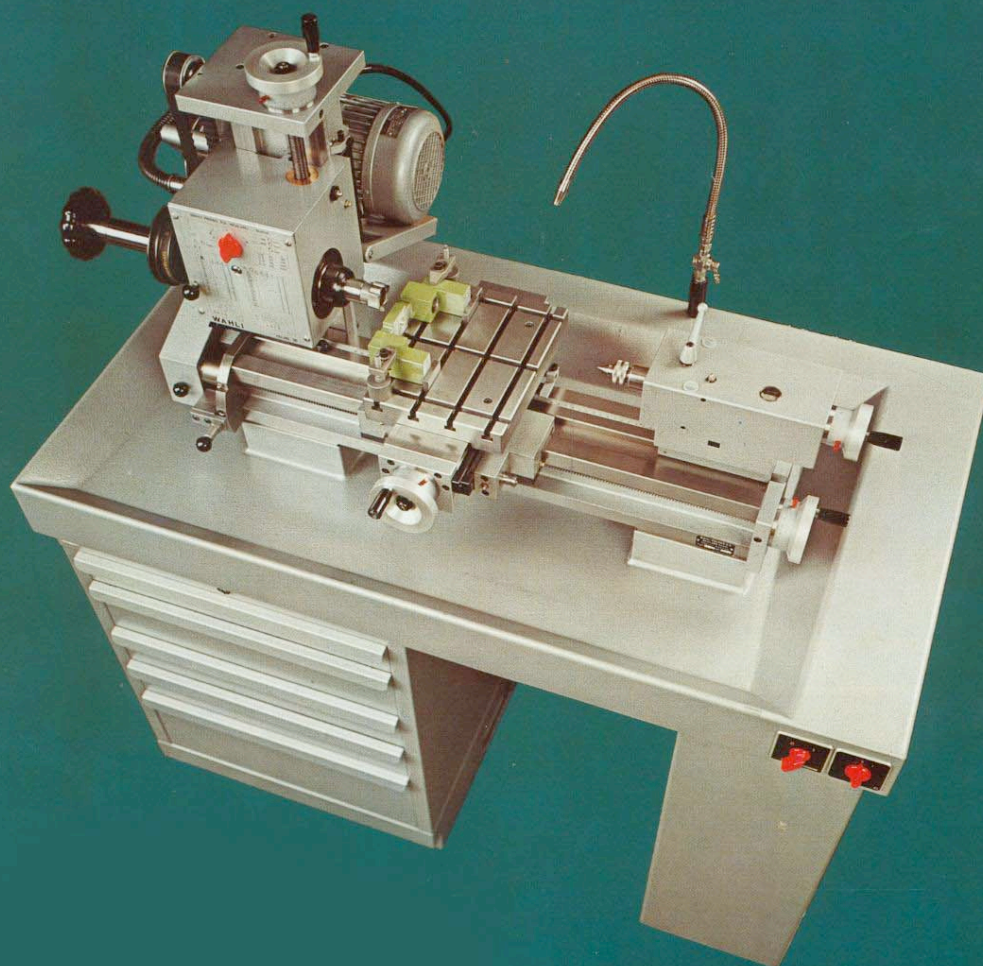
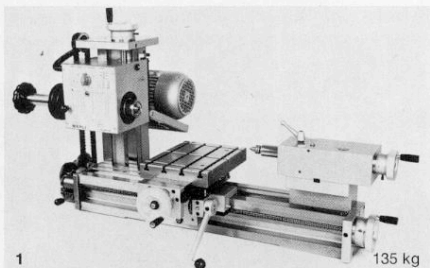


WAHLI

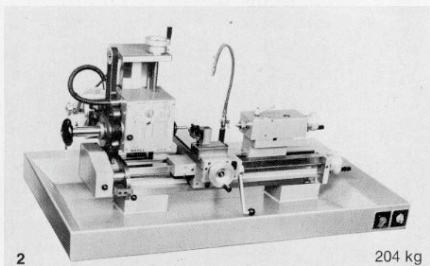
multi 76 Machine-outil de précision à usages multiples
Mehrzweck-Präzisions-Werkzeugmaschine
Multi purpose precision machine tool





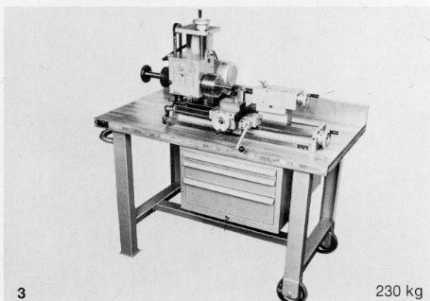
1

135 kg



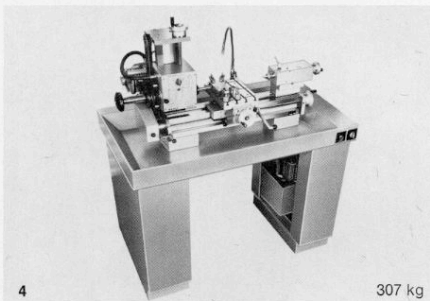
2

204 kg



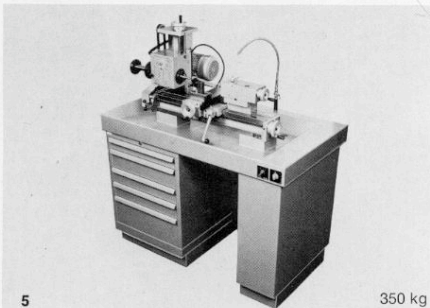
3

230 kg



4

307 kg



5

350 kg

1 Machine standard comprenant: Banc rectifié - Colonne verticale - Entraînement par moteur électrique - Poupée avec renvoi - Chariot avec entraînement par vis-mère - Contre-poupée - Dispositif de filetage et d'avances (sans les roues) - Equipement électrique 220/380 V triphasé 50—60 Hz (autres tensions sur demande)

1 Standard-Maschine, bestehend aus: Geschliffenes Bett - Senkrechter Ständer - Antrieb durch Elektromotor - Spindelstock mit Vorgelege - Schlitten mit Leitspindeltrieb - Reitstock - Gewindeschneid- und Vorschubvorrichtung (ohne Räder) - Elektrische Ausrüstung 220/380 V - Dreiphasig, 50—60 Hz (andere Spannungen auf Verlangen)

1 Standard machine, consisting of: Ground bed - Vertical column - Electric motor drive - Headstock with back gear - Slide with lead screw - Tailstock - Screwcutting and feed attachment (without gear wheels) - Electrical equipment 220/380 V, three-phase, 50—60 periods (other specifications upon request)

2 Machine standard montée sur bac
 Equipement électrique incorporé pour: — pompe d'arrosage
 — appareil à meuler

2 Standard-Maschine mit Späneauffangbecken
 Elektrische Ausrüstung inbegriffen für: — Kühlpumpe
 — Schleifapparat

2 Standard machine on chip tray
 Electrical equipment included for: — coolant pump
 — grinding attachment

3 Machine standard sur établi roulant LISTA J2
 (avec ou sans bac) avec bloc tiroirs B 210
 Tiroirs 1 x haut. 50 mm, 1 x 100 mm, 1 x 150 mm
 Même exécution sans roues aussi livrable

3 Standard-Maschine auf fahrbarem Werkstück LISTA J2
 (mit oder ohne Späneauffangbecken)
 mit Schubladenblock B 210
 Schubladen 1 x Höhe 50 mm, 1 x 100 mm, 1 x 150 mm
 gleiche Ausführung, aber ohne Räder, ebenfalls lieferbar

3 Standard machine on mobile workbench LISTA J2
 (with or without chip tray)
 with tool cabinet B 210
 drawers 1 x height 50 mm, 1 x 100 mm, 1 x 150 mm
 same execution, but without wheels, also available

4 Machine standard sur bac et sur socle 2 corps
 (sans tiroirs)

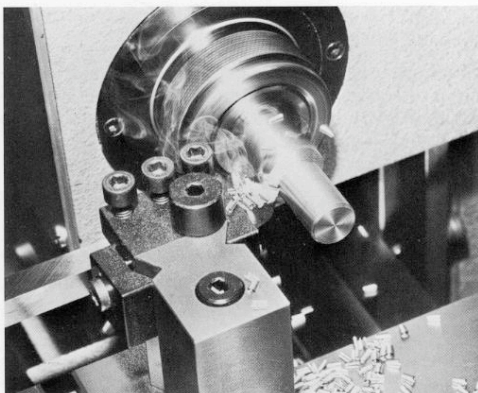
4 Standard-Maschine mit Späneauffangbecken auf zweiteiligem Sockel
 (ohne Schubladen)

4 Standard machine with chip tray on stand with 2 legs
 (without drawers)

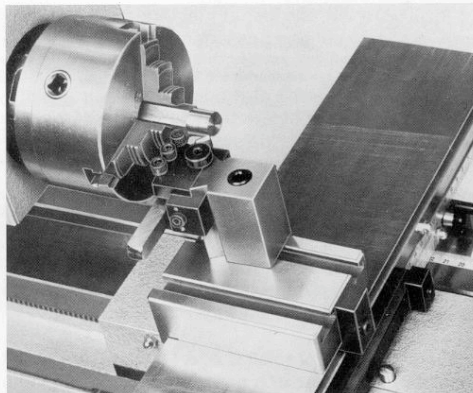
5 Machine standard sur bac et sur socle avec armoire LISTA B 212
 Tiroirs 1 x haut. 75 mm, 2 x 100 mm, 1 x 125 mm, 1 x 200 mm

5 Standard-Maschine mit Späneauffangbecken und Sockel mit Schrank LISTA B 212
 Schubladen 1 x Höhe 75 mm, 2 x 100 mm, 1 x 125 mm, 1 x 200 mm

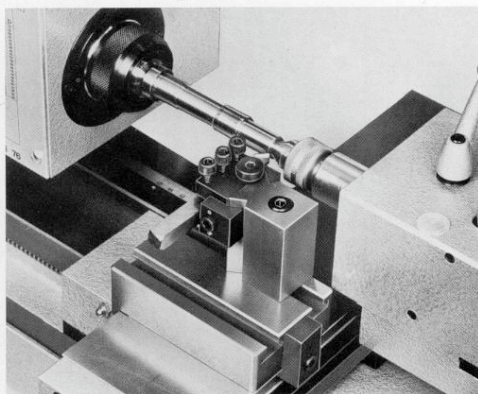
5 Standard machine with chip tray on stand, with tool cabinet LISTA B 212
 drawers 1 x height 75 mm, 2 x 100 mm, 1 x 125 mm, 1 x 200 mm



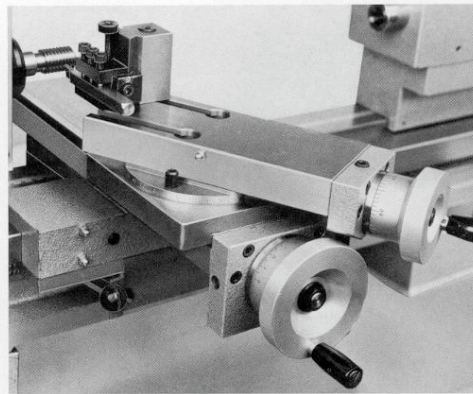
Tournage
Drehen
Turning



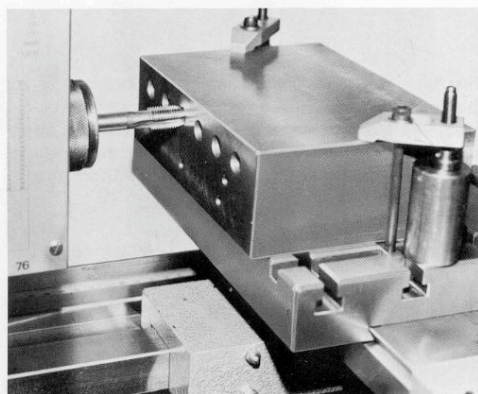
Tournage mandrin 3 mors
Drehen mit Dreifackenfutter
Turning with 3-jaw chuck



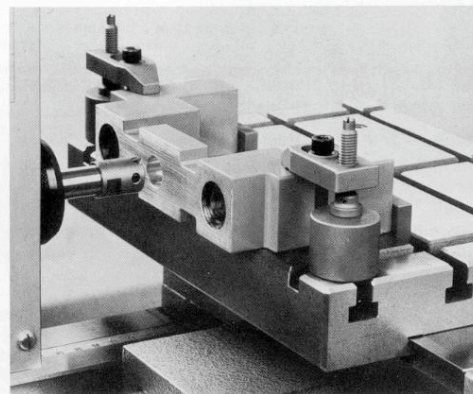
Tournage entre pointes
Drehen zwischen Spitzen
Turning between centers



Filetage
Gewindeschneiden
Threading



Taraudage
Gewindebohren
Tapping



Tournage intérieur (sur pièce fixe)
Bohrung ausdrehen
Boring hole

Le MULTI 76 est une petite machine-outil à 3 axes pour usages multiples possédant les avantages suivants:

Construction moderne et rigide - Grande précision - Puissance remarquable - Manipulation aisée et rapide - Changements de mises en train rapides - Entretien réduit au minimum.

La machine et les accessoires en option permettent les opérations d'usinage suivantes:

Centrage - tournage - filetage - taraudage - fraisage - fraisage d'engrenages - fraisage d'entrées de clavette - perçage - alésage - meulage.

Grâce à la haute précision et à l'universalité, il est possible de réaliser une grande variété d'éléments mécaniques complets et de tous genres.

Le MULTI 76 est destiné particulièrement aux industries et métiers suivants:

Outillage - modelage - électro-mécanique et mécanique de précision - appareillage - ateliers de réparation et de prototype - laboratoires - ateliers de formation - écoles techniques, etc.

Une démonstration du MULTI 76 vous convaincra!

La poupée est pourvue d'une broche montée sur roulements à billes à contact oblique préchargés, graissés à vie.

L'entraînement de la vis-mère est synchronisé avec la broche-poupée sur toute la course verticale de celle-ci. (Brevet déposé)

Die MULTI 76 ist eine kleine 3-achsige Mehrzweck-Werkzeugmaschine mit folgenden Vorteilen:

Moderne und starre Bauart - Hohe Präzision - Aussergewöhnliche Zerspanungsleistung - Einfache und schnelle Handhabung - Kurze Umrüstzeiten - Minimaler Unterhalt.

Die Maschine, mit entsprechendem Zubehör ausgerüstet, erlaubt u. a. folgende Bearbeitungen:

Zentrieren - Drehen - Gewindeschneiden - Gewindebohren - Fräsen - Zahnrad-Fräsen - Nuten-Fräsen - Bohren - Ausreiben oder Ausdrehen - Schleifen.

Infolge der hohen Präzision und der universellen Einsatzmöglichkeit kann eine grosse Anzahl von Teilen verschiedenster Art hergestellt werden.

Die MULTI 76 ist für folgende Industrie- und Gewerbebezüge besonders geeignet: Werkzeugbau - Musterbau - feinmechanische und elektromechanische Fertigung - Apparatebau - Instandsetzungsbetriebe - Versuchswerkstätten - Laboratorien - Lehrwerkstätten - technische Schulen usw.

Eine Vorführung der MULTI 76 wird auch Sie überzeugen!

Der Spindelstock ist mit einer Spindel ausgerüstet, welche auf vorgespannten, für die Lebensdauer geschmierten Kontakt-Kugellagern gelagert ist.

Der Leitspindelantrieb ist mit der Spindelstockspindel auf ihrer ganzen senkrechten Verstellung synchronisiert. (Patent angemeldet)

The MULTI 76 is a small, 3-axis, multi-purpose machine tool with the following advantages:

Modern and rigid design - High precision - Remarkable power - Easy and quick handling - Quick set-up changes - Minimum maintenance.

The machine, when equipped with the proper optional accessories, is capable of carrying out the following operations:

Centring - turning - threading - tapping - milling - milling of gears - milling of keyways - drilling - reaming and boring - grinding.

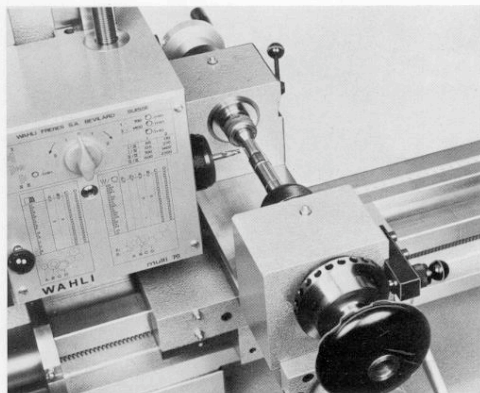
Thanks to its high precision and its versatility the machine can produce a large variety of mechanical components of every kind.

The MULTI 76 has been designed particularly for the following industries: tooling - model making - precision mechanical and electro-mechanical applications - instrument industry - repair and maintenance shops - prototype fabrication - laboratories - training shops - vocational schools, and so on.

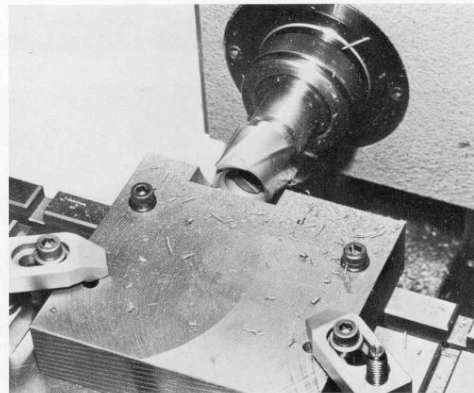
A demonstration of the MULTI will convince you!

The headstock is equipped with a spindle mounted on pre-loaded contact ball bearings, greased for life.

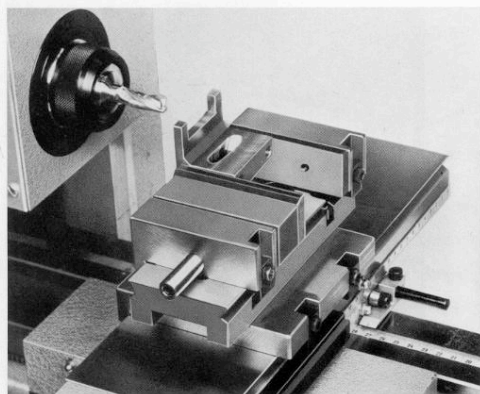
The lead screw drive is synchronized with the headstock spindle over its entire range of vertical displacement. (Patent deposited)



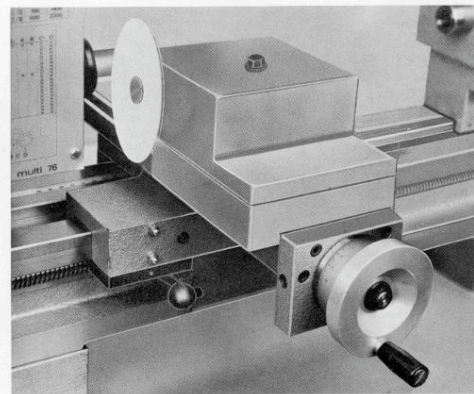
Fraisage d'une entrée de clavette
Fräsen einer Keilnute
Milling of keyway



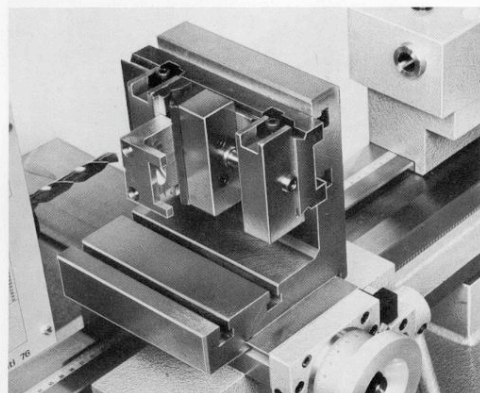
Gros fraisage
Grobfräsen (Schruppen)
Heavy milling



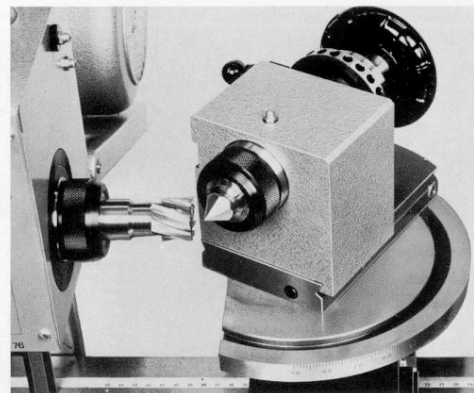
Fraisage
Fräsen
Milling



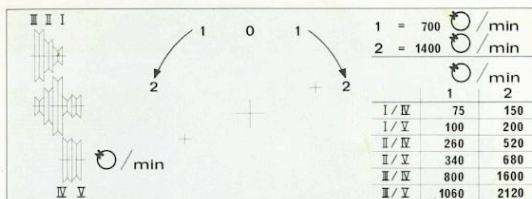
Meulage
Schleifen
Grinding



Perçage
Bohren
Drilling

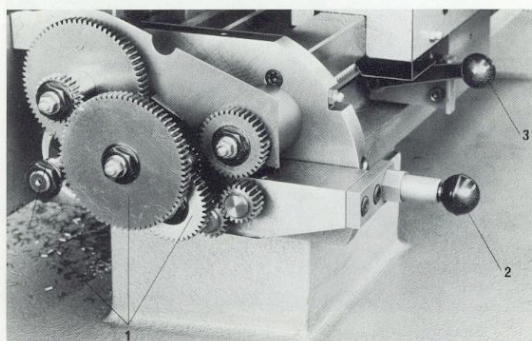


Fraisage de facettes
Fräsen einer Facettenspitze
Milling of multi-faceted point

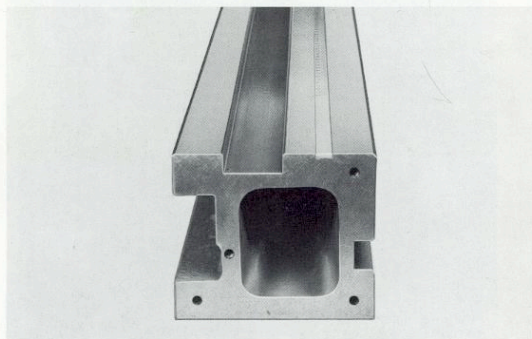


	A	B	C	D
0.2	24	72	21	70
0.25			21	56
0.3			27	60
0.35			21	40
0.4			24	40
0.45			27	40
0.5			30	40
0.6			36	40
0.7			42	40
0.75	48	48	21	56
0.8			24	60
1			30	60
1.25			36	48
1.5			42	48
1.75			48	40
2			50	40
2.5			54	36
3			60	30
3.5			64	24
4			72	24
4.5			80	24
5			90	24

	Z ₁	Z ₂	A	B	C	D
0.05	18	72	24	72	21	70
0.0625					21	56
0.075					27	60
0.0875					21	40
0.1					24	40
0.1125					27	40
0.125					30	40
0.15					36	40
0.175					42	40
0.1875					21	56
0.2					24	60
0.25					30	60
0.3125					36	48
0.375					42	48
0.4375					48	40
0.5					50	40
0.625					54	36
0.75					60	30
0.875					64	24
1					72	24
1.125					80	24
1.25					90	24

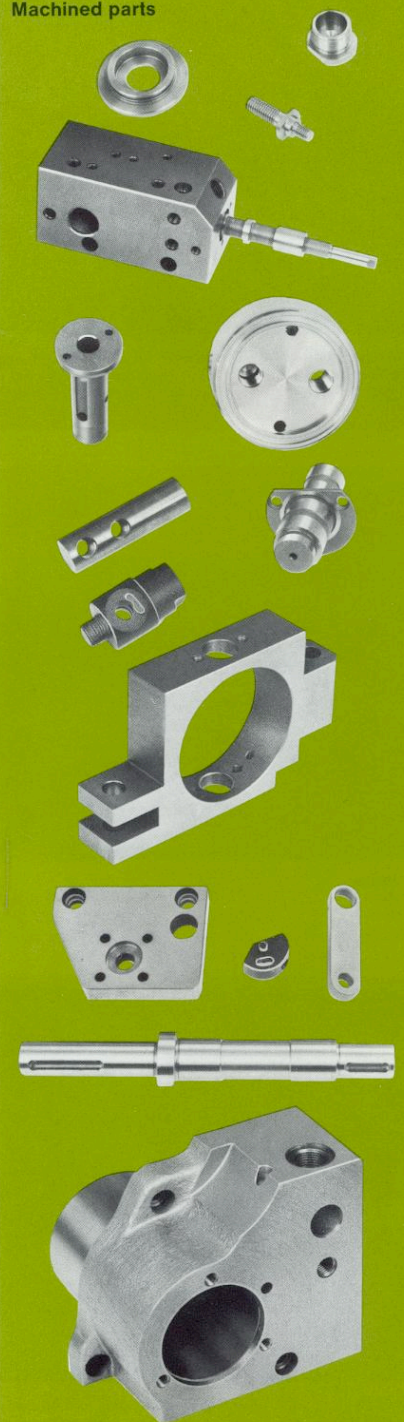


- 1 Roues de filetage et d'avances
Wechselräder für Gewindeschneiden und automatischen Vorschub
Gear wheels for threading and automatic feed
- 2 Levier d'inversion
Hebel für Drehsinnwechsel
Inversion lever
- 3 Levier de débrayage de l'écrou
Ausschalthebel für die Mutter
Lever for disengaging nut



Profil du banc (brevet déposé)
Profil des Maschinenbettes (Patent angemeldet)
Profile of machine bed (Patent deposited)

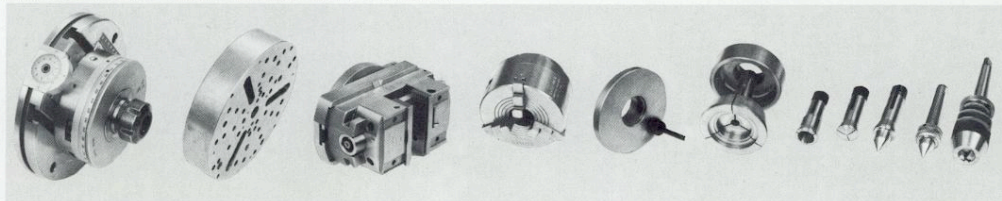
Pièces usinées Bearbeitete Werkstücke Machined parts



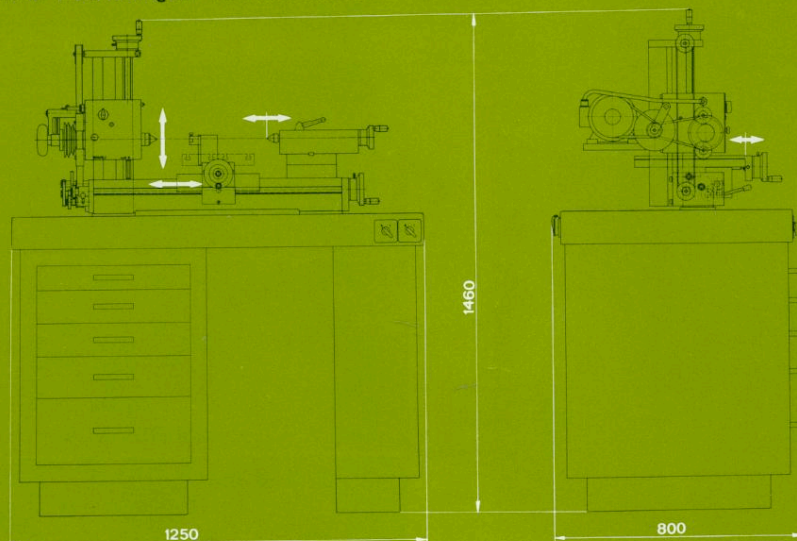
Accessoires - Zubehör - Accessories

Article No	Désignation Bezeichnung Description			
76-22.000	Commande à levier du chariot transversal Hebelsteuerung des Querschlittens Lever control for cross slide	1,350 kg		8,200 kg
76-27.000	Semelle pivotante (180 degrés) Schwenkbare Auflage (180 Grad) Swivelling support (180°)	76-22.000		76-27.000
76-25.000	Table (surface utile 250 mm x 190 mm) Aufspanntisch (nützliche Fläche 250 mm x 190 mm) Clamping table (working surface 250 x 190 mm / 9.84 x 7.48")			8,800 kg
76-26.000	Equerre (surface utile 150 mm x 150 mm) Aufspannwinkel (nützliche Fläche 150 mm x 150 mm) Angle plate (working surface 150 x 150 mm / 5.9 x 5.9")	9,900 kg	76-25.000	76-26.000
76-28.000	Diviseur (avec disque de 24 divisions) Teilvorrichtung (mit Teilscheibe für 24 Schaltungen) Dividing attachment (with indexing disc for 24 divisions)			
76-29.000	Contre-poupée pour diviseur Reitstock für Teilvorrichtung Tailstock for dividing attachment	8,200 kg	76-28.000	7,100 kg
76-24.000	Chariot pivotant Schwenkbarer Schlitten Swivelling slide	6,100 kg		
76-30.000	Etau (largeur mors 85 mm, ouverture maxi 80 mm) Schraubstock (Backenbreite 85 mm, Spannweite max. 80 mm) Vise (width of jaws 85 mm / 3.35", max. opening 80 mm / 3.15")		5,200 kg	
76-36.000	Support à main Handauflage Hand support	1,200 kg	76-36.000	
76-23.100	Support porte-burin Stahlhalter-Sohle Toolholder base	1,950 kg	76-23.100	
76-23.200	Porte-burin Stahlhalter Tool holder	0,250 kg	76-23.200	
76-35.000	Dispositif d'arrosage Kühlungsvorrichtung Coolant unit			
76-21.200	Jeu complet de roues pour dispositif de filetage et d'avances (19 pièces) Vollständiger Satz Wechselräder für Gewindegewinde- und Vorschubvorrichtung (19 Stück) Complete set of change gears for screwcutting and feed attachment (19 gears)	11,900 kg	76-35.000	4,820 kg
		76-21.200		

Autres accessoires - Anderes Zubehör - Other accessories



Encombrement - Abmessungen - Machine dimensions



Caractéristiques techniques

Hauteur de pointes	120 mm
Distance entre-pointes	350 mm
Course verticale	160 mm
Course transversale du chariot	180 mm
Course broche contre-poupée à vis	60 mm
Cône intérieur de la broche contre-poupée	Morse 2
Hauteur de broche poupée depuis banc	70 à 230 mm

Avances automatiques	0,05 à 1,25 mm/tour
Filetage pas de	0,2 à 5 mm
Moteur à deux vitesses, puissance	0,25 / 0,4 kW
12 vitesses broche poupée	
75 - 100 - 260 - 340 - 800 - 1060 min ⁻¹	
150 - 200 - 520 - 680 - 1600 - 2120 min ⁻¹	
Nez de broche	SCHAUBLIN W 20

Technische Daten

Spitzenhöhe	120 mm
Spitzenweite	350 mm
Senkrechter Hub	160 mm
Querhub des Schlittens	180 mm
Reitstockspindelhub (auf Schraube)	60 mm
Innerer Konus der Reitstockspindel	Morse 2
Spindelhöhe über der Bank	70—230 mm

Automatische Vorschübe	0,05—1,25 mm/U
Gewinde mit Steigungen von	0,2—5 mm
Polumschaltbarer Motor, Leistung	0,25 / 0,4 kW
12 Spindeldrehzahlen:	
75 - 100 - 260 - 340 - 800 - 1060 min ⁻¹	
150 - 200 - 520 - 680 - 1600 - 2120 min ⁻¹	
Spindelrinne	SCHAUBLIN W 20

Technical Data

Height of centers	120 mm (4.72")
Distance between centers	350 mm (13.78")
Vertical displacement	160 mm (6.30")
Transversal displacement of cross slide	180 mm (7.09")
Displacement of counterheadstock spindle (on screw)	60 mm (2.36")
Inside taper of counterheadstock spindle	Morse 2
Height of spindle over the bench	70—230 mm (2.75"—9.06")

Automatic feeds	0,05—1,25 mm/Rev. (0.002—0.049")
Threading from pitch	0,2—5 mm (0.008"—0.197")
2-speed motor	power 0,25 / 0,4 kW (0,34/0,54 HP)
12 spindle speeds:	
75 - 100 - 260 - 340 - 800 - 1060 min ⁻¹	
150 - 200 - 520 - 680 - 1600 - 2120 min ⁻¹	
Spindle nose	SCHAUBLIN W 20

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Représentant / Vertretung / Agent:

Imprimé en Suisse A AG 10000 1.77

WAHLI

INSTRUCTION multi 76

for starting - up, setting and maintenance

Valid from MACHINE No 151

Machine No:

Customer:

WAHLI FRERES S.A., MACHINE TOOL MANUFACTURERS

CH - 2735 BÉVILARD/SUISSE

Telephone: 032 92 13 23

Telex: 34 168

M U L T I 76**CONTENTS****Page**

Technical data «Multi 76»	2
Lifting, installation, cleaning, electrical supply and lubrication	3
Bed	4
Vertical column	5
Electric motor drive	6
Headstock	7
Saddle with leadscrew drive	8
Tailstock	9
Thread cutting and feed attachment	10
Table of change wheels for cutting a Whitworth thread	
Wiring diagram W 76 / W 78	
Accessories MULTI 76 / 78	

TECHNICAL DATA FOR «MULTI 76»

Center height	125 mm (4.92")
Distance between centers	350 mm (3.78")
Vertical travel	160 mm (6.3")
Saddle transverse stroke	180 mm (7.09")
Automatic feeds	0,05 to 1,25 mm (.002 to .049") /revolution
Thread cutting pitches from	0,2 to 5 mm (.0079 to .1969")
Complete set of change gears for screw cutting and feed attachment	No. of teeth: 21, 24, 24, 27 30, 36, 40, 40, 42, 48, 48, 48, 50, 54, 56, 60, 70, 72.
2-speed motor, power	0,25 / 0,4 kW
12 main spindle speeds	75–100–260–340–800–1060 min ⁻¹ 150–200–520–680–1600–2120 min ⁻¹

Headstock

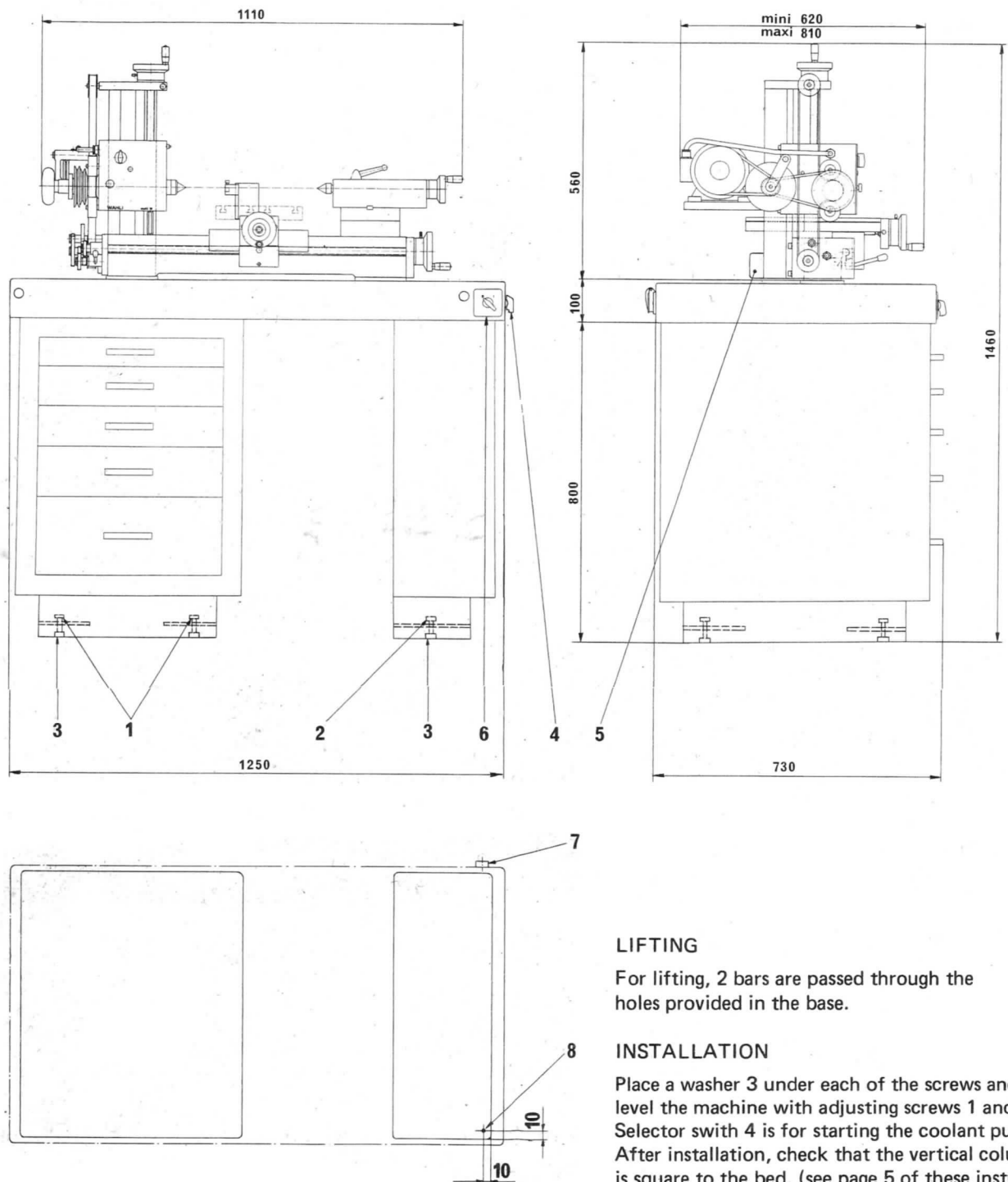
Height of main spindle over bed	70 to 230 mm (2.76 to 9.06")
Spindle nose taper	Schaublin W 20
Spindle nose external thread	M37,6 x 3
Parallel location on spindle nose	Ø 37.97 x 10 mm (1.4949 x .39")
Spindle bore	Ø 20 mm (.78")
Through bore with standard collet	Ø 14,5 mm (.58")

Tailstock

Barrel travel	Up to machine No. 190 60 mm (2.36")
	From machine No. 191 95 mm (3.74")
Barrel internal taper	Morse 2

Weight

Multi without tray and stand	135 kg (297 lbs)
Multi with tray, stand and cupboard	350 kg (770 lbs)



LIFTING

For lifting, 2 bars are passed through the holes provided in the base.

INSTALLATION

Place a washer 3 under each of the screws and level the machine with adjusting screws 1 and 2. Selector switch 4 is for starting the coolant pump. After installation, check that the vertical column is square to the bed. (see page 5 of these instructions).

CLEANING

Remove all rust preventive grease with a clean cloth soaked in parafin.

ELECTRICAL CONNECTION

Before connecting the machine to the supply, check that the supply voltage agrees with that stamped on the name plate on the motor.

If the machine is supplied without the base, connect the supply to socket 5.

If the machine is supplied with the base, the mains lead is fed through sleeve 7 and connected to the main switch 6.

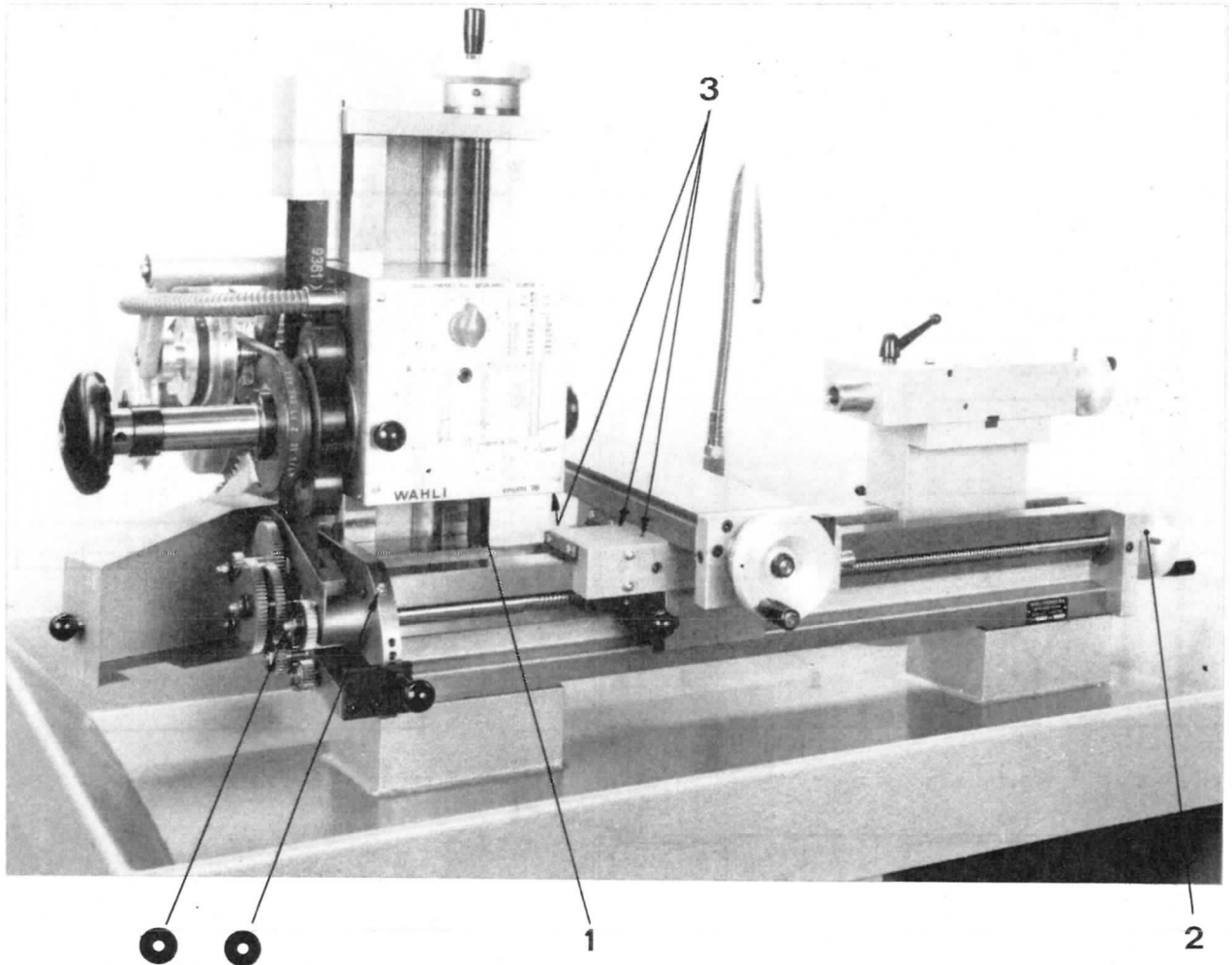
If the supply cable is brought up from underneath, entry is at 8 and connection to the main switch at 6.

Should the direction of rotation be incorrect, two phases of the incoming supply must be changed over.

LUBRICATION

All parts are described in the following pages. Those provided with lubrication points are marked thus: . All lubrication points, dependent on use, should be lubricated at least daily with a good quality mineral oil. (Viscosity 2,5 to 3,5° E at 50° C).

The main spindle and motor bearings are lubricated with long life grease which should be sufficient for approximately 10'000 hours operation.



BED

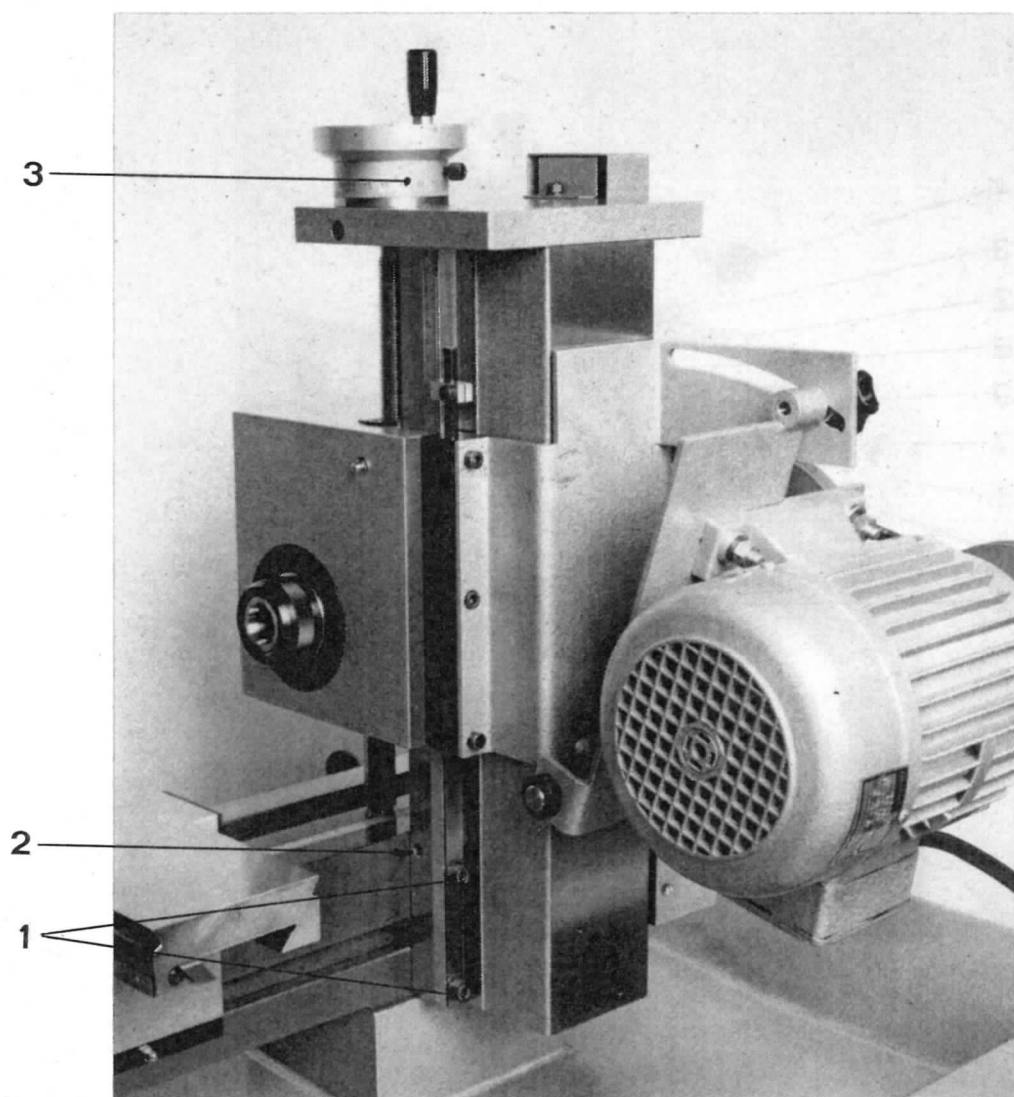
Equipment

Two slip gauges are supplied with each machine. The 65 mm (2.5591") slip is used to align the headstock accurately with the tailstock for working between centers. The 17 mm (.6693") slip is fitted when not working between centers in order to prevent swarf entering the slip location bore.

3 tapped holes are provided under the headstock and on the saddle which can be used by the customer to attach a protective apron of some soft material to protect the bed from damage and to avoid accumulation of swarf.

Longitudinal feed

One division on handwheel 2 gives a saddle movement of 0,02 mm (.0008")



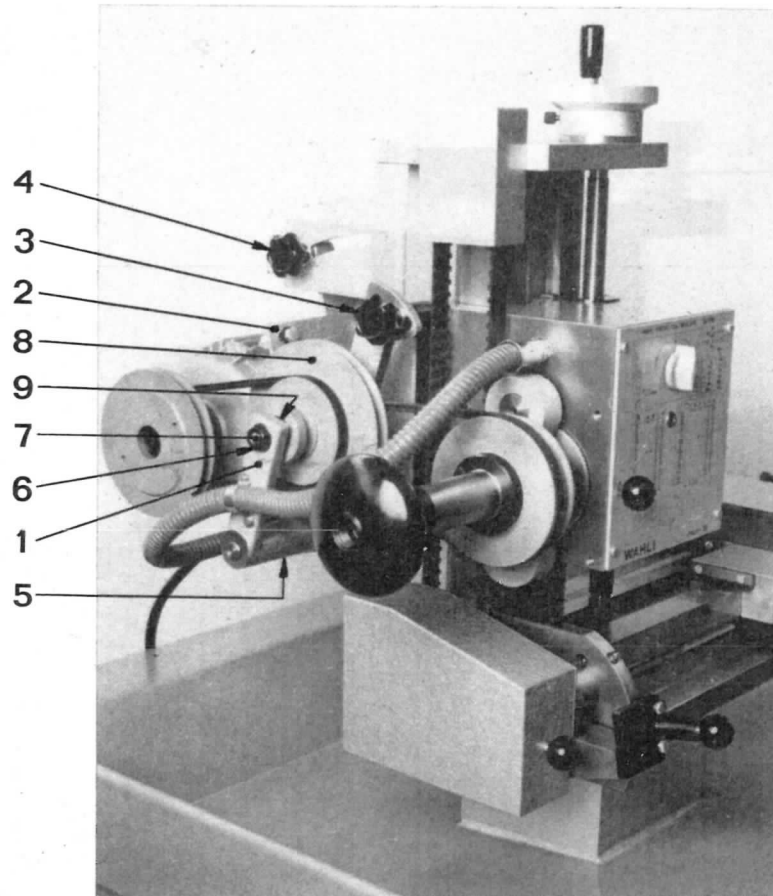
VERTICAL COLUMN

Setting perpendicularity

The vertical column can be set square to the bed. Slacken the four screws 1, adjust the vertical column about the pivot point with the two screws 2, then tighten the screws 1 again.

Vertical travel

One division on scale drum 3 relates to a vertical displacement of the headstock of 0,01 mm (.0004").



ELECTRIC MOTOR DRIVE

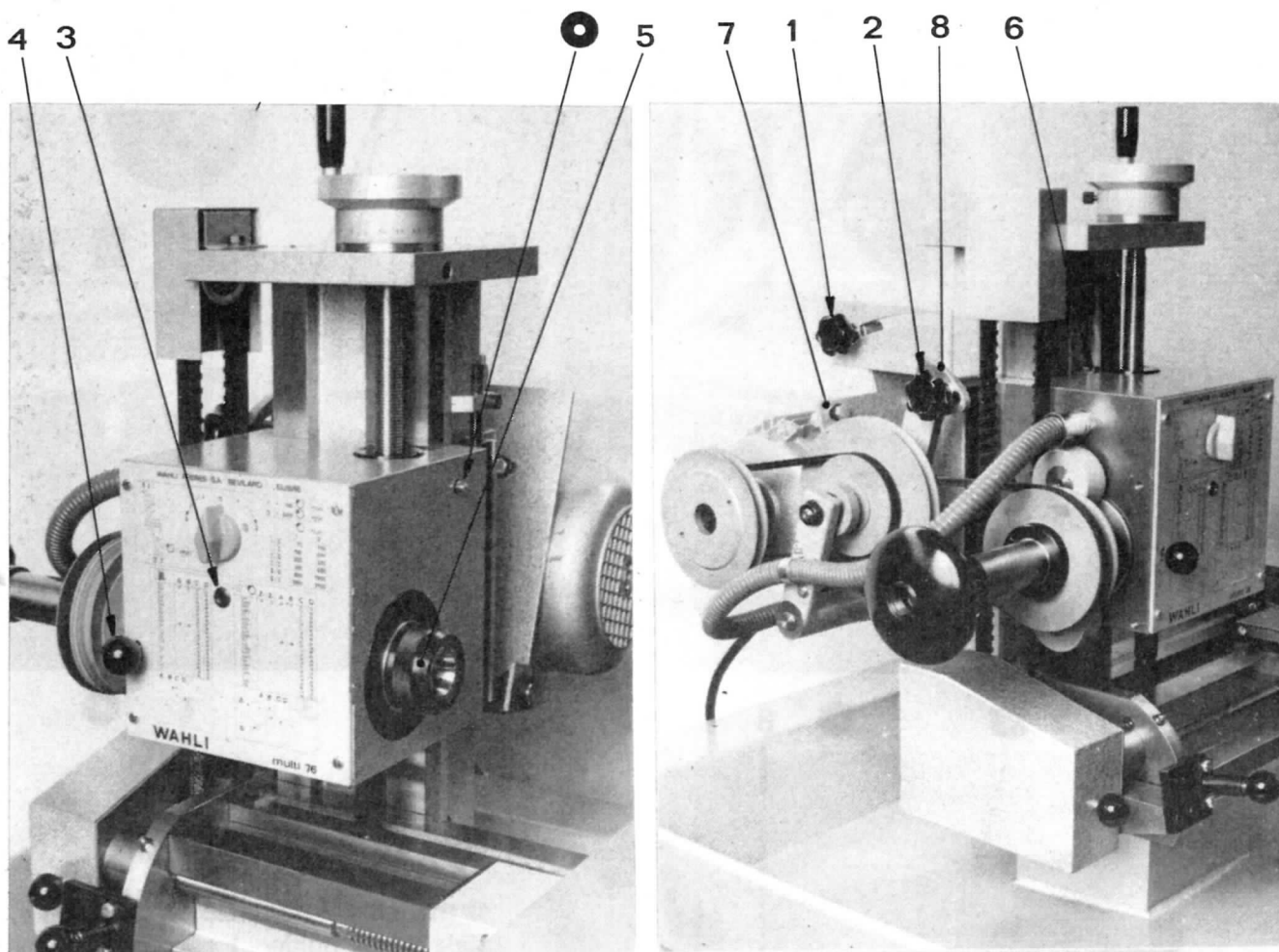
The tension of the V-belts is adjusted with bracket 1, motor plate 2 and the star-grips 3 and 4.

Drive belts

The main spindle is driven by two V-belts, section 10x6Z, inside length 540 mm. A «Power Grip» timing belt type 420 L 075 M4N4 drives the feed spindle.

Changing a belt

To change a drive belt they should first be slackened and then star grip 4 tightened. Remove star grip 3 and after slackening screw 5, pull bracket 1 forwards. Remove nut 6, pull out spindle 7 and remove belt pulley 8. Replace the V-belt, then re-assemble in the reverse order. Do not forget to replace the spacer sleeve 9 between the pulley bearing 8 and bracket 1.



HEADSTOCK

The main spindle runs in 2 angular contact bearings. To avoid damage to the bearings, no blows should be struck on the spindle.

Spindle speeds

12 spindle speeds are available. They are listed on the front plate. To move the V-belts from one step to another, slacken the star grips 1 and 2 and pivot the brackets 7 and 8. The headstock can be clamped in any position with the screw 3.

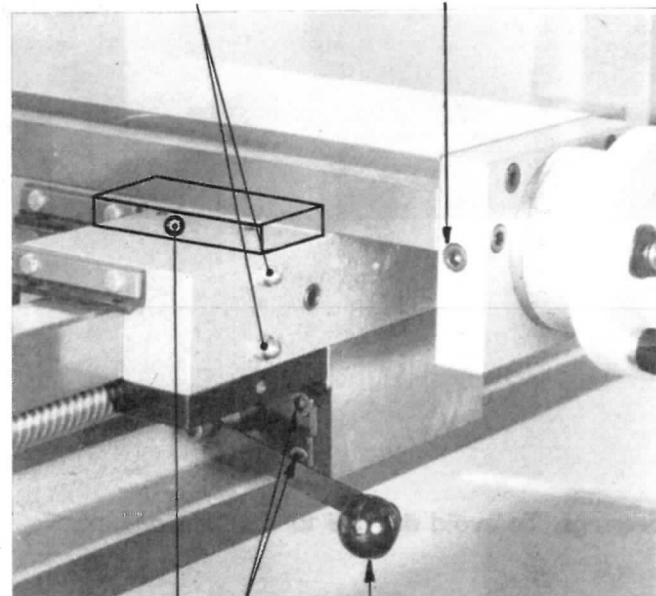
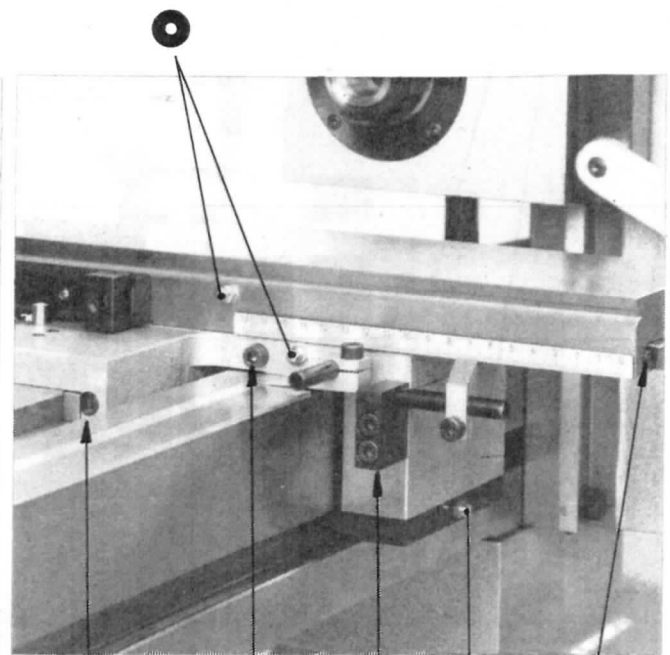
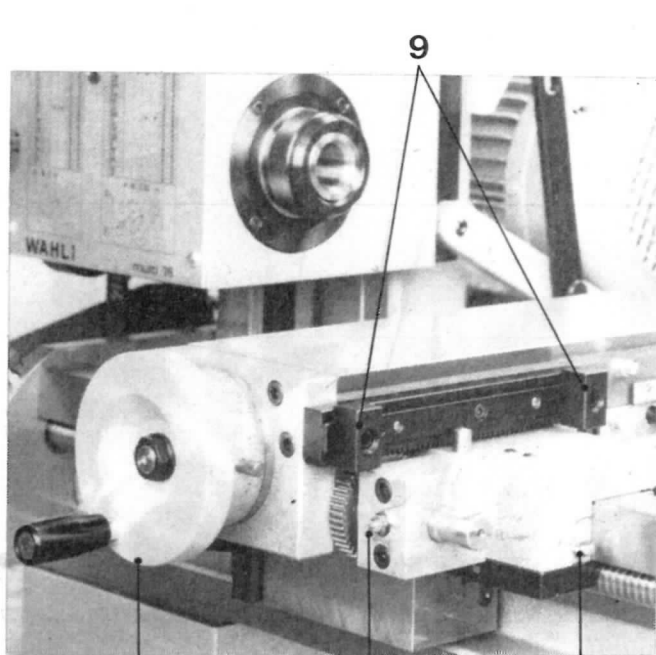
Spindle locking attachment

To lock the spindle, depress knob 4 to engage the spring loaded plunger in a hole in the perforated disc.

Protective nut 5 should always be fitted to avoid damage to the spindle nose thread.

Adjusting the play in the headstock slide

A tapered gib strip is used to adjust the play in the headstock slide. Setting is with the aid of screw 6.



SADDLE POWER FEED

If the table is mounted on the cross slide, index holder 1 must be removed and screwed into the tapped hole provided on the saddle.

Cross feed

One division on the handwheel 2 gives a movement of the cross slide of 0,01 mm (.0004"). The cross slide can be clamped with screws 3. From machine No. 191, the cross slide is clamped with screw 10.

Adjusting the play in the saddle and the half nut

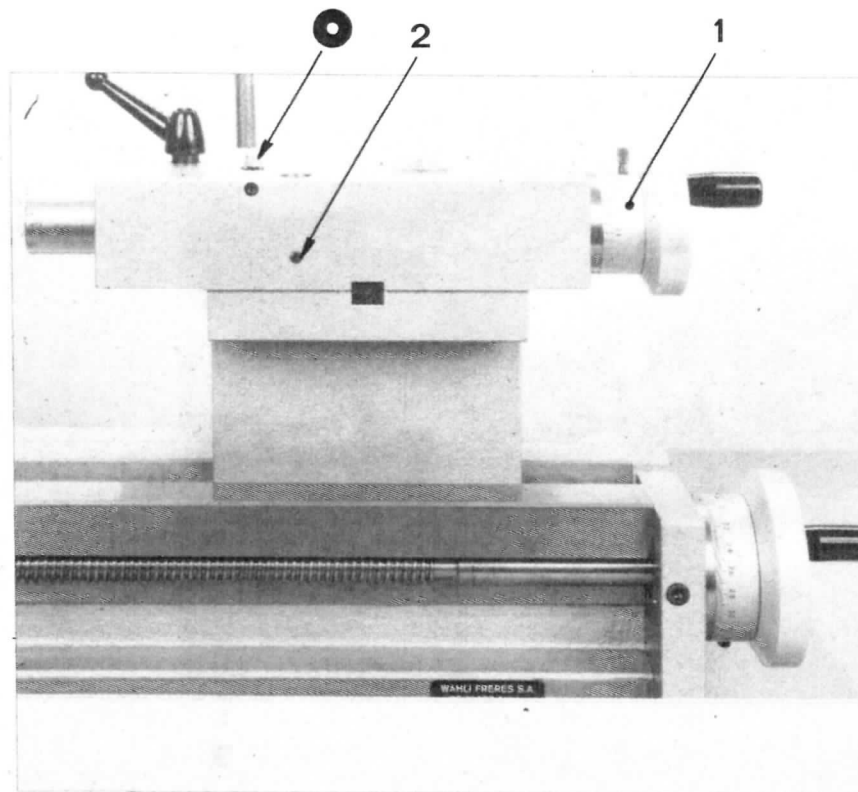
Two tapered gib strips are provided for the adjustment of play in the saddle and the cross slide. Adjustment is with screws 4 and 5.

To adjust the play in the half nut, slacken the two screws 6, press the half nut against the lead screw and tighten the two screws 6 again.

Spring loaded lever 7 is used to engage and dis-engage the saddle feed.

Lever operation of cross slide

To use the hand lever movement on the cross slide, remove screw 8 and retract handwheel 2 sufficiently to provide the travel required. Stops 9 on the rack are used to limit the stroke.



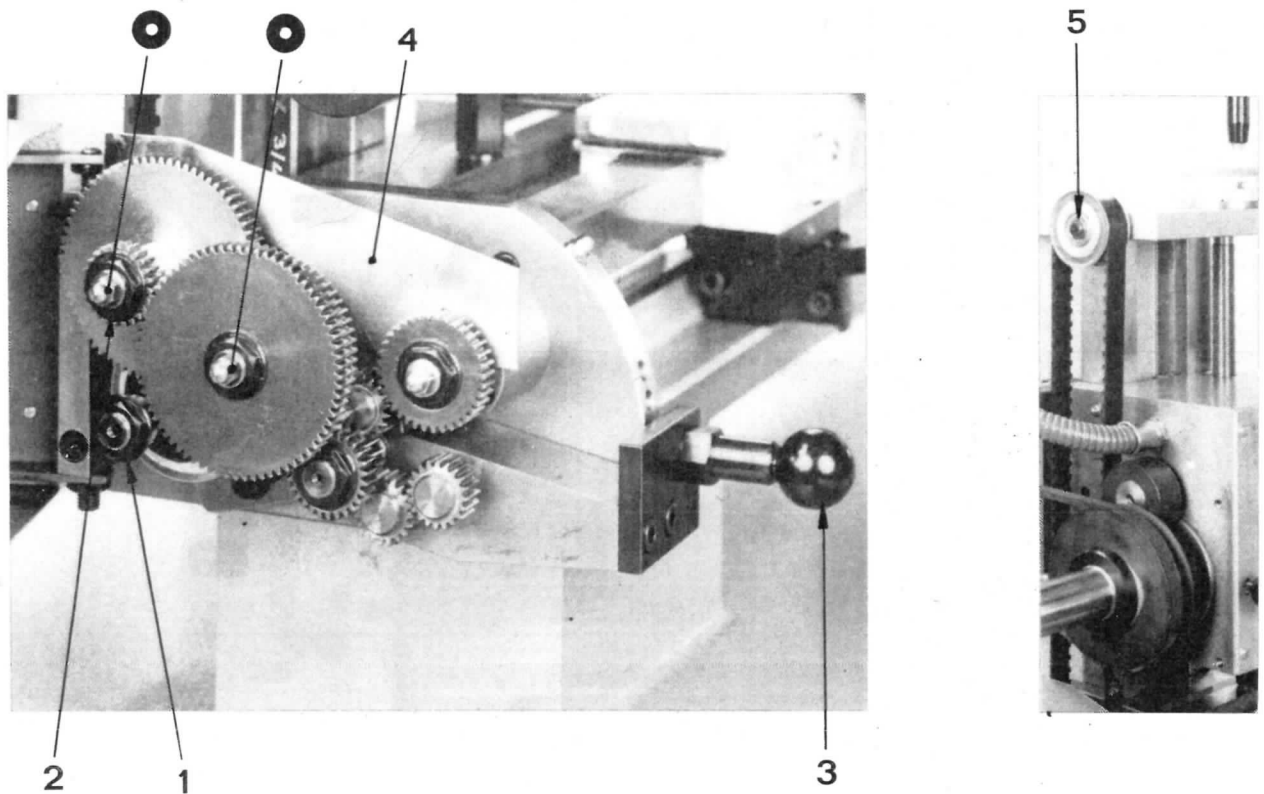
TAILSTOCK

One division on handwheel 1 relates to a barrel travel of 0,1 mm (.004").
From machine No. 191, each division relates to a travel of 0,02 mm (.0008").

An extractor is fitted inside the barrel to simplify removal of the tailstock center.
Simply retract the barrel until the center is ejected.

Centering the tailstock

The tailstock is aligned horizontally with the headstock with the aid of the screws 2.
Vertical alignment is with the slip gauge 1 (see page 4) which is screwed to the bed.



SCREW CUTTING AND FEED ATTACHMENT

Important:

For screw cutting the V-belt should always be on step I of the motor pulley so that the main spindle rotates slowly.

Feed speeds and change gears for screw cutting

The change gears required for specific rates of feed and for screw cutting are listed on the front plate on the headstock.

Wheel A is mounted on spindle 1 for screw cutting.

An additional pair of change wheels is required for power feed and wheel A is mounted on spindle 2.

Lever 3 is used to reverse the direction of the saddle feed, in the mid-position the power feed is disengaged.

Changing the timing belt

The feed wheels and the guard 4 must be removed to change the timing belt. Belt tension is adjusted with the eccentric spindle of the upper pulley 5.

**TABELLE DES ENGRENAGES
POUR:**

Filetage d'un pas Whitworth avec
vis mère métrique
Jeu de roues supplémentaires pour
pas Whitworth (9 pièces)
28-30-32-33-38-39-45-55*-
65*

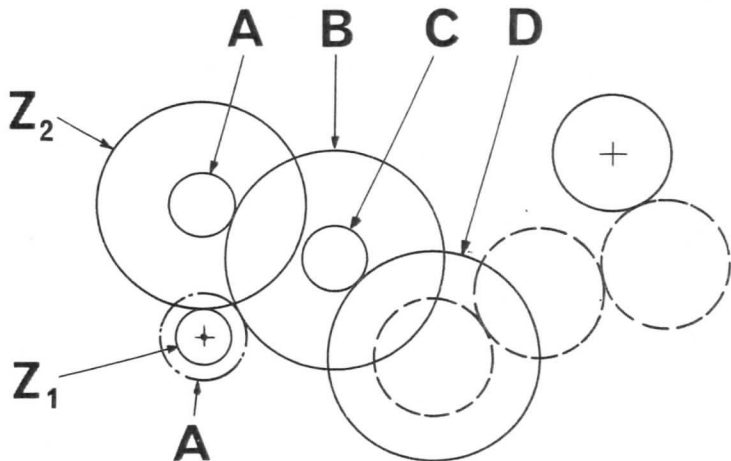
**TABELLE DER ZAHNRAEDER
ZUM:**

Schneiden eines Whitworth-Gewin-
des mit metrischer Leitspindel
Satz zusätzlicher Zahnräder für
Whitworth-Gewinde (9 Stücke)
28-30-32-33-38-39-45-55*-
65*

**A CHART OF GEAR WHEELS
FOR:**

Threading of Whitworth thread with
metric lead screw drive
Supplementary gear wheels set for
Whitworth thread (9 pieces)
28-30-32-33-38-39-45-55*-
65*

						
Nbre de filets au pouce Gangzahl auf 1 Zoll Number of threads per inch	Z₁	Z₂	A*	B*	C	D
80	18	72	55	65	30	40
72	18	72	55	65	30	36
64	18	72	55	65	30	32
60	18	72	55	65	30	30
56	18	72	55	65	30	28
48	18	72	55	65	45	36
44	18	72	55	65	45	33
40	18	72	55	65	45	30
36	18	72	55	65	45	27
32	18	72	55	65	45	24
28			55	65	30	56
24			55	65	30	48
20			55	65	30	40
19			55	65	30	38
18			55	65	30	36
16			55	65	30	32
14			55	65	45	42
13			55	65	45	39
12			55	65	45	36
11			55	65	45	33
10			55	65	45	30
9			55	65	40	24
8			55	65	45	24
7			55	65	45	21
6			55	65	60	24

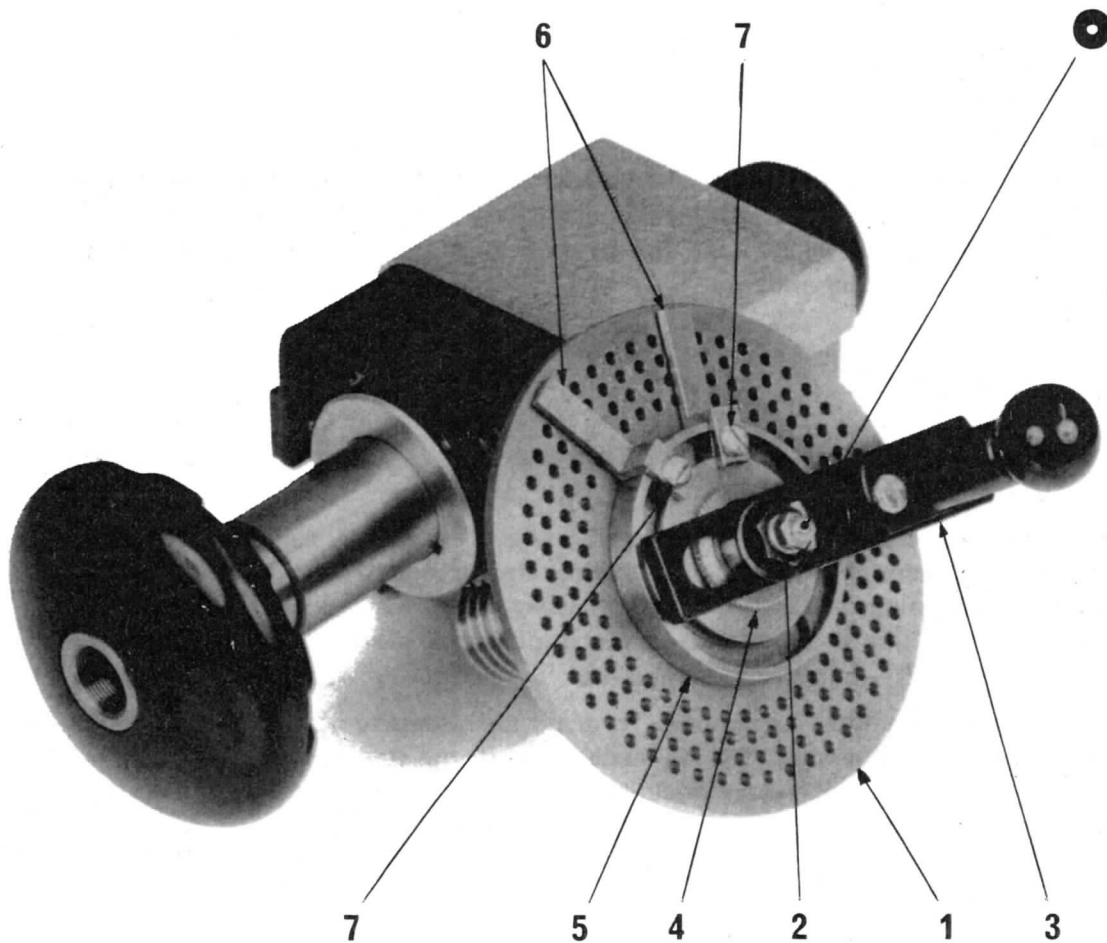


- * engrenages avec module 0,8
- * Zahnräder mit Modul 0,8
- * Gear wheels with module 0,8

ACCESSOIRES
ZUBEHOER
ACCESSORIES

multi 76
multi 78

- Dependent on the frequency of use, but at least once daily, the dividing unit should be lubricated with a good quality mineral oil (viscosity 2,5 to 3,5° E at 50° C).



Dividing head with 1 : 40 ratio (new model)

(These operating instructions are valid for dividing heads from No. 21)

With this additional accessory, a circle can be divided into «n» equal parts. The ratio of the worm drive on this attachment is 1/40. It is supplied with 4 perforated discs.

Perforated disc No. 1 with hole numbers: 15 – 16 – 17 – 18 – 19

Perforated disc No. 2 with hole numbers: 20 – 21 – 23 – 25 – 27

Perforated disc No. 3 with hole numbers: 29 – 31 – 33 – 37 – 39

Perforated disc No. 4 with hole numbers: 41 – 43 – 47 – 49

Calculation example

Assuming it is required to produce a hexagon, the spindle must be indexed to six equally spaced positions.

n = number of divisions (6)

$$\frac{40}{n} = \frac{40}{6} = \frac{20}{3} = 6 \frac{2}{3} = 6 + \frac{10}{15} \text{ or } 6 + \frac{14}{21} \text{ etc.}$$

The division between each position is therefore 6 turns of the handle plus 10 divisions on the 15-hole circle, or 6 turns of the handle and 14 divisions on the 21-hole circle. This means that perforated disc No. 1 with the 15-hole circle, or perforated disc No. 2 with the 21-hole circle must be used.

Setting the attachment

The dividing attachment is fitted on one of the two sides of the dividing housing, depending on the latter's position.

To change the perforated disc 1, remove nut 2, take off handle 3, remove knurled nut 4 and stop ring 5, unscrew the two screws securing the perforated disc and then change the disc. When re-assembling take care to insert the two spring washers between perforated disc 1 and stop ring disc 5. Set lever 3 so that the locating plunger engages either the holes in the 15- or 21-hole circle as required.

The six complete turns must be counted. To avoid the necessity of counting the 10 or 14 holes, the stop bars can be used. Set the angle between the stop bars so that there are 10 or 14 holes on the 15- or 21-hole circle between them. Slacken the screws 7 to set the stop bars.

TAILSTOCK WITH CAPSTAN HANDLE Art. 76—38.000

Lubrication

Lubricate with the barrel fully retracted to avoid the oil running out of the capstan spindle.

Centering the tailstock

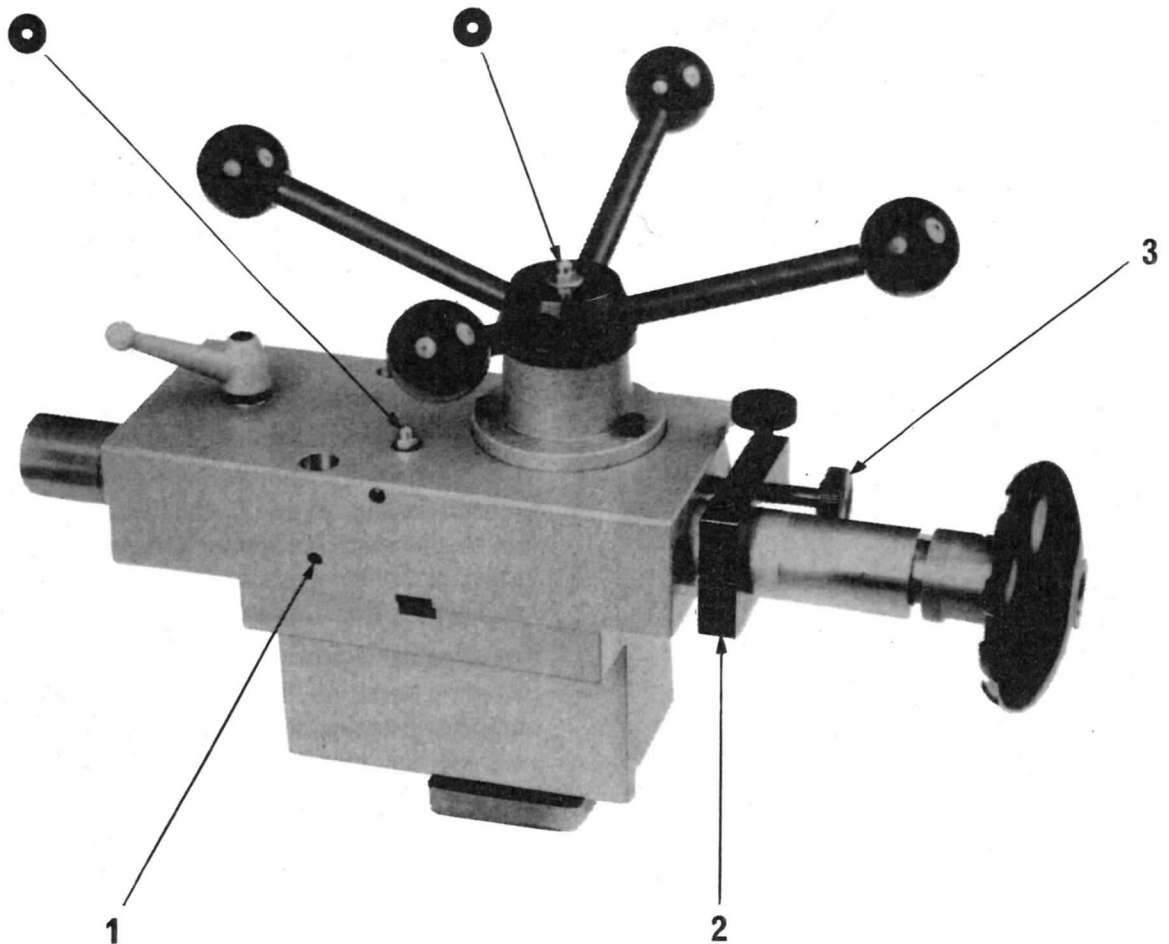
Screw 1 is used to center the tailstock in the horizontal plane.

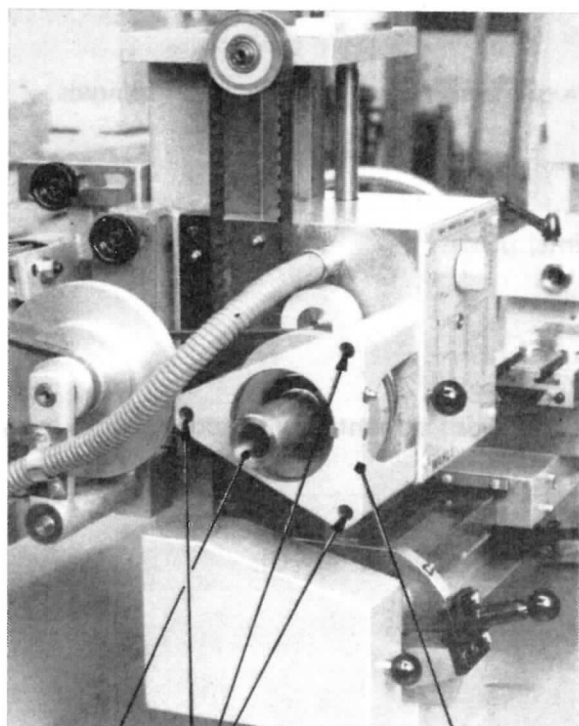
Setting the stroke of the barrel

The total stroke of the barrel is 100 mm (3.94")

Coarse setting of the stroke is achieved with clamp 2. Fine adjustment is with screw 3.

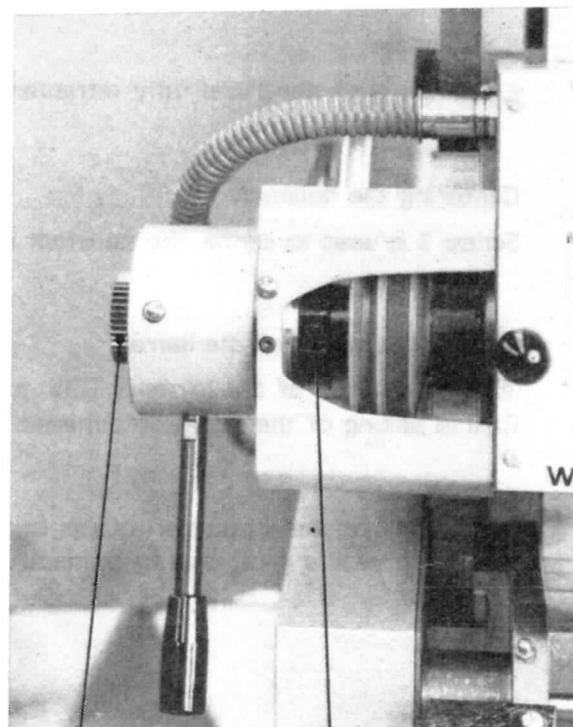
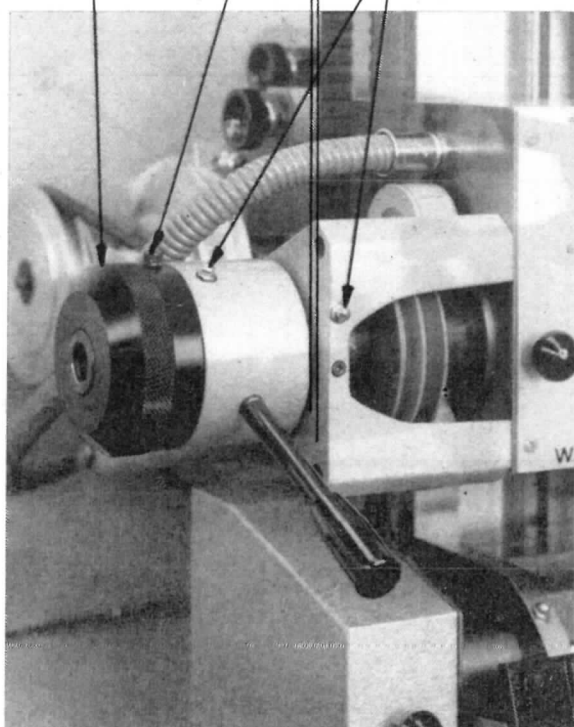
- Dependent on the frequency of use, but at least once daily, the dividing unit should be lubricated with a good quality mineral oil (viscosity 2,5 to 3,5° E at 50° C).





4 2 1

1-2mm Jeu Spiel Play



3 5

This attachment, for the rapid clamping of workpieces in the collets, is mounted on the headstock.

When mounting the attachment, it must be accurately centered.

The manual drawbar is removed. Fit bracket 1, but do not tighten the 3 screws 2. Push the attachment with setting sleeve 3 onto spindle 4, press it up against the belt pulley locknut and tighten screw 5. Fit a center or a collet in the spindle nose and screw in drawbar 6, without setting screw 7, until the center or the collet can be clamped. To center the attachment, clamp the center or collet, press bracket 1 against the headstock and tighten the 3 screws 2.

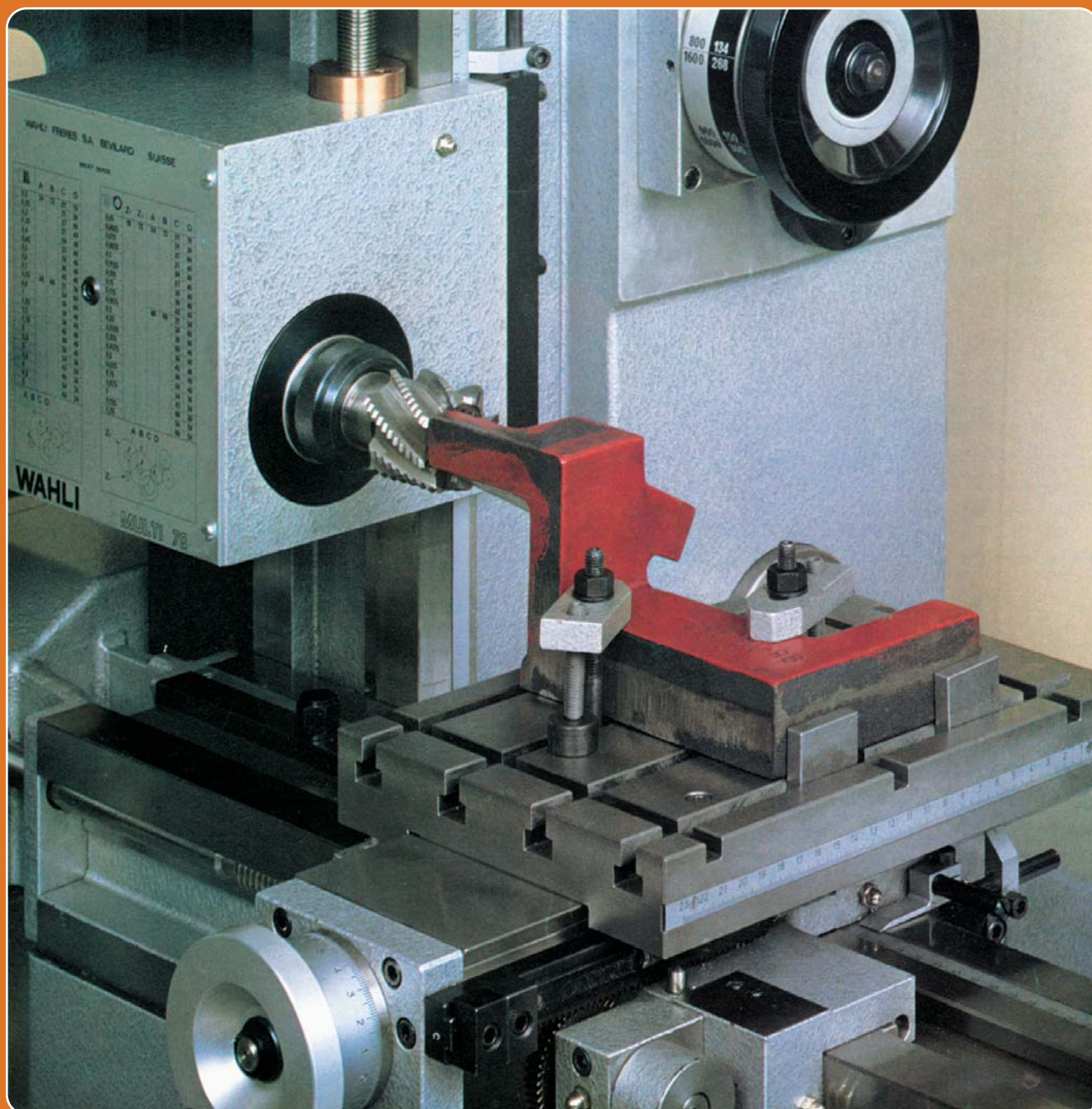
The drawbar 6 is screwed in or out to adjust the clamping force on the workpiece. When the correct clamping pressure has been set, tighten setting screw 7, ensuring that the cone point of the screw engages in a groove in setting sleeve 3.

The attachment should be lubricated every 5 hours through nipple 8.

Charpié SA

Atelier de mécanique

MULTI 78 Machine-outil de précision à usages multiples
Mehrzweck-Präzisions-Werkzeugmaschine
Multi-purpose precision machine tool



Route de Sorvilier 21
CH-2735 Bévillard

Tél. +41 (0)32 491 62 34
Fax +41 (0)32 491 62 35

MULTI 78



Le MULTI 78 est une petite machine—outil universelle de précision à 3 axes. Il est constitué par un banc de forme tubulaire très rigide et une colonne verticale basée sur le même principe. Cette colonne permet le déplacement de la poupée dans le plan vertical. La vis—mère actionne le déplacement du chariot longitudinal sur lequel est monté le chariot transversal. La reprise du jeu dans les trois axes se fait par lardons coniques.

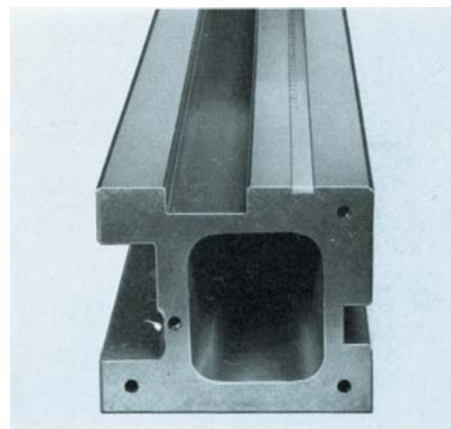
L'entraînement se fait par un variateur de vitesse et un réducteur. Ceci permet un réglage continu aisé et très rapide des nombres de tours de la broche, sans réducteur entre 300 et 3000 min⁻¹, avec réducteur entre 50 et 500 min⁻¹. Les roues de division pour les avances et les filetages sont logées dans un carter fermé avec bain d'huile.

Le MULTI 78 possède les avantages suivants:

Construction moderne et rigide — Grande précision — Broche de la poupée montée sur roulements à billes à contact oblique préchargés et graissés à vie — Entraînement de la vis—mère synchronisé avec la broche sur toute la course verticale de la poupée — Roues de division et toutes les parties coulissantes trempées et rectifiées — Manipulation aisée et rapide — Changements de mise en train rapides — Entretien réduit au minimum — etc.

Idéal dans n'importe quel domaine de la mécanique, le MULTI 78 permet d'exécuter toutes les opérations courantes: tournage, filetage, taraudage, centrage, perçage, alésage, fraisage, travaux de division, rectification intérieure et extérieure, etc., pour travaux en séries et pièces unitaires.

La qualité et la grande variété d'accessoires disponibles destinent les machines MULTI à tous les ateliers de mécanique, de réparation et d'outillage, laboratoires de recherche, écoles techniques et professionnelles, artisans, etc. Partout où des pièces en métal, matière synthétique, bois, etc. doivent être usinées de manière rapide, précise et rationnelle, les MULTI apportent une solution élégante tout en économisant la précieuse surface du sol dans les ateliers.



Profil du banc (brevet déposé)

Profil des Maschinenbettes (Patent angemeldet)

Profile of machine bed (Patent deposited)

MULTI 78

Die MULTI 78 ist eine kleine Mehrzweck—Präzisions—Werkzeugmaschine mit 3 Achsen. Sie besteht aus einem Hohlprofil—Bett und einer vertikalen Kolonne gleicher Bauweise. Diese Kolonne ermöglicht die vertikale Verschiebung des Spindelstockes. Mit Hilfe der Leitspindel wird der Längsschlitten, auf dem der Querschlitten montiert ist, verschoben. Das Spiel wird in den drei Achsen durch konische Keile aufgehoben.

Der Antrieb geschieht durch einen Variator und ein Reduktionsgetriebe. Dies ermöglicht ein bequemes und schnelles Einstellen der stufenlosen Drehzahlen, ohne Reduktionsgetriebe zwischen 300 und 3000 min⁻¹, mit Reduktionsgetriebe zwischen 50 und 500 min⁻¹. Die Wechselräder für den Vorschub und zum Gewindeschneiden befinden sich in einem geschlossenen Gehäuse mit Ölbad.

Die MULTI 78 bietet folgende Vorteile:

Moderne und starre Konstruktion — Grosse Präzision — Hauptspindel mit vorgespannten, mit Dauerschmierung versehenen Schrägkugellagern ausgerüstet — Antrieb der Leitspindel auf dem ganzen vertikalen Verstellweg mit der Hauptspindel synchronisiert — Wechselräder und alle Führungen gehärtet und geschliffen — Einfache und schnelle Handhabung — Kurze Umrüstzeit — Minimaler Unterhalt — usw.

Die MULTI 78 ist auf jedem Gebiet der Mechanik ideal und ermöglicht alle laufenden Operationen wie Drehen, Gewindeschneiden, Gewindebohren, Zentrieren, Bohren, Ausreiben, Fräsen, Teilarbeiten, Innen— und Aussenschleifen, usw. für Einzel- oder Serienfabrikation.

Dank der hohen Qualität und dem vielseitigen Zubehörprogramm werden die MULTI—Maschinen für folgende Industrie— und Gewerbebezweige besonders empfohlen: Mechanische Betriebe, Reparaturwerkstätten, Werkzeugbau, Forschungslabors, Lehrwerkstätten, technische Schulen, Kunsthandwerk, usw. Ueberall, wo Werkstücke aus Metall, Kunststoff, Holz, usw. schnell, genau und rationell bearbeitet werden müssen, bieten die MULTI—Maschinen eine elegante Lösung dar, und begnügen sich zudem noch mit einer kleinen Bodenfläche in der Werkstatt.

	A	B	C	D
0,2	24	72	21	70
0,25			21	56
0,3			27	60
0,35			21	40
0,4			24	40
0,45			27	40
0,5			30	40
0,6			36	40
0,7			42	40
0,75	48	48	21	56
0,8			24	60
1			30	60
1,25			30	48
1,5			36	48
1,75			42	48
2			40	40
2,5			50	40
3			54	36
3,5			42	24
4			60	30
4,5			54	24
5			60	24

	Z ₁	Z ₂	A	B	C	D
0,05	18	72	24	72	21	70
0,0625					21	56
0,075					27	60
0,0875					21	40
0,1					24	40
0,1125					27	40
0,125					30	40
0,15					36	40
0,175					42	40
0,1875			48	48	21	56
0,2					24	60
0,25					30	60
0,3125					30	48
0,375					36	48
0,4375					42	48
0,5					40	40
0,625					50	40
0,75					54	36
0,875					42	24
1					60	30
1,125					54	24
1,25					60	24

The MULTI 78 is a small position multi—purpose machine tool with up to 3 axes. It comprises a bed with a hollow profile and a vertical column of similar construction. The headstock can be moved vertically on this column. The saddle, which carries a cross—slide, is moved with a lead screw. Tapered gib strips are used to adjust the 3 primary slide movements.

The V—belt drive of the W 76 is replaced by a variator and reduction gear box on the model W 78. This permits easy and quick speed change through the range of 300 to 3000 min⁻¹ in indirect drive, and 50 to 500 min⁻¹ through the reduction gear box. In the lower speed range the motor power is doubled. The feed and thread change gears are in an enclosed housing with oil bath lubrication.

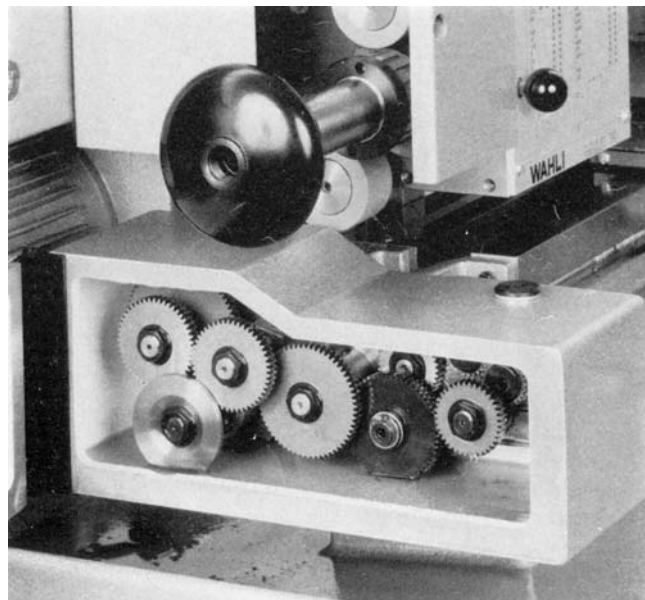
The MULTI 78 offers the following advantages:

Rigid, modern construction — high precision main spindle supported in pre—loaded taper roller bearings which are lubricated for life — lead screw drives synchronised over the complete headstock vertical travel with the rotation of the main spindle — change gears and all guideways hardened and ground — simple and rapid operation — short change over times — minimal maintenance — etc.

The MULTI 78 is ideally suited to all mechanical fields and can be used for all normal operations such as turning, tapping, thread cutting, centering, drilling, reaming, milling, dividing, internal and external grinding, etc. for one off and batch production.

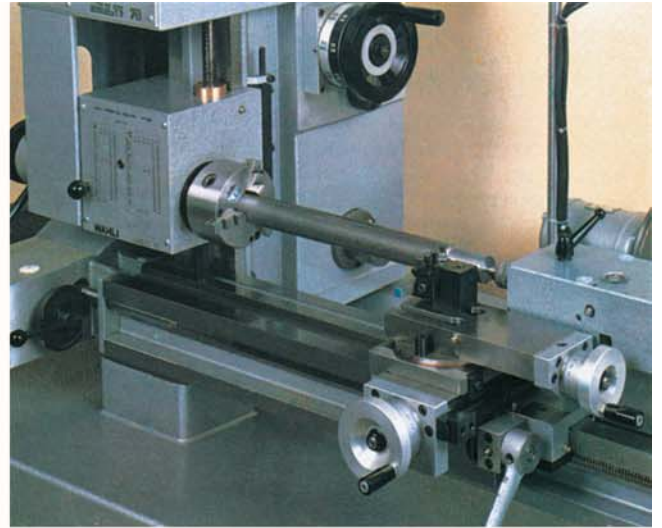
Through their high quality and comprehensive range of accessories the Multi—machines are particularly suitable for the following industrial and training purposes: mechanical workshops, repair workshops, toolrooms, research laboratories, apprentice schools, technical colleges, model shops, etc.

Wherever metal, plastic or wooden parts require quick, accurate and economic machining, the Multi—machines offer an elegant solution and take up the minimum of workshop floor space.

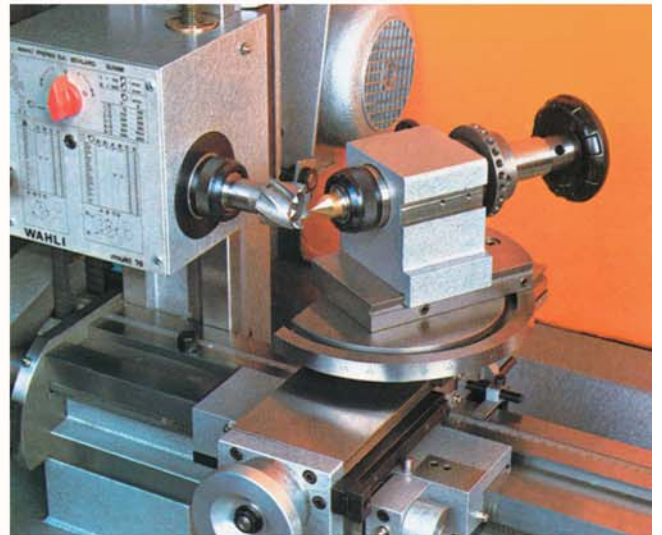


Roues de filetage et d'avances
Wechselräder zum Gewindeschneiden und
für den automatischen Vorschub
Gear wheels for threading and automatic feed

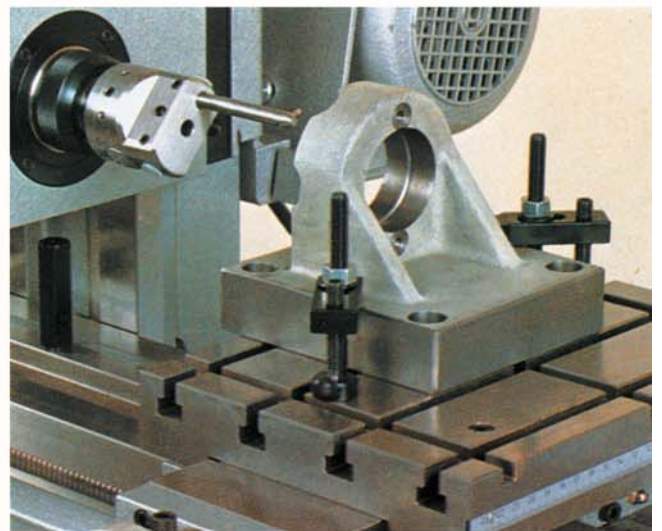
Pièces usinées
Bearbeitete Werkstücke
Machined parts



Tournage
Drehen
Truning

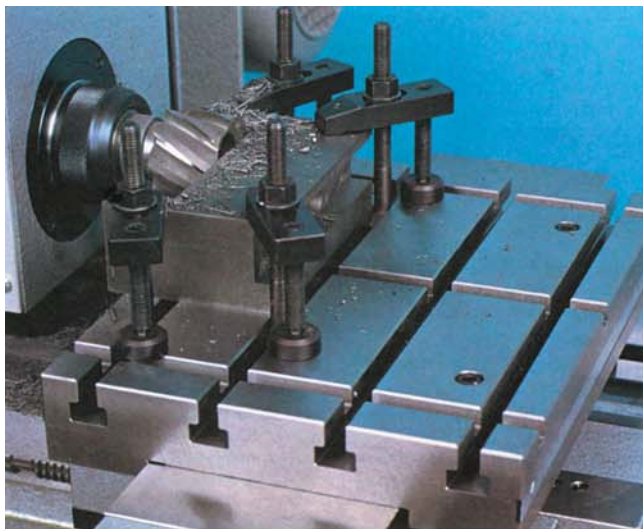


Fraisage de facettes
Fräsen einer Facettenspitze
Milling of multi-faceted point

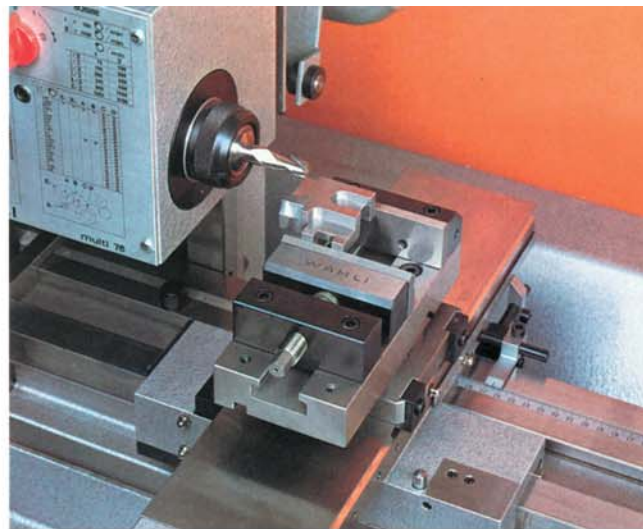


Tournage intérieur
 Ausdrehen einer Bohrung
 Boring hole

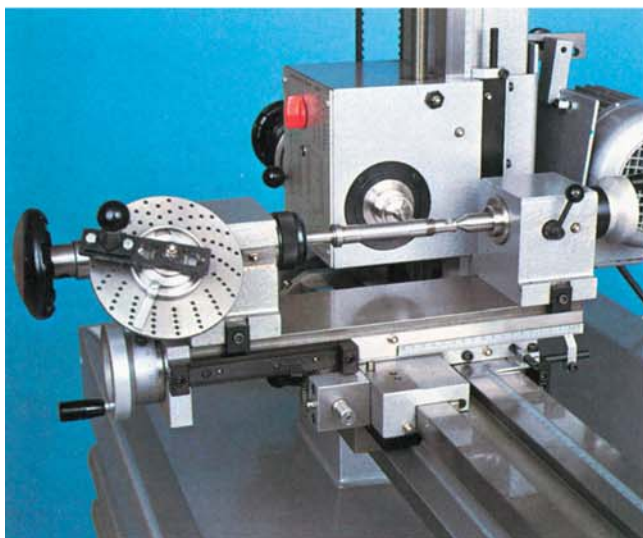
MULTI 78



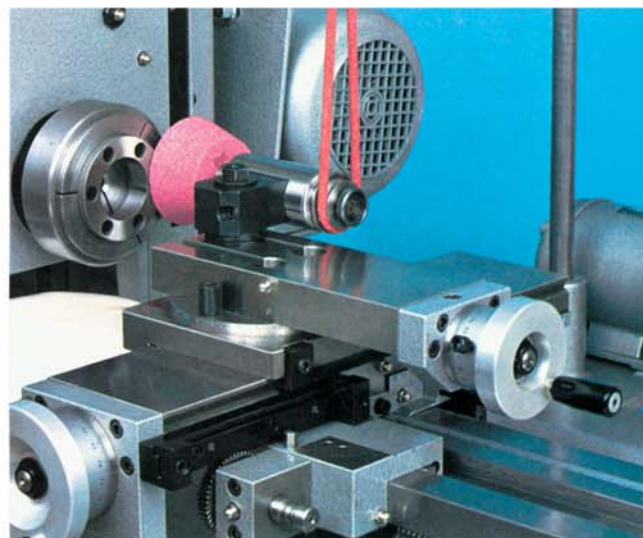
Gros fraisage
Grobfräsen (Schruppen)
Heavy milling



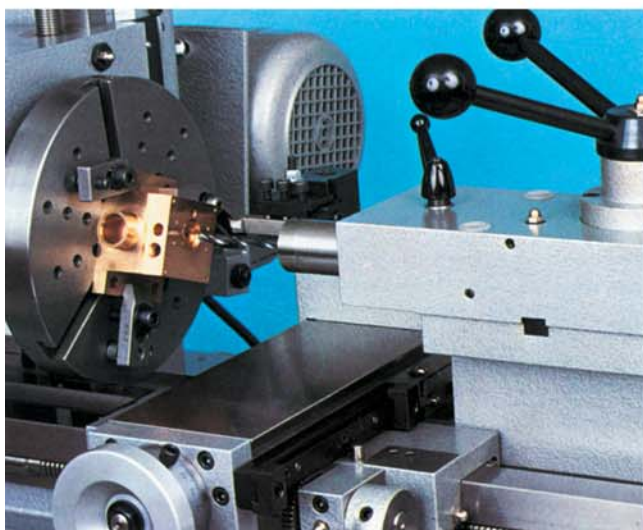
Fraisage
Fräsen
Milling



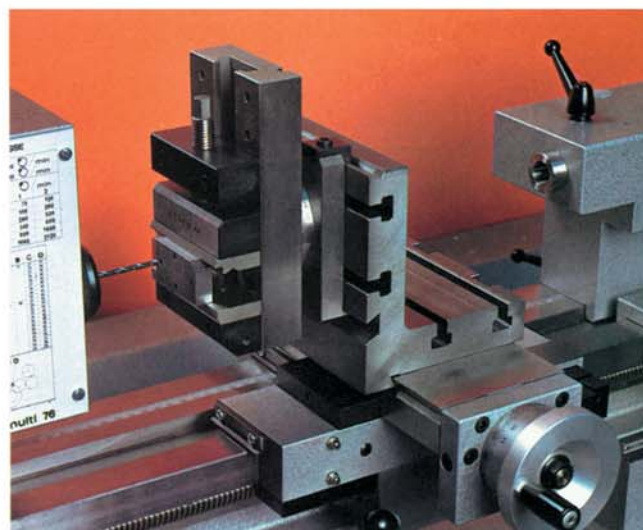
Fraisage d'une entrée de clavette
Fräsen einer Keilnute
Milling of keyway



Meulage
Schleifen
Grinding



Perçage
Bohren
Drilling



Perçage
Bohren
Drilling

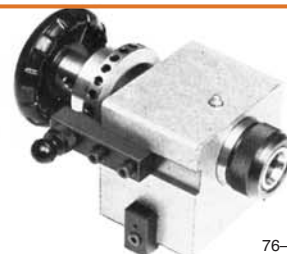
Accessoires chariot Zubehör Schlitten Accessories for slide

76-24.000

Chariot pivotant
Schwenkbarer Schlitten
Swivelling tool slide



76-24.000
6,100 kg



76-28.000
8,200 kg

76-28.000

Diviseur avec disque de 24 divisions
Teilvorrichtung mit Teilscheibe für 24 Schaltungen
Dividing attachment with indexing disc of 24 divisions

76-29.000

Contre-poupée pour diviseur
Reistock für Teilvorrichtung
Tailstock for dividing attachment



76-29.000
7,100 kg



76-28.100
8,300 kg

76-28.100

Appareil à diviser rapport 1:40, avec 4 disques perforés
(se monte sur art: 76-28.000)
Teilvorrichtung mit Verhältnis 1:40, mit 4 Lochscheiben
(wird auf Art. 76-28.000 montiert)
Dividing attachment on item 76-28.000

76-25.000

Table, surface utile 250x190 mm
Aufspanntisch, nützliche Fläche 250x190mm
Table, working surface 250x190 mm

76-25.200

Bride de serrage pour rainures à T 16 mm
Spannbride für T- Nuten 16 mm
Clamping device for T - slots 16 mm



76-25.000
9,900 kg



76-25.200
0,200 kg



76-26.000
8,800 kg

76-25.210

Jeu de 4 art. 76-25.200
Satz von 4 Art. 76-25.200
Set of 4 art. 76-25.200

76-26.000

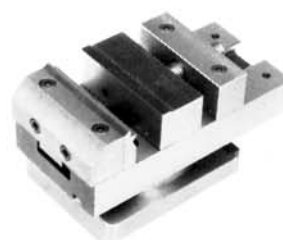
Equerre, surface utile 150x150 mm
Aufspannwinkel, nützliche Fläche 150x150 mm
Angle plate, working surface 150x150 mm

Etau comprenant art:
Schraubstock umfasst Art:
Vice including art:

76-30.000

et
und
and

Etau, largeur mors 85 mm, ouverture maxi 80 mm
Schraubstock, Backenbreite 85 mm, Spannweite max. 80 mm
Vice, width of jaws 85 mm max. opening 80 mm



76-30.000 +76-30.100
6,150 kg



76-27.000
8,200 kg

76-30.100

Support pivotant pour étau
Schwenkbarer Support für Schraubstock
Swivelling base for vice

76-27.000

Semelle pivotante 180 degrés
Schwenkbare Auflage 180 Grad
Swivelling base 180 degrees

76-22.000

Commande à levier du chariot transversal
Hebelsteuerung des Querschlittens
Lever control for cross-slide



76-44.000
1,350 kg

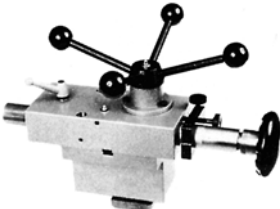
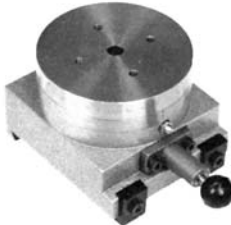
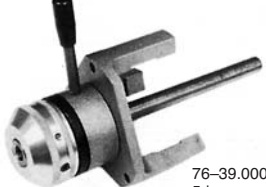


76-22.000
3,150 kg

76-44.000

Commande à levier du chariot longitudinal
Hebelsteuerung des Längsschlittens
Lever control for feed-slide

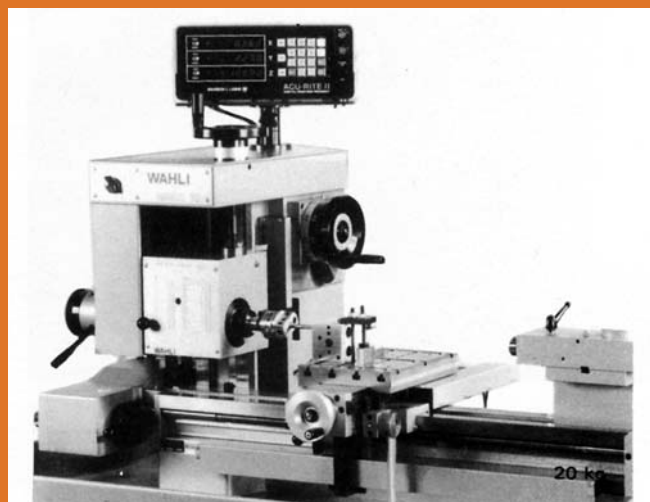
MULTI 78

Accessoires — Zubehör — Accessories			
Article No	Désignation	Bezeichnung	Description
76-38.000	Contre-poupée à croisillon (pour pince W-20) Reistock mit Kreuzgriff (für Spannzange W-20) Cross-handle operated tailstock (for collet W-20)		76-38.000 18,700 kg
76-40.000	Dispositif de commande par moteur indépendant pour appareil à rectifier Antrieb für Schleifapparat durch unabhängigen Motor Drive of grinding attachment through independent motor		76-40.000 18,200 kg
76-40.400	Support porte-diamant Diamanthalte-Support Diamond-holder support		76-40.400 2 kg
76-37.000	Plateau tournant Ø 100 mm, à disques interchangeables, livré avec disque de 24 divisions Drehtisch Ø 100 mm, mit auswechselbaren Scheiben, geliefert mit Teilscheibe für 24 Schaltungen Rotary table Ø 100 mm, with interchangeable discs, delivery with disc of 24 divisions		76-37.000 4,600 kg
76-37.150	Porte-pince biconique Ø de serrage 3-26 mm, pour pinces ESX 40 (se monte sur art. 76-37.000, livré avec clé à ergots) Spannzangen-halter, Spann-Ø 3-26mm, für Spannzangen ESX 40 (zur Montage auf Drehtisch 76-37.000, geliefert mit Hakenschlüssel) Two-tapers collet-holder Ø 3-26 mm, for collets EXS 40 (mounted on art. 76-37.000, delivery with stop-pin spanner)		76-37.150 2,200 kg
76-45.000	Butée à 4 arrêts réglables pour coulisse longitudinale Revolveranschlag mit 4 einstellbaren Anschlägen für den Längsschlitten Limit-stop with 4 adjustable stops for feed-slide		76-45.000 3,600 kg
76-46.005	Lunette fixe Feste Lünette Steady rest		76-46.005 2,800 kg
76-39.000	Dispositif de serrage rapide Schnellspannvorrichtung Device for rapid collect clamping		76-39.000 5 kg
76-42.000	Arrêt réglable pour poupée Einstellbarer Anschlag für Spindelstock Adjustable limit-stop for headstock		76-42.000 0,400 kg
76-21.200	Jeu complet de roues pour dispositif de filetage et d'avance, 18 pièces, avec étui Satz Wechselräder für Gewindeschneid- und Vorschubvorrichtung, 18 Stück, mit Holzetui Complete set of change gears for threading and feed attachment, 18 pieces, with box		76-21.200 2,400 kg
76-21.300	Jeu de roues supplémentaires pour pas whitworth, 9 pièces, avec étui Satz zusätzlicher Zahnräder für Whitworth-Gewinde, 9 Stück, mit Holzetui Set of additional wheels for whitworth thread 9 pieces, with wooden box		76-21.300 0,950 kg

MULTI 78

Accessoires — Zubehör — Accessories

Article No Désignation Bezeichnung Description



Affichage digital / Digitalanzeige / Digital display

Affichage digital de la position des 3 axesw X, Y, Z

Digitale Positionsanzeige der 3 Achsen X, Y, Z

Digital display of position 3 axis X, Y, Z

76-52.000

Pièces d'adaptation pour affichage digital

Anbauteile für digitale Positionsanzeige

Adaptation parts for digital display

76-52.000

Caractéristiques techniques

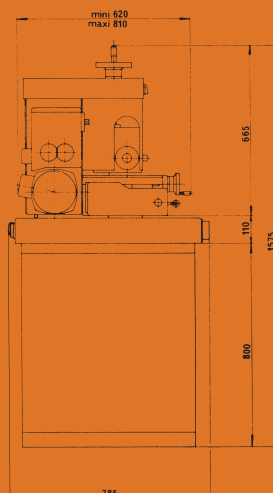
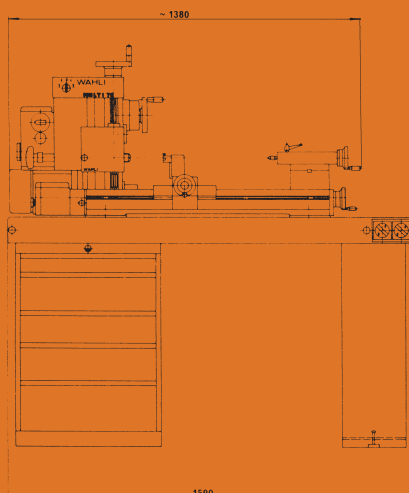
Hauteur de pointes
Distances entre—pointes
Courses verticales
Courses transversales du chariot
Courses broche contre—poupée à vis
Nez de broche standard
Cône de la broche contre—poupée
Hauteur de broche depuis banc
Avances automatiques
Filetages pas métriques
Filetages pas en pouces
80 — 6 filets par pouce
Moteur à 2 vitesses, puissance
Nombre de tours avec réducteur
Nombre de tours sans réducteur
Poids machine avec socle

Technische Daten

Spitzenhöhe
Spitzenweite
Vertikaler Weg des Spindelstockes
Querweg des Schlittens
Hub der Gegenspitze
Standard—Spindelausführung
Konus der Pinole
Spindelhöhe über dem Bett
Automatische Vorschübe
Gewindesteigungen metrisch
Gewindesteigungen Zoll
80 — 6 Steigungen pro Zoll
Polumschaltbarer Motor, Leistung
Drehzahlen mit Reduktionsgetriebe
Drehzahlen ohne Reduktionsgetriebe
Gewicht Maschine mit Sockel

Technical Data

Height of centers 125 mm
Distance between centers 550 mm
Spindle travel over bed 160 mm
Stroke of cross table 180 mm
Stroke of spindle 95 mm
Spindle nose (standard) SCHAUBLIN W 20
Spindle taper MORSE 2
Height of spindle over bed 70 — 230 mm
Automatic feeds 0,05 — 1,25 mm/t
Threading pitch metric 0,2 — 5 mm
Threading pitch inch 80 to 6 threads per inch
2—speed motor, power 0,5/0,9 kW
Speed range with reduction gear-box 50 — 500 min⁻¹
Speed range without reduction gear-box 300 — 3000 min⁻¹
Weight of machine with stand ~ 440 daN



Représentant / Vertretung / Agent :