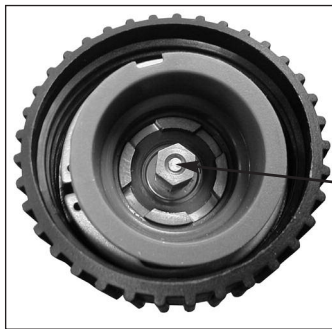


SETHCO® P90 DRUM PUMP

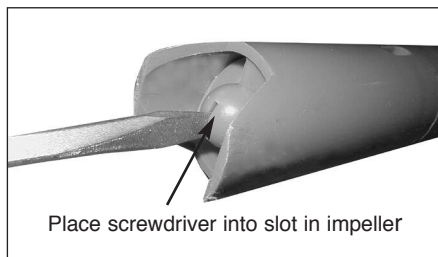
DISASSEMBLY:

1. **Separate motor from pump** by unscrewing collar (1) from motor. Gently pull pump from motor.
2. Remove coupling (6) from pump by simply lifting off.



Secure nut with 3/8" Socket Wrench

3. **Remove impeller (12)**
With coupling removed, secure coupling nut with a 3/8" socket wrench.

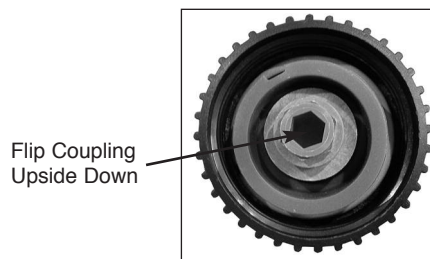


Place screwdriver into slot in impeller

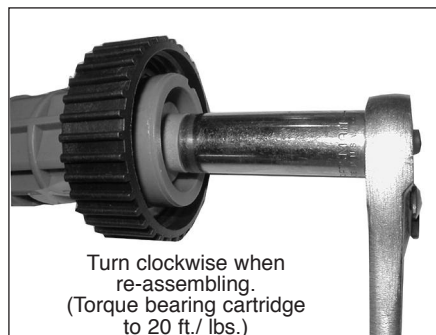
Now turn pump over and place screw driver into screwdriver slot in impeller (12). Unthread impeller (12) by turning it counter clockwise. Hold the 3/8" socket to prevent turning of the coupling nut (7).

4. **Remove bearing cartridge (13) and shaft (9) assembly.** Take coupling (6) and flip it upside down and place it over coupling nut (7) and bearing housing (3). The four tabs on the coupling (6) should fit into the corresponding knockout in the bearing housing (3). Take a 5/8" socket and place it over the coupling (6) and unthread counter clockwise. Once bearing cartridge (13) is completely

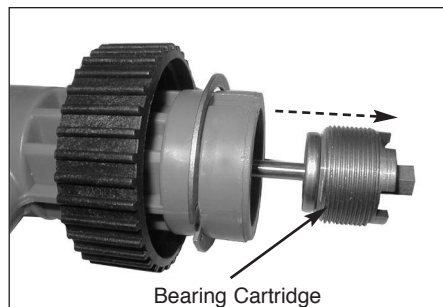
unthreaded, pull assembly out of tube (10) being careful not to bend shaft (9). If vapor seal (5) stays in tube and not on shaft assembly, it is worn and should be replaced.



Flip Coupling Upside Down



Turn clockwise when re-assembling.
(Torque bearing cartridge to 20 ft./ lbs.)

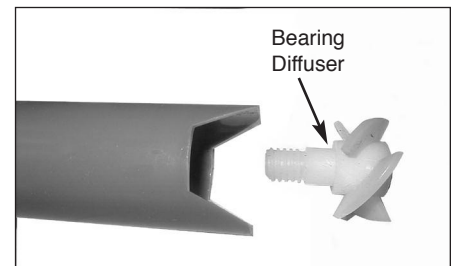


Bearing Cartridge

5. Using a small pair of pliers, grip the shaft (9) just below the bearing cartridge (13). Using a 3/8" wrench, unthread the coupling nut (7) counter clockwise. Once coupling nut (7) is unthreaded, simply slide the bearing cartridge (13) off the shaft (9). Vapor seal (5) can now slide upward off the shaft (9). Seal (5) should only be removed/installed upward. Check seal (5) for wear and replace if necessary.
6. Remove o-ring (8) from tube (10).

Check for wear and replace if necessary.

7. **To remove bearing diffuser (11) from tube (10),** flip the tube (10) upside down so that you can see into the bottom of the pump. Using your coupling (6) again, place the coupling (6) with the four tabs facing into the tube (10) into the bottom of the pump. Using your 5/8" socket, unthread the bearing diffuser (11) by turning counter clockwise. A slight click will be felt as diffusers disengage from lower head. Once unthreaded, pull bearing diffuser (11) out of tube (10).



Bearing Diffuser

8. Before dismantling bearing cartridge (13) inspect ball bearings as follows. Hold both sides of ball bearings and rotate entire assembly slowly by hand. Rotation should be absolutely smooth with no roughness. If continued operation is questionable, replace bearing cup assembly (4).
9. **To remove bearing cup (4) from bearing cartridge (13),** press the bearing cup (4) out of bearing cartridge (13) using a small arbor press. Bearing cup assemblies (4) that have been used, may press out by hand. This is normal.

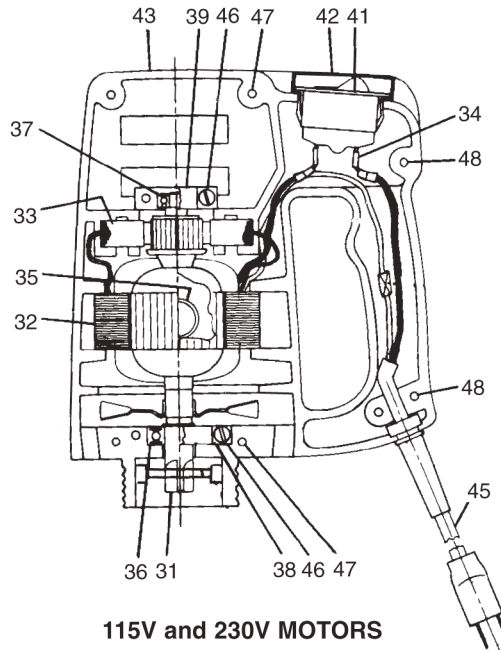
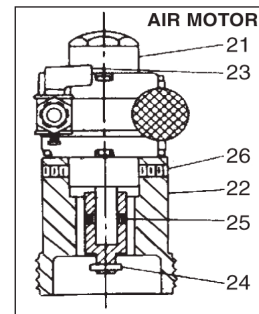
NOTE: These ball bearings are lubricated with special grease. Replace with original factory quality parts only. We strongly recommend that you replace bearing cup (4) and seal (5) together.

(See Parts List and Drawing on next page)

MOTORS

AIR MOTOR

ITEM	NAME	REQ'D	PART NUMBER
21	Air Motor	1	576P500182-509
22	Adapter	1	010P60-550
23	Valve (Brass)	1	940P22-080
24	Coupling Assembly	1	851P102523-720
25	Set Screw	2	800P102402-680
26	Set Screw	2	800P022005-720



115V and 230V MOTORS

115V and 230V MOTORS

ITEM	NAME	REQ'D	PART NUMBER
31	Armature - 115V (Note 4)	1	020P90115-195
31A	Armature - 230V (Note 5)	1	020P90230-195
32	Field - 115V (Note 4)	1	302P90115-195
32A	Field - 230V (Note 5)	1	302P90230-195
33	Brush & Holder Assy. (Note 4 & 5)	2	032P80-195
34	Spade Connection	1	171P12646-195
35	O-Ring	1	590P2210-341
36	Bearing (Note 4 & 5)	1	080P622149-720
37	Bearing (Notes 4 & 5)	1	080P621221-720
38	Clamp	1	130P80716-720
39	Clamp	1	130P8004-720
41	Switch-115V	1	871P808-195
41A	Switch - 230V	1	871P8041-195
42	Cover	1	140P101710-195
43	Motor Housing	1	450P90-593
45	Cord - 115V	1	132P18216-195
45A	Cord-230V (Note 8)	1	132P18216-195
46	Screw	4	790P101604-720
47	Pan Head Screw	4	790P10102-680
48	Pan Head Screw	3	790P101006-680
51	Armature - Field Set, 115V (Note 1)	1	578P90115-195
52	Armature - Field Set, 230V (Note 2)	1	578P90230-195
53	Motor Assy. - 115V (Note 6)	1	381-L
54	Motor Assy. - 230V (Note 7)	1	381-M

NOTES

- Includes 1 each of items 31, 32, 36, 37, and 2 each of item 33.
- Includes 1 each of items 31A, 32A, 36, 37, and 2 each of item 33.
- Includes items 36 and 37.
- Included with item 51.
- Included with item 52.
- Includes items 31-48.
- Includes items 31-48.
- Does not include plug.

WARNING!

DO NOT USE WHEN
COMBUSTIBLE OR
FLAMMABLE
CONDITIONS EXIST.
MOTOR CAN SPARK!
**EXPLOSION OR
INJURY OR DEATH
CAN OCCUR.**

MAINTENANCE DISASSEMBLY

- Isolate pump electrically.
- Separate motor from pump.

—CAUTION—

**WEAR PROTECTIVE CLOTHING AND EQUIPMENT
ALWAYS DISCONNECT FROM POWER SOURCE
BEFORE SERVICING.**

- Relocate motor to repair area.
- Remove screws (47, 48).
- Remove upper half of motor housing.
- Remove screws (46) and clamps (38, 39).
- Remove brush assemblies (33).
- Remove field (32) and armature (31).

INSPECTION

- Check brushes (33) for rough wear or cracks, and free travel.
- Check all connections.
- Check all wires for cuts or nicks.
- Check bearings (36, 37) by rotating with fingers. If there is a bumpy or sandy feeling, replace.
- Check armature (31) If commutator's surfaces are rough or winding wire burned, replace armature.
- Check field (32) If winding is burned, replace.
- Check switch (41) If rocker does not stay in ON or OFF position replace switch.

ASSEMBLY

- Slide armature (31) into field (32) with white wire facing commutator.
- With white wire facing up, place armature (31) and field (32) into motor housing (43) so that bearings (36,37) and field (32) are properly seated.
- Install clamps (38, 39) using screws (46).
- Check armature (31) for free rotation.
- Install brush assemblies (33).
- Install switch (41) with yellow sticker facing up.
- Press black and white wires (black wire leading to the switch) into the groove in motor housing, making sure no wire can come in contact with armature.
- Place O-ring (35) in upper half of motor housing.
- Place two halves of motor housing together, properly aligned.
- Secure motor housings with screws (47, 48).
- Snap in switch (41) with cover (42).

TESTING

Jog motor and listen for smoothness of running.

				30" PUMP TUBE	40" PUMP TUBE	50" PUMP TUBE	60" PUMP TUBE
ITEM	QTY	DESCRIPTION	MATERIAL	PART #	PART #	PART #	PART #
1	1	COLLAR	POLYPRO	160P644-571	160P644-571	160P644-571	160P644-571
2	1	RETAINING RING (COLLAR)	STEEL	700P5108196-880	700P5108196-880	700P5108196-880	700P5108196-880
3	1	BEARING HOUSING (NOTE 4)	S.S.	440P102462-680	440P102462-680	440P102462-680	440P102462-680
4	1	BEARING CUP W/BEARINGS (NOTE 4)	POLYPRO/SS	440P102455-586	440P102455-586	440P102455-586	440P102455-586
5	1	VAPOR SEAL	TEFLON	760P102460-777	760P102460-777	760P102460-777	760P102460-777
6	1	COUPLING	NYLON	170P201975-525	170P201975-525	170P201975-525	170P201975-525
7	1	COUPLING NUT	S.S.	170P102453-680	170P102453-680	170P102453-680	170P102453-680
8	1	O-RING	VITON	590P2115-830	590P2115-830	590P2115-830	590P2115-830
9	1	SHAFT	HAST. C	850P9032-340	850P9042-340	850P9052-340	850P9062-340
10A	1	TUBE (Note 1)	POLYPRO	910P9030-580	910P9040-580	910P9050-580	910P9060-580
10B	1	TUBE (Note 1)	PVDF	910P9030-384	910P9040-384	910P9050-384	910P9060-384
11	1	BEARING DIFFUSER	TEFZEL	241P102457-769	241P102457-769	241P102457-769	241P102457-769
12A	1	IMPELLER	POLYPRO	430P201979-571	430P201979-571	430P201979-571	430P201979-571
12B	1	IMPELLER	PVDF	430P201979-384	430P201979-384	430P201979-384	430P201979-384
13	1	BEARING CARTRIDGE (Note 2)	POLYPRO/SS	445P90-347	445P90-347	445P90-347	445P90-347
14A	1	STRAINER (Note 3)	POLYPRO	870P90-580	870P90-580	870P90-580	870P90-580
14B	1	STRAINER (Note 3)	PVDF	870P90-384	870P90-384	870P90-384	870P90-384

NOTE 1: Outer shell only, does not include any internal parts

NOTE 2: Includes items 3 and 4

NOTE 3: Optional equipment

NOTE 4: Included with item 13

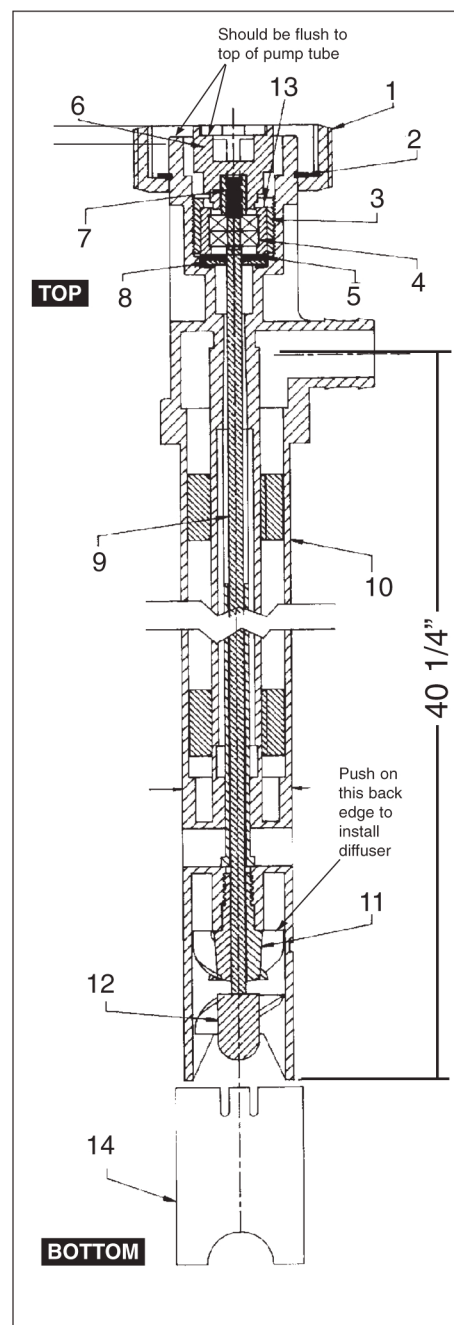
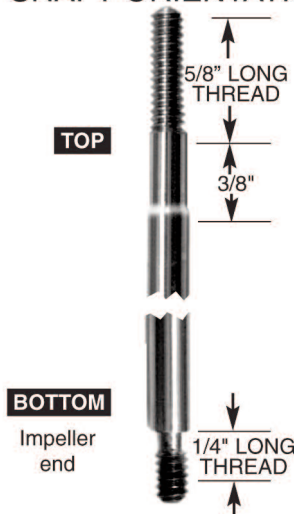
ASSEMBLY:

1. To **assemble bearing diffuser** (11) to tube (10), flip tube (10) upside down and thread bearing diffuser (11) into tube (11) using the coupling (6) as in disassembly. Turn until the diffuser vanes "click" into position in the lower head and full resistance is felt.
2. Take bearing cartridge (13) and slide it over the shaft (9). See TD-391-90 on the following page for bearing cartridge assembly instructions. Make sure that the four tabs on the bearing cartridge (13) are on top. Now take coupling nut (7) and thread it over the shaft (9). Tighten coupling nut (7) using a small pair of pliers on the shaft, just below the bearing cartridge (13) and a 3/8" wrench on the coupling nut (7).
3. Slide the vapor seal (5) up the entire length of the shaft (9). Make sure the seal is oriented correctly. Use a drop of loctite® (medium strength) on the shaft (9) and coupling nut.
4. Replace o-ring (8) in the o-ring groove in the top of the pump. Slide bearing cartridge (13) shaft (9) assembly down the tube (10). Now take the coupling (6), and just as you did when disassembling the pump, flip it over and place the four tabs into the four knockouts in the bearing cartridge (13). Tighten clockwise using a 5/8" socket.
5. Leave coupling (6) in bearing cartridge (13) and flip the pump over. Place pump on floor firmly to keep coupling (6) engaged in bearing cartridge (13). Tighten impeller (12) onto the shaft (9) by placing a screwdriver in the slot and turning clockwise.

6. Now turn the pump over and flip the coupling (6) over so that the four tabs are facing up. At this point make sure that rotating assembly rotates freely with no binding points in rotation. Friction should be uniform through 1 complete revolution.
7. Now install the motor so that cross on motor shaft lines up with the cross in coupling (6). Tighten collar (1) on motor.

ROUTINE BEARING CHECK
Periodically check bearing cartridge (13) for corrosion and wear by loosening collar (1) and removing motor. A good bearing cartridge will spin freely when coupling (6) is turned by hand. Rough bearings or difficult rotating will indicate bearing replacement is required. Another indication of bearing wear is that the top surface of the coupling (6) has dropped 1/16" or more below the top of the pump head. See Sethco TD-381-90 for more information.

SHAFT ORIENTATION



ALWAYS SPECIFY MODEL, SERIAL NUMBER, NAME PART NUMBER AND THIS DRAWING NUMBER WHEN ORDERING.

P90 DRUM PUMPS - SAFETY RULES

CAUTION: Read rules for safe operation and instructions carefully

1. **KNOW YOUR UNIT**—Read owners manual carefully. Learn its applications, limitations, capabilities and proper use.
2. **HAZARDOUS LOCATIONS**—Use hazardous duty motor in locations where fire or explosion hazards may exist due to flammable gases or vapors. Use air motor in a dust environment. Use stainless steel pump for flammable liquids.
3. **KEEP WORK AREA CLEAN**—Cluttered areas and benches invite accidents.
4. **AVOID DANGEROUS ENVIRONMENT**—As with any electric power tool, don't expose the unit to rain.
5. **KEEP BYSTANDERS AWAY**—All visitors and unauthorized persons should be kept a safe distance from work areas.
6. **STORE PROPERLY**—As with any power tool, when not in use, unit should be cleaned and stored in a dry place away from unauthorized personnel.
7. **DON'T FORCE TOOL**—Do not use pump to break ice in drums or break up sludge masses. Rapid wear and/or damage will occur when pumping abrasives or thick materials.
8. **WEAR PROPER APPAREL**—No loose clothing or jewelry to get caught on hoses or cords. Rubber gloves, aprons and footwear are recommended.
9. **USE SAFETY GLASSES**—The operation of any power tool can result in foreign objects (splashing) being thrown into the eyes, which can result in severe eye damage. Always wear safety glasses with eye shields before commencing power tool operation. We recommend Wide Vision Safety Mask for use over spectacles, or safety glasses.
10. **DON'T ABUSE CORD**—Never carry tool by cord or yank it to disconnect from receptacle. Keep cord from heat and sharp edges.
11. **SECURE PUMP AND HOSE**—When not pumping from a drum, secure pump to prevent accidental immersion into tanks. Secure discharge end of hose to prevent "whipping" of hose. Secure hose clamp tight.
12. **DO NOT IMMERSE**—pump into fluid above pump discharge. Do not immerse motor in any fluid.
13. **DON'T OVERREACH**—Keep proper footing and balance at all times.
14. **MAINTAIN EQUIPMENT** with care — Keep pump clean for best performance. Follow maintenance instructions.
15. **DISCONNECT MOTOR**—when not in use and before servicing, remove plug from power supply.
16. **AVOID ACCIDENTAL STARTING**—Don't carry plugged-in tool with finger on switch. Be sure switch is off when plugging in.
17. **KEEP HANDS AND FINGERS FROM IMPELLER.**
18. **KEEP FACE AWAY**—Don't look into hose, pump discharge or suction.
19. **REVIEW MATERIAL SAFETY DATE SHEET OF THE PRODUCT TO BE PUMPED.**



INTRODUCTION

DOUBLE INSULATION is a concept in safety, in electric power tools, which eliminates the need for the usual three wire grounded power cord and grounded supply system. Wherever there is electric current in the tool there are two complete sets of insulation to protect the user. All exposed metal parts are isolated from the internal metal motor components with protecting insulation.

IMPORTANT — Servicing of a motor with double insulation requires extreme care and knowledge of the system and should be performed only by a qualified service technician. For service, we recommend returning your motor to Sethco.

HAZARDOUS DUTY MOTOR — When service is required, return to factory. NOTE: This motor is equipped with a thermal overload sensor. When activated the pump will stop and re-start automatically when the motor cools.

SWITCH

The standard 115V & 230V electric P90 motor is equipped with a rocker switch located in the upper part of the handle. Press the upper part of the rocker to start and the opposite half to stop. The switch has a built in circuit breaker which will trip the switch in the event of an overload. Be sure switch is in the "off" position before connecting to power supply.

SWITCH

The hazardous duty motor is equipped with a rotary switch. Make sure the switch is in the "off" position before connecting to power supply.

OPERATION

1. Align coupling splines and motor spline.
2. Align motor key and pump head.
3. Insert pump head into motor and secure with collar (1).
4. Slip hose clamp over hose end.
5. Slip hose onto pump discharge. Push hose onto full length of discharge nipple. (1-1/8 inches).
6. Align hose clamp between discharge nipple "barbs".
7. Tighten hose clamp.

START-UP (CAUTION — OBSERVE SAFETY RULES)

1. Insert pump into drum.
2. Control or secure discharge hose.
3. Plug in motor.
4. Switch unit on.

STOPPING

1. Switch unit off.
2. Unplug motor.
3. Lift pump from fluid slowly; allowing pump to drain.

STORAGE

1. Run pump in a rinsing solution for 30 seconds with discharge hose open and 30 seconds with discharge hose closed.
2. Allow pump to drain.
3. Store upright in a secure area to prevent unauthorized use.

MAINTENANCE

When servicing, replace with original factory quality parts only. Only the parts shown in the materials list are intended to be replaced by the customer. The standard 115V & 230V motor is equipped with a "DOUBLE INSULATION" system and should be serviced only by a qualified service technician.

TROUBLE SHOOTING

Problem: Pump doesn't pump

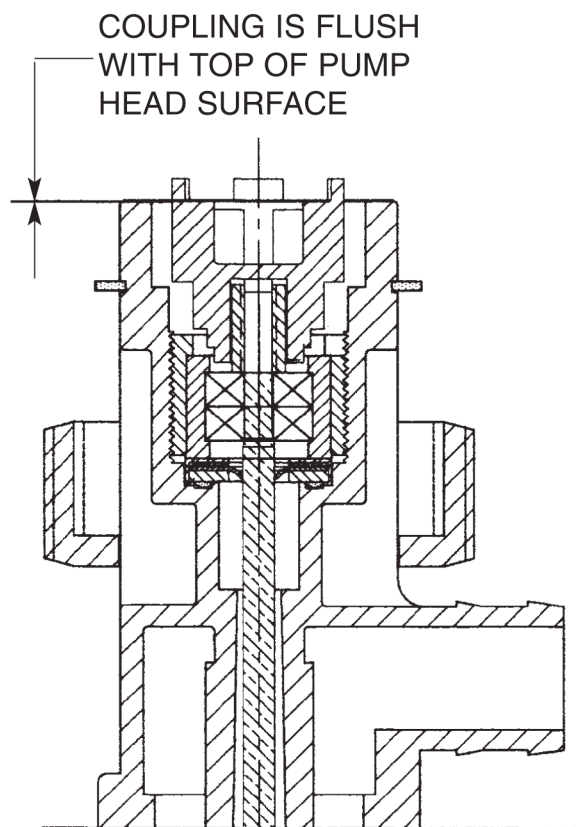
Probable Cause	Remedy
1. Motor not turning	1. Check electric outlet & plug
	2. Check rocker switch
	3. Unplug motor and remove pump, keeping fingers clear of spline. Plug in and test motor.
	4. Return to factory
2. Motor bearing "frozen"	1. Return to factory
3. Motor brushes worn	1. Return to factory
4. Pump coupling sheared	1. Replace
5. Solution solidified in pump	1. Flush
6. Impeller damaged	1. Replace
7. Pump bearings "frozen"	1. Replace
8. Debris in suction	1. Unplug pump motor & clear
9. Hose crimped	1. Straighten
10. Less than 2" of liquid in drum	1. Tilt drum

Problem: Pump capacity reduced

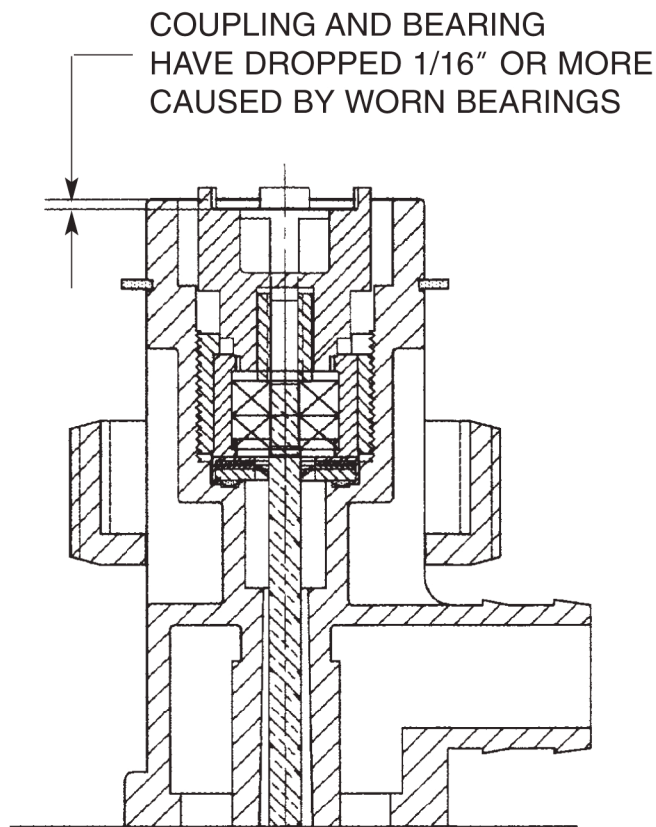
1. Worn impeller and/or suction intake	1. Replace
2. Low voltage	1. Check outlet
3. Thick fluids	1. Consult factory
4. Hose crimped	1. Straighten
5. Pump bearings worn	1. Replace
6. Motor bearing worn	1. Return to factory
7. Suction partially clogged	1. Unplug motor and clean
8. Discharge line restricted	1. Unplug motor and clear

SETHCO
MODEL P90
BEARING/ COUPLING
Operations & Maintenance Manual

NEW / GOOD PUMP
PROPER POSITION OF COUPLING



OLD / WORN BEARINGS
COUPLING DROPPED, NEEDS BEARINGS



SIGNS OF WORN BEARINGS

- Coupling wears out, needs replacement
- Motor speed slows down
- Motor speed varies while pumping
- Smell of plastic burning
- Flow from pump is degraded

TROUBLESHOOTING

- Periodically check for free rotation of coupling by hand. Some resistance is normal, but roughness or difficulty turning indicates bearing replacement is needed.
- Compare height of top of coupling with top of pump head. They should be nearly flush. If they have dropped 1/16" or more, replace bearings. Inspect and replace vapor seal and coupling if necessary.

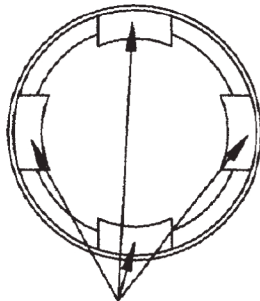
SEE REVERSE SIDE FOR ASSEMBLY OF BEARING INTO CUP

ASSEMBLY OF BEARINGS INTO CUP

1. Use bench press to press poly bearing cartridge into stainless bearing cup with "T" marking on poly bearing cartridge facing top.
2. Press until poly cartridge stops against base of stainless standing crown segments.

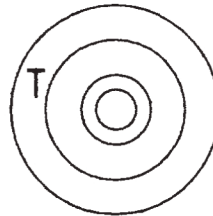
TOP VIEW

BEARING CUP
FROM TOP



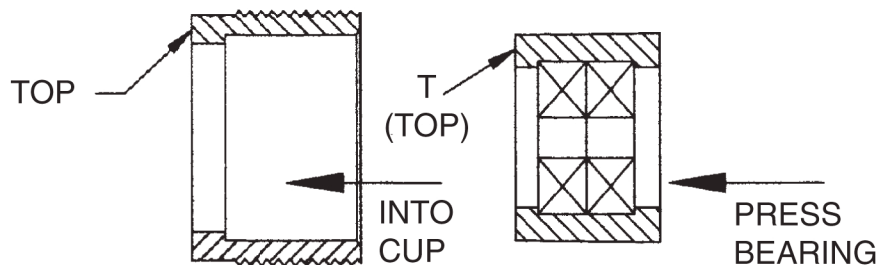
CROWN SEGMENTS

POLY BEARING
FROM TOP

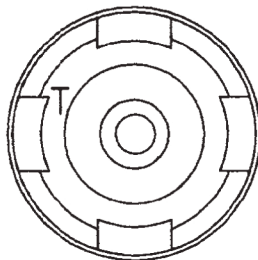


SIDE VIEW

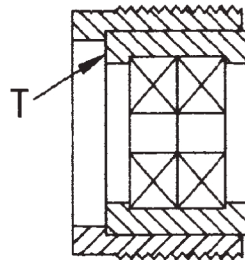
TOP OF BEARING MARKING "T" IS ON TOP



FINISHED ASSEMBLY



TOP VIEW



SIDE VIEW

NOTES



A Met-Pro Fluid Handling Technologies Business
Sethco Product Brand

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