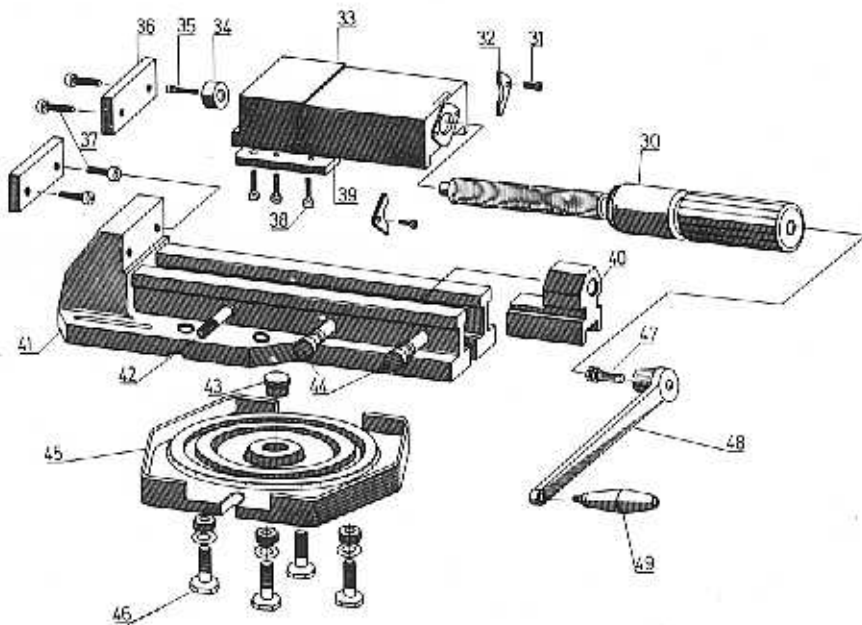


ARNOLD HYDRAULIC VISE



Parts list

- 30 Hydraulic spindle.
- 31 Mounting plate screw.
- 32 Spindle Mounting plate.
- 33 Movable jaw.
- 34 Pressure plate
- 35 Pressure plate screw
- 36 Plain jaws.
- 37 Jaw screw.
- 38 Gib screw.
- 39 Gib (Left and right hand).
- 40 Spindle shoe.
- 41 Main body
- 42 Fixed stop.
- 43 Centering pin.
- 44 Cross pin.
- 45 Swivel base
- 46 T-bolt (with nut and washer).
- 47 Crank hexagone.
- 48 Crank arm.
- 49 Crank handle.
- 50 Complete crank (It involves Nrs. 47, 48 and 49 together).

The moment an Hydraulic Vise ARNOLD is supplied it means that it is fully guaranteed to start work right away.

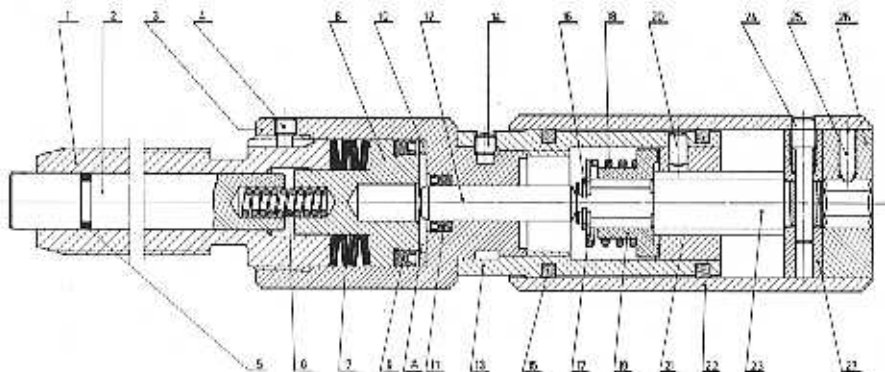
The vise features two clamping lengths. **The clamping length selection** is determined by the position of a spindle shoe (40) which can be set either between the fixed stop (42) and the first of the cross pin (44), or set between the two said pins. To do so, the first of the pins is to be removed and the movable jaw (33) towards either way together with spindle shoe (40). Once the position has been set, replace the pin removed previously.

It should be emphasized that both the cross pins (44) are to be **screwed in down to their stops**, otherwise the full pressure imparted by the hydraulic spindle shall not be achieved.

The Hydraulic Spindle Unit may be also **used independently on other fixtures.**

IMPORTANT: If eventually the hydraulic spindle unit were to be repaired, please forward us the unit itself. For removing it from the vise just release the screws attaching the mounting plate screw (31) and then unscrew the unit off the spindle shoe (40).

ARNOLD HYDRAULIC SPINDLE



- | | | | |
|--------------------------|-----------------------|-------------------|-----------------------|
| 1 Threaded Spindle. | 8 Large piston. | 15 Guide rings. | 22 Spindle sleeve. |
| 2 Pushrod | 9 Large seal. | 16 Safety ring. | 23 Torque rod. |
| 3 Cylinder. | 10 Disc. | 17 Washer. | 24 Locking pin screw. |
| 4 Allen set-screw. | 11 Small seal. | 18 Clutch spring | 25 Spring ring. |
| 5 Spring ring. | 12 Small piston. | 19 Coupling disc. | 26 Crank disc. |
| 6 Preset-tension spring. | 13 Threaded cylinder. | 20 Dowel pin. | 27 Retaining disc. |
| 7 Belleville spring. | 14 Allen set-screw. | 21 Coupling body. | |

Operating Features

The Hydraulic Spindle Unit is actoned by means of a crank which is fitted in the crank disc housing arranged in part (26). When the crank is turned, threaded spindle (1) runs through the spindle shoe (40) pushing the movable jaw (33) until jaws (36) meet the workpiece to be clamped. When the threaded spindle (1) encounters a determined resistance it stops acting, but by keeping on with the cranking procedure it makes the coupling disc (19) detach from the coupling body (21) and thus the torque rod (23) — which is firmly attached by parts (24) and (27) — to spindle sleeve (22) advances and consequently intro-

duces the small piston (12) in the oil chamber A in order to create an overpressure.

The pressure produced by the oil pushes the large piston (8) which at the meantime pushes pushrod (2). The pushrod through pressure plate (34) and movable jaw (33) transmits the power developed by the hydraulic differential mechanism to the clamping jaw. This maximum pressure moment is produced once spindle sleeve (22) has run over the threaded cylinder (13) and stopped against cylinder (3). The moment this point is reached, it is useless trying to increase the hydraulic pressure by hammering on the crank or by trying any other procedure.

Hydraulic Power Setting

If along the time the pressure decreases due to oil leakage, oil chamber A should be set by following the steps stated below:

- 1 Disassemble the hydraulic spindle unit from the vise or from any other fixture it may happen to be attached on.
- 2 Remove allen set-screw (4).
- 3 Drive forward threaded spindle (1) by giving it one third of a turn in cylinder (3) until the threaded hole in the cylinder matches with the next slot on the main spindle.
- 4 Replace allen set-screw (4) and thus the setting procedure shall have been accomplished.

Hydraulic Oil Filling up

- 1 Disassemble the hydraulic spindle unit from the vise or from any other fixture it may happen to be attached on.
- 2 Remove allen set-screw (4).
- 3 Unscrew threaded spindle (1) being careful that preset-tension (6) and Belleville springs (7) do not fling off when the spindle is removed.
- 4 Remove allen set-screw (14).
- 5 Clamp cylinder (3) and remove threaded cylinder (13).
- 6 Keep cylinder (3) in a vertical position and remove small piston (12) upwards.
- 7 Whenever filling up oil-chamber A, a disc must be made whose size may differ according to the type of vise involved (See Table).

Place cylinder (3) on a flat surface with its large opening on the said disc, and with the help of a small pin or still better by using air under pressure, push forward large piston (8) until it stops against the mentioned disc. If air pressure is used for this purpose, hold tightly the cylinder so it does not move due to the pressure applied.

DISC		
Type	Max. \varnothing	Height
0	27 mm.	11 mm.
1 and 2	35 mm.	8 mm.
3	45 mm.	14 mm.

- 8 Pour hydraulic oil into the chamber until its level reaches the upper edge of the opening. Oil chamber A should be completely free of **air bubbles**. To accomplish this, stir the oil gently with a clean prick, and refill again to reach the level stated above if it were necessary.

The hydraulic oil to be used should feature a viscosity of 6,5 E/50.^o C., type.

- 9 Now introduce gently small piston (12) into cylinder (3) by its chamfered end pushing it and creating a twisting movement at the meantime. Small piston (12) must be absolutely clean so as not to damage small seal (11).

- 10 Hold tight cylinder (3) and then screw in the threaded cylinder (13). The hole practiced through the threaded cylinder (13) has to match with the oil chamber slot, but if they did not, then unscrew threaded cylinder (13) and give it a **180.^o** turn for it features a double entry thread. If the threaded cylinder is screwed in through the proper thread entry, the openings shall certainly match with each other. Once the matching has been accomplished, replace allen set-screw (14) and tighten it firmly.

- 11 The Belleville springs (7) are to be replaced as shown in the corresponding drawing.
- 12 Screw in threaded spindle (1) with pushrod (2) and preset-tension (6) into cylinder (3) until this group can not be driven ahead any more by hand. Followingly, threaded spindle (1) shall be advanced by screwing it into cylinder (3), until the second slot on the spindle matches with the hole tapered in the cylinder. Screw (4) is now to be replaced and tightened so as to keep everything assembled properly.
- 13 After having filled up the hydraulic spindle with the proper oil, it should be actioned several times before it is reassembled for service routines.

The Hydraulic Spindle Unit Applied to Other Fixtures

If the hydraulic spindle unit were to be applied to any other fixture, the following important points are to be remembered:

The less the fixture strains elastically, the greater shall be the pressure obtainable from the spindle whose hydraulic travel comes only to about 1.8 mm. Such a short distance needs obviously a very rigid support to fulfill its purpose.

There is available a bush for the hydraulic spindle which can be acquired by the user if the spindle is applied to other fixtures.

If the fixture the Hydraulic spindle unit is to be applied on is provided with a connecting pin, the said pin should move freely in its guides or bushes.

As not all fixtures are constructed so they feature rigid walls or supports, we suggest the use of a 0.2 to 6 Ton dynamometer to check the pressures it is able to stand.

With a standard hydraulic spindle unit it will not be possible to stack tight metal sheets or similar parts if they are strained, since the spindle travel features only 1.8 mm. If either the hydraulic spindle or the vise will be used mainly for this purpose, we suggest the user to contact our Technical Department.

Remarks

If by any chance it were necessary to disassemble the torque rod (23) from the retaining disc (27), before removing sleeve (22) it shall be necessary to INTRODUCE locking pin screw (24) inside the threaded housing featured by part (27). After the previous procedure, the sleeve can be removed and then unscrewed the mentioned locking pin screw (24).

Whenever requiring spares for the said spindle, both the names and the reference numbers given to them in this instruction handbook are to be stated.

JANUARY 1981