

SERVICE AND INSTRUCTIONS MANUAL
FOR MAINTAINING THE

*VERTICAL TURRET
MILLING MACHINE*
KONDIA

MODEL FV-1-CNC

THIS BOOK CONTAINS USEFUL INSTRUCTIONS FOR THE
MAINTENANCE AS WELL AS FOR THE LOCATION; SO, WE
ADVISE TO CHECK CAREFULLY ALL THE DETAILS AS
THEY WILL BE REFLECTED PROFITABLY ON THE RESULT
AND LONG LIFE OF MACHINE

IMPORTANT: Whenever you write us with reference to this
machine or you request us spare parts for same, please
state besides of the reference number of the part you
request, the serial and number of machine it is for.

MODEL FV-1-CNC

CHARACTERISTICS

TABLE

Work area	1070 × 300 mm
Nº of T slots	3
Width of slots	16 mm
Distance between slots	65 mm

TRAVEL

Longitudinal (X)	600 mm
Cross	350 mm
Knee vertical (manual)	419 mm

HEADSTOCK

Spindle motor	3 HP
Speed range	60 - 4000 r.p.m.
Spindle taper	ISO-30 (Quick Change Nut)
Vertical travel	125 mm

FEEDS AND FEATURES

Rapid feed	6000 mm/min.
Maximum cutting speed	1500 mm/min.
Positioning accuracy	± 0,01
Repeatability	0,008
System resolution	0,001

WEIGHT AND MEASURES

Net weight	1,400 Kg
Gross weight	1,550 Kg
Floor space required	2400 × 1700 mm

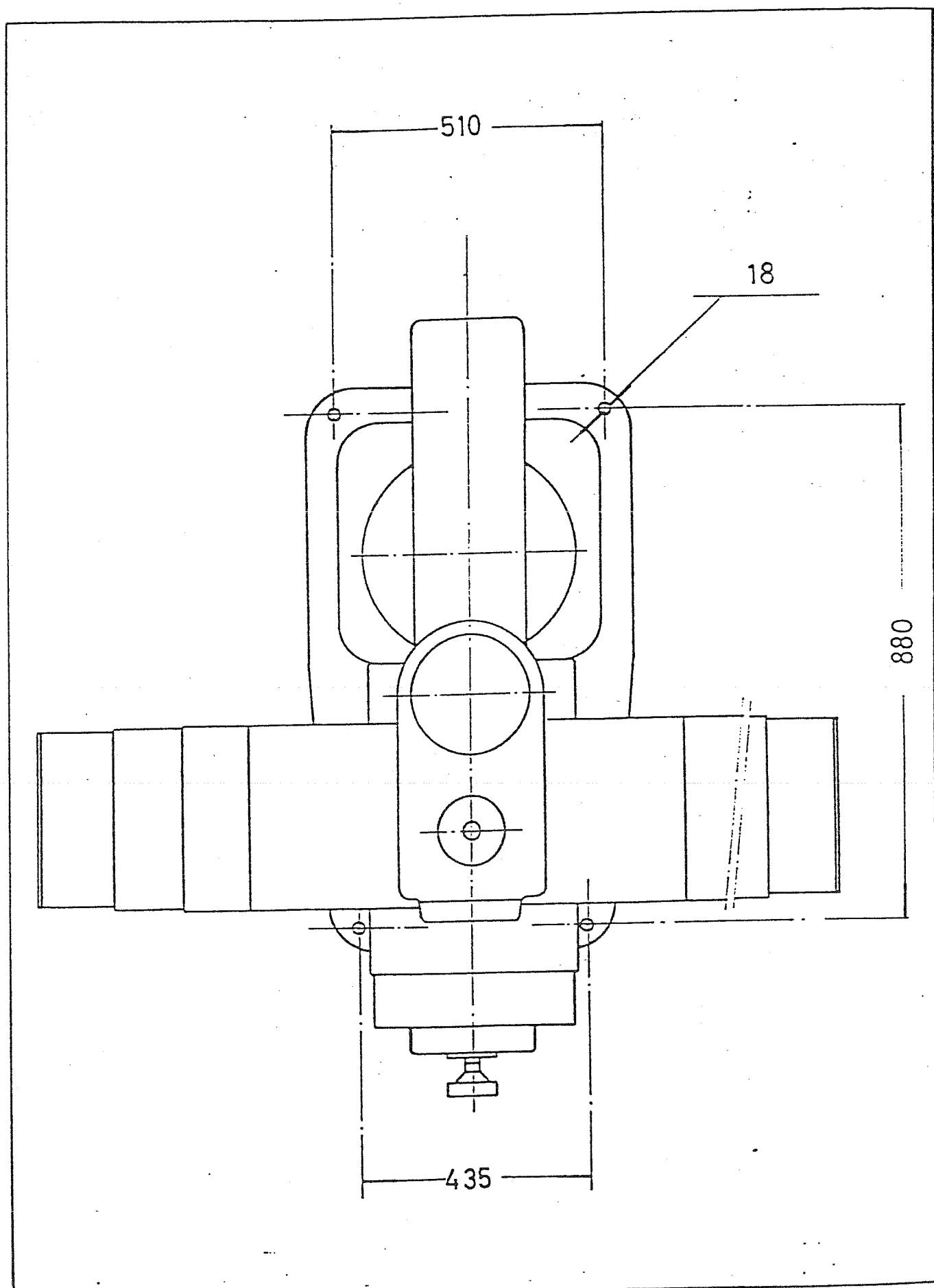
STANDARD EQUIPMENT

- Central greasing system.
- Coolant system.
- Precision ball leadscrews in X, Y, Z.
- End limit switches on the three axis.

KONDIA

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Fundación



UNPACKING AND LOCATION

Unpacking

Remove carefully the case and protectors, in order not to damage the machine or scrape it. All the movements that will have to be performed to the machine, will be done rising it by means of a wire, which will be placed, in the two holes that the column wears for this purpose. Once the machine is located in the correspondent place, the wire will be taken away and in the two holes of the framework will be placed the Bronze plugs that are forwarded in the toolbox.

Control

Check the shipment carefully in accordance with the detailed despatch list, which is included in the toolbox. In case you notice that some accessory or tool is missing, advise it immediately to the representative to whom has been bought the machine, stating the components that have not been received and which are stated in the despatch list.

Cleaning

Clean carefully the antirust cover with which is protected the machine. Do not move the table, saddle arm or square nor any mobile part, till all the ways are perfectly clean and duly lubricated.

Afterwards, move by hand the table, saddle and arm till the end of their travels in one direction. Clean lubricated exposed ways and then move each unit till the end of its travel in the contrary sense and perform the same operation.

For ram lubrication and greasing, once the antirust cover has been taken away, loosen the three fastening screws No 28 of page 5, and operate towards the back and the front by means of lever No 16 of same page.

Foundation

When setting the machine on a concrete base, we advise to use thin mortar in order to prevent any contingency on the floor, as well as to get a solid base at every point.

When setting the machine on an uneven floor, shoes or wedges should be used to correct same as much as possible.

In case the machine is placed on rubber plugs, you may take advantage of the 4 base holes for their levelling and fastening.

See foundation dimensions on page No 4.

Levelling of machine

Place the machine levelling worktable in longitudinal and transversal with an accuracy device.

Lubrication

the useful life; warranty and accuracy of this machine will be determined by its correct operation and proper lubrication. Carefully observe the nameplate recommendations and avoid substitutions.

All bearings making up this assembly are sealed and greased for life.

IMPORTANT: Do not make work the machine until it is properly lubricated.

CENTRALIZED LUBRICATION

The centralized lubrication includes the lubrication of all the carriage and table ways, as well as the lubrication of the three starting screws.

The feed pump is placed on the left side of the knee and we recommend to use it any time you feel it convenient, depending in any case on the works or movements of the machine.

To proceed on the lubrication, pull up the front hand lever of the pump and release it afterwards.

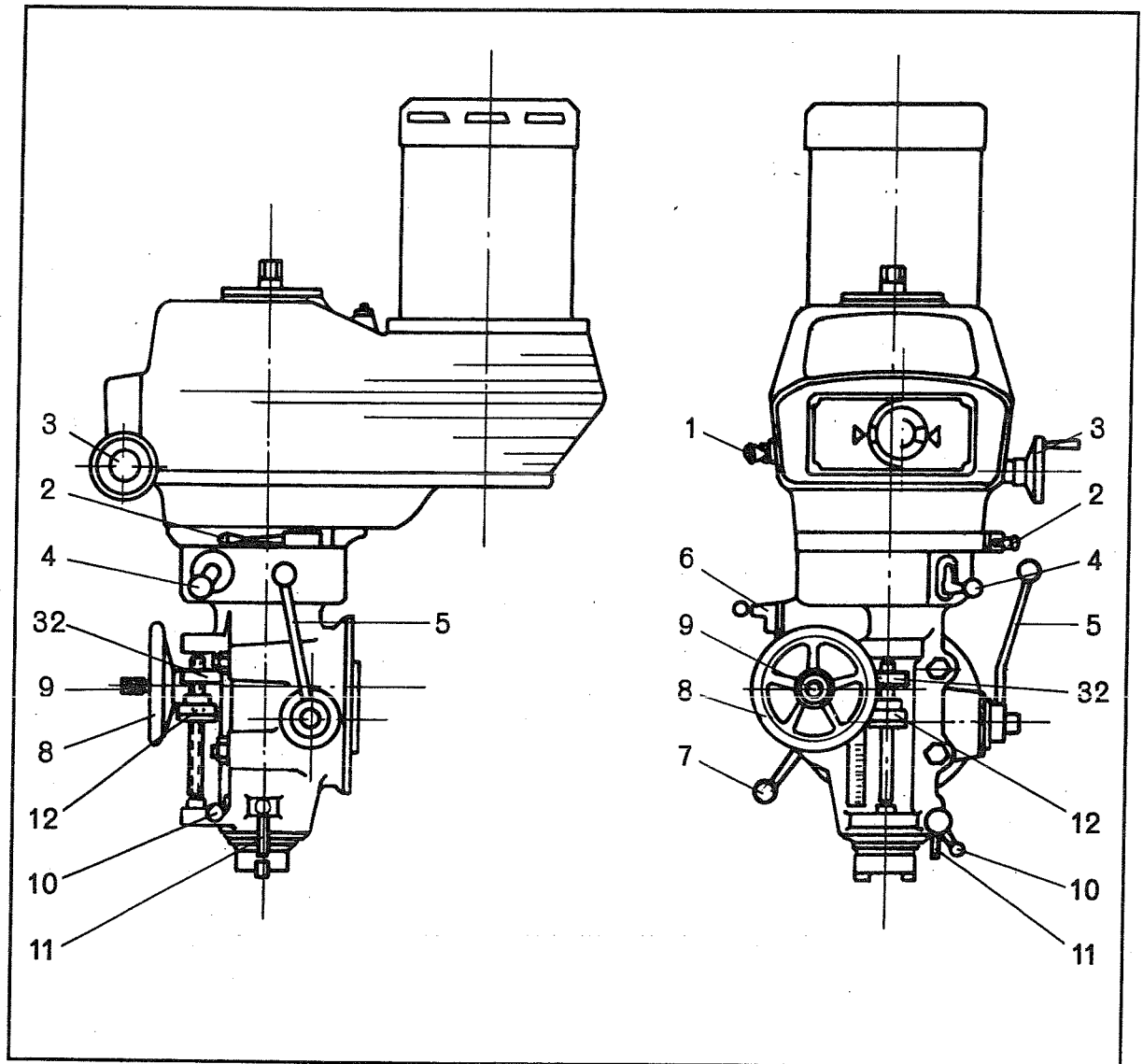
We advise to clean the pump at least twice a year, for this purpose, take the pump out of the oil tank and put it in a container filled with benzine, in order to obtain a complet cleaning with various obsorptions.

See below the different types of oil suitable for the centralize lubrication. Any oil for ways or with E.P. additive can be used.

MANUFACTURER	MOBIL	ESSO	SHELL	AGIP	B. P.	TOTAL	Houghton	GS
TYPE	Fabris K 43	Vectra Oil N. 1	Tanna Oil 27	F. 1 CLS 3	Energol HP 10-C Maccurat 32	Drosara 20	Sta-Put 300	MI S
*E - 50°C	2,8	3	3	3	3	3	3,3	3
MANUFACTURER	FINA	GULF	CASTROL	VEEDOL	AMOCO	C. SOTELO	REPSOL	KLI
TYPE	Hydran CIN 31	Stainless Machine	Magna GC	Amarex 43 E.P.	American way oil 15 H	Zeus G-50	Guia - 2	Lar S: Po
*E - 50°C	3	3	2,3	2,3 + 3,1	3	4,8-5,2	4,8-5,1	3

Recommended oil is a special one for ways, viscosity 3 to 50° E to 50°.

General description of variable speed Headstock



1. Brake control.
2. Speed range selection lever.
3. Speed selection handwheel.
4. Control for the automatic movement of main spindle.
5. Control for movement by hand of main spindle.
6. Control for feeds change.
7. Control for automatic clutch.
8. Hand wheel for slow feed by hand of main shaft.
9. Nozzle for feed reversal of main shaft.
10. Control of locking-brake of main shaft.
11. Micrometric comparerholder support.
12. Micrometric nut.
32. Sleeve stop (main spindle).

Service instructions

CAUTION: Do not change spindle when motor is stopped. Speeds marked on dial are approximate.

To tighten or unfasten draw bars of tool, first lock main spindle by means of brake lever n.° 1 located at the left side of framework. Turn this lever up or down and bring it up to obtain a complete locking.

Draw bar of tool should be tightened to a normal stress; use the wrench delivered with the machine for that purpose. If the tool should not get out of the machine coupling taper when taking it out, give a slight blow over the head of draw bar and the tool gets off machine spindle quite easily.

Spindle brake

For spindle braking, use lever n.° 1 located at the left side of framework, turning it up or down. To obtain a complete locking, bring this lever up after performing previous operation.

When brake does not fulfil its functions due to wear, it must be replaced, as it cannot be adjusted.

CAUTION: Be assured that brake is disconnected before starting head power motor. This is important, as it may damage the motor.

Selection for high and low speeds

Speeds selection (high and low) is obtained by means of lever n.° 2, located at the right side of headstock. Forward position of lever corresponds to high speed range (from 500 to 4,250 RPM). Backward position of lever corresponds to low speed range (from 60 to 500 RPM).

In high speed position, spindle rotation is similar to motor rotation. In low speeds, this rotation is inverse to motor rotation: to obtain adequate rotation, use the corresponding electric control (down push-button).

High-neutral-low mechanism

This mechanism, operated by lever n.° 2, is in charge of selecting speed range. We recommend to turn spindle by hand to make clutching easier when proceeding to that change.

The head is fitted with the neutral position system in order to allow a free rotation of spindle, for positioning, checking and fitting operations.

When lever is at neutral position, after a long working period, a light noise might appear: that noise would be produced by a defective clutching. This may be corrected by bringing part n.° 759 (positioning plate) to an adequate adjusting position.

High speed

In high speed position, spindle is directly operated by means of a tapered teeth clutch. If this clutch is not tightened enough, a light noise may be produced: this can be corrected by changing position of positioning plate n.° 759 upwards, until noise disappears. When positioning plate has a long displacement, this operation needs to reverse this plate.

CAUTION. Do not change high and low speeds when motor is stopped.

Clutch control for main spindle automatic feed

Control No. 4, page 2, connects endless gear of automatic feeds of main spindle. The plate that the machine wears located under the control, states the position of connection or disconnection.

Clutching is performed by operating this lever clockwise.

Worm of feeds can be connected when the main spindle is in motion; nevertheless it must be carefully connected in order to avoid that the worm gets damaged. It can be disconnected at any time.

IMPORTANT: We advise that the endless gear of feeds be disconnected as long as they are not used. This will avoid an unnecessary wear in the spindle feeds system.

CAUTION: Do not use this automatic feed system with spindle speeds higher than 3,000 RPM.

Control for feeds change

This control is used to select the three feeds of main spindle: .0028", .00157" and .0047" per revolution of main spindle, No. 6, page 2.

The plate that machine wears located under the control states feeds positions.

It is easier to change of position when the main spindle is rotating.

Feeds reverse nozzle

The position of this nozzle, No. 9, page 2, states feed direction of main of shaft, being its direction reverse, depending on if you work in low speeds or high speeds, for each position of nozzle.

It is advised to let nozzle in neutral position when automatic feed is not used.

Main spindle hand feed

BY MEANS OF HAND WHEEL: Nozzle No. 9 should be in intermediate position, and control lever No. 7 aligned.

BY MEANS OF LEVER: Main spindle is moved down by operating lever No. 5, page 2, counterclockwise. To use this system, unclutch lever No. 7, page 2.

WARNING: It is necessary to sling feeds control lever No. 7, page 2, if you wish to use the stops of automatic release.

Lever as well as hand wheel can be taken away when they are not being used.

Feeds control command

The command of feeds control (automatic clutch) No. 7, page 2, overloading clutch meshes when you pull it towards the left; and it remains in this position till stop of main shaft No. 32, page 2, gets in contact with micrometric nut No. 12, page 2, making clutch release automatically. Clutch can be released by hand as well, operating lever No. 7 towards the right.

NOTE: Feeds control lever is carefully located to be automatically released when sleeve stop presses against micrometric nut or against safety pin of upper part; nevertheless, if this comes out of adjustment, it can be placed again easily regulating the screw located in the end of released rod, No. 404.

CAUTION: When adjusting main spindle, check if the automatic releases in both directions.

Sleeve stop (main shaft)

This stop No. 32, page 2, is used to release clutch of automatic feed in both directions; upwards and downwards, as well as the location point to work in determined depths.

Sleeve blocking (main shaft)

It is a positive blocking to use when it is in stationary position, for instance, in milling operations, etc. No. 10, page 2. We advise to use this blocking whenever it is not wished a sleeve movement.

Micrometric comparer of support rod

This rod is used for fastening the micrometric comparer, No. 11, page 2.

Main spindle sleeve

This sleeve wears its external part protected by a cover of hard chrome of .003".

General instructions

CAUTION: Do not change headstock speeds when motor is stopped. This is important, as the opposite might damage the mechanism.

Spindle speeds are obtained by turning handwheel No. 3, page 2, located at the right side of head. There are two speed ranges: one high-speed range, from 500 to 4,250 RPM; one low-speed range from 60 to 500 RPM, which are selected as follows:

Low-speed range (60 to 500)

This range is obtained by means of clutching back gears of head through lever No. 2. When performing this operation, try not to force control lever if any difficulty in clutching is observed. Bring lever into neutral position by turning spindle manually, thus obtaining an easier synchronization of teeth. Then, operate lever until perfect positioning at LOW SPEED.

High-speed range (500 to 4,250)

This range is directly obtained, by setting control lever No. 2 into HIGH position. Do not force lever when performing this operation. If any difficulty in clutching is observed, brake head by turning spindle manually, until obtaining adequate clutching.

Remarks:

Wear of variator belt may cause a slight unphasing in spindle revolutions as related to revolution showing plate. Proceed as follows for correction:

By means of wheel No. , set speed showing plate at the point of highest speed (about 4,250 RPM or 500 RPM according to used range); then, with a speed gage fitted on spindle, check spindle speed. By means of adjustable screw No. 784, correct speed shown on main spindle, until being the same as the one shown on speed plate. Then fasten adjustable screw with nut No. 838.

If main spindle revolutions are good and speed showing plate appears to be unphased as related to previous revolutions, unfasten sleeve nut No. 885 and turn the plate until the reference comes upon the actual spindle speed. A speed gage may be used for that purpose. When speed is regulated, fasten sleeve nut.

CAUTION: Try not to change speed range (HIGH-LOW) when spindle automatic feed worm is clutched on (No. 4, page 2).

If the variable speed framework needs changing position, unfasten the three nuts Nos. 846 and turn framework consequently.

CAUTION: After setting framework into position, fasten above mentioned nuts before connecting power motor.

Instructions for replacements

Motor replacement

1.—Set spindle speed at its lowest point, for high-speed as well as for low-speed range. This, motor pulleys are in the most adequate position to proceed to dismantling of motor. Then, cut out motor.

2.—Then, unfasten down back cover No. 705 and take it off. By means of screws No. 847, lock sliding pulley of motor shaft No. 709 with the spring holder washer. Fit those screws into washer holes and screw them to the pulley, until fastening elastic washer No. 849 gets free.

After performing previous operation, bring speed plate to the point of highest revolutions (according to range); this will untighten the belt and will make easier the subsequent operation.

3.—Now, unfasten both screws No. 839 fixing the motor to the framework, and take off the fastening elastic washer from the inside pulley-spring assembly No. 849. Then take the motor out from the upper part.

To fix in the new motor, make the previous operations the other way round.

Replacement of variable transmission belt (830)

1.—Make the previous operations, as for changing motor.

2.—Dismantle upper cover of framework No. 725. Then, unfasten screws Nos. 833 fixing the balance beam No 718 and take out bushings No. 719. Take off brake lever No. 231, as well as bushing No. 730, and unfasten the six screws No. 876 fixing framework to chuck or gearbox.

The framework is now fixed only by two locating pins, and it may come off with a light blow.

3.—Change the variable transmission belt No. 830 for a new one, if possible of the same trade mark.

IMPORTANT: The use of a defective or worn out belt may cause a vibration and an excessive temperature.

Replacement of reduction tooth belt (503)

1.—Perform previous operations, as for changing the variable transmission belt.

2.—Take off the assembly formed by main spindle down pulley and its support No. 703, by unfastening the six feed screws No. 853.

Once this assembly has been taken off, change the belt. We recommend that the belt should always be provided by the Manufacturer or, instead, by machine Distributor.

IMPORTANT: All these replacement operations will be easier if the variable speed framework is separated from the headstock itself. For that purpose, unfasten the three nuts No. 851 and get off variable speed framework upwards.

Final recommendations

Lubrication

Long life, accuracy and warranty of this variable speed headstock are conditioned by an adequate use and lubrication. Therefore, please follow strictly the greasing indications shown on headstock plate, and avoiding the use of different lubricants.

Bearings fitted in this assembly are watertight and have a life-long greasing capacity.

Work

Use end mills of 2, 3 or 4 grooves. Those of 8 grooves are not usually so satisfactory. When using frontal millers there must be observed the practice of usual or Standard cuts.

The feeds can be used to drill holes until a 3/8" dia. Use manual feeds for holes that are superior than the mentioned one.

The surcharge clutch is mounted to bear weight of as much as 200 lbs. of downwards pressure on the sleeve which allows drillings of until 3/8" dia. in soft steel tools.

CAUTION: This clutch is to be used only when it is absolutely necessary.

WARNING: In heavy duty milling operations, hold the head as close to the column face as possible, in order to obtain a maximum stiffness.

NOTE: Due to the use of an adjustable mechanism, speed range of head does not change because of differences in electric frequency. Therefore, shown speeds are the same when power motor is fed either with 50 or with 60 cycle.

Service instructions - SADDLES

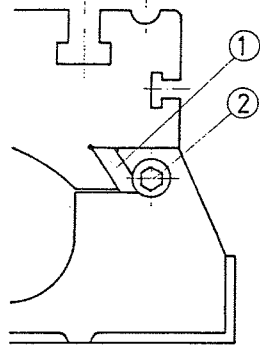


Fig. 3

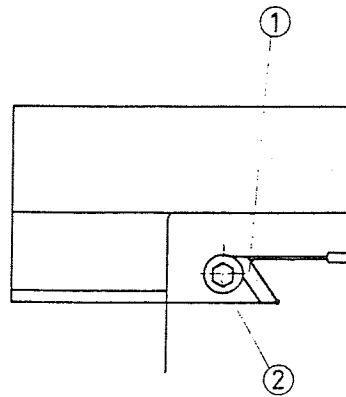


Fig. 4

Fitting of rule to table

The table is provided with a conical rule, Fig. 3, No. 1, in the whole saddle length, with two adjustment screws on both sides, Fig. 3, No. 2. To adjust the rule unfasten the screw of the thin part of the rule and tighten from opposite side until a light friction is felt when moving the table by hand.

Fitting of transversal saddle rule

For this operation the same procedure as in the case before will be followed; however, the steel-wiper will have to be removed first. Rule Fig. 4, No. 1, and screw, Fig. 4, No. 2.

Vertical saddle (blocking brakes)

When milling only with the table longitudinal feed it is recommended the fastening of the square to the column, and the saddle to the square to add stiffness to those pieces and avoid deeper cut with a minimum of vibrations. The fastening lever of the saddle is situated on the left hand side of the saddle, page 9, Fig. 6.

WARNING (locking brake): An excessive pressure may cause a light table fastening. Use moderate pressure, as this will fasten saddle well enough.

Table (blocking brake)

The table fastening lever is located in the frontal part of the saddle and must be used for fastening whenever that a longitudinal movement is not required, page 9, Fig. 7.

Blocking brake of vertical saddle with column

The control to tighten square is at the front and on the left side of it and must be turned round clockwise to brake the square. This is only a tension brake and will not block the square completely.

In case of needing a stronger blocking follow the instructions given before with the two levers that are on the left side of it, page 5, No. 21.

Leave it always braked unless the square is needed for other works.

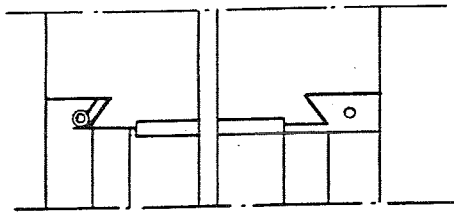


Fig. 5

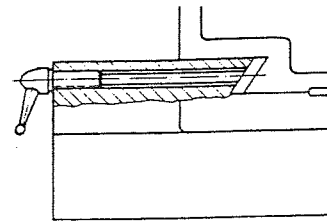


Fig. 6

Table demounting

Release first of all joint socket of spindle to support shaft or to the automatic feed box of table (see page 11) and afterwards the 4 screws that fasten the spindle support to table. Make rotate the spindle on the support, and nut will come out completely.

Once this is done, it can be easily demounted from table, just by sliding it on saddle.

Transversal saddle demounting

Release 4 screws that fasten shield of front part and make rotate afterwards the spindle in such a way that the whole lot comes out.

Afterwards nuts support that goes screwed to transversal saddle, will be removed and sliding it on vertical saddle (knee), after having taken away wedge No. 1, Fig. 4, will come out easily from saddle.

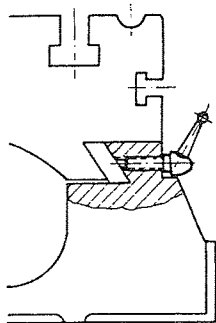


Fig. 7

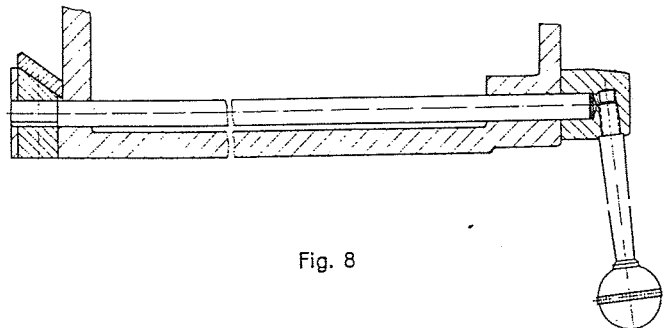
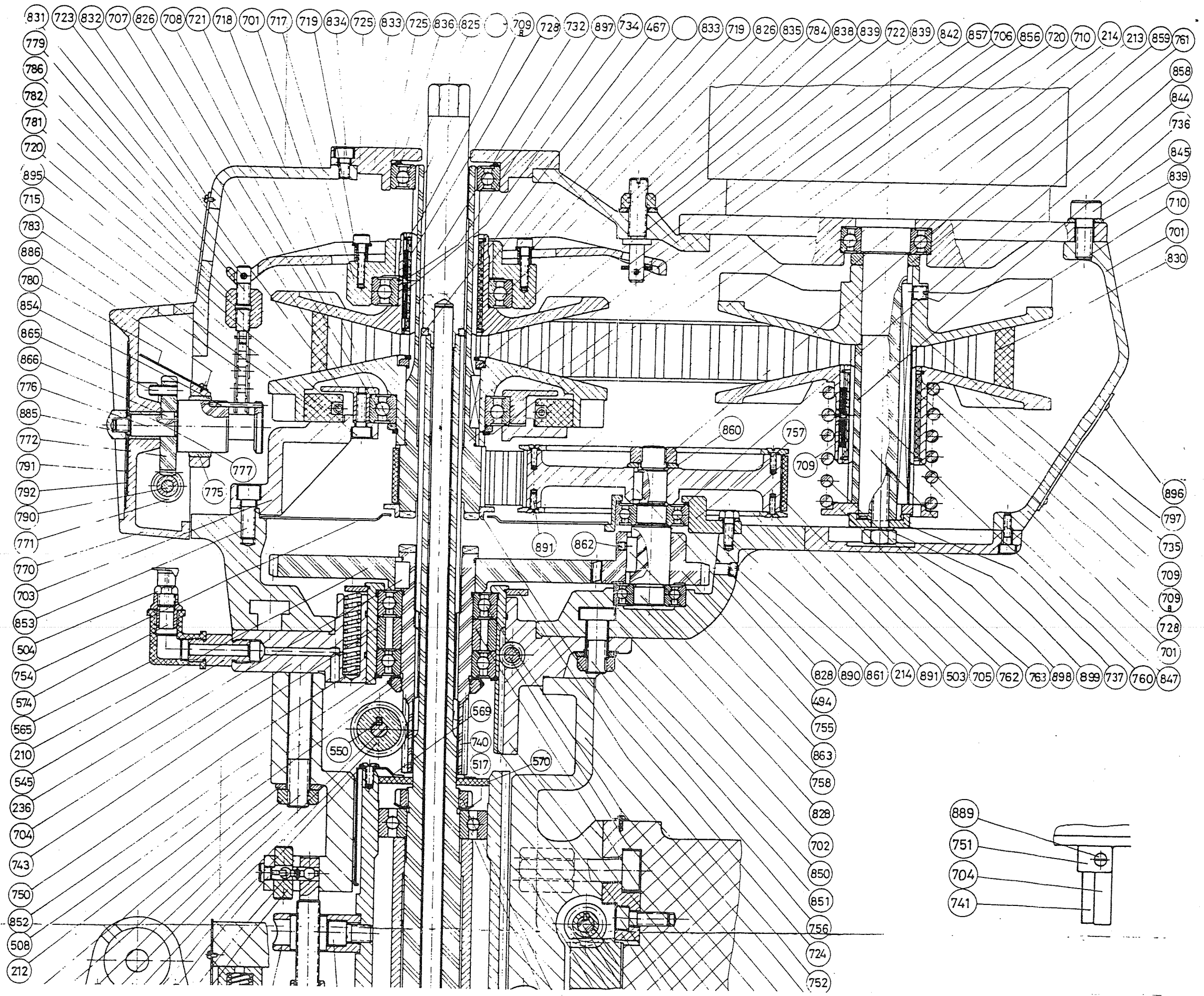
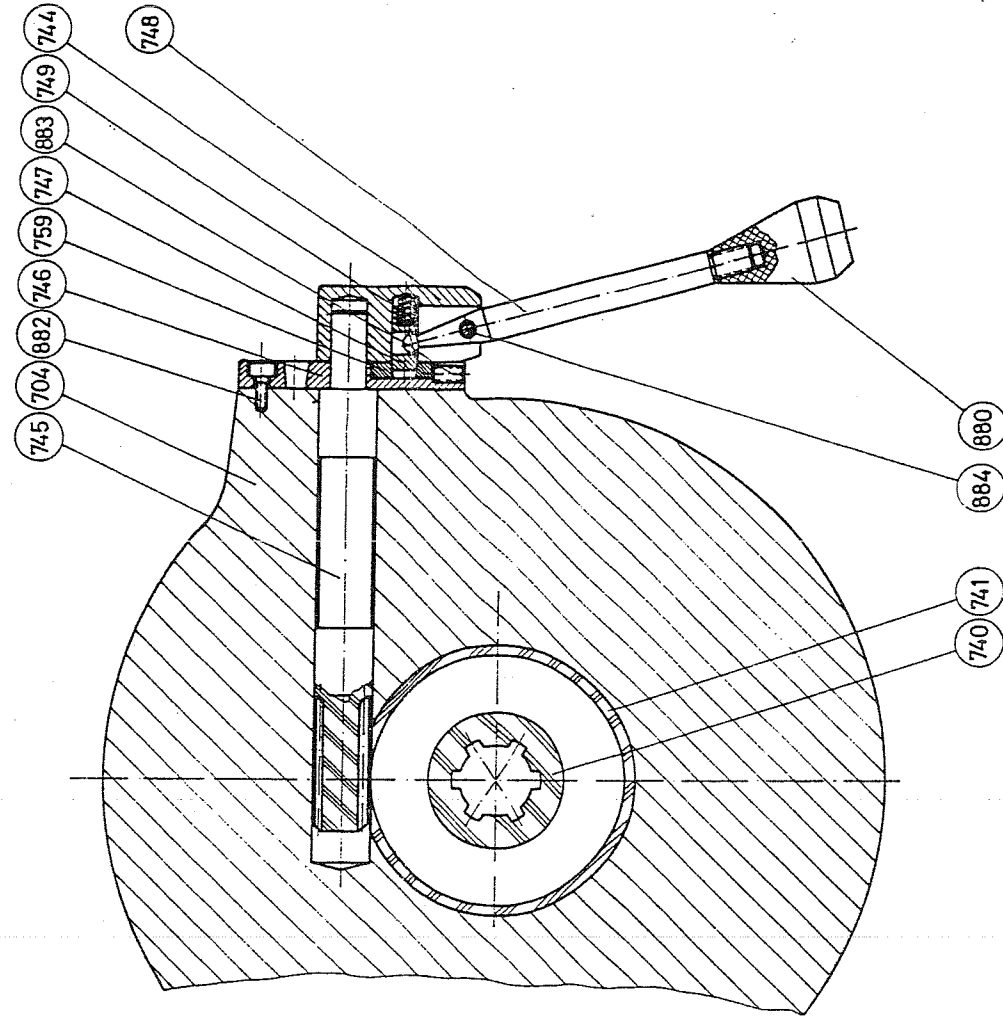
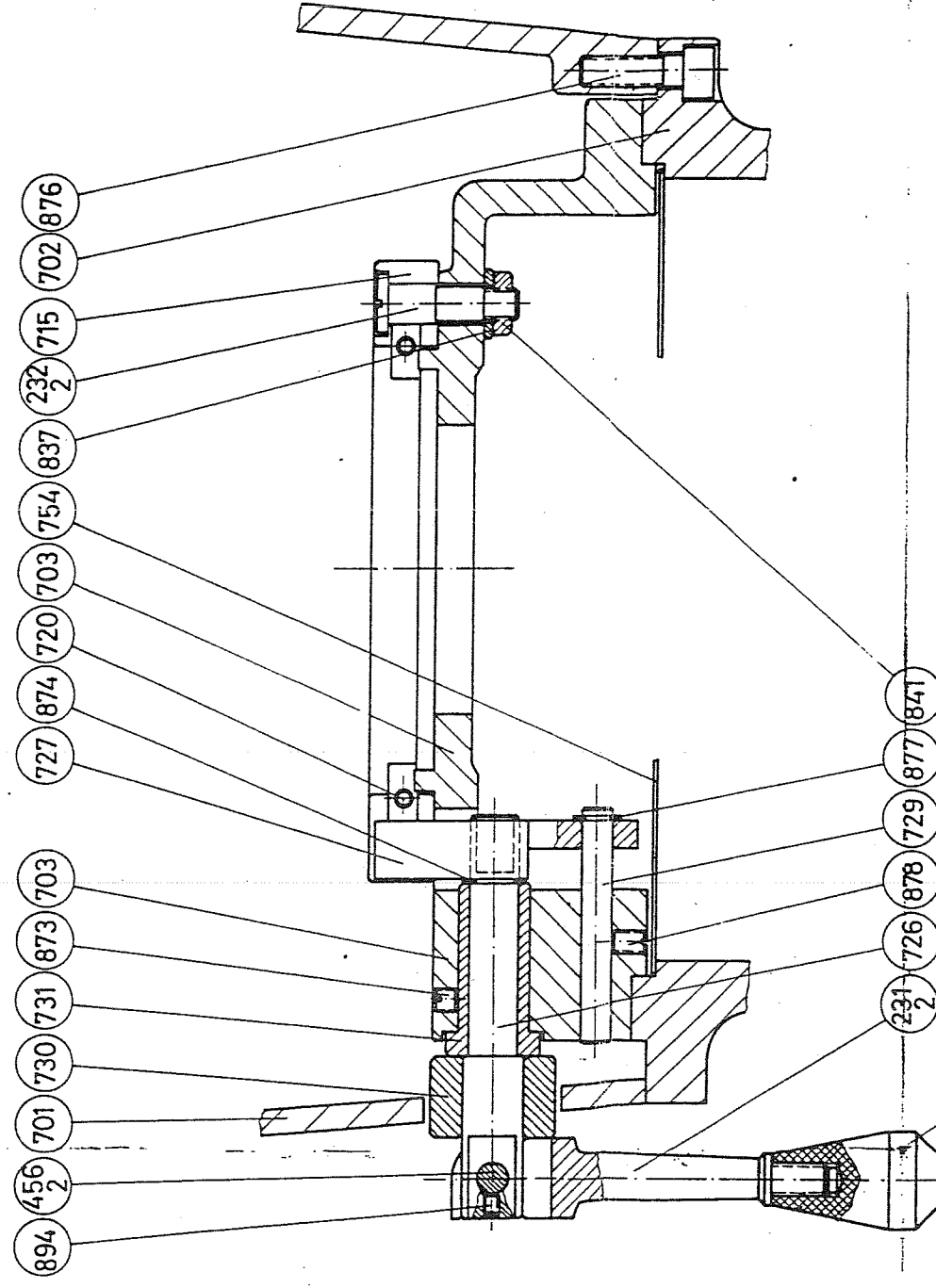
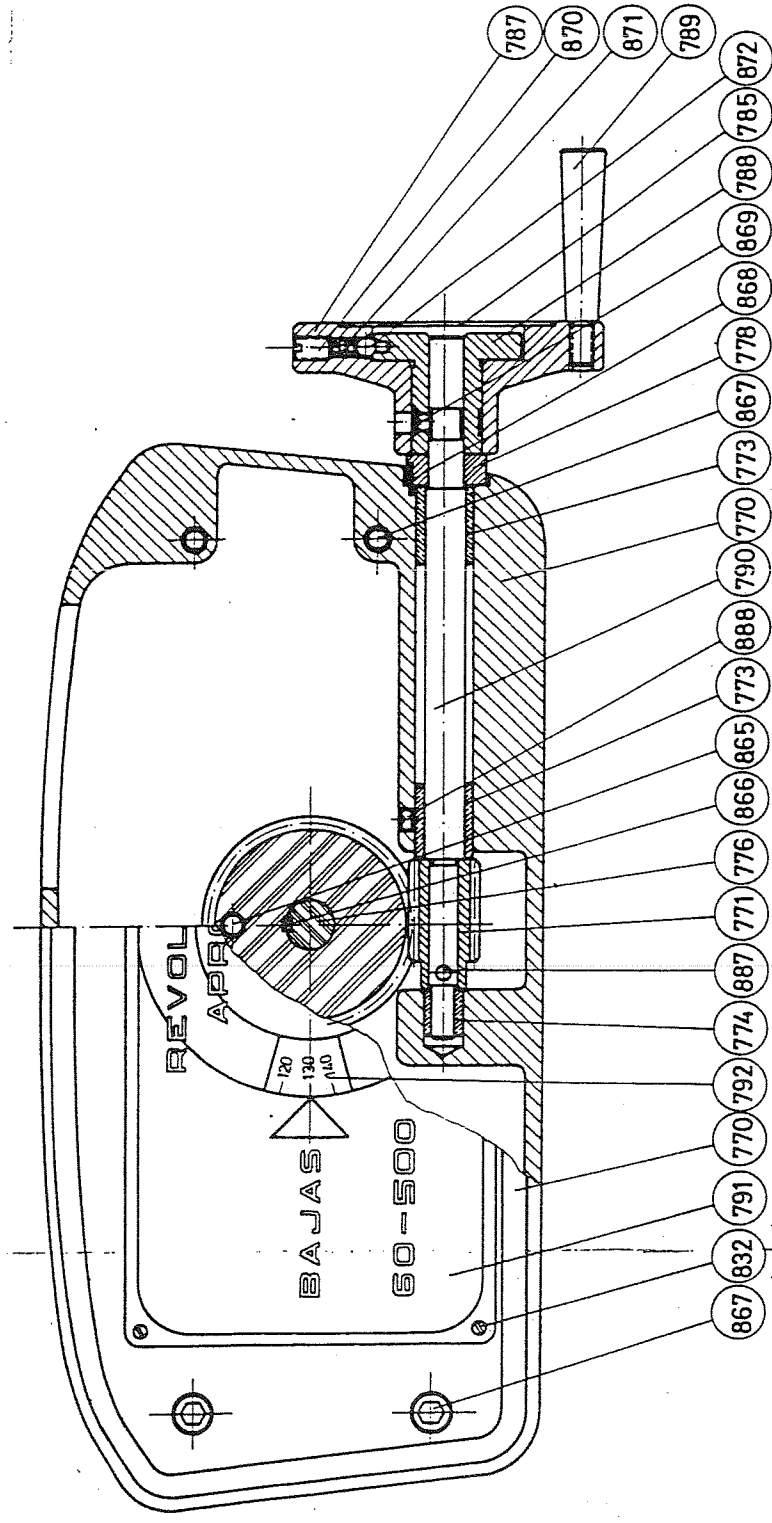


Fig. 8

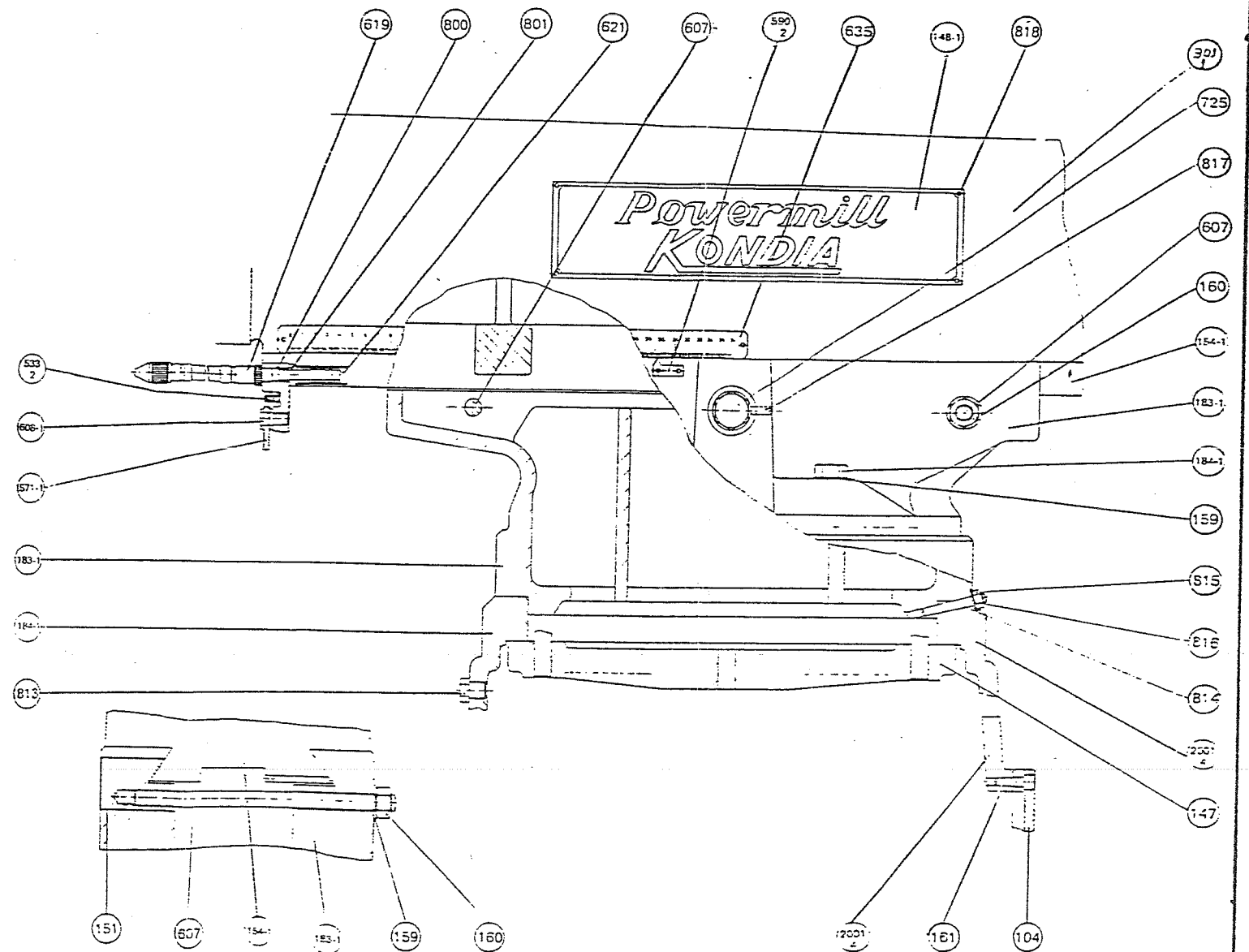
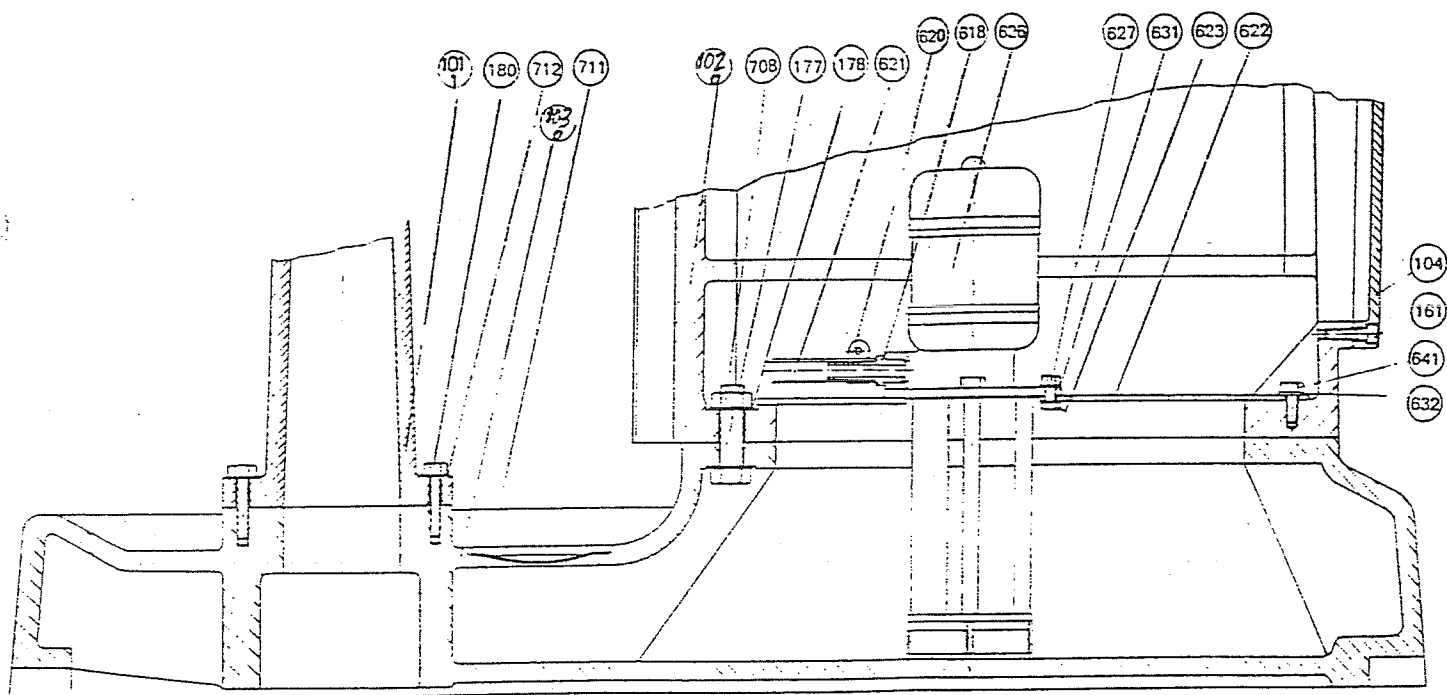


555-2	Special ring	717-10	Drive pan	755-10	Driving gear	798-10	Grid	868-10	Elastic pin Ø 2x10
556-2	Conical pin	718-10	Balancing beam	756-10	Square head screw	825-10	FAFNIR bearing FAG 6007-2ER-CE	869-10	Allen setscrew RM-5x5
557-2	Bakelite ball Ø 35 RM-8	719-10	Balancing beam bushing	757-10	Cover	826-10	FAFNIR bearing FAG 9110PP	870-10	Allen setscrew RM-6x5
558-2	Allen Screw RM 5x45	720-10	Traction springs	758-10	Gear shaft	827-10	FAFNIR bearing SKF 6008JEM1	871-10	Spring Ø 5x1
560-2	Sleeve	721-10	Main pulley ring	759-10	Locking piece	828-10	6203 2 RS Bearings	872-10	Steel ball Ø 5
564-2	Setscrew	722-10	Pulley fastening ring	760-10	Main motor	830-10	"Continental" belt 20-85 type	873-10	Allen setscrew RM-6x10
565-2	Aluminium elbow	723-10	Cover for main spindle bearing	761-10	Motor bushing	831-10	Elastic pin Ø 3	874-10	Elastic ring E-10
566-2	Conical pin	724-10	Clutch ring	762-10	Spring rest	832-10	PHILLIPS screws Ø 3	876-10	Allen screw RM-8x25
569-2	Steel felt	725-10	Upper cover of framework	763-10	Operating spring	833-10	ALLEN screws, RM-5x25	877-10	Elastic ring E-8
570-2	Felt washer	726-10	Shaft of brake operation	770-10	Operating support	834-10	ALLEN screws, RM-6x15	878-10	Allen setscrew RM-6x10
571-2	Quill skirt	727-10	Brake cams	771-10	Wormgear	835-10	Elastic ring E-38	880-10	Tapered balls 25x40
572-2	Washer	728-10	Splined bushing	772-10	Gear	836-10	Wavy washer Ø 62	882-10	Allen screws RM-4x10
574-2	Greasing sleeve	729-10	Brake rotation bolt	773-10	Bushing	837-10	Washer Ø 8	883-10	Allen setscrew RM-5x10
575-2	Sleeve	730-10	Brake bushing	774-10	Bushing	838-10	Nut RM-10	884-10	Cylindrical pin Ø 5x22
576-2	Sleeve	731-10	Brake shaft bushing	775-10	Operating shaft bushing	839-10	Washer Ø 10	885-10	Blind nut
579-2	Washer	732-10	Fastening-draw bar	776-10	Operating shaft	841-10	Nut RM-8	886-10	Screw RM-4x10
581-2	Rivet	734-10	Key 5x4x4	777-10	Bushing	842-10	Cotter (shear) pin Ø 3	887-10	Elastic pin Ø 3x12
583-2	Allen screw	735-10	Key	778-10	Ring	844-10	Allen setscrew RM-6x10	888-10	Allen setscrew RM-6x10
587-2	Setscrew	736-10	Splined shaft	779-10	Pin	845-10	Allen screws RM-10x25	889-10	Allen screw castellated head, RM-4x10
588-2	Setscrew	737-10	Washer	780-10	Metal sheet for air piping	850-10	Washer Ø 12	890-10	Allen setscrew M-8x10
589-2	Pin	740-10	Splined hear hub.	781-10	Pin	851-10	RM-12 nut	891-10	Castellated screw M-4x12
591-2	Washer	741-10	Sliding bearing box	782-10	Regulating nut	852-10	Elastic ring I-68	892-10	Castellated screw M-3x12
600-2	Hauling key	742-10	Bushing	783-10	Chain	853-10	Allen screw RM-8x25	894-10	Allen setscrew M-4x8
601-2	Allen screw M 6x15	743-10	Spacing bushing	784-10	Regulating spindle	854-10	Elastic pin Ø 3	895-10	Allen screw M-6x20
701-10	Belts cover	744-10	Lever hub	785-10	Warning plate	856-10	Elastic ring E-50	896-10	Rivet
702-10	Gearbox	745-10	Tooth change shaft	786-10	Firm plate	857-10	Cotter 8x8x30	897-10	Castellated screw M-3x5
703-10	Main spindle support	746-10	Rotation plate	787-10	Handwheel	858-10	Wavy washer Ø 40	898-10	Screw RM 10x30
704-10	Support plate	747-10	Locking nozzle	788-10	Handwheel hub	859-10	Nut RM-14	899-10	Grower washer Ø 10
705-10	Down cover of framework (housing)	748-10	Control lever	789-10	Control handle	860-10	Washer Ø 14		
706-10	Pulley shaft clutch	749-10	Spring	790-10	Operating shaft	861-10	Hexagon-head screws RM-6x20		
707-10	Main spindle pulley	750-10	Clutch springs	791-10	Speed plate	862-10	Allen setscrew RM-6x8		
708-10	Main sliding pulley	751-10	Guideways flanges	792-10	Speed disk	863-10	Cotter 6x6x20		
709-10	Sliding motor pulley	752-10	Drive ring	793-10	Spindle feed plate	865-10	Elastic pin Ø 6x15		
709-H-10	Ring	753-10	Pins	795-10	Speed change plate	866-10	Cotter 4x4x7		
715-10	Main spindle brake	754-10	Protecting sheet	797-10	Lubrication plate	867-10	Allen screws RM-6x15		

154-2	Sleeve	191-2-A	Reverse clutch rod	405-2	Special pin	444-2	Worm gear spacer	494-2	Key 5x5x26
155-2	Sleeve	192-2-A	Feed worm shaft	407-2-A	Bearing spacer	445-2	Dowel pin	503-2	Timing belts
157-2	Quill housing	193-2-A	Feed shift rod	408-2-A	Cam rod	446-2	Cluster gear shift crank	504-2	Gits oil cup
158-2-A	Quill nosepiece	194-2	Feed reverse bevel gear	409-2	Elastic pin	447-2	Anchorage shaft	508-2	M3 Washer
159-2-A	Quill stop micro screw	195-2	Feed bevel pinion	410-2	Trip plunger bushing	448-2	Micrometer nut	509-2	Allen screw RM 6x18
160-2	Quill lock sleeve	196-2	Cluster gear input shaft	411-2	Feed trip plunger bushing	449-2	Quill micro stop nut	510-2	Conical pin
161-2-A	Quill	197-2	Cluster gear shaft	412-2	Feed reverse trip plunger	450-2	Clock spring	511-2	Conical pin
162-2-B	Feed trip lever	198-2	Cluster gear cover	413-2	Reverse trip ball lever screw	456-2	Lever shaft	513-2	Special setscrew
163-2	Feed trip plunger	199-2	Shift crank	414-2	Cluster gear shaft upper bearing	460-2	Spring setscrew	514-2	Allen screw H 8x40
164-2-A	Discharge piston	200-2	Feed gear shifter fork	415-2	T-bolt	461-2	Spring	515-2	Key 4x4x25
165-2	Trip handle	201-2	Feed worm gear shaft sleeve	416-2	Black plastic ball handle 25 mm. dia.	463-2	Boston Worm	517-2	MB washer
166-2	Quill stop knob	202-2	Worm gear cladle throw-out	417-2	Anchorage nozzle	464-2	Feed drive worm gear shaft	521-2	Bearing
167-2	Reverse trip ball lever	203-2-A	Worm gear cradle	418-2	Pinion Shaft Hub screw	465-2	Feed drive worm gear	522-2	Special setscrew
168-2-A	Cam rod sleeve assembly	204-2	T-Bolt	419-2	Quill pinion shaft bushing	466-2	Feed engage pin	523-2	Elastic ring Ø E-10
169-2	Feed trip bracket	205-2	Sprocket	420-2	Pinion shaft worm gear spacer	467-2	Drawbar washer	524-2	Setscrew RM 6x8
170-2	Overload clutch worm gear	206-2	Graduated scale	421-2	Overload clutch lever spring plunger	468-2	Worm gear	525-2	Elastic ring Ø E-15
171-2	Quill pinion	207-2	Safety clutch spring	422-2	Dowel pin	469-2	Worm shaft	526-2	Key 5x5x20
172-2	Overload clutch ring	208-2-1	Graduated area	423-2	Allen setscrew RM 6x20	471-2	Key 4x4x7,5	527-2	Hexagonal Head Screw RM 5x20
173-2-A	Overload clutch sleeve	210-2	Spindle bull gear	424-2	Overload clutch washer	472-2	Key 5x4x12	528-2	Key 5x5x16
174-2	Overload clutch trip lever	212-2	Castellated nut	425-2	Compression spring	474-2	Handwheel	529-2	Steel ball Ø 5
175-2	Clutch arm cover	213-2	Timing belt pulley	426-2	Compression spring	474-2-A	Handwheel handle	530-2	Spring
176-2	Overload clutch	214-2	Timing belt pulley flange	427-2	Compression spring	475-2	Elastic ring E-16	531-2	Nozzle
178-2	Spring cover	231-2	Brake lock handle	428-2	Overload clutch locknut	476-2	Steel ball Ø 5	532-2	Round head screw RM-4x18
179-2	Pinion shaft hub sleeve	232-2	Brake rotation screw	429-2	Clutch ring	477-2	Conical pin	532-A-2	Adjustment key
180-2-A	Pinion shaft hub	233-2-C	Main spindle	430-2	Washer	478-2	Elastic pin Ø 4	533-2	Pin fastening screw
181-2	Quill pinion shaft	236-2	Cotter 10x8x15	431-2	Feed drive cluster gear	479-2	RM-8 nut	534-2	M 12 Nut (exagonal)
182-2	Bushing	241-2	Special setscrew	432-2	Feed drive cluster gear (center)	480-2	Key 5x3x9	535-2	M 12 special nut (exagonal)
183-2	Hollow head cap screw	243-2	Allen special setscrew	433-2	Feed drive cluster gear (upper)	481-2	Screw round Head RM 4x12	543-2	Washers Ø 12
184-2	Feed reverse bevel gear	244-2	Allen special setscrew	434-2	Washer	482-2	Key 3x3x9	547-2	Setscrew
185-2-A	Coupling	245-2	Allen special screw	435-2	Feed worm shaft bushing	483-2	Indicator rod	548-2	Pin
186-2	Conical pinion	398-2	Feed driving gear	436-2	Reverse knob	484-2	Conical pin	549-2	Key 4x4x30
187-2	Allen setscrew RM 6x15	399-2	Feed drive gear	437-2	Handle screw	485-2	Allen screw RM 5x15	550-2	Key 4x4x22
188-2	Angular contact ball bearing	400-2	Feed bevel gear	438-2-A	Spindle dirt shield	486-2	Bearing 6206-PP	551-2	Special key
189-2	Bushing	401-2	Quill lock bolt	441-2	Castellated nut (KM)	487-2	Roll pin	552-2	Key 4x4x45
190-2-A	Hand wheel coupling	404-2	RM 4x8 pin	443-2	Shift sleeve	488-2	Conical pinn	554-2	Special ring



Capítulo 0: Cuerpo



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|----|-------|------------------------|
| | 104-0 | Tapa posterior |
| | 147-0 | Freno soporte |
| FK | 148-1 | Rótulo |
| | 151-0 | Freno carnero |
| FK | 301-1 | Carnero |
| | 159-0 | Arandela |
| | 160-0 | Tuerca exagonal |
| | 101-1 | Soporte carro vertical |
| | 161-0 | Tornillo Allen |
| | 177-0 | Tornillo exagonal |

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|----------|-----------------------|
| FK 183-1 | Soporte camero |
| FK 184-1 | Tornillo porta camero |
| 533-2 | Tornillo sujeción |
| 571-1 | Protección |
| 590-2 | Indicador |
| | |
| 607-0 | Espárrago |
| 608-1 | Bulón tecla |
| 616-0 | Tornillo Allen |
| 618-0 | Racord |
| 619-0 | Grifo |
| 620-0 | Abrazadera |

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|-------|-------------------|
| 622-0 | Soporte |
| 623 0 | Tuerca exagonal |
| 626-0 | Moto-bomba |
| 627-0 | Tornillo exagonal |
| 631-0 | Arandela |
| 632-0 | Arandela |
| 635-0 | Regla graduada |
| 641-0 | Tornillo exagonal |
| 708-0 | Tuerca exagonal |
| 711-0 | Colador |
| 712-0 | Arandela |

- 801-0 Racord

- 813-0 Tornillo tope
814-0 Pasador cónico
815-0 Tuerca exagonal
816-0 Arandela
817-0 Espárrago
818-0 Remache estriado

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schemes and nomenclature

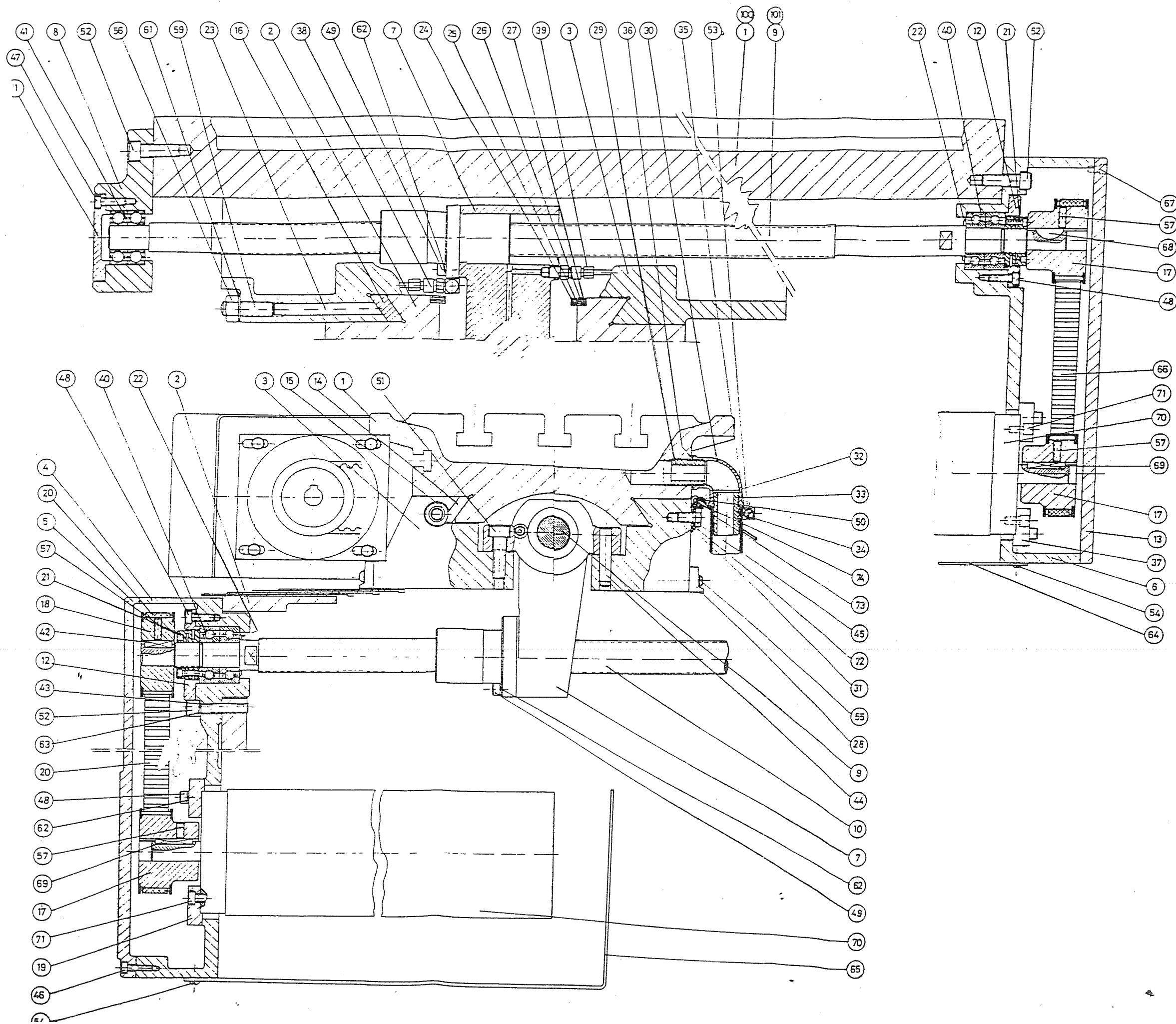
TO ORDER SPARE PARTS

ATTENTION:

Besides of the number of
component, state as well the
correspondent chapter number.

FV-CNC-2601-1	TABLE
FV-CNC-2601-2	KNEE
FV-CNC-2601-3	SADDLE
FV-CNC-2601-4	"Y" FRONT ALUMINIUM BRACK
FV-CNC-2601-5	COVER PLATE
FV-CNC-2601-6	"X" BRACKET
FV-CNC-2601-7	BALLSCREW BRACKET
FV-CNC-2601-8	LEFT BRACKET
FV-CNC-2601-8	"X" BALLSCREW
FV-CNC-2601-10	"Y" BALLSCREW
FV-CNC-2601-11	LEFT COVER PLATE
FV-CNC-2601-12	BEARING BOX COVER
FV-CNC-2601-13	"X" COVER PLATE
FV-CNC-2601-14	TABLE GIB
FV-CNC-2601-15	ALLEN SETSCREW
FV-CNC-2601-16	SADDLE-KNEE GIB
FV-CNC-2601-17	MOTOR PULLEY
FV-CNC-2601-18	SHAFT PULLEY
FV-CNC-2601-19	FLANGE
FV-CNC-2601-20	BELT
FV-CNC-2601-21	AUTOBLOCK NUT
FV-CNC-2601-22	PROTECTION RING
FV-CNC-2601-23	SADDLE LOCK PLUNGER
FV-CNC-2601-24	FIRST LEAF COVER
FV-CNC-2601-25	SECOND LEAF COVER
FV-CNC-2601-26	THIRD LEAF COVER
FV-CNC-2601-27	FORTH LEAF COVER
FV-CNC-2601-28	PROTECTION
FV-CNC-2601-29	COUPLING SLEEVE
FV-CNC-2601-30	ELBOW
FV-CNC-2601-31	SQUARE
FV-CNC-2601-32	PROTECTIVE CLOTH
FV-CNC-2601-33	SCREW JOINT
FV-CNC-2601-34	DRIVING PIPE
FV-CNC-2601-35	CLASP
FV-CNC-2601-36	JOINT
FV-CNC-2601-37	"X" MOTOR FLANGE
FV-CNC-2601-38	SUPPORT VALVE "X"

FV-CNC-2601-39	SUPPORT VALVE "Y"	
FV-CNC-2601-40	BEARING <i>74221A</i>	2x
FV-CNC-2601-41	BEARING	
FV-CNC-2601-42	KEY	
FV-CNC-2601-43	PIN	
FV-CNC-2601-44	PIN	
FV-CNC-2601-45	EXAGONAL SCREW	M8 x 15
FV-CNC-2601-46	ALLEN SCREW	M5 x 20
FV-CNC-2601-47	ALLEN SCREW	M6 x 20
FV-CNC-2601-48	ALLEN SCREW	M6 x 25
FV-CNC-2601-49	ALLEN SCREW	M6 x 30
FV-CNC-2601-50	ROUND HEAD SCREW	M4 x 10
FV-CNC-2601-51	ALLEN SCREW	M10 x 35
FV-CNC-2601-52	ALLEN SCREW	M10 x 40
FV-CNC-2601-53	PLANE HEAD SCREW	M4 x 25
FV-CNC-2601-54	SCREW	M6 x 10
FV-CNC-2601-55	SCREW	M6 x 20
FV-CNC-2601-56	EXAGONAL NUT	M12
FV-CNC-2601-57	ALLEN SETSCREW	M6 x 15
FV-CNC-2601-58	ALLEN SETSCREW	M12 x 8
FV-CNC-2601-59	ALLEN SETSCREW	M12 x 40
FV-CNC-2601-60	WASHER	Ø 8
FV-CNC-2601-61	WASHER	Ø 12
FV-CNC-2601-62	GROWER WASHER	Ø 6
FV-CNC-2601-63	GROWER WASHER	Ø 10
FV-CNC-2601-64	"X" MOTOR HOUSING	
FV-CNC-2601-65	"Y" MOTOR HOUSING	
FV-CNC-2601-66	BELT	
FV-CNC-2601-67	ALLEN SCREW	M5 x 15
FV-CNC-2601-68	"X" PULLEY KEY	
FV-CNC-2601-69	MOTOR KEY	
FV-CNC-2601-70	MOTOR	
FV-CNC-2601-71	ALLEN SCREW	
FV-CNC-2601-72	WASHER	
FV-CNC-2601-73	EXAGONAL NUT	M4
FV-CNC-2601-74	WASHER	Ø 4



181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
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QUILL DRIVE

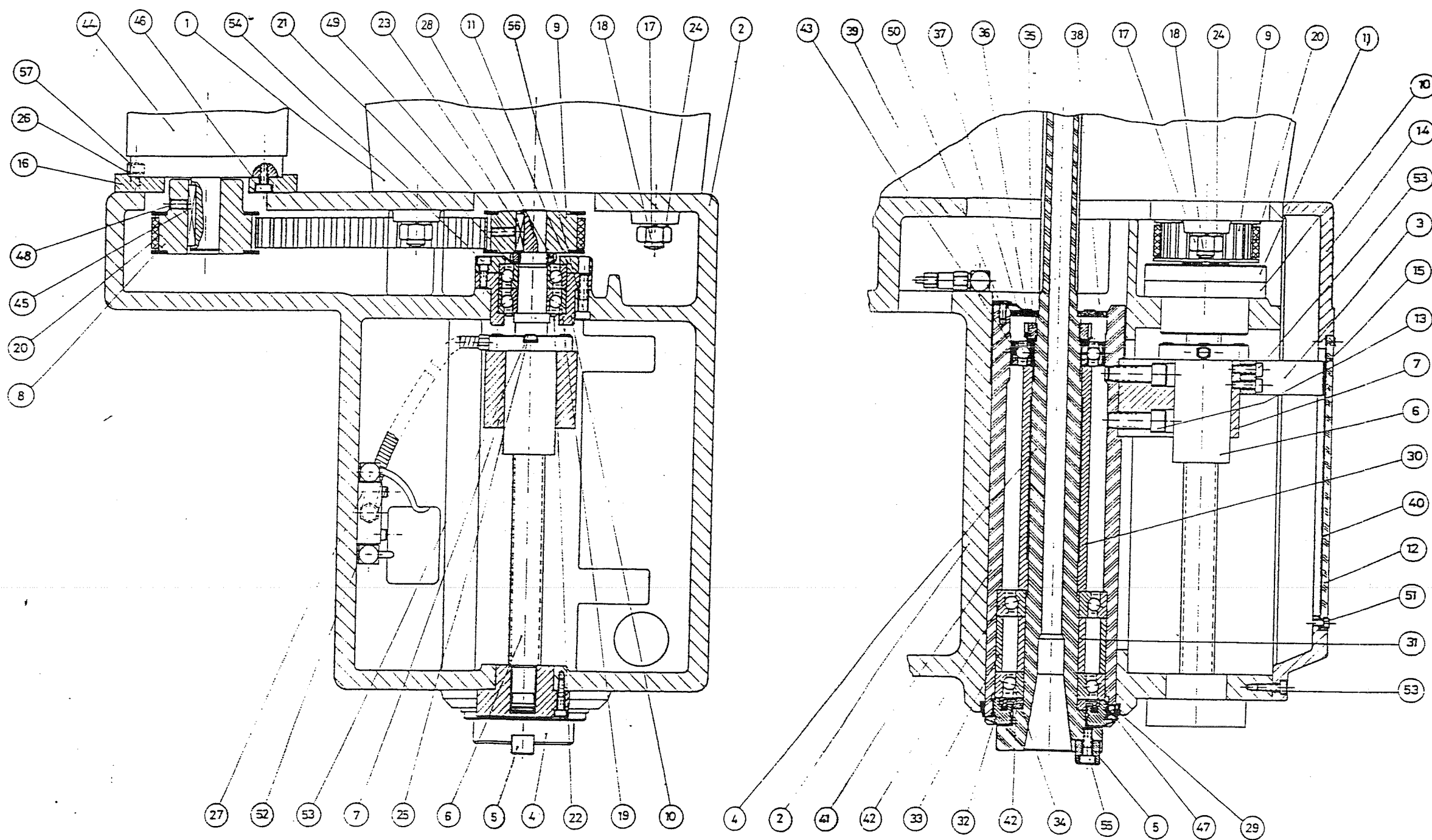
FV-CNC-2600-1	HOUSING
FV-CNC-2600-2	RAM
FV-CNC-2600-3	INDICATOR BRACKET
FV-CNC-2600-4	MAIN SPINDLE
FV-CNC-2600-5	KEY
FV-CNC-2600-6	BALLSCREW "Z" AXIS
FV-CNC-2600-7	BALLSCREW BRACKET
FV-CNC-2600-8	MOTOR PULLEY
FV-CNC-2600-9	BALLSCREW PULLEY
FV-CNC-2600-10	BEARING BOX
FV-CNC-2600-11	BOX COVER PLATE
FV-CNC-2600-12	PLASTIC PLATE
FV-CNC-2600-13	SCREW
FV-CNC-2600-14	FRONT COVER
FV-CNC-2600-15	INDEX
FV-CNC-2600-16	FLANGE
FV-CNC-2600-17	EXAGONAL NUT
FV-CNC-2600-18	PIN
FV-CNC-2600-19	BEARING
FV-CNC-2600-20	BELT
FV-CNC-2600-21	SAFETY WASHER
FV-CNC-2600-22	RING
FV-CNC-2600-23	KEY
FV-CNC-2600-24	GROWER WASHER Ø 12
FV-CNC-2600-25	GROWER WASHER Ø 5
FV-CNC-2600-26	GROWER WASHER Ø 6
FV-CNC-2600-27	GREASING PLATE
FV-CNC-2600-28	SAFETY NUT
FV-CNC-2600-29	FELT WIPER
FV-CNC-2600-30	BUSHING
FV-CNC-2600-31	BUSHING
FV-CNC-2600-32	NOSE PIECE
FV-CNC-2600-33	BEARING SPACER
FV-CNC-2600-34	SPINDLE DIRT SHIELD
FV-CNC-2600-35	LOCK NUT
FV-CNC-2600-36	SAFETY RING
FV-CNC-2600-37	STEEL FELT
FV-CNC-2600-38	FELT WASHER

FV-CNC-2600-39	WASHER
FV-CNC-2600-40	GRADUATED SCALE
FV-CNC-2600-41	QUILL
FV-CNC-2600-42	BEARING PAIR
FV-CNC-2600-43	BEARING
FV-CNC-2600-44	MOTOR
FV-CNC-2600-45	KEY
FV-CNC-2600-46	SCREW
FV-CNC-2600-47	PIN M6 x 5
FV-CNC-2600-48	PIN M6 x 10
FV-CNC-2600-49	PIN M6 x 15
FV-CNC-2600-50	SPECIAL SCREW M5 x 10
FV-CNC-2600-51	ALLEN SCREW M4 x 8
FV-CNC-2600-52	ALLEN SCREW M4 x 20
FV-CNC-2600-53	ALLEN SCREW M5 x 15
FV-CNC-2600-54	ALLEN SCREW M6 x 15
FV-CNC-2600-55	ALLEN SCREW M6 x 16
FV-CNC-2600-56	ALLEN SCREW M6 x 30
FV-CNC-2600-57	ALLEN SCREW M6 x 25

QUILL DRIVE

FV-CNC-2600-1	HOUSING
FV-CNC-2600-2	RAM
FV-CNC-2600-3	INDICATOR BRACKET
FV-CNC-2600-4	MAIN SPINDLE
FV-CNC-2600-5	KEY
FV-CNC-2600-6	BALLSCREW "Z" AXIS
FV-CNC-2600-7	BALLSCREW BRACKET
FV-CNC-2600-8	MOTOR PULLEY
FV-CNC-2600-9	BALLSCREW PULLEY
FV-CNC-2600-10	BEARING BOX
FV-CNC-2600-11	BOX COVER PLATE
FV-CNC-2600-12	PLASTIC PLATE
FV-CNC-2600-13	SCREW
FV-CNC-2600-14	FRONT COVER
FV-CNC-2600-15	INDEX
FV-CNC-2600-16	FLANGE
FV-CNC-2600-17	EXAGONAL NUT
FV-CNC-2600-18	PIN
FV-CNC-2600-19	BEARING
FV-CNC-2600-20	BELT
FV-CNC-2600-21	SAFETY WASHER
FV-CNC-2600-22	RING
FV-CNC-2600-23	KEY
FV-CNC-2600-24	GROWER WASHER Ø 12
FV-CNC-2600-25	GROWER WASHER Ø 5
FV-CNC-2600-26	GROWER WASHER Ø 6
FV-CNC-2600-27	GREASING PLATE
FV-CNC-2600-28	SAFETY NUT
FV-CNC-2600-29	FELT WIPER
FV-CNC-2600-30	BUSHING
FV-CNC-2600-31	BUSHING
FV-CNC-2600-32	NOSE PIECE
FV-CNC-2600-33	BEARING SPACER
FV-CNC-2600-34	SPINDLE DIRT SHIELD
FV-CNC-2600-35	LOCK NUT
FV-CNC-2600-36	SAFETY RING
FV-CNC-2600-37	STEEL FELT
FV-CNC-2600-38	FELT WASHER

FV-CNC-2600-39	WASHER
FV-CNC-2600-40	GRADUATED SCALE
FV-CNC-2600-41	QUILL
FV-CNC-2600-42	BEARING PAIR
FV-CNC-2600-43	BEARING
FV-CNC-2600-44	MOTOR
FV-CNC-2600-45	KEY
FV-CNC-2600-46	SCREW
FV-CNC-2600-47	PIN M6 x 5
FV-CNC-2600-48	PIN M6 x 10
FV-CNC-2600-49	PIN M6 x 15
FV-CNC-2600-50	SPECIAL SCREW M5 x 10
FV-CNC-2600-51	ALLEN SCREW M4 x 8
FV-CNC-2600-52	ALLEN SCREW M4 x 20
FV-CNC-2600-53	ALLEN SCREW M5 x 15
FV-CNC-2600-54	ALLEN SCREW M6 x 15
FV-CNC-2600-55	ALLEN SCREW M6 x 18
FV-CNC-2600-56	ALLEN SCREW M6 x 30
FV-CNC-2600-57	ALLEN SCREW M6 x 25



Item	Description	Qty	Unit	Material	Remarks
1	Parafuso Allen	1	PC-10		
2	"	1	PC-10		
3	"	1	PC-10		
4	"	1	PC-10		
5	"	1	PC-10		
6	"	1	PC-10		
7	"	1	PC-10		
8	"	1	PC-10		
9	"	1	PC-10		
10	"	1	PC-10		
11	"	1	PC-10		
12	"	1	PC-10		
13	"	1	PC-10		
14	"	1	PC-10		
15	"	1	PC-10		
16	"	1	PC-10		
17	"	1	PC-10		
18	"	1	PC-10		
19	"	1	PC-10		
20	"	1	PC-10		
21	"	1	PC-10		
22	"	1	PC-10		
23	"	1	PC-10		
24	"	1	PC-10		
25	"	1	PC-10		
26	"	1	PC-10		
27	"	1	PC-10		
28	"	1	PC-10		
29	"	1	PC-10		
30	"	1	PC-10		
31	"	1	PC-10		
32	"	1	PC-10		
33	"	1	PC-10		
34	"	1	PC-10		
35	"	1	PC-10		
36	"	1	PC-10		
37	"	1	PC-10		
38	"	1	PC-10		
39	"	1	PC-10		
40	"	1	PC-10		
41	"	1	PC-10		
42	"	1	PC-10		
43	"	1	PC-10		
44	"	1	PC-10		
45	"	1	PC-10		
46	"	1	PC-10		
47	"	1	PC-10		
48	"	1	PC-10		
49	"	1	PC-10		
50	"	1	PC-10		
51	"	1	PC-10		
52	"	1	PC-10		
53	"	1	PC-10		
54	"	1	PC-10		
55	"	1	PC-10		
56	"	1	PC-10		
57	"	1	PC-10		

KONDA

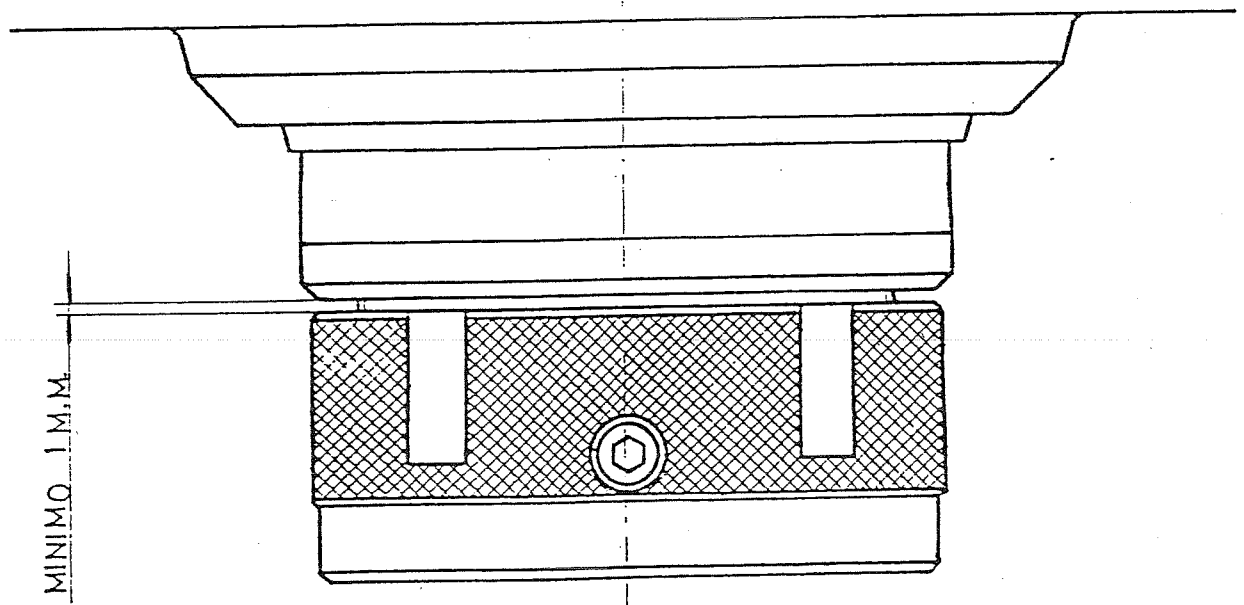
PC-10-2000

PC-10-2000

Máquina FREZADORA T.V.T. - S.R.L.

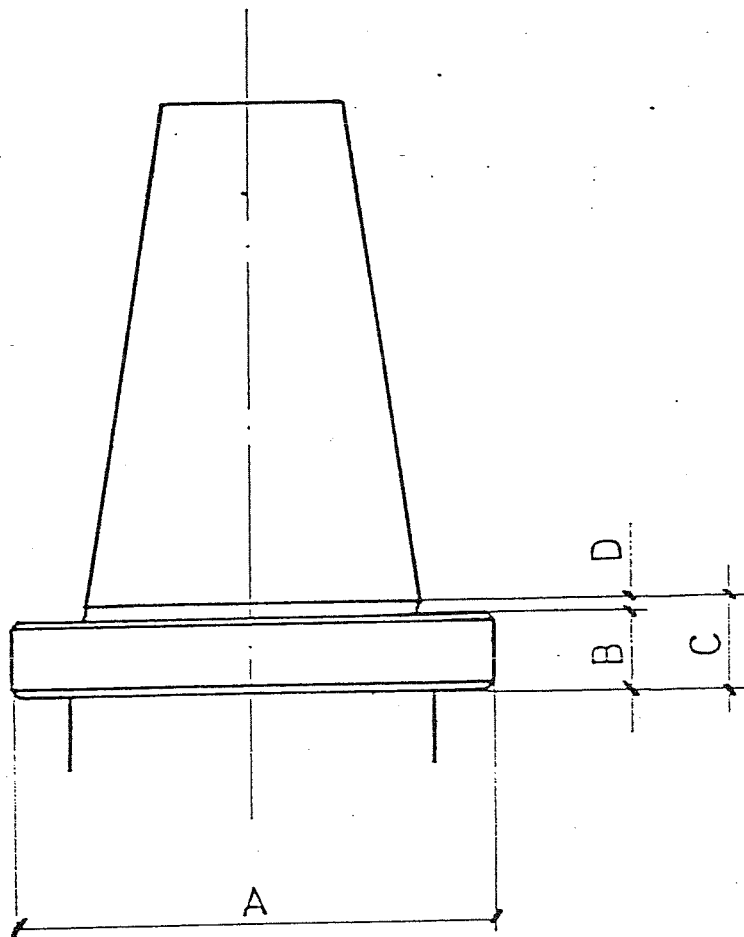
Pieza TUERCAS AMARRE RAPIDO

TUERCAS AMARRE RAPIDO		CODIGO
ISO 40	DIN 2080	4530397
ISO 40	BRISTOL	4530398
ISO 30	DIN 2080	4530395
ISO 30	BRISTOL	4530396



KONDIA

URBANO CONDE, S. A.



	A	B	C	D
ISO 40 DIN 2080	63	10	11,6	1,6
ISO 40 BRISTOL	63	8	9,9	1,9
ISO 30 DIN 2080	50	8	9,6	1,6
ISO 30 BRISTOL	46	8,70	10,7	2