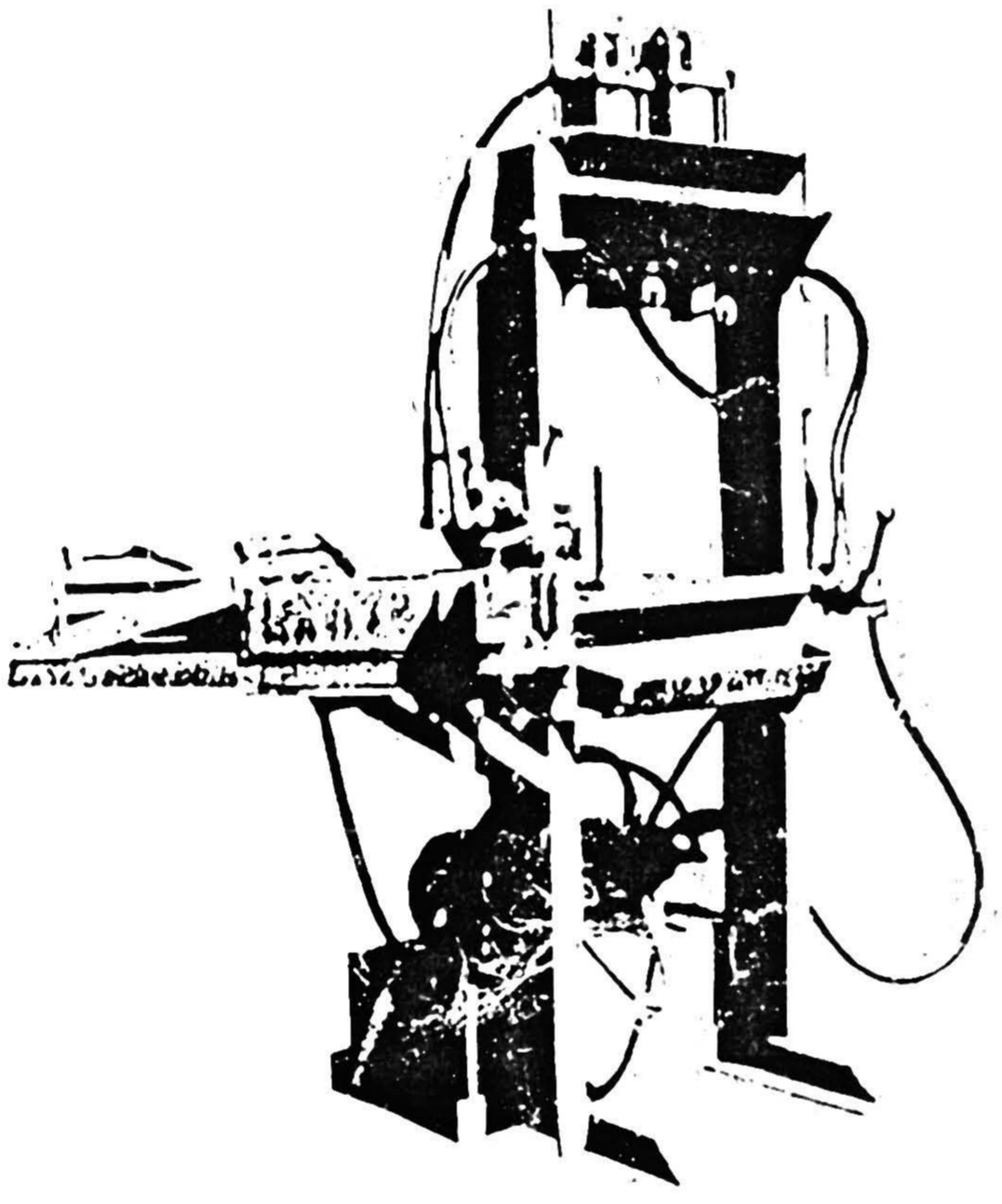
PRESS for Starters, Alternators, & Generators



LS Industries

710 E. 17th ST.
WICHITA, KS 67214
316-265-7997

LITTLE SWEDE EQUIPMENT

- Blasting
- Degreasing
- Hydraulic
- Special

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ALTERNATOR, STARTER, GENERATOR PRESS

This press is designed specifically for the electrical parts rebuilder. It does what formerly took 4 or 5 presses to do, and even more.

The press is a rugged functional tool that fits into both small and large operations. It operates through hydraulic pressure from an electrically driven pump which drives three independently controlled cylinders. The various components of starters, generators, and alternators are removed or replaced while held in specially designed fittings.

The LS Press for Starters, Alternators, and Generators has been designed with heavy heat treated tooling. When maintained and operated as instructed it can provide years of efficient operation.

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SAFETY

This machine has been designed and constructed with safety as a prime consideration. Because it is a machine, however, it could, if mishandled or improperly operated, maintained, or used, have the potential for causing injury. As LS Industries has taken steps to provide safety devices and product information to prevent injuries, it cannot be held responsible for injury to persons or property through the use or misuse of LS Industries equipment.

- Shut power off before performing maintenance on machine.
- Maintain all mechanical and electrical parts regularly.
- Always keep all guards in place when operating.
- Secure to bench, floor, or base; keep bolts tight.
- Use only high flash-point, low foaming, non-flammable hydraulic oils.
- Bolt upright press to table.
- Ground machine and test quality of ground.
- Prohibit smoking by operator and others near the press.
- Always wear eye protection while operating machine.
- Keep safety latch closed to prevent parts from flying out.
- Replace parts only with identical parts.
- Maintain all mechanical, electrical, and hydraulic parts regularly.
- Never operate at pressures greater than rated pressure.
- Inspect hydraulic hoses daily; replace if damaged. Do not inspect with hands.
- Study instructions thoroughly before operating.

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ABOUT HYDRAULIC SAFETY

Hydraulic power is selected as a driving force for machinery because it is safe, reliable and efficient. It is also economical to maintain and clean to use. There are, however, certain general safety precautions which must be taken when using any hydraulically powered equipment.

- Hydraulic oil in mist form is ignitable, so smoking and ignition sources must be controlled.

- Hydraulic lines and fittings must be specially selected and rated for their required pressure.

- Fluid under pressure can escape from cracks or pinholes in fittings and lines and is capable of causing injury or death by injection into tissues. Do not feel for leaks while the system is under pressure.

- Bearings or parts being pressed can disintegrate and become missiles. Be sure all parts are held straight and all safety guards are in place.

- Leaked hydraulic fluid from poor seals or damaged components can cause hazardous slippery surfaces on concrete floors and dangerous falls. Put absorbent material on it and clean up daily.

- Hydraulic hoses which are kinked, crushed, or pinched may result in burst lines or components.

- Scuffed, cut or damaged hoses are potentially dangerous. Replace them immediately with hoses of the same specification.

- A hydraulic leak is a danger signal; repair or replace defective parts immediately.

- Wear safety glasses whenever using hydraulic equipment.

- Don't forget, even when a piece of hydraulic equipment is stopped, the system may still be pressurized after the pump is turned off. Bleed it back before opening for maintenance.

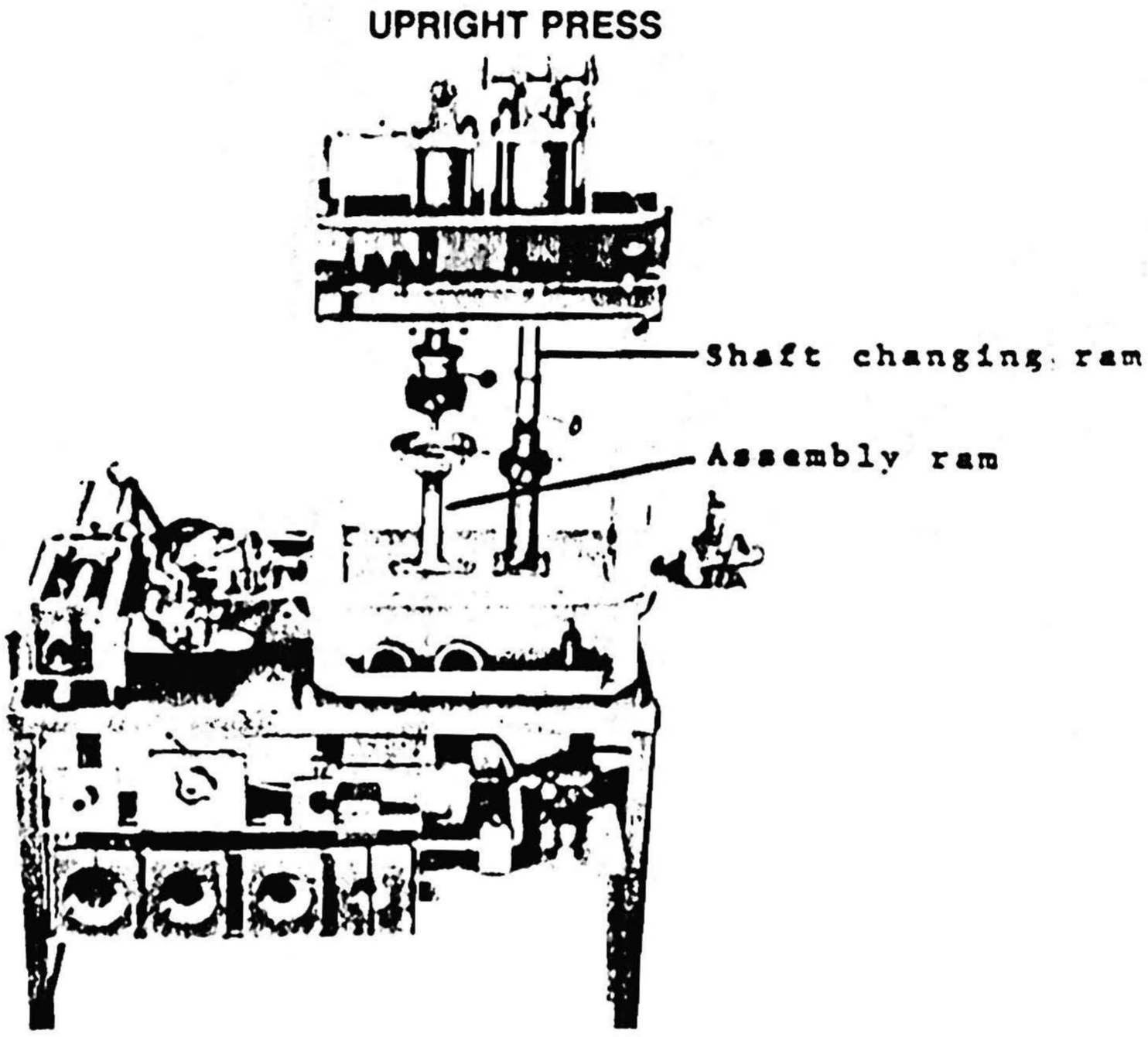
- A pressurized system may actuate a machine even when the pump is turned off.

- Treat every machine as a potential hazard: NEVER place hands in the point of operation until safety blocks are inserted to prevent closing.

- Finally, READ THE INSTRUCTIONS carefully; if you don't know, don't guess; ask your supervisor.

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I. INSTALLATION



A. MOUNTING

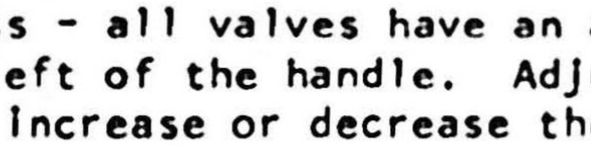
- Recommended table height 30".
- Presses can be mounted together on one table or separated by using additional hoses and pipe.
- Cut hole in table below the shaft changing press.
- Bolt upright press to table.
- Hose connections go from valve to valve in series (i.e. - pressure hose from pump ⟶ inlet of laydown valve
  outlet of laydown press ⟶ inlet of shaft changing ram
  outlet of shaft changing ram ⟶ inlet of assembly ram
  outlet of assembly ram valve ⟶ tank return).

WARNING: Air should be bled out of cylinder before using by running rams up and down several times.

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B. ELECTRICAL

- Secure electrical starting box in a convient location.
- Connect Electrical
  220V - 1 phase - 30 amps
  220V - 3 phase - 15 amps
  440V - 3 phase - 7 amps
- Check pump rotation
  1 phase motors will be wired correctly
  3 phase motors - reverse any two lead wires to reverse rotation.
  Correct rotation - pump will not pump when running backwards



- Test Quality of ground.

C. FLUID LEVEL

- Fluid is prefilled and should not need refilled for 2 or 3 years unless a leak develops.
- Fluid level should be 1/4 to 7/8 full tank: Remove cover to check and add oil.
- Use low foaming hydraulic oil (approximately 10 weight).

II. OPERATION

DO NOT OPERATE WITHOUT EYE PROTECTION

A. Hand valves

- All valves are fine metering (ram speed can be controlled from slow to fast by the amount the valve handle is pulled out)
- Bypass - all valves have an adjustable bypass located on the left of the handle. Adjusting this screw in or out will increase or decrease the maximum pressure for any one cylinder.

B. Alignment

- All stands are bolted and can be easily moved or shimmed for correct centering.

- Always keep safety shields in place when operating.

III. UPRIGHT PRESS -- ASSEMBLY RAM

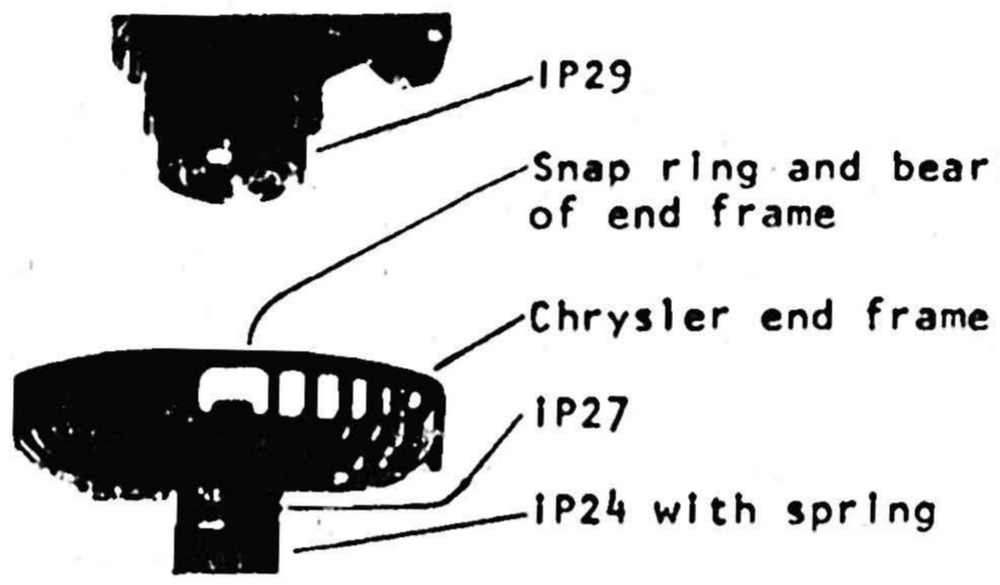
A. Instal ation of rotor



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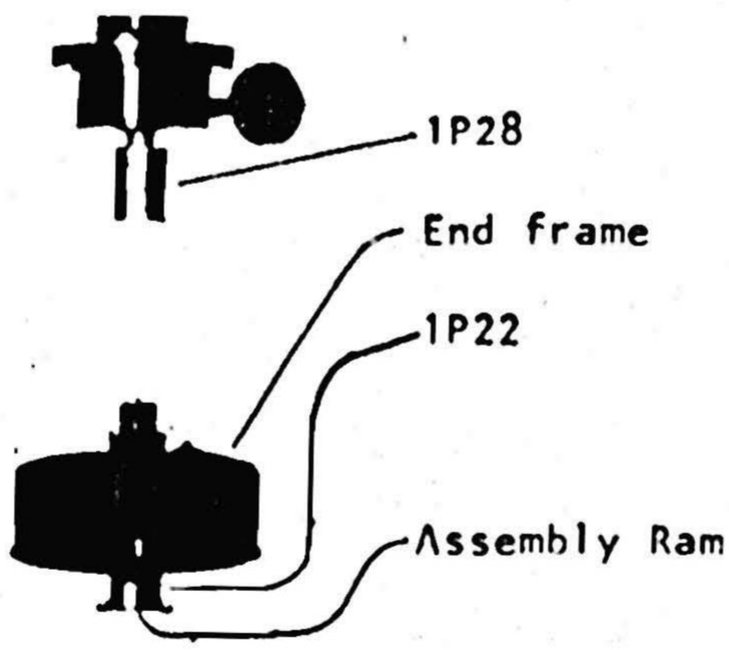
- Big time saver - unskilled operator can correctly assemble 200 Chrysler alternators per hour.
- Pull valve handle until the ram stops. The valves pressure bypass determines the depth the ram travels. If the Chrysler pulley is installed too deep, decrease the ram bypass pressure (turn screw out) or vice versa if not far enough.
- Use at least one used part. Two new parts often have too tight an interference fit.

B. Installing ball bearing and snap ring into Chrysler end frame



- Time saver - bearing and snap ring installed simutaneously and bearing tightness checked.
- Pull valve handle until ram stops.
- Tight bearing - Tool 1P27 will bottom out on 1P24 before the snap ring clicks into place.

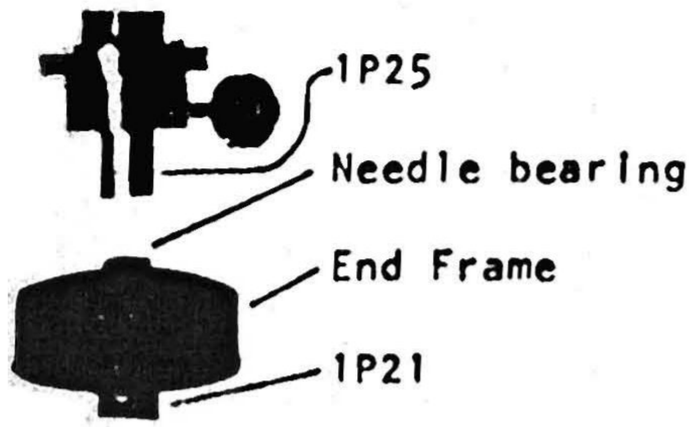
C. Removing needle bearings



- Pull valve handle until end frame drops clear.

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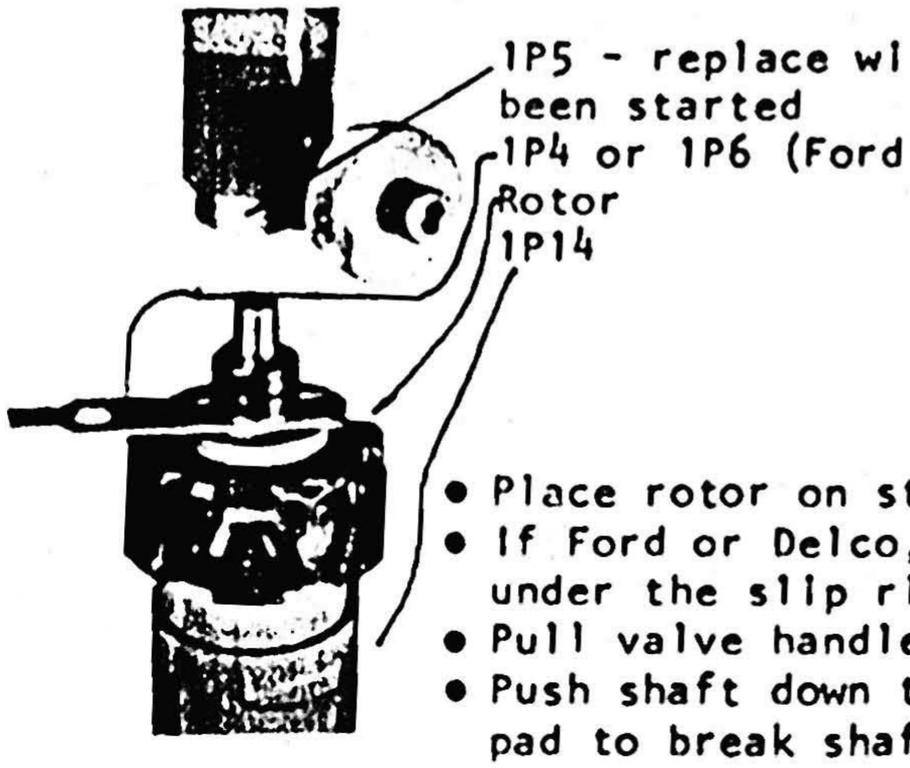
D. Installing Needle Bearings



- Place end frame over spring loaded stand. If a Chrysler endframe, line up the milled surface of 1P25 with the Chrysler endframe.
- Place needle bearing on end frame
- Pull valve handle until ram bottoms

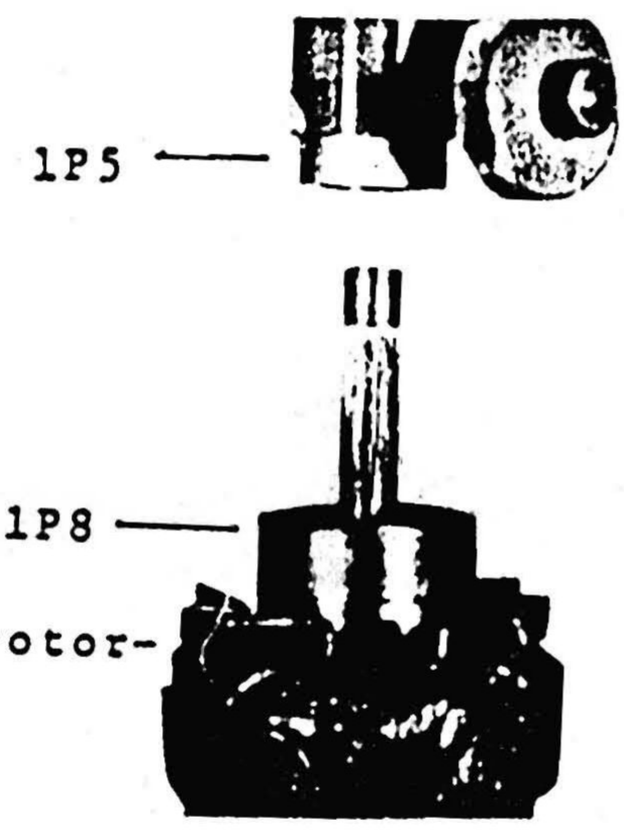
IV. Upright Press-Shaft Changing Ram

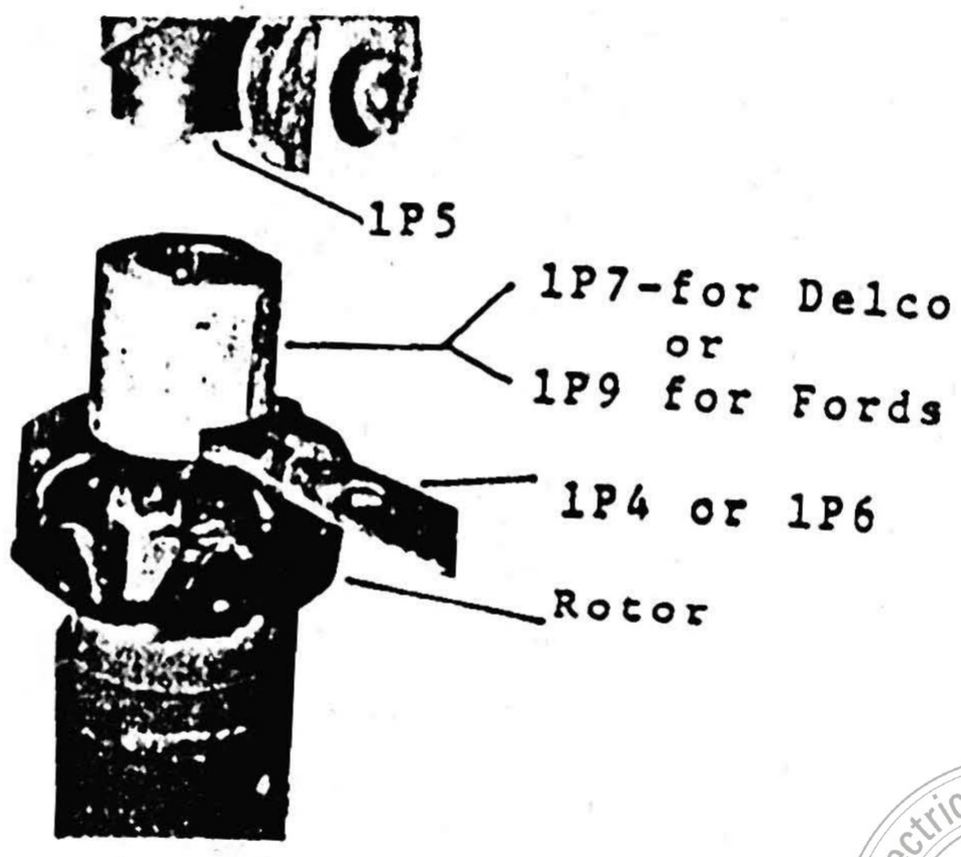
A. Removing alternator rotor shafts



- Place rotor on stand.
- If Ford or Delco, place 1P4 or 1P6 or the combination under the slip ring.
- Pull valve handle slowly until the rotor shaft breaks loose.
- Push shaft down to the slip ring level. (Always use the flat pad to break shaft loose).
- Raise ram and replace 1P5 with the 1P16 push shaft.
- Advance ram slowly until shaft falls through. The 1P16 shaft is hardened such that it will bend or disintegrate.

B. Installing alternator rotor shafts

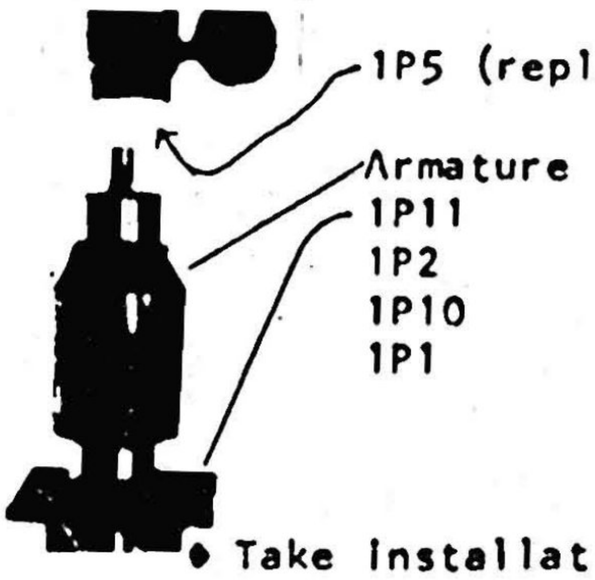




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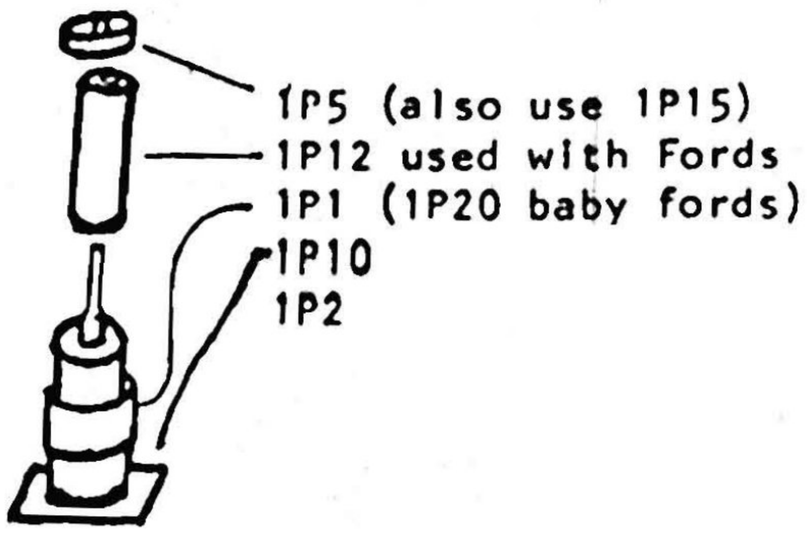
- If a Chrysler rotor is being shafted and it has been moved since the shaft was removed, run 1P16 down through the rotor. This will align the fan blade (If the fan blade is off center, the new shaft will punch a new hole and ruin the fan blade).
- If a Delco or Ford Rotor, place the appropriate thickness of Forks (1P4 or 1P6) under the slip ring.
- Advance ram slowly until the shaft has a good start.
- Back ram off and place 1P7, 1P8, or 1P9 on rotor.
- Press shaft in until the ram bottoms out on the spacing sleeve (1P7, 8, or 9).
- The compression when the ram bottoms on spacing sleeve, compresses the rotor itself and helps eliminate any electrical leakage.

C. Removing Delco Armature shafts



- Take installation tool 1P12 and 1P12S and measure depth that new shaft will be installed.
- Stands 1P3, 1P10 and 1P1 are used to achieve a good working heigh . 1P10 with 1P1 or 1PZ will be used in the next step (reshafting)
- Bring ram down and break the shaft loose using the flat pad Insert 1P16 and finish removing shaft.

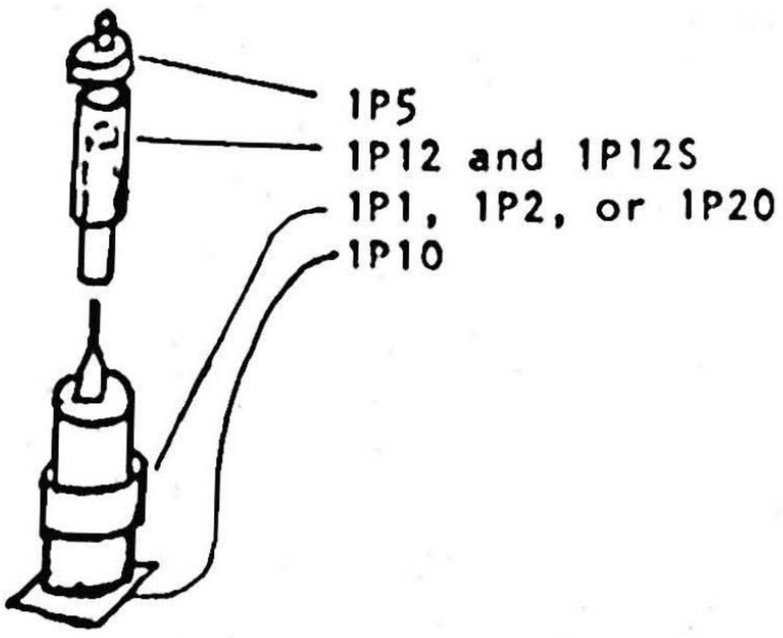
D. Removing Ford and Chrysler shafts



- Take Installation tool 1P12 and 1P12S and measure depth that new shaft will be installed (Ford only - not Chrysler)
- Place 1P1S over the Ford shaft and then bring the ram down and break the shaft loose.
- Remove 1P1S and continue to push shaft out.

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E. Installing Armature Shafts.



- Place armature into can (1P1 for Ford and Delco, 1P2 for small Delco, and 1P20 for the baby Fords). The bottom of the commutator should rest on the bottom of holder 1P10 (washers can be used to shim the bottom of 1P10 if needed). This will keep the commutator from spreading.
- Place shaft into armature and put 1P12 and 1P12S over the shaft. The 1P12 pushes on the shoulder of the shaft eliminating any bending of the shaft. 1P12 has machined tapers on both ends. Be sure to fit the proper taper to the given shaft.
- Bring the ram down and start the shaft While inserting the shaft, back the ram off at lease 2 to 3 times to allow the shaft to recenter itself.
- Feather the ram down slowly until it is inserted to the right depth, several attempts will probably be needed before the operator develops a good feel for bringing the ram down slowly (this is done by pulling lightly on the hand valve).

IV. LAYDOWN DISASSEMBLY PRESS

A. Removing Chrysler alternator pulleys

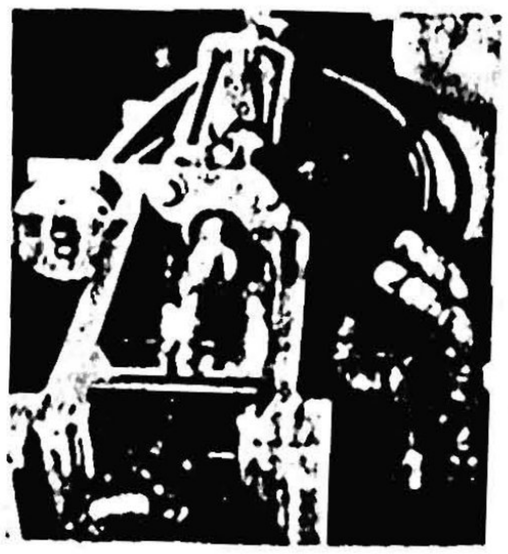


2P8

- Place 2P8 into slot - Make sure that the ledge it sets on is clear of chips otherwise the pushrod will not line up.
- Lift handle and insert pulley.
- While holding the rear of the alternator in one hand pull the central lever until the rotor drops free.

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B. Removing Bearings



2P9

- Same as "A" page 9. The jaws fit between the clip and the bearing, so it is only necessary to open the jaws wide enough to go over the bearing.

C. Removing Races



2P7

2P5

- Same as "A" page 9.
- Jaw fits over middle of race
- Tighten clamp 2P5 down before removing race.

). Removing Ford and Delco drive and plates



2P6

- After removing pulley from the Ford or Delco alternator, put the end frame in the jaws as shown.
- Be sure to twist the end frame as far as possible, otherwise the end of the tool will bend.

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E. Removing pulleys, starter end plates, etc.



Hold down clamp
2P1, 2P2, 2P3, 2P4
2P11 is used to push small bearings & fits over end of shaft

(E1) Pulleys

- Insert bottom half of plates (2P1-4) into slot. For pulleys the tapered side should be facing inward to match the contour of the pulley
- Insert top half of plate.

- CLOSE SAFETY LATCH - Plates may fly out.

- Holding the piece up, bring the ram forward slowly until you are sure it is properly aligned.

(E2) End Plates

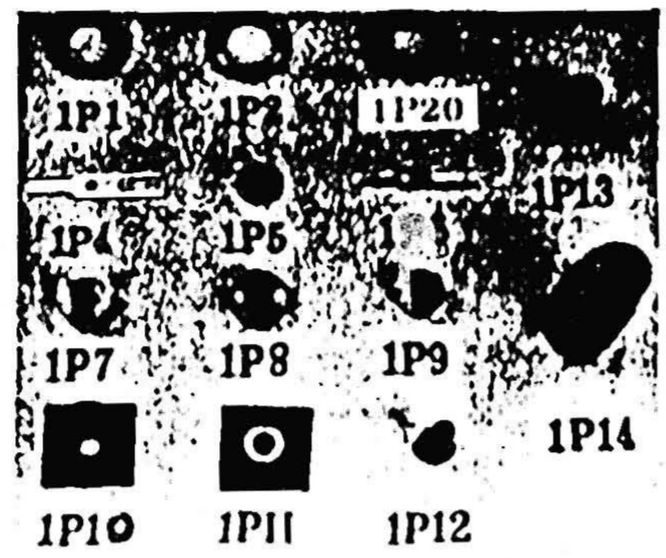


- Turn plates (2P1-2P4) opposite as used for pulleys so that the flat side will butt up against the end plate.
- Procede as above.

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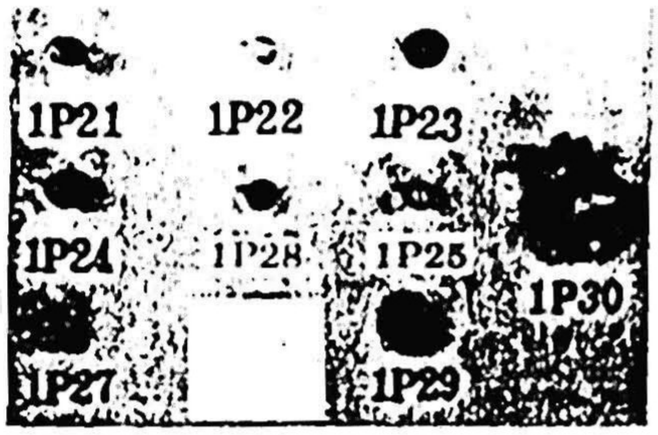
TOOLING & COMPONENT PARTS

UPRIGHT PRESS (1PO)



Complete Tooling (1PT1) .....

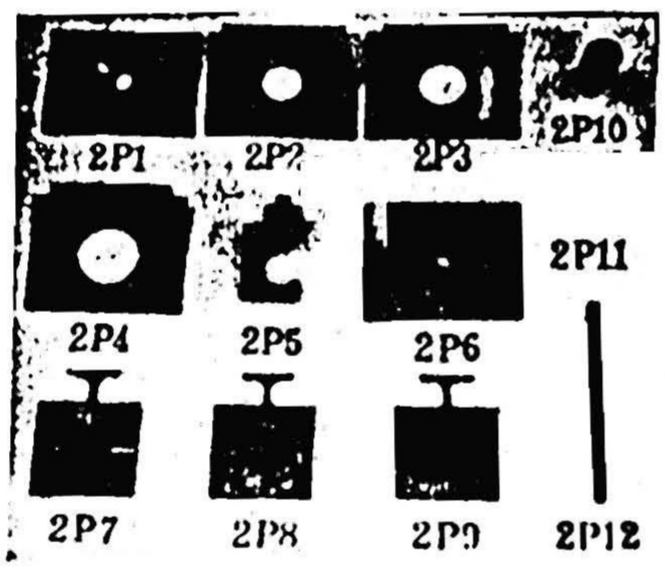
1P1	FORD & DELCO STARTER ARMATURE SHAFT INSTALLATION SLEEVE
1P2	SMALL DELCO ARMATURE SHAFT INSTALLATION SLEEVE .....
1P4	THIN FORK USED ON ALL ALTERNATORS FOR SPACING SLIP RINGS .
1P5	SMOOTH SURFACED PUSH PAD .....
1P6	THICK FORK USED ON ALL ALTERNATORS FOR SPACING SLIP RINGS
1P7	SLEEVE FOR SPACING ROTOR SHAFTS IN DELCO ALTERNATORS ....
1P8	SLEEVE FOR SPACING ROTOR SHAFTS IN CHRYLSER ALTERNATORS
1P9	SLEEVE FOR SPACING ROTOR SHAFTS IN FORD ALTERNATORS .....
1P10	STARTER ARMATURE SLEEVE HOLDER .....
1P11	STARTER ARMATURE STAND FOR REMOVING SHAFTS .....
1P12	STARTER SHAFT INSTALLATION GAUGE & TOOL .....
1P13	CHUCK FOR RAM (NO JAWS) .....
1P14	STAND FOR REMOVING ALTERNATOR SHAFTS .....
1P15	ALTERNATOR & STARTER PUSH OUT SHAFT .....
1P20	— SMALL FORD STARTER ARMATURE SHAFT INSTALLATION RING .....



Complete Tooling (1PT2) .....

1P21	NEEDLE BEARING SPRING LOADED INSTALLATION STAND .....
1P22	NEEDLE BEARING REMOVING STAND .....
1P23	STAND FOR ASSEMBLY OF ALTERNATORS .....
1P24	STAND EXTENSION & SPRING FOR INSTALLATION OF BALL BEARINGS
1P25	NEEDLE BEARING INSTALLATION CHUCK EXTENSION TOOL (CHRYSLER, FORD & DELCO) .....
1P27	BALL BEARING SNAP RING BASE TOOL (USE WITH 1P29) .....
1P28	NEEDLE BEARING CHUCK EXTENSION REMOVING TOOL .....
1P29	BALL BEARING & SNAP RING CHUCK EXTENSION INSTALLATION TOOL
1P30	CHUCK WITH JAWS (COMPLETE) .....
1P31	STAND .....

LAYDOWN PRESS (2PO)



Complete Tooling (2PT1) .....

2P1	SMALL BEARING REMOVER PLATES (⅞" hole) .....
2P2	SMALL PULLEY PULLER PLATES (2" hole) .....
2P3	MEDIUM PULLEY PULLER PLATES (2½" hole) .....
2P4	LARGE PULLEY PULLER PLATES (3" hole) .....
2P5	CLAMP USED ON BROKEN BEARING PULLER .....
2P6	ALTERNATOR END PLATE PULLER .....
2P7	BROKEN BEARING PULLER (COMPLETE) .....
2P8	PULLEY PULLER WITH HUBS (COMPLETE) .....
2P9	BALL BEARING PULLER (COMPLETE) .....
2P10	CHUCK .....
2P11	PUSH ROD EXTENSION FOR 2P1 PLATES .....
2P12	PUSH ROD .....

LS means same day shipment on parts!

OPTIONAL TOOLING

1P30A	CHUCK JAWS ONLY
2P7B1	SHOULDER BOLTS FOR PULLER PLATES
2P7B2	ALLEN SCREWS TO HOLD JAWS ON PLATES
2P7A	BROKEN BEARING PULLER JAWS ONLY
2P8A	BROKEN PULLEY PULLER JAWS ONLY
2P9A	BALL BEARING PULLER JAWS ONLY
2P13	POWER STEERING PULLEY PULLER (1¼ FACE)
2P14	POWER STEERING PULLEY PULLER (1⅛ FACE)
2P15	FIVE SPOKE END PLATE PULLER
2P16	SPLIT PLATE FOR POWER STEERING PLATE
2P17	SMALL FORD AND MOTOROLA BEARING PULLER
2P18	VW BEARING PULLER
1P21	CHEVETTE ARMATURE SLEEVE

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SPECIFICATIONS

	Tonnage 5 HP	Tonnage 10 HP	Ram Travel Speed	Dimension L	W	H
Upright						
4" Cylinder	10 Ton	20 Ton	2 In/Sec.	24"	10"	39'
5" Cylinder	15 Ton	30 Ton	1.3 In/Sec.	24"	10"	39'
Lay Down	15 Ton	20 Ton	2 In/Sec.	33"	7"	6'
Power Unit				28"	15"	10'
Table				48"	24"	30'

WARRANTY

All electrical presses manufactured by LS Industries are warranted for one year from date of sale to be free of defects in materials and workmanship. This warranty shall apply only to the original purchaser, and only when installed and operated according to the instructions within this manual. This exludes normal wear and any failure due to accident, modification, tampering with safety devices, or abuse.

LS Industries shall not be liable for loss of time, manufacturing costs, labor, materials, or loss of profit, either directly or indirectly the result of operational failure of product of its manufacture.

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LS Industries
710 E. 17 • WICHITA, KS 67214
(316) 265-7997

INSTRUCTIONS FOR

ASSEMBLY & DISASSEMBLY FOR DIESEL

ARMATURE SHAFTS (40 MT & 50 MT)

IN

LS COMBINATION STARTER / ALTERNATOR PRESS

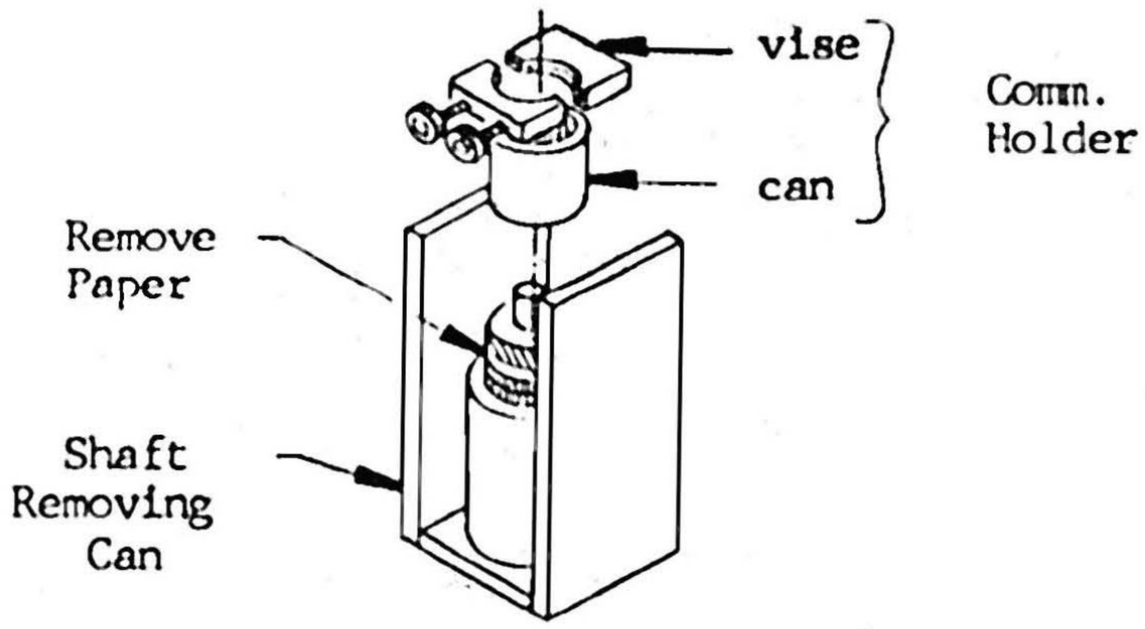
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NOTES:
1. Presses without legs must be bolted on a table with a hole in it to allow shaft to drop thru.
2. Pressure should have a maximum setting of 3000 psi.

SHAFT REMOVAL

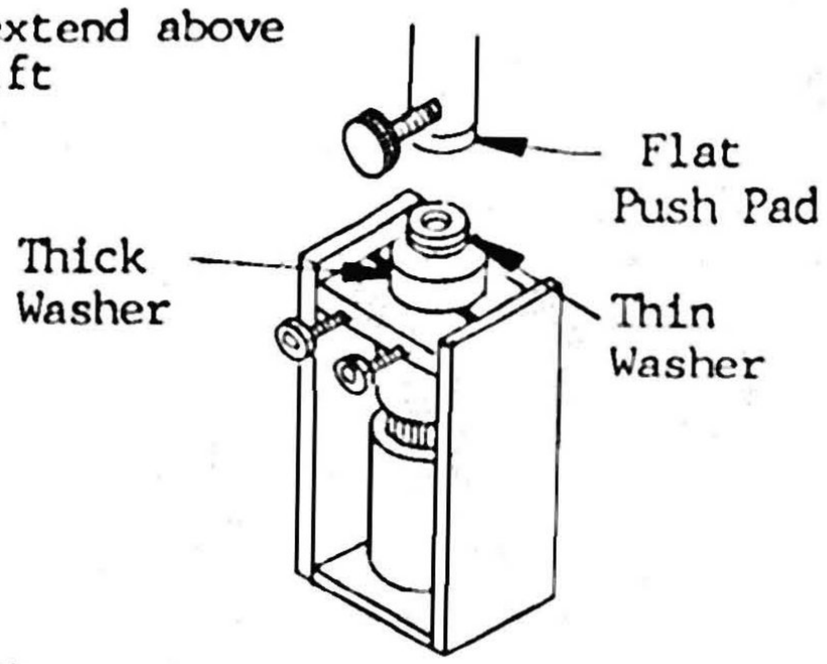
1. Cut paper wire from around armature. (If paper is too thick it keeps armature from seating properly in can.)

2. Place Shaft Removing Can, with base down and set armature in. Place Comm. Holder can over armature. Set vise on, but do not tighten.

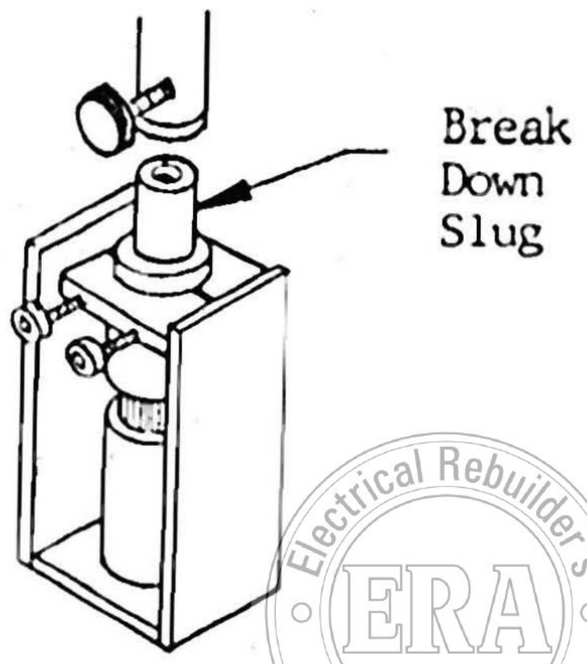


3. Place Flat Push Pad in cylinder chuck and tighten.

4. Place (1) Thick Washer and (5) Thin Washers to extend above shaft and bring ram down to seat armature in Shaft Removing Can. Bring pressure up to 500 psi. With pressure on, tighten vise by hand, then with wrench.



5. Measure distance shaft extends above Comm. Holder with washers usually (1 thick and 3 thin). This measure is important for reassembly purposes.



6. Remove thin washers and place the Break Down Slug over shaft and adjust set screw into top of shaft after catching shoulder.

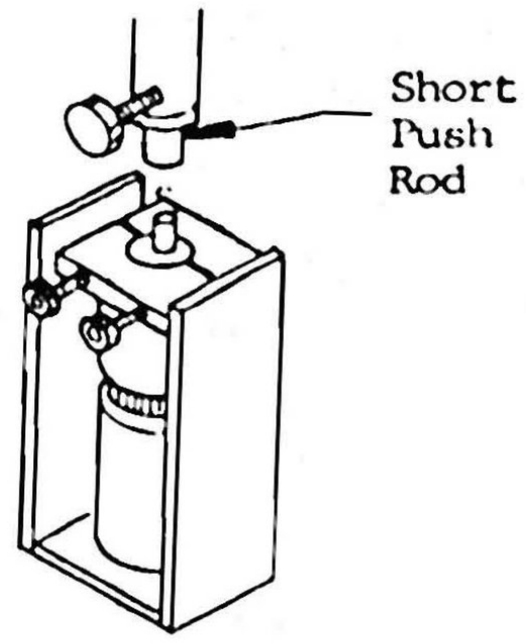
OMIT THIS STEP ON 50MT

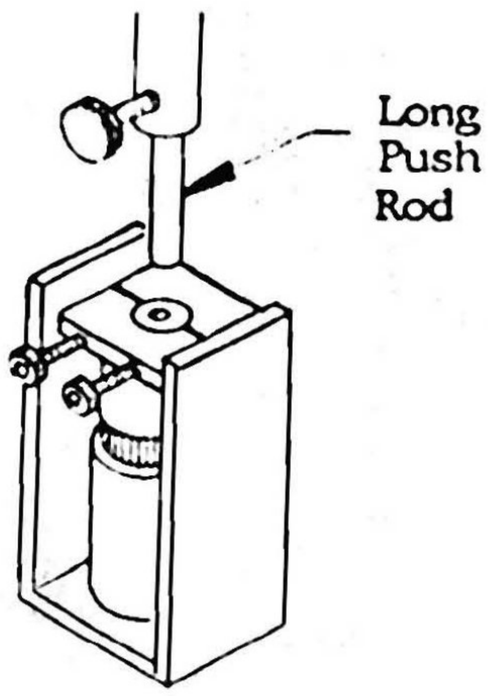
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7. Lower ram and slowly bring up pressure to 2000 psi and hold for about 30 seconds. Increase pressure gradually until shaft breaks loose. (Usually takes 2300 psi.) CAUTION: When shaft breaks loose it can make a loud snap. If the shaft hasn't broken loose at 3000 psi, remove armature from tooling and soak in WD40 for 24 hours.

8. If shaft bends or splits, stop immediately. Take armature out of can and with a hacksaw, saw off at the shoulder and continue.

9. Remove the Flat Push Pad from the cylinder chuck replacing it with the Short Push Rod. Pressing directly on armature shaft, push as far as possible.

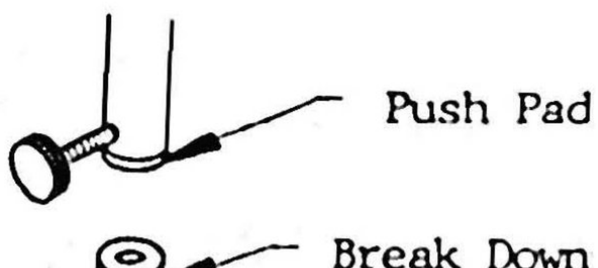




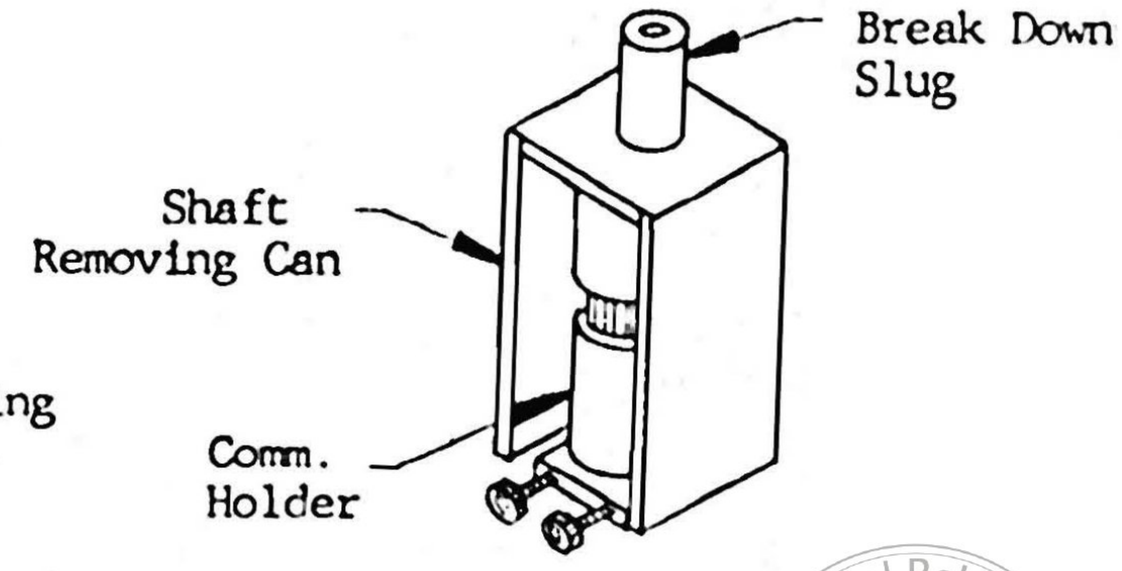
10. Replace the Short Push Rod with the Long Push Rod.
The Long Push Rod may need to be inserted into the armature first and then slid up into the chuck. Continue pushing until shaft falls completely out the bottom of the press. (Keep feet clear.)

SHAFT REMOVING CAN REMOVAL

11. Drop Shaft Removing Can a few inches off the floor upside down onto legs. The can should fall off.



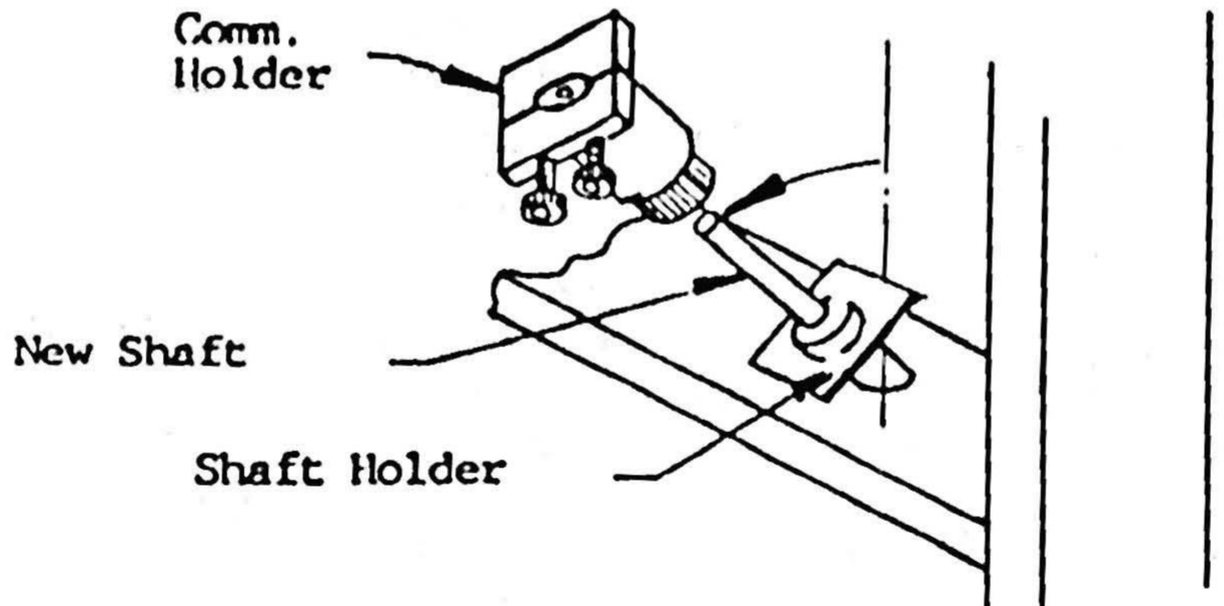
12. If not, set Shaft Removing Can upside down on legs, back in the press. Replace the Long Push Rod with the Push Pad in the cylinder chuck. Place the Break Down Slug over armature. Bring ram down until armature with Comm. Holder drops out. Remove Shaft Removing Can and set aside.



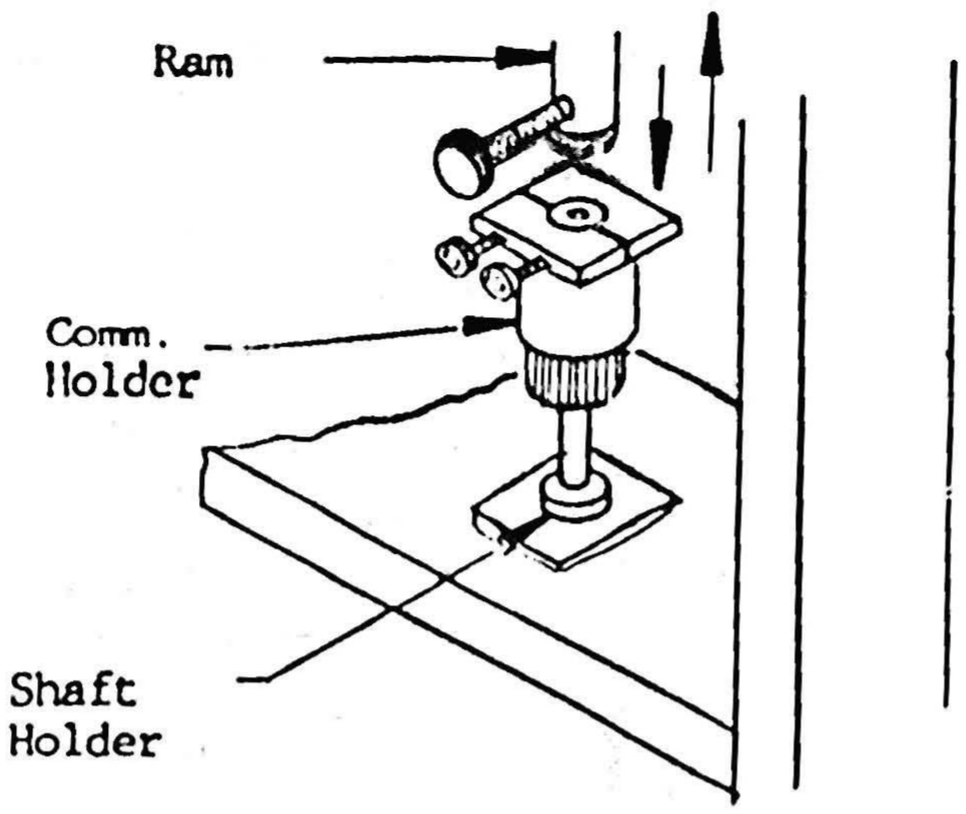
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13. Place Shaft Holder over new shaft for armature and adjust set screw in bottom of Shaft Holder so that the spline rests on the shoulder and set screw rests on bottom of the shaft.

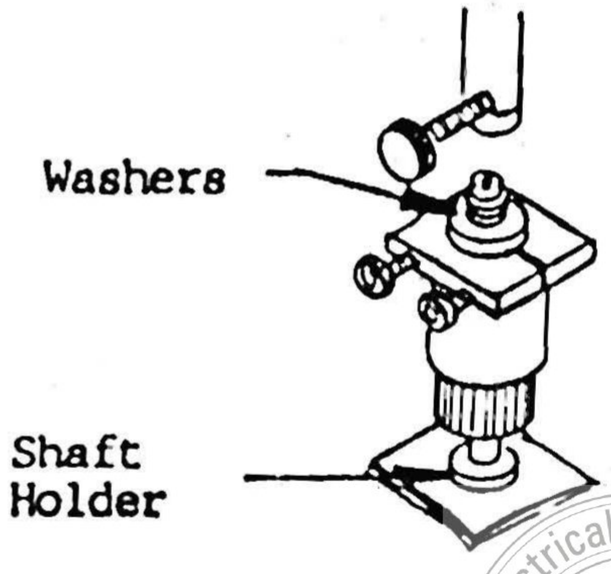
14. Place the Shaft Holder with shaft into base of press. Tilt forward and set Comm. Holder on, with armature still in it.



15. Bring ram down and push shaft 2", then back off. This helps keep the shaft aligned straight in armature. Continue pushing down and backing off, in 2" increments until shaft approaches top of Comm. Holder.

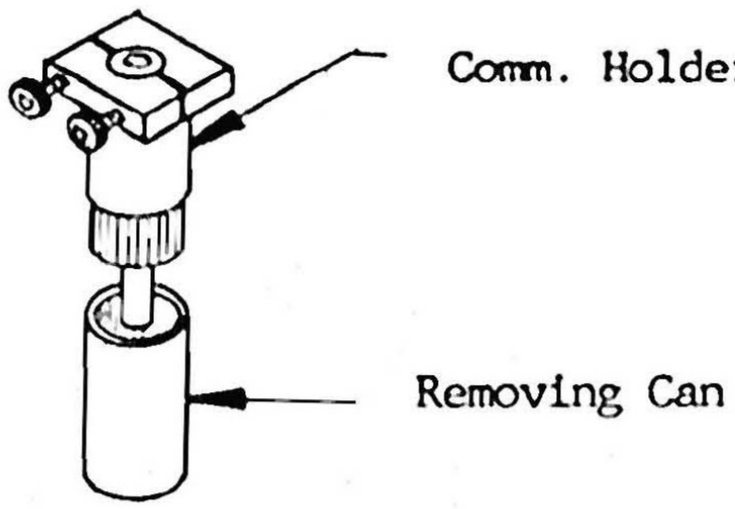


16. When the shaft approaches the top of the Comm. Holder, place washers as measured in step 5, on top of vise. Push shaft to proper height. At this point, shaft is completely installed in armature.

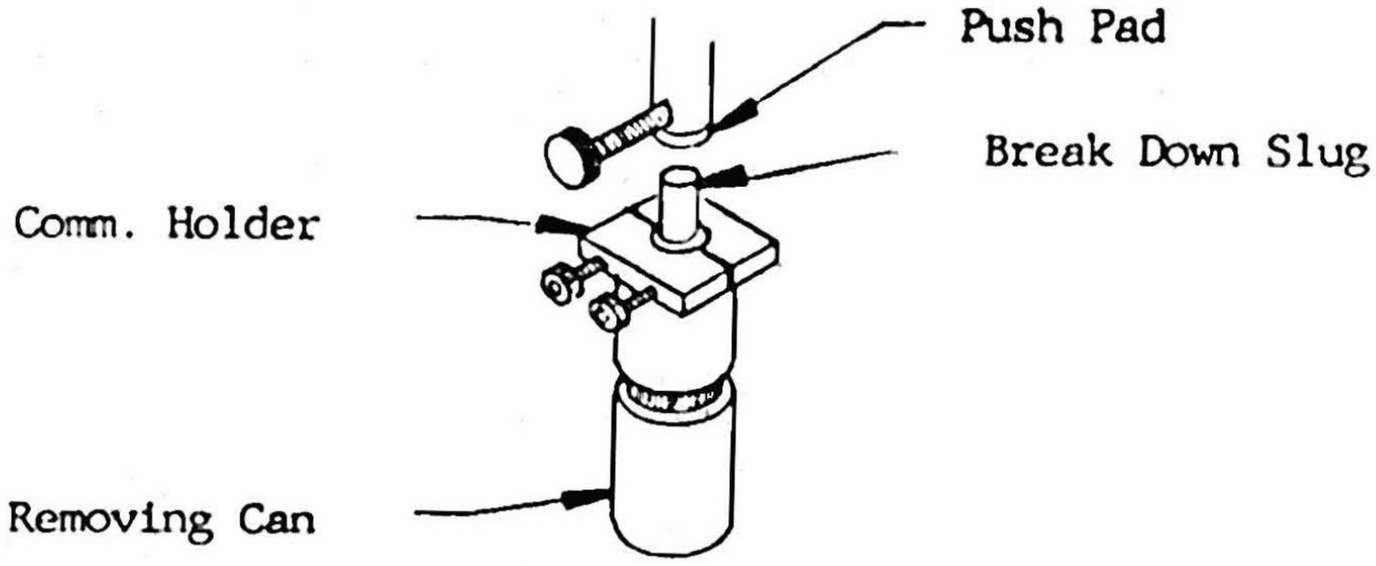


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17. Remove Shaft Holder. (If tight, use the set screw to push shaft out. Remember to reset set screw before installing the next shaft.) Place Removing Can on base of press and set Comm. Holder with armature in on top.



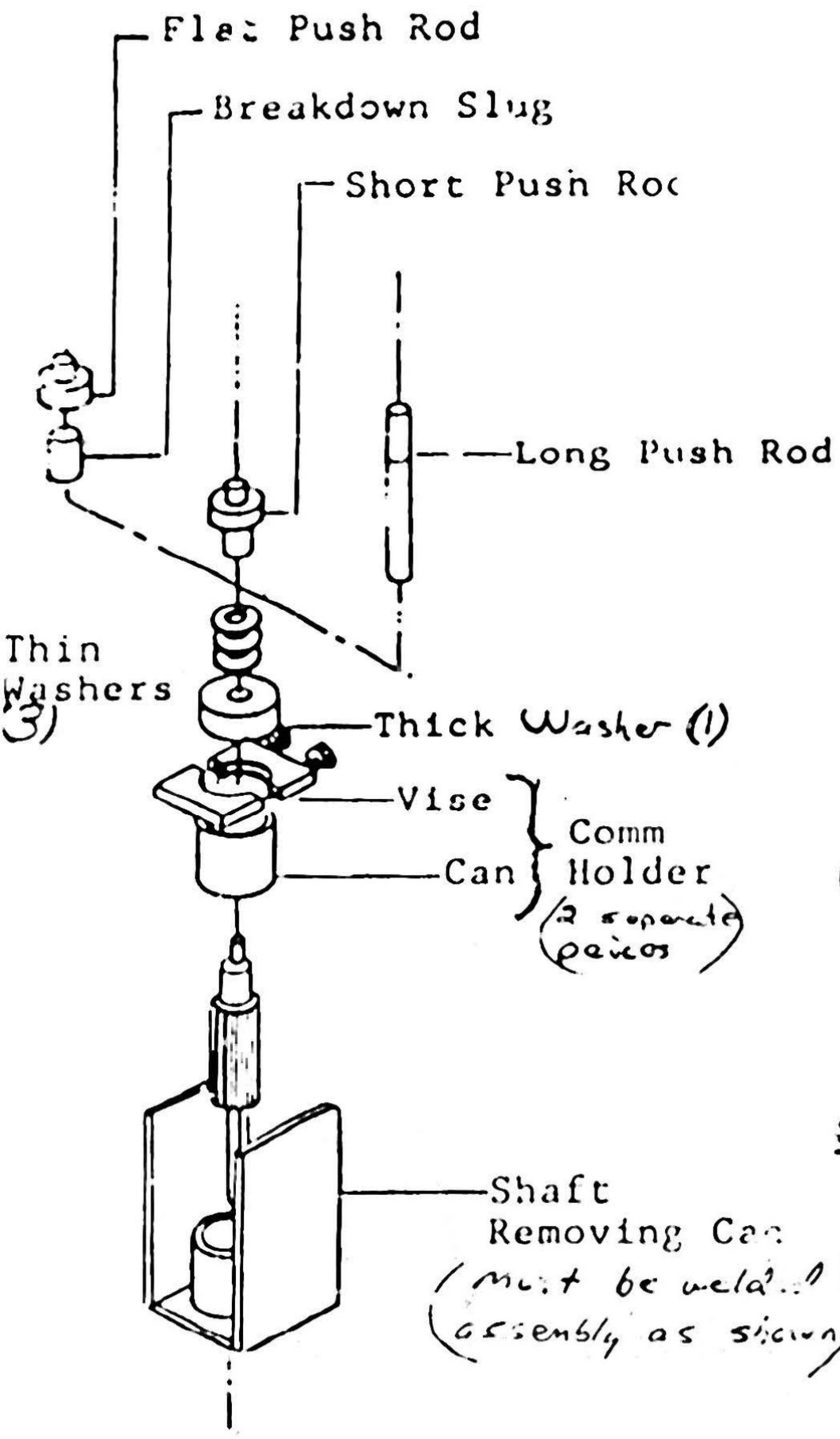
18. Loosen Comm. Holder vise. Using the Push Pad in the cylinder chuck, place Break Down Slug over shaft. Push until the armature is free from Comm. Holder.

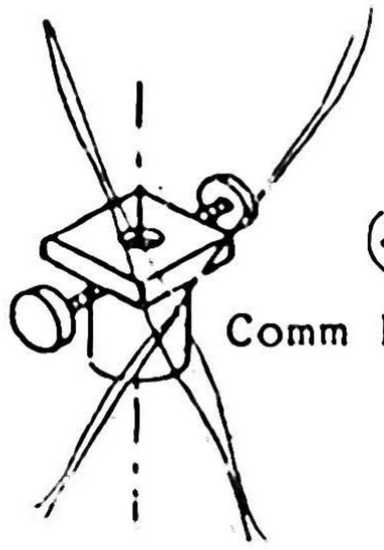


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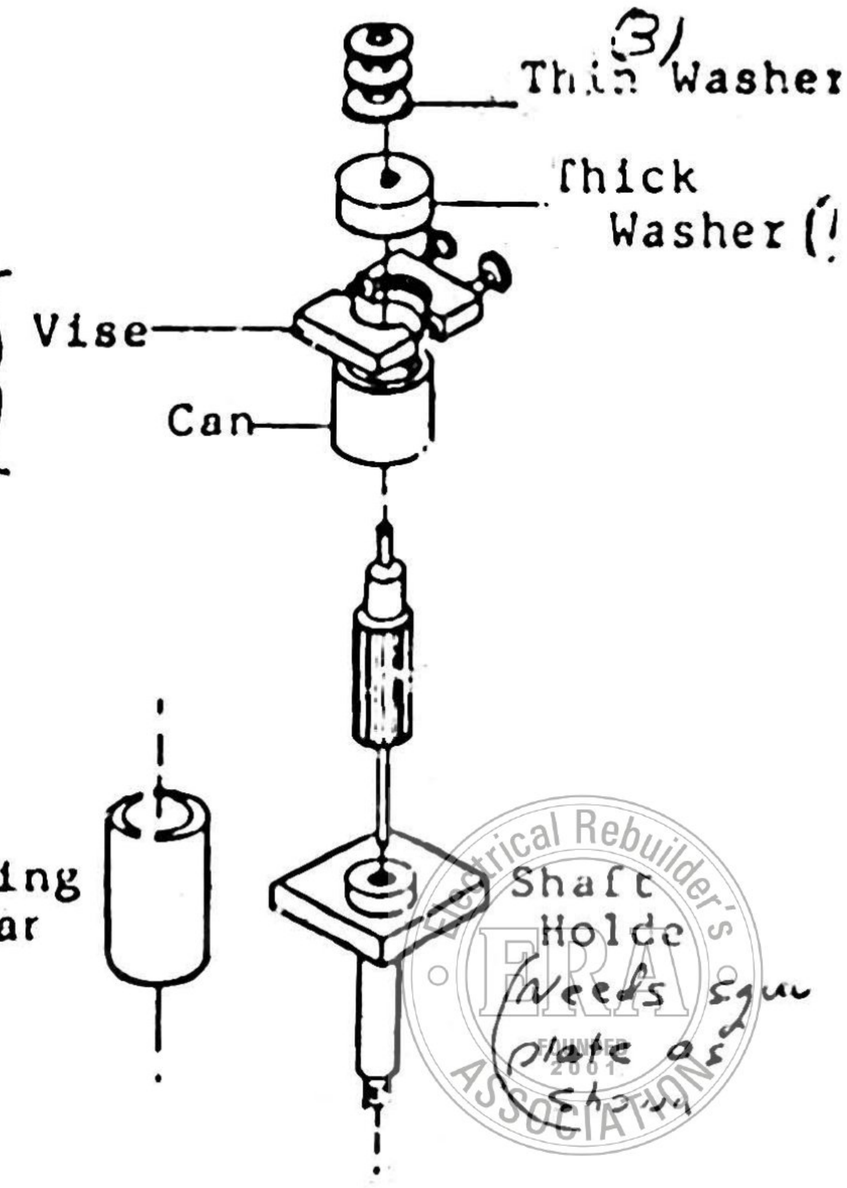
	STD. EPDT	OPTIONAL		OPTIONAL		OPTIONAL	
	40MT	30MT (Interchangable)		50MT		SINGLE BRUSH 35 MT	
Subassembly							
Push Pad	1P5 ✓	USE STD. U.S.	Don't Duplicate O.D	U.S.	O.D	U.S.	O.D.
HORT PUSH ROD	DT-2 ✓	U.S.	O.D	U.S.	O.D	U.S.	O.D.
ONG PUSH ROD	DT-3 ✓	U.S.	O.D.	U.S.	O D	U.S	O D
REAKDOWN SLUG	DT-4 ✓	U.S.	O.D	DT-13		U.S.	O D.
HAFT EMOVING CAN	DT-6 ✓	DT-15		DT-14		U.S.	O D
ssembly						Same grip	
OMM HOLDER	DA-3S2 ✓	DA-1S2 ✓		DA-4S2		DA-2S2 (Metal case	
'ASHERS 3 thin 1 thick	DA-5 ✓	U.S.	O D	U.S.	O.D	U.S.	O.D
HAFT HOLDER	DA-7P ✓	DA-6P Don't Duplicate ✓		DA-10P* 7P ✓		DA-6P Don't Duplicate	
EMOVING CAN	DA-9 ✓	U.S.	O.D.	DA-11		U.S.	O D.
EPLACEMENT AWS	DA-3S2J 122.00	DA-1S2J 122.00		DA-4S2J 122.00		DA-2S2J 122.00	

* DA-10P Can be replaced with DA-7P by using a 1⅝" long set screw. (DA-7P & DA-10P are same parts with different length set screw. DA10P uses 1⅝" - DA-7P uses 2⅛")





STYLE 1
(Old style)



STYLE 2

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