

OWNER'S MANUAL

MODEL NO. 390.2505

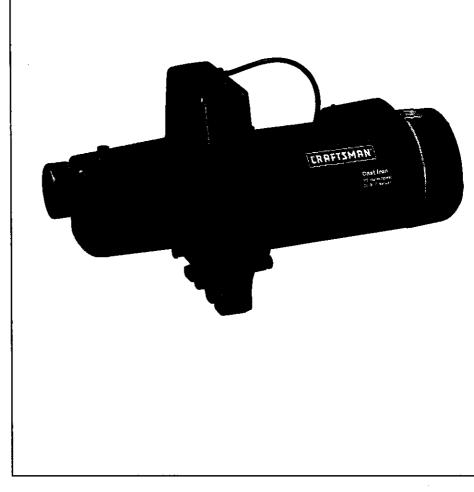
CAUTION: Read and Follow All Safety Rules and Operating Instructions Before First Use of This Product.

Save This Manual For Future Reference.

CRAFTSMAN® SHALLOW WELL JET PUMP

- Safety Instructions
- Installation
- Electrical
- Maintenance
- Repair Parts

Sears, Roebuck and Co., Hoffman Estates, IL 60179 U.S.A.

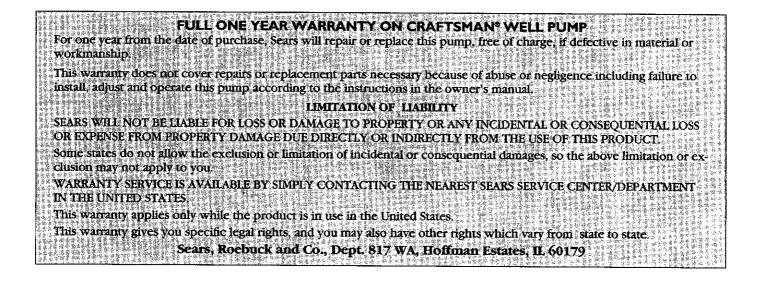


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INTRODUCTION

Please read our instructions before installing and using your pump. This will help you obtain the full benefits of the quality and convenience built into this equipment. It will also help you avoid any needless service expense resulting from causes beyond our control which are not covered by our warranty.



RULES FOR SAFE INSTALLATION AND OPERATION

- 1. Read the Owners Manual and Rules for Safe Operation and Installation Instructions carefully. Failure to follow these Rules and Instructions could cause serious bodily injury, and/or property damage.
- 2. Check your local electrical wiring codes before installation. If your local codes are not followed, your pump will not work to its full rated capacity and could present a fire hazard. If in doubt, contact your local power company.
- 3. **BE SURE** your pump installation meets all local plumbing, pump and well codes.
- 4. While installing your pump, always keep the well covered to prevent leaves and foreign matter from falling into the well, contaminating the water and/or causing possible serious damage to the mechanical operation of the pump.
- 5. Always test the water from well for purity before using. Check with local health department for test-ing procedure.
- 6. Before installing or servicing your pump, **BE SURE** pump power source is disconnected.
- 7. **BE SURE** your pump electrical circuit is properly grounded.

- 8. Complete pump and piping system MUST be protected against below freezing temperature. Allowing the pump or piping to freeze could cause severe damage and voids the Warranty.
- 9. **BE SURE** the line voltage and frequency of the electrical current supply agree with the motor wiring as shown on motor nameplate.
- 10. The correct fusing and wiring sizing is essential to proper motor operation. Use recommended fusing and wire size data in the manual (Pages 5 and 6).
- 11. Pump water only with this pump.
- 12. Periodically inspect pump and system components.
- 13. Relief valve must be capable of passing full pump flow at 75 PSI.

AWARNING Pump body may explode if used as a booster pump unless relief valve capable of passing full pump flow at 75 PSI (517 kPa) is installed.

A CAUTION Motor normally operates at high temperature and will be too hot to touch. It is protected from heat damage during operation by an automatic internal cutoff switch. Before handling pump or motor, stop motor and allow it to cool for 20 minutes.

MAJOR COMPONENTS AND WHAT THEY DO

Tank and Air Volume Control

The tank serves two functions. It provides a reservoir of water, so that the pump doesn't need to start every time water is drawn from a fixture in the house, and it maintains a cushion of air under pressure.

When Captive Air[®] Tanks are used, no air volume control is necessary. This tank is precharged with air at the factory.

When a Standard Tank is used, an air volume control adds air to the tank when it is needed. See instructions included with Air Volume Control for details on installation and operation.

Pressure Switch

The pressure switch provides automatic control.

Model No.	Pump Starts At	Pump Stops At
390.2505	30 Pounds	50 Pounds

When used with a Captive Air[®] Tank, the precharge may need adjustment. See the Captive Air[®] Tank instructions for details.

Impeller and Jet

The impeller of the pump rotates with the motor shaft, causing the water to fly out from its rim by centrifugal force. The rotation of the impeller creates a partial vacuum which pulls in more water. Part of the water is diverted back to the jet where it passes through the nozzle and venturi, reinforcing the vacuum to draw in more water and delivering it at a high velocity to the impeller.

Because of the shallow setting, the partial vacuum created by the pump is sufficient to pull water to the pump, therefore, the jet assembly is attached directly to the pump.

Piping In The Well

A Shallow well jet pump can be installed on a dug well, drilled well or with a driven point. SEARS shallow well jet pumps have a built-in check valve. In a dug or cased well, a foot valve and strainer is recommended and should be installed 5 to 10 feet below the lowest level to which the water will drop while pump is operating (pumping water level), See Figure 3, Page 4. Your well driller can furnish this information. The strainer should not be too close to the bottom, or sediment may clog it. Before installing foot valve, check to see that it works freely.

When using a foot valve, a priming tee and a plug as shown in Figure 1, is recommended.

Be sure the total lift from the pumping water level to the pump does not exceed 20 feet if the pump is over the well, or less if the pump is offset from the well. Both figures are for sea level – the maximum lift at which the pump can operate satisfactorily decreases with the elevation at the approximate rate of 1 foot per 1,000 feet of elevation. Thus, if the lift is 17 feet and your elevation is 3,000 feet above sea level, you would then be pumping 17 plus 3 or 20 feet. This is still satisfactory for shallow well pumping.

Horizontal Piping From Well To Pump

On well point installations where the horizontal piping is more than 25 feet, a check valve should be installed as shown in Figure 3, Page 4.

When the pump is offset more than 25 feet from the well, horizontal piping should be increased in size to reduce friction losses. In no case should the offset piping be smaller than the suction tapping of the pump.

Horizontal Offset Piping Sizes for Shallow Well Jets

1-1/4"	1-1/2"	2"
Up to 25 Ft.	25 to 50 Ft.	50 to 200 Ft.

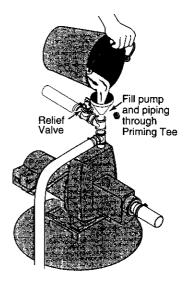
Discharge Pipe Sizes

When the pump is set a distance from the house or point of water use, the discharge pipe size should be increased to reduce pressure losses caused by friction.

1"	1-1/4"	1-1/2"	
Up to 25 Ft.	25 to 100 Ft.	100 to 600 Ft.	

Emergency Power

In some areas and with some installations, an emergency power supply to guard against power failure is a good idea. If you install an engine-generator set for emergency backup power for your pump, supply the generator set manufacturer with the nameplate data from the pump motor. He will then be able to provide a generator of the correct size to power your pump. Also, be sure to add the load from any other accessories (such as lights) that may be on the same circuit.





INSTALLATION

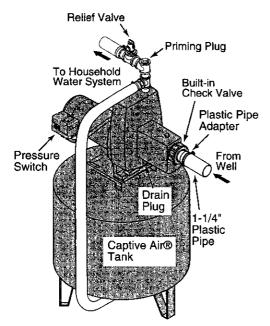


Figure 2 – Typical Installation - Captive Air® Pressure Tank

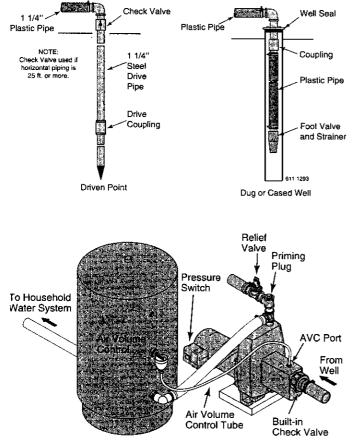


Figure 3 – Typical Installation - Standard Pressure Tank

Pump Installation

SEARS jet pumps can be used with Captive Air[®] Tanks as shown in Figure 2.

For mounting pump to tank, purchase tank fitting Kit No. 2788.

CRAFTSMAN Captive Air[®] Tanks are precharged with air at the factory. Check the tank Owner's Manual to find if air charge needs adjustment. Your pump requires 30 pounds for proper operation.

The jet pump can also be mounted on standard horizontal tanks. A kit consisting of all necessary piping, elbows, and other fittings, is furnished with the tank for mounting pump using this method. See Figure 3. Instructions are included with tank.

Air Volume Control – Included With Standard Horizontal Tank

There is a 1-1/4" x 1/4" reducer bushing and a 1/4" x 1-1/2" nipple supplied in the fittings package. Use the one that fits into the air volume control tapping in the end of the tank as shown in Figure 3. Use pipe compound on male threads. Screw the air volume control on to the 1/4" fitting and the right angle compression fitting into the bottom tapping of the air volume control.

Remove the 1/4" pipe plug, Key No. 13, Page 10, on the jet portion of the pump body near the check valve. Insert a 1/4" compression fitting into this tapping. Cut tubing to length and assemble the two fittings in the air volume control and pump body. Use nuts, sleeves, and inserts furnished.

Priming the Pump

A CAUTION Never run pump dry. Running pump without water may cause pump to overheat, damaging seal and possibly causing burns to persons handling pump. Fill pump with water before starting.

AWARNING Never run pump against closed discharge. To do so can boil water inside pump, causing hazardous pressure in unit, risk of explosion and possibly scalding persons handling pump.

DO NOT START MOTOR UNTIL PUMP HAS BEEN FILLED WITH WATER.

- 1. Remove the priming plug. fill pump with water. Replace priming plug. If a priming tee and plug have been provided at the well head for a long horizontal run, be sure this tee is filled and the plug replaced, using pipe compound on plug threads. See Figure 1, Page 3.
- 2. Start the pump. Water will be pumped in a few minutes; the time depending upon the depth to water, and the distance of horizontal run. If pump does not prime, check for a possible leak on the suction side of the pump. Reprime. Check to be sure suction lift – distance from water level to pump – does not exceed 20 feet.

ELECTRICAL

A Disconnect power before working on pump, motor, pressure switch, or wiring.

Motor Switch Settings

If the motor can operate at either 115 or 230 volts, it is set at the factory to 230 volts. Do not change motor voltage setting if line voltage is 230 volts, or if you have a single voltage motor.

NOTICE: Never wire a 115 volt motor to a 230 volt line.

Remove Motor End Cover

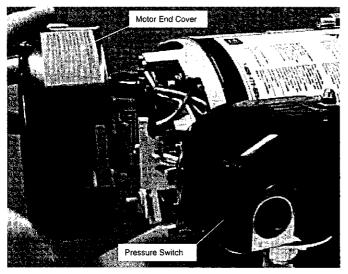


Figure 4 – Removing Motor End Cover

You will need to remove the motor end cover to change the voltage setting. The illustration above also shows the pressure switch. If the power supply connection still needs to be made, the pressure switch cover will need to be removed.

Your motor terminal board (located under the motor end cover) should look like the one at right.

Dial Type Voltage Selector

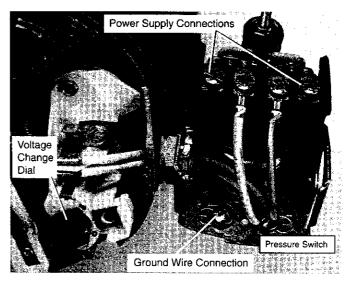


Figure 5 - Voltage Set To 230 Volts, Dial Type

To change to 115 volts:

- 1. Make sure power is off.
- 2. Turn the dial counter-clockwise until 115 shows in the dial window.
- 3. Reinstall the Motor end cover
- 4. Go to Wiring Connections, Page 6.

AWARNING Hazardous voltage. Can shock, burn, or kill. Connect ground wire before connecting power supply wires. Use the wire size (including the ground wire) specified in the wiring chart. If possible, connect the pump to a separate branch circuit with no other appliances on it.

AWARNING Explosion hazard. Do not ground to a gas supply line.

Wiring Connections

AWARNING Fire hazard. Incorrect voltage can cause a fire or seriously damage the motor and voids the warranty. The supply voltage must be within $\pm 10\%$ of the motor nameplate voltage.

NOTICE: Dual-voltage motors are factory wired for 230 volts. If necessary, reconnect the motor for 115 volts, as shown. Do not alter the wiring in single voltage motors.

Install, ground, wire, and maintain your pump in compliance with the National Electrical Code (NEC) or the Canadian Electrical Code (CEC), as applicable, and with all local codes and ordinances that apply. Consult your local building inspector for code information.

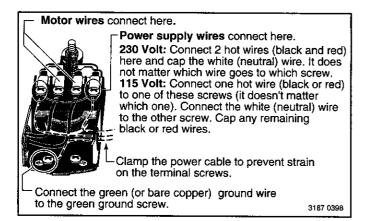


Figure 6 – Pressure switch wiring

Connection Procedure

- 1. Connect the ground wire first as shown in Figure 6. The ground wire must be a solid copper wire at least as large as the power supply wires.
- 2. There must be a solid metal connection between the pressure switch and the motor for motor grounding protection. If the pressure switch is not connected to the motor, connect the green ground screw in the switch to the green ground screw under the motor end cover. Use a solid copper wire at least as large as the power supply wires.
- 3. Connect the ground wire to a grounded lead in a service panel, to a metal underground water pipe, to a metal well casing at least ten feet (3M) long, or to a ground electrode provided by the power company or the hydro authority.
- 4. Connect the power supply wires to the pressure switch as shown in Figure 6.
- 5. Reinstall the pressure switch cover.

Motor Horse-					Distance	in Feet Fi	rom Motor	to Meter	
	Max. Load	Branch* Fuse Rating	0' to 50'	51' to 100'	101' to 200'	201' to 300'	201' to 400'	401' to 500'	
power	Volts	Amperes	Amps			Wire	Size		
1/2	115/230	10.4/5.2	15/15	14/14	14/14	10/14	10/14	6/14	6/12

TABLE I: WIRING CHART - Recommended Fusing and Wiring Data

* Time delayed fuses are recommended instead of fuses in any motor circuit.

MAINTENANCE

Lubrication

It is not necessary to lubricate the pump or its motor. The motor has two ball bearings lubricated for life. The mechanical shaft seal in the pump is water lubricated and self-adjusting.

Draining for Winter

When the pump is to be disconnected from service, or is in danger of freezing, it should be drained.

Turn power to pump OFE Open a faucet to bleed off pressure. Remove the priming plug to vent the pump. Drain the pressure tank. Drain all piping to a point below the freeze line.

To drain an air volume control, remove AVC tubing and turn (loosen) it 180° on the $1/4^{"}$ pipe fitting in the tank. This will permit any water remaining in the air volume control to drain back into the tank.

To drain pressure tank, remove plug, piping or hose at lowest point in the tank.

The Shaft Seal

The pump is designed for ease of servicing. Should repair or replacement of the motor or seal be needed, the pump and piping do not need to be disconnected or disturbed.

If it is necessary to repair or replace the motor, it is a good idea to replace the seal plate gasket and the shaft seal, Key Nos. 4 and 5 of pump drawings, Page 10. Therefore, we suggest that you order these two items to have on hand for future use.

The seal consists of primarily two parts; a rotating half and a ceramic seat.

NOTICE: The highly polished and lapped faces of the seal are easily damaged. Read the instructions thoroughly and handle the seal with care.

- 1. Disconnect electric service (pull switch), and disconnect wiring to pump. Disconnect pressure switch tube.
- 2. Remove capscrews holding motor to pump body. Motor with impeller and diffuser can now be removed.

- 3. Carefully tap diffuser to remove from seal plate.
- 4. Remove canopy from end of motor.
- 5. Partially unscrew capacitor clamp; move capacitor to one side.
- 6. Hold motor shaft with 7/16" wrench on the flats on the motor shaft and unscrew impeller.

Removal of Old Seal

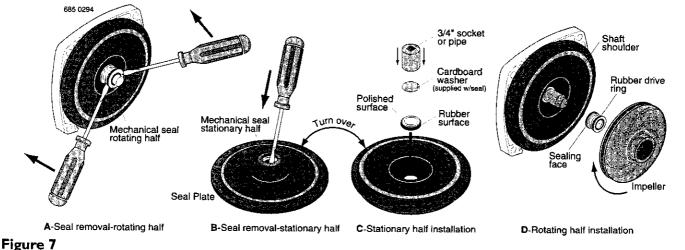
- 1. After unscrewing impeller, carefully remove rotating part of seal by prying up on sealing washer, using two screwdrivers (see Figure 7A). Use care not to scratch motor shaft.
- 2. Remove seal plate from motor and place on flat surface, face down. Use a screwdriver to push ceramic seat out from seal cavity (see Figure 7B).

Installation of Floating Seat (Figure 7C)

- 1. Clean polished surface of floating seat with clean cloth.
- 2. Turn seal plate over so seal cavity is up. Clean cavity thoroughly.
- 3. Lubricate outside rubber surface of ceramic seat with soapy water and press firmly into seal cavity with finger pressure. If seal will not locate properly in this manner, place cardboard washer over polished face of seat and press into seal cavity using a 3/4" socket or 3/4" piece of standard pipe.
- 4. **DISPOSE OF CARDBOARD WASHER.** Be sure polished surface of seat is free of dirt and has not been damaged by insertion. Remove excess soapy water.

Installation of Rotating Part of Seal Unit (Figure 7D)

- 1. Reinstall seal plate using extreme caution not to nick or scratch ceramic portion of seal on motor shaft.
- 2. Inspect shaft to make sure that it is clean.
- 3. Clean face of sealing washer with clean cloth.



MAINTENANCE

- 4. Lubricate inside diameter and outer face of rubber drive ring with soapy water and slide assembly on motor shaft (sealing face first) until rubber drive ring hits shaft shoulder.
- 5. Screw impeller onto the shaft until impeller hub stops against shaft shoulder. This will automatically locate seal in place and move the sealing washer face up against seat facing.

Cleaning Impeller

- 1. Disconnect power to pump.
- 2. Remove motor.
 - (a) Remove motor wiring from pressure switch.
 - (b) Remove 4 capscrews, Key No. 17, Page 10, which hold the motor to the pump body.
 - (c) Remove motor, seal plate, impeller and diffuser, (Key Nos. 1, 3, 6 and 7), Page 10, as a unit. Diffuser, Key No. 7, can now be lifted off and the impeller exposed and cleaned.

Replacing Venturi

Follow Steps 1 and 2 above, for Cleaning Impeller.

- 1. Remove venturi, Key No. 9, Page 10, by turning it counter-clockwise. This will expose the nozzle, Key No. 10, which can be removed by using a 5/8" hex socket and turning it counter-clockwise.
- 2. To replace venturi, turn it clockwise until snug.
- 3. Replace all parts. Connect motor wiring and turn on power.

Cleaning Shallow Well Jet

- 1. Disconnect power to pump.
- 2. Unscrew cleanout plug (Key No. 15, Page 10) from pump.
- 3. Insert an ice pick or other small diameter pointed tool into the nozzle and dislodge foreign material. If it is not possible to push the obstruction through the nozzle or if the nozzle is damaged, follow instructions above under "Replacing Venturi".
- 4. Replace all parts. Connect motor wiring and turn on power.

HOW TO HANDLE A GASEOUS WELL

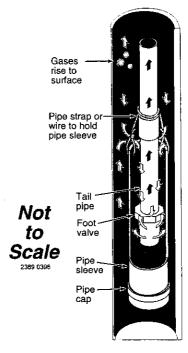
In some localities well water contains gases which must be allowed to escape before the water is used. This can be done as shown in Figure 8.

A good way of delivering gas-free water is to suspend a pipe, closed at the bottom and open at the top, surrounding the suction pipe, Figure 8. Since the gases rise in the well casing, the water sucked down through the pipe and into the suction pipe is free of gas. It is imperative that this type of well be vented to the outside of any enclosure.

Air Control In Flowing Wells

Flowing wells, or wells with little or no drawdown, could create a special problem in air control in the operation of your water system.

In such cases, it is recommended that you install a Captive Air[®] Tank, in which an air control mechanism is not required.



Pump Performance (In Gallons per Minute)

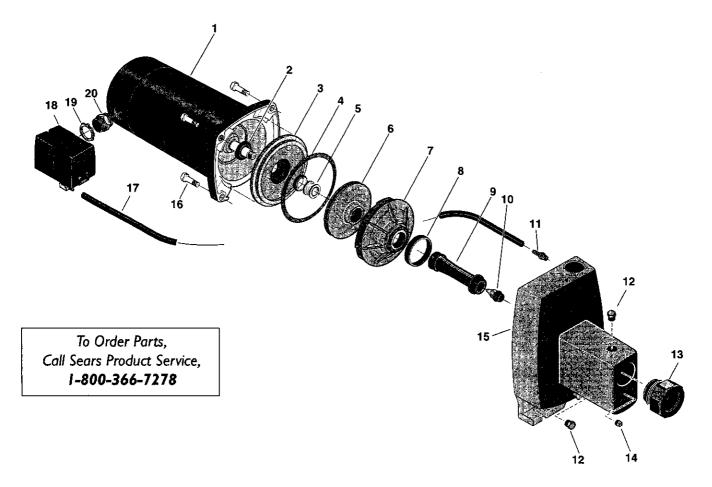
Figure 8

Pump		Suction D	uction Discharge Discharge Pumping Depth in Fee				eet	
Model	Description	Size	Size	Pressure PSI	5'	10'	15'	20'
390.2505	1/2 HP Cast Iron Shallow Well Jet	1-1/4"	1"	40	8.2	7.3	6.2	5.0

TROUBLESHOOTING CHART

SYMPTOM	P	OSSIBLE CAUSE(S)	C	ORRECTIVE ACTION
Motor will not run	1.	Disconnect switch is off	1.	Be sure switch is on
	2.	Fuse is blown	2.	Replace fuse
	З.	Starting switch is defective	3.	Replace starting switch
	4.	Wires at motor are loose, disconnected, or wired incorrectly	4.	Refer to instructions on wiring. Check and tighten all wiring.
	5.	Motor is wired incorrectly	5.	Refer to instructions on wiring
	6.	Pressure switch contacts are dirty	6.	Clean by sliding pieces of plain paper between contacts
Motor runs hot and overload kicks off	1. 2.	Motor is wired incorrectly Voltage is too low		Refer to instructions on wiring Check with power company. Install heavier wiring if wire size is too small. See wiring instructions
	З.	Pump cycles too frequently	3.	See section below on too frequent cycling
Motor runs but no water is delivered	1.	Pump in new installation did not pick up prime through: a. Improper priming b. Air leaks c. Leaking foot valve	1.	In new installation: a. Re-prime according to instructions b. Check all connections on suction line, air volume control, and jet c. Replace foot valve
	2.	Pump has lost prime through:a. Air leaksb. Water level below suction of pump	2.	 In installation already in use: a. Check all connections on suction line, air volume control, jet and shaft seal b. Lower suction line into water and re-prime. If receding water level in well exceeds suction lift, a deep well pump is needed
	3	Jet or impeller is plugged	2	Clean jet or impeller according to instructions
		Check valve or foot valve is stuck in closed position	I	Replace check valve or foot valve
	5.	Pipes are frozen	5.	Thaw pipes. Bury pipes below frost line. Heat pit or pump house.
	6.	Foot valve and/or strainer are buried in sand or mud	I	Raise foot valve and/or strainer above well bottom
Pump does not deliver water to full		Water level in well is lower than estimated	1.	A deep well jet pump may be needed (over 20 ft. to water)
capacity (Also check point 3	2.	Steel piping (if used) is corroded or limed, causing excess friction	2.	Replace with plastic pipe where possible, otherwise with new steel pipe
immediately above)	3.	Offset piping is too small in size	3.	Use larger offset piping
Pump pumps water but does not shut	1.	Pressure switch is out of adjustment or contacts are "frozen"	1.	Adjust or replace pressure switch
off	2.	Faucets have been left open	2.	Close faucets
	З.	Jet or impeller is clogged	3.	Clean jet or impeller
	4.	Water level in well is lower than estimated	4.	Check possibility of using a deep well jet pump
	5.	Motor is wired incorrectly	5.	Refer to instructions on wiring
Pump cycles too frequently	1.	Standard pressure tank is water- logged and has no air cushion	1.	Drain tank to air volume control tapping. Check air volume control for defects. Check for air leaks at any connection
	2.	Pipe leak	2.	Check connections
	3.	· · · · · · · · · · · · · · · · · · ·	3.	Close faucets or valves
	4.		4.	Replace foot valve
	5.	Pressure switch is out of adjustment	5.	• • •
	6.	Air charge too low in Captive Air® Tank	6.	Disconnect electrical power and open faucets until all pressure is relieved. Using automobile tire pressure gauge, check air pressure in tank at the valve stem located at top of tank. If air pressure is lower, pump air into tank from outside source until proper air pressure is reached. Check air valve for leaks, using soapy solution, and replace core if necessary.
Air spurts from	1.	Pump is picking up prime	1.	As soon as pump picks up prime, all air will be ejected
faucets	2.	Leak in suction side of pump	2.	Check suction piping
	З.	Well is gaseous	3.	Change installation as described in manual
	4.	Intermittent over-pumping of well	4.	Lower foot valve if possible, otherwise restrict discharge side of pump

REPAIR PARTS

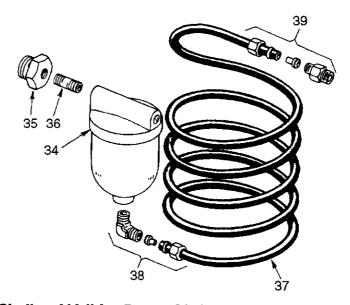


Mod	lel 3	90.	2505)
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Key No.	Part Number	Qty. Used	Description
1#	J218-953C	1	Motor - 115/230V - 60 Cycle
2	17351-0009	1	Water Slinger
3	N3-9	1	Seal Plate
4	N20-35	1	Gasket - Seal Plate
5	U109-6A	1	Shaft Seal
6	J105-40P	1	Impeller
7	L1-25P	1	Diffuser
8	N20-34	1	Gasket - Diffuser
9	N32P-66	1	Venturi
10	N34P-17	1	Nozzle No. 43
11	U111-211T	1	Hose Barb
12*	-	2	Pipe Plug - 1/4" NPT - Hex Head
13	N212-12P	1	Check Valve
14*	-	1	Pipe Plug - 1/8" NPT - Square Head
15†	N176-38A	1	Pump Body Assembly
16*	_	4	Capscrew - 3/8"-16x1-1/4" Hex Head
17	U37-672P	1	Switch Tube
18	2781	1	Pressure Switch
19	U36-112ZP	1	Locknut - 1/2"
20	L43-5C	1	Connector

Includes Key Nos. 9, 10, 12, and 13.
Standard hardware item. May be purchased locally.
For repair or service to motors, always give the motor model number and any other data found on the motor model plate.

REPAIR PARTS



Shallow Well Jet Pump Air Volume Control Package For Use With Standard Air Tanks

Key No.	Part Number	Description
34	2761	Air Volume Control
35	U78-774P	Reducer Bushing - 1-1/4" x 1/4" NPT
36*	U37-17GPT	Nipple - 1/4" x 1-1/2"
37	U37-205P	Tube - AVC
38	U111-86T	Compression Fitting Elbow - 1/4" NPT
39	U111-100T	Compression Fitting Straight - 1/8" NPT

(Not Furnished - Must be purchased separately)

* Standard hardware item. May be purchased locally.



OWNER'S MANUAL

Model No. 390.2505

The model number of your Shallow Well Jet Pump will be found on a model plate on the pump body.

When requesting service or ordering parts, always give the following information:

- Product Type
- Model Number
- Part Number
- Part Description

CRAFTSMAN® SHALLOW WELL JET PUMP

For the repair or replacement parts you need Call 7 am - 7 pm, 7 days a week **1-800-366-PART**

(1-800-366-7278)

For in-home major brand repair service Call 24 hours a day, 7 days a week **1-800-4-REPAIR** (1-800-473-7247)

For the location of a Sears Repair Service Center in your area Call 24 hours a day, 7 days a week 1-800-488-1222

For information on purchasing a Sears Maintenance Agreement or to inquire about an existing Agreement call 9 am - 5 pm, Monday-Saturday 1-800-827-6655



SEARS

Sears, Roebuck and Co., Hoffman Estates, IL 60179 U.S.A.