SERVICE INSTRUCTIONS FOR THE CHRISTEN 05-10 DRILL GRINDING MACHINE

Table of contents

SERVICE INSTRUCTIONS FOR THE

CHRISTEN 05-10 / ITEM 501 DRILL GRINDING MACHINE

Machine number:

Transport

The CHRISTEN 05-10 drill grinding machine is delivered as an entirely assembled unit, with the exception of segment 45C and its associated magnifying glass holder which is sent separately. After unpacking the machine, make certain that all accessories are accounted for and clean all parts to which a protective grease coating has been applied. When cleaning the machine, take care that neither oil nor grease reaches the grinding wheel.

Thereupon mount segment 45C with associated magnifying glass holder, pivoting fork 18A and chuck on the pivoting drum and clamp it into position by means of lever 49.

Maintenance

Remove with a dry brush the abrasive dust produced by grinding. The filling of grease inserted at the factory into the bearings of the pivoting device and of the motor suffices for 5000 to 10000 working hours, during which time no refilling will be necessary.

The guides (for example that of adjusting segment 45C, pivoting fork 18A, chuck and chuckholder) should be cleaned according to the frequency of their use and lubricated slightly with a fine machinery oil. When the machine is not in use, it should be covered with a plastic cloth.

Electrical connections

Equip the machine with a plug corresponding to the kind of current provided. When connecting up, be very careful to connect correctly the neutral conductor with special marking (yellow-green). Connect the other phases so that the motor turns in clockwise direction (see wiring diagram on page 5).

The built-on motor starting switch is suitable for star as well as for delta connection (see Figs. 1 and 1a on page 5). It should be noted that a corresponding transformer must be mounted for the different tensions.

Power required:

for three-phase A-C connection	0.092 kW
for single-phase current connection	0.092 kW

General

The CHRISTEN 05-10 drill grinding machine produces the four-facet point grinding method on left and right twist and flat drills within the capacity of .020" to .394" dia. (0,5-10 mm). The basic machine allows to grind drills with diameters from .020" to .250" (0,5-6,35 mm) and a pivoting and clamping unit, available as special accessory, is taking drills from .236" to .394" (6-10 mm).

The well-known advantages of the four-facet point are:

- self centering properties
- close tolerances of the drilled holes
- improved tool life owing to reduced drilling stresses
- simple adaption of the cutting angles to the material to be machined
- good reproducibility of given cutting angles

Heedless of any run-out of the drill in the chuck, concentric grinding of both cutting lips is naturally attained due to patented supporting device, as each of the two drill lands rests in turn against the same support, in the immediate vicinity of the grinding wheel. Contrary to other drill grinding machines, both cutting lips can therefore be ground in one set-up. This is very time-saving, as readjustments and corrections otherwise necessary for concentric grinding are thus avoided.

The machine base 50A incorporates the electrical equipment comprising a transformer for the lighting of the setting magnifying glass, a terminal board and a capacitor in the case of single-phase current connection.

Capacity of capacitor: 20 uF at 110 volts - 6 uF at 220 volts

On the base is mounted the housing 63, which supports the horizontally fitted motor 69/70 with built-on switch 71, as well as the pivoting device 46C. The setting drum 39A for setting the clearance angles and the setting segment 45C for the point angle are mounted in the support of the pivoting device 46C. The tumbler switch 68, socket 66 for the 6 V illumination and the security holder 67 with bajonet joint are located sidewise on the plate. The filament lamp can be exchanged by means of releasing the screw 64 and draw out the holder 51.

The grinding wheel 40 with flange 21 is secured directly to the end of the motor shaft and can be adjusted in axial direction. The adjusted grinding wheel is fixed by means of the knurled screw 29.

The point thinning attachment which is an optical equipment will be mounted on the free end of the motor.

Above all, the brake handle and the flange cover have to be removed.

TECHNICAL DATA

Application range

Four-facet grinding method for two-lip left- and righthand twist and flat drills within the diameter range of .020" to .394" (0,5-10 mm). The basic machine allows to grind drills with diameters from .020" to .250" (0,5-6,35 mm).

Clamping of drill

One chuck with 4 interchangeable collets is available for clamping drills with diameters from .020" to .250" (0,5-6,35 mm).
Clamping ranges:
.020" - .059" (0,5-1,5 mm), .059" - .118" (1,5-3,0 mm), .118" - .177" (3,0-4,5 mm), .177" - .25" (4,5-6,35 mm).
Drills with diameters from .236" to .394" are clamped by means of a chuck with 2 collets delivered with special clamping and pivoting unit (item 509).

Setting range

Point angle for drill dia. .020" - .236" (0,5-6,0 mm)	60^0 to 180^0
Point angle for drill dia. .236" - .394" (6,0-10,0 mm)	100^0 to 180^0
Lip clearance angle	0^0 to 15^0
Angle of the secondary relief-ground facet	by means of fixed stop uniformly adjusted to approximately 30^0

Motor

Three-phase A.C. flange-mounted motor with built-on switch:	- Power	0,1 kW at 50 cycles	0,1 kW at 60 cycles
	- Speed	2780 rpm at 50 cycles	3300 rpm at 60 cycles
Single-phase A.C. flange-mounted motor for 110 volts or 220 volts respectively with built-on switch:	- Power	0,1 kW at 50 cycles	0,1 kW at 60 cycles
	- Speed	2780 rpm at 50 cycles	3300 rpm at 60 cycles

Dimensions of machine	without point thinning attachment	with point thinning attachment
Overall dimensions:	12" x 16" x 11" / 300 x 400 x 280 mm	19" x 12½" x 11" / 480 x 320 x 280 mm
Net weight:	61.7 lbs / 28 kg	70.6 lbs / 32 kg
Gross weight:	86 lbs / 39 kg	94.8 lbs / 43 kg

Standard accessories for machine item 501

1 item 500 wooden box comprising:
- 1 precision chuck holder
- 1 collet for dia. .020" - .059" (0,5-1,5 mm)
- 1 collet for dia. .059" - .118" (1,5-3,0 mm)
- 1 collet for dia. .118" - .177" (3,0-4,5 mm)
- 1 collet for dia. .177" - .250" (4,5-6,35 mm)
- 1 diamond dresser
- 1 setting gauge

1 grinding wheel dia. 4.92" (125 mm) 180-G-15 1f, on flange
1 single- or three-phase motor with switch and cable
1 magnifying lens, illuminated (6 volt, with transformer)
4 keys for socket cap screws .078", .098", .118" and .157" (2/2,5/3/4 mm)
1 plastic cover
1 instruction manual

For various grinding wheels see selecting list on page 12.

SPECIAL ACCESSORIES

- Supplementary clamping devices

item 500 clamping unit for drills dia. .019" - .250" (0,5-6 mm)
item 502 clamping unit for drills dia. .236" - .315" (6-8 mm)
item 503 pivoting unit for 2 or 4 divisions for drills dia. .019" - .250" (0,5-6 mm)
item 504 pivoting unit for 3 or 6 divisions for drills dia. .019" - .250" (0,5-6 mm)
item 505 clamping unit for drills with MT 1
item 509 clamping unit for drills dia. .236" - .394" (6-10 mm)
item 513 pivoting unit for 2, 3 or 6 divisions for drills dia. .236" - .394" (6-10 mm)

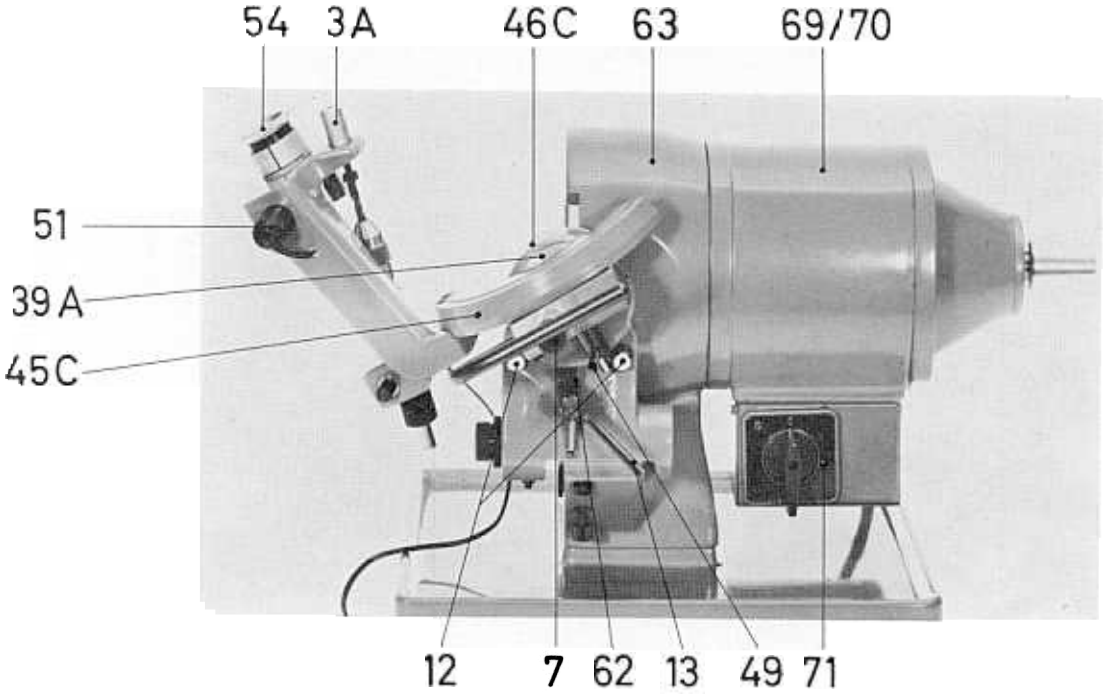
- Supplementary grinding attachments

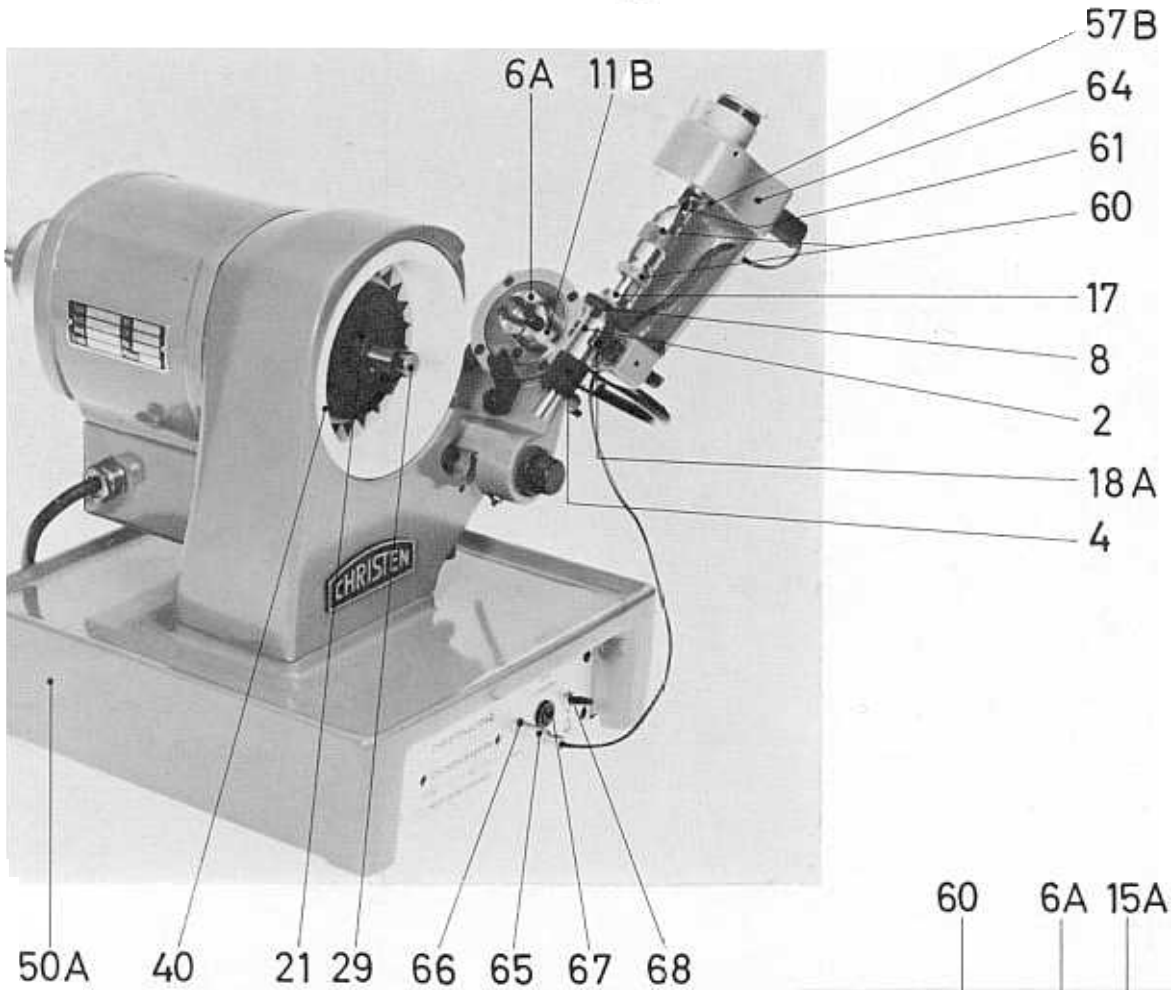
item 506 point thinning attachment complete (see page 19)
item 507 special grinding attachment for small drills additional
508 special grinding attachment for small drills mounted on machine instead of standard attachment
} see page 26

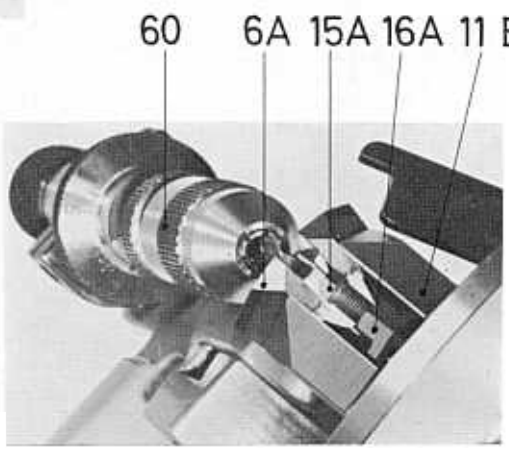
- Further special accessories

item 6AC centering tongs carbide tipped
item 7A friction nut for centering tongs
item 15/16AC drill stop carbide tipped
item 21 grinding wheel flange (additional)
item 30 grinding wheel diamond dresser (additional)
item 120 adapter (for inch-grinding wheels)
item 524 balancing device complete
item 24 balancing arbor, separate

Supplementary grinding wheels dia. 4.92" (Ø 125 mm) for 05-10 / item 501 see page 12.
Supplementary grinding wheels dia. 2.95" (Ø 75 mm) for item 506 see page 22.


54
3A
46C
63
69/70
51
39A
45C
12
7
62
13
49
71


57B
6A
11B
64
61
60
17
8
2
18A
4
CHRISTEN
50A
40
21
29
66
65
67
68


60
6A
15A
16A
11B

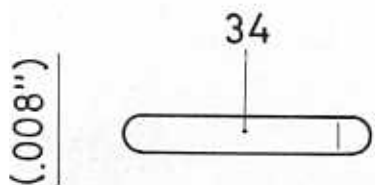

34
(.008")

FIG. 1

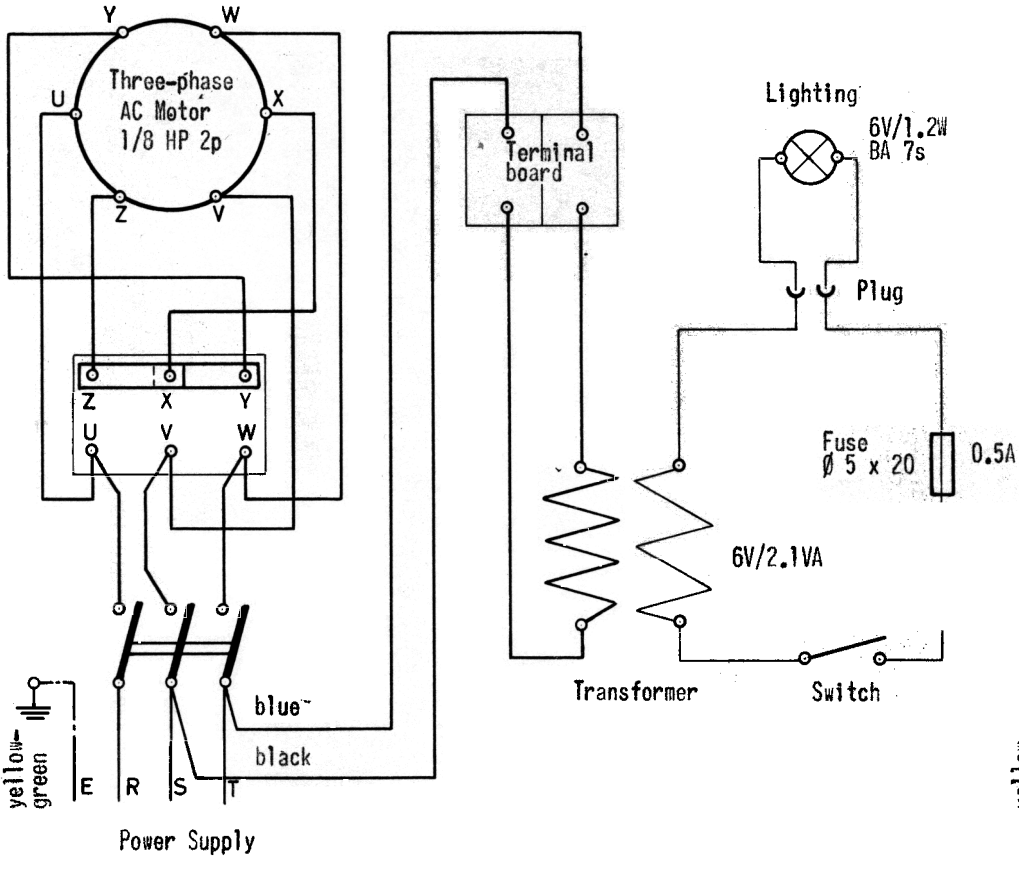


FIG. 1a

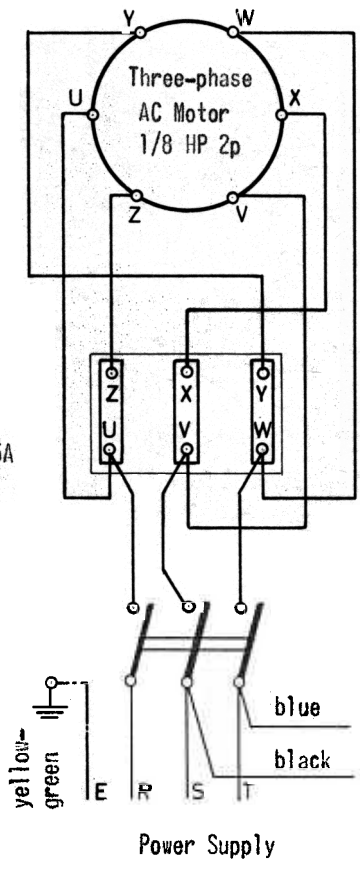
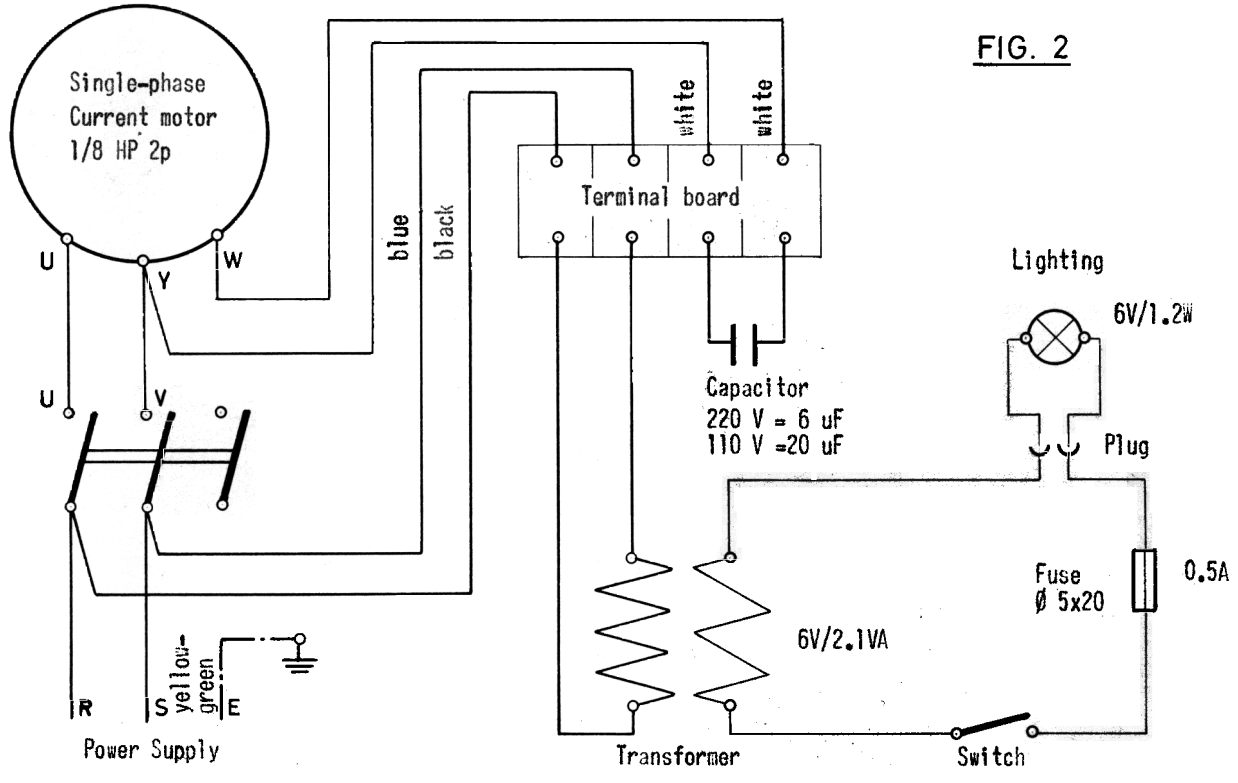


Fig. 1 Drive by three-phase AC motor, star connection

Fig. 1a Drive by three-phase AC motor, delta connection

Fig. 2 Drive by single-phase current motor

FIG. 2



How to set the grinding wheel

Before ever putting the machine into operation and after each truing up of the grinding wheel with the diamond dresser 30, set the correct clearance between the grinding wheel 40 and the centering tongs holder 11B using the .007" setting gauge 34 delivered with the machine. The grinding wheel flange 21, secured by means of a clamping key on the end of the motor shaft, can be slid in axial direction after slackening of the knurled screw 29.

To set the grinding wheel, open the centering tongs 6A slightly by means of nut 7 and pass the pivoting device 46C over the grinding wheel to the extreme inner position. Then press the setting drum 39A lightly against the fixed stop 12, which is provided for righthand drills and set at approximately 30°.

Now insert the setting gauge 34 between the centering tongs holder 11B and the cutting face of the grinding wheel and place the grinding wheel against the setting gauge. Then tighten the knurled screw 29 to lock the grinding wheel in position.

Incorrect setting of the wheel might damage the centering tongs holder or the centering tongs.

Correct grinding is indeed based on this adjustment.

How to set the grinding angles

It has been proved that for the grinding of different materials different point and clearance angles should be used so that the drill may be obtain optimum results.

To set the required point angle, slacken the clamping nut 49 and bring the setting segment 45C to the position in which the reading of the required angle coincides with the zero line. Then tighten the clamping nut 49 to lock the setting segment in position.

Set the cutting lip clearance angle with the help of the scale on the setting drum 39A. The scale on the right side of the zero mark is used when grinding righthand drills and the scale on the left when grinding lefthand drills. You only set the cutting lip clearance angle. The angle of the secondary relief-ground facet is set permanently at approximately 30° by means of the fixed stop 12. To set the cutting lip clearance angle, slacken the clamping nut 13, bring the setting drum 39A to the reading of the required angle, place the stop 62 (kept by spring-load in central position) correspondingly and lock it in position by tightening the clamping nut.

How to clamp the drill and how to set it to length

After having set the required point and clearance angles and placed the grinding wheel in the correct position, prepare the drill for actual grinding as follows:

1. Clamp drill into the corresponding chuck, leaving a protruding part of approximately .59" to .79" (15...20 mm) (less for very fine drills).

Clamping ranges of the chuck with 4 interchangeable collets: .020"-.059" (0,15-1,5 mm), .059"-.118" (1,5-3,0 mm), .118"-.177" (3,0-4,5 mm), .177"-.25" (4,5-6,35 mm). Drills with diameters from .236"-.390" (6-10 mm) may be clamped by means of a pivoting and clamping unit available as special accessory.

2. Insert shank of chuck 60 in chuck holder 2. Swing the whole under the length stop 3A and pull out chuck 60 until the drill point touches the spring-loaded length stop 3A. The length stop, in its extreme downward position, indicates the approximate position of the drill point relative to the cutting face of the grinding wheel. Now lightly lock chuck in the chuck holder in position by turning clamping nut 4.

3. Raise spring-loaded length stop 3A and swing drill into the corner of set square 57B underneath the magnifying glass 54.

4. Look through the magnifying glass 54, and rotate the chuck body by means of the knurl until the cutting edges of the drill are parallel to the vertical side of set square 57B (see Fig. 3 to 5); then lock the chuck body in the chuck holder finally in position with the help of clamping nut 4.

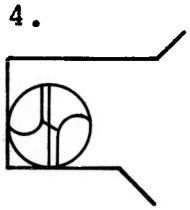
Fig. 3 

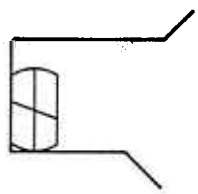
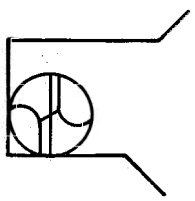
Fig. 4 

Fig. 5 

5. Swing drill from under the magnifying glass and place it into the centering tongs 6A. Provided that the points 2 and 4 have been properly carried out, the land of the drill will come to rest on the drill support 15A/16A.

6. Lightly clamp drill in the centering tongs 6A by means of clamping nut 7.

How to grind the drill

The actual grinding operation consists of four passes of the drill across the grinding face of the wheel, one forward and one backward stroke for each cutting edge.

a) The forward stroke, during which the setting drum 39A is pressed against the fixed stop 12, provides the angle of the secondary relief-ground facet which has been definitely set at 30° for all drill diameters.

b) The return stroke from the inner to the outer side of the grinding wheel provides the cutting lip clearance angle. To do this, swing the setting drum until it abuts against the adjusted stop 62. (The setting drum indicates for example 12°).

As a consequence of these operations the first cutting edge has been ground. Now, in order to grind the second cutting edge in the same way, index the chuck together with its drill by 180°. To carry out this indexing motion, unclamp the centering tongs 6A with the help of nut 7, and swing the drill out of reach of the jaws of the centering tongs. Pull chuck 60 forward until the lugs locking in two corresponding grooves of the chuck holder sleeve 17 are disengaged so that the chuck can be turned by 180°.

Having carried out the indexing motion, the chuck holder will click back through the action of a return spring. Now swing the drill back so as to place it into the centering tongs 6A and lock it lightly by means of clamping nut 7. Thereupon, grind the second cutting lip.

During the indexing motion, keep the drill absolutely out of reach of the centering tongs. If the drill is turned in the tongs, this will cause the clamping places to be damaged so much that precise grinding will very soon be quite impossible.

To feed the drill against the grinding wheel, turn feed nut 8 which is provided with a scale. To do this, the centering tongs 6A must be open. It is important that the removal of chips takes place regularly for both cutting edges alike. A too great chip removal during the grinding of the second lip could draw the drill's temper or produce cracks. One graduation line of the feed nut represents a drill feed of .002". The feed range is limited; therefore, if the feed nut is in its final position, screw it back before grinding another drill.

When grinding drills with acutangular points, adjust nut 16A so that the position of drill support 15A is set in such a way that the land of the drill comes to rest on the support 15A. While turning the nut 16A clockwise, the drill support 15A moves consequently into the centering tongs 6A. The nut 16A can be adjusted by means of swinging the drill support 15A outwards.

How to dress the grinding wheel

To true the grinding wheel, set segment 45C at 180°. Following this adjustment, insert the diamond dresser 30 in the chuck holder 2 and set the point of the diamond on to the angular rest situated underneath the centering tongs 6A. Turn feed screw 8 to make the diamond dresser touch the cutting surface of the grinding wheel. Now the grinding wheel can be trued by the regular to and fro movement of the pivoting device.

How to balance the grinding wheel

For quiet running it is essential that the grinding wheel is well balanced. For this purpose, the front of the wheel flange is fitted with three balancing weights. Balance the grinding wheel on balancing ways by displacing these weights as required.

Size of grain of grinding wheel

For drills with diameters of less than .039" it is advisable to use a wheel with small sized grain. Extra wheels with different sized grain can be supplied, see selecting-list of grinding wheels on page 12.

The four-facet grinding method

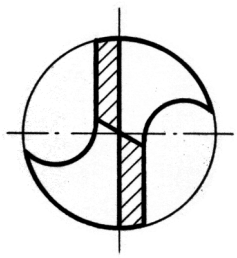


Fig. 6

Fig. 6 - Correctly ground

The brake lines between the primary and secondary relief-ground facets touch each other in the centre of the drill or are slightly off centre.
Excellent drilling conditions.

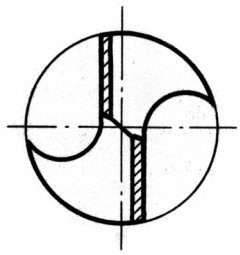


Fig. 7

Fig. 7 - Unfavourably ground

The brake lines between the primary and secondary relief-ground facets are too far off drill's centre. The relief-ground facets form too broad and edge in the middle.
Less good drilling conditions than under Fig. 6

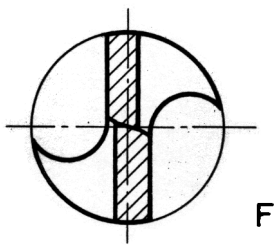


Fig. 8

Fig. 8 - Incorrectly ground

The primary relief-ground facets are too broad and overlap.
Very bad drilling conditions.

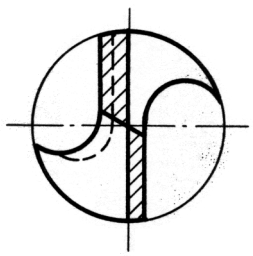


Fig. 9

Fig. 9 - Eccentric drill, correctly ground

The different widths of the primary relief-ground facets are caused by irregular drill flutes. The different widths of the primary reliefs can be corrected by point thinning.

Grinding faults

Incorrect grinding - see Figs. 7 and 8 - is due to:

1. inaccurate setting of the grinding wheel
2. damaged centering tongs
3. inexact centering of the machine

Proceedings to correct grinding faults

In most of the cases incorrect grinding is caused by inaccurate setting of the grinding wheel. Instruction for setting the grinding wheel see page 6.

Should the exact setting of the grinding wheel not correct the grinding fault, the state of the centering tongs has to be verified. In order to do this the following sequence of operations has to be observed:

Set the adjusting segment 45B at 120°. Clamp the 4 mm dia. test pin, set to length and prepare for grinding as described above. Then, using the 30° left-hand and right-hand final positions of the setting drum 39A, grind first one and then the other facet on the pin. Then index the chuck by 180° and repeat the grinding operation. If the result corresponds to Fig. 10 the centering tongs 6A have been correctly fitted. If there are divergences, then the centering tongs must be at fault and have to be replaced.

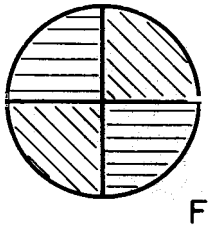


Fig. 10

Should there still be divergences from Fig. 6 after this, then the machine has to be newly centered.

Centering of the machine is advisable whenever the centering tongs 6A, drill stop 15A/16A and centering tongs holder 11B are replaced or when the centering is disturbed by incorrect handling.

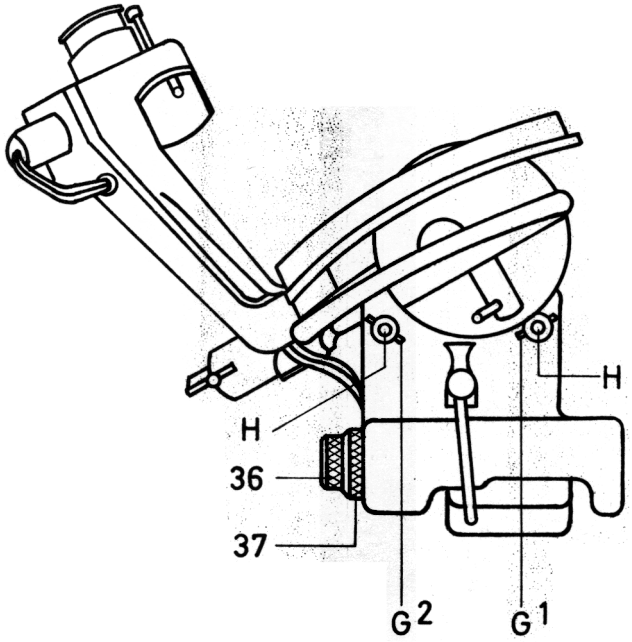
Centering Procedure

True the grinding wheel with diamond dresser and set the wheel snugly with the help of the setting gauge 34. When truing, set adjusting segment 45C at 180°.

To check the centering, grind a test pin 4 mm (.16") diameter and approximately 50 mm (2") long using the following method:

Set segment 45C on 120°. Clamp the test pin, set to length and prepare for grinding. The relief angle should be set on the drum 39A at 12° for right-hand drills. Grind 4 facets on the pin in the same way as for a drill. Then repeat the procedure as for a left-hand drill. If the results correspond to Figs. 12 and 12a the machine is correctly centered.

Fig. 11



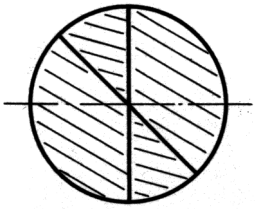


Fig. 12

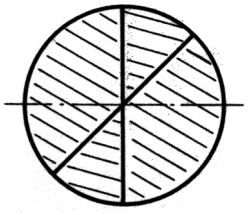


Fig. 12 a

If there are divergences the grinding plane must be either behind or in front of the pivoting axis. Correct the grinding plane by adjusting the setting surfaces on the centering tongs holder, which forms the stop for the grinding plane adjustment, in conjunction with the setting gauge 34.

If the relief-ground facets for the right-hand drill overlap each other as in Fig. 13, make the necessary correction by screwing forward (clockwise) the adjusting screw G.1 Fig. 11 situated on the right-hand side.

Conversely if they fall short of the centre as in Fig. 13a this can be corrected by screwing back the same screw.

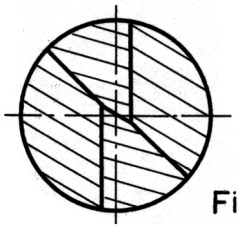


Fig. 13

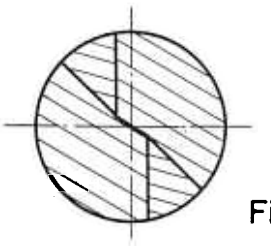


Fig. 13a

The maximum correction is reached when the remaining error is divided equally between positive and negative at right-hand respectively left-hand drills.

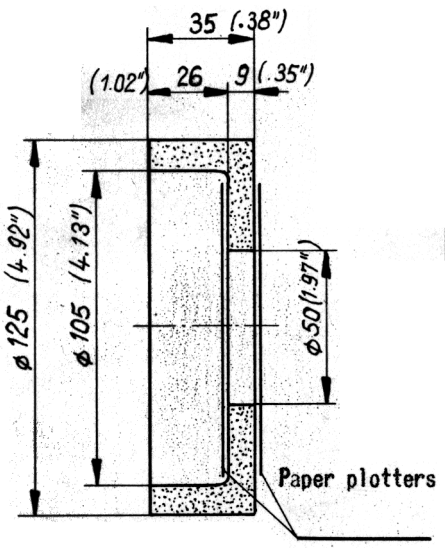
If exclusively right or left-hand drills are ground the error can be regulated by screwing forward or backward the adjusting screw G.1 Fig. 11 until the right-hand respectively left-hand drill shows a theoretically exact grinding picture.

<u>After each correction, reset the grinding wheel with the help of setting gauge 34.</u>

Carry out the final centering test with right and left-hand 4 mm (.16") drills.

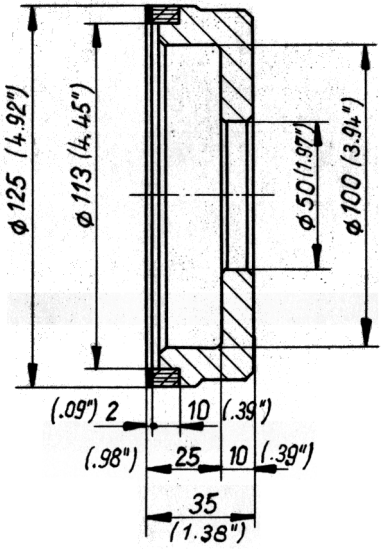
If the relief-ground facets correspond to those attained in the test, set the left-hand adjusting screw G.2 Fig. 11 to scale in accordance with the right-hand adjusting screw G.1. Then lock both screws with the clamping screws H. Fig. 11 and finally seal the latter with white paint.

Forms and qualities of the grinding wheel for Drill Grinding Machine CHRISTEN 05-10



Item	Quality	Grit	Hardness	Structure	Remarks
40-1	VITONEVA	60	H		Relatively coarse-grained wheel; recommended for grinding of drills within the diameter range from approx. 6-10 mm (.236" - .390") only
40-2	VITONEVA	120	G	14 1f	Recommended for grinding of drills within the diameter range of approx. 5-8 mm (.195" - .314")
* 40-3	VITONEVA	180	G	15 1f	Recommended for grinding of drills within the diameter range of approx. 0,5-6 mm (.019" - .236")
40-4	VITONEVA	220	G	14 1f	Recommended for grinding of drills within the diameter range of approx. 1-3 mm (.039" - .118")
40-5	VITODURUM	400	11	3	Specially fine-grained wheel; recommended for grinding of drills within the diameter range of approx. 0,5-2mm (.019" - .078")
40-6	VITOCARBON	150	G		Silicium-carbide wheel suitable for grinding of tungsten carbide drills

* Standard accessories



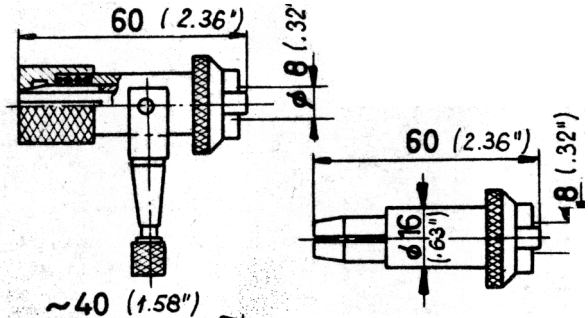
40-7A/21	Diamond	D 15	Concentration C 50	bakelite bonded
40-7B/21	Diamond	D 30	Concentration C 50	suitable for grinding of tungsten carbide drills
40-7C/21	Diamond	D 70	Concentration C 50	

CHRISTEN

12

Spare parts list for 05-10 Drill Grinding Machine

Valid from machine no. 5500

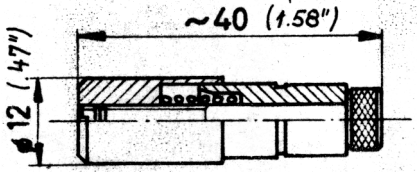


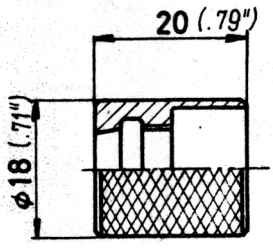
Item 2/4/8/17/18A/35

Chuck holder complete

Item 2/8/17

Bush for chuck holder, graduated nut and chuck holder assembled



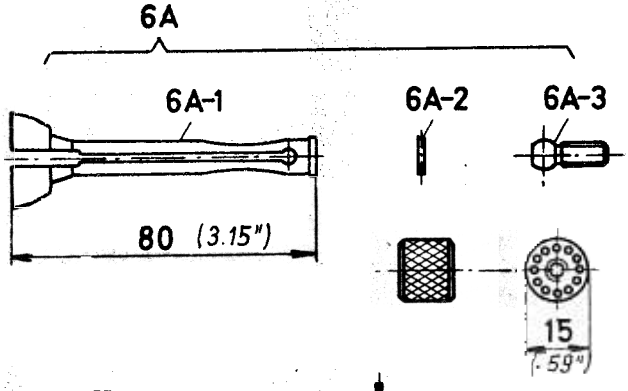


Item 3A

Length stop complete

Item 4

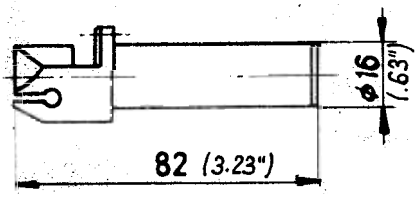
Chuck clamping nut without spring



Item 6A
Centering tongs compl.consist.of:
6A-1 Centering tongs
6A-2 Pin
6A-3 Screw

Item 7

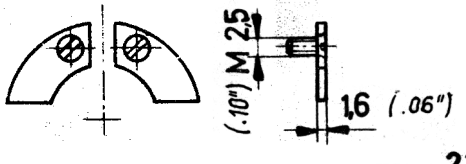
Locking nut for centering tongs

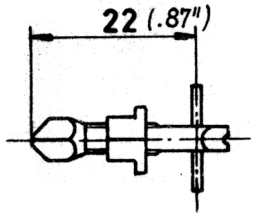


Item 11B

Holder for centering tongs compl

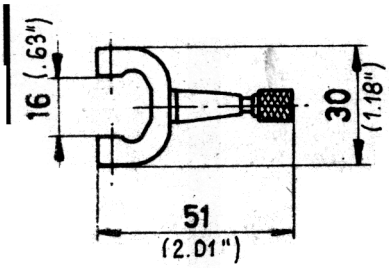
Item 11B-1
2 Cover plates and 2 special screws for centering tongs



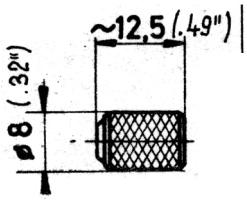


Item 15A/16A

Drill stop



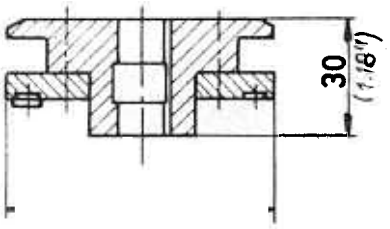
Item 18A
Cone for pivoting fork with spring loaded nut



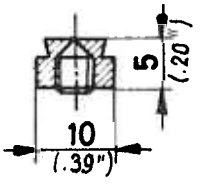
Item 19A

Spring loaded nut for cone

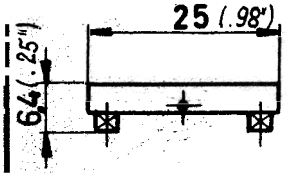
Spare parts list 05-10, valid from machine no. 5500



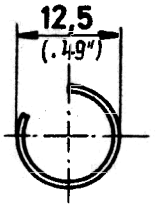
Item 21
Flange for grinding wheel



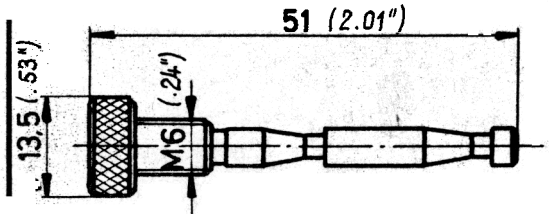
Item 23
Balancing weight for Item 21



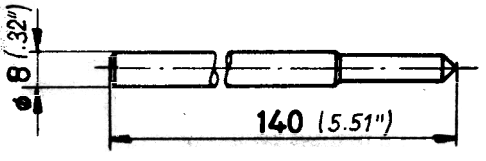
Item 27
Key for motor shaft



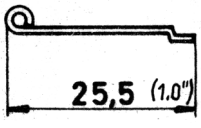
Item 28
Spring for key Item 27



Item 29
Clamping screw for motor shaft

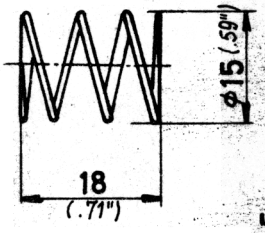


Item 30
Diamond wheel dresser

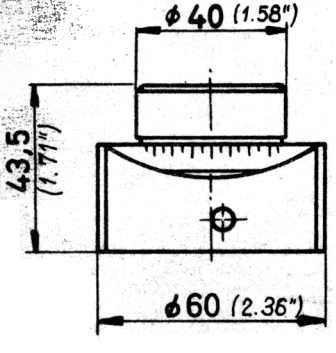


Item 31A
Spring for drill stop

Item 34
Setting gauge



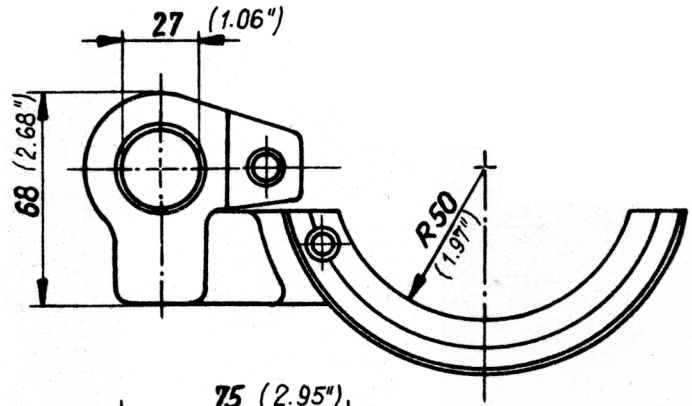
Item 35
Spring for clamping nut Item 4



Item 39A
Setting drum for backing-off angle

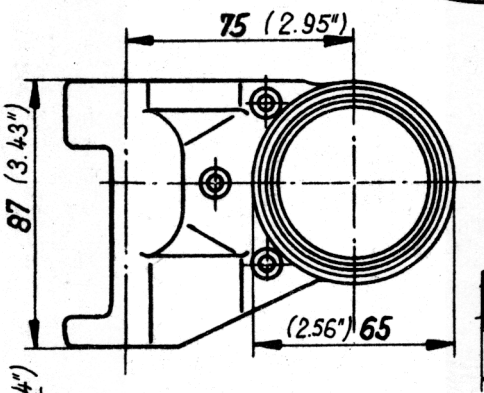
(See selecting list of grinding wheels on page 12.)

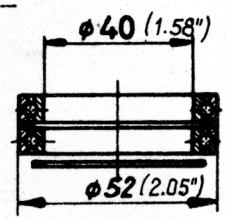
Spare parts list 05-10, valid from machine no. 5500



Item 45C

Segment for point angle setting 60° - 180°



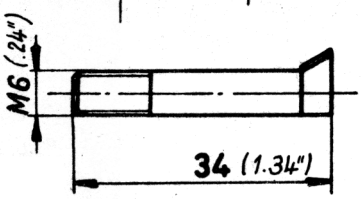


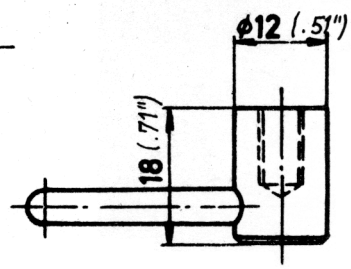
Item 46C

Pivoting casting

Item 47A (61808 SKF Germany)

Special ball bearing with sealing ring



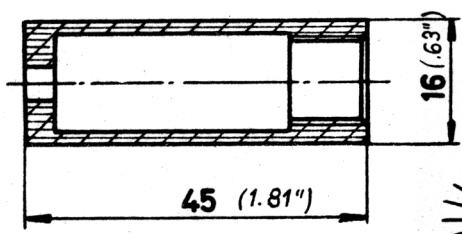


Item 48

Locking pin for segment

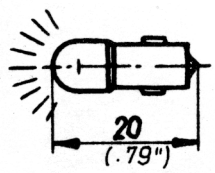
Item 49

Lever for locking pin



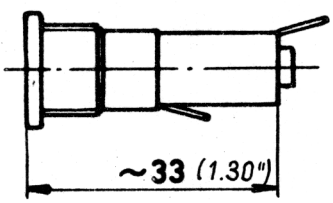
Item 51

Microscope light holder



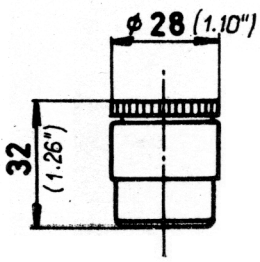
Item 52

Filament lamp 6 volts, 1,2 watt; Ba 7s



Item 53

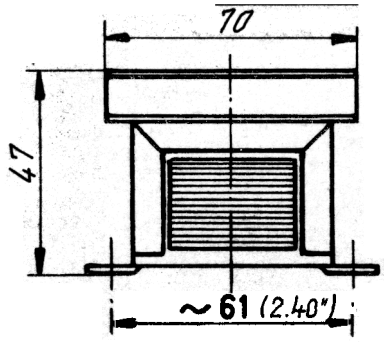
Holder for filament lamp MFG 035.2502



Item 54

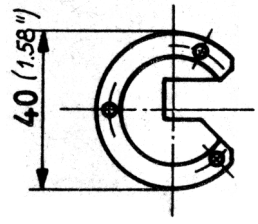
Magnifying glass with frame (magnification 12 x)

Spare parts list 05-10, valid from machine no. 5500

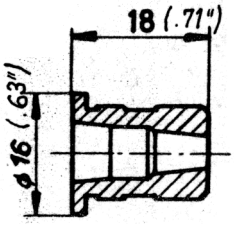


Item 55-1
6 volts transformer for 110, 125, 145, 220, 240 v., 50 or 60 cycles

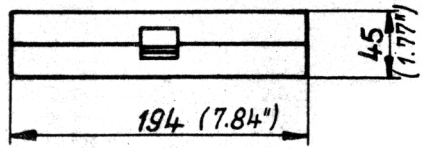
Item 55-2
6 volts transformer for 380, 400, 420, 440, 500 v., 50 or 60 cycles



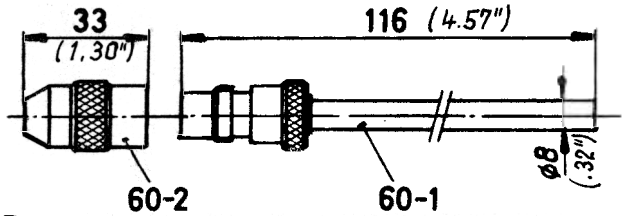
Item 57 B
Drill setting gauge



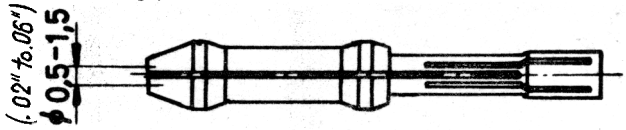
Item 58
Bronze bush for cone Item 18A



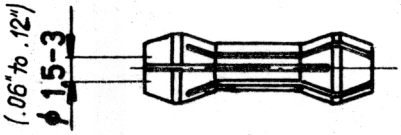
Item 59
Wooden box for chuck holder and collets



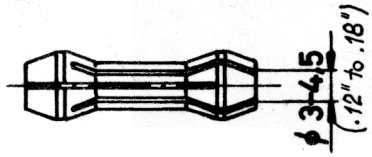
Item 60
Chuck holder compl. consisting of:
Item 60-1 chuck holder
Item 60-2 knurled chuck clamping nut



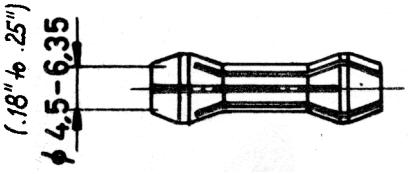
Item 61-1
Collet for dia. .019"-.059" (0,5-1,5 mm)



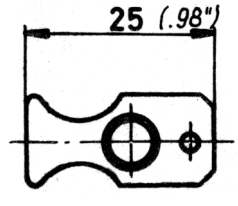
Item 61-2
Collet for dia. .059"-.118" (1,5-3,0 mm)



Item 61-3
Collet for dia. .118"-.177" (3,0-4,5 mm)

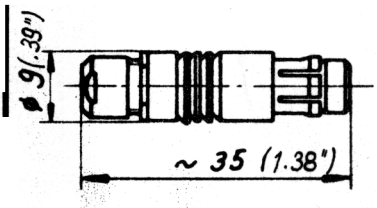


Item 61-4
Collet for dia. .177"-.25" (4,5-6,35 mm)

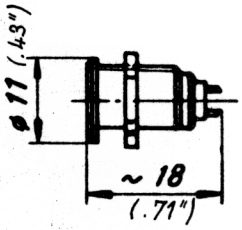


Item 62
Stop for pivoting unit

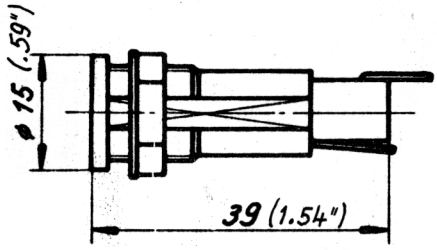
Spare parts list 05-10, valid from machine no. 5500



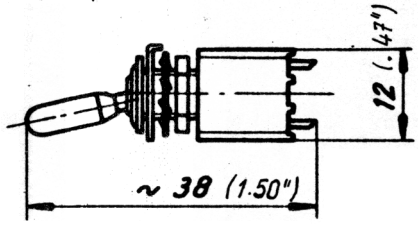
Item 65
Plug for illumination
S 102.A051



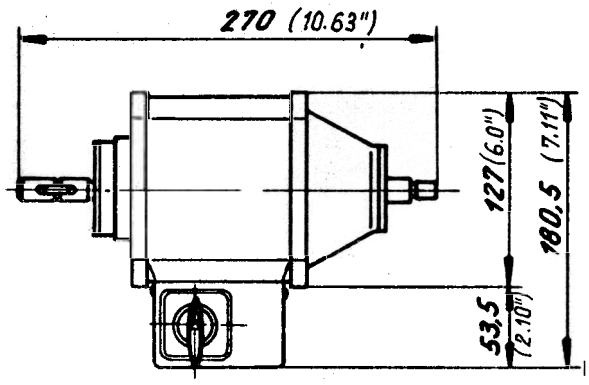
Item 66
Socket for illumination
D 102.A051



Item 67
Security holder with bajonet joint
FEI 031.1431

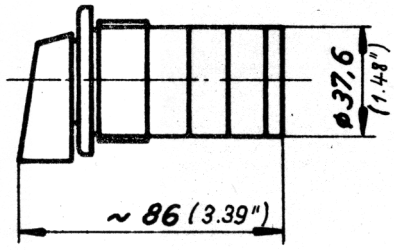


Item 68
Tumbler switch for illumination
2036.5



Item 69
Single-phase motor with switch

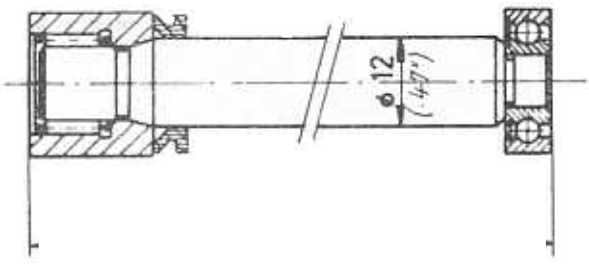
Item 70
Three-phase motor with switch



Item 71

Switch for motor

Spare parts list 05-10, valid from machine no. 5500



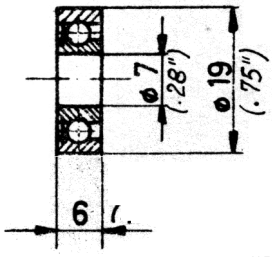
Item 116A

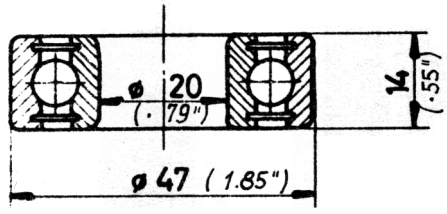
Pivoting-shaft with housing,
V-seal and two bearings

Item 117

Ballbearing for pivoting-shaft

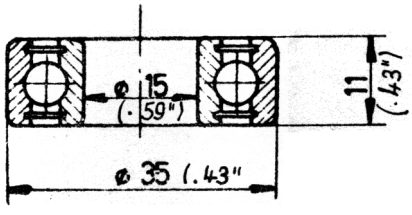
RIV EL-7Z





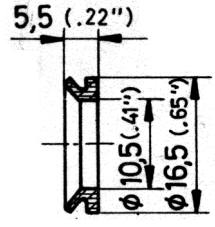
Item 118A

Ballbearing for motor



Item 119

Ballbearing for motor

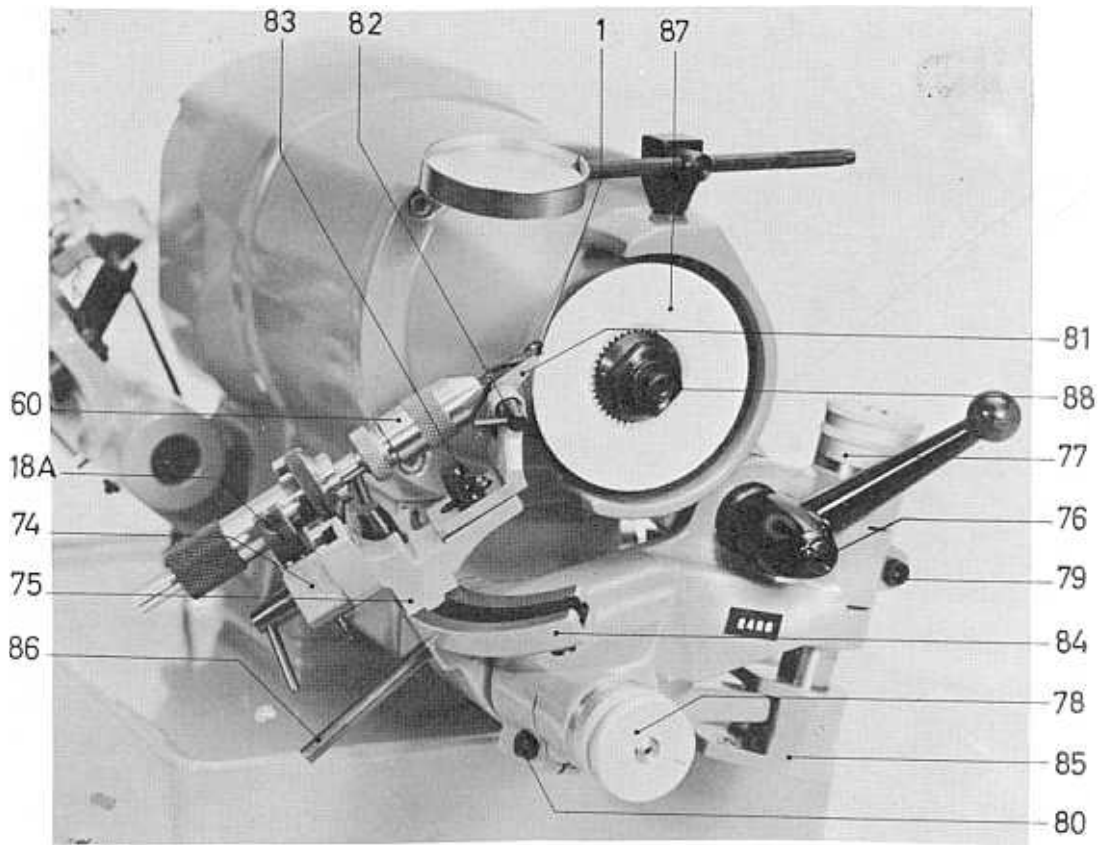


Item 121

V-seal

Special accessory Point thinning Attachment Item 506

For CHRISTEN 05-10 Drill Grinding Machine



General

The design and construction of the point thinning attachment is such that it can be employed for grinding almost all point thinning angles.

The drill 1, whilst held in the chuck, is removed together with the collet 60 and the pivoting fork 18A after loosening the spring loaded nut, from the front pivoting device and placed on the point thinning attachment. The position of the main cutting edge adjusted for the grinding of the drill point remains unchanged relative to the pivoting fork. After the point thinning operation, it is therefore possible to regrind the drill point without any further adjustment of the position of the drill. The length of the drill must however, protrude rather more from the chuck, according to the drill support of the attachment.

To allow rapid changing of the chuck with pivoting fork from one bearing to the other, we recommend operation without the spring loaded nut, which keeps the cone of the pivoting fork in the bearing. Always ensure that the cone lies concentric in the bearing, by careful holding of the collet.

There are the following adjusting movements to be distinguished:

a) Rotating the drill around its axis. Setting range of piece 74: 50° to the left and the right from the vertically positioned cutting edge.

b) Pivoting the drill around the drill point. Setting range of piece 75: 35° to the left and the right from the drill positioned 90° to the grinding wheel axis.

c) Pivoting the device around pivoting point 76, for setting the grinding position on the grinding wheel periphery.

d) Feeding the drill in radial direction to the grinding wheel Setting handle 77.

e) Feeding the drill in axial direction to the grinding wheel. Setting handle 78.

Both movements d) and e) may be fixed by means of screws 79 and 80. According to the diameter of the drill to be thinned, the drill support 81 must be adjusted in both directions parallel to the drill axis and in the longitudinal direction of the drill, according to the grinding position at the periphery of the grinding wheel.

The drill support consists of two movable V-supports. The larger support is for drills with diameters 4 - 10 mm (0.157" - 0.39") and the smaller one for drills with diameters 1 - 4 mm (0.039" - 0.157") By releasing screw 82, the drill support can be set in the desired position and adjusted parallel to the drill axis. The adjustment in the longitudinal direction of the drill can be effected when releasing screw 83.

Grinding procedure

Move the drill by means of pivoting part 84 to the grinding wheel. The pivoting movement is fixed by means of an adjustable stop 85.

After thinning the first cutting edge, remove from grinding wheel and rotate the drill (together with chuck and collet) around 180°. Grind the second cutting edge in the same way as the first one.

The grinding movements should be effected by the operator's left hand, at the same time the right hand is used for the setting and dividing movements. Hold left hand on handle 86. The thumb should press the cone of the pivoting fork in the bearing and the collet slightly to the rear.

Grinding wheels

The grinding wheel 87 is mounted on a hub, which is mounted on the motor shaft and secured by means of a washer and screw 88. According to the grinding operation, the hub with grinding wheel, or the grinding wheel only, can be reversed.

Cylindrical wheels (type A1) and cup wheels (type D1) are available in various hardnesses and grits (see grinding wheels' list page 22).

It is recommended to keep several grinding wheels in stock. This ensures rapid point thinning for all the required grinding radii without having first to dress the grind wheel to the desired form.

Dressing of the grinding wheel

The grinding wheel is to be dressed free by hand by means of a dressing stone. The form of the grinding wheel depends on the point thinning to be done.

Standard accessories for point thinning attachment item 506

1 saucer grinding wheel, dia. 2.953" x .394" x .630" (Ø 75 x 10 x 16 mm), shape D1, grain 80 , hardness J, with flange
1 cylindrical grinding wheel, dia. 2.953" x .236" x .630" (Ø 75 x 6 x 16 mm), shape A , grain 80, hardness J, without flange
1 dressing stick
1 magnifying glass, magnification 2,5, complete with handle and adjustable support
1 spanner 22 mm
1 Allan key s = 4 mm

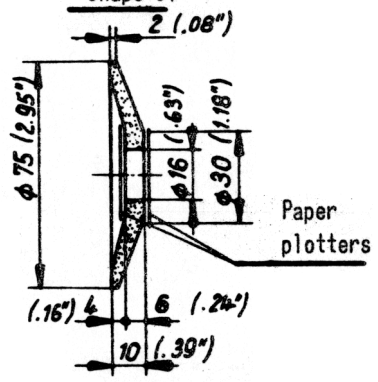
Special accessories for item 506

Item	89	grinding wheel flange (additional)
Item	93/94	grinding wheel diamond dresser with support
Item	94	diamond dresser separate
Item	95	dressing stick (additional)
Item	104	spacer for grinding wheel .040" (1 mm)

For various grinding wheels see selecting list on page 22.

Forms and qualities of the grinding wheel for point thinning attachment of Drill Grinding Machine CHRISTEN 05-10

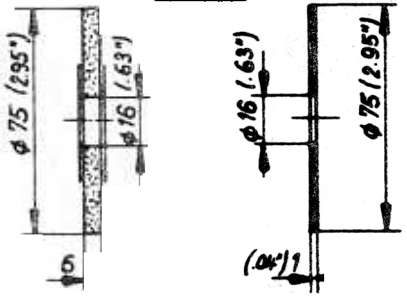
Shape D1

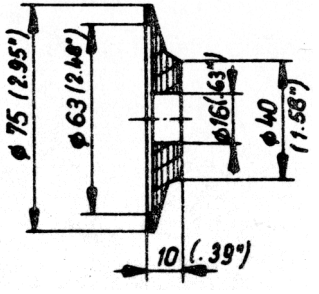


Item	Quality	Grit	Hardness	Structure	Shape	Remarks
87-1b	VITONEVA	220	K		D1	Cup wheel for point thinning
87-1c	VITODURUM	400	II	3	D1	Specially fine cup wheel for point thinning
87-1d	VITORUBIN	80	J		D1	Cup wheel for point thinning
87-3	VITOCORIT	80	V	2	A	Bakelite bonded straight grinding wheel for point thinning of small drills
87-2a	VITORUBIN	80	J		A	Straight grinding wheel for point thinning

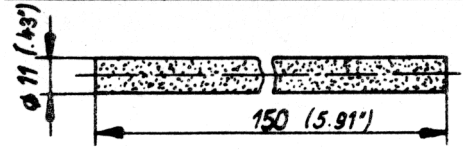
*Standard accessories

Shape A





87-4A/89	Diamond			Concentration C 50		bakelite bonded
87-4B/89	Diamond	D 30		Concentration C 50		for point thinning of
87-4C/89	Diamond	D 70		Concentration C 50		tungsten carbide drills



* 95	VITOCARBON	24/30	R			Dressing stone for special forms and radius

* Standard accessories

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22

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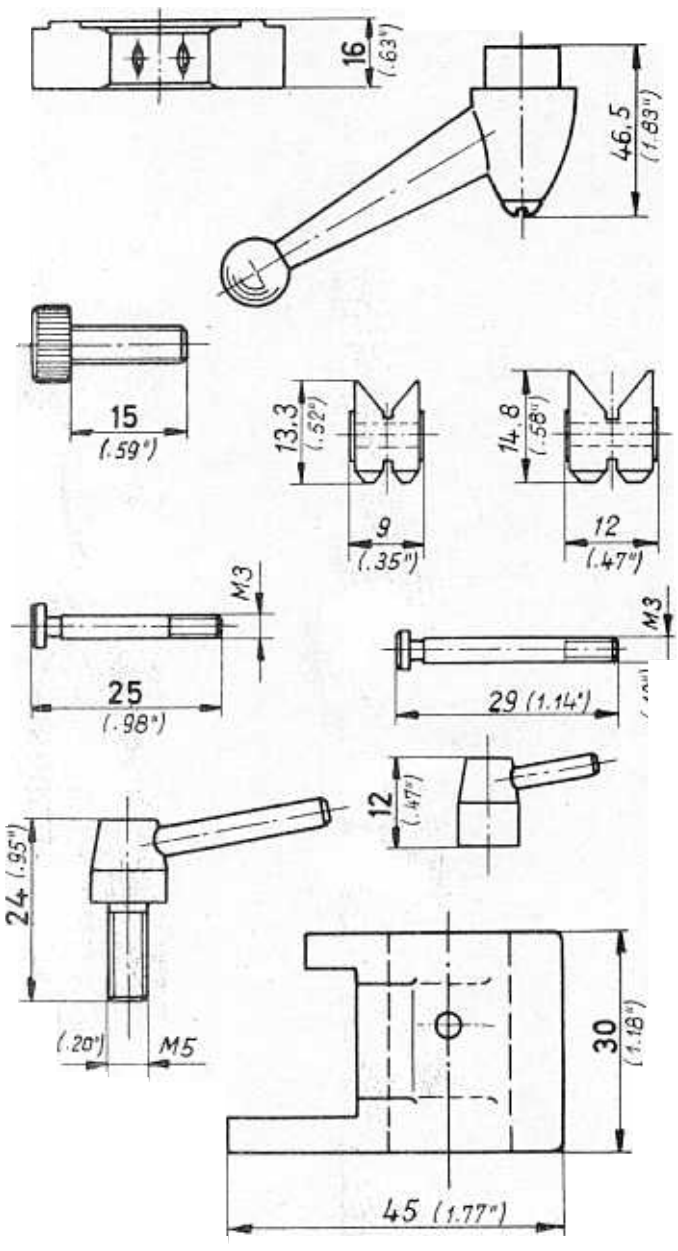
Spare parts list for Point Thinning Attachment
Valid from attachment no. 195



Item 74
Angle adjustment segment

Item 76
Main clamping lever

Item 79 and Item 80
Allen screw M5 x 15

Item 81	Item 81A
Centering V-support(.02"-.314")	Centering V-support(.02"-.39")
Item 82-1	Item 82-1A
Axle for item 81	Axle for item 81A

Item 82-2
V-support clamping lever

Item 83
Locking bolt

Item 85
Stop for vertical adjustment

(See selecting list of grinding wheels on page 22.

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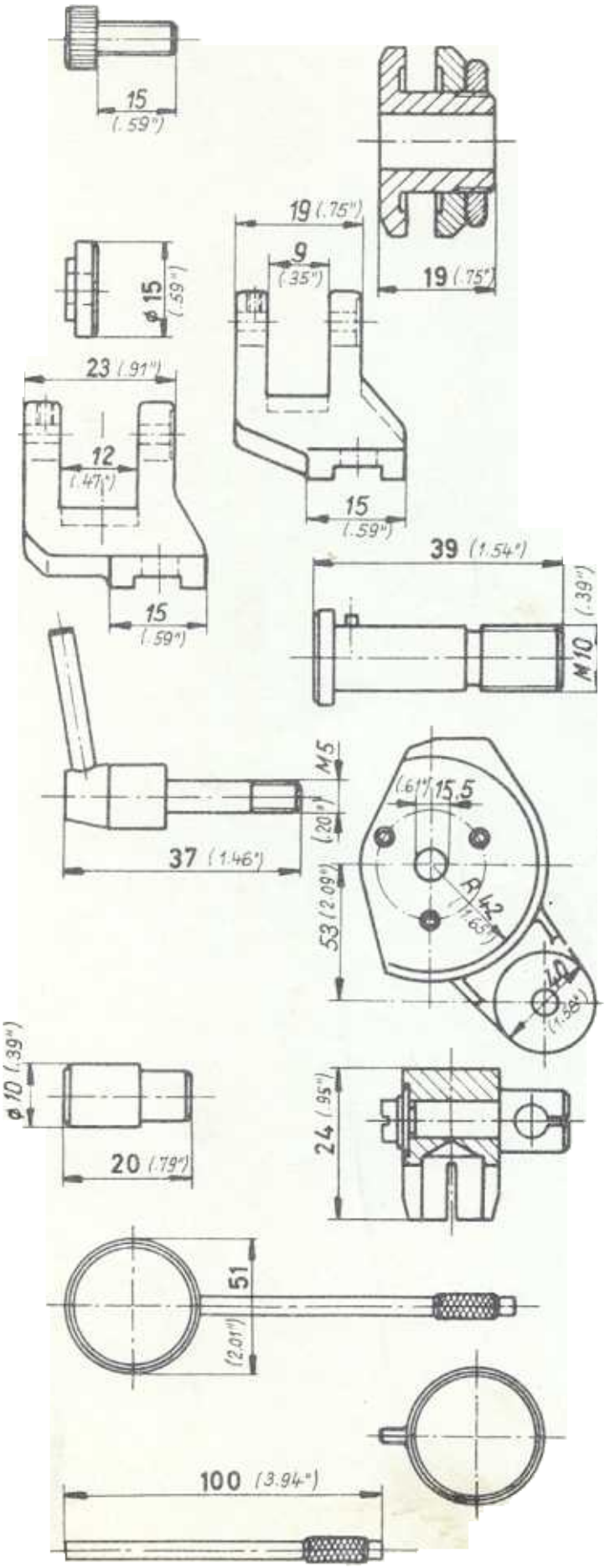
Spare parts list for Point Thinning Attachment



Item 88

Allen screw M 5x15

Item 89

Grinding wheel flange without wheel

Item 92

Washer for wheel flange

Item 96A

Holder for V-support .02" to .315" (0,5...8 mm)

Item 96C

Holder for V-support .02" to .39" (0,5...10 mm)

Item 97

Special screw with pin

Item 98

Clamping lever for Item 74

Item 99

Mounting flange for Magnetic-motor

Item 101

Clamping bolt for magnifying glass

Item 102

Adjustable support for magnifying glass complete

Item 103

Magnifying glass with handle (2,5 x)

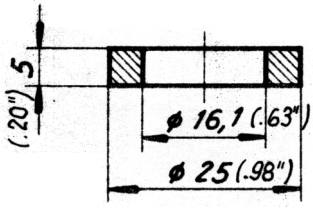
Item 103-1

Magnifying glass with frame (2,5 x)

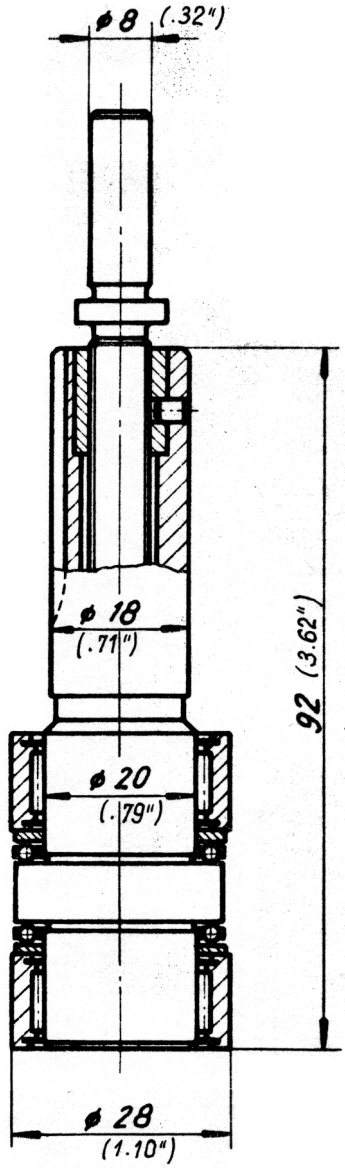
Item 103-2

Handle for magnifying glass

Spare parts list for Point Thinning Attachment



Item 104 (special accessory)
Spacer for grinding wheels
item 87-3

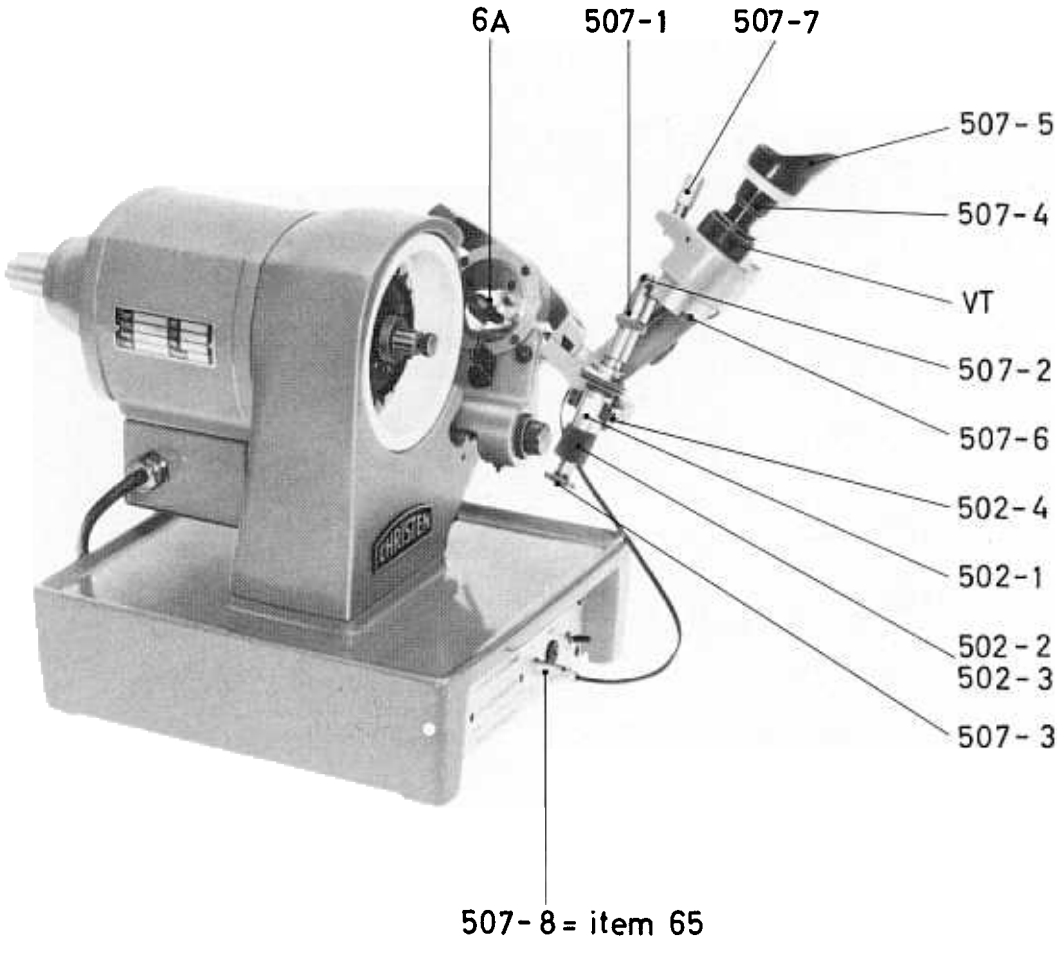


Item 109

Turn-axle adjustment unit compl.

Special Grinding Attachment for small drills item 507/508

to Drill Grinding Machine CHRISTEN 05-10



Range of Application

Four facet grinding for two fluted, left- and righthand cutting twist- and flat drills of carbide or HSS.
Grinding range 0,5...3 mm, clamping range 0,3...4 mm.
Other dates see page 3.

Mounting

Is the special grinding attachment for small drills item 507 delivered as supplementary equipment, the mounting is effected as follows:

- disconnect cable for illumination from base 50 A by pulling on plug 65 (see picture page 4)
- unscrew clamping screw 49, move with segment 45 C out of clamping range and take away the standard grinding attachment
- mount the special grinding attachment, set the required point angle and fix by means of clamping screw 49
- connect cable for illumination
- change locking nut for centring tongs against friction nut for centring tongs

Operation

The handling of the special grinding attachment for small drills is principally the same as for the standard grinding attachment.
We subsequently only explain the variations to the basic machine:

- Clamping of the drill

  The drill is clamped in a special precision chuck holder with collets type Schäublin B8/Art. 95, clamping range 0,3...4 mm. The collets are available in steps of 0,1 mm. The drills are to clamp as short as possible according to the point angle. The standard accessories of this attachment include one collet Ø 1 mm.

- How to set the drill

  After having clamped the drill, loosen the chuck clamping nut 502-2 for chuck 507-1 and swivel the whole unit under the length stop 507-7. Thereby the front end of the clamping chuck rests against the stop of the plate 507-6 for drill setting. The clamping chuck with the drill is now to set to length by means of the down pushed length stop 507-7 and the clamping nut 502-2 slightly tightened so that the clamping chuck can yet be turned.
  Swivel afterwards the clamping chuck under the microscope. Thereby the plate 507-6 centers the chuck according to the reticule in the microscope. The drill cutting edge is now to set parallel to the vertical line in the reticule. Depending on the expected quantity of material to grind off and the ascent of the flute, the grinding-reserve is to consider on setting the drill.
  After setting, the clamping nut 502-2 is to tighten, the clamping chuck back-moved and the drill put on the drill stop in the centring tongs. On tightening the friction nut (7A) for centring tongs the drill will be properly centered.

- Grinding of drill

  According to instructions given on page 7.

Microscope

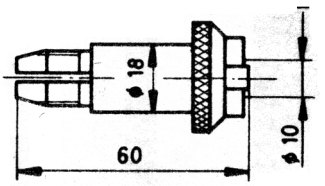
The magnification of the microscope is 20 x, field Ø 3 mm. The reticule can clearly be set on occular 507-4.

Grinding wheels

Use within the grinding range of 0,5...3 mm grinding wheels with fine grain. For selection see page 12.
On ordering the special grinding attachment for small drills (item 508) mounted on the machine (without standard grinding attachment) a special dressing diamond Ø 10 mm (item 507-9) suitable to clamping chuck Ø 10 mm is delivered. On delivery as supplementary equipment (item 507) the grinding wheel is dressed with the standard dressing diamond Ø 8 mm (item 30) of the standard clamping chuck Ø 8 mm.

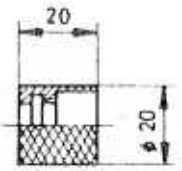
Spare parts list: valid for attachment No 507/508-198

Special Grinding Attachment for small drills item 507/508



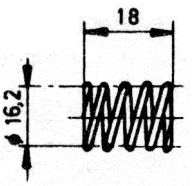
Item 502-1

Bush for chuck holder, graduated nut, chuck holder, assembled



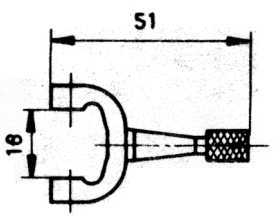
Item 502-2

Chuck clamping nut without spring



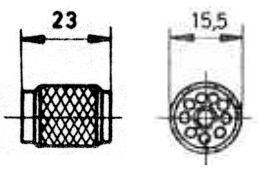
Item 502-3

Spring for chuck clamping nut



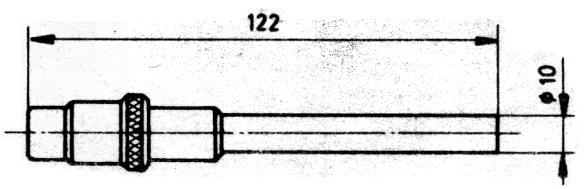
Item 502-4

Cone and pivoting fork with spring loaded nut



Item 7A

Friction nut for centring tongs



Item 507-1

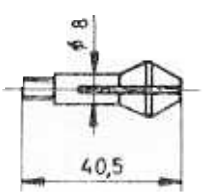
Chuck without collets

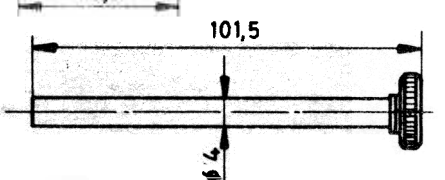
Item 507-2

Collets B8, Art. 95

ø 0,5 - 0,9 mm (.020" - .035")
ø 1,0 - 1,9 mm (.039" - .075")
ø 2,0 - 4,0 mm (.079" - .157")

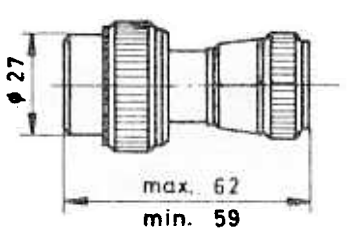
available in steps of 0,1 mm (.004")





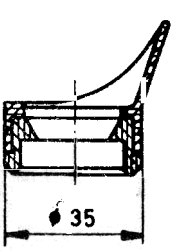
Item 507-3

Collet rod for chuck



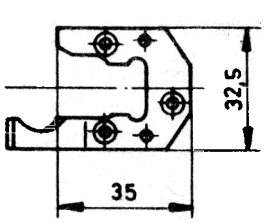
Item 507-4

Microscope (20x) with reticule



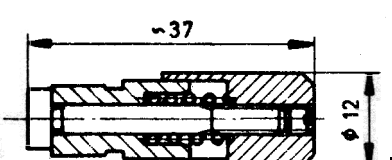
Item 507-5

Eye-piece complete



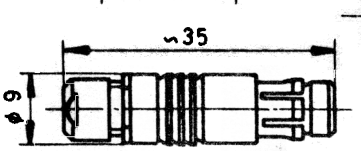
Item 507-6

Plate for drill setting



Item 507-7

Length stop complete



Item 507-8 corresponds item 65

Plug for illumination S 102 A051