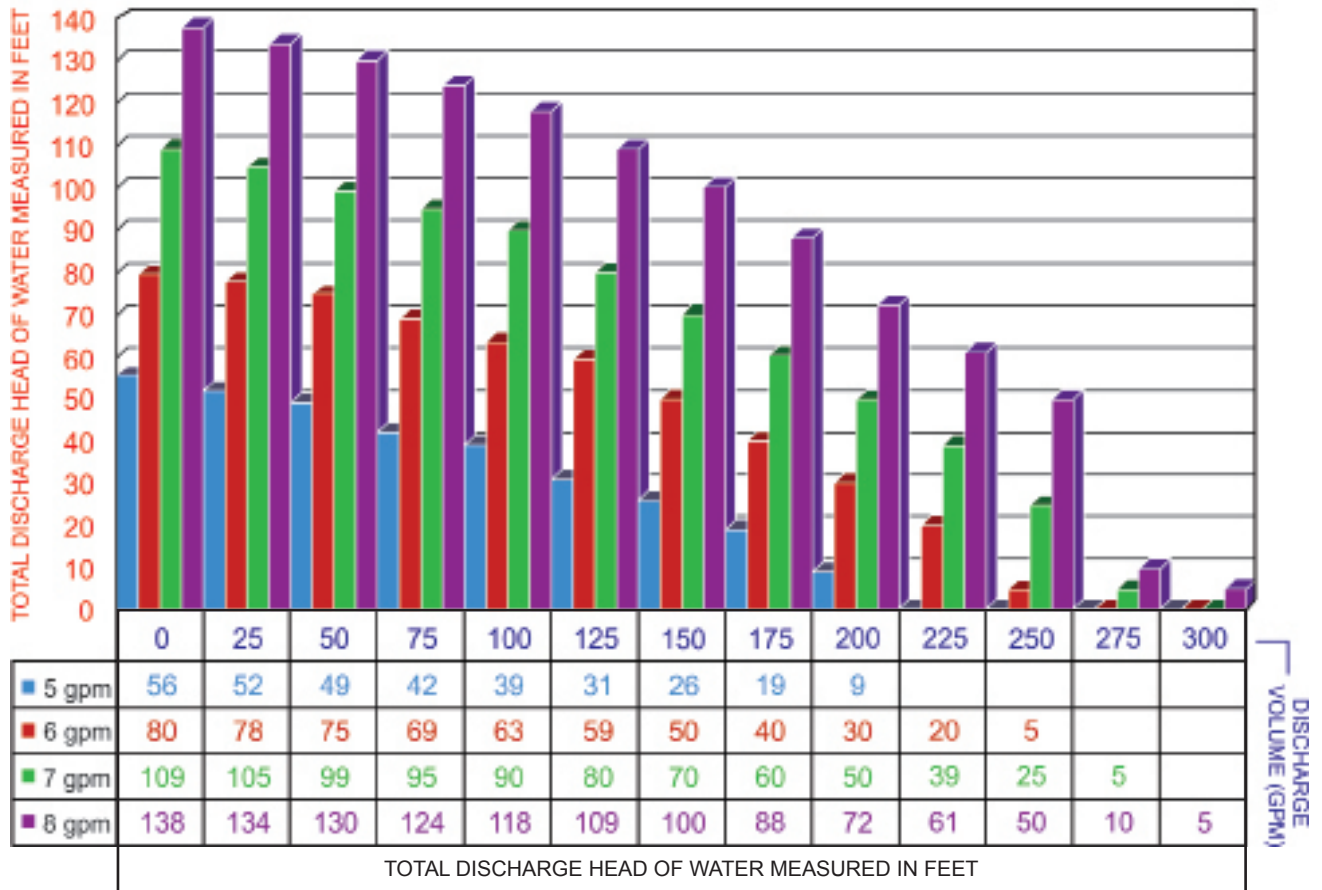


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REL-SP2

2 INCH HYDRAULIC SUBMERSIBLE PUMP

The graph below illustrates discharge volume and head with relation to hydraulic flow.



The test above was conducted using a regulated hydraulic source and a fixed discharge assembly.

Results may vary under field conditions.

Contact your **RELIABLE** representative for literature about the **REL-HPU-2000** 2,000 psi hydraulic power unit and the **REL-TP3** 3 inch Hydraulic Trash Pump.



RELIABLE EQUIPMENT

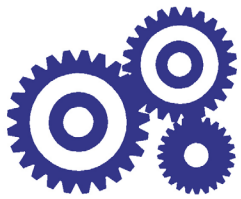
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RELIABLE EQUIPMENT & SERVICE CO., INC.

REL-SP3-500

3 INCH SUBMERSIBLE HYDRAULIC PUMP

The **REL-SP3** Submersible Pump is a light weight, efficient way to move large quantities of liquids *FAST*.

No priming required!

The **REL-SP3** is also able to pump petroleum products.

The **REL-SP3** is able to run all day without seal damage.

3" Compact, lightweight Submersible Pump
Operate on Open and Closed Center systems.

X-Long carry handle aids in placement.

High impact strainer housing.

Whip set and flush-face couplers included.

Can run dry without damage.

Specifications

Capacity: Up to 500 GPM

Flow Range: 5-8 GPM

Operating Pressure: 1200-2000 PSI

Intake Port: 1 15/16" (49mm)

Discharge Port: 3" NPFT (51mm)

Height: 17" (over handle)

Width: 8-1/2" x 9-1/2" diameter

Weight: 17 lbs.

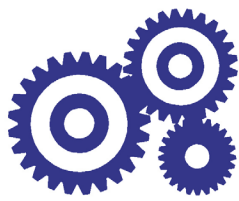


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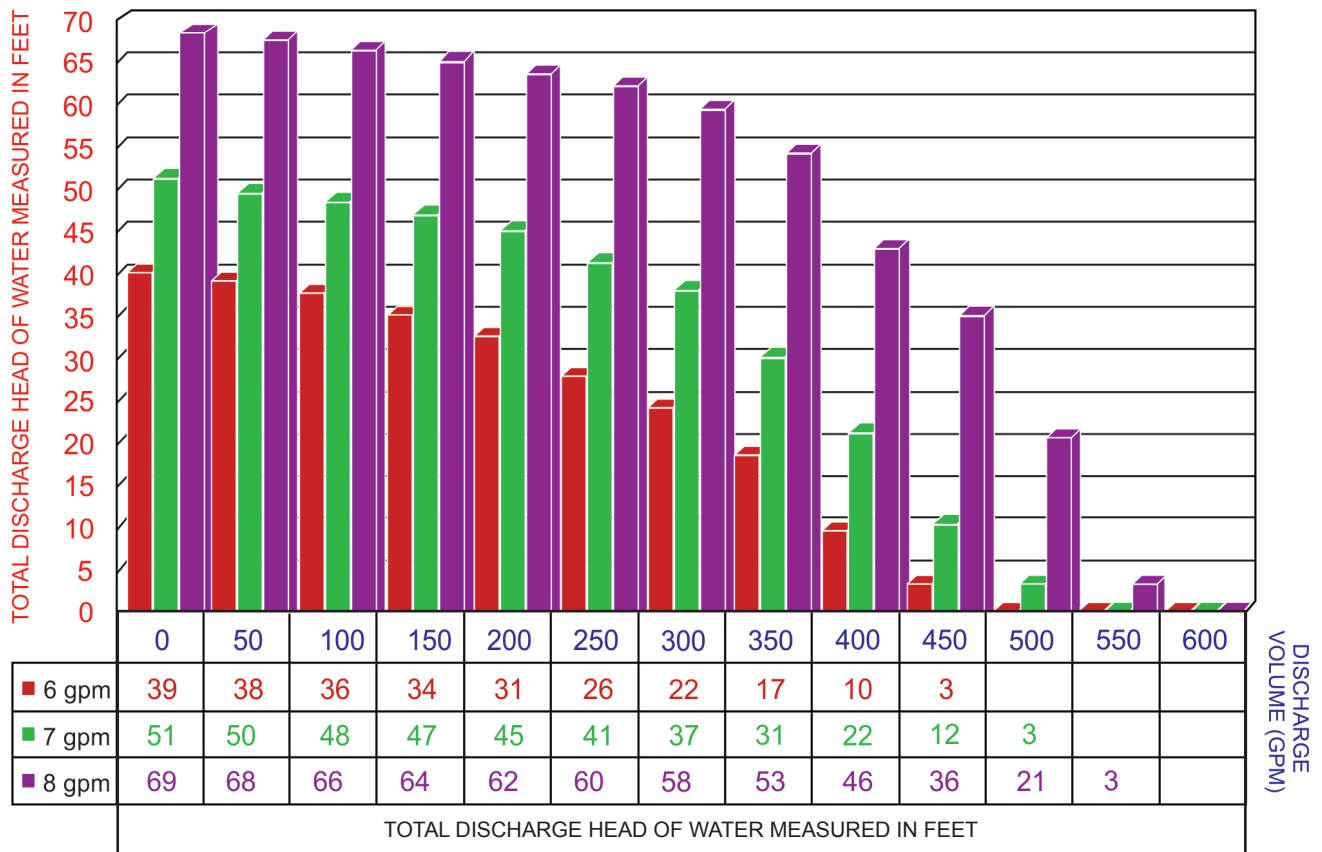


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REL-SP3

3 INCH HYDRAULIC SUBMERSIBLE PUMP

The graph below illustrates discharge volume and head with relation to hydraulic flow.



The test above was conducted using a regulated hydraulic source and a fixed discharge assembly.

Results may vary under field conditions.

Contact your **RELIABLE** representative for literature about the **REL-HPU-2000** 2,000 psi hydraulic power unit and the **REL-TP3** 3 inch Hydraulic Trash Pump.



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Phone: 800-966-3530 • Fax: 215-357-9193

Visit us on the web at www.Reliable-Equip.com



WARNING

BEFORE USING THIS TOOL, READ THE WARNINGS and the recommended practices described in this manual. Failure by the operator to read and fully understand these warnings will leave this person unqualified to use and operate this tool. Property damage, severe personal injury, and/or death could result by not following these warnings.

These warnings will appear in appropriate locations when they are pertinent to the particular subject being shown. Read each one carefully and follow them strictly.



WARNING

Eye Protection

Always wear eye protection to avoid injury from flying debris or hydraulic oil leaks. Failure to do so can result in serious personal injury.



WARNING

Skin Irritation

Hydraulic oil may cause irritation. Use care to prevent contact with skin. In case of accidental contact, wash affected area immediately



WARNING

Hard Hat

Always wear a hard hat to avoid injury from falling debris. Failure to do so can result in serious personal injury.



WARNING

Foot Protection

Always wear foot protection. Failure to do so can result in serious personal injury.



WARNING

Hearing Protection

Always wear hearing protection, to avoid hearing loss due to long term exposure to high noise levels.



WARNING

Protective Gloves

Always wear protective gloves & cloths. Failure to do so can result in serious personal injury.



WARNING

SAFE OPERATION & CARE

USE THIS TOOL FOR ITS INTENDED PURPOSE ONLY

Any other use can result in injury or property damage.

INSPECT TOOL BEFORE USE. Replace any worn, damaged or missing parts. A damaged or improperly assembled tool may malfunction, injuring operator and/or nearby personnel.

INSPECT HYDRAULIC HOSES AND COUPLINGS before each use. Repair or replace if any cracking, leakage, wear or damage is found. Worn or damaged hoses may fail resulting in personal injury or property damage.

CLEAR WORK AREA of all bystanders and unnecessary personnel before operating this tool.

KEEP ALL PARTS OF THE BODY AWAY FROM MOVING PARTS.

Failure to observe this warning could result in serious injury.



WARNING

HYDRAULIC POWER SUPPLY

TURN HYDRAULIC SOURCE OFF before making any connection **DO NOT attempt to make any changes** to any of the component parts or accessories when connected to the power source.

DO NOT adjust, inspect, or clean any tool while the tool is connected to the power source. The tool could accidentally start up and cause serious injury.

DO NOT lock the tool in the On Position. In an emergency, serious damage or injury could occur during the time required to stop the tool.



DANGER

OIL INJECTION INJURY

Hydraulic oil or fluid under the skin is a serious injury. Oil under pressure can penetrate the skin and may cause dismemberment or loss of life. Seek medical assistance immediately if such an injury should occur.

Always wear safety gloves, eye protection and all required safety equipment when operating or handling this tool.

DO NOT use fingers or hands to attempt to locate a leak.

DO NOT handle hoses or couplers while system is pressurized.

NEVER open or service the system before depressurizing.



WARNING

HOSES AND FITTINGS

There exists the potential for shock in using anything other than certified non-conductive hoses and hydraulic oil with dielectric properties, when using system components near energized electrical lines. Failure to recognize these conditions could cause electrocution.

Hoses and fittings used with this tool must comply with S.A.E. J1273 which covers recommended practice for selection, installation, and maintenance of hose and hose assemblies. The **correct hoses and fittings are available from your supplier.**

WARNING: Failure to comply with these warnings could result in severe bodily injury or death.



WARNING

UNIT/HOSE CONNECTIONS

ALWAYS DISCONNECT pump/power source and turn the key to the **OFF** position before connecting or disconnecting any components.

ALWAYS DEPRESSURIZE hydraulic system, before connecting or disconnecting any of the systems components.

ALWAYS TIGHTEN COUPLINGS COMPLETELY. Loose or improperly connected couplings may not allow fluid to pass through the hose creating a blockage in the supply or return line.

ALWAYS INSPECT HOSES AND CONNECTORS before connection to tool. Replace or repair if any leakage is evident. Leakage is a sign of deterioration in component parts.

Connect hoses and confirm proper flow direction to & from tool.



WARNING

SERIOUS BURN HAZARD

HOT SURFACES MAY CAUSE SERIOUS BURN INJURY

The hydraulic motor may be hot during and after operation.

CAUTION: HYDRAULIC FLUID MAY CAUSE SERIOUS BURNS

Never disconnect tool, hoses, or fittings while the hydraulic power source is running or if the hydraulic fluid is hot.

**IF YOU HAVE ANY QUESTIONS REGARDING THE SAFE USE
AND/OR OPERATION OF THIS TOOL, CONSULT YOUR AREA SUPERVISOR,
OR CONTACT RELIABLE EQUIPMENT AT 800-966-3530**



WARNING

ELECTRICAL SHOCK HAZARD

Always wear and use the necessary clothing, equipment and safety practices to protect against electrical shock. Failure to follow these rules can result in serious personal injury or death.



GENERAL SAFETY



USE ALL APPROPRIATE AND APPLICABLE PERSONAL SAFETY EQUIPMENT as required by the operating company.

ALWAYS INSPECT TOOL for wear or deterioration or damage every day. Worn or damaged parts may cause malfunction of tool or unsafe circumstance.

KEEP ALL BODY PARTS AWAY FROM MOVING PARTS OF THE PUMP.

DO NOT DIRECT DISCHARGE TOWARDS ANY PERSON, ANIMAL OR VEHICLE.

MOVE OUTSIDE DANGER ZONES BEFORE ACTIVATING THE PUMP

MAKE SURE THERE IS NO PERSON IN CLOSE PROXIMITY to you, the tool, or the discharge who could be injured by any operation being performed, tool malfunction or flying debris.

DO NOT OVEREXTEND your position by overreaching or unbalancing the footing necessary to maintain physical control of your body.

USE THIS TOOL FOR THE MANUFACTURERS' INTENDED PURPOSE ONLY.

OBSERVE CLOSELY ALL SAFETY RULES FOR A PARTICULAR JOB CLASS



WARNING

Operation/Safety methods may vary in accordance with the working guidelines established by each utility or contractor.

For your own safety, ensure that you fully comply with all safe operation guidelines required by your employer.

Consult your training or safety personnel or supervisor as needed.

HYDRAULIC SYSTEM REQUIREMENTS

- Operating Pressure: 1200-2000 PSI (70-140 bar)
Max. Relief Setting: 2100 psi (145 bar)
Flow Range: 5-8 gpm **REL-PS2** 7-12 gpm (26-45 lpm) **REL-PS3**
Max. Backpressure: 250 psi (17 bar)
Cooling System: Required
Min. Filtration: 25 Micron
Sound Pressure <85 dBA @ 1m
Hydraulic Fluids: All hydraulic fluids that meet these listed specifications or listed HTMA specifications may be used for this tool.

S. U. S.
@ 100° F (38° C).....140 TO 225
@ 210° F (99° C)..... 40 minimum
FLASH POINT 340° F min. (170° C min.)
POUR POINT -30° F min. (-34° C min.)

- Hydraulic Hoses: 2500 psi (175 bar) minimum working pressure (Ref. J517)
Hose assembly should include flush face quick disconnect couplers as recommended by the HTMA.
(Hydraulic Tool Manufacturers Association)

CAPACITY

- | | | |
|---------------------|--------------------------------------|--|
| Intake Port: | 1 15/16 in. (49mm) | 2 3/4 in. (70 mm) |
| Discharge Port: | 2” NPFT (51mm) | 3” NPT (76 mm) |
| Discharge Capacity: | Up to 275 gpm
(Illustration pg 5) | Up to 500 gpm (1,890 lpm)
(Illustration pg 7) |

WEIGHT & CLEARANCE

- | | | |
|---------|--------------------------|-----------------------------|
| Weight: | 15 lbs. | 21 lbs. (9.5 kg) |
| Height: | 14” (over handle) | 17 in. (over handle) |
| Width: | 8-1/2” x 9-1/2” diameter | 10W x10.5L (25.4 x 26.7 cm) |



WARNING

Operation/Safety methods may vary in accordance with the working guidelines established by each utility or contractor.
For your own safety, ensure that you fully comply with all safe operation guidelines required by your employer.
Consult your training or safety personnel or supervisor as needed.

OPERATION

PRE-OPERATION

Do not use this tool under unsafe working conditions or locations.

Use this pump only for it's intended purpose.

This pump is not designed for operation with a suction pipe inlet.

Read entire manual prior to operation of this tool.

(Refer to all safety recommendations and warnings)

Observe all safety precautions & procedures required by the operating company.

Check the Pump inlet screen and discharge for debris or obstruction.

Connect a compatible (2" SP2 or 3" SP3) discharge hose and securely tighten.

Ensure that hydraulic source is OFF and Control Valve is in the OFF position before making any connections.

Connect appropriate hydraulic hose to the tools' return and pressure ports.
(Length may vary) Use a length of hose that will not restrict free movement, or pose any hazard to the operator or other personnel on the work site.

OPERATION

Observe ALL required safety guidelines established by the Utility or Contractor.

Lower the pump into the liquid, or position tool as required by the application.

Remove any kinks from discharge hose to ensure proper flow of discharge.

Position and direct the discharge hose in a manner that neither hose, or discharge will restrict free movement, or pose a hazard to the operator or other personnel.

 **WARNING** **DO NOT direct discharge towards any person, animal or vehicle.**

Turn ON hydraulic source and select an appropriate flow for the tool. (7 gpm)

COLDER WEATHER - Allow hydraulic fluid to warm for 3-5 minutes before operating.

NOTE: Do Not lift water with solids beyond 40 ft. if hydraulic flow is below 7 gpm

Move the Control Valve to the ON position.

Allow unit to run, watching for excessive solids and/or reduced discharge flow.

Possible Cause: The hydraulic flow/head ratio may be insufficient to carry excess solids. The pump may have settled into excessive solids beneath the liquid to be pumped.

Stop Pump to check & resolve.

Reduced flow may cause accumulation of solids in the volute, and increase pump wear.

Failure to resolve may result in reduced discharge capacity and/or pump damage.

Move the Control Valve to the OFF position.

Return the Flow Selector to the OFF position, and Turn KEY to the OFF position.

DAILY MAINTENANCE



IMPORTANT: The greatest cause of hydraulic system failure is dirt. Prevent the introduction of foreign matter into the pump via hydraulic fluid, dirty connections or accumulation of sediment in the hydraulic system.

The life, reliability, and safety of the tool is dependent on proper maintenance. Maintenance must be performed by authorized and trained personnel **ONLY**.

Inspect pump for wear or damage. Worn or damaged parts may malfunction during operation.

All parts must be replaced with new parts if signs of wear or damage are evident.

Inspect the fittings, and hydraulic lines. (i.e. kinks, leaks, dirt, etc.) *Do Not use hands!*

Inspect Hoses. Worn or damaged and aged hoses may malfunction during operation.

Clean and inspect pump before storage. Solids, fibers and sand may become attached to the volute screen, or trapped within the pump chamber and hose assembly.

Remove the volute by removing the two (2) hex head cap screws at the base of the handle.

Lift the flange/motor assembly straight up, from the volute. (refer to Dwg # 1)

CAUTION: Impeller may be sharp.

Clean the inner screen, discharge and the impeller. *Impeller removal should not be necessary.*

Visually Inspect the impeller for cracks, breakage, and excessive wear. *Replace as required.*

NOTE: A worn or damaged impeller may reduce pump performance.

If required the impeller may be removed by removing the center cap screw and lockwasher while holding the impeller. **CAUTION:** Impeller may be sharp.

Install or replace the impeller using the center cap screw and lockwasher.

Re-assemble the pump by replacing motor/flange assembly and securing the two (2) hex head cap screws and lockwashers to connect the handle, flange and volute.

Clean and empty the discharge hose before storage.

Inspect and clean hydraulic couplers before and after each use.

NOTE: Keep Label Set clean and legible. Replace decals when necessary.



CAUTION

Failure to observe all warnings and instructions could result in property damage, severe personal injury, and/or death.

BEFORE USING THIS PRODUCT READ THE SAFETY WARNINGS

and recommended practices described in the manual. Failure by the operator to read and fully understand the warnings will leave this person unqualified to use and operate the tool.



CAUTION

Operation and safety methods may vary in accordance with the guidelines established by each utility. For your safety, ensure that you fully comply with all safe operation guidelines established by your respective power utility.

REL-SM

EXTREME CAUTION SHOULD BE TAKEN TO ENSURE THE SAFETY OF ALL PERSONNEL

Any attempt to resolve a performance related issue, or to repair a product that is not working as expected in the field, will require knowledge of the tool and the application being performed.

TROUBLESHOOTING TIPS AND FIELD SOLUTIONS

Pump Will Not Start	No Hydraulic Flow or Pressure	Check Hydraulic Supply - Pressure and Flow
	Impeller Jammed	Disconnect from Source - Ensure that Impeller Moves Freely by Turning the Center Cap Screw. Clean/Clear as required.
	Improper or Defective Coupling	Check Coupler Connections and Flow Direction
Poor Performance	Insufficient Hydraulic Flow	Check Flow /Head (refer to illustration on pg. 5)
	Flow Reversed	Check Coupler Connections and Flow Direction
	Volute Screen Restricted	Pump may have settled into solids. Raise Pump Volute Screen may be Obstructed. Clear Screen
	Discharge Kinked or Restricted	Straighten Discharge Hose & Clear Obstructions
	Impeller Worn or Damaged	Check Impeller for Damage or Excessive Wear Replace Impeller as Required.
	Pump Not Matched to Application	Check Requirements - Adjust or Replace Pump.
	Excessive Solids in Liquid	Reduce Solids Increasing Flow May Remove Excess Solids, but may result in wear or damage to the pump.
IF THE ISSUE OR THE PROPER SOLUTION IS NOT FOUND ABOVE CONTACT YOUR RELIABLE SERVICE REPRESENTATIVE		

WARNING: ALL tool repair and service must be performed by authorized and trained personnel ONLY. Improper maintenance or tampering could result in malfunction causing damage to equipment and/or injury to personnel.

Complete disassembly is not recommended. Return the unit to an authorized dealer for total disassembly and/or repair.

All maintenance or disassembly should take place on a flat, clean work surface covered with towels or wipers so as to have a clean space for the disassembled parts. Inspect each part during disassembly for wear, scratches, and cuts. Discard the worn or damaged parts and replace with new factory authorized parts.

O-rings are sensitive to sharp edges. Inspect closely for cuts or damage. A small cut will cause a leak. When assembling or disassembling O-rings, use hydraulic fluid as a lubricant to help disassembly or installation.

MAJOR COMPONENT

16

OPERATION RECORDS

Date	Hours	Liquid Type	Solid Type & Concentration	Flow	Head

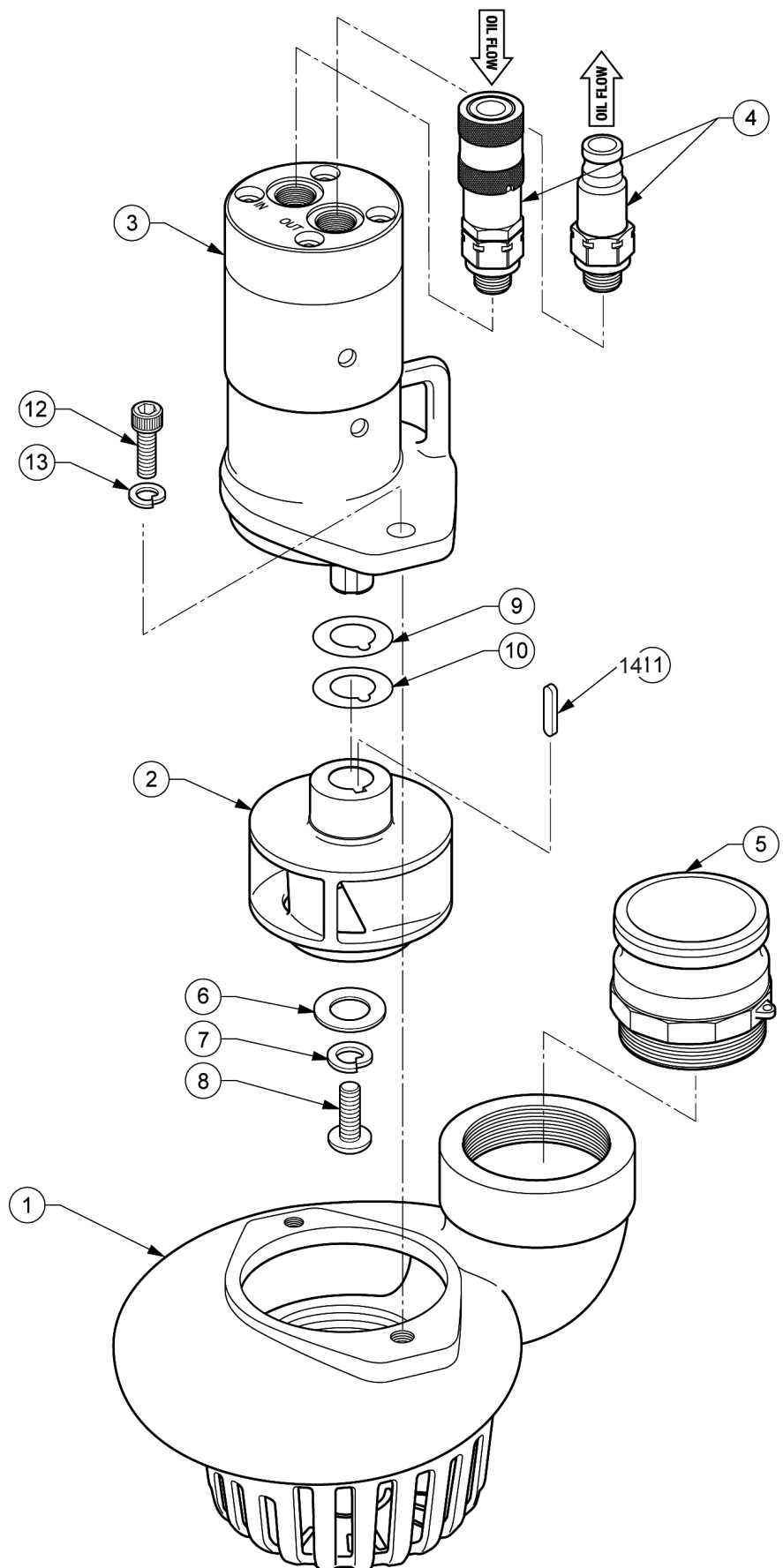
REL-SP3

MAJOR COMPONENTS

Motor assembly is sold as a complete unit only.

REL-SP3 PARTS LIST

#	P/N	Description	Qty
1	SP351	Volute	1
2	SP352	Impeller	1
3	SP353	Motor Assembly	1
	SP354	Motor Mount	1
4	FF-370	FF Coupler Set	1
5	SP360	Cam Loc 3"	1
6	SP207	Impeller Bolt	1
7	SP208	Impeller Lock Washer	1
8	SP209	Impeller Washer	1
9	SP211	Impeller Shim .010	1
10	SP212	Impeller Shim .020	1
12	68016849	Motor Mount Bolts	3
13	SP356	Motor Mount Washers	3
14	SP316	Motor Shaft Key	1
	SP364	Seal Kit	1
	SP365	Label Set	1
	R-SP3-H	Handle	NOT SHOWN



OPERATION RECORDS

Date	Hours	Liquid Type	Solid Type & Concentration	Flow	Head

USER NOTES

If you have any questions regarding the information in this manual please contact **RELIABLE EQUIPMENT** at the address, phone or fax numbers shown below.

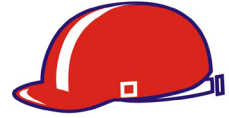


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Read Manual



Protective Head Wear



Protective Eye Wear



Protective Clothing



Hearing Protection



Protective Foot Wear



Electrical Shock



Hot Surfaces



Hydraulic Injection