SWING BEAM ACTION
HYDRAULIC SHEAR
PARTS AND OPERATING MANUAL

MODEL CS 630

SERIAL NUMBER

CAPACITY

Mild Steel 42kg/mm^2 (60,000 lbs/in^2)

Stainless Steel 70kg/mm^2 (100,000 lbs/in^2)

Aluminum

Motor H.P.

Type of Pump

Cutting Length

DREIS & KRUMP MANUFACTURING CO.
7400 SOUTH LOOMIS BOULEVARD • CHICAGO, ILLINOIS 60636, U.S.A. • (312) 874-1200

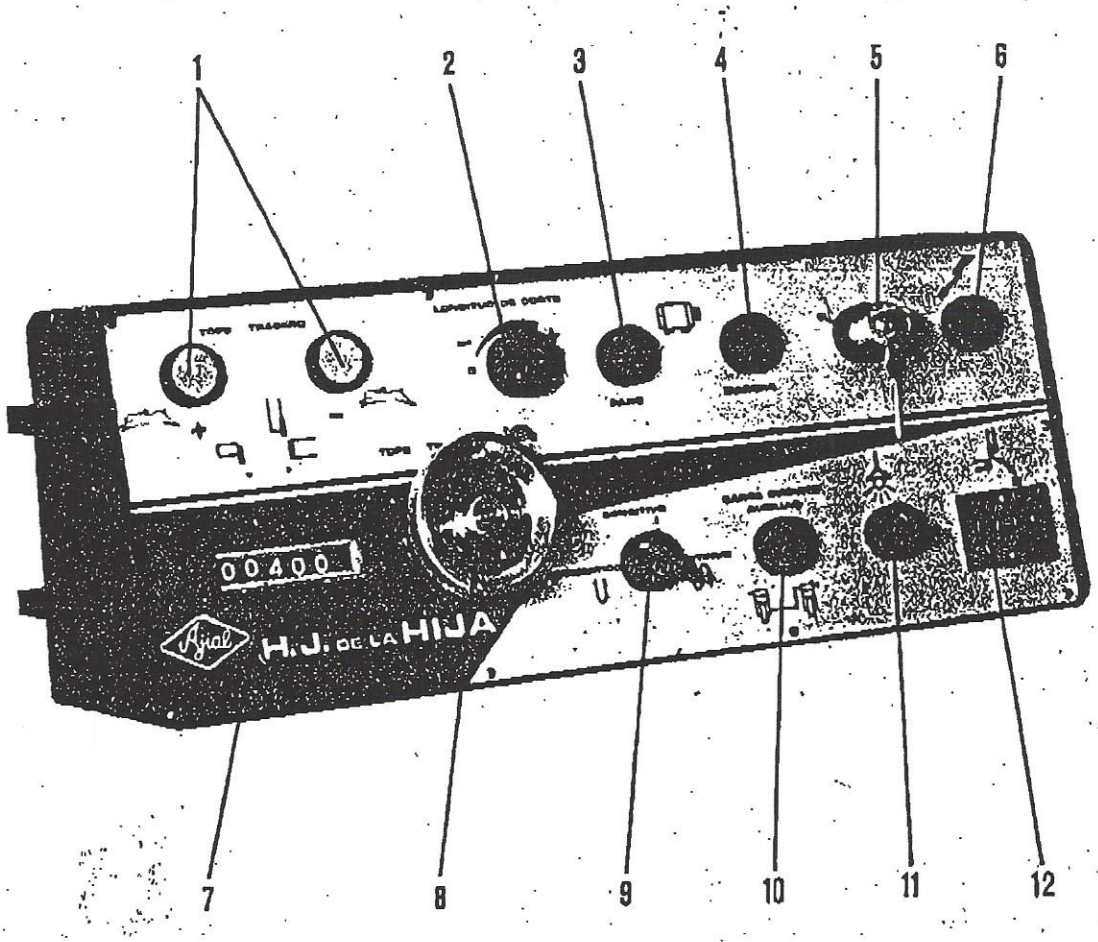


FIG. 1

1. Back gauge quick advance button.
2. Cutting length regulator.
3. Motor stop push button.
4. Motor start push button.
5. Key selector switch.
6. "Power on" pilot light.
7. Back gauge position indicator.
8. Back gauge position fine adjustment.
9. Mode selector.
10. Is not applicable to this machine.
11. Shadow light switch.
12. Stroke counter with reset to zero.

INSTALLATION

The foundation must be made according to the corresponding drawing, and cured before installing the machine.

The anchor bolts must be cemented in the foundation and aligned with the hollow jack screws supplied with the machine.

The levelling will have to be carried out 72 hours after cementing of the anchor bolts. Secure the machine to the foundation after levelling in both directions.

STARTING OPERATION

Clean up all protective grease and rust-proof varnish.

Set up the squaring arm on the table at a right angle in relation to the lower blade.

Check by means of jogging the motor rotation. Rotation must be in the direction of the arrow on the motor frame.

SHARPENING OF BLADES

The blades have been perfectly adjusted at the factory.

When the cutting edges of the blades are worn out, the blades should be turned over in order to keep on cutting with the remaining sharp cutting edges.

The lower blade has four cutting edges, and the upper one has two.

When all the cutting edges are worn out, they must be sharpened.

The radius of the cutting edge must not excede 1/10 of the sheet thickness to be cut.

Use of dull blades will result in:

Excessive force on the blades, which can be broken easily.
Irregular cuts with great burrs.
Decreased shear capacity due to the increased cutting force requirement.

CHANGING OF BLADES (fig. 2).

The upper blade (1) can be removed after the fastening screws (4) have been loosened. Support the blades on wooden bars.

In order to remove the lower blade, the fastening screws (10) have to be taken out by means of an Allen key through the drilled holes provided in the adjustment bar (2).

BLADE CLEARANCE ADJUSTMENT

Before adjusting the blade clearance, check if the top part of the upper blade is seated against the beam shoulder; and that the lower part of the lower blade is seated on the table.

After sharpening of the blades, it may be necessary to shim the blades to prevent the bolts bearing on the clearance holes.

To adjust blade clearance, proceed as follows:

1. Set the mode selector switch (No. 9, Fig. 1) in single stroke position.
2. For the machines equipped with blade clearance adjustment, set the blade clearance adjustment lever to max. clearance position.
3. Stroke down the swinging beam to bottom position and keeping the foot switch actuated, close the shut off valve (8) on the left side of the shear.
4. Release the foot switch.
5. Turn off the motor.
6. The swinging beam will stay in down position due to trapped oil on top of L.H. main cylinder (see Hydraulic Schematic).
7. Gradually open the shut off valve, observing the swinging beam creeping up. When the R.H. of the blades starts to open, close the shut off valve and check the blade clearance with feeler gauge.
8. Repeat opening and closing of the shut off valve until whole length of blade clearance is checked.
9. The minimum clearance between the blades must be .0015" - .002" if the clearance is smaller or larger, adjust the lower blade support (3 Fig. 2) by loosening the lower blade support screws (7) and manipulating the pull back screws (8) and jack screws (9).

   CAUTION: Retighten the lower blade support screws (7) before starting of machine.

10. Open the shut off valve fully (about 1/4 turn) letting the swinging beam to return to top position.

P I V O T S (Fig. 4, Pg. 11).

They consist of two eccentric shafts (15) retained in the arms of the swing beam by the covers (16), turning on double-row self-aligning ball bearings (11). This bearing is mounted on an eccentric ring (13), which is fastened to a segment gear (9), actuated by the pinion (8) by means of the control lever (7). The eccentricity of the ring (13) can be changed, and therefore, the clearance between the blades. The control lever (7) can be moved axially on the shaft (5) to the outside, permitting the shaft and the pinion (8) to turn. When moved to the inside, it engages with the anti-rotation ring teeth (2), to prevent the shaft from rotation and changing of the blade clearance. The cover (10) has a pointer to indicate the blade clearance for the material thickness to be cut. The indicator plate is mounted on the frame. The cover is equipped with a grease fitting for lubrication of the bearings at 6 month intervals.

BACK GAUGE (Fig. 7 & 8).

The back gauge stop bar (23) is attached to the nut housing (15) containing nuts (13 & 16) driven by the lead screws (10) driven thru the gear transmission (7 & 19) by a motor (3). The other end of the motor drives a counter located in the control panel (5), indicating the gauge position.

The left hand lead screw is driven by sprockets and chain on the front of the lead screws. The chain tensioner sprocket (17) provides correct chain tightness and is adjustable. The fine adjustment of the gauge position is made by a handwheel (8 fig. 1) located in the control panel. Parallel adjustment of back gauge bar to lower blade is made by adjustment screws on the nut housing (15).

To eliminate lead screw & nut backlash, the final back gauge adjustments should be forward.

M A I N T E N A N C E

Weekly: Lubricate back gauge nuts (fig. 8) thru the fittings on the nut housings.

Every six months: (Weekly during the first three months). Check the tension of the back gauge drive chain (fig. 8). Clean the back gauge lead screws with a brush and gasoline. If highly dirty, clean it more often.

H Y D R A U L I C H O L D D O W N S

They are small hydraulic single acting cylinders (fig. 5 & 6) connected to the pressure side of the shear circuit, exerting clamping force proportional to the cutting force. Although the hold-down feet are self-aligning, the narrowest piece that can be safely clamped, must be over 10 mm. (.394") wide.

CUTTING LENGTH REGULATOR

Rotation of the cutting length knob (Fig. 1, No. 2) changes the swinging beam stroke. Shortening of the stroke will increase the production rate of the pieces due to the reduced cycle time. By turning the cutting length control completely to the left, the regulation of the stroke control is by-passed. Then the stroke length control can be regulated by release of the foot switch at the desired time.

The top position of the swinging beam is controlled by an electrical microswitch (located on the left side of the frame) or by bottoming of main cylinders, depending on the operating mode. The bottom position of the swinging beam is controlled by the end of the stroke valve.

HYDRAULIC OIL

On the machines without oil level sight gauges, the oil level must be checked every six months or whenever a leak or spill has been observed.

Remove the cover to check the oil level. The oil level should be from 3 to 5 cm. or (2.0 inches) below the cover.

The oil will have to be changed after 2500 working hours, or old oil suitability verified by the oil supplier. At the same time, the oil filter should be cleaned.

The recommended oils must comply with the following specifications:

Hydraulic oil for high pressure.
Viscosity index of 120, at least.
Viscosity to 50º C., between 3,5º and 5º Engler.

In a building without heat, use oil with a freezing point lower than the lowest temperature.

SPARE PARTS

When ordering spare parts, please refer to the serial number and type of machine, as well as the part number shown in this manual.

END OF STROKE VALVE

It limits the bottom of the beam stroke. The adjusting screw permits fine regulation of bottom position. The beam should not lower more than necessary to cross blades at the high end of the blades (see Fig. 11).

" P " - connected to the control valve.

" A " - connected to the hydraulic hold downs.

" T " - return to tank.

MAIN & RETURN CYLINDERS

The main cylinders are bolted to the frame (Fig. 29) with the piston rods resting on the swinging beam.

The main cylinders can be removed thru the circular opening of the swinging beam after the removal of the return cylinders. Refer to the section RETURN CYLINDER MAINTENANCE.

The return cylinders are connected to the lower side of the main cylinder and the upper side of the beam (see Fig. 28) by bronze saddles.

These cylinders return the beam to its top position and are filled with nitrogen, and are totally separated from the hydraulic circuit.

HYDRAULIC UNIT

It is located in the oil tank and consists of a gear pump, a hydraulic filter, and a solenoid controlled safety valve.

The electric motor is mounted on the outside of the oil tank, operating the pump through a flexible coupling.

The oil tank covers must be sealed to prevent foreign matter entry.

RETURN CYLINDER MAINTENANCE

To charge up the cylinders, a compressed nitrogen bottle with hose connection and the valve shut-off is needed.

a) Return Cylinder removal
Proceed as follows:.

1. Shut off electrical power.
2. Unscrew and remove the cap (Ref. 1).
3. Loosening of nut (2) will permit the nitrogen to escape the cylinder and decrease the pressure. The weight of the swinging beam will force the oil from the main cylinder to the tank and will lower the beam to the bottom of the stroke.
   CAUTION: Support the return cylinders from falling down.
4. Remove the cylinders.

b) Repairing and Installation

1. Remove the check valve, clean and repair the cylinder and piston and assemble again with the cylinder in upright position.
2. With the cylinder in upright position, using hand oiler, fill with oil the space between the piston and the cylinder.

   Capacities - Shears from 4 to 6 mm.: 35 cubic cm. per cylinder.
   Shears from 10 to 13 mm.: 130 cubic cm. per cylinder.

   When filling with oil, the cylinder must be in the position indicated in figure no. 9.

   Place the valve (Ref. 3), by screwing it.

   The Piston Cavity Must Remain Free of Oil. This Cavity Serves as a Nitrogen Container.

c) Install the cylinder again and charge the cylinder with nitrogen, using the bottle and provided connectors.

d) Open the bottle shut off valve slowly and charge the cylinder to the correct pressure. When the nitrogen bleeds through the valve, then the cylinder is fully charged.

e) Disconnect the hose and cap the check valve. Getting good results depends on the perfect closing and adjustment of all the components.

The hard-chromium plated piston surfaces should be protected from any damage, to prevent seal damages and premature leaks.

SQUARING ARMS

The squaring arm is fastened and keyed perpendicularly with the blades and is also furnished with a scale.

After sharpening of the blade, the squaring arm has to be adjusted, by loosening the squaring arm clamping screws.

The movable disappearing stops and top block of squaring arm can be used as front gauges.

BLADES

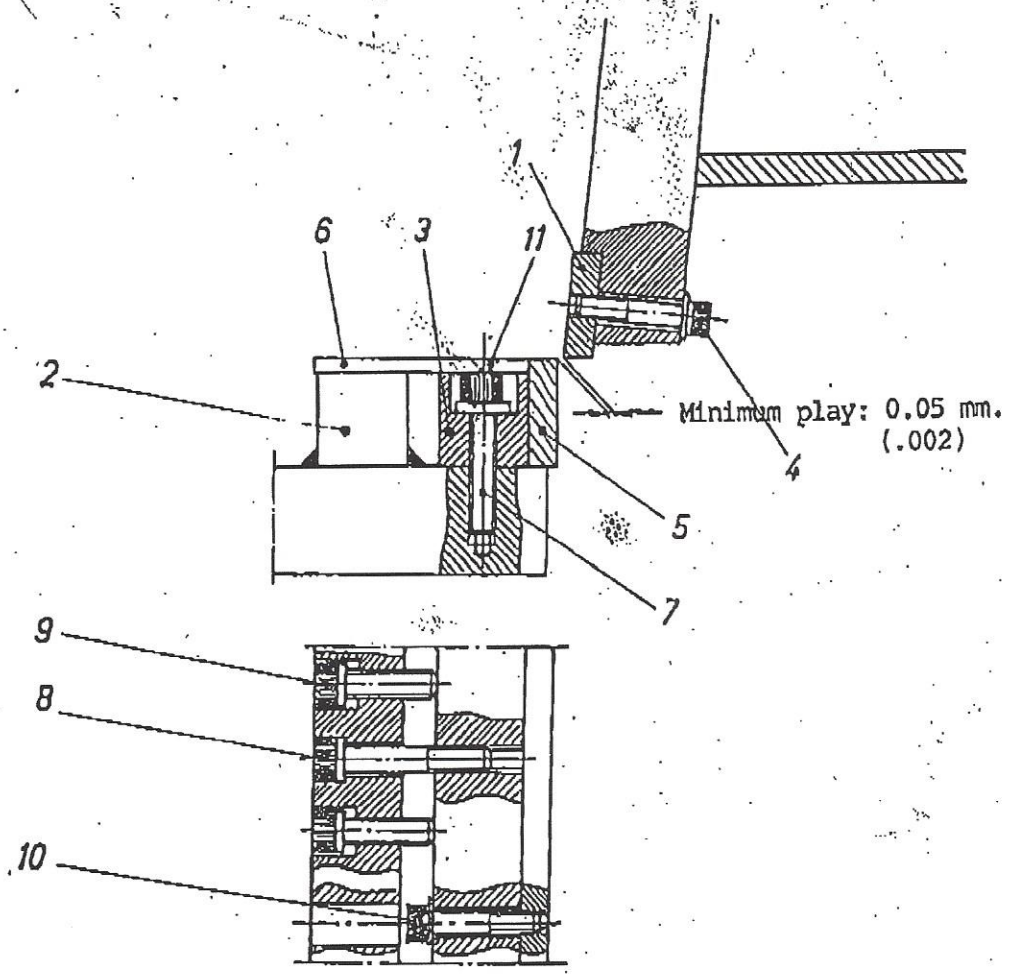
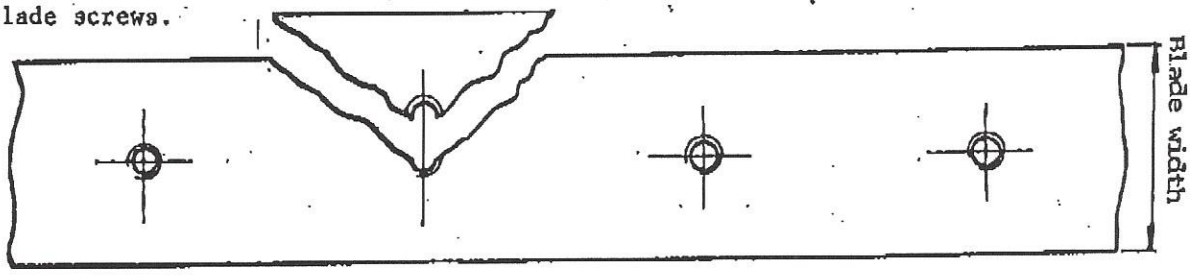


Fig. 2

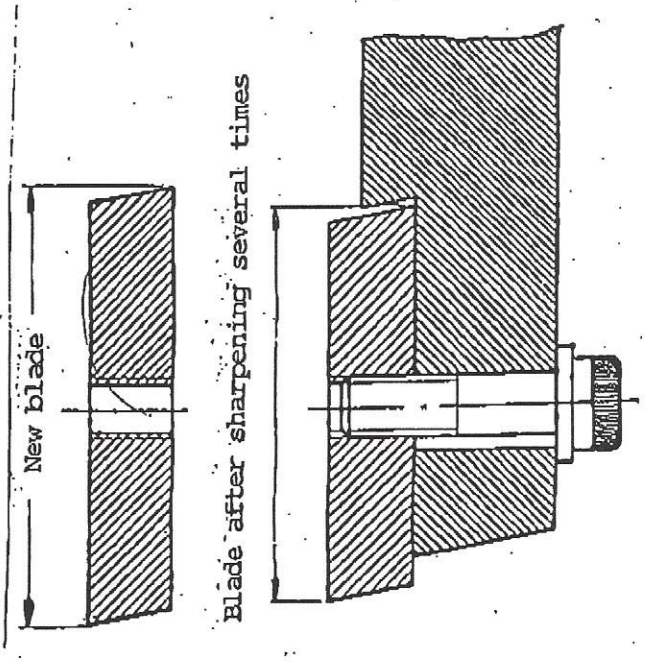
1. Upper blade (2 cutting edges).
2. Lower blade adjustment bar.
3. Lower blade support.
4. Upper blade screws 120kg/mm^2 (170,000 lbs/in^2).
5. Lower blade (4 cutting edges).
6. Cover.
7. Lower blade support screws.
8. Pullback screws 90 kg/mm^2 (128,000 lbs/in^2).
9. Jack screws.
10. Lower blade screws 90 kg/mm^2 (128,000 lbs/in^2).

BLADE INSTALLATION AFTER SHARPENING

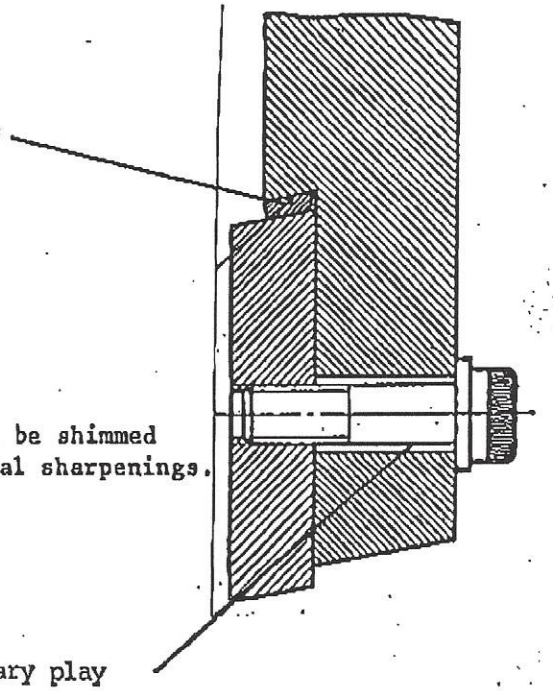
CAUTION: Shim the blades after sharpening when required to provide clearance for blade screws.



Blade broken due to lack of screw clearance.



INCORRECT



Blades must be shimmed after several sharpenings.

CORRECT

* This process is also applicable to the lower blades.

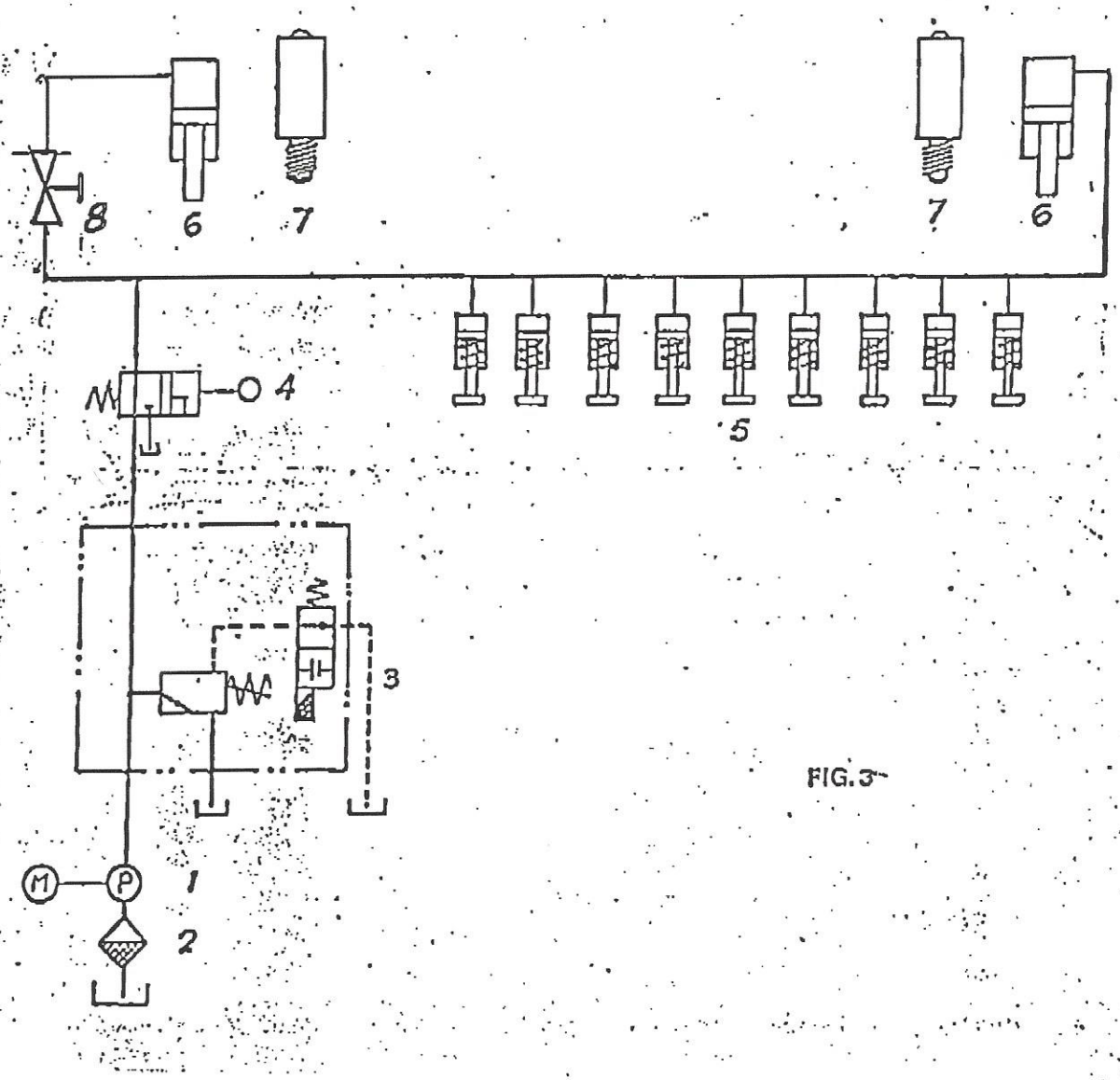


FIG. 3

HYDRAULIC CIRCUIT

1. High pressure gear pump
2. Suction filter
3. Solenoid controlled hydraulic relief valve
4. End of stroke valve
5. Hold downs
6. Main cylinders
7. Return cylinders (pneumatic)
8. Shut off valve

CLEARANCE ADJUSTMENT PIVOT

For Shears From 4 to 10 mm.

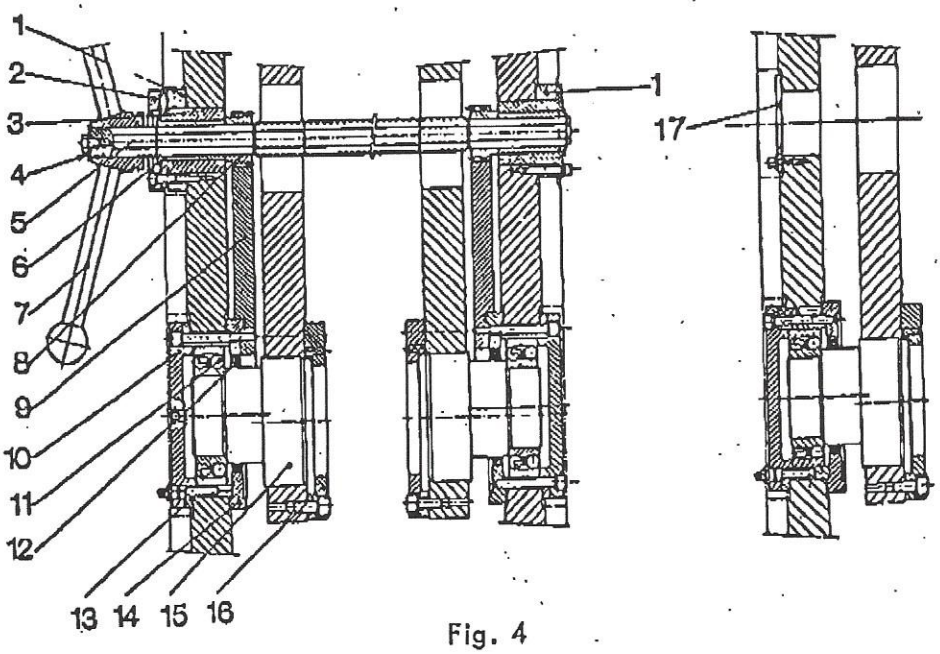


Fig. 4

1. Centering ring.
2. Anti-rotation ring.
3. Bearing support.
4. Retention washer.
5. Drive shaft.
6. Bearing.
7. Adjustment control lever.
8. Pinion.
9. Segment Gear.
10. Cover.
11. Pivot bearing.
12. Seal (felt).
13. Eccentric ring.
14. Segment support.
15. Eccentric.
16. Retaining ring.
17. Cover (on machines without blade clearance adjustment).

HYDRAULIC HOLD DOWNS

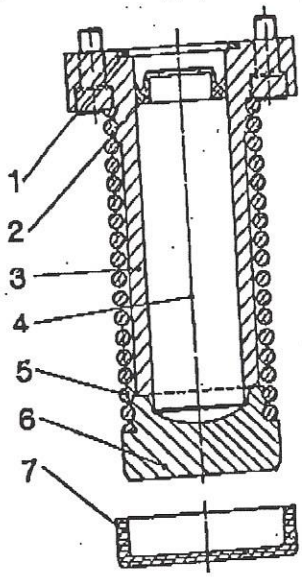


Fig. 5
SHEARS 8 to 10 mm.(1/4" to 3/8") CAPACITY

1. "O" ring.
2. Hydraulic Seal.
3. Cylinder.
4. Piston.
5. Return spring.
6. Foot.
7. Rubber boot (Optional) (applicable to all Hold Downs).

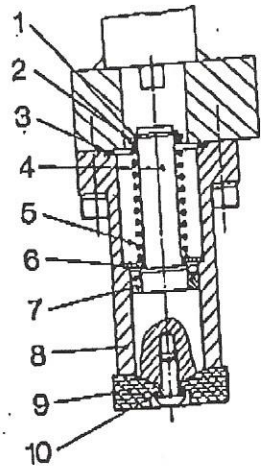


Fig. 6
SHEARS 4 to 6 mm.(.157" to 1/4") CAPACI

1. Retaining ring.
2. Washer.
3. "O" ring.
4. Piston.
5. Return spring.
6. Washer.
7. Hydraulic seal.
8. Cylinder.
9. Foot (nylon).
10. Foot screw.

BACK GAUGE

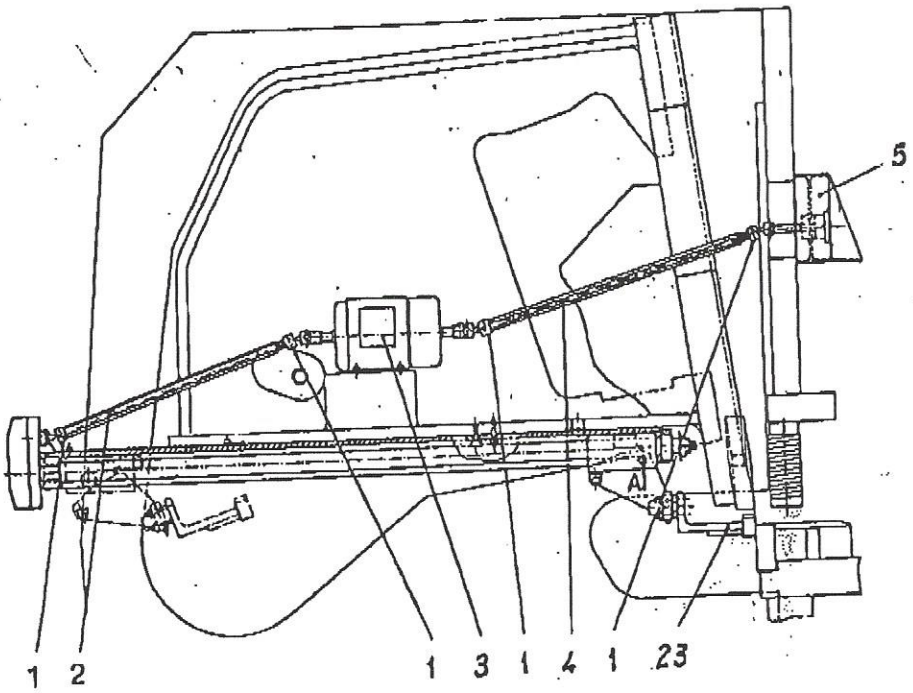


Fig. 7

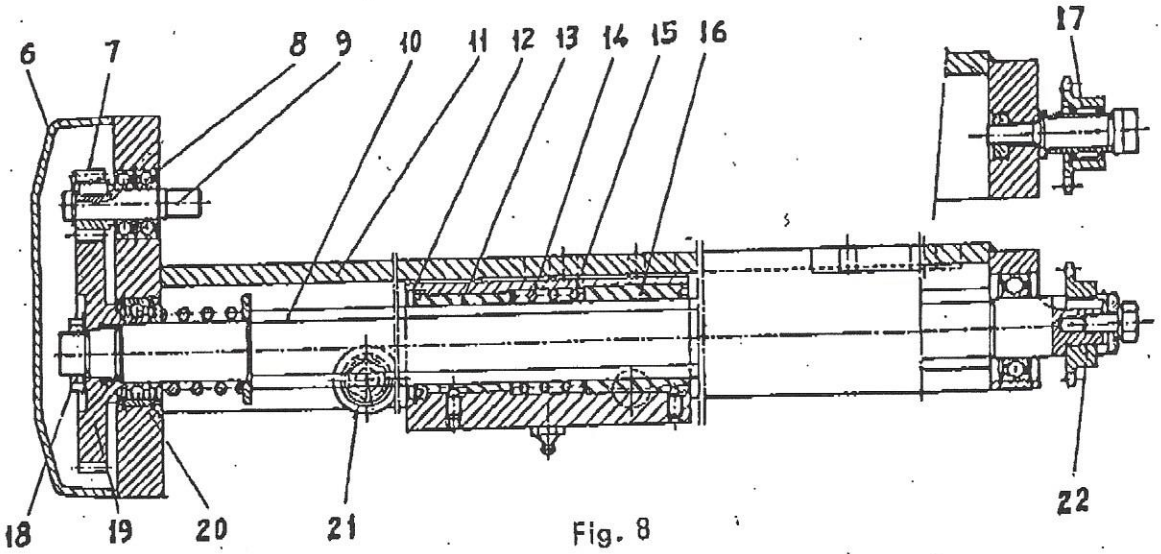
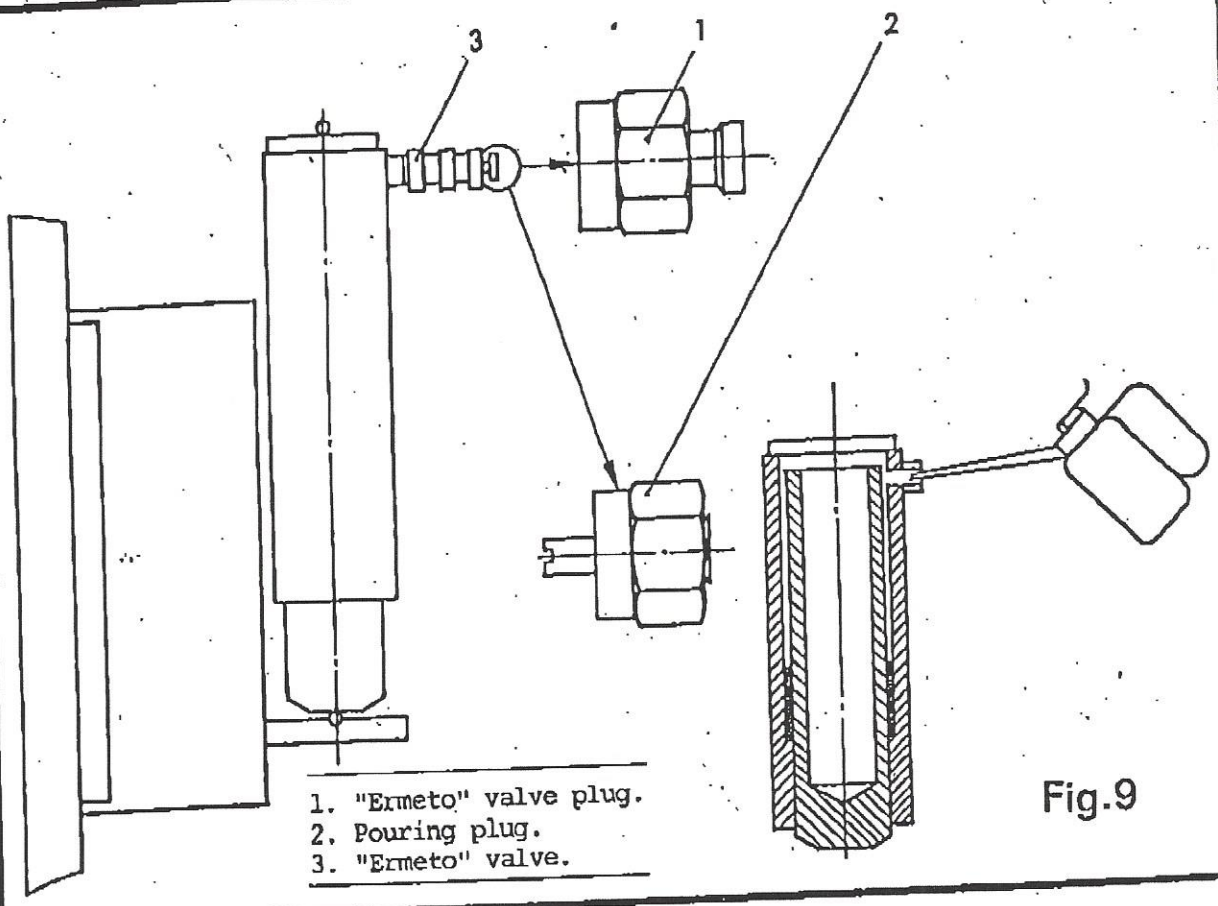


Fig. 8

1. Universal joints.
2. Back shaft.
3. Back gauge motor.
4. Front shaft.
5. Control panel.
6. Back cover.
7. Pinion.
8. Pinion bearings.
9. Drive shaft.
10. Lead screw.
11. Back gauge support.
12. Retention ring.
13. Lead screw back nut.
14. Nut spring.
15. Nut housing.
16. Lead screw front nut.
17. Chain tightening sprocket.
18. Lock nut.
19. Lead screw gear.
20. Lead screw bearing.
21. Back gauge roller.
22. Chain drive sprocket.
23. Back gauge bar.



1. "Ermeto" valve plug.
2. Pouring plug.
3. "Ermeto" valve.

Fig.9

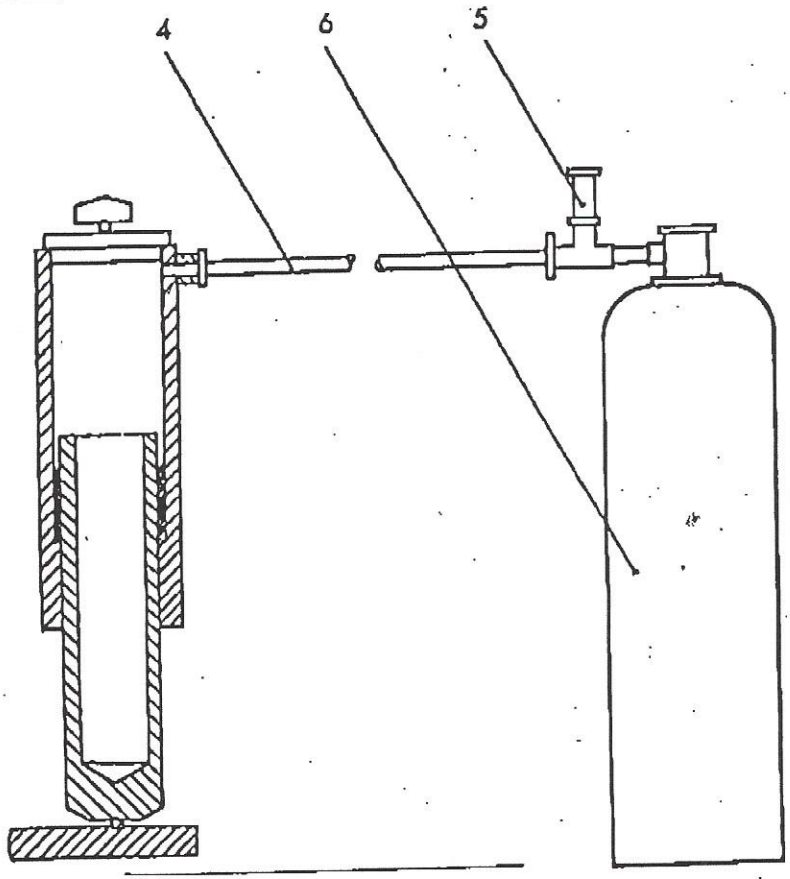


Fig.10

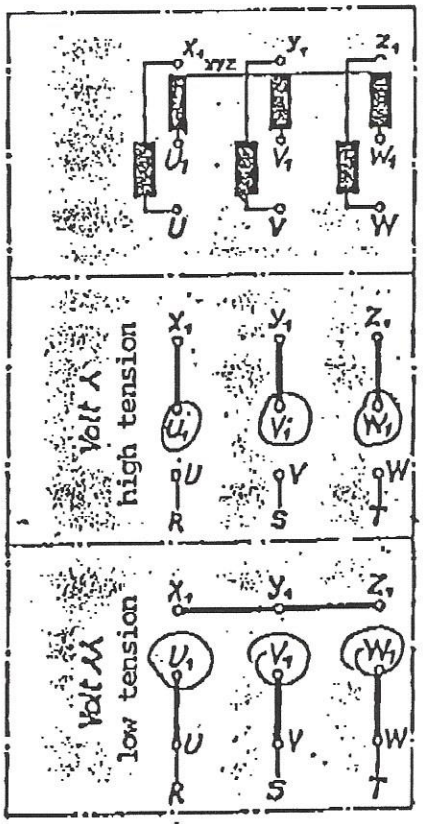
4. Flexible pipe.
5. Safety valve.

CONNECTING DIAGRAM FOR BACK GAUGE MOTOR.	E-6302

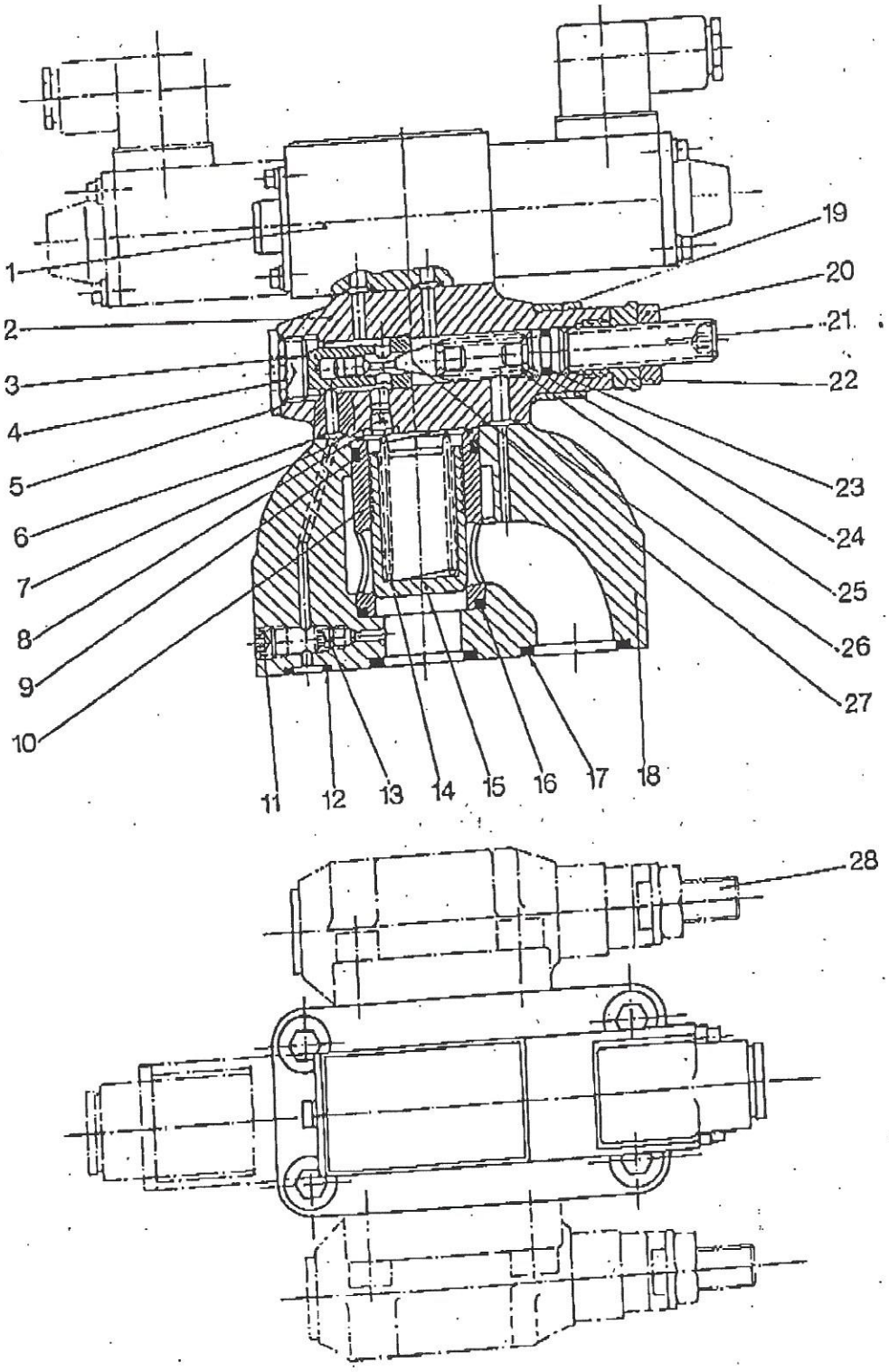
FOR THREE-PHASED MOTOR

WITH 9 TERMINALS

CONNECTION λ/λλ



Distributor

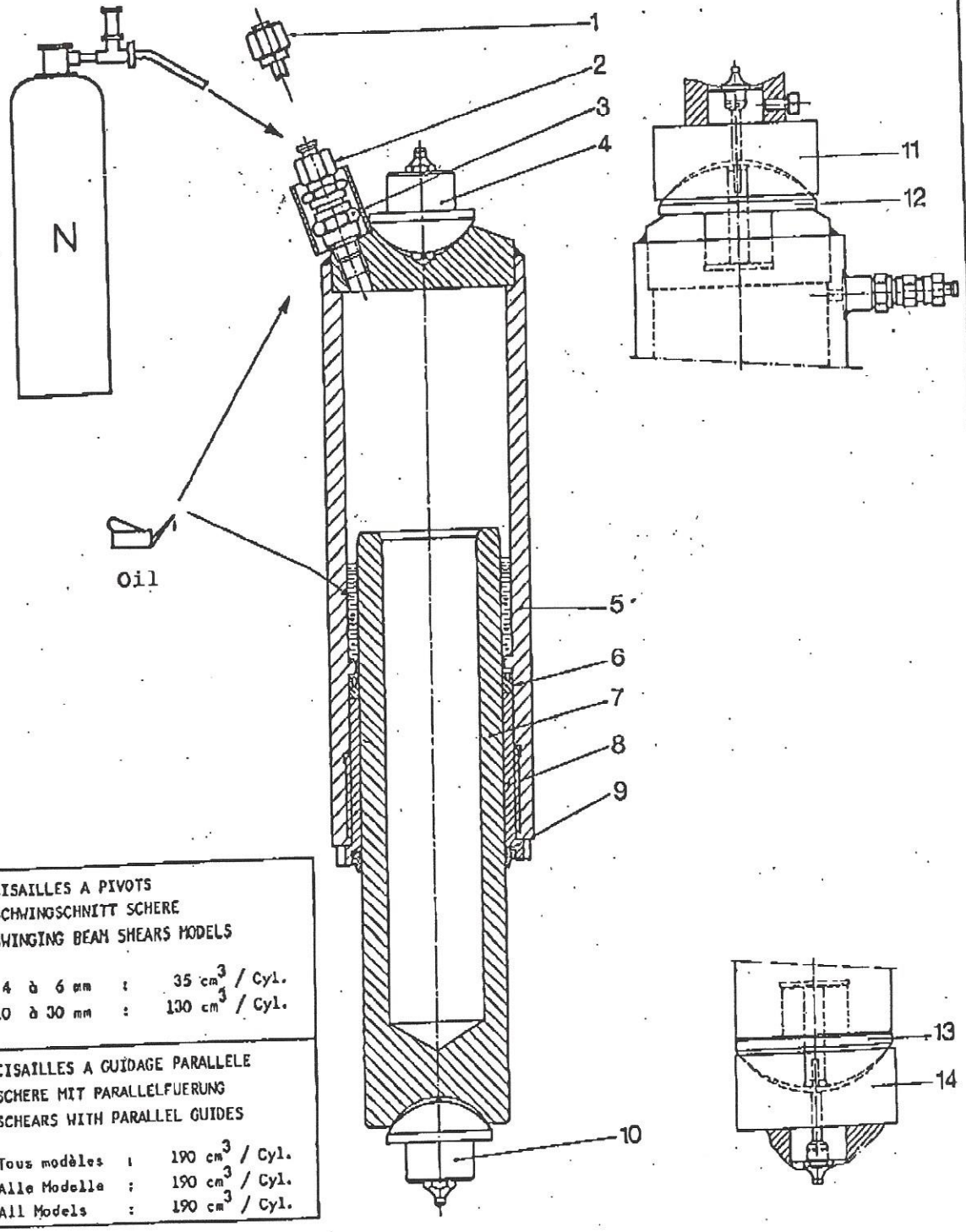


DISTRIBUTOR'S NOMENCLATURE.

1. Solenoid Valve (4 ways, 2 positions) size NG-6.
2. Pilot Body.
3. Seat Socket of Pilot Needle.
4. Socket Fastening Plug.
5. Plug Seal.
6. "O" Ring.
7. Pilot Gage.
8. "O" Ring.
9. "O" Ring.
10. Cartridge Socket.
11. Inner Pilot Plug.
12. Seal.
13. Inner Pilot Gage.
14. Spring.
15. Cartridge Piston.
16. "O" Ring.
17. "O" Ring.
18. Valve Body.
19. ---
20. Lock Nut.
21. Adjustment Screw.
22. Fastening Nut.
23. Pressure Piston.
24. "O" Ring.
25. Spring.
26. "O" Ring.
27. Pilot Needle.
28. Adjustment Screw.

RETURN CYLINDERS

fig.28



CISAILLES A PIVOTS SCHWINGSCHNITT SCHERE SWINGING BEAM SHEARS MODELS	
4 à 6 mm	35 cm^3 / Cyl.
10 à 30 mm	130 cm^3 / Cyl.

CISAILLES A GUIDAGE PARALLELE SCHERE MIT PARALLELFUERUNG SCHEARS WITH PARALLEL GUIDES	
Tous modèles	190 cm^3 / Cyl.
Alle Modelle	190 cm^3 / Cyl.
All Models	190 cm^3 / Cyl.

RETURN CYLINDERS' NOMENCLATURE

1. Pouring Plug.
2. "Ermeto" Valve Plug.
3. "Ermeto" Valve.
4. Cylinder Piston Knuckle.
5. Return Cylinder Body.
6. VN Gasket.
7. Piston.
8. Piston Guide Socket.
9. Wiper Seal.
10. Cylinder Piston Knuckle.
11. Upper Dolly.
12. Upper Knuckle.
13. Lower Knuckle.
14. Lower Dolly.

CYLINDER

SWINGING BEAM SHEARS UP TO 10 mm.

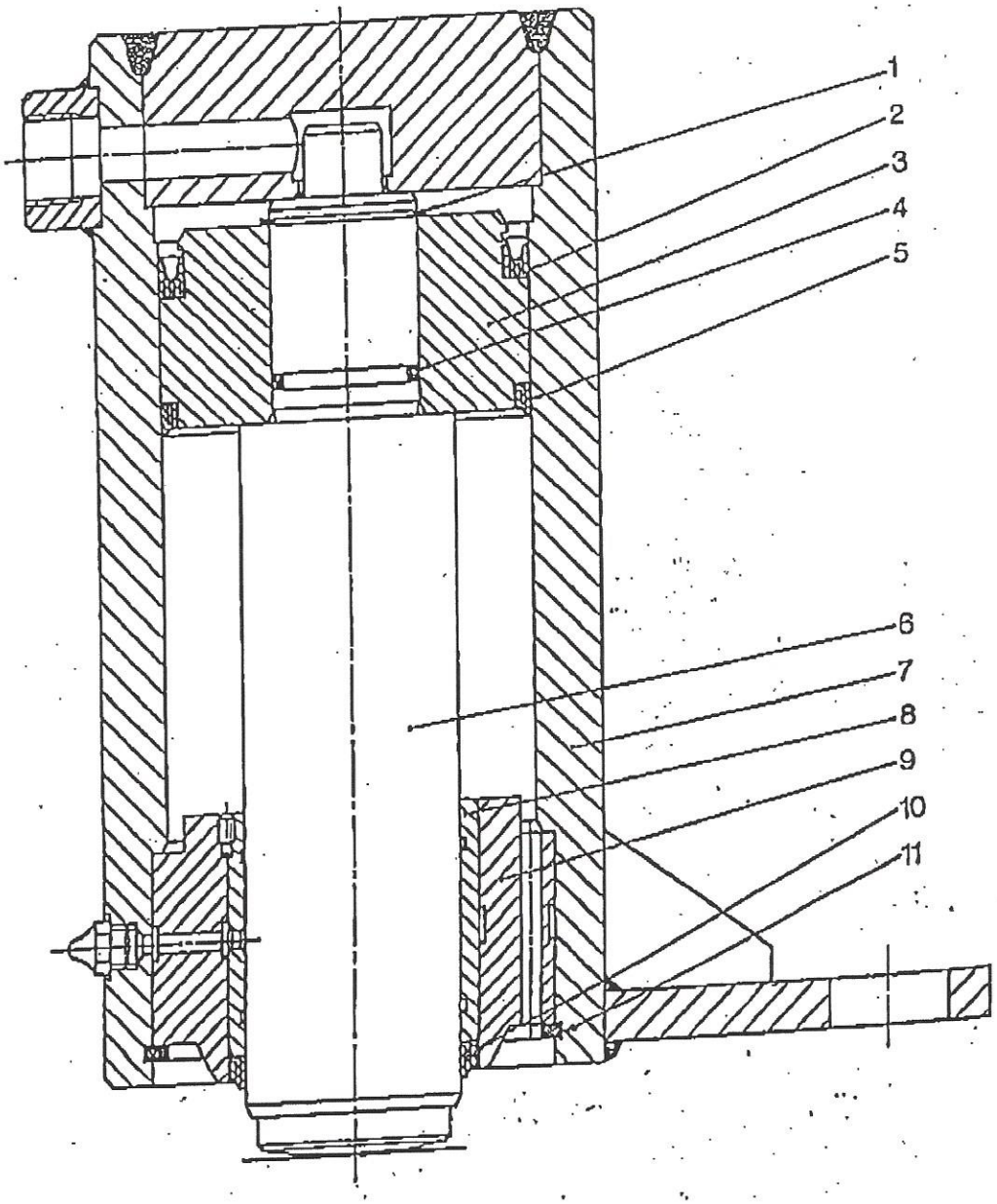


FIG. 29

CYLINDER'S NOMENCLATURE

SWINGING BEAM SHEARS UP TO 10 mm.

1. Elastic Ring.
2. Piston Seal VN.
3. Piston Head.
4. "O" Ring.
5. Piston Head's Wiper Seal.
6. Piston Shank.
7. Cylinder Body.
8. Piston Guide Socket.
9. Piston Guide.
10. Shank's Wiper Seal.
11. Elastic Ring.

SWINGING BEAM SHEARS FROM 13 To 25 mm.

1. Elastic Ring.
2. Gasket VN.
3. Piston Head.
4. "O" Ring.
5. Piston Head's Ring.
6. Wiper Seal.
7. Piston Shank.
8. Cylinder Body.
9. Piston Guide Socket.
10. Piston Guide.
11. Wiper Seal.
12. Elastic Ring.
13. Piston Knuckle.
14. Knuckle Dolly.
15. Support Plate.

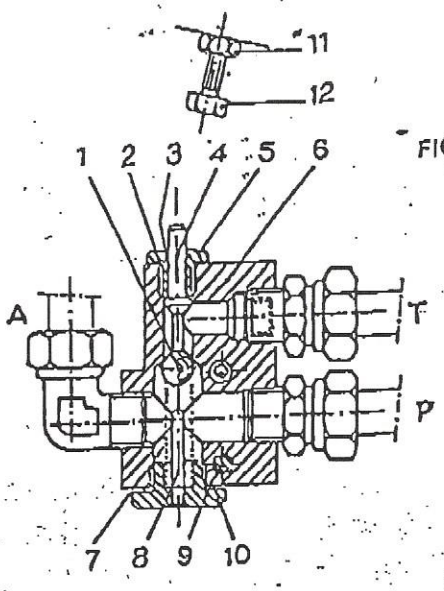


FIG. 11

END OF STROKE VALVE

1. Locking Ball.
2. BS Seal.
3. "O" Ring.
4. Valve Pulsator.
5. Guide Screw.
6. Valve Body.
7. Spring.
8. Ball Gauge.
9. BS Seal.
10. Valve Guide Gauge.
11. Lock Nut.
12. Adjustment Screw.