SAVE

Tool Shop Copy

JUNE 1981

SERVICE MANUAL

FOR

darda®

SPLITTER

AND

HYDRAULIC PUMP

PAGE 16 (LAST PAGE) #06-300 PRESSUREMATIC VALVE INFO

*

06-300 VALVE

FOR #2, 3, + 5 MODELS

EMACO

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SECTION I: FAMILIARIZATION

GENERAL INFORMATION

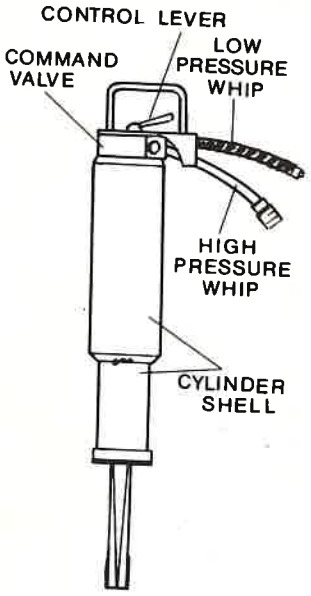


Fig. 1

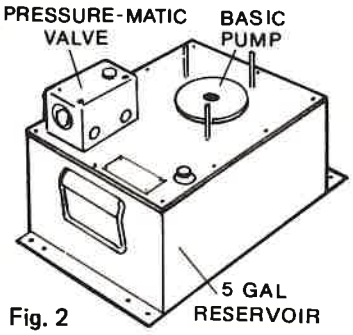


Fig. 2

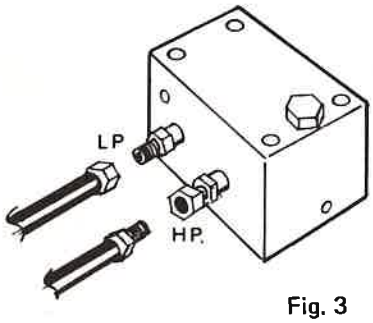


Fig. 3

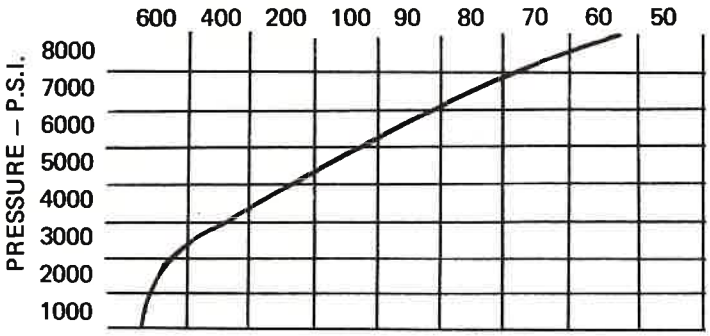
HYDRAULIC SYSTEM

The **Hydraulic System** of the DARDA splitter consists of a 5 gallon reservoir, 2-stage hydraulic pump powered by gas, air, or electric motor, a pressure-matic valve to regulate the pressure, and a command valve, which controls the direction of plug travel (forward or retract). fig. 1

BASIC PUMP

The **Basic Pump** (#521) is a two-stage pump: gear driven low pressure and axial piston driven high pressure. It has a built in safety valve (#515) that will not allow the pump to pump over 10,000 PSI. Normal operating pressures should never exceed 7,100 lbs. We do not recommend that you try to service this unit as it requires facilities and testing equipment that most shops do not have. Return it to the factory for exchange or repair. See fig. 2

PUMP PERFORMANCE CHART



PRESSURE-MATIC VALVE

From the reservoir and the Basic Pump, the fluid flows directly to the **Pressure-Matic Valve.** This valve is the secret of the splitter's one-man operation. It lets the basic pump build up pressure until the maximum of 7,100 PSI is reached, then it by-passes with an audible "pop" and routes the fluid directly into the reservoir at approximately 800-1,000 PSI. The release pressure of the valve can be adjusted if needed.

From the Pressure-Matic Valve, the fluid is pumped via high pressure hose (40,000 PSI minimum burst) to the **Command Valve.** This is the valve that controls the operation of the splitter. The Command Valve has three positions.

1. Lever center: Fluid circulates in system.

2. Lever left: Fluid forces plug forward.

3. Lever right: Fluid forces plug back.

COMMAND VALVE

The operation of the Command Valve is really quite simple as shown above. When the lever is in the center position (1), fluid circulates freely in the system. When the lever is in the forward position (2), the Command Valve directs the fluid into the cylinder, forcing the plug to extend. This is how the actual splitting process occurs.

When the plug has reached full forward extension and the pressure-matic valve has "popped", the control lever must be returned to the center position (1) momentarily to allow the system to stabilize and let the pressure-matic valve reset so that it may cycle correctly.

The lever is then moved to the retract position (3) which again directs the fluid towards the cylinder, this time forcing the plug back. When maximum retraction has occurred, the pressure-matic valve will allow the pressure to build to 7,100 PSI and by-pass. Returning the lever to center position (1) completes the cycle.

The Hydraulic Cylinder itself is basically a double acting hydraulic ram and operates accordingly.

SIMPLIFIED FLOW DIAGRAM

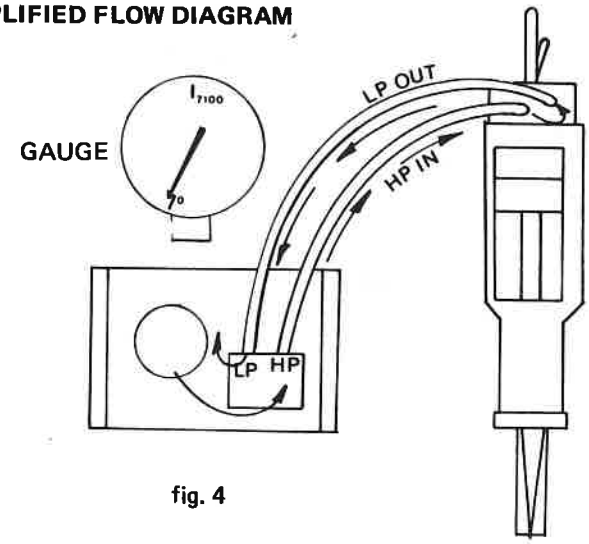


fig. 4

COMMAND VALVE LEVER IN CENTER POSITION – FLUID CIRCULATES FREELY AT LOW PRESSURE.

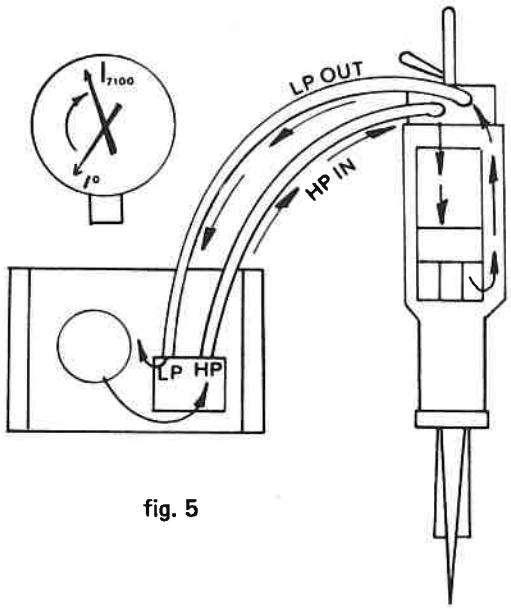


fig. 5

COMMAND VALVE LEVER IN FORWARD POSITION – FLUID DIRECTED INTO CYLINDER FORCES PISTON FORWARD.

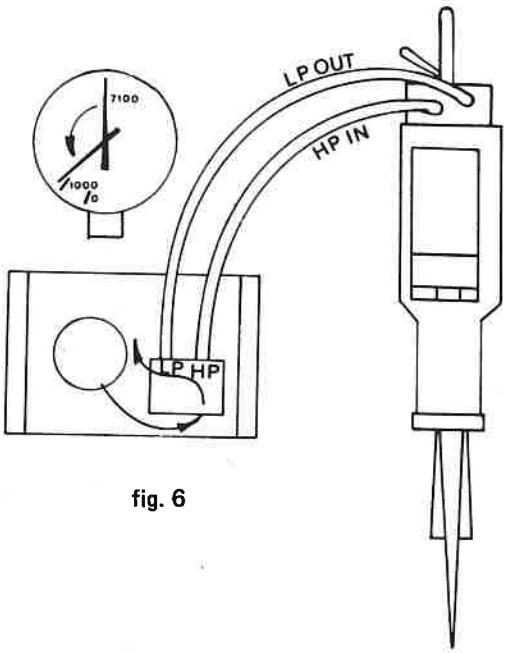


fig. 6

PISTON REACHES FULL EXTENSION AND PRESSURE-MATIC VALVE BY-PASSES – FLUID IS RETURNED DIRECTLY TO RESERVOIR AT 800-1,000 PSI.

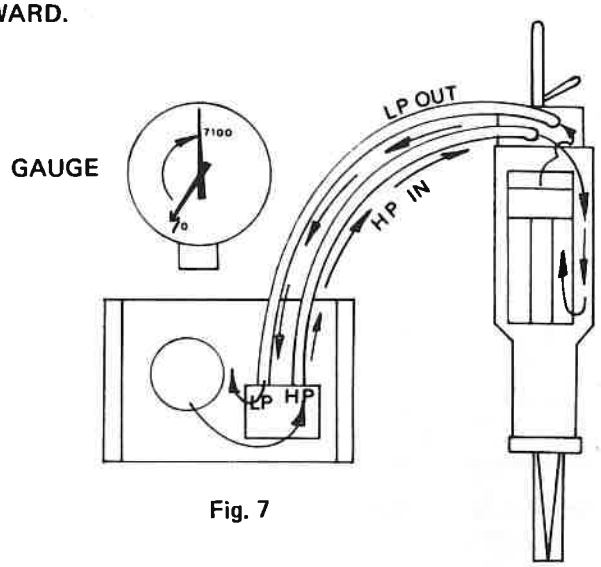


Fig. 7

COMMAND VALVE LEVER RETURNED TO CENTER POSITION. READY FOR RETURN CYCLE – SAME FLOW AS FIG. 3.

Lever in retract position forces piston up, retracting the plug. When piston reaches full retraction, same conditions as Fig. 4 occur. When lever is returned to center position, cycle is complete. Fig. 4

HOSES

The standard hoses for the Darda splitter consists of one each, high pressure hose (40,000 psi minimum burst); one medium pressure hose (9,000 psi minimum burst); and a pair of high and medium pressure hose whips. The hoses are connected to the tool via quick disconnect, self-sealing couplings which carry identical pressure ratings.

HYDRAULIC FLUID

We recommend that you use a high grade aircraft hydraulic fluid. This can be obtained at most airports and from the major oil companies.

RECOMMENDED HYDRAULIC FLUID

OIL SUITABLE FOR USE WITH THE DARDA ROCK-SPLITTING UNITS

EMACO - 015-1
EXXON - Code 3126
Code Univis J-13
SHELL OIL COMPANY - Aero Shell Fluid #4
STANDARD OIL COMPANY (OHIO) - Eldoran 5606

During warm weather use hydraulic fluid with viscosities of 300 SSu at 100°F. For best efficiency, especially during cold weather, use Hydraulic Fluid conforming to EMACO 015-1.

Change hydraulic fluid every three months with average use. Inspect and clean suction filter of power unit by removing the 10 phillips head screws of the cover plate and lift unit from the tank. Check for sludge in tank. Avoid mixing hydraulic fluids since there is a possibility of jelling.

If a heavier weight standard hydraulic fluid is used, the speed at which the splitter operates (cycle time) will be greatly reduced, cutting production.

AVERAGE CYCLE TIME (NO LOAD)

Below are the *average* cycle times for the Rock Splitter under shop test conditions. Cycle time is defined as full plug extension to pop off - full plug retraction to pop off.

FLUID	EMACO #015-1 - UNIVIS J13
TEMP	68°F.
PUMP	ELECTRIC
PRESSURE	7,100 PSI
HOSES	10'

CYCLE TIME (SECONDS)

TOOL SIZE	FORWARD	RETRACT
#8	30.5	21
#5	17.5	14
#3	10.5	8
#2	7	5.5

This chart can be used as a guide to judge overall operating performance characteristics of your splitter and pump.

PLUG & FEATHER LUBRICATION

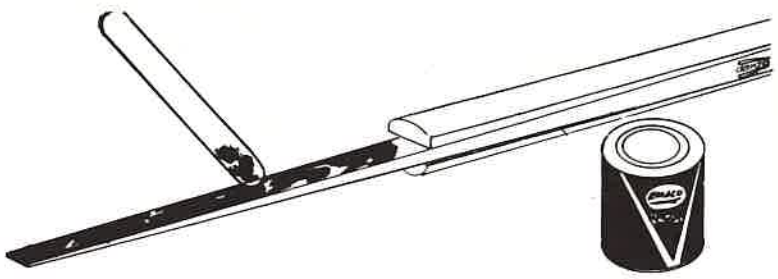


Fig. 8

Extend the plug and lubricate both sides with the recommended lubricant. Fig. 8 For hard work and best results, lubricate prior to each split. Small boulders of easy to split material, or most concrete, requires less frequent lubrication, e.g., each second to fifth split.

It is important that only the recommended lubricant be used since other types of greases are inadequate. Good lubrication means almost twice the power and production as compared to neglected lubrication.

Lubrication is simple. First extend plug fully. Apply lubricant with a flat piece of wood, steel, or brush. Use lubricant sparingly, but frequently.

NOTE: Cracking of the ground and hardened surface at the lower end of Feathers is *perfectly normal.* It occurs during manufacturing and the first few uses of the tool. Lubricant is retained in these cracks. However, lack of lubrication, crooked drill holes or a broken plug will cause one or both feathers to fail prematurely.

Should the plug be broken, stop; do not continue splitting with damaged plug or feathers otherwise you could damage good parts. If the tip of the plug is broken off *less than* 2" from the end, dress the jagged edges on a grinder and continue operating. If the feathers are broken or bent severely, replace them.

POWER UNITS

The hydraulic power units for the DARDA Rock Splitter are offered with three different power sources. See below.

POWER	GASOLINE	AIR	ELECTRIC	ELECTRIC
CODE	01	02	03	05
HORSEPOWER	3.5	3*a	1.0*c	1-1/8*b
RPM	32-3600	2-3500	3450	12000
WEIGHT – EXCLUSIVE OIL*d	79 lb.	94 lb.	85 lb.	80 lb.
WIDTH	18"	18"	18"	18"
DEPTH	12¼"	12¼"	12¼"	12¼"
HEIGHT	22"	20¼"	23½"	19¾"

*a – Air Pressure requirement is 50 to 80 CFM at 100 PSI. Air to be clean, dry and lubricated.
*b – Universal type motor 50-60 cycles, 117V, 21-28 Amps varies with oil viscosity.
*c – 60 Cycles 115/230 Volts, or 3 phase 208-220/440 Volts.
*d – In summer, use non-foaming, high quality oil of viscosity (300-SSU at 100°F). In winter, or all season, use Hydraulic Fluid conforming with EMACO 015-1. Oil capacity - 5 Gal.

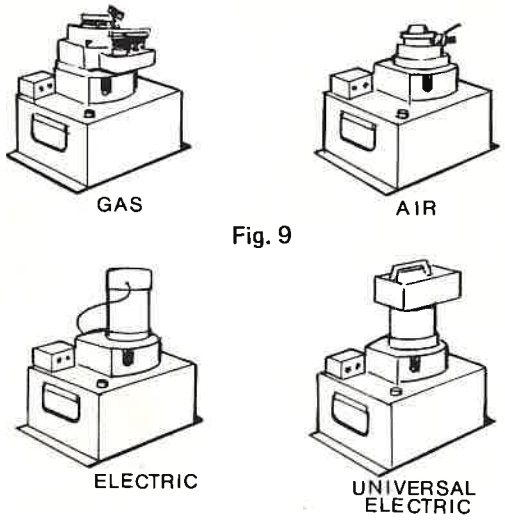


Fig. 9

The motors on these units can be interchanged easily so that you have complete versatility with one pump*. Servicing of these motors and pumps is covered in Section II.

* Due to its design, the 05 (Electric-Universal) *cannot* be converted.

FIELD MAINTENANCE

Field maintenance should consist of checks on the unit to include:

1. Fluid levels
2. Oil level
3. Oilers
4. Quick connects
5. Hoses
6. Plug and feathers
7. Leakage around cylinder halves
8. Air filter on gasoline engine
9. #0050 Rubber bumper on splitting cylinder
10. All connections clean and tight

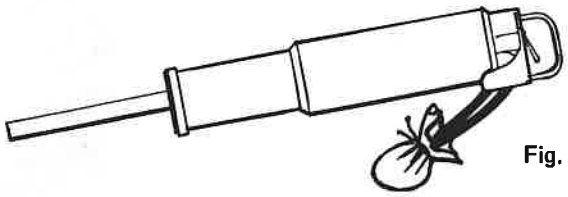


Fig. 10

Care should be taken not to allow any dirt to come in contact with the couplings; failure to keep these clean will shorten their life. It is recommended that when the cylinder is not connected to the hoses that a small rag be tied around the couplings to keep them clean and free of dirt. Fig. 10

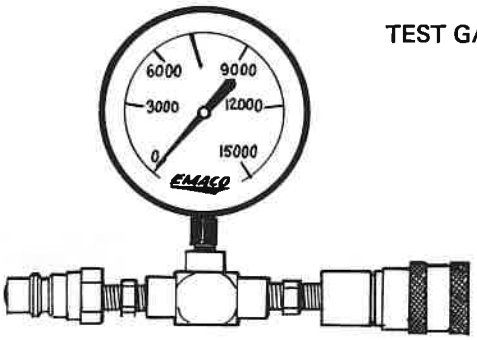
Field maintenance should be taken care of by the serviceman at the beginning of each day's work, or the operator of the tool whenever he has the opportunity. These simple checks will help to combat costly downtime.

SERVICE TOOLS

In addition to standard mechanic's tools, the following tools are needed:

1. Chain Wrench (EMACO)
2. Stuffing Box Wrench (EMACO)
3. Valve Adjust & Sleeve Removal Tool (EMACO)
4. Set of Metric Combination Wrenches
5. Set of Metric Allen Wrenches
6. Pressure Gauge with Quick Couplings (EMACO)
7. Torque Wrench (in/lbs)

It is recommended that only *metric* tools be used on the splitter and pressure-matic valve. The pump and hoses are standard American sizes and components.

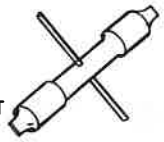


TEST GAUGE fig. 11

SPECIAL SERVICE TOOLS

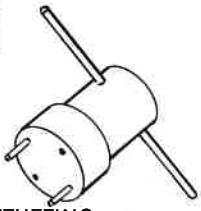
CHAIN WRENCH

Fig. 12



VALVE ADJUST TOOL

Fig. 13



STUFFING BOX WRENCH

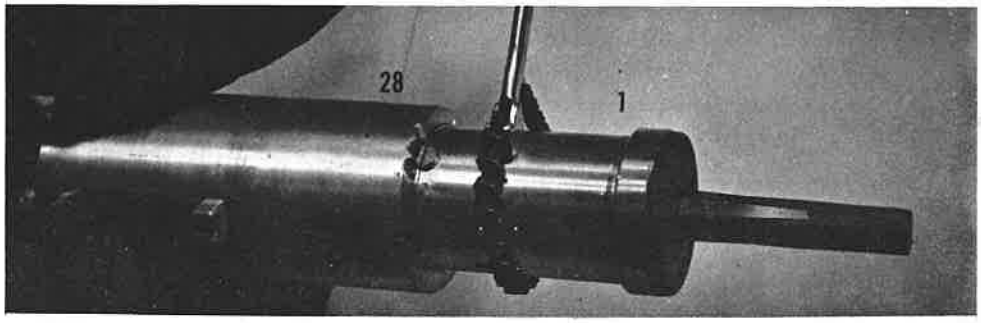
Fig. 14

SECTION II: SERVICE PROCEDURES — Pumps & Cylinder Sizes 2, 3, 5

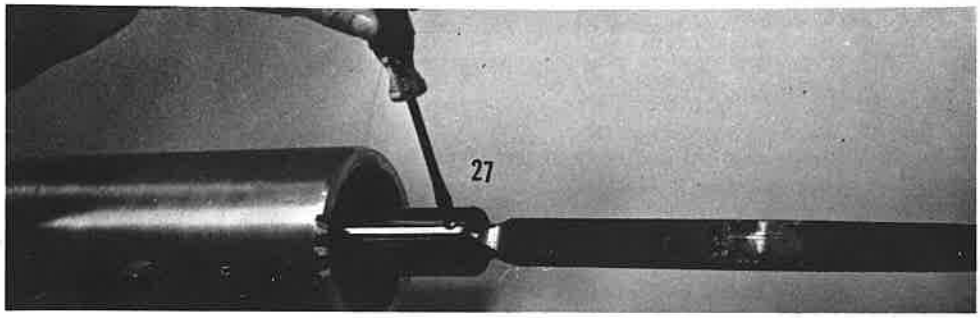
CHANGING PLUG & FEATHERS FOR MODELS 2, 3, 5

NOTE: Numbers refer to parts list exploded drawings not code No. Cylinder should be connected to power unit for this operation.

1. Loosen (#28) Lock Screw. **NOTE:** Flat side facing upper barrel (photo A). **DO NOT** Remove.
2. Unscrew (#1) lower barrel and slide off plug and set aside.
3. Run piston out to full forward position.
4. Remove (#27) set screw (photo B).
5. Rotate plug until 12 steel balls (#18) have fallen out, remove plug #34 (photo C).
6. Replace plug and 12 steel balls.
7. Tighten set (#27) screw down and back up ½ turn. Plug must rotate freely.



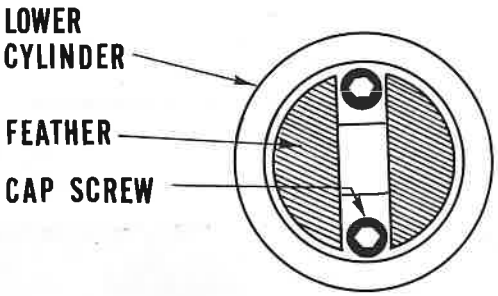
A

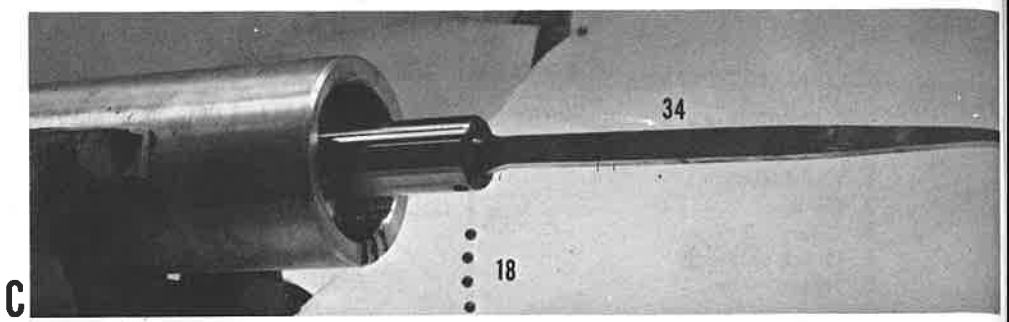


B

HOW TO REPLACE FEATHERS

9. Remove (#28) lock screw from lower barrel (photo D)
10. Remove (#2) sleeve from lower barrel (photo E).
11. Tap feather (#35) out one at a time. (Sometimes a slight twist helps) Photo F.
12. Replace feathers (Be sure they are seated correctly at the bottom of the lower cylinder) Replace sleeve (#2) and lock screw (#28), (finger tight).
13. Retract piston
14. Slide (#1) lower barrel into position
* 15. **CAUTION:** Be careful not to cross threads of the two cylinder halves. They cannot be rethreaded — Compressed air is useful here to blow the threads clean.
16. Tighten lower cylinder barrel until lock screw (#28) is opposite indentation in upper barrel.
17. Tighten lockscrew and secure by trying to unscrew lower barrel with chain wrench.
18. Be sure to use OPTIMOL and lubricate the plug & feathers completely before returning tool to use.





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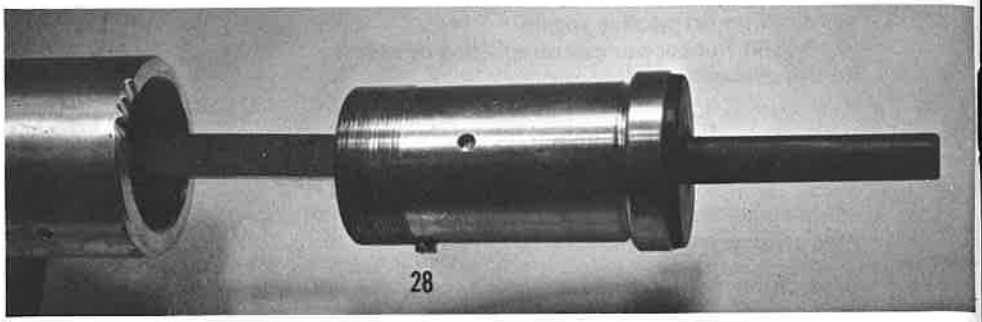
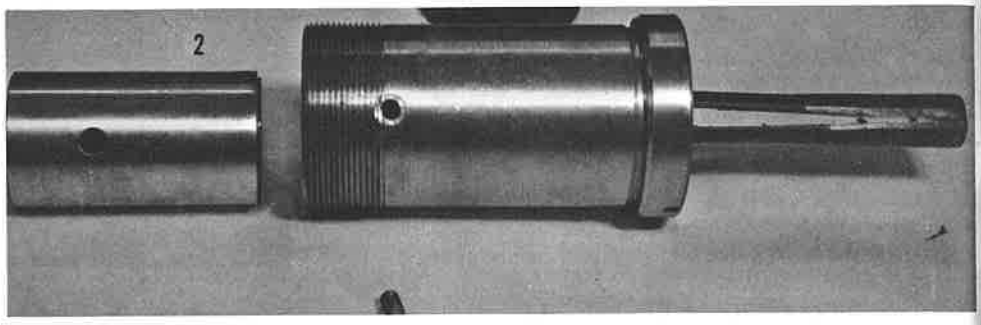
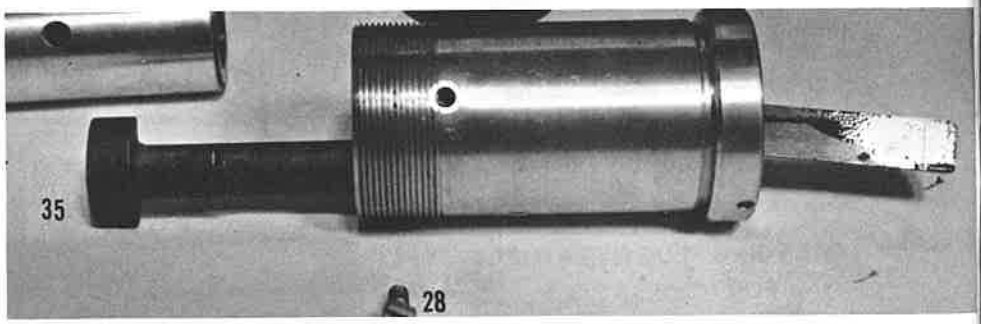


D



E



F

REPAIR OR REPLACE PRESSURE-MATIC VALVE 06-100 EXTERNAL

See Page No. 16 for internal Pressure-Matic Valve 06-300

TO SERVICE PRESSURE-MATIC VALVE (TOOLS NEEDED)

1. #08-4 Valve Tool - EMACO
2. Set of metric sockets
3. Allen wrench set
4. Magnifying glass
5. Blow gun
6. Solvent and brush

DISASSEMBLY Fig. 15

1. Remove hoses from valve.
2. Remove the 4 socket head screws (#15) that secure valve to pump unit.
3. Lift valve straight up.
4. Remove discharge tube (#17) from bottom of valve.
5. Place valve in vise with large hex head bolt up and break EMACO seal with pliers or cutters. Loosen (#4) socket set screw.
6. Remove screw plug (#14) and seal ring (#13) with 17mm socket.

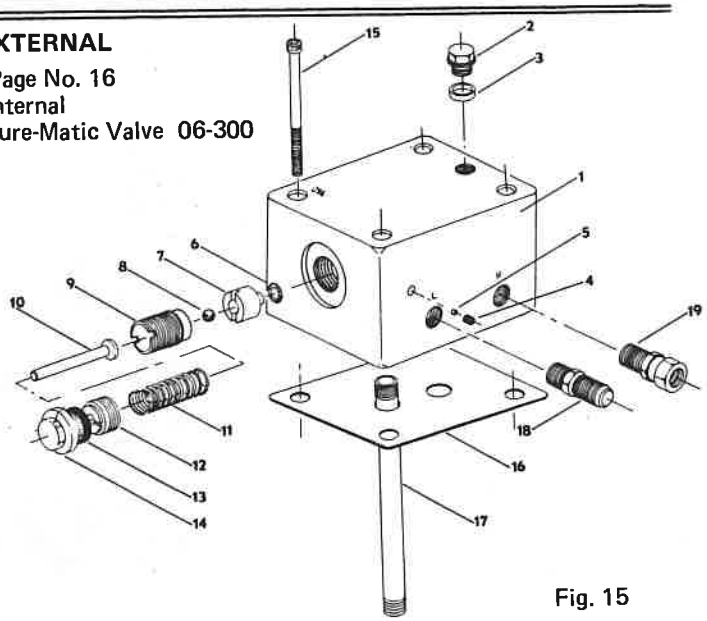


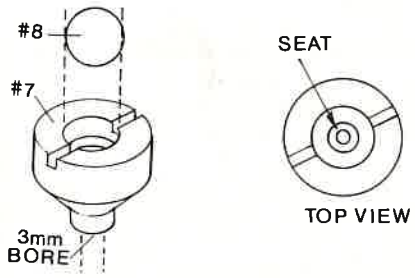
Fig. 15

7. Remove adjusting screw (#12) with EMACO valve tool (08-4) using end with the hole in it.
8. This exposes the spring (#11) and valve stem (#10) which can be lifted out with a magnet.
9. This exposes the sleeve (#9) which can be removed using EMACO valve Tool (08-4) with the straight blade end.
10. This exposes the steel ball (#8) and valve seat (#7) - remove the valve body from vise and shake out valve seat with the ball and note the o-ring (#6) on the end of the valve seat. If valve seat sticks, use air pressure at coupling (#19).
    Malfunction of this valve can usually be narrowed down to Parts #6, #7, or #8 in the above drawing. When the valve does not build pressure or recycles (that is, builds pressure to 7,100 pops, and then immediately builds pressure and pops again), the o-ring (#6) is damaged or expanded and should be replaced. Should this fail to correct the problem, the seat and ball (#7 and #8) must be replaced.
11. Examine o-ring for possible damage and replace.
12. Clean all parts including valve body.
13. Check valve seat for damage and ball for wear; if needed, replace. (See Fig. 16)
14. Oil all parts and use reverse procedure for reassembly.
15. Screw down pressure adjusting screw approximately 10 turns from start (or approximately 2 turns from time spring pressure is felt) and replace seal ring (#13) and tighten screw plug (#14).
16. Put valve back on pump and test for correct operation with EMACO pressure gauge.
17. If pressure is low, increase by turning adjusting screw (#12) to the right (clockwise).
18. If pressure is too high, decrease by turning adjusting screw (#12) to the left (counter clockwise).

DETAIL OF VALVE SEAT & BALL

The Ball (#8) must fit firmly in the valve seat for the valve to operate properly. If it falls out when the seat is inverted, it is too loose. If it requires considerable pressure to remove from the seat, it is too tight. Correct fit is determined by pressing the ball into the seat with a slight "click"; and if the seat is inverted, the ball should be able to be shaken out. Inspect seat with a magnifying glass to determine if the seat is worn unevenly due to a piece of foreign material passing through and lodging under the ball. *Do not* attempt to grind or dress or otherwise alter the seat. This could lead to a high pressure overload which could damage the tool.

VALVE SEAT Fig. 16



SERVICING COMMAND VALVE

1. Disconnect cylinder from power unit.
2. Remove high and low pressure whips.
3. Remove pin (#13) from control lever (#12) with hammer and small pin punch – be careful not to lose it!
4. Remove four socket head cap screws (#18).
5. Remove control lever by pulling it off shaft.
6. Lift off handle.
7. Remove remaining socket head cap screws (#19) and (#20).
8. Lift off Command Valve. Be careful not to lose the two o-rings (#14).
9. Place valve in vise with the camshaft (#9) facing you and the two seal plugs (#4) up.
10. Remove the seal plugs and seal rings with 17mm wrench.
11. Remove valve seats (#6) with 9mm deep socket. Using probe magnet, remove the balls (#2).
12. Inspect the seat (#6) for wear (See Fig. 18); if worn, replace.
13. Inspect the springs for expansion (#3) at the ends. If expanded or worn, replace.
14. Replace balls (#2).
15. Loosen valve body in vise and turn the plug holes downward with the camshaft still facing you.
16. Using a thin drift pin, rotate the camshaft (#9) 180 degrees (one-half turn).
17. Using a large screwdriver as a lever underneath the drift pin, *gently* pop out the front disk (#11) and the camshaft.

Fig. 18

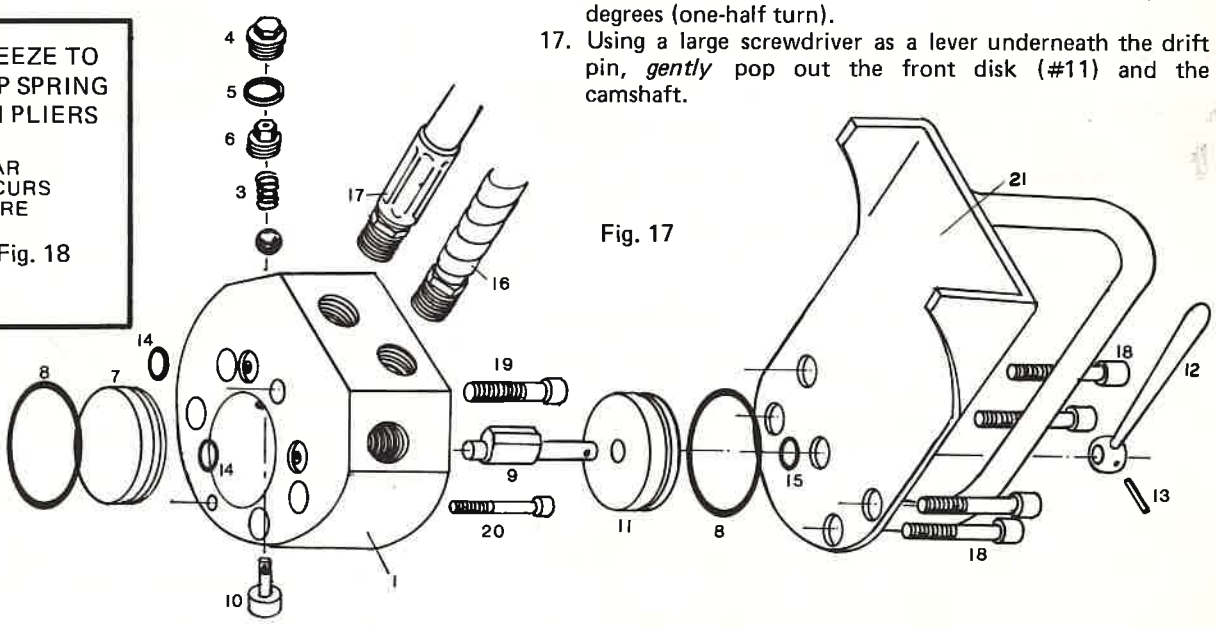
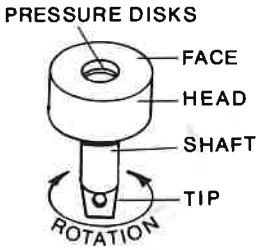


Fig. 17

18. Replace o-rings (#8 and #15).
19. Inspect camshaft for excessive wear. If needed, replace.
20. Using a sharp object such as an ice pick or awl, make a small scratch next to one of the valve shafts (#10). Put a scratch on the corresponding valve shaft.
21. **Important:** If the valve shafts are to be reused, do not mix them up. They must be put back in the same side that they were removed from.
22. Inspect valve shafts for wear or stiffness. (See Fig. 19).
23. Using the handle of a hammer or screwdriver, *gently* tap out the end disk (#7). Replace o-ring (#8).
24. Thoroughly clean all parts. In order to insure complete sealing after reassembly, it is sometimes necessary to grind the valve body slightly if the seal rings (#5) have severely scored the surface of the aluminum.
25. Before starting to reassemble, replace o-ring (#8) and install end disk.
26. If new valve shafts are used, they sometimes must be individually fitted in the valve. This is done by very carefully grinding or filing the tip of the shaft until the control lever (#12) can be easily moved to the stop pins on the handle.

    (Valve must be assembled to do this.) Take care to remove the least amount possible of metal from the tip. The control lever should be stiff, but not so stiff that it has to be forced to the stop pin. Over grinding will cause the lever to have excessive play in neutral position. Allowable play in neutral position should not exceed 3/4". Sometimes the valve must be assembled and taken apart two or three times to get the correct clearance as each valve is different and may have more or less wear than another.
27. After the valve shafts are installed, fit the camshaft through the front disk. Install the camshaft with the lobe facing away from the valve shafts to avoid hanging up and damaging the shafts.
28. After front disk and camshaft are in place, again position the camshaft by rotating it 180 degrees. This will put it in the correct operating position.
29. Turn the valve over so that valve seat holes are turned up. Taking one side at a time, drop a steel ball in position as shown. Fig. 20 Move control lever *away* from side you are working on. Seat the ball using a punch and hammer. A light tap is all that is required to seat the ball correctly. NOTE: Some valves shafts will fit perfectly the first time; others will have to be fitted and ground.



CHECK FACE AND TIP FOR WEAR

Fig. 19

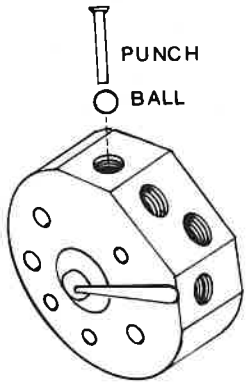


Fig. 20

30. Next install the spring on the valve seat by crimping one end and pushing it on. (See inset) fig. 18
31. Install seats with springs with control valve pointed away from side you are working on.
32. Finish assembly and reinstall valve on cylinder. Test for proper operation with gauge.

CAUTION

Handle (#21) must be in place to test valve, as it serves to hold the front disk in position. Serious damage and possible injury could occur if valve is tested without handle.

SERVICE OF GASOLINE ENGINE

The Gasoline Engine is warrantied by its manufacturer. Do not send to EMACO for warranty. Take to authorized repair station.

1. This engine is a standard gasoline engine and should be serviced accordingly.
   a. Clean air filter *once a day* under unusually dusty conditions. Otherwise, once a week.
   b. Check oil *once a day* when unit is in daily use. Check it prior to each use. Otherwise, change oil whenever it becomes dirty.
   c. **WARNING:** *Do not* transport unit when gas tank is full and fill cap is blocked off. Due to the design of the carburetor, the gas could slosh into the crankcase of the engine. If the oil is diluted and the engine is run, serious damage will occur.
   d. This engine uses regular gasoline. Do not mix gas and oil together.
   e. Use SAE 30 oil in summer and 10W 20W in winter (straight 10W below 20°F.)
   f. In cold, damp conditions, it may be necessary to remove the air cleaner and hand choke the engine.

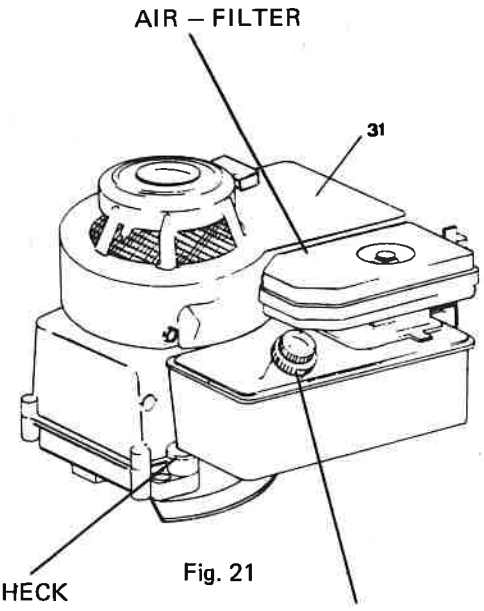


Fig. 21

SERVICING BASIC PUMP ASSEMBLY

We do not recommend that you try to repair the basic pump unit (#521) as it is a highly complex, two-stage pump, which requires a hydraulic test bench and complete parts inventory to service. It is suggested that you send it back to EMACO for exchange or repair.

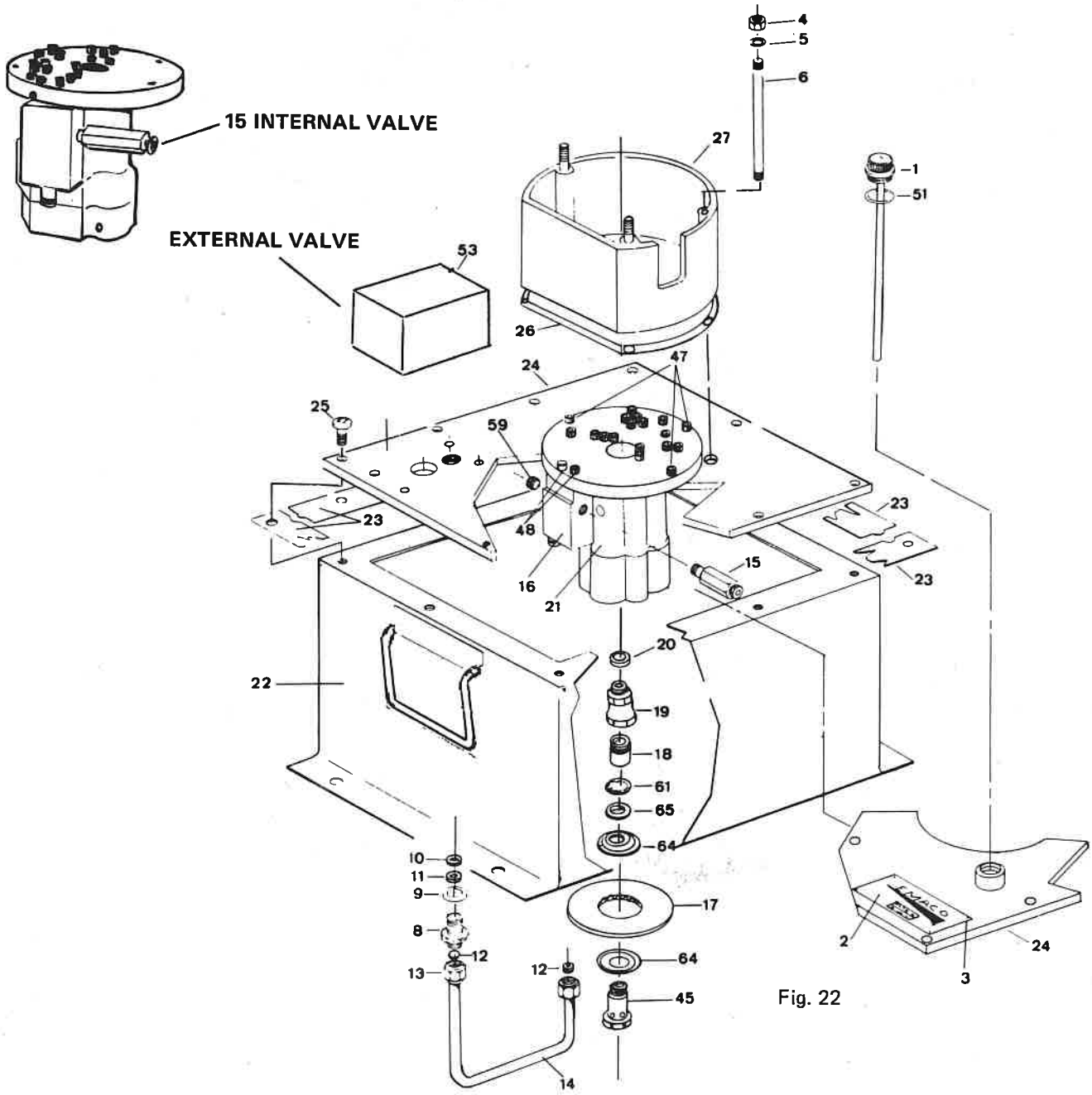


Fig. 22

INTERCHANGING BASIC PUMP

1. Remove motor from unit and remove adapter (#27).
2. Remove screws (#25) that hold cover plate to reservoir.
3. Lift off cover plate and put reservoir aside. Turn over so that pump is exposed and remove the high pressure oil line.
4. Turn plate back over so that top (name plate side) of cover is facing you.
5. Carefully remove the 2 screws (#48) that hold the check valve to basic pump.
6. Then remove the 3 screws (#47) that hold pump to cover plate.
7. Basic pump can now be lifted out. (Be sure not to lose o-ring on top of check valve.)
   NOTE: DO NOT TAMPER WITH any other screws on basic pump or try to disassemble it. This will void your warranty.
8. Interchange oil filter screen and adapters on new pump if required.
9. Reinstall basic pump reversing above procedure.
   NOTE: The 2 check valve screws must be torqued to a reading of 180 in lbs.
   NOTE: Do not try to adjust or disassemble the relief valve (#15). If you suspect a malfunction, replace it. The same holds true for the check valve (#16).

SERVICE AIR MOTOR

1. Remove air motor from pump by removing the three nuts and lockwashers from the studs.
2. Remove shaft adapter (#30) from shaft; remove adapter plate (#7).
3. Place motor in vise with soft jaws and clamp the shaft.
4. Removing bearing cover (#67) and gasket (#68).
5. Remove six hex bolts (#70); drive out small roll pins used for alignment.
6. Remove motor from vise and turn over.
7. Remove drive end bearing cover (#80) with o-ring (#79) and seal (#78); replace seal and o-ring.
8. Using a plastic or rubber mallet, drive the shaft up through the drive end bearing until rotor assembly (#74) can be lifted out of motor body (#73) and drive casting (#76) Fig. 24
9. Using a small gear or bearing puller, remove dead end casting (#71) from rotor. Be very careful not to damage the gasket surfaces of the body (#73) or dead end casting (#71). Fig. 25
   Note: On early models, it may be necessary to remove driver rotor nut and lockwasher before using puller.
10. Now tap out the dead end bearing (#69) from the casting and the drive end bearing (#77) from lower casting.
11. Remove and discard old vanes (#75).
    Note: On early models, the vanes will be attached to small springs and push pins through the rotor. Fig. 27
12. Clean all parts thoroughly and inspect for damage and wear.
13. If motor was leaking air between body (#73) and lower casting (#76), remove six (6) socket screws (#81) and replace gasket (#72).
14. Prior to reassembly, be sure all gasket surfaces are flat and free from burrs or gouges. Surfaces can be trued up with a fine flat file.
15. Begin reassembly by dropping rotor in body and lower casting (#73, #76).
16. Replace vanes, making sure that the clipped corners face center of rotor (#74).
    Note: When replacing vanes which require springs, be sure the small slot in the vane is at the top of the rotor and the push pins are centered in the rotor.
17. Squirt a liberal amount of oil on rotor, vanes, and inside body casting during assembly.
18. Coat the gasket surface of body and dead end casting with a film of oil. Place gasket (#72) on body making sure holes match up.
19. Replace dead end cover with six (6) hex bolts and make finger tight. Turn motor over.
20. Replace drive end bearing (#77), seal (#78), o-ring (#79), and cover (#80).
21. Turn motor upright, install dead end bearing (#69), and then tighten six (6) hex bolts (#70) and install roll pin for alignment.
22. At this point, you might discover that the rotor shaft will not turn. This is normal because now the rotor must be centered in the body. In some cases, the rotor will turn freely due to wear on the end castings; if so, disregard next four steps.
23. Place motor in vise so that both ends of rotor shaft can be easily reached. Attach muffler and air line (do not exceed 100 PSI).
24. Turn on air motor. If motor fails to spin, begin tapping on drive end of shaft with light blows. (Brass or plastic hammer). Gradually increase the strength of the blows until motor begins to rotate. If the motor still fails to turn, repeat procedure on dead end of rotor shaft. Never strike blows hard enough to cause mushrooming of the shaft ends. Fig. 26

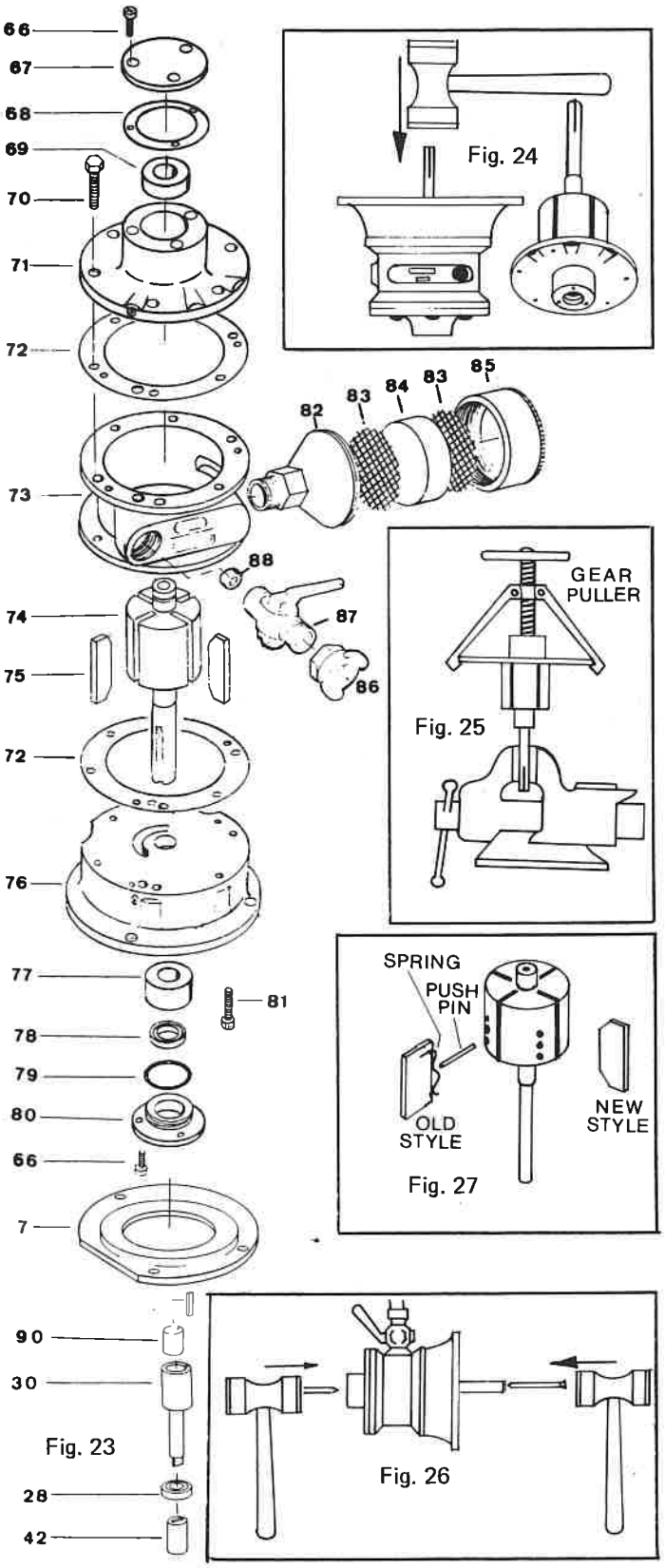


Fig. 23

Fig. 24

Fig. 25

Fig. 27

Fig. 26

25. After motor begins to turn, take a center punch and press on drive end of shaft. Note motor speed: If it increases when pressed, a few more taps with the mallet are needed. If it slows down, take punch and press dead end to see if motor speeds up. If motor speeds up when dead end is pressed, a few more blows are required.
26. Rotor is properly centered when pressing on both ends of shaft (one at a time) causes motor to slow down or causes little change in speed.
27. Replace dead end bearing cover and gasket; check for air leaks.

SERVICE STUFFING BOX

Take special precautions not to damage the aluminum cylinder threads during disassembly. They are metric and are very difficult to recut. Even slightly damaged threads will make removal (and subsequent installation) of the Stuffing Box and Lower Cylinder Shell next to impossible and could result in a useless tool. This fact cannot be stressed enough. *BE CAREFUL.*

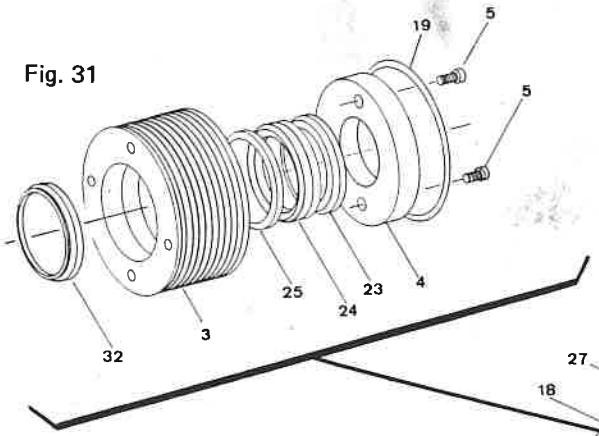


Fig. 31

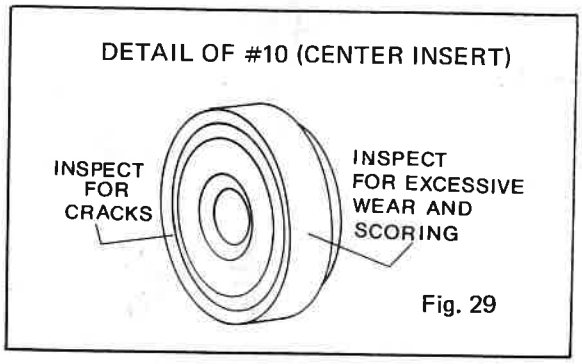


Fig. 29

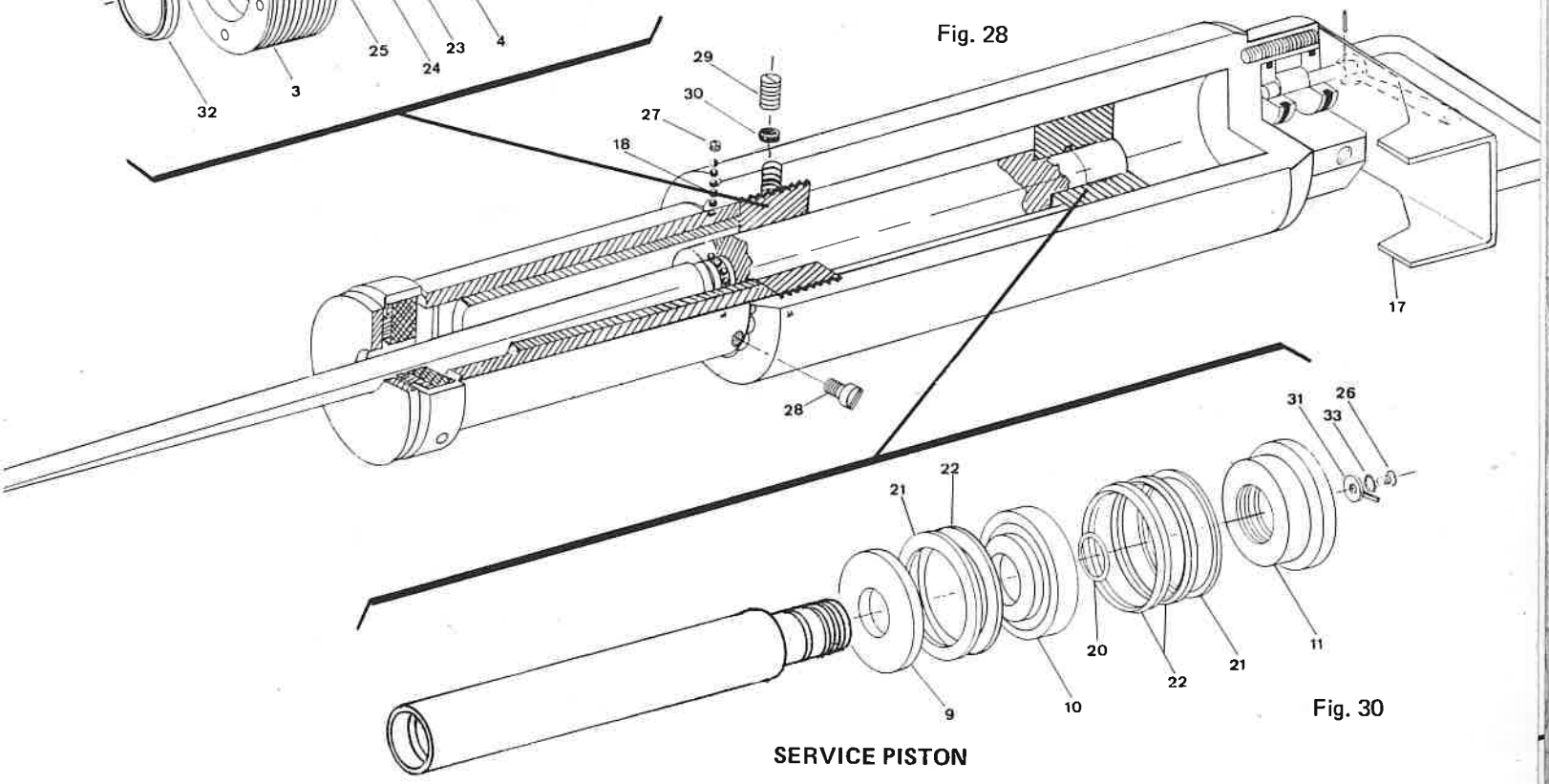


Fig. 28

Fig. 30

REMOVE AND REINSTALL STUFFING BOX Fig. 31

1. Place tool in vise; proceed to remove lower cylinder as if you were changing plug and feathers.
2. Remove plug.
3. Run piston back to fully retracted position.
4. Remove the set screw (#29) on the outside of upper cylinder barrel.
5. Using EMACO STUFFING BOX WRENCH (#08-3), align the pins with the corresponding holes in the stuffing box and unscrew it. Remove 2 socket head cap screws (#15) and remove stuffing box cover (#4). If required*, replace o-ring (#19*), seal (#23), seal (#24), seal (#25), and gasket ring (#32).
   *Always replace (#19) o-ring each time stuffing box is removed.
6. To reinstall reverse the above procedure and remember to check the plastic plug (#30) under screw (#29) for wear and replace if needed.
   NOTE: Piston partially extended makes lining up and initial threading of the stuffing box easier.

SERVICE PISTON

REMOVE AND REPAIR PISTON Fig. 30

1. To remove piston, disassemble tool and remove stuffing box using EMACO stuffing box wrench.
2. Gently pull piston out of cylinder, control lever in neutral, 1 quick coupler removed.
3. Remove (#26) screw washer and retainer (#33 - #31).
4. Unscrew (with chain wrench) and remove stop plate (#11).
5. Gently remove seals (#21 - #22) and o-ring (#20).
6. Lift off (#10) and inspect for cracks and edge wear. (See inset) Fig. 29
7. Remove #21, #22, and #9.
8. Inspect parts and replace where needed.

Faulty piston seals are usually indicated by a sluggish tool or low pressure build up on both forward and retract cycles when everything else is adjusted properly.

Reassemble in reverse order. DO NOT over tighten (#11) stop plate. Set lock plate (#31) in original position.

When installing piston in cylinder, be careful not to damage the new piston seals. Oil the cylinder bore thoroughly before reassembly.

SERVICE LOWER CYLINDER SHELL

1. Unscrew lower shell from cylinder as you would to change plug and feathers.
2. Remove cylinder lock screw (#28).
3. Remove insert (#2), check support ring (#6); if worn, replace.
4. Remove feathers and rubber bumper (#16).
5. Unscrew end cap (#13) with chain wrench; remove guide plate (#14) and rubber retainer (#15).

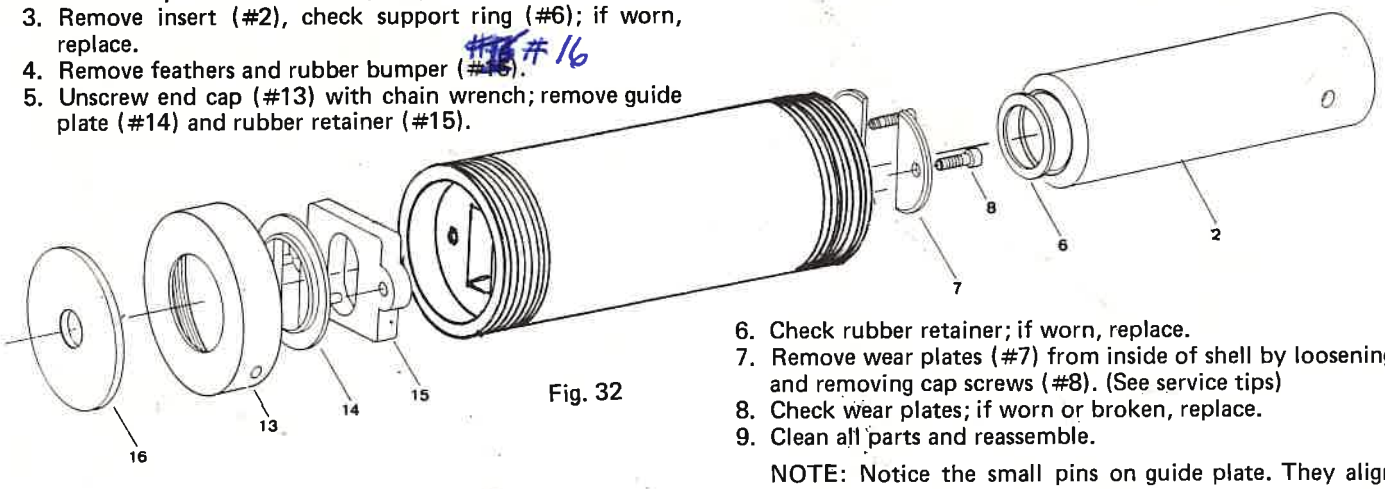


Fig. 32

6. Check rubber retainer; if worn, replace.
7. Remove wear plates (#7) from inside of shell by loosening and removing cap screws (#8). (See service tips)
8. Check wear plates; if worn or broken, replace.
9. Clean all parts and reassemble.

NOTE: Notice the small pins on guide plate. They align with corresponding holes in the rubber retainer and the lower shell (#1). Be sure that they are lined up properly during reassembly.

SECTION III: CYLINDER SIZE C-8

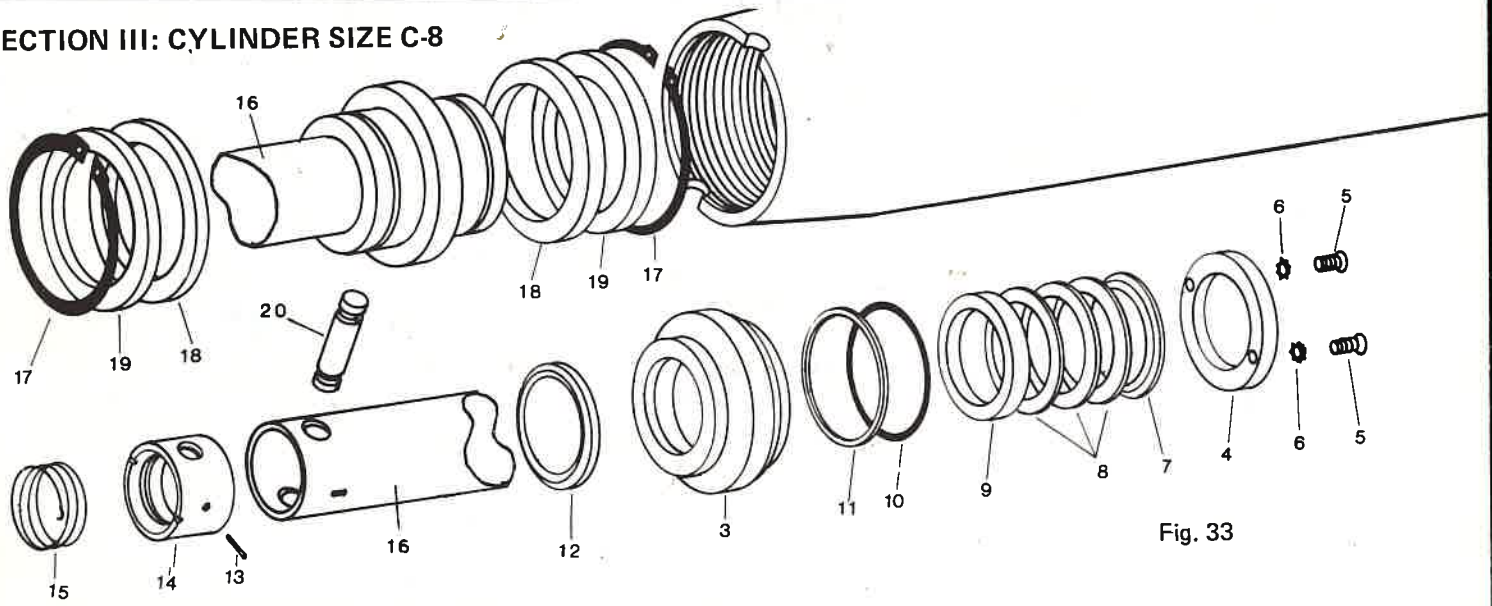


Fig. 33

GENERAL INFORMATION

a. The C-8 splitter is different than the #2, #3, or #5. The C-8 incorporates many changes that make it easier to service and maintain than the standard splitters. Features such as easy to remove piston and seals and heavy duty wearing parts should make servicing substantially faster than our standard tools.

b. **Service Tools**
In addition to standard mechanics tools, you will need:
1. Set of metric Allen Wrenches
2. Good pair of outside snap-ring pliers (heavy duty)
3. *Thin* wall deep 10mm 1/4" Drive Socket

c. **CAUTION: Never attempt to operate C-8 with the lower shell removed.**
The lower shell of the C-8 is the retainer for the stuffing box and piston. Operating the C-8 with hydraulic or air pressure when the lower cylinder is unthreaded could cause the piston to blow out and possibly injure by-standers. The easiest way to avoid this problem is to remove the high pressure whip before unthreading the cylinder halves.

SERVICE PROCEDURES – C-8

Item numbers are used for part identification – refer to exploded view. For Command Valve service, refer to SECTION II.

a. Service Upper Cylinder Shell including Piston Stuffing Box, and Guide Ring.
1. Purge cylinder of hydraulic fluid. (See Service Tips)
2. Remove plug and feathers (See Fig. 35
3. Remove high pressure whip and put command valve lever in forward position.
4. Remove cylinder lock screws (#21).
5. Unthread lower cylinder shell and set aside.
6. Use a large screwdriver or steel bar through the plug pin hole in the piston . Support the piston rod and pull gently until the piston is removed from the cylinder. Be careful not to let the piston drop out of the bore and hit the threads as they are aluminum and can be easily damaged.
7. Drive out the small roll pin (#13) and remove the guide ring-spring assembly (#14, #15) from the piston.

8. The stuffing box (#3) can now be pulled off the piston rod and disassembled by removing the two flat head socket screws (#5). Inspect the large o-ring (#10) and plastic support ring (#11); replace if needed. Inspect the stuffing box seals (#7, #8, #9) and the dirt wiper (#12). Replace if needed. Clean and reassemble.
9. Using large outside snap ring pliers (Wear eye protection!), remove the snap rings (#17) and piston seals (#18, #19); inspect and replace if needed. Reassemble making sure the seals face the proper direction.
10. Before reassembling, check the cylinder bore for excessive scoring and cracks.
11. Oil the cylinder bore before attempting to install the piston.

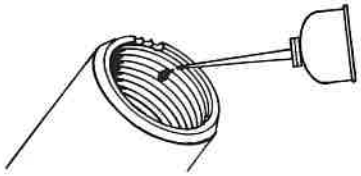
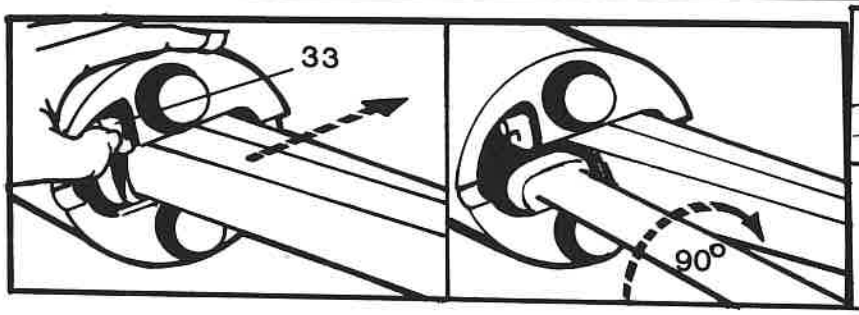
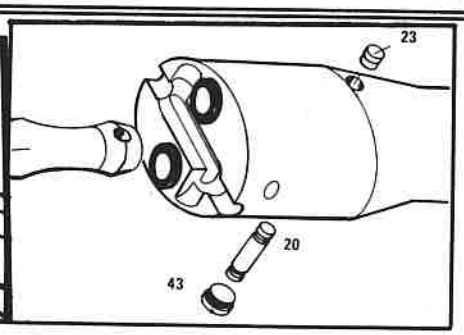


Fig. 34



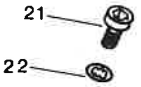


REMOVE FEATHERS Fig. 35

1. Pull up both feather lock bars (#33) and push plug and one feather to one side as far as they will go.
2. Grasp other feather, twist 90° and pull out.
3. Move plug to other side and remove other feather.

REMOVE PLUG: Fig. 36

1. Extend plug fully and remove plastic plug (#23) and screw plug (#43).
2. Using a small pin punch, knock out plug pin (#20). Pull plug straight out.
3. Reinstall using reverse of the above.



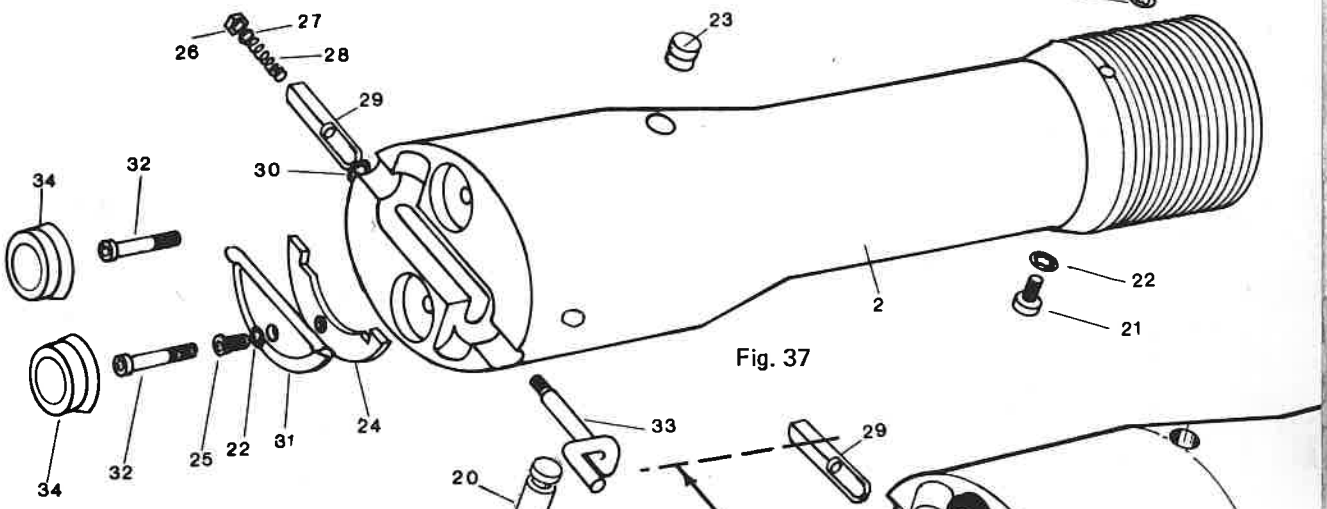


Fig. 37

Service Lower Cylinder Shell

1. Begin by removing plug and feathers and retracting piston. Then disconnect cylinder from power source (hydraulic or air).
2. Remove the two cylinder lock screws (#21). Unscrew lower cylinder shell and slide off piston.
3. Remove the two plastic plugs (#23).
4. Using a pin punch through the access hole, drive the sleeve (#29) approximately three-quarters of the way out. (Be sure feather lock bars are in closed position.) Now remove the two nuts (#26) and the washer (#27), which hold the feather lock bar in the sleeve. Remove spring (#28). Pull the feather lock bar (#33) out and finish driving out the sleeve.
5. Use a screwdriver and pry out the rubber bumpers (#34). Remove the socket head cap screws (#32) and the lower wear plates (#31). The socket head cap screw (#25) is accessible through the same hole where the cap screw (#32) was removed. Remove cap screw (#25) and the upper wear plates (#24).
6. Replace any worn or bent parts and clean thoroughly before reassembly.
7. Check the o-ring (#30) inside the sleeve (#29) and replace if needed.
8. When reinstalling the wear plates, be sure that the socket head cap screws (#32, #25) are securely tightened.
9. **Caution:** When reinstalling the sleeve (#29), make sure that the flat side of the sleeve is flush with the flat inside of the lower shell or you will not be able to reinstall the plug. Fig. 37
10. Use a little oil on the rubber bumpers (#34) to make installation easier.

SECTION IV: TROUBLE SHOOTING

LEAKAGE PROBLEMS

WHERE	WHY	FIX
1 Between main and lower cylinder shell	#0060 o-ring worn; stuffing box seals worn.	Replace seals and o-ring.
2 Around Command Valve	#0630 o-rings worn; #0613-0614 seals and screw covers too tight or not tight enough. #0617 or #0659 o-rings worn. Whip connections loose.	Replace o-rings. Tighten or retighten seals and screw covers. Tighten hose connections or apply teflon tape.
3 Around Plugs & Feathers	Same reasons as #1.	Same fix as #1.
4 Around set screw #0073	Set screw not tight; #0074 plastic plug worn out.	Tighten screw. Replace.
5 Around Pressure-Matic Valve	Gasket #0640 worn out. Screw plug #0626 too loose or too tight. #0639 screws loose. #0628 set screws loose. #0637 seal too loose or too tight. #409 and #410 fittings loose. #509 and #511 o-ring and spacer worn.	Tighten all fittings and screw plugs. Replace gaskets, o-rings, and spacer.
6 Around Reservoir	Cover plate gasket worn. Cover plate screws loose (#545). Reservoir cracked. Dip Stick o-ring (#525) worn. #526 Adapter gasket worn.	Tighten all screws. Replace gaskets. Weld or replace reservoir. Replace o-rings.
7 Around Quick-Connects	1. Fitting Loose. 2. #407 o-ring worn out. 3. Coupling worn out.	1. Tighten or reinstall with teflon tape. 2. Replace. 3. Replace.

PLUG & FEATHER PROBLEMS

SYMPTOM	WHY	FIX
Plug broken or bent at bottom or lower half	1. Hole too shallow. 2. Hole crooked.	1. See chart for correct hole size. 2. Drill straight holes.
Excessive wear and scoring	1. Not enough lubrication. 2. Wrong lubricant. 3. Lubricant contaminated with rock chips, etc.	1. Lubricate for every split. 2. Use recommended lubricant *only*. 3. Keep container covered when not in use.
Plug broken at top.	1. Too many retaining balls or too few (#0058).	1. Be sure there are only 12.
Very severe ball grooves in top of plug	1. Not enough lubrication. 2. Plug worn out.	1. Lubricate every split. 2. Replace.
Feathers loose in tool (#2, #3, #5)	1. Wear plates worn or broken (#008). 2. Rubber retainer worn out (#0049). 3. Guide plate worn or broken (#0048).	1. Replace. 2. Replace. 3. Replace.
Plug "chatter" during splitting	1. Not enough or improper lubrication.	1. Lubricate every split in tough work.
Broken feather shoulders	1. Insufficient lubrication. 2. Broken wear plates (#008).	1. Lubricate every split in tough work. 2. Replace.
Feathers Very Loose C-8 Splitter ONLY	1. Feather lock bars broken, bent. 2. Wear plates (#007 & #008) broken or bent. 3. Feather shoulders worn.	1. Replace. 2. Replace. 3. Replace.

PRESSURE PROBLEMS (use gauge for checking)

SYMPTOM	WHY	FIX
Pressure rises slowly and holds without reaching maximum (7100 PSI). Both forward and retract.	1. Defective o-ring (#0630) in pressure-matic valve. 2. Defective seat and ball in pressure-matic valve (#0631 & #0632). 3. Faulty adjustment in pressure-matic valve. 4. Defective 0-ring (#0061) on piston. 5. Relief valve (#515) defective. 6. Pump screen (#517) blocked. 7. Pump worn out.	1. Replace o-ring. 2. Replace ball and seat. 3. Readjust pressure screw. 4. Replace o-ring. 5. Replace relief valve. 6. Clean screen and replace fluid. 7. Replace pump; contact EMACO for exchange program.
Pressure too high – above 7100 PSI	1. Faulty seat and ball in pressure-matic valve (#0631 and #0632). 2. Adjusting screw (#0636) too far in on pressure-matic valve. 3. Damaged valve stem (#0634).	1. Replace ball, seat and o-ring (#0630). 2. Loosen and recalibrate valve. 3. Replace.
Low pressure on forward cycle; retract ok (or reverse of above)	1. Faulty springs (#0612), balls (#0611), valve seats (#0615), or valve shafts (#0621). Any one of, or combination of, the above.	1. Rebuild command valve *starting* with springs (#0612), balls (#0611) and seats (#0615).
Plug extends but won't retract (or reverse of above)	Same as #1 above.	Same as #1 above.
Pressure ok; tool won't move in either forward or retract valve position	1. Faulty quick-connect coupling on the high pressure line. 2. Blocked high pressure whip. 3. Broken camshaft (#0618) on command valve.	1. Replace quick-connect. 2. Blow out or replace. 3. Replace camshaft.
Motor runs fine; no pressure	1. Broken drive coupler (#551). 2. Drive key missing. 3. Pump screen blocked (#517). 4. Pressure-matic valve (#06-100). 5. Faulty check valve (#515). 6. Faulty relief valve (#516). 7. Pump worn out (#521).	1. Replace; check for pump stiffness. 2. Replace. 3. Clean screen; change fluid. 4. Rebuild valve. 5. Replace. 6. Replace. 7. Replace or rebuild.
Low pressure whip breakage	1. Operator fails to pause in neutral valve position. 2. Quick connect coupling worn out; check for severe ball grooves on male half of couplings. 3. Hose blocked. 4. Pressure too high.	1. Refer to Sec. I - Command Valve. 2. Replace. 3. Check and replace if needed. 4. Recalibrate pressure-matic valve. See Sec. II - Service Pressure-Matic Valve.

SERVICE TIPS

1. It is easy to purge the hydraulic system of fluid with air (see below).
2. In order to make removal of the wear plates (#8) easier, fasten the correct size Allen Wrench to a long extension. (See illustration)

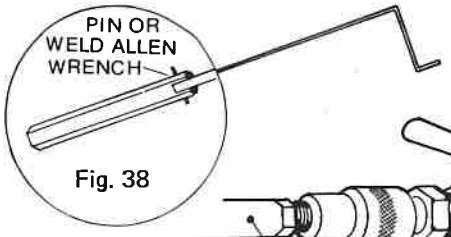
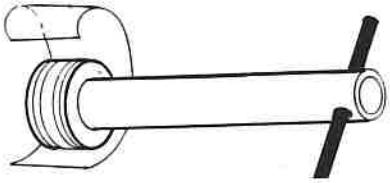


Fig. 38

NOTE: It is helpful to use a piece of thin plastic wrapped around the head of the piston to aid in sliding it back in the bore. The plastic will protect the seals and keep them from hanging up. Remove the plastic as you start to slide the piston in the bore .

Fig. 39



Place steel bar (or large screwdriver) through plug pin hole for easy piston removal (C-8).

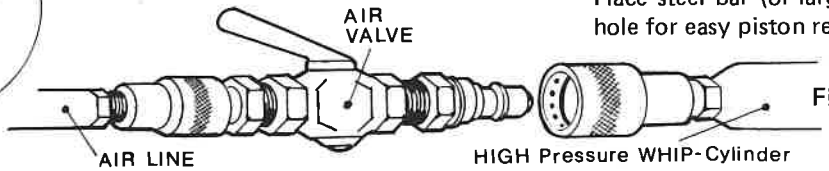


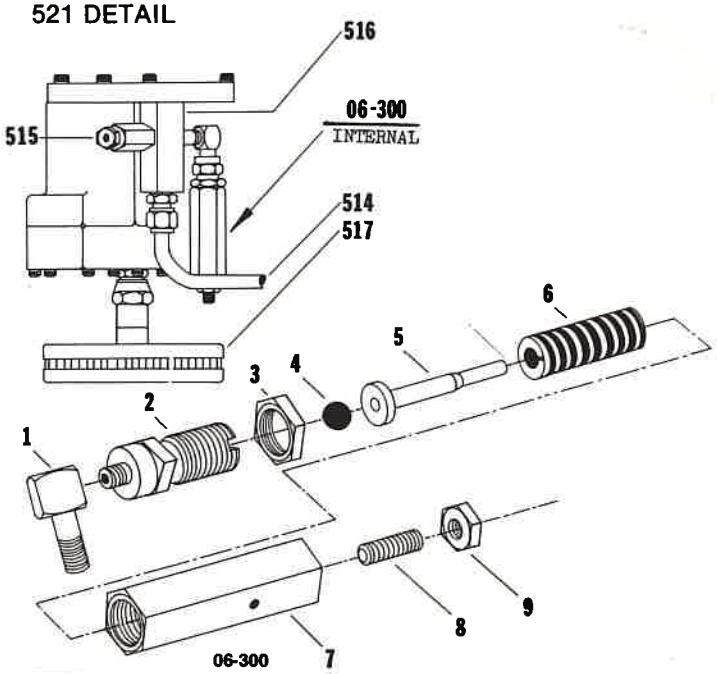
Fig. 40

SERVICE PRESSURE-MATIC VALVE 06-300

1. Remove the reservoir cover plate screws (#25) (See Page No. 9).
   The engine/valve/pump coverplate assembly can now be lifted off as a unit.
2. Locate the 06-300 valve. It is directly opposite the relief valve (#15) and hangs vertically from a small elbow as shown (See Page No. 9).
3. Unscrew the valve from the elbow. Clamp the valve housing in a vise and loosen the housing lock nut (#3).
4. Remove from the vise and unscrew the valve housing (#7).
5. Loosen lock nut (#9) and remove set screw (#8).
6. Inspect all parts for damage and wear. Normally, the seat (#2), ball (#4) and spring (#6) are the only parts that will require replacement when the valve is malfunctioning. A kit containing these parts is available. Order part #07-12.
7. Clean and lightly oil parts before assembly. Drop the spring and stem in the Housing. Push the ball in the seat. Make sure the housing lock nut is fully threaded on the seat. Carefully screw the seat/ball assembly into the housing until slight resistance is felt. Now, screw the housing on until three to three and one half full threads show *above* the housing lock nut when it is touching the valve housing. This will be a good starting point for pressure adjustment.
8. Snug the lock nut against the housing. Using a torque wrench and crows foot wrench, set the nut to 40 ft/lbs. This is to prevent vibration from loosening the nut and changing the pressure setting.
9. Screw in the allen set screw until it contacts the valve stem. Do not force. When contact is made, back it out 1¼ to 1½ turns. Hold the screw in position and tighten the set screw lock nut to 11 ft/lbs.
10. Reinstall the valve on the elbow and set the cover plate/motor/pump assembly back on the reservoir. Secure the coverplate with two screws in opposite corners. Connect a splitter and test gauge and start the pump. Run splitter and verify the relief pressure.
11. If the pressure is low, the valve housing must be tightened (turn clockwise). If the pressure is too high the housing must be loosened (counter clockwise). Whenever the housing is turned, the set screw spacing *must be* readjusted to make sure the valve stem has the proper clearance as outlined in step #9. Failure to do this will cause damage to the valve. Torque all nuts after readjusting.

NOTE: When replacing or inspecting the upper or lower wear plates, *always* replace the tooth washers (item #22). Never try to reuse them.

521 DETAIL



Item No.	Part No. or Code	Description	No. Req.
1	0668	Valve Adapter	1
2	0660	Valve Seat	1
3	0667	Housing Lock Nut	1
4	0661	Ball	1
5	0666	Valve Stem	1
6	0662	Spring	1
7	0665	Valve Housing	1
9	0664	Set Screw Lock Nut	1
8	0663	Allen Set Screw	1

TOOL SHOP COPY

March 15, 1976

OPERATING INSTRUCTIONS FOR THE darda SPLITTER

MODELS 2 - 2W - 3 - 3W - 5 - 5W - C-8

The DARDA Splitter is one of the finest tools made and has been engineered to give years of service.

Over ten years of field experience has proven that proper lubrication and operation will help reduce maintenance costs and prolong the life of the unit. Follow the recommended procedures outlined in this folder.

Read the "New Method" book for suggested uses of the splitter in the demolition of rock and concrete. For detailed maintenance instructions on pump and cylinder, refer to the Service Manual.

UNPACKING AND SETTING UP TOOL FOR OPERATION

SAVE

1. Unpack unit. Included in box:
   a. "New Method" book (1)
   b. Engine or motor instruction sh[illegible] (1)
   c. Bag containing:
      1. Plug lubricant
      2. Lube applicators (6)
      3. EMACO ruler
2. Attach hoses to pump unit a[illegible]valve. Tighten securely.
3. Unscrew dip stick and fill pump reservoir with recommended hydraulic fluid. (5 gal)
4. Unpack cylinder – check to see if hose whips are correctly installed, low pressure closest to handle on right side.
5. Connect cylinder whips to hoses with the quick connect couplers.
6. If a gas unit is used, be sure to put oil in the engine (SAE 30 summer/SAE 20 in winter) prior to starting.
7. Lube plug and feathers (see page 2). Assuming that you have read and understood the engine and operating manual, you are now ready to operate the DARDA Splitter.

RECOMMENDED HYDRAULIC FLUID

OIL SUITABLE FOR SUMMER AND WINTER USE WITH DARDA SPLITTING UNITS

EMACO – Code 015-1 – Conforms with Mil-Spec. H5606,

HUMBLE OIL & REFINING CO. – Code 3126 – Code Nato H515 – Code Univis J-43

SHELL OIL COMPANY – Aero Shell Fluid #4

STANDARD OIL COMPANY (OHIO) – Eldoran 5606

AMERICAN OIL & SUPPLY CO. – P.O. Code 4226

OPERATING INSTRUCTIONS

PRIOR TO START

1. **Check all fluid levels, hose and power connections.**
2. **Electric power supply and extension cables should be adequate for 3000 watts.**
3. **Air hoses and piping should always be blown free from water, dirt and scale prior to connecting. If air motor is used continuously, add filter trap and line oiler 10 feet or closer to air motor.**
4. **On Gas engine check crankcase oil level each time gas tank is filled.**
5. **Start power unit always with lever on rock splitting cylinder in center (neutral) position.**

START

6. **Check that Plug and Feathers are in good condition. End of retracted plug should be approximately 1¼" from tip of feathers. Don't work with defective parts since additional damage might occur and splitting power is substantially impaired.**
7. **For efficiency, drill straight and proper size holes.**

Tool Sizes	2 or 2W	3 or 3W	5	5W	C8
Diameter	1-3/16"	1-5/16"	1-5/8"	1-3/4"	1-3/4"
Depth	12"	18"	26"	26"	26"

OPERATION

8. **Lubricate plug and feathers with OPTIMOL SUPERLUBE or MOLYLUBE 200. Never use oil or grease.**

HAVE YOU . . .

a. Read and understood "New Method" book, especially pages 5, 6, and 7?
b. Drilled the correct size and depth holes?
c. Properly lubricated the plug and feathers?
d. Properly connected and serviced the cylinder and pump? (Hydraulic fluid, oil, all connections tight.)

SPLITTER DO'S & DON'TS

DO . . . Lubricate every second or third split.

Keep connection clean.

Check fluid levels periodically (daily).

Follow standard safety procedures.

Drill holes the proper depth and diameter.

Consult EMACO if you're not sure of hole pattern.

DON'T . . . Do not use cylinder as a lever or pry bar.

Do not use standard lubricants such as grease or petroleum products on plugs and feathers.

Do not operate splitter with defective or damaged plug and feathers.

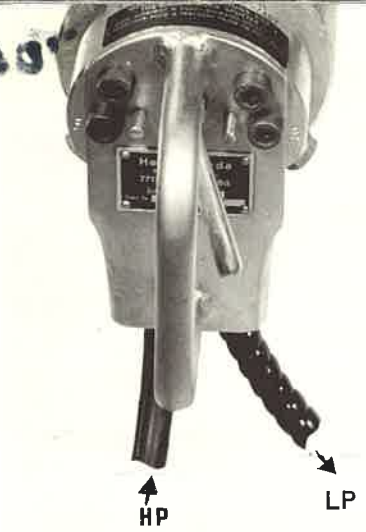
Do not let splitter deflect more than 1" from vertical when splitting.

Do not drill unnecessary holes.

Do not leave splitter with plug extended.

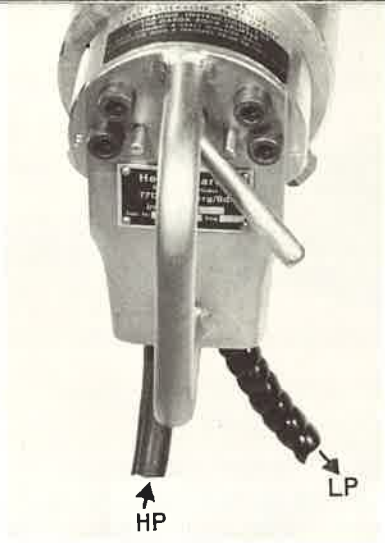
LEVER LEFT
POS. 1 – PLUG FORWARD

When the plug is at its extreme forward position, the Pressure-Matic valve will "pop" with a slight noise, switching the pump to low pressure by-pass.



LEVER TO RIGHT OF CENTER
POS. 2 – PLUG STOPPED

The plug will remain in any position desired and the oil will recirculate freely through hoses & both valves. This is the ideal idling position. Start pump with valve in this position.



LEVER RIGHT
POS. 3 – RETRACT PLUG

When the plug is at its upper end position, then the Pressure-Matic will automatically switch pump to low pressure by-pass. A "pop" noise is audible when this occurs.

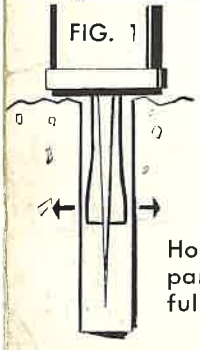
Keep control valve in Pos. 2. This will relieve pressure in the entire system. Be sure quick connect couplings are well connected, since these couplings are self-sealing. An incomplete connection can result in a blocked pressure line or a blocked return line. In this case it is possible that the low pressure whip will burst and have to be replaced. This is a *safety feature* to protect damage to the control valve. Don't use high pressure hose as low pressure whip.

HOLE SIZE – DRILL ROD

In order to use the full splitting force of the DARDA® Tool, a proper size drilled hole is required. A hole drilled oversized will limit the length and depth of a break – See Figure No. 1. A hole drilled the correct size will permit the maximum break and speed up work Fig. 2.

TOOL SIZE	SIZE OF HOLE REQUIRED	MAXIMUM EXPANSION OF FEATHER	DEPTH AT WHICH SPLITTING FORCE IS EXERTED
2	1-3/16" x 12"	.33" (8.5mm)	6" (150mm)
2W	1-3/16" x 12"	.47" (12mm)	
3	1-5/16" x 18"	.40" (10mm)	9" (230mm)
3W	1-5/16" x 18"	.51" (13mm)	
5	1-5/8" x 26"	.47" (12mm)	15" (380mm)
5W	1-3/4" x 26"	.67" (17mm)	
C-8	1-3/4" x 26"	.75" (20mm)	15" (380mm)

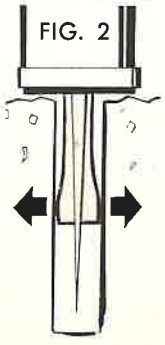
FIG. 1

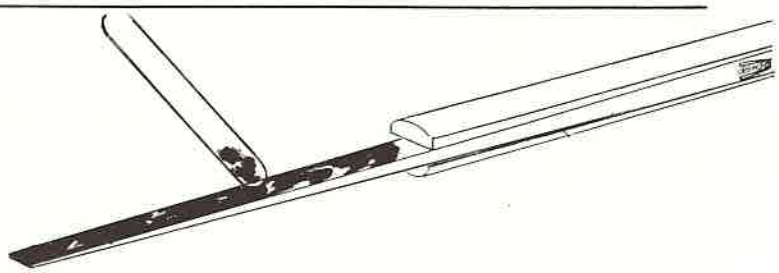


Hole too large; expansion of tool not fully used.

Snug fit with proper size hole permits tool to split with maximum force.

FIG. 2





LUBRICATION OF PLUG AND FEATHERS

Extend plug and **lubricate** both sides of plug with the recommended lubricant. For hard work and best results, lubricate prior to each split. Small boulders of easy to split material require less frequent lubrication, e.g. each second to fifth split.

It is important that only recommended products be used, since other regular mineral oil types of greases do not perform at all. Depending on the hardness of the rock, and the size of the intended split, lubrication of plug & feathers has to be done more frequently. Under extreme conditions or with a new tool, lubricate prior to each split. Good lubrication means almost twice the power and production as compared to neglected lubrication.

Lubrication is simple. First extend plug fully. Apply lubricant with a flat piece of wood, steel or brush. Use lubricant sparingly, but frequently.

Do not continue to work with defective plug & feathers. It will lead to damage to the still intact working parts.

It is possible under certain conditions and lack of lubrication the plug cannot be retracted. In this case it will be necessary to drill another hole in the line with the intended split and break the frozen tool free using a second tool.

NOTE: Cracking of the ground and hardened surface at the lower end of Feathers is *perfectly ncrmal.* It occurs during manufacturing and the first few uses of the tool. Moly-lubricant is retained in these cracks. However, lack of lubrication, crooked drill holes or a broken plug will cause one or both feathers to fail prematurely.

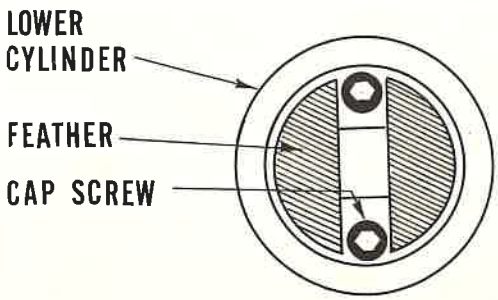
CHANGING PLUG & FEATHERS FOR MODELS 2, 3, 5

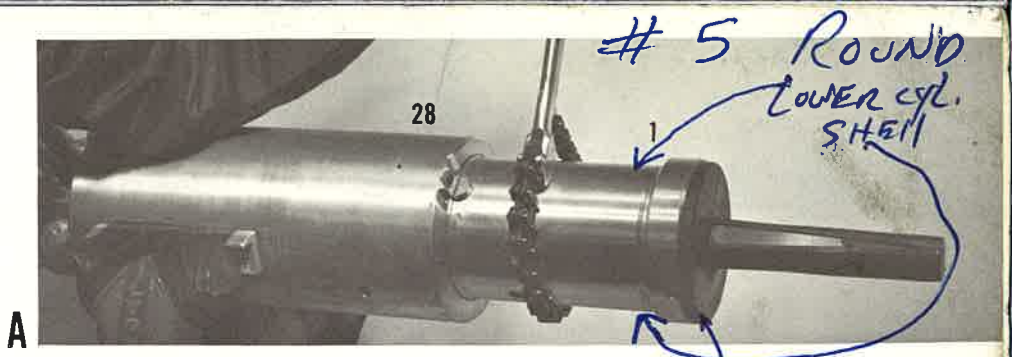
NOTE: Numbers refer to parts list exploded drawings not code No. Cylinder should be connected to power unit for this operation.

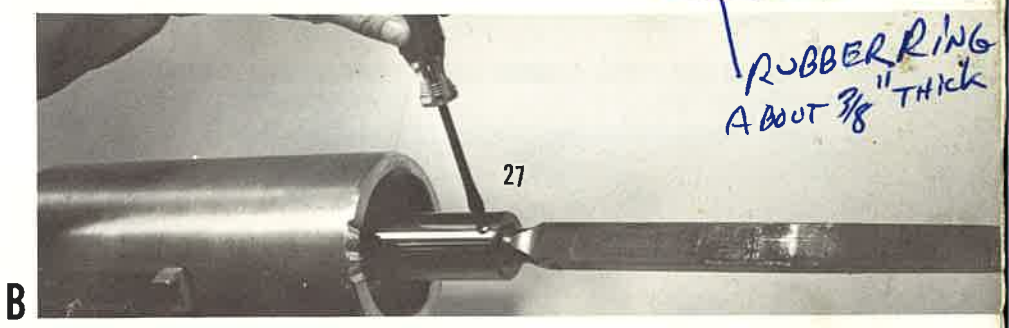
1. Loosen (#28) Lock Screw. **NOTE:** Flat side facing upper barrel (photo A). **DO NOT** Remove.
2. Unscrew (#1) lower barrel and slide off plug and set aside.
3. Run piston out to full forward position.
4. Remove (#27) set screw (photo B).
5. Rotate plug until 12 steel balls (#18) have fallen out, remove plug #34 (photo C).
6. Replace plug and 12 steel balls.
7. Tighten set (#27) screw down and back up ½ turn. Plug must rotate freely.

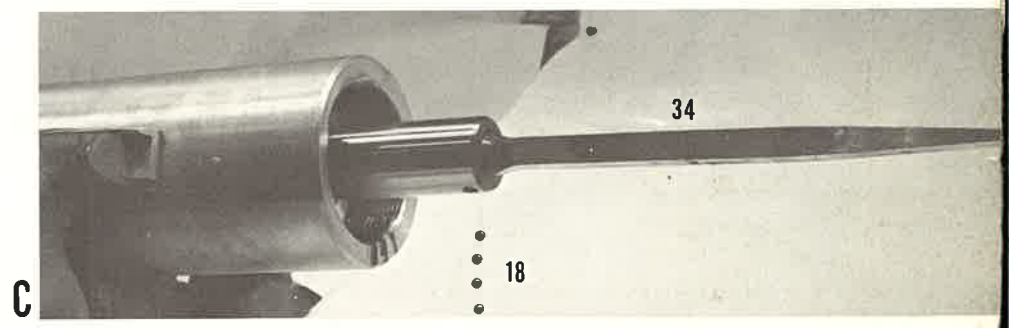
HOW TO REPLACE FEATHERS

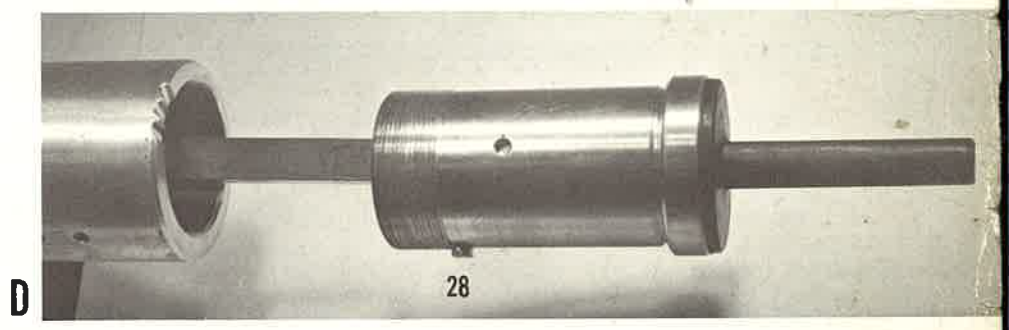
9. Remove (#28) lock screw from lower barrel (photo D)
10. Remove (#2) sleeve from lower barrel (photo E).
11. Tap feather (#35) out one at a time. (Sometimes a slight twist helps) Photo F.
12. Replace feathers (Be sure they are seated correctly at the bottom of the lower cylinder) Replace sleeve (#2) and lock screw (#28), (finger tight).
13. Retract piston
14. Slide (#1) lower barrel into position
- * 15. **CAUTION:** Be careful not to cross threads of the two cylinder halves. They cannot be rethreaded – Compressed air is useful here to blow the threads clean.
16. Tighten lower cylinder barrel until lock screw (#28) is opposite indentation in upper barrel.
17. Tighten lockscrew and secure by trying to unscrew lower barrel with chain wrench.
18. Be sure to use Molykote and lubricate the plug & feathers completely before returning tool to use.

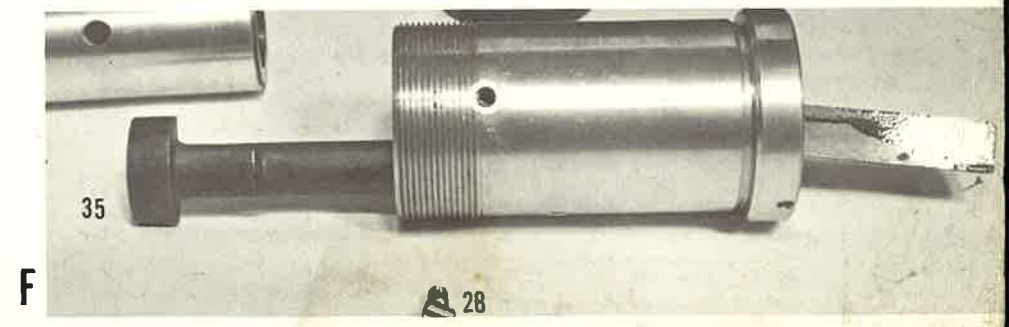




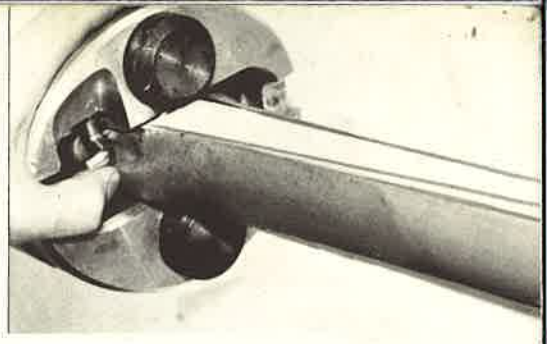






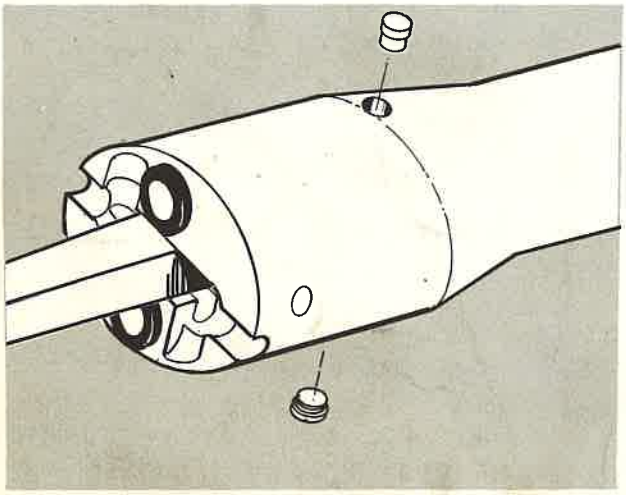


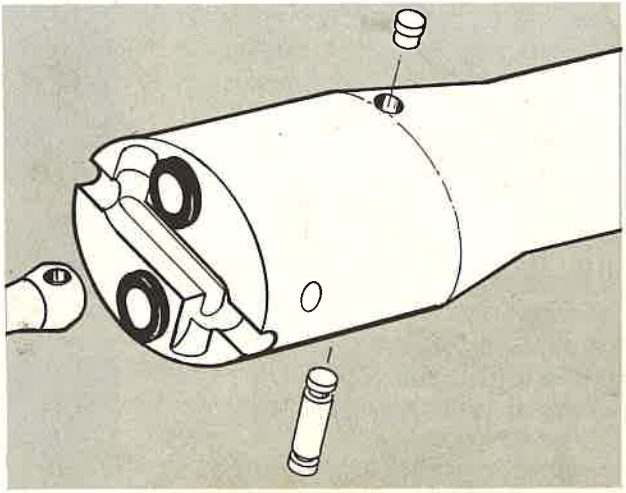




CHANGING PLUG & FEATHERS FOR MODEL C-8

1. Pull up both feather lock bars (#33) and push plug and one feather to one side as far as they will go.
2. Grasp other feather, twist 90° and pull out.
3. Move plug to other side and remove other feather.
4. Reinstall feathers using the reverse of the above.
5. *Do not* attempt to operate the splitter with feathers unlatched.





CHANGE PLUG:

1. Extend plug fully and remove plastic plug (#23) and screw plug (#43).
2. Using a small pin punch, knock out plug pin (#20). Pull plug straight out.
3. Reinstall using reverse of the above.

FLOW BAR OPERATION - "SLAVE CYLINDER"

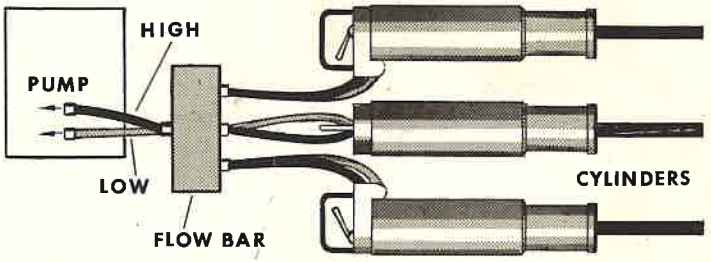
Our hydraulic pump can operate up to five splitting cylinders at the same time using the flow bar.

Connect the 50' high & low pressure hoses to the back of the flow bar using the connections provided. Install 10' (or longer if preferred) high & low hose sets on the front of the bar and connect to the splitters as you would normally. Do not confuse high and low pressure. The flow bar is furnished with the proper connectors when you receive it.

Operation:

When operating with the flow bar, start with all cylinders in neutral position. It is helpful to have a pressure gauge in the high pressure line of one of the splitters. Pick a cylinder closest to you or easiest to get to. This cylinder becomes your "command unit" while the others are "slave" units. Place all slave units in forward valve position. Now, when you are ready to split, put the lever on your command cylinder in forward position and all splitters will now operate as one. Keep in mind that the more splitters you use, the slower they will operate due to the increased volume of hoses and cylinders and the fixed flow rate of the pump. When the split has been made, return your command cylinder valve to neutral position. Switch all slaves to retract position and then your command cylinder. The splitters will retract, and you can begin the cycle again.

During the splitting process, you will note that some splitters seem to operate faster than others. This is normal because of differences in the material you are trying to split. This is why we recommend a gauge so that you can easily determine when maximum pressure has been attained.



FIELD MAINTENANCE

Field maintenance should consist of basic checks of the unit to include:

1. Fluid levels.
2. Oil level (G/M only).
3. Oilers (A/M only).
4. Quick connects (for dirt, leakage, etc.).
5. Hoses, (Leakage, worn spots, etc.).
6. Plug and feathers breakage, (worn, broken, bent, properly lubricated).
7. Leakage around cylinder halves.
8. Keep pump screen clean. (Check in shop.)
9. Air filter on G/M.
10. #50 Rubber bumper and #49 rubber retainer (worn out?)
11. Keep all connections clean!!!

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