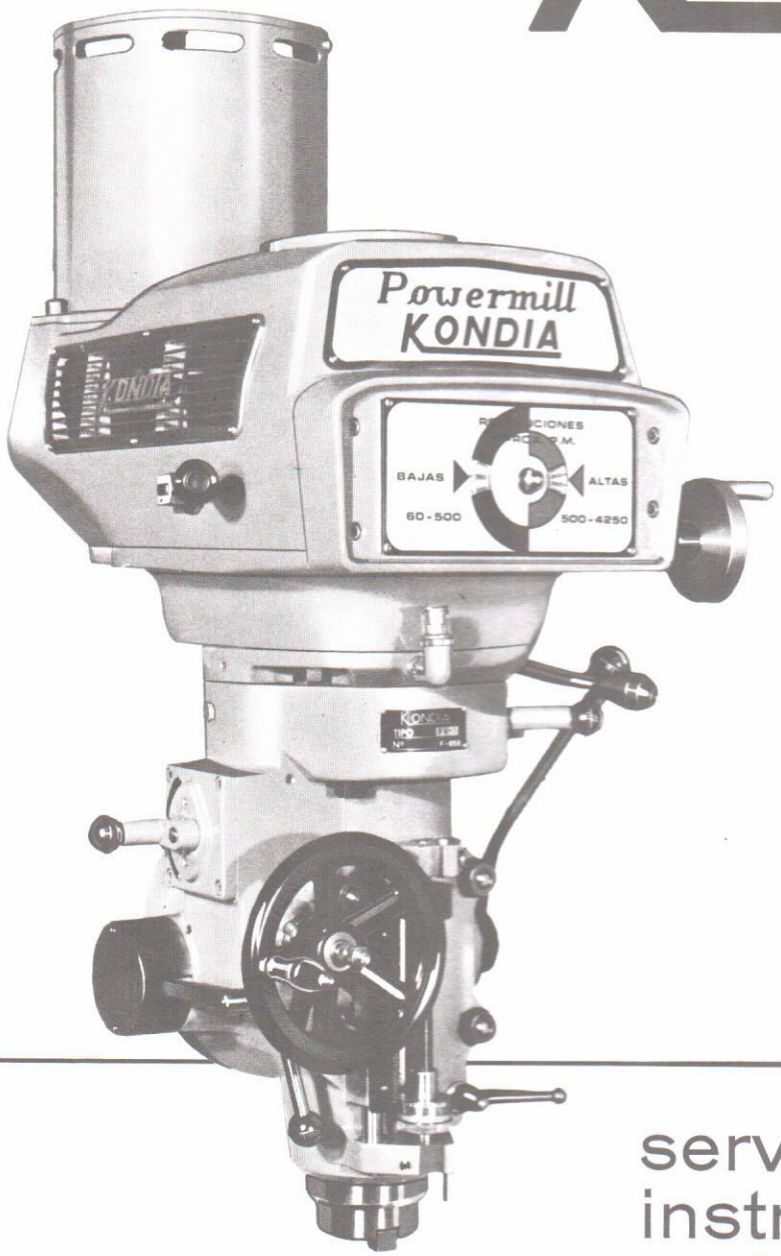
variable speed headstock

KONDIA



MODEL KV

service and instruction book for variable speed

HEADSTOCK

maintenance

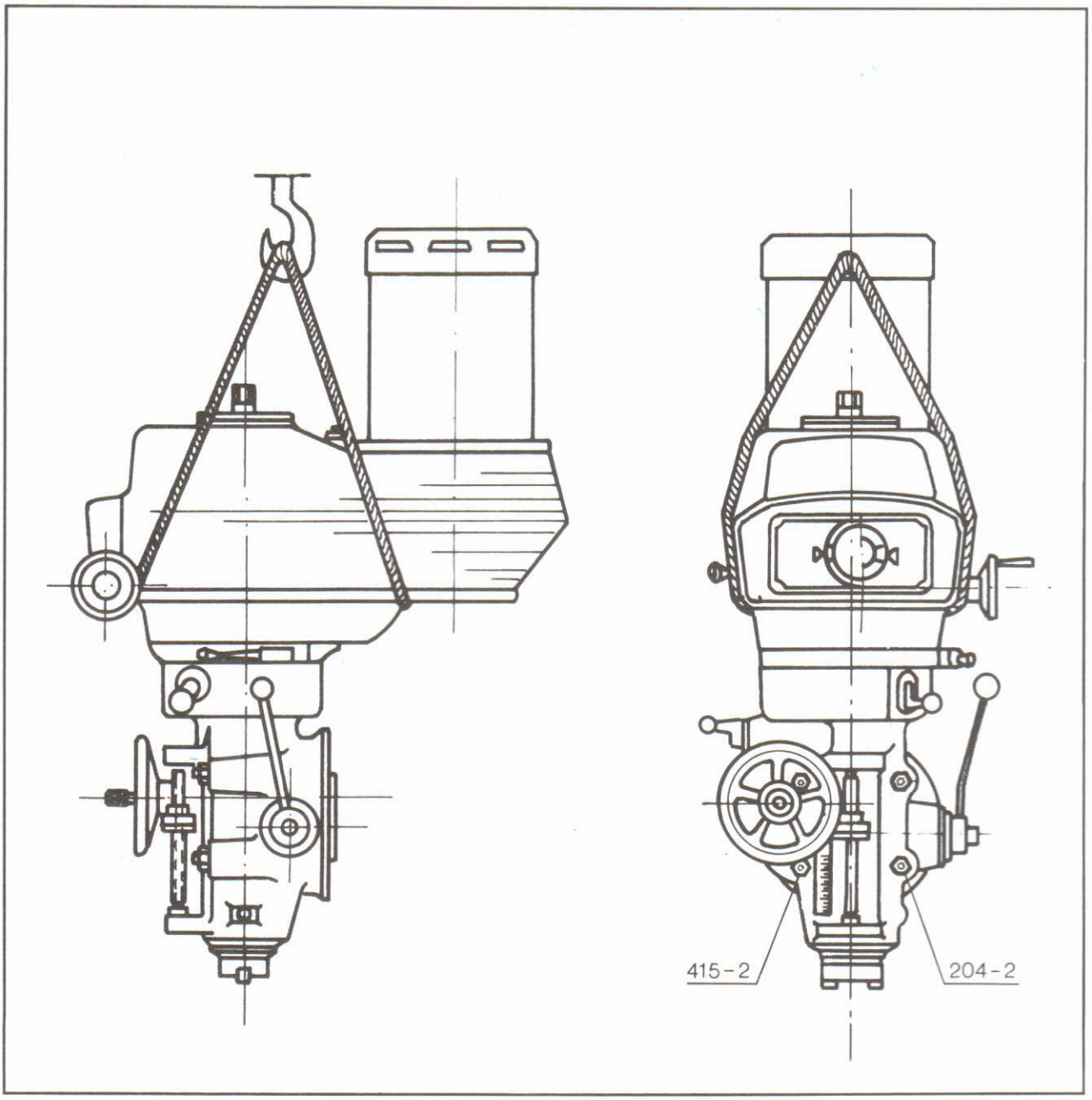
Variable speed headstock

KONDIA

THIS BOOK CONTAINS USEFUL INSTRUCTIONS,
FOR THE MAINTENANCE AS WELL AS
FOR THE LOCATION; SO, WE ADVISE, TO CHECK
CAREFULLY ALL THE DETAILS

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.

Transport and installation



Transport

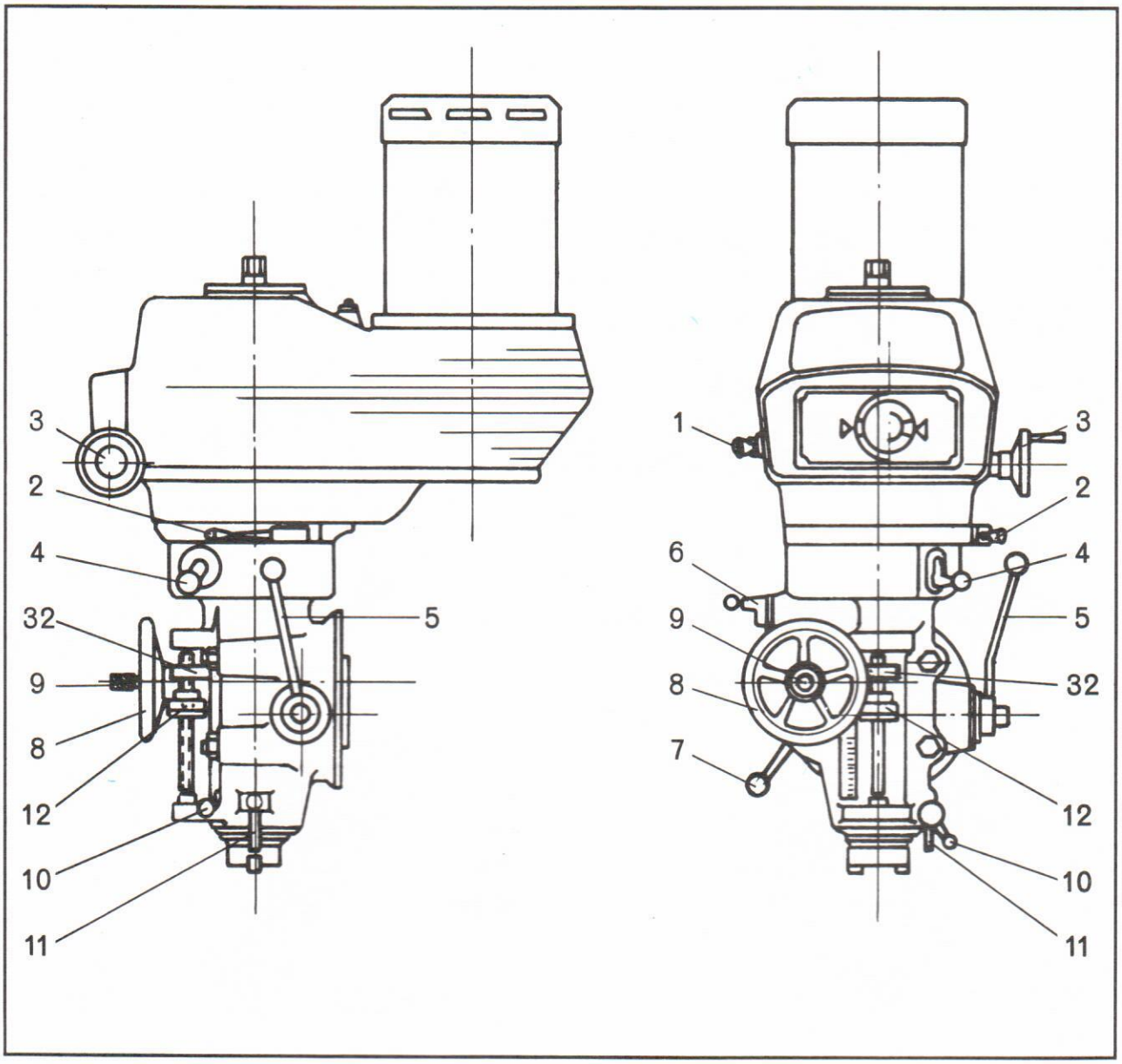
We recommend to fit a rope becket for transporting variable speed head, as shown on Figure.

Installation

Fit screws Nos. 204-2 and 415-2 into the four holes of head.
Then, make a previous tightening by means of four nuts corresponding to screws mentioned above. Finish fastening head with the same nuts.

CAUTION: A bad tightening of nuts could provoke a strain on sensitive parts of head.

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 sahft, 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.

Feds 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 determinated 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 oppqsite might damage the mechanism.

Spindle speeds are obtained by turning handweel 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 N.o 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 removal

1.- Set Spindle speed to the top position within the range at what the machine is working.

This arrangement raises the sliding motor pulley at the topmost position and therefore the push spring will offer a min. resistance when handling it, then proceed to disconnect machine and Spindle motor.

2.- Unfasten lower rear cover no. 705-10 and remove it.

Proceed to remove screw no. 898-10. When the above is being done you will notice part no. 762-10 moves downwards operated by spring no. 763-10, allowing to extract the operating spring and splined shaft no. 736-10 once the screw has been removed.

3.- Loosen the two screws ref. no. 845-10 that fasten the motor to the belt housing and remove it pulling upwards.

To replace a new motor reverse above steps.

Changing variable speed belt no. 830-10

1.- Complete the operations for removing the motor.

2.- Remove top cover no. 725-10 and then loosen screws 833-10 that fasten balancing beam 718-10 and release balance bushing 719-10. Then remove brake lever 231-2 (brake lock handle) and brake bushing 730-10, remove the six (6) screws 876-10 holding the belt housing to its sub-plate.

The belt housing is now held in place by two (2) dowel pins and can be removed with a slight tap.

3.- Remove the old belt no. 830-10 and replace it with a new one, if possible of the same trademark.

WARNING: Vibration and heat could result from the use of a worn out or defective belt.

Changing timing belt no. 503-2 Code no. 234130310579

1.- Complete the operations for the removal of the motor and the variable speed belt.

2.- Remove the bottom pulley of main spindle with its bracket no. 703-10 by loosening the six (6) screws no. 853-10.

Then remove the old belt and replace it with a new one.

We recommend the belt to be supplied by the machine distributor.

WARNING: All the replacement operations will be made easier by having initially detached the variable speed head housing.

Final recommendations

Lubrication

Long life, accuracy and warrantee 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.

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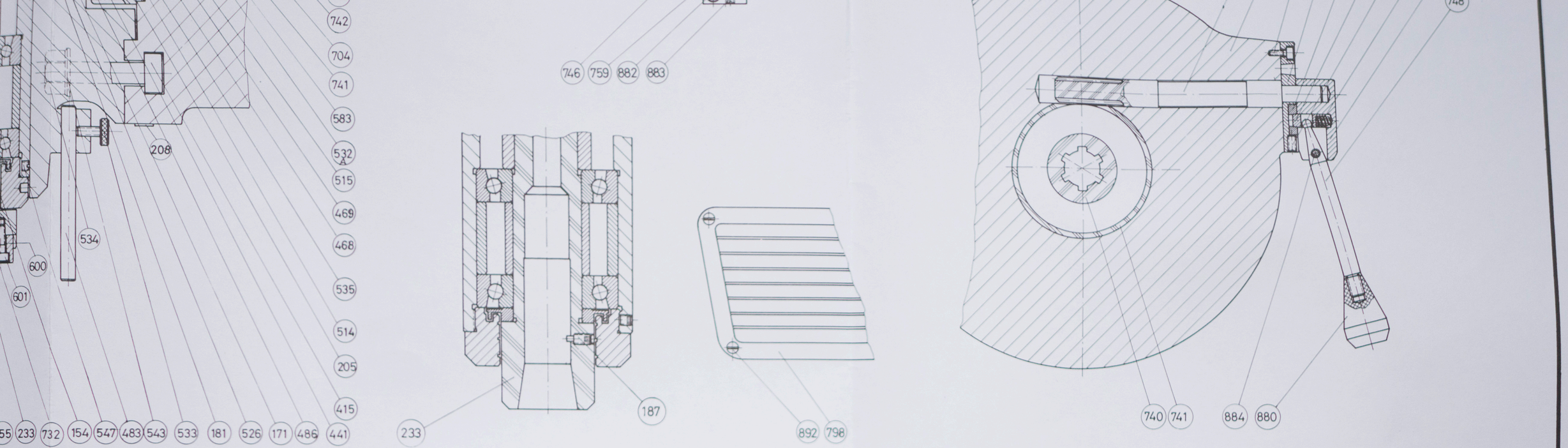


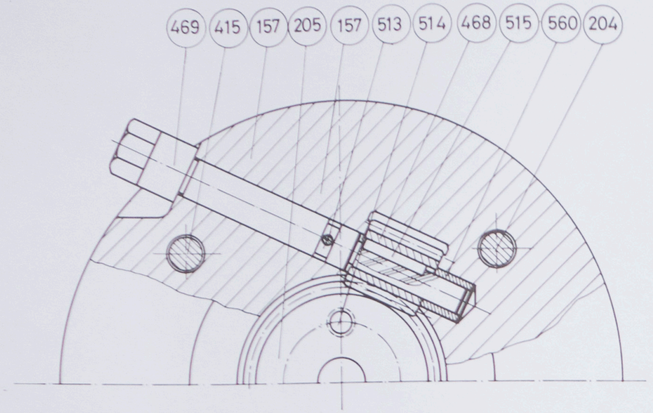
555-2 Special ring
556-2 Conical pin
557-2 Bakelite ball Ø 35 RM-8
558-2 Allen Screw RM 5x45
560-2 Sleeve
564-2 Setscrew
565-2 Aluminium elbow
566-2 Conical pin
569-2 Steel felt
570-2 Felt washer
571-2 Quill skirt
572-2 Washer
574-2 Greasing sleeve
575-2 Sleeve
576-2 Sleeve
579-2 Washer
581-2 Rivet
583-2 Allen screw
587-2 Setscrew
588-2 Setscrew
589-2 Pin
591-2 Washer
600-2 Hauling key
601-2 Allen screw M 6x15
701-10 Belts cover
702-10 Gearbox
703-10 Main spindle support
704-10 Support plate
705-10 Down cover of framework (housing)
706-10 Pulley shaft clutch
707-10 Main spindle pulley
708-10 Main sliding pulley
709-10 Sliding motor pulley
709-H-10 Ring
715-10 Main spindle brake

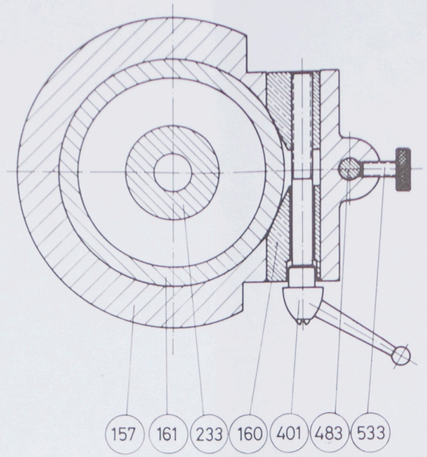
717-10 Drive pan
718-10 Balancing beam
719-10 Balancing beam bushing
720-10 Traction springs
721-10 Main pulley ring
722-10 Pulley fastening ring
723-10 Cover for main spindle bearing
724-10 Clutch ring
725-10 Upper cover of framework
726-10 Shaft of brake operation
727-10 Brake cams
728-10 Splined bushing
729-10 Brake rotation bolt
730-10 Brake bushing
731-10 Brake shaft bushing
732-10 Fastening-draw bar
734-10 Key 5x4x4
735-10 Key
736-10 Splined shaft
737-10 Washer
740-10 Splined hear hub.
741-10 Sliding bearing box
742-10 Bushing
743-10 Spacing bushing
744-10 Lever hub
745-10 Tooth change shaft
746-10 Rotation plate
747-10 Locking nozzle
748-10 Control lever
749-10 Spring
750-10 Clutch springs
751-10 Guideways flanges
752-10 Drive ring
753-10 Pins
754-10 Protecting sheet

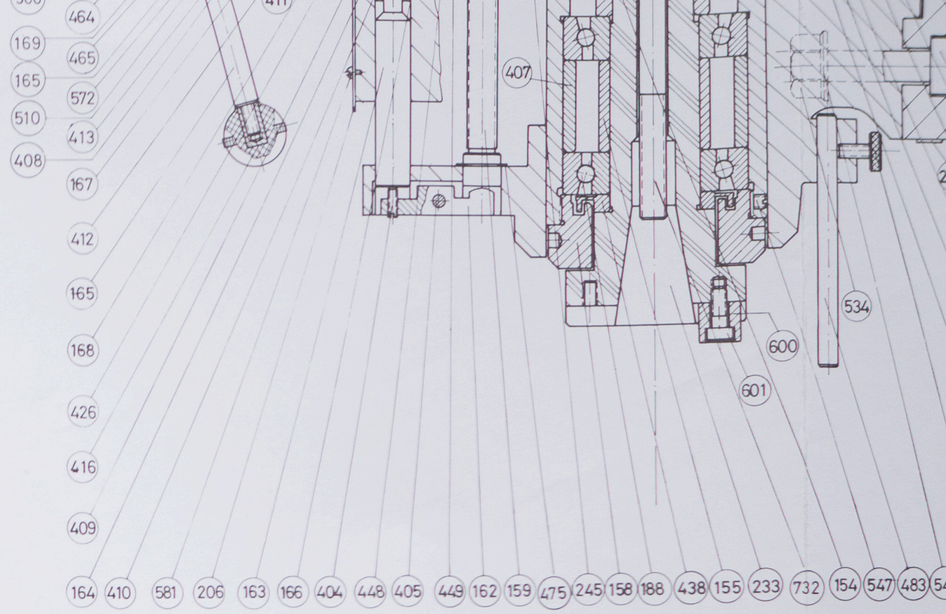
755-10 Driving gear
756-10 Square head screw
757-10 Cover
758-10 Gear shaft
759-10 Locking piece
760-10 Main motor
761-10 Motor bushing
762-10 Spring rest
763-10 Operating spring
770-10 Operating support
771-10 Wormgear
772-10 Gear
773-10 Bushing
774-10 Bushing
775-10 Operating shaft bushing
776-10 Operating shaft
777-10 Bushing
778-10 Ring
779-10 Pin
780-10 Metal sheet for air piping
781-10 Pin
782-10 Regulating nut
783-10 Chain
784-10 Regulating spindle
785-10 Warning plate
786-10 Firm plate
787-10 Handwheel
788-10 Handwheel hub
789-10 Control handle
790-10 Operating shaft
791-10 Speed plate
792-10 Speed disk
793-10 Spindle feed plate
795-10 Speed change plate
797-10 Lubrication plate

798-10 Grid
825-10 FAFNIR bearing
826-10 FAFNIR bearing
827-10 FAFNIR bearing
828-10 6203 2 RS Bearings
830-10 "Continental" belt 20-85 type
831-10 Elastic pin Ø 3
832-10 PHILLIPS screws Ø 3
833-10 ALLEN screws, RM-5x25
834-10 ALLEN screws, RM-6x15
835-10 Elastic ring E-38
836-10 Wavy washer Ø 62
837-10 Washer Ø 8
838-10 Nut RM-10
839-10 Washer Ø 10
841-10 Nut RM-8
842-10 Cotter (shear) pin Ø 3
844-10 Allen setscrew RM-6x10
845-10 Allen screws RM-10x25
850-10 Washer Ø 12
851-10 RM-12 nut
852-10 Elastic ring I-68
853-10 Allen screw RM-8x25
854-10 Elastic pin Ø 3
856-10 Elastic ring E-50
857-10 Cotter 8x8x30
858-10 Wavy washer Ø 40
859-10 Nut RM-14
860-10 Washer Ø 14
861-10 Hexagon-head screws RM-6x20
862-10 Allen setscrew RM-6x8
863-10 Cotter 6x6x20
865-10 Elastic pin Ø 6x15
866-10 Cotter 4x4x7
867-10 Allen screws RM-6x15

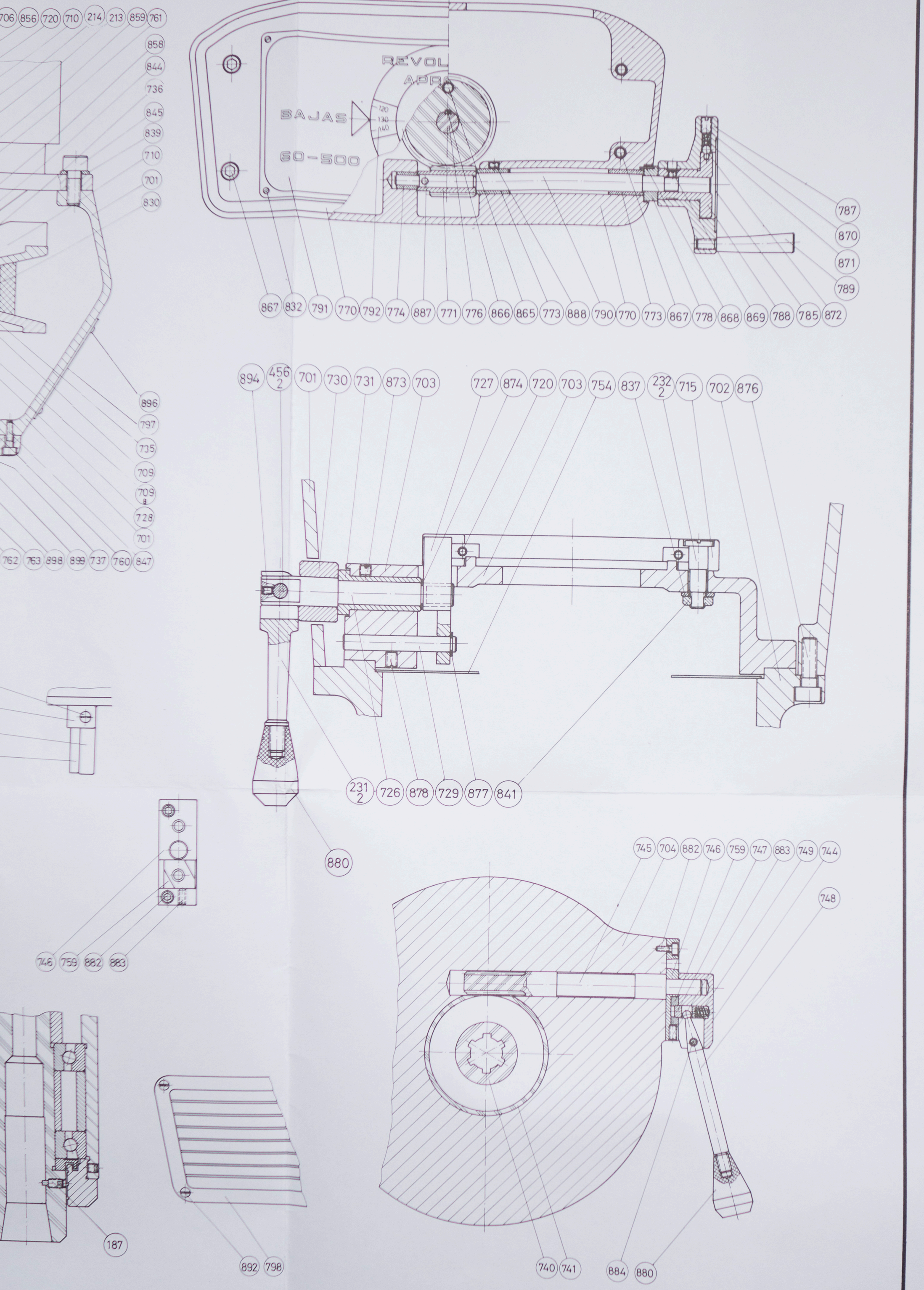
868-10 Elastic pin Ø 2x10
869-10 Allen setscrew RM-5x5
870-10 Allen setscrew RM-6x5
871-10 Spring Ø 5x1
872-10 Steel ball Ø 5
873-10 Allen setscrew RM-6x10
874-10 Elastic ring E-10
876-10 Allen screw RM-8x25
877-10 Elastic ring E-8
878-10 Allen setscrew RM-6x10
880-10 Tapered balls 25x40
882-10 Allen screws RM-4x10
883-10 Allen setscrew RM-5x10
884-10 Cylindrical pin Ø 5x22
885-10 Blind nut
886-10 Screw RM-4x10
887-10 Elastic pin Ø 3x12
888-10 Allen setscrew RM-6x10
889-10 Allen screw castellated head, RM-4x10
890-10 Allen setscrew M-8x10
891-10 Castellated screw M-4x12
892-10 Castellated screw M-3x12
894-10 Allen setscrew M-4x8
895-10 Allen screw M-6x20
896-10 Rivet
897-10 Castellated screw M-3x5
898-10 Screw RM 10x30
899-10 Grower washer Ø 10







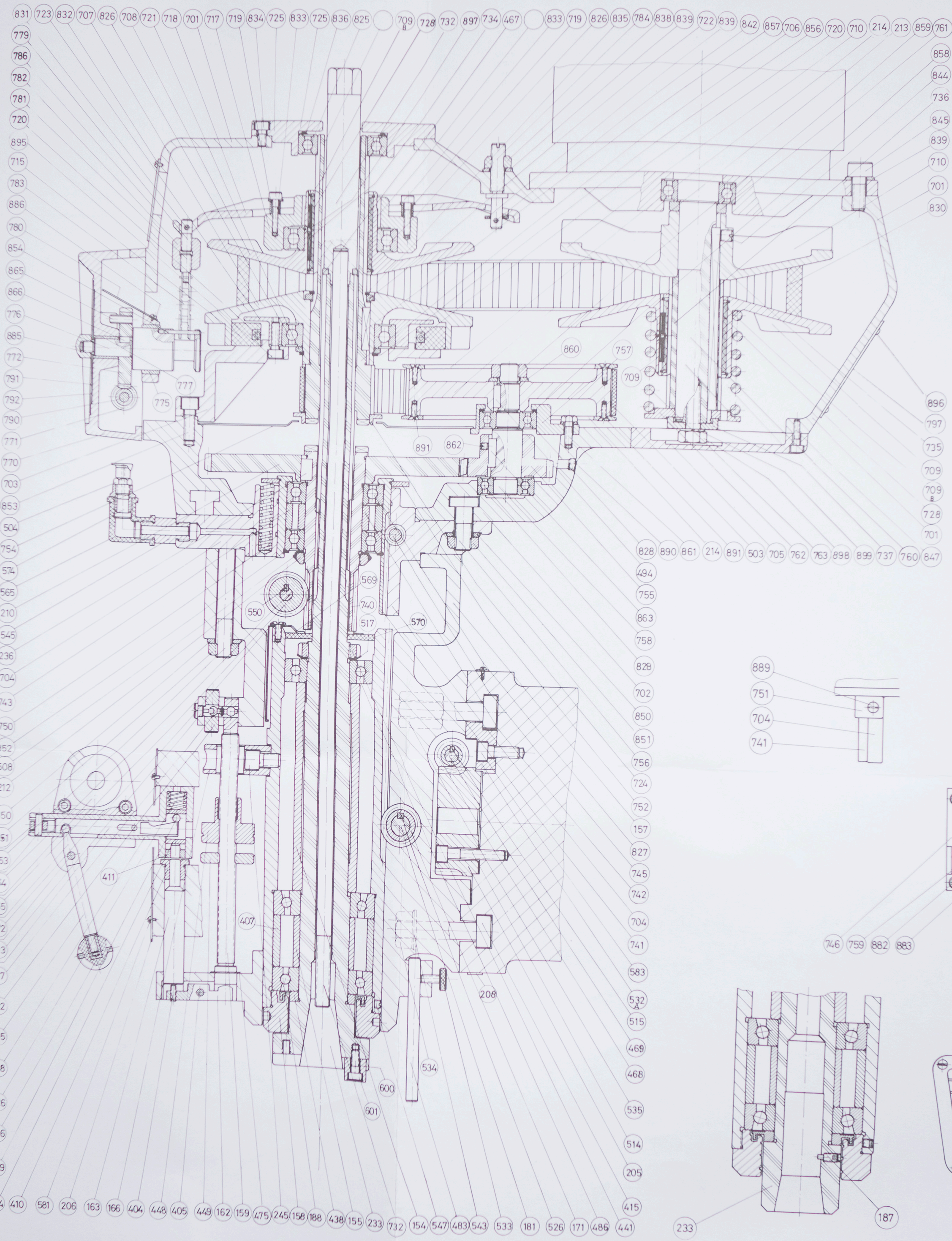
154-2	Sleeve
155-2	Sleeve
157-2	Quill housing
158-2-A	Quill nosepiece
159-2-A	Quill stop micro screw
160-2	Quill lock sleeve
161-2-A	Quill
162-2-B	Feed trip lever
163-2	Feed trip plunger
164-2-A	Discharge piston
165-2	Trip handle
166-2	Quill stop knob
167-2	Reverse trip ball lever
168-2-A	Cam rod sleeve assembly
169-2	Feed trip bracket
170-2	Overload clutch worm gear
171-2	Quill pinion
172-2	Overload clutch ring
173-2-A	Overload clutch sleeve
174-2	Overload clutch trip lever
175-2	Clutch arm cover
176-2	Overload clutch
178-2	Spring cover
179-2	Pinion shaft hub sleeve
180-2-A	Pinion shaft hub
181-2	Quill pinion shaft
182-2	Bushing
183-2	Hollow head cap screw
184-2	Feed reverse bevel gear
185-2-A	Coupling
186-2	Conical pinion
187-2	Allen setscrew RM 6x15
188-2	Angular contact ball bearing
189-2	Bushing
190-2-A	Hand wheel coupling
191-2-A	Reverse clutch rod
192-2-A	Feed worm shaft
193-2-A	Feed shift rod
194-2	Feed reverse bevel gear
195-2	Feed bevel pinion
196-2	Cluster gear input shaft
197-2	Cluster gear shaft
198-2	Cluster gear cover
199-2	Shift crank
200-2	Feed gear shifter fork
201-2	Feed worm gear shaft sleeve
202-2	Worm gear cladle throw-out
203-2-A	Worm gear cradle
204-2	T-Bolt
205-2	Sprocket
206-2	Graduated scale
207-2	Safety clutch spring
208-2-1	Graduated area
210-2	Spindle bull gear
212-2	Castellated nut
213-2	Timing belt pulley
214-2	Timing belt pulley flange
231-2	Brake lock handle
232-2	Brake rotation screw
233-2-C	Main spindle
236-2	Cotter 10x8x15
241-2	Special setscrew
243-2	Allen special setscrew
244-2	Allen special setscrew
245-2	Allen special screw
398-2	Feed driving gear
399-2	Feed drive gear
400-2	Feed bevel gear
401-2	Quill lock bolt
404-2	RM 4x8 pin
405-2	Special pin
407-2-A	Bearing spacer
408-2-A	Cam rod
409-2	Elastic pin
410-2	Trip plunger bushing
411-2	Feed trip plunger bushing
412-2	Feed reverse trip plunger
413-2	Reverse trip ball lever screw
414-2	Cluster gear shaft upper bearing
415-2	T-bolt
416-2	Black plastic ball handle 25 mm. dia.
417-2	Anchorage nozzle
418-2	Pinion Shaft Hub screw
419-2	Quill pinion shaft bushing
420-2	Pinion shaft worm gear spacer
421-2	Overload clutch lever spring plunger
422-2	Dowel pin
423-2	Allen setscrew RM 6x20
424-2	Overload clutch washer
425-2	Compression spring
426-2	Compression spring
427-2	Compression spring
428-2	Overload clutch locknut
429-2	Clutch ring
430-2	Washer
431-2	Feed drive cluster gear
432-2	Feed drive cluster gear (center)
433-2	Feed drive cluster gear (upper)
434-2	Washer
435-2	Feed worm shaft bushing
436-2	Reverse knob
437-2	Handle screw
438-2-A	Spindle dirt shield
441-2	Castellated nut (KM)
443-2	Shift sleeve
444-2	Worm gear spacer
445-2	Dowel pin
446-2	Cluster gear shift crank
447-2	Anchorage shaft
448-2	Micrometer nut
449-2	Quill micro stop nut
450-2	Clock spring
456-2	Lever shaft
460-2	Spring setscrew
461-2	Spring
463-2	Boston Worm
464-2	Feed drive worm gear shaft
465-2	Feed drive worm gear
466-2	Feed engage pin
467-2	Drawbar washer
468-2	Worm gear
469-2	Worm shaft
471-2	Key 4x4x7,5
472-2	Key 5x4x12
474-2	Handwheel
474-2-A	Handwheel handle
475-2	Elastic ring E-16
476-2	Steel ball Ø 5
477-2	Conical pin
478-2	Elastic pin Ø 4
479-2	RM-8 nut
480-2	Key 5x3x9
481-2	Screw round Head RM 4x12
482-2	Key 3x3x9
483-2	Indicator rod
484-2	Conical pin
485-2	Allen screw RM 5x15
486-2	Bearing
487-2	Roll pin
488-2	Conical pinn
494-2	Key 5x5x26
503-2	Timing belts
504-2	Gits oil cup
508-2	M3 Washer
509-2	Allen screw RM 6x18
510-2	Conical pin
511-2	Conical pin
513-2	Special setscrew
514-2	Allen screw H 8x40
515-2	Key 4x4x25
517-2	MB washer
521-2	Bearing
522-2	Special setscrew
523-2	Elastic ring Ø E-10
524-2	Setscrew RM 6x8
525-2	Elastic ring Ø E-15
526-2	Key 5x5x20
527-2	Hexagonal Head Screw RM 5x20
528-2	Key 5x5x16
529-2	Steel ball Ø 5
530-2	Spring
531-2	Nozzle
532-2	Round head screw RM-4x18
532-A-2	Adjustment key
533-2	Pin fastening screw
534-2	M 12 Nut (exagonal)
535-2	M 12 special nut (exagonal)
543-2	Washers Ø 12
547-2	Setscrew
548-2	Pin
549-2	Key 4x4x30
550-2	Key 4x4x22
551-2	Special key
552-2	Key 4x4x45
554-2	Special ring
555-2	Speci
556-2	Conic
557-2	Bakel
558-2	Allen
560-2	Sleev
564-2	Setsc
565-2	Alum
566-2	Conic
569-2	Steel
570-2	Felt w
571-2	Quill
572-2	Wash
574-2	Greas
575-2	Sleev
576-2	Sleev
579-2	Wash
581-2	Rivet
583-2	Allen
587-2	Setsc
588-2	Setsc
589-2	Pin
591-2	Wash
600-2	Hauli
601-2	Allen
701-10	Belts
702-10	Gearh
703-10	Main
704-10	Supp
705-10	Down
706-10	Pulle
707-10	Main
708-10	Main
709-10	Slidin
709-H-10	Ring
715-10	Main



755-10 Driving gear
756-10 Square head screw
757-10 Cover
758-10 Gear shaft
759-10 Locking piece
760-10 Main motor
761-10 Motor bushing
762-10 Spring rest
763-10 Operating spring
770-10 Operating support

798-10 Grid
825-10 FAFNIR bearing
826-10 FAFNIR bearing
827-10 FAFNIR bearing
828-10 6203 2 RS Bearings
830-10 "Continental" belt 20-85 type
831-10 Elastic pin Ø 3
832-10 PHILLIPS screws Ø 3
833-10 ALLEN screws, RM-5 x 25

868-10 Elastic pin Ø 2 x 10
869-10 Allen setscrew RM-5 x 5
870-10 Allen setscrew RM-6 x 5
871-10 Spring Ø 5 x 1
872-10 Steel ball Ø 5
873-10 Allen setscrew RM-6 x 10
874-10 Elastic ring E-10
876-10 Allen screw RM-8 x 25



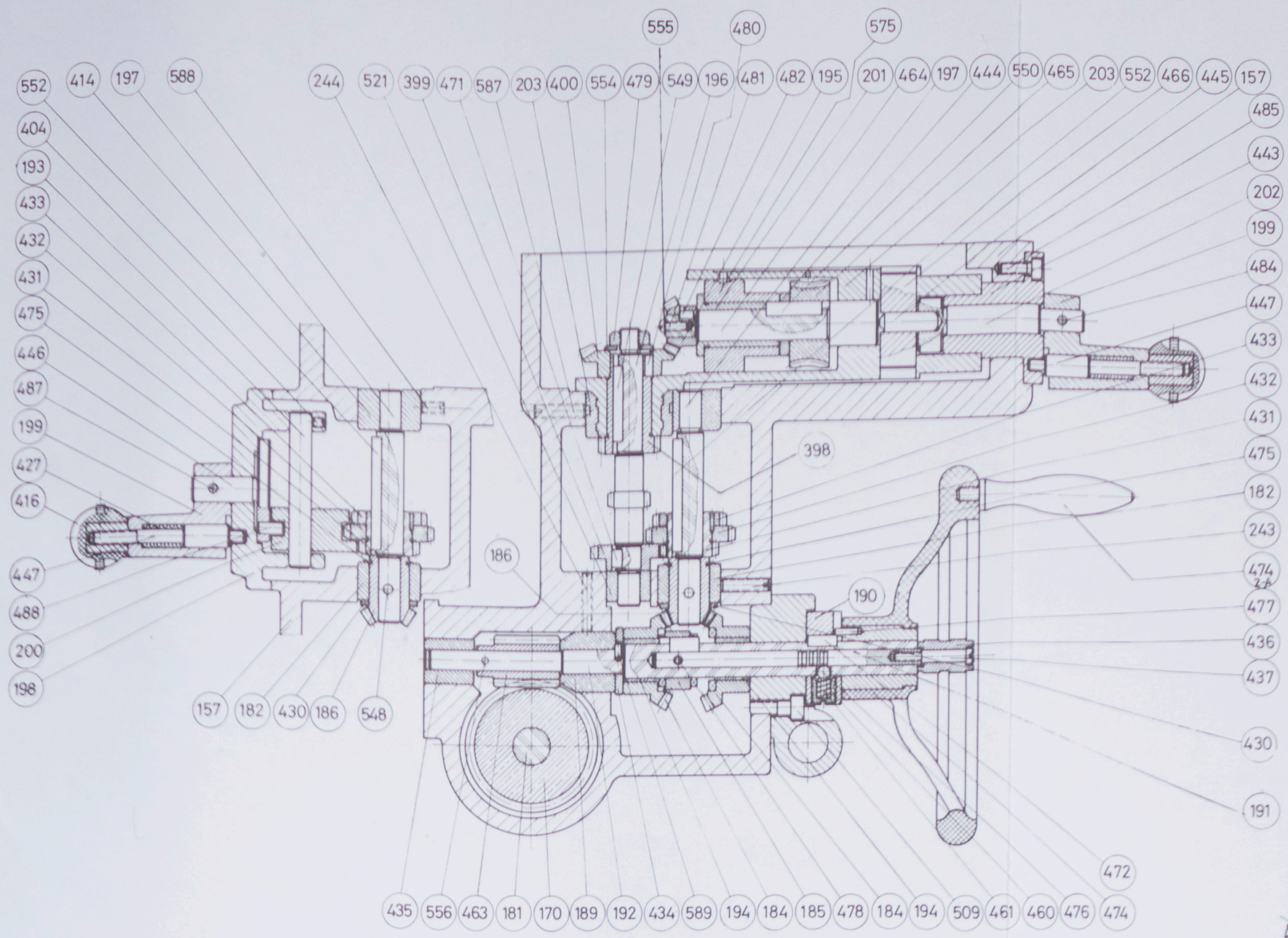
-2	Worm gear spacer
-2	Dowel pin
-2	Cluster gear shift crank
-2	Anchorage shaft
-2	Micrometer nut
-2	Quill micro stop nut
-2	Clock spring
-2	Lever shaft
-2	Spring setscrew
-2	Spring
2	Boston Worm
2	Feed drive worm gear shaft
2	Feed drive worm gear
2	Feed engage pin
2	Drawbar washer
2	Worm gear
2	Worm shaft
2	Key 4 x 4 x 7,5
2	Key 5 x 4 x 12

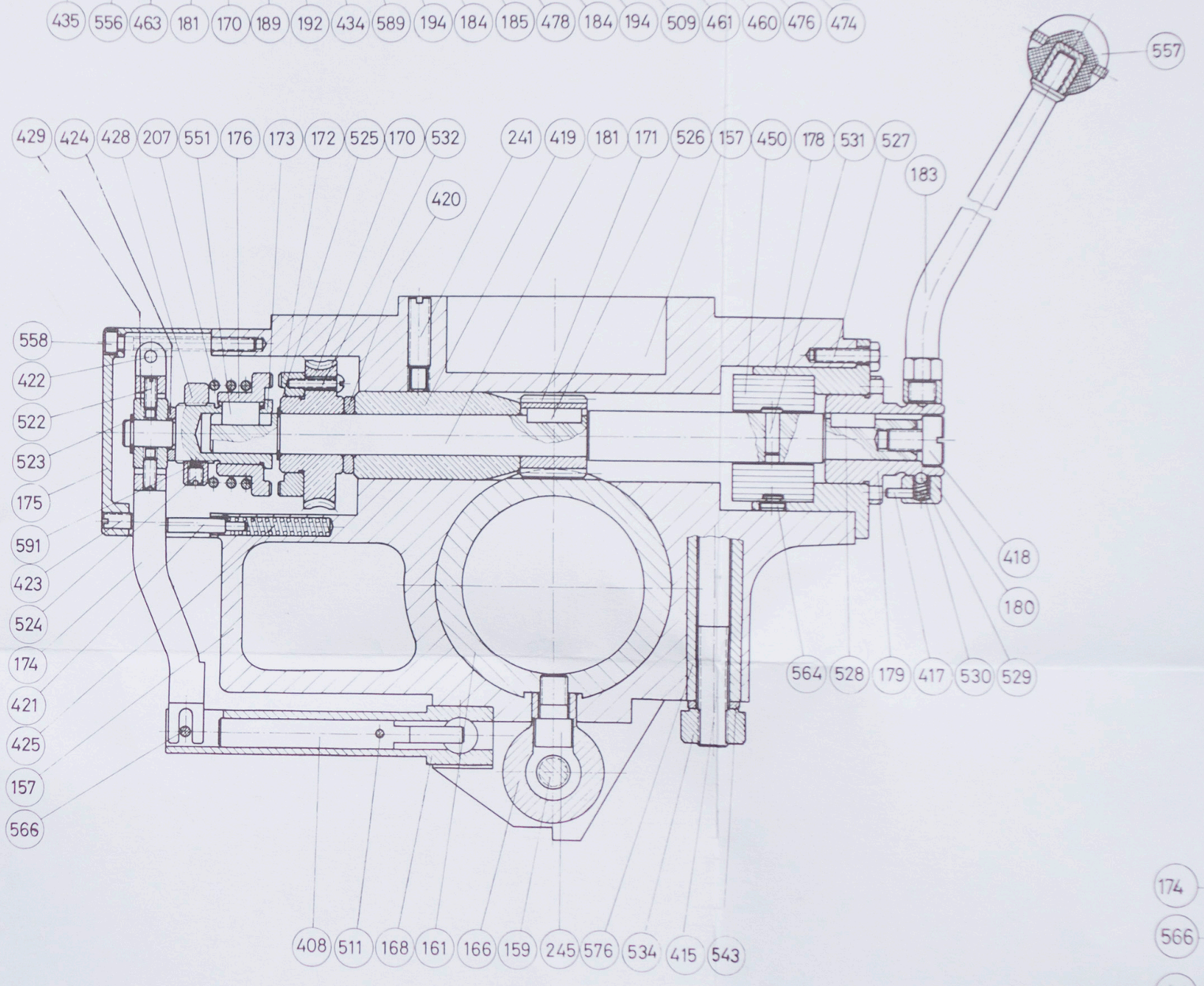
494-2	Key 5 x 5 x 26
503-2	Timing belts
504-2	Gits oil cup
508-2	M3 Washer
509-2	Allen screw RM 6 x 18
510-2	Conical pin
511-2	Conical pin
513-2	Special setscrew
514-2	Allen screw H 8 x 40
515-2	Key 4 x 4 x 25
517-2	MB washer
521-2	Bearing
522-2	Special setscrew
523-2	Elastic ring Ø E-10
524-2	Setscrew RM 6 x 8
525-2	Elastic ring Ø E-15
526-2	Key 5 x 5 x 20

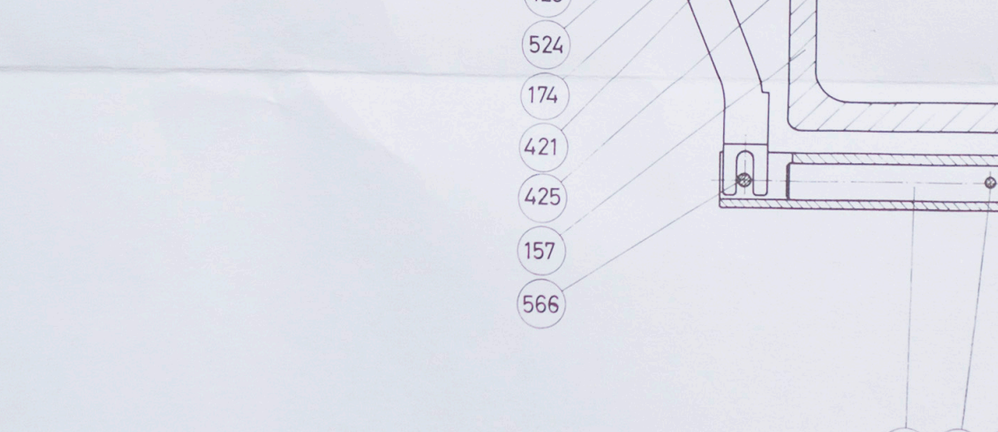
555-2	Special ring
556-2	Conical pin
557-2	Bakelite ball Ø 35 RM-8
558-2	Allen Screw RM 5 x 45
560-2	Sleeve
564-2	Setscrew
565-2	Aluminium elbow
566-2	Conical pin
569-2	Steel felt
570-2	Felt washer
571-2	Quill skirt
572-2	Washer
574-2	Greasing sleeve
575-2	Sleeve
576-2	Sleeve
579-2	Washer

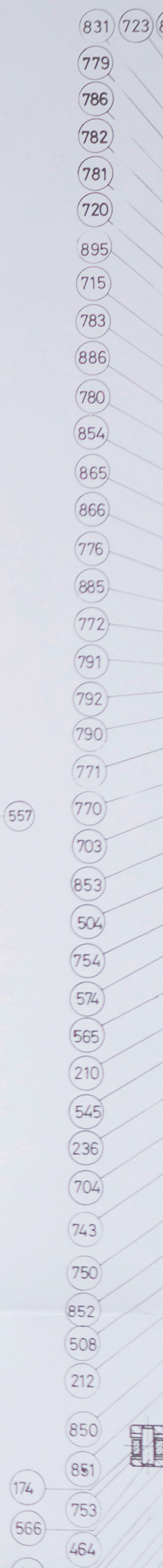
717-10	Drive pan
718-10	Balancing beam
719-10	Balancing beam bushing
720-10	Traction springs
721-10	Main pulley ring
722-10	Pulley fastening ring
723-10	Cover for main spindle bearing
724-10	Clutch ring
725-10	Upper cover of framework
726-10	Shaft of brake operation
727-10	Brake cams
728-10	Splined bushing
729-10	Brake rotation bolt
730-10	Brake bushing
731-10	Brake shaft bushing

755-10	Driving gear
756-10	Square head scr
757-10	Cover
758-10	Gear shaft
759-10	Locking piece
760-10	Main motor
761-10	Motor bushing
762-10	Spring rest
763-10	Operating spring
770-10	Operating suppo
771-10	Wormgear
772-10	Gear
773-10	Bushing
774-10	Bushing









154-2 Sleeve
155-2 Sleeve
157-2 Quill housing
158-2-A Quill nosepiece
159-2-A Quill stop micro screw
160-2 Quill lock sleeve

191-2-A Reverse clutch rod
192-2-A Feed worm shaft
193-2-A Feed shift rod
194-2 Feed reverse bevel gear
195-2 Feed bevel pinion

405-2 Special pin
407-2-A Bearing spacer
408-2-A Cam rod
409-2 Elastic pin

444-2 Worm gear spacer
445-2 Dowel pin
446-2 Cluster gear shift