Clausing Metosa C1340S Lathe Manual

C1340S = S/90-165 in manual

Clausing Metosa C1340S Lathe Manual

MT92079

C13/C14

FROM S/N 30586 -

ENE-94

Pinacho

PRECISION CENTRE LATHES

mod. SP/165
mod. SP/180
mod. S-90/165
mod. S-90/180

instructions manual

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SYMBOL OF PRECISION

DESCRIPTION

FUNCTIONAL AND DIMENSIONAL DESCRIPTIONS

	SP/165	S-90/165	SP/180	S-90/180
	mm.	inches	mm.	inches
CAPACITY				
Centre height	165	6 1/2"	180	7"
Centre distance	750-1000	30"-40"	750-1000	30"-40"
Swing over bed	335	13 3/16	360	14"
Swing over gap	490	19 1/4"	520	20 7/16"
Swing over carriage	310	12 3/16"	335	13 3/16"
Swing over cross slide	175	6 7/8"	205	8 5/64"
Bed width	250	10"	250	10"
Gap length in front of face plate	120	4 3/4"	120	4 3/4"
HEADSTOCK				
Main spindle bore	42	1 5/8"	42	1 5/8"
Main spindle nose	DIN 55022-5	Camlock n° 5	DIN 55022-5	Camlock n° 5
Main spindle taper	4	4	4	4
THREAD AND FEED BOX				
44 Longitudinal feeds	0,05-0,75	0,0018-0,026"	0,05-0,75	0,0018-0,026"
44 Cross feeds	0,025-0,375	0,0005-0,0076"	0,025-0,375	0,0005-0,0076"
44 Metric threads	0,5-7,5	0,5-7,5	0,5-7,5	0,5-7,5
44 Whitworth threads in T.P.I	60-4	60-4	60-4	60-4
44 Modular threads	0,25-3,75	0,25-3,75	0,25-3,75	0,25-3,75
44 Pitch diametral thread	120-8	120-8	120-8	120-8
* Threads of lead screw	6	4h/1"	6	4h/1"
SLIDE AND CARRIAGE				
Cross slide travel	245	9 5/8"	245	9 5/8"
Tool post slide travel	120	4 3/4"	120	4 3/4"
Maximum tool dimensions	16x16	5/8"x5/8"	20x20	3/4"x3/4"
TAILSTOCK				
Tailstock barrel diameter	48	1 7/8"	48	1 7/8"
Tailstock barrel travel	140	5 1/2"	140	5 1/2"
Tailstock taper	3MT	3MT	3MT	3MT
MOTOR				
Pump motor power in HP	0,07	0,07	0,07	0,07
STEADIES				
Max-min. capacity of fixed steady	10-115	3/8 -4 1/2"	10-115	3/8 -4 1/2"
Max-mim. capacity of travelling steady	10-70	3/8 -2 3/4"	10-70	3/8 -2 3/4"

	SP/165	SP/180	S-90/165	S-90/180
Speed range	9 60-2000	9 60-2000	18 30-2000	18 30-2000
Main motor power in HP	3	4	2,5/4,5	2,5/4,5

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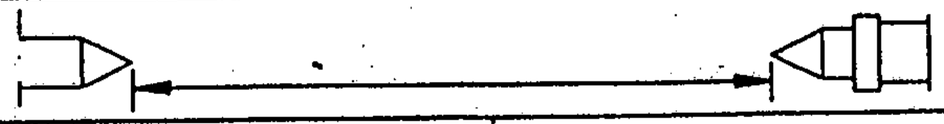
Mod. .....

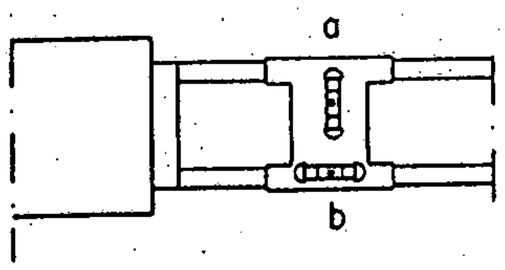
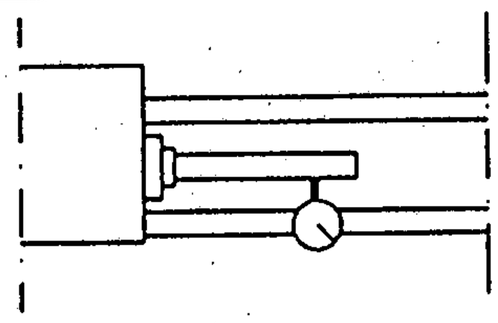
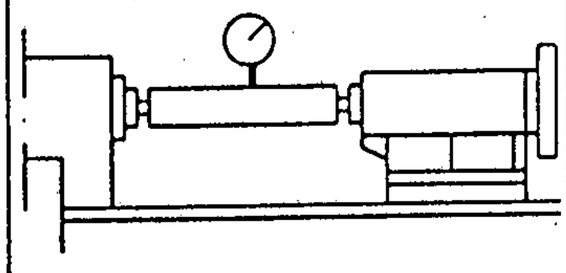
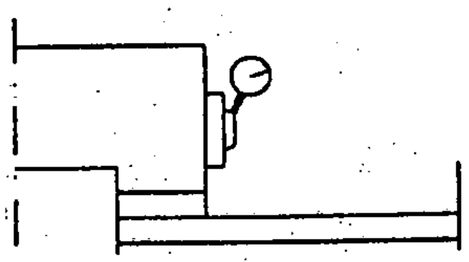
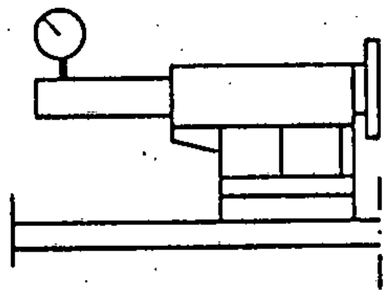
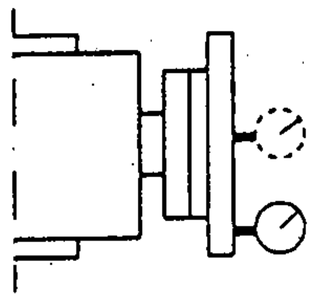
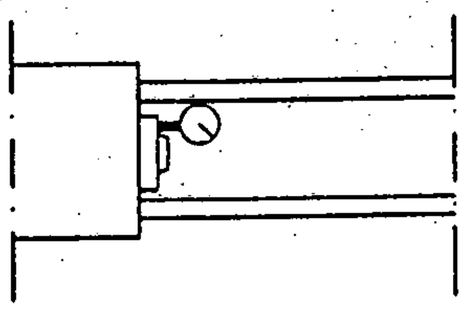
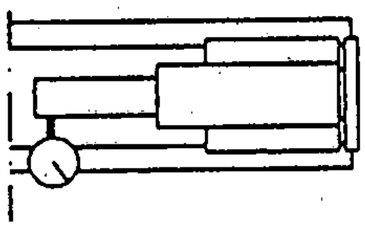
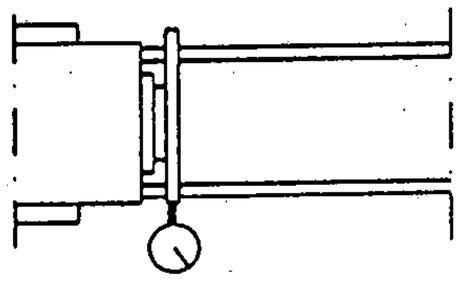
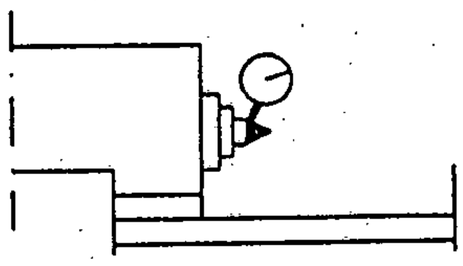
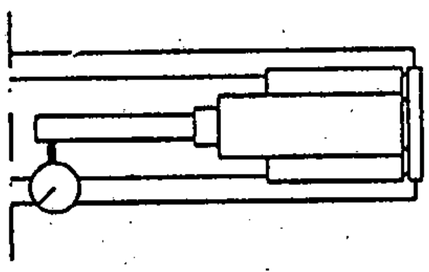
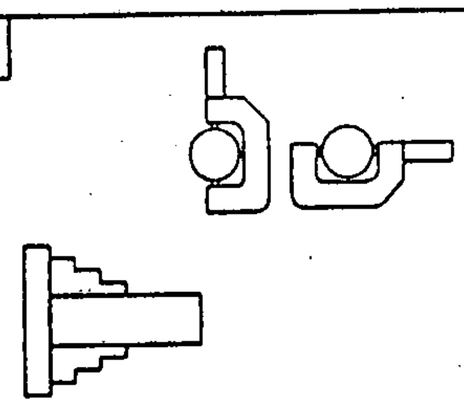
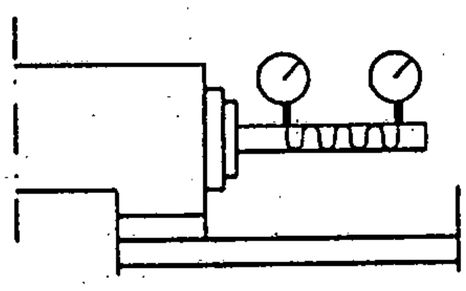
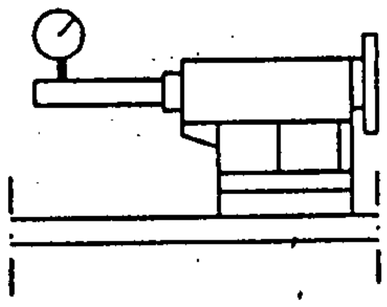
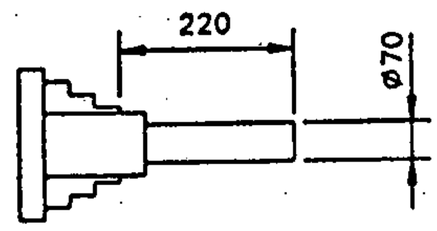
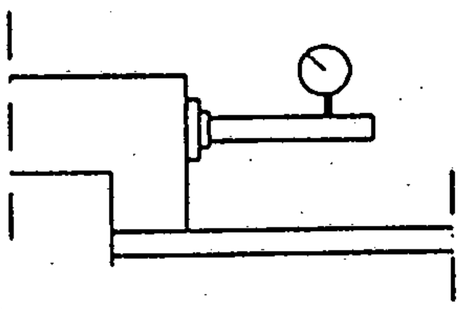
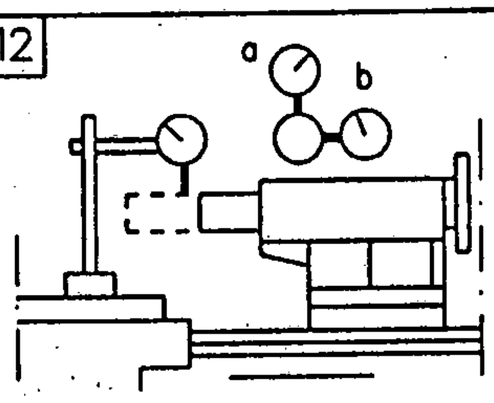
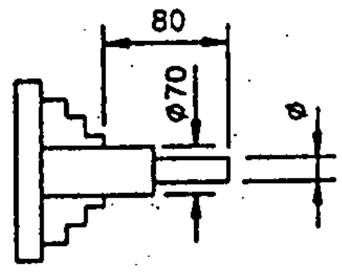
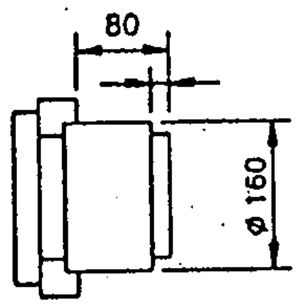


N° .....

N° ..... CV ..... Hz .....

D .....

T .....

1		a 0.02 b 0.02	7		0.01	13	 0.03
2		0.015	8		0.01	14	 0.02
3		0.01	9		0.01	15	 0.01
4		0.015	10		0.02	16	 0.01
5		0.01 0.02	11		0.02	17	 0.02
6		0.01	12		a 0.02 b 0.02	18	
						19	

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INTRODUCTION

TOGETHER WITH THE MACHINE, YOU WILL RECEIVE THIS INSTRUCTIONS MANUAL WHICH WE ADVISE YOU TO READ CAREFULLY, OBSERVING ITS CONTENT.

THE PURPOSE OF THIS MANUAL, APART FROM THE INSTRUCTIONS FOR STARTING UP THE MACHINE AND THE NECESSARY EXPLANATIONS, IS TO SOLVE ANY DOUBTS WHICH MIGHT ARISE WITH RESPECT TO ANY MECHANISM, CONSULTING THE RELATIVE PAGE NUMBER.

VERIFICATION CERTIFICATE

MACHINE TYPE/MODEL:
MANUFACTURING NUMBER:
MANUFACTURER: METOSA

WE HEREBY CERTIFY THAT:

- THE MACHINE WHOSE DATA ARE GIVEN ABOVE, HAS BEEN VERIFIED ACCORDING TO DIN 8606 STANDARS.
- THE VERIFICATION HAS PROVED THE CORRECT OPERATION OF THE MACHINE IN ALL ITS ASPECTS.
- THE MACHINE IS SUPPLIED EX-FACTORY WITHOUT ANY MANUFACTURING DEFECT. COMPLYNG WITH THE SAFETY REGULATION REQUIREMENTS FOR MACHINES.
- NOISE LEVEL $\leq$ 85 dB

NOTE: THE VERIFICATION TESTS WHICH FIGURE IN THE SHEET OF STANDARDS WHICH HAVE BEEN CARRIED OUT IN THE FACTORY, MUST BE APPROVED BEFORE USING LATHE; THEY HAVE TO BE IN CONFORMITY WITH THOSE OBTAINED IN THE ABOVE MENTIONED VERIFICATION SHEETS.
A CENTESIMAL LEVEL MUST BE USED FOR THIS OPERATION.

WE RECOMMEND A PERIODICAL REVISION OF THE LEVELLING, UNTIL THE FOUNDATIONS ARE COMPLETELY SET.

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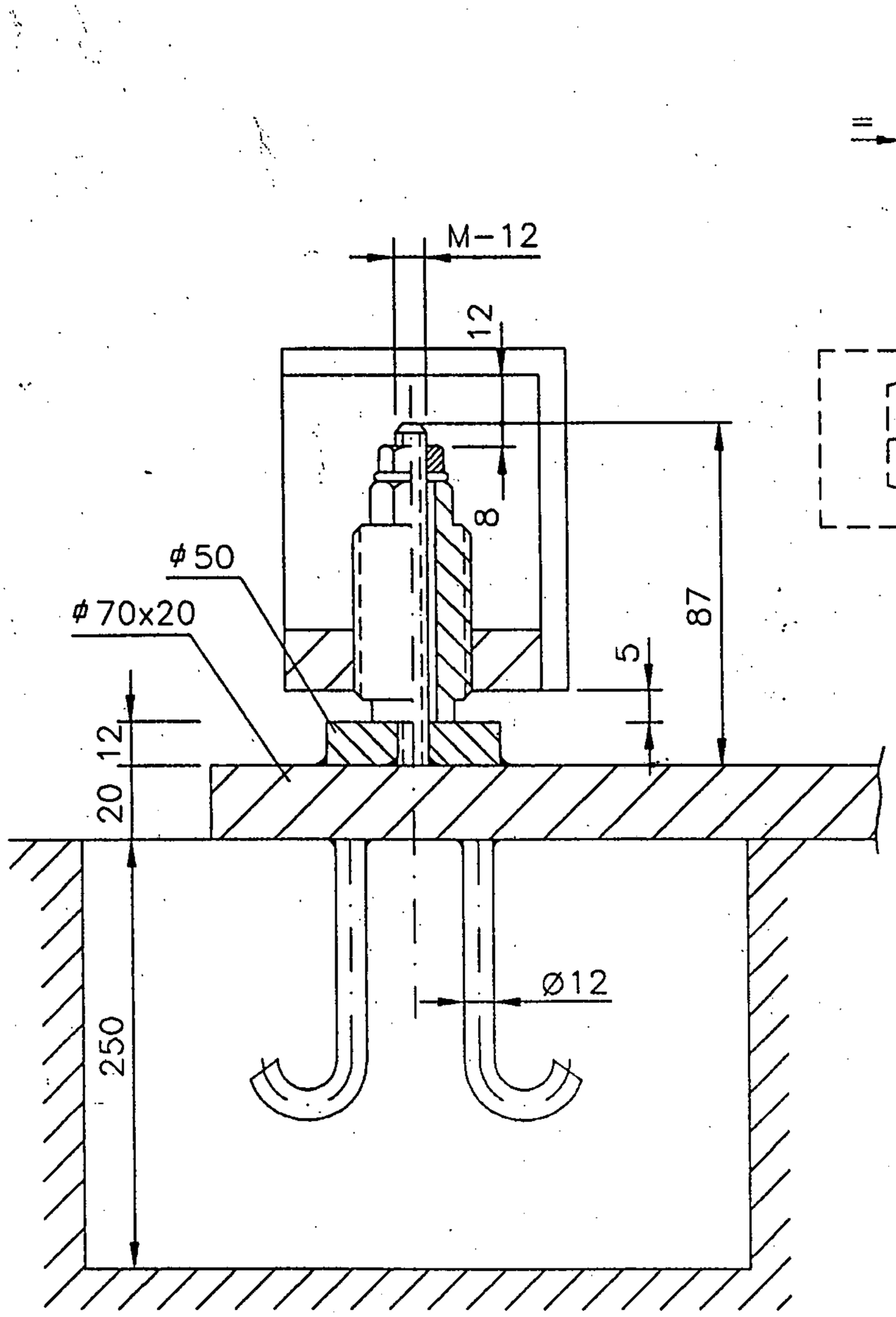
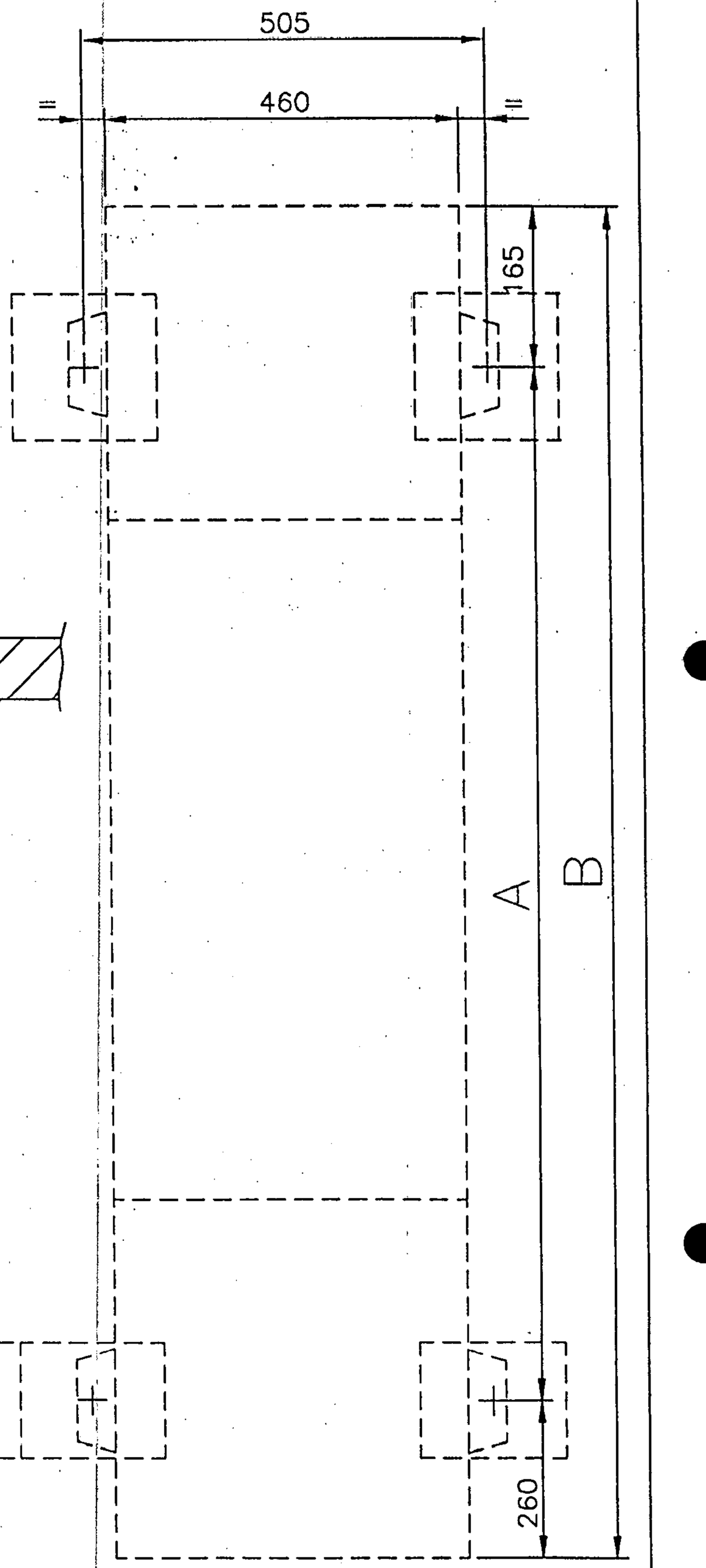
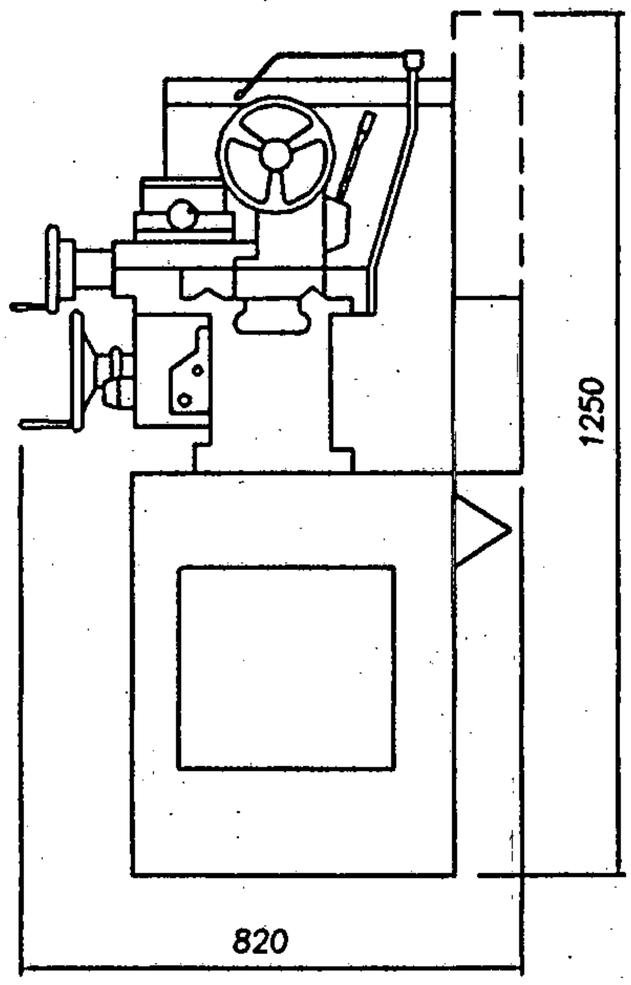
SYMBOL OF PRECISION

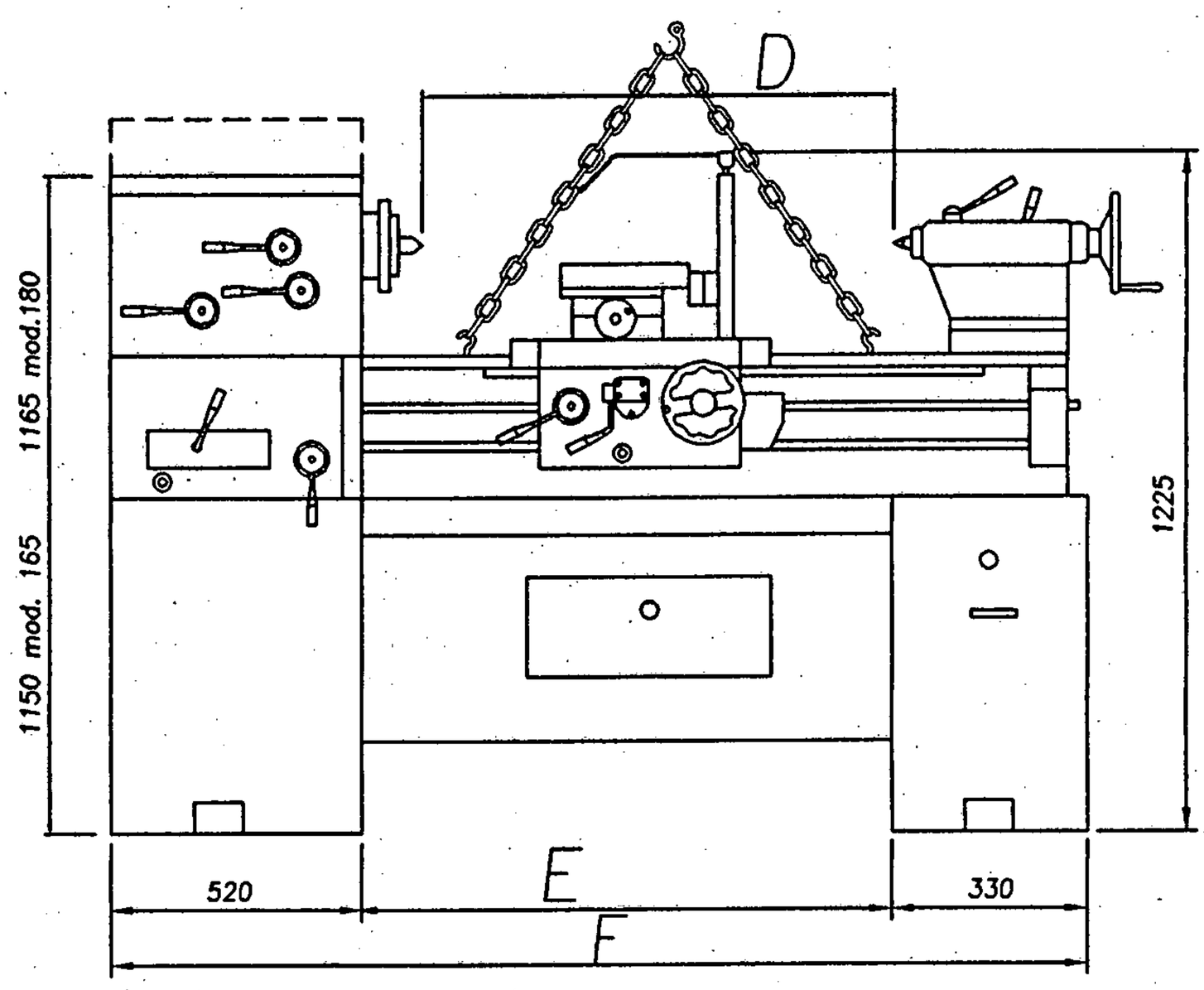
INSTALLATION

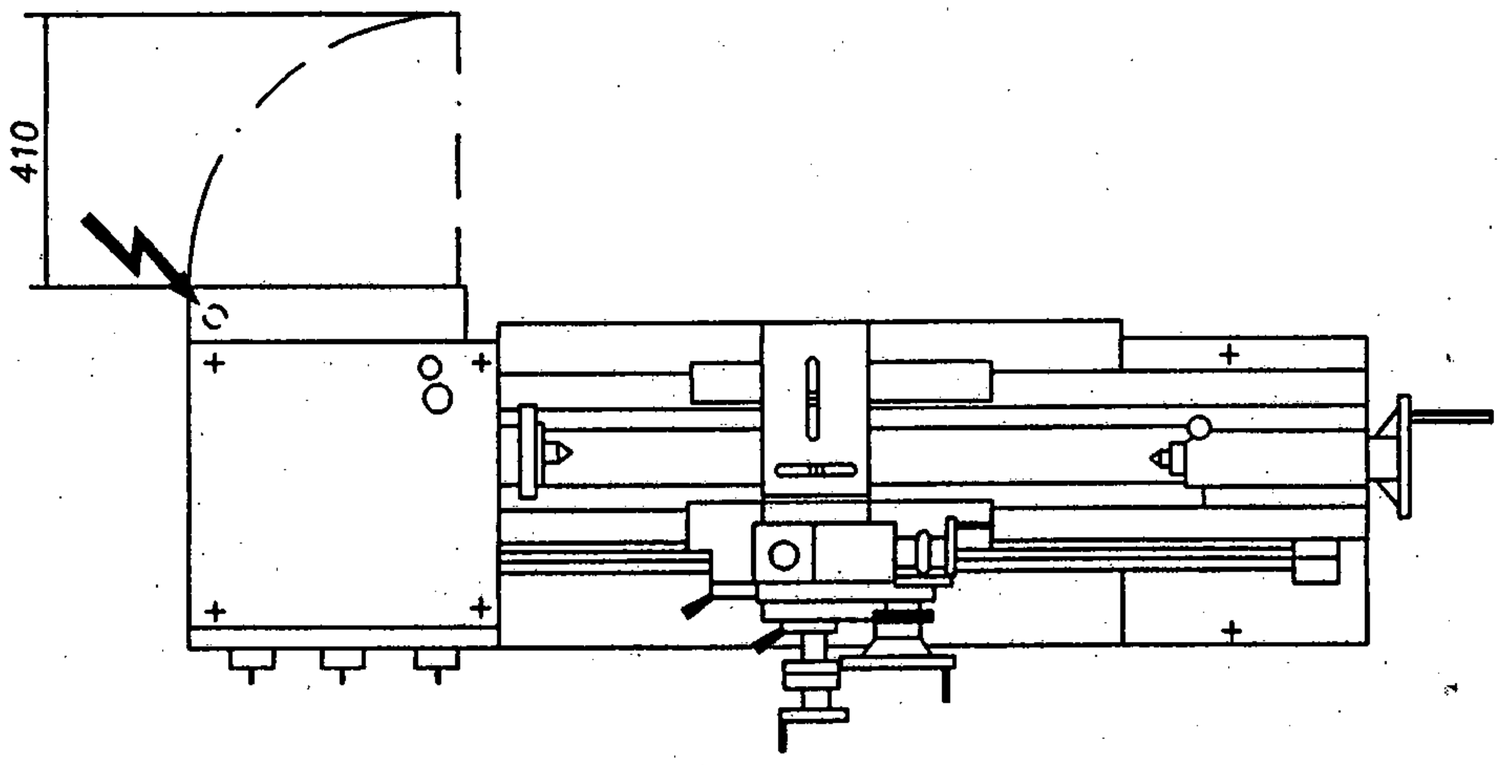




⇉ — ⇇	A	B
750	1350	1775
1000	1625	2050







D	E	F
750	925	1775
1000	1200	2050

		SP/165 S-90/165		SP/180 S-90/180	
	D	750	1000	750	1000
KGS	NETO NET NET NETTO	705	755	735	785
	BRUTO GROSS BRUT BRUTTO	830	880	870	920

INSTALLATION INSTRUCTIONS

The quality of the work carried out by the machine depends mainly on the experience and skill of the operator, and therefore its is important to provide the best possible conditions for the machine and the operator.

The lighting is an important element for obtaining goog results. Daylight is the best, but artificial lighting is also satisfactory if this forms few shadows and is sufficiently intense. A good location for your new Lathe must be a warm, dry place, with sufficient space on all sides, isolated from the places where people walk through, permitting sufficient space for the operator and maintenance.

Vibration is a detriment for any lathe, and can adversely affect the operation of your machine and the results of the work on the parts. A cement floor is advisable, however, any good solid foundation is admissible, providing the machine is solidly supported. On other occasions it is advisible to place the machine on antivibratory supports.

- LIFTING

The machine must be lifted using slings as indicated in the drawing, taking the necessary precautions. The carriage and tailstock must be moved to the end of the bed, to obtain good balance under the hook.

- UNPACKING THE MACHINE

Place the lathe in a place near to where it is finally going to be located, before proceding to unpack the machine. If the packaging shows signs of possible transport damage, take the necessary precautions not to damage the machine when unpacking. If any damage is located, the carrier and/or shipper must immediately be notified of this fact, to establish any claim which might appear.

Inspect the machine completely and carefully, making sure that all the material, such as shipping documents, manuals and accessories supplied with the machine, have been received.

WARNING

DO NOT MOVE THE CARRIAGE NOR THE TAILSTOCK UNTIL THE LATHE HAS BEEN CLEANED AND LUBRICATED AS EXPLAINED IN THE FOLLOWING CHAPTERS.

- FINAL CLEANING

Your new lathe must be completely cleaned after being unpacked, to make sure that all the moving parts and sliding surfaces cannot be damaged when operating the machine. Each unit leaves the factory with all its polished parts and sliding surfaces suitably greased, to avoid oxidation in the period of time that elapses until it is started up. Eliminate all the wrapping and clean all the surfaces with a degreaser to soften and eliminate the protecting greases and coatings.

Clean all the surfaces with a clean piece of cotton wool and lubricated the lathe as explained in the following chapter, before beginning to operate with the machine and connect the power.

WARNING

DO NOT USE COMPRESSED AIR TO CLEAN OR DRY AFTER THE CLEANING, THE AIR JET MAY DRAW PARTICLES TO SENSITIVE AREAS, DAMAGING THEM.

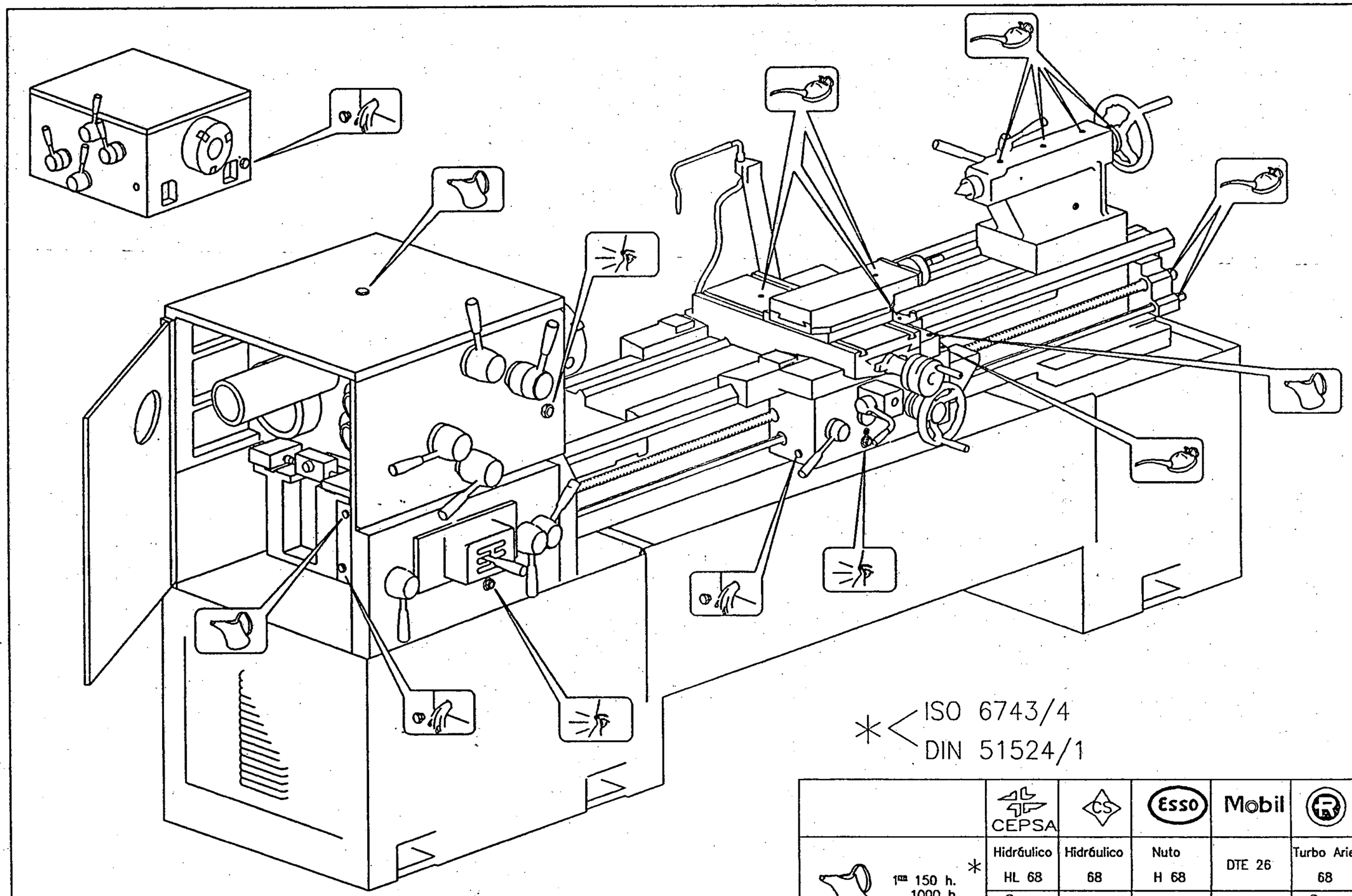
- LUBRICATION

The lubrication and initial greasing of your new Lathe consists of checking the oil levels through the headstock, Apron and Feed Box oil sight to make sure there is lubrication. They must be filed to half way up the viewer. In addition, all the points indicated in the enclosed drawing must be lubricated, before proceding to move the slides. Once these operations have been carried out the machine can be started up.

The Headstock, Feed Box and Apron oil must be changed 150 hours after being filled for the first time. And them after every 1000 hours operation.

Use any of the oil types recommended in the table as reference, where a list of the main companies and makes and their grades are given, for machine oils which adapt to our specifications. This table can be used in comparison with the characteristics of any other make you prefer.

Finally the lubrication is limited to a daily application on the oilers every 8 hours, by means of an oli-can. In addition, an application on the bed guides is advisable.



* < ISO 6743/4
DIN 51524/1

	CEPSA	CS	Esso	Mobil		Shell
1ª 150 h. .....1000 h. *	Hidráulico HL 68	Hidráulico 68	Nuto H 68	DTE 26	Turbo Aries 68	Tellus Oil 68
	Super Multigrado 15w50	Todogrado 20w50	Essoluble 20w50	Delbac 15w50	Super Multigrado 20w50	Helix 20w50
8 h.	Premium SAE 30	Premium CS SAE 30	Esso extra Motor Oil 3	Mobiloil A	Motor oil SAE 30	K100 Motor Oil 30

EXE-92

INSTRUCTIONS FOR LEVELLING AND PERIODICAL VERIFICATION

It is absolutely necessary for the lathe to be perfectly level, as indicated below, for the machine to work properly and to obtain the desired quality in the work.
The lathe can be positionned in three ways:

a) FREE POSITIONING
This must be done by laying down a strong base, on each support of the 6 levelling points, between the foundation and the machine leg.

b) ANTIVIBRATORY POSITIONING
On a light foundation, make the 6 square holes 200 mm. each side by 250 mm. deep approximately. See page 8.

c) FIXED POSITIONING
- On a light foundation, make the 6 square holes 200 mm. each side by 250 mm. deep approximately. See page 8.
- Fit the three previously prepared flat irons (70x20), in line with the centres of the levelling points.
- Pour concrete into each of the square holes and leave to set.
- Lift the machine from the floor and fit part (A) into each levellingpoint with the rod centred in the inner hole of the tightening device (B) and anchor well.
- Place the machine on the previously fitted flat irons and weld.
- Proceed to level

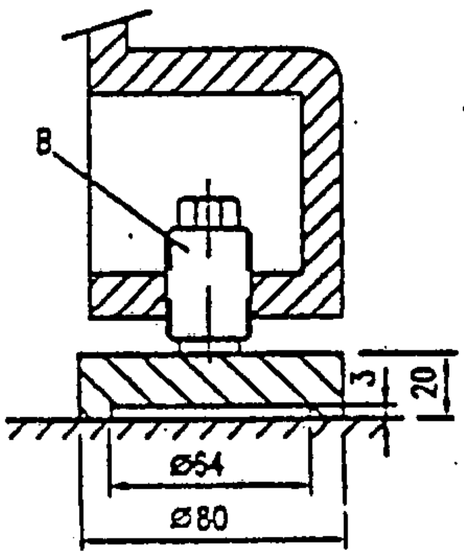
IMPORTANT: In the antivibratory and fixed positioning ways, the rods must NEVER rub against the inner hole of the tightening device (B).

LEVELLING

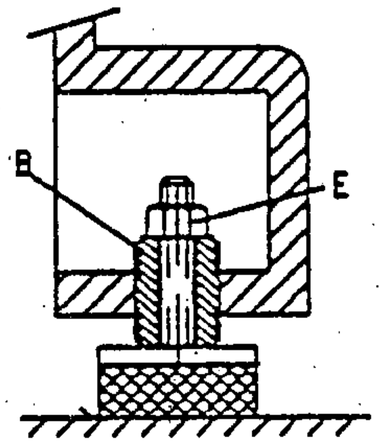
Once the bases are in place, proceed to level, following the instructons given by us:
- Fit precision levels (0.05 mm/mt) on the cross slide, as indicated in the figure.
- Position the carriage on the centre of the bed and by means of the 4 end tightening devices (C) obtain a reading of 0.05 mm/mt on the levels.
- Adjust the tightening devices (D) until they place pressure but do not vary the levelling.
- Lock with nuts (E) and check the levelling again.
- Check that all the tightening devices are supported.
- Before starting work with the machine, check the tolerances with the verification sheet enclosedd with this manual.

IT IS ADVISABLE TO MAKE A COMPLETE VERIFICATION FROM TIME TO TIME.

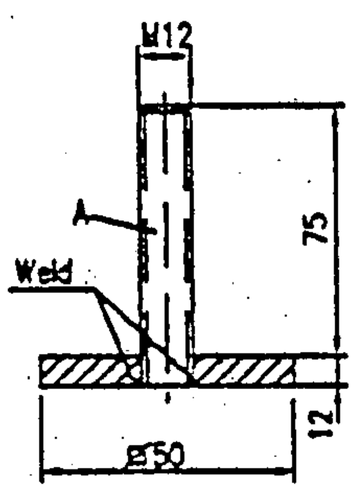
FREE



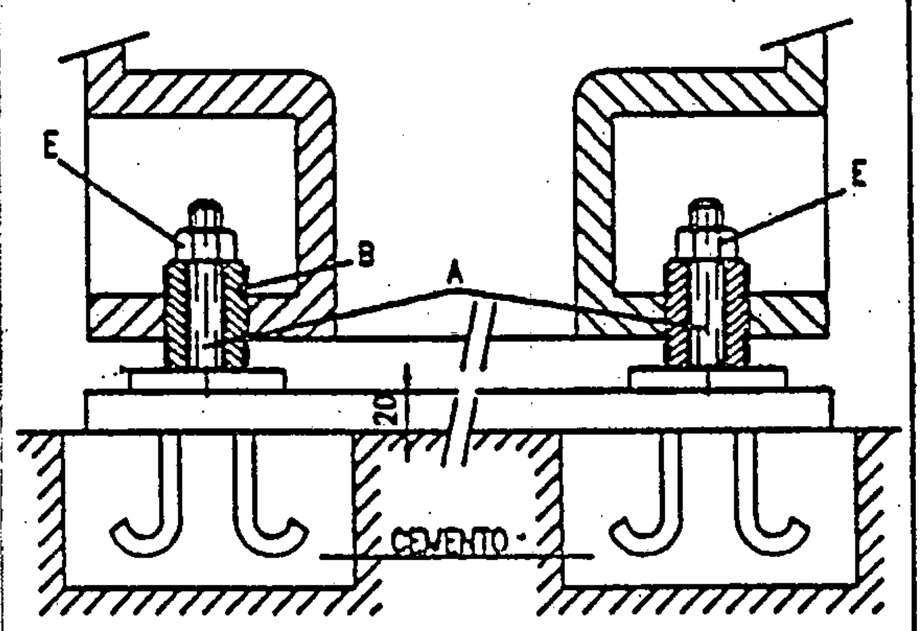
ANTIVIBRATORY



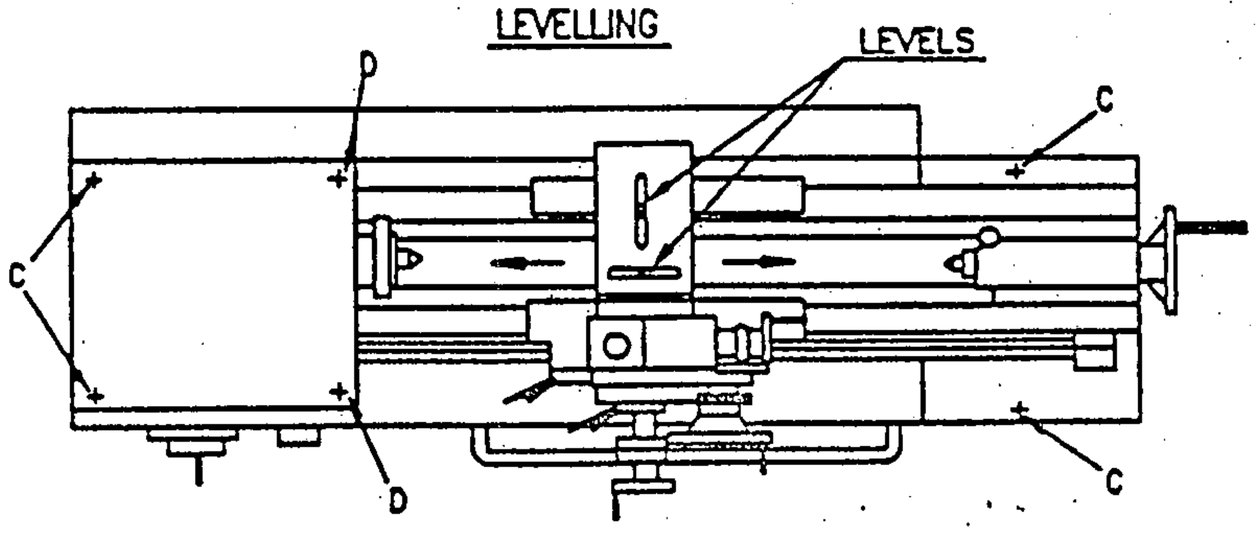
DETAIL ROD "A"

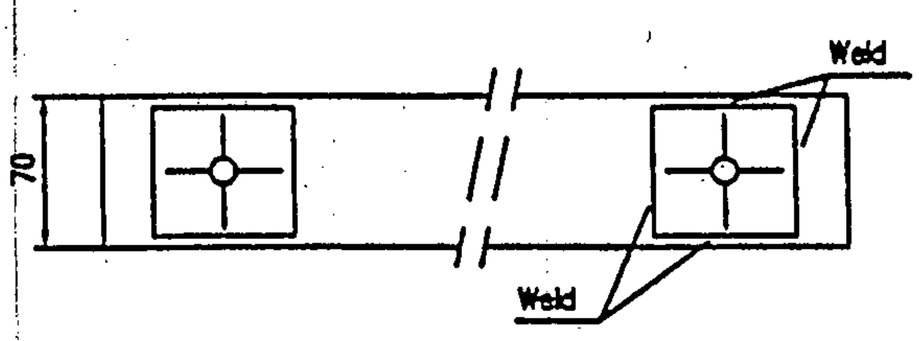


FIXED



LEVELLING LEVELS





INITIAL START UP

Connect the motor and the controls to a suitable electricity supply, in accordance with all the local codes. Before connecting the motor, make sure that all the voltages and other current requirements of the motor adapt to the electrical power supply. When the connection has been made, check that the motor phase (rotation) is correct, checking that the rotation of the main shaft or face plate, is forwards when the start lever is down.

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SYMBOL OF PRECISION

OPERATION

MT92143 08–165	VISIBLE PARTS
Item	Description
1	Headstock
2	Headstock cover
3	Speed change control
4	Speed change control
5	Feed direction control
6	Advance change control
7	Headstock oil level window
8	Face plate
9	Electrical box
10	Splash guard
11	Saddle
12	Coolant nozzle
13	Coolant nozzle support
14	Cross slide
15	Tool post
16	Topslide
17	Apron oil window
18	Apron handwheel
19	Apron
20	Feed movement control
21	Lead nut control
22	Cross handwheel
23	Start control
24	Topslide handwheel
25	Tailstock lock
26	Tailstock barrel
27	Tailstock barrel lock
28	Tailstock
29	Tailstock handwheel
30	Bed
31	Lead screw
32	Shaft support bracket
33	Feed shaft
34	Thread dial
35	Tailstock pedestal
36	Tray
37	Tray box
38	Headstock pedestal
39	Emergency switch
40	Quick–change gearbox clutch protection
41	QC gearbox–feed/thread selection
42	QC gearbox oil level window
43	Selector
44	QC gearbox
45	Cover plate
46	Main spindle
47	Rack
48	Pump motor switch
49	Brake pedal *Mechanical brake version

VISIBLE PARTS CE ENE–92	
Item	Description
1	Headstock
2	Headstock cover
3	Speed change control
4	Speed change control
5	Feed direction control
6	Advance change control
7	Headstock oil level window
8	Face plate
9	Electrical box
10	Splash guard
11	Saddle
12	Coolant nozzle
13	Coolant nozzle support
14	Cross slide
15	Tool post
16	Topslide
17	Apron oil window
18	Apron handwheel
19	Apron
20	Feed movement control
21	Lead nut control
22	Cross handwheel
23	Start control
24	Topslide handwheel
25	Tailstock lock
26	Tailstock barrel
27	Tailstock barrel lock
28	Tailstock
29	Tailstock handwheel
30	Bed
31	Lead screw
32	Shaft support bracket
33	Feed shaft
34	Thread dial
35	Tailstock pedestal
36	Tray
37	Tray box
38	Headstock pedestal
39	Emergency switch
40	Bar protection
41	QC gearbox–feed/thread selection
42	QC gearbox oil level window
43	Selector
44	QC gearbox
45	Cover plate
46	Main spindle
47	Rack
48	Pump motor switch
49	Brake pedal
50	Front protection
51	Quadrant plate door

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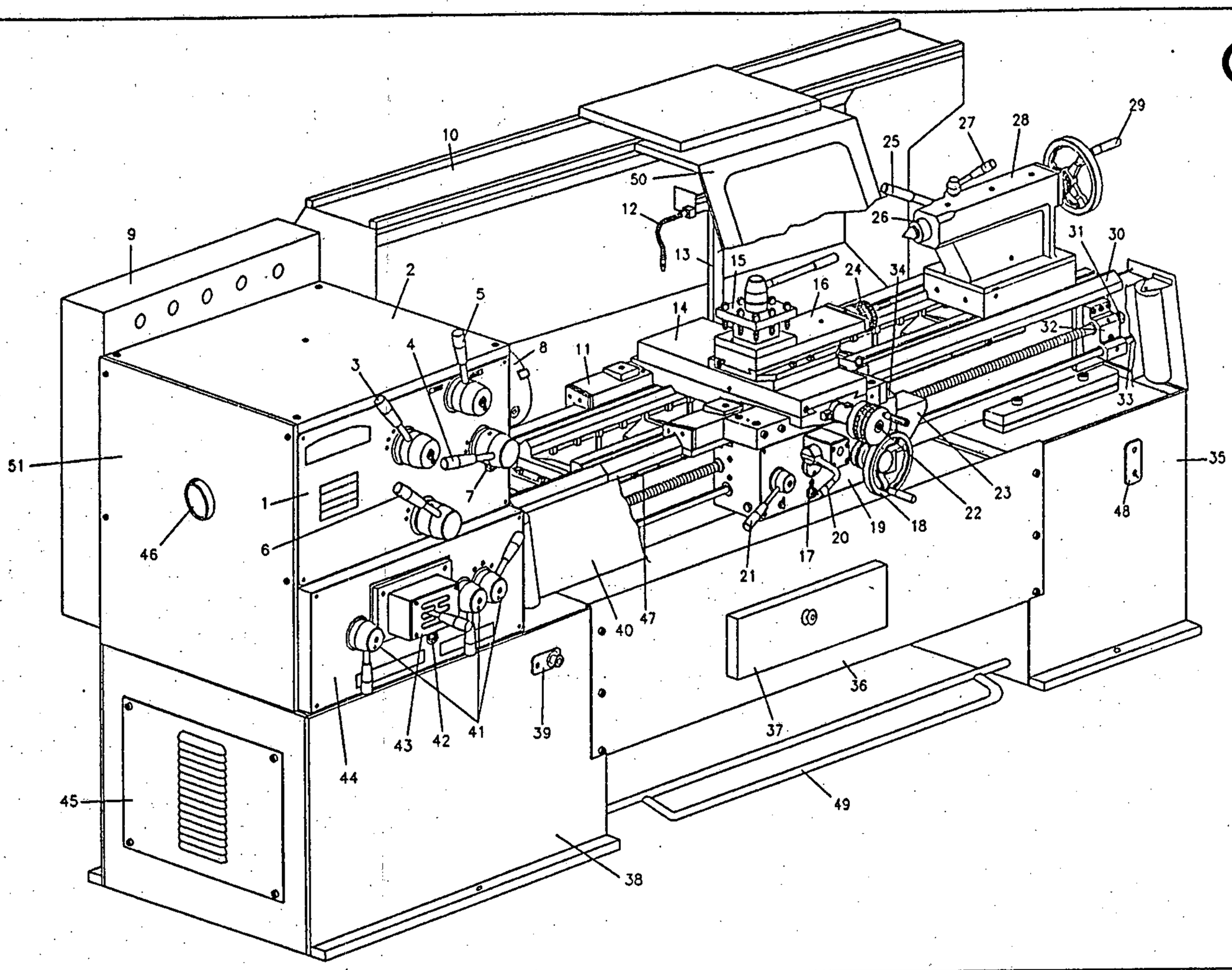

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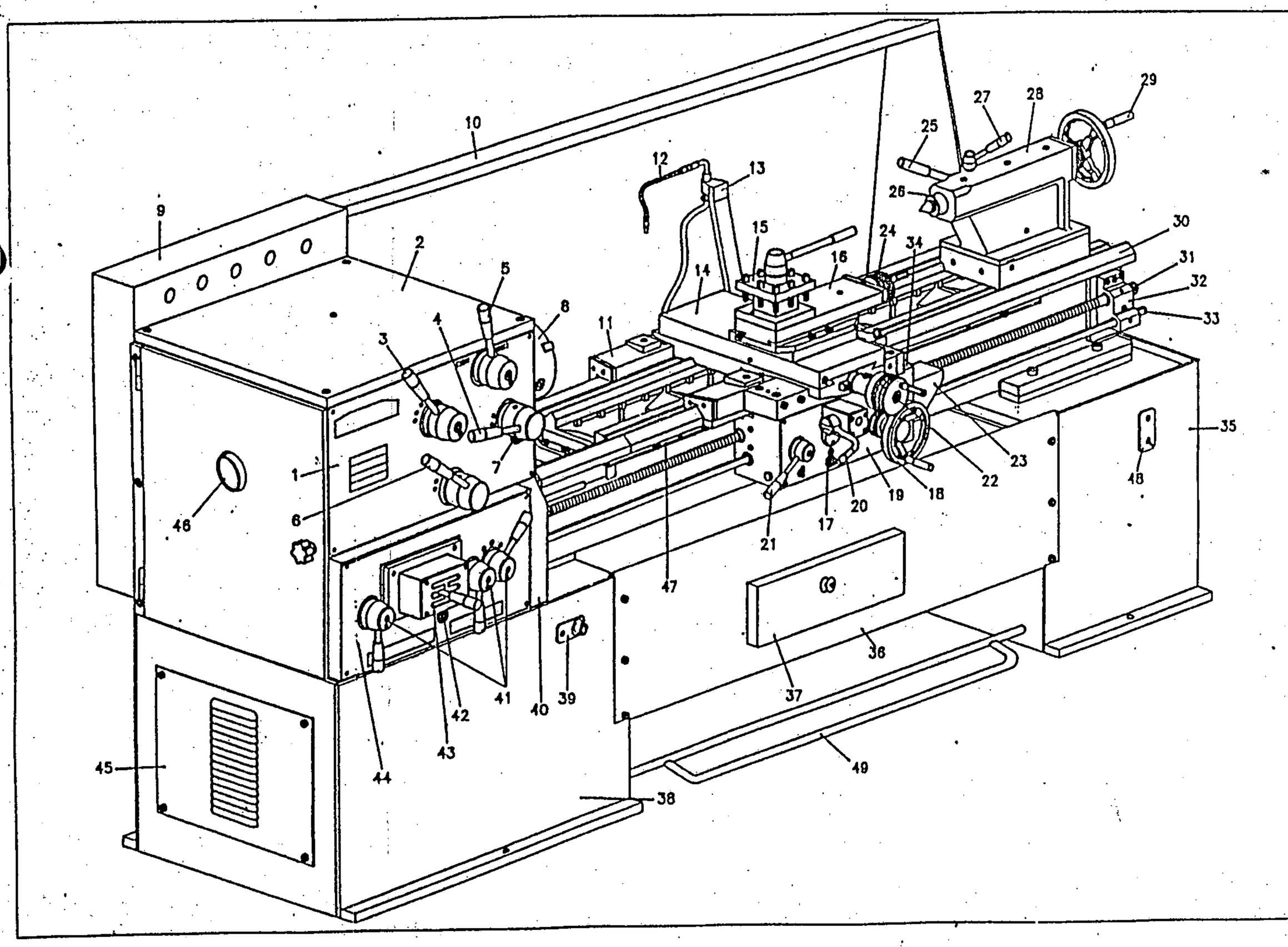

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It is not the aim of this manual to provide instructions for executing each and every one of the jobs that the machine can do. It is assumed that the operator is trained in the use of this type of machine. The descriptions which are given in the following chapter correspond to the identification of the lathe controls and indicators with their functions.

This type of machine is designed to be able to do any type of lathe work within the capacities described in characteristics.

Before starting the machine up:

- Check if the machine has been lubricated according to the diagram.
- Check that the start control level is in horizontal position.
- Connect the electrical current.
- Select the correct speed for the work to be done, by means of the speed change controls situated on the headstock. To select any speed, the main spindle or face plate must be stoppedd

MANUAL MOVEMENT CHOICE

- The automatic movement control handle situated on the square apron plug must be in horizontal position.
- The longitudinal movement is obtained with the wheel situated on the apron.
- The transversal movement is obtained with the wheel situated on the carriage.
- With these movement niether the quadrant plane nor the quich-change gearbox operate.

AUTOMATIC MOVEMENT CHOICE

* FEEDING

- Place the feed direction control handle situated on the headstock, in position which indicatees feed to the left.
- Select the desired work feed (see section "choice of feeds").
- Place the QC gearbox handle in feeding position.
- Position the feed movement control handle, situated on the apron upwards.
- With the position indicated, the carriage moves towards the face plate.
- For the carriage to move to the tailstock, change the position of the feed direction control handle, always maintaining the rotation of the faceplate in normal working direction.

* GRINDING

- Position the control handles, as described in feeding section except for the feed movement control handle situated on the apron which must be positioned downwards.

* THREADING

- Choose desired thread interval (see "thread choice" section).
- Place the apron nut control handle in downwards position (nut closed). To do this, the feed movement control handle must be in neutral position (horizontal).
- For the carriage to move towards the faceplate or tailstock, use the feed direction control situated on the headstock.

IMPORTANT

To be able to use the feed movement control handle situated on the apron, the apron nut control handle must be horizontal (nut open), due to a safety mechanism which prevents the feed- handle from operating when threading or viceversa.

The same occurs to use the nut control handle, so the feed movement handle must be in horizontal position.

START UP

– *The start up handle, situated on the right of the apron, starts up the machine.*

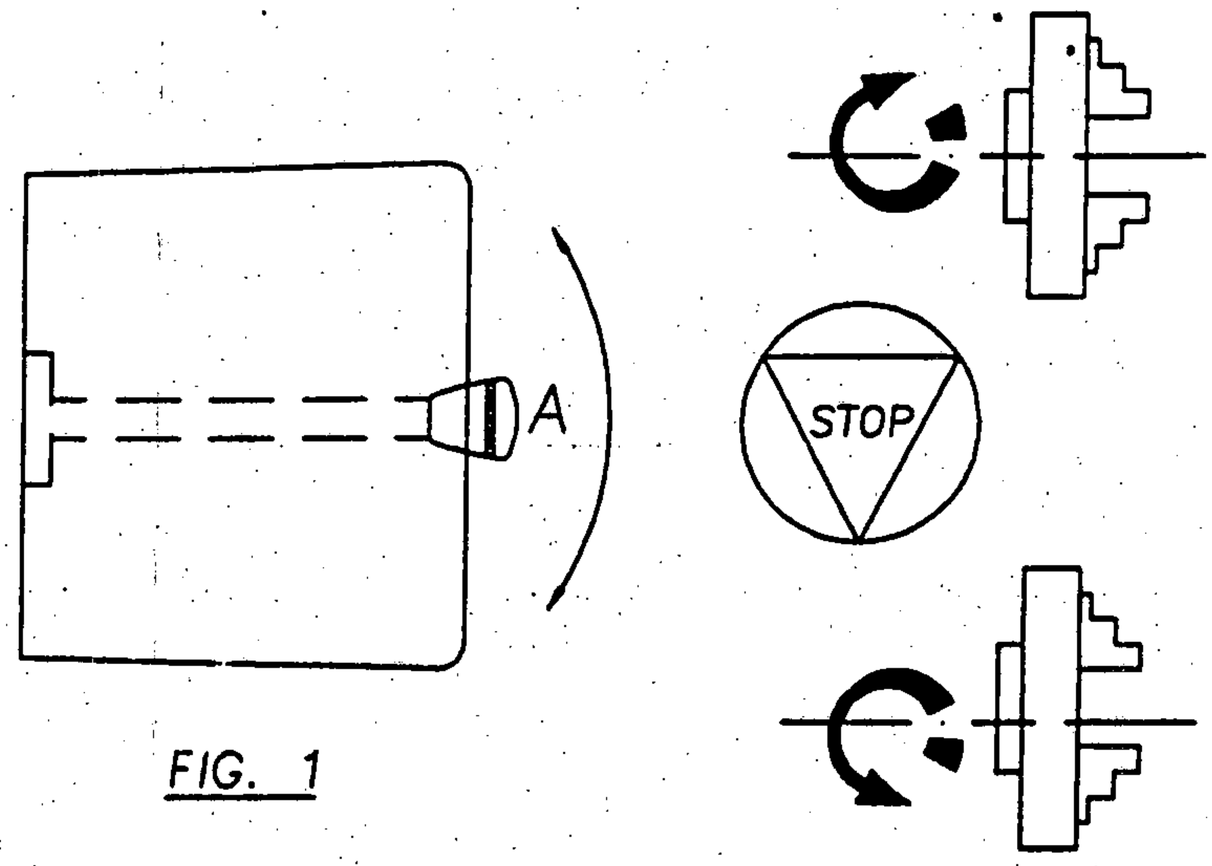


FIG. 1

Move the handle (A) up or down depending on the direction of rotation required, as indicated in Fig. 1

STOP

* *Mechanical brake version:*

– *Depress the brake pedal (B) Fig. 2, slightly to stop the machine.*
– *To start the machine up again, use handle (A) according to start up instructions.*

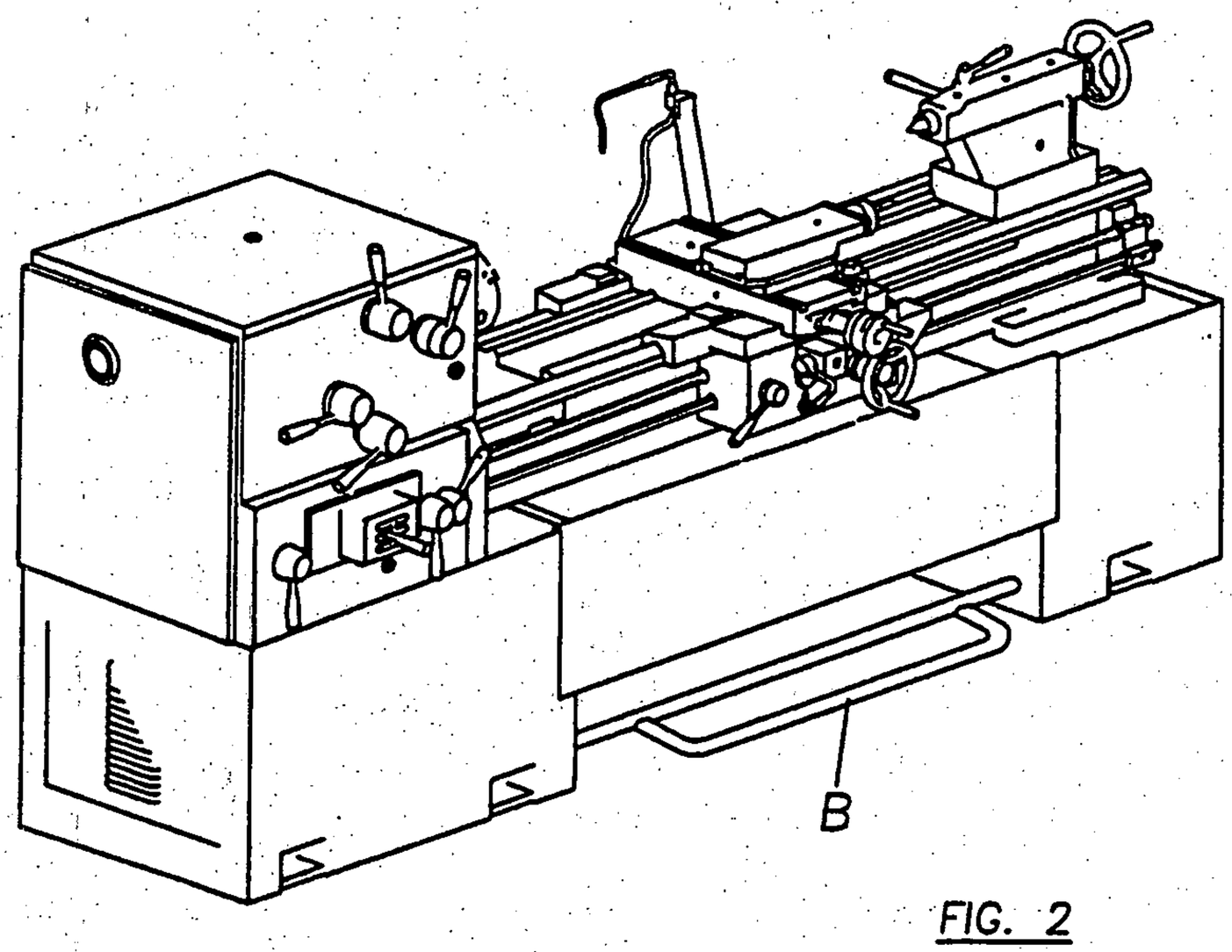


FIG. 2

* *Electric brake version:*

– *Adjust the control handle (A), situating it in STOP position.*
– *To start the machine up again, use handle (A) according to start up instructions.*

NOTE: To regulate the braking time, use the brake timer, situated on the left–hand side of the electrical box.

LATHE WITH LEAD SCREW IN MILLIMETERS

- LONGITUDINAL FEED SELECTION

- See which feed of those indicated on the plate, is suitable for the work to be carried out.
- Position the control handles as shown on chart.

Example: Feed 0,1 mm/1 rev. plate = 1-E-M-~~
1=QC gearbox selector number.
E=Feed change control situated on headstock
M=Position the two control handles QC gearbox (A and B)
~~ =Position control (C) QC gearbox

- CROSS FEED SELECTION

- See which feed of those indicated on the plate, is suitable for the work to be carried out.
- Position the control handles as shown on chart.

Example: Feed 0,15 (in chart 0,3/2=0,15) mm/1 rev. plate = 7-F-M-~~
7=QC gearbox selector number
F=Feed change control situated on headstock
M=Position the two control handles QC gearbox (A and B)
~~ =Position control (C) QC gearbox

- THREAD SELECTION

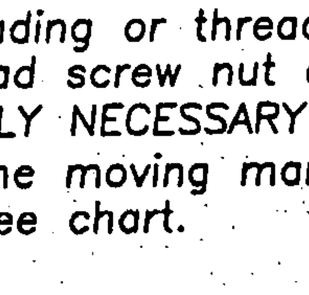
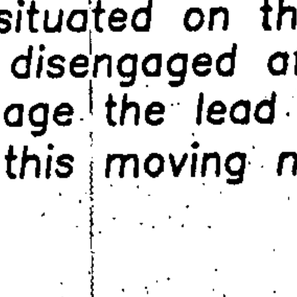
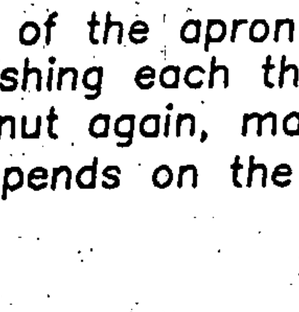
- Position the control handles as shown on the chart for the type of thread to be cut.
- Verify the position of the QUADRANT PLATE gears, corresponding to the chart.

Example: Metric with 5 mm. interval = METRIC-4-G-M
METRIC= METRIC group box
4 = QC gearbox selector number
G = Feed change control situated on headstock
M = Position the 3 control handles QC gearbox (A,B and C)

IMPORTANT: The movement of the carriage towards the faceplate or tailstock, is obtained with feed direction control situated in HEADSTOCK. Position as required.

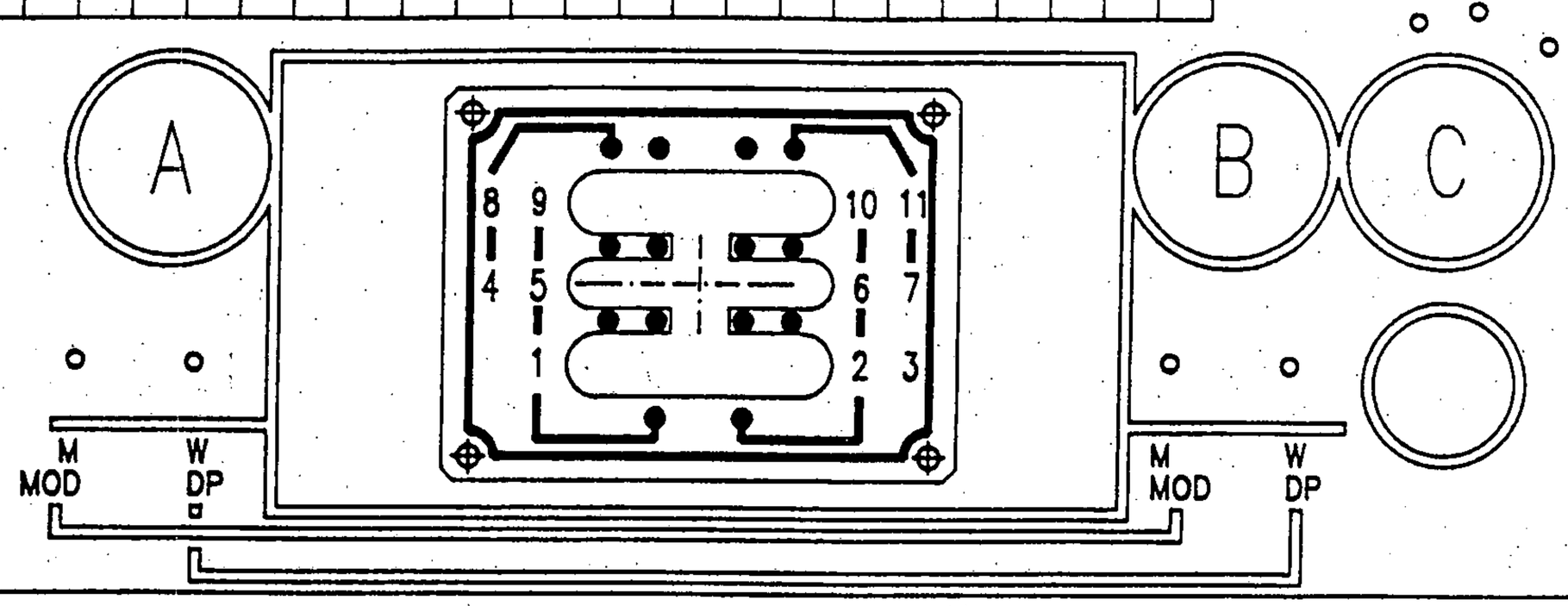
* THREADING DIAL OPERATION

- CUT METRIC THREADS IN LATHE WITH LEAD SCREW IN MILLIMETERS
It is advisible to use the threading or thread dial, situated on the right of the apron.
If this method is used, the lead screw nut can be disengaged after finishing each threading pass. Therefore it is ABSOLUTELY NECESSARY to engage the lead screw nut again, making the fixed mark (0) coincide with the moving mark (1), this moving mark depends on the thread interval wich is being made. See chart.

Thread interval in mm.	0,5-0,75-1-1,125-1,5 2-2,25-3-4,5-6	8	4
Marks on the dial	1-2-3-4-5-6-7-8	1-5	1-3-5-7
CHART			

* CUT T.P.I. THREADS IN LATHE WITH LEAD SCREW IN MILLIMETERS
To cut this type of threads, it is ABSOLUTELY NECESSARY to keep the lead screw nut engaged (closed) whilst the thread is being cut, having to invert the direction of rotation of the face plate by meams of the start handle, when ending each threading pass, at the same time as the tool is withdrawn or penetrates into the cut, depending on the work.

METRICO	WHITWORTH	MODULO	D.PITCH	
M	W	MOD	DP	M



METRICO mm.				WHITWORTH h"				MODUL. mm.π				D. PITCH h"π			
○	M				○	W			○	MOD.				○	D.P.			
	D	E	F	G		D	E	F	G	D	E	F	G		D	E	F	G
1	0.5	1	2	4	11	60	30	15	7 1/2	1	0,25	0.5	1	2	11	120	60	30	15
2	0.562	1.125	2.25	4.5	10	56	28	14	7	2	0.281	0.562	1.125	2,25	10	112	56	28	14
3	0.593	1.187	2.375	4.75	9	54	27	13 1/2	6 3/4	3	0.296	0.593	1.187	2.375	9	108	54	27	13 1/2
4	0.625	1.25	2.5	5	8	52	26	13	6 1/2	4	0.312	0.625	1,25	2.5	8	104	52	26	13
5	0.685	1.375	2.75	5.5	7	48	24	12	6	5	0.342	0.685	1.375	2.75	7	96	48	24	12
6	0,718	1.437	2.875	5.75	6	46	23	11 1/2	5 3/4	6	0.359	0,718	1.437	2,875	6	92	46	23	11 1/2
7	0.75	1.5	3	6	5	44	22	11	5 1/2	7	0.375	0.75	1,5	3	5	88	44	22	11
8	0.812	1.625	3.25	6.5	4	40	20	10	5	8	0.406	0.812	1.625	3.25	4	80	40	20	10
9	0.843	1.687	3.375	6.75	3	38	19	9 1/2	4 3/4	9	0.421	0.843	1.687	3.375	3	76	38	19	9 1/2
10	0.875	1.75	3.5	7	2	36	18	9	4 1/2	10	0.437	0.875	1.75	3.5	2	72	36	18	9
11	0.937	1.875	3.75	7.5	1	32	16	8	4	11	0.468	0.937	1.875	3.75	1	64	32	16	8

○	M			
	D	E	F	G
1	0.05	0.1	0.2	0.4
2	0.056	0.113	0.226	0.452
3	0.059	0.119	0.238	0.476
4	0.062	0.125	0.25	0.5
5	0.069	0.138	0.276	0.552
6	0.072	0.144	0.288	0.576
7	0.075	0.15	0.3	0.6
8	0.081	0.163	0.326	0.652
9	0.085	0.17	0.34	0.68
10	0.088	0.176	0.352	0.704
11	0.094	0.188	0.376	0.752

- LONGITUDINAL FEED SELECTION

- See which feed of those indicated on the plate, is suitable for the work to be carried out.
- Position the control handles as shown on chart.

Example: Feed 0,006"/1 rev. plate = 9-E-M- ~~~
9=QC gearbox selector number
E=Feed change control situated on headstock
M=Position the two control handles QC gearbox (A and B)
~~~ =Position control (C) QC gearbox

- CROSS FEED SELECTION

- See which feed of those indicated on the plate, is suitable for the work to be carried out.
- Position the control handles as shown on chart.

Example: Feed 0,001"/1 rev. plate = 1-E-M- ~~~
1=QC gearbox selector number
E=Feed change control situated on headstock
M=Position the two control handles QC gearbox (A and B)
~~~ =Position control (C) QC gearbox

- THREAD SELECTION

- Position the control handles as shown on the chart for the type of thread to be cut.
- Verify the position of the END TRAIN gears, corresponding to the chart.

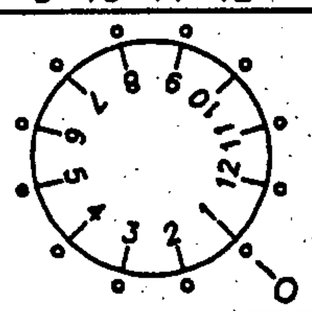
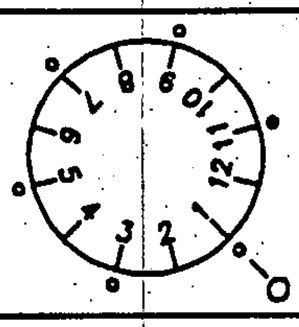
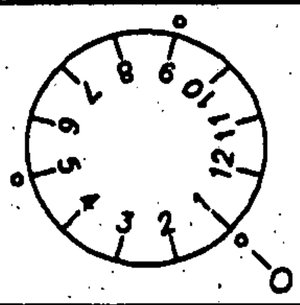
Example: T.P.I.: 16 = T.P.I.-1-E-T.P.I.
TPI=T.P.I. groupbox
1=QC gearbox selector number
E = Feed change control situated on headstock
T.P.I.= Position three control indicators QC gearbox (A,B and C)

IMPORTANT: The movement of the carriage towards the faceplate or tailstock, is obtained with feed direction control situated in HEADSTOCK. Position as required.

* THREADING DIAL OPERATION

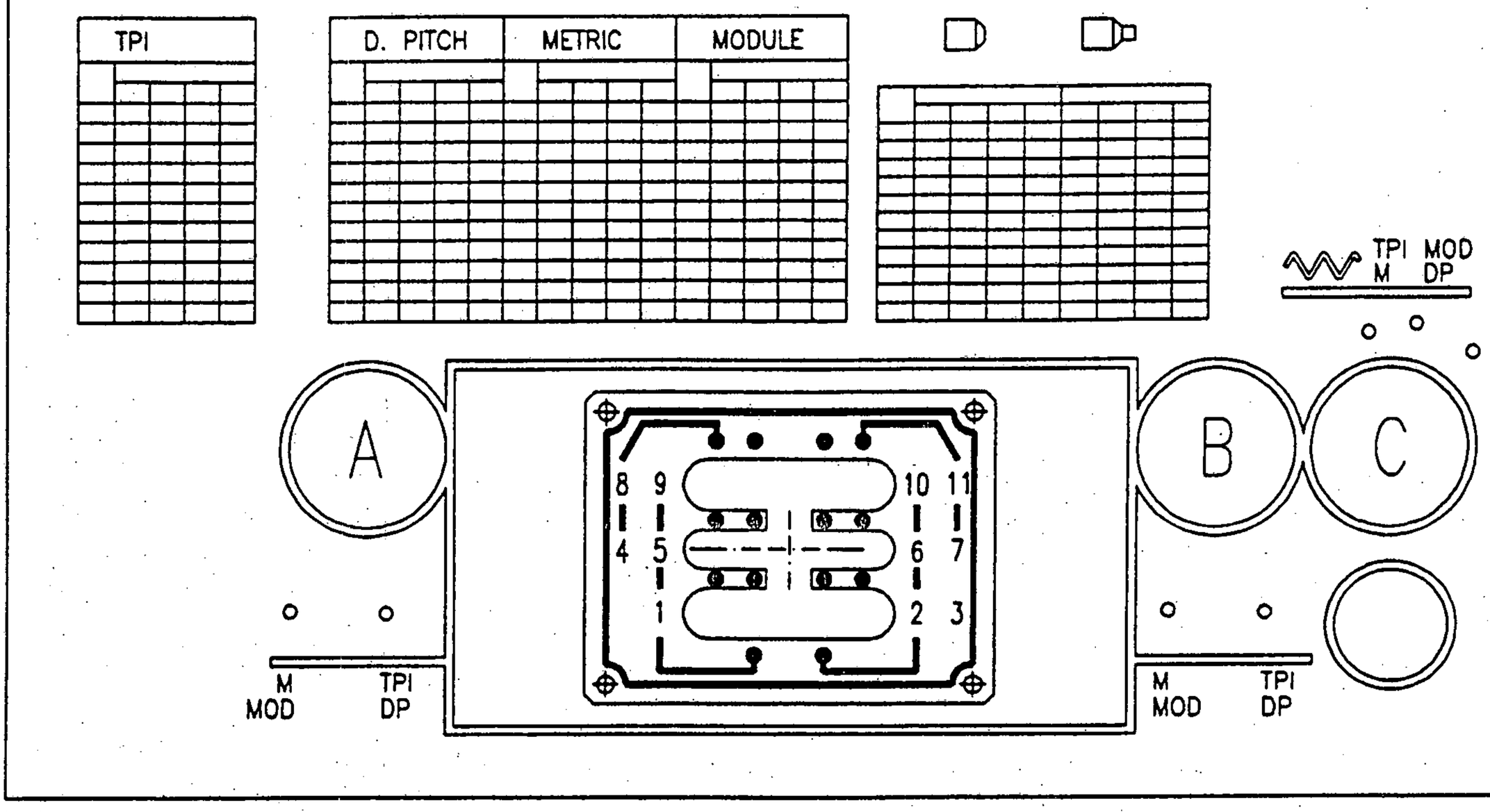
- CUT T.P.I. THREADS IN LATHE WITH LEAD SCREW IN T.P.I.

It is advisable to use the threading or thread dial, situated on the right of the apron. If this method is used, the lead screw nut can be disengaged after finishing each threading pass. Therefore it is ABSOLUTELY NECESARY to engage the lead screw nut again, making the fixed mark (0) coincide with the moving mark (1), this moving mark depens on the thread interval wich is being made. See chart.

Thread interval in T.P.I.	4-6-8-10-12 etc. (even)	5-7-9-11-13 etc. (odd)	4,5-5,5 etc. (halves)
Marks on the dial	1-2-3-4-5-6-7-8 9-10-11-12	1-3-5-7-9-11	1-5-9
CHART			

* CUT METRIC THREADS IN LATHE WITH LEAD SCREW IN T.P.I.

To cut this type of threads, it is ABSOLUTELY NECESSARY to keep the lead screw nut engaged (closed) whilst the thread is being cut, having to invert the direction of rotation of the face plate by meams of the start handle, when ending each threading pass, at the same time as the tool is withdrawn or penetrates into the cut, depending on the work.



TPI h"				
	TPI			
	D	E	F	G
11	60	30	15	7½
10	56	28	14	7
9	54	27	13½	6¾
8	52	26	13	6½
7	48	24	12	6
6	46	23	11½	5¾
5	44	22	11	5½
4	40	20	10	5
3	38	19	9½	4¾
2	36	18	9	4½
1	32	16	8	4

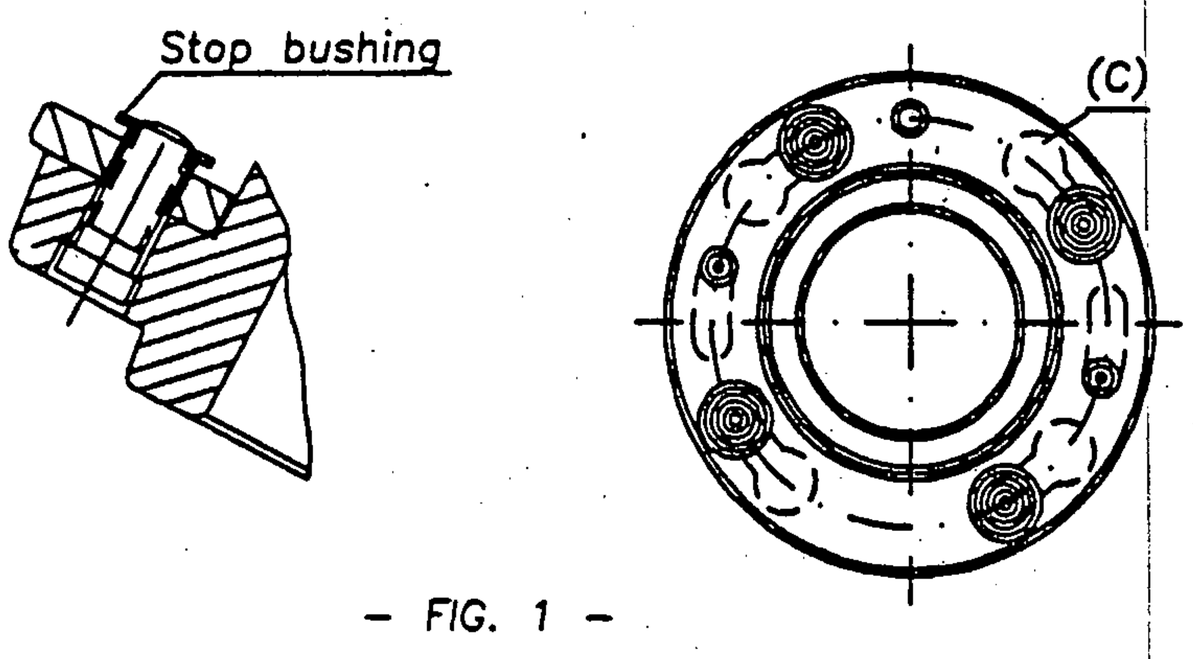
D.PITCH h"π					METRIC mm.					MODULE mm.π				
	D. P.					M					MOD			
	D	E	F	G		D	E	F	G		D	E	F	G
11	120	60	30	15	1	.5	1	2	4	1	.25	.5	1	2
10	112	56	28	14	2	.562	1.125	2.25	4.5	2	.231	.562	1.125	2.25
9	108	54	27	13½	3	.593	1.187	2.375	4.75	3	.296	.593	1.187	2.375
8	104	52	26	13	4	.625	1.25	2.5	5	4	.312	.625	1.25	2.5
7	96	48	24	12	5	.685	1.375	2.75	5.5	5	.342	.685	1.375	2.75
6	92	46	23	11½	6	.718	1.437	2.875	5.75	6	.359	.718	1.437	2.875
5	88	44	22	11	7	.75	1.5	3	6	7	.375	.75	1.5	3
4	80	40	20	10	8	.812	1.625	3.25	6.5	8	.406	.812	1.625	3.25
3	76	38	19	9½	9	.843	1.687	3.375	6.75	9	.421	.843	1.687	3.375
2	72	36	18	9	10	.875	1.75	3.5	7	10	.437	.875	1.75	3.5
1	64	32	16	8	11	.937	1.875	3.75	7.5	11	.468	.937	1.875	3.75

	M				M			
	D	E	F	G	D	E	F	G
1	.0005	.001	.002	.004	.0018	.0036	.0072	.0144
2	.00055	.0011	.0022	.0044	.002	.004	.008	.016
3	.0006	.0012	.0024	.0048	.0021	.0042	.0084	.0168
4	.00065	.0013	.0026	.0052	.0022	.0044	.0088	.0176
5	.0007	.0014	.0028	.0056	.0024	.0048	.0096	.0192
6	.00072	.00145	.0029	.0058	.0025	.0051	.0102	.0204
7	.00075	.0015	.003	.006	.0027	.0054	.108	.0216
8	.0008	.0016	.0032	.0064	.0029	.0058	.0116	.0232
9	.00085	.0017	.0034	.0068	.003	.006	.012	.024
10	.0009	.0018	.0036	.0072	.0031	.0062	.0124	.0248
11	.00095	.0019	.0038	.0076	.0033	.0066	.0132	.0264

FACE PLATE MOUNTING INSTRUCTIONS

* DIN 55022 *

- Insert all the bolts (B) into the chuck back of the face plate.
- Fit the nuts and washers in the bolts (B).
- Turn the bayonet disc (A) in clockwise direction, until the stop.
  Once turned, the hole (C) of the bayonet disc must coincide with the hole of the shaft nose.
- Turn the bayonet disc (A) again in anticlockwise direction until the stop, and tighten the nuts adequately.



– FIG. 1 –

* CAM–LOCK *

Insert all the bolts in the plate chuck back, until the circular reference line (F) is in line with the wall of the chuck back (fig. 2) and the semicircular grooves are in line with the holes of the lock or eccentric spindles.
Fit the lock screws (E) into each bolt (D) and suitable tighten.
Make sure that the two contact sides (plate and shaft) are well cleaned of impurities.

– NOW YOUR FACE PLATE CAN BE MOUNTED –

Before coupling the face plate to the shaft nose, check that the reference line of the eccentric, coincides with the reference line of each housing in the nose of the shaft (unlocked position).
In those housings there are also two marks (V), one at 90° and another at 180°, from the reference line (1).
The area between 0° and 90° is for attachment and the area from 90° to 180° is the safety area.
Place the face plate in position and tighten the eccentrics by turning in clocwise direction with the wrench supplied for this purpose.
If the reference line on the eccentric, is not in the 90° to 180° area, the face place must be withdrawn, and that bolt in particular must be adjusted again.

WAY TO ADJUST THE CAM–LOCK BOLT

- Slacken and withdraw the locking screw (E).
- Turn the bolt (D) completely round inwards and outwards as necessary.
- Fit the locking screw (E) on again into its housing and tighten again.

DO NOT FIT ANY FACE PLATE FROM ANOTHER MACHINE BEFORE VERIFYING BEFOREHAND THE CORRECT ADJUSTMENT OF EACH THE BOLTS WITH THEIR ECCENTRICS.

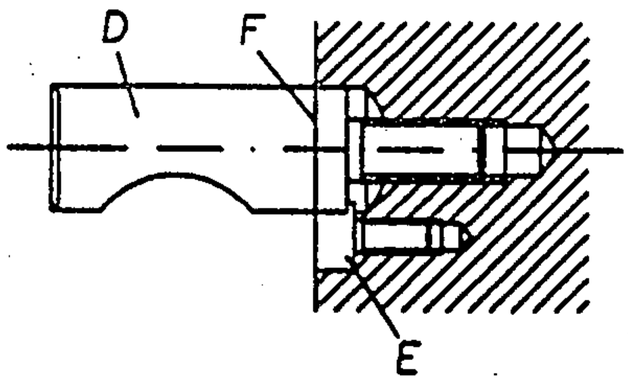


FIG. 2

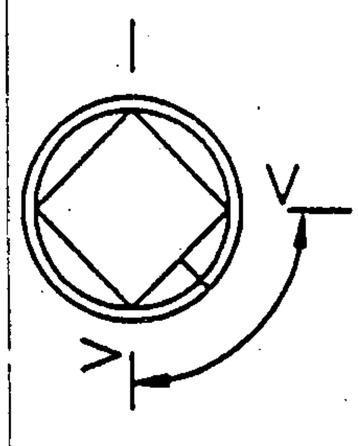


FIG. 3

metosa

Pinacho

SYMBOL OF PRECISION

MAINTENANCE

TRANSMISSION BELT ADJUSTMENT

The belts leave the factory with the tension adjusted.
After a few hours operation, the belts must be tightened again, because they stretch as they are new.
We leave the correct tension of the belt or belts, to the operator's own criterion, due to his experience.
As a guide, we advise starting the lathe up, at maximum speed, the tension being adequate if, on starting up, the belts do not slide or make a noise.
The tension is adjusted by slackening the nut (H) and tightening nut (G) until the suitable tension is reached.

CLUTCH ADJUSTEMENT FOR TURNING

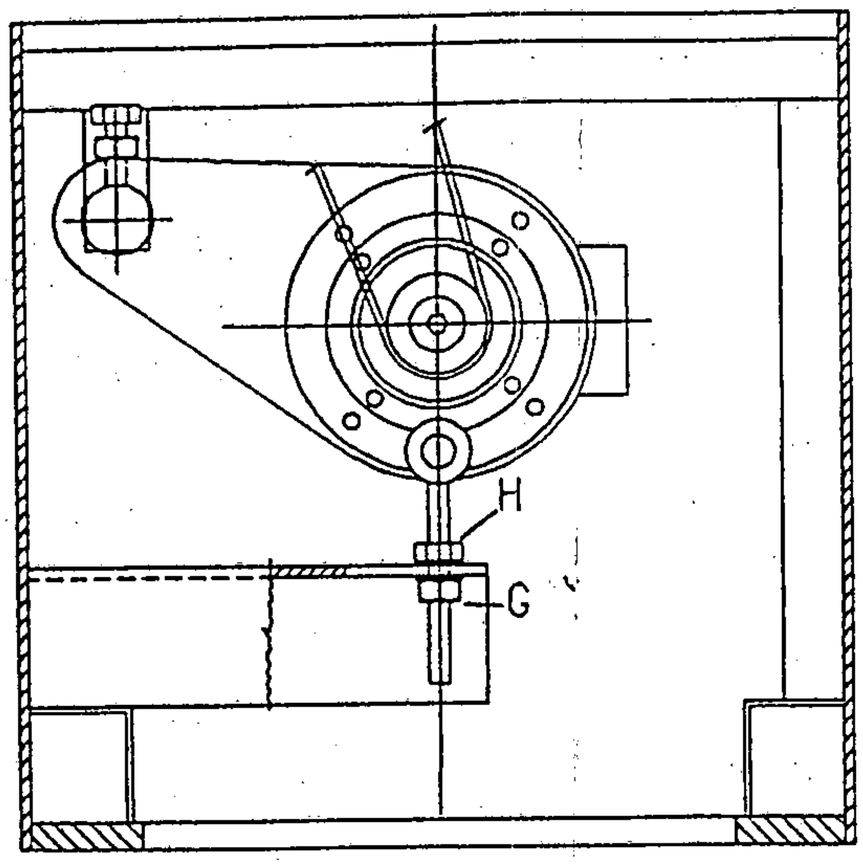
– STANDARD

The machines leave the factory with the clutch adjusted at the correct tension.
As a guide, the machine must support, when turning, a pass depth of 1mm. per 1 HP motor power.
If, due to wear of the fibre washer (A), it should not take the pass, the tension must be increased by tightening nut (B) in clockwise direction, having previously taken off the 3 screws which secure it.
If on the contrary, it takes more pass, the tension will have to be reduced, slackening nut (B) in anticlockwise direction.

HEADSTOCK SET-OVER ADJUSTMENT

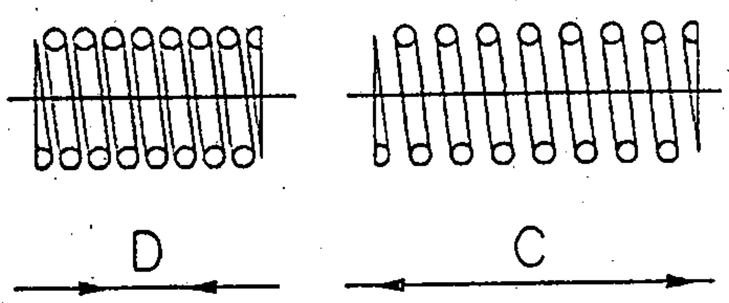
The set-over of the headstock or lack of parallelism of the headstock with the bed, is corrected by adjusting screw (J) in one direction or another, as necessary.
To do this, the four attachment screws of the headstock or bed must be slackened beforehand.

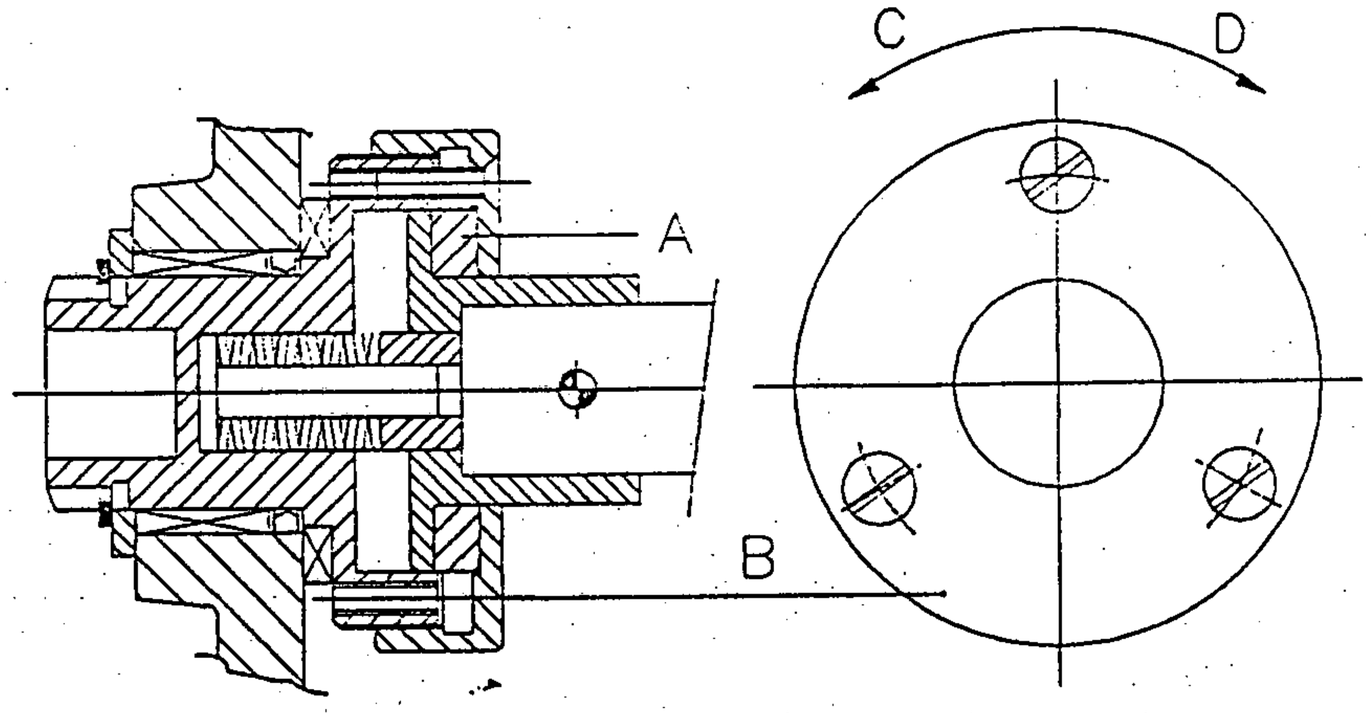
IMPORTANT. Before adjusting the set-over of the headstock, due to the taper turning, MAKE SURE THAT THE LEVELLING IS CORRECT, as indicated on page 12.



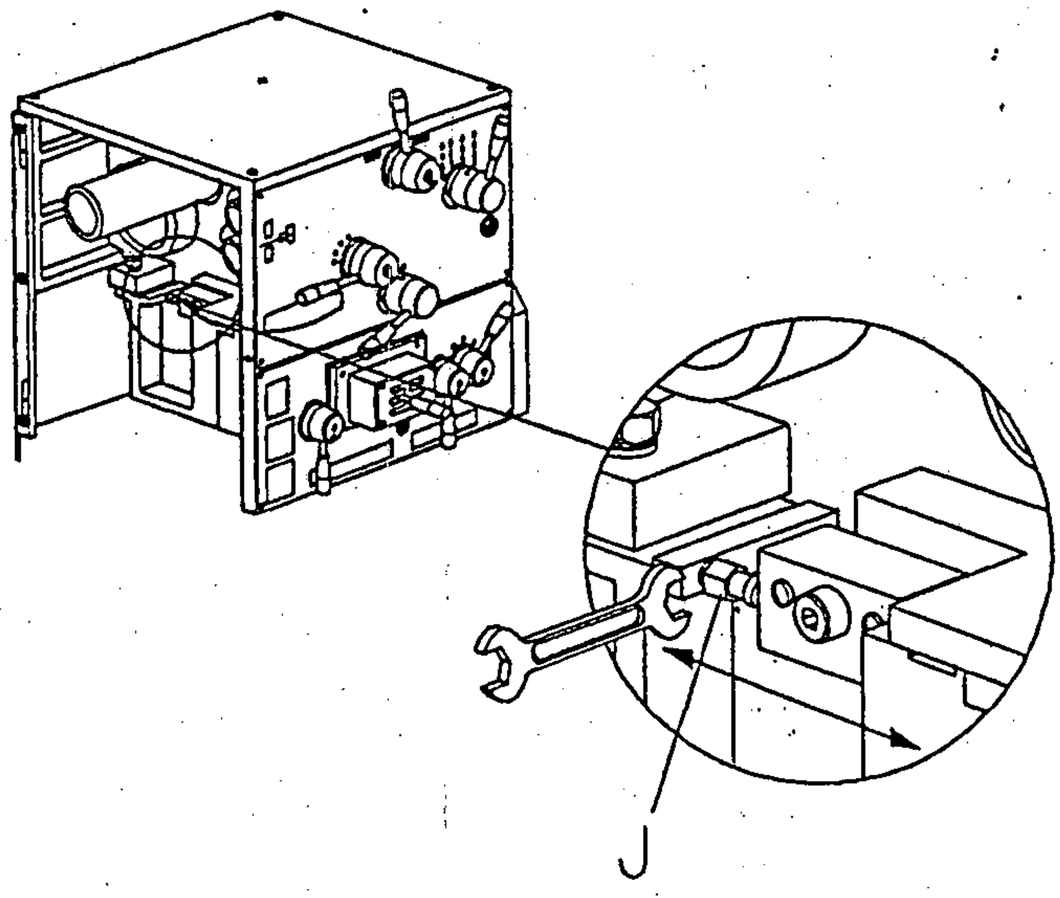
AJUSTE TENSION CORREA MOTOR
MOTOR BELT ADJUSTMENT
REGLAGE DE LA TENSION DE LA COURROIE DU MOTEUR
EINSTELLUNG DES ZAHNRIEMENS, HAUPTANTRIEB

AJUSTE EMBRAGUE BARRA DE CILINDRAR
SLIP CLUTCH ADJUSTMENT
REGLAGE DE LA BARRE D'EMBRAYAGE ET DE LA BARRE A CHARRIOTER
EINSTELLUNG DER RUTSCHKUPPLUNG





STANDARD



CORRECCION DESCENTRAMIENTO CABEZAL
HEADSTOCK OFF-CENTER ADJUSTEMENT
CORRECTION DESALIGNEMENT POUPEE
SPINDELSTOCK-JUSTIERUNG

ELECTRIC BRAKE ADJUSTMENT

All the machine leave the factory with the brake adjusted, with play of 0,3 to 0,5 mm.
To adjust, take off screw (B), dismount pulley (C) and grind on the side wall (A), until the play indicated is obtained.
To adjust the braking time, adjust the timer, situated on the left-hand area of the electric panel.

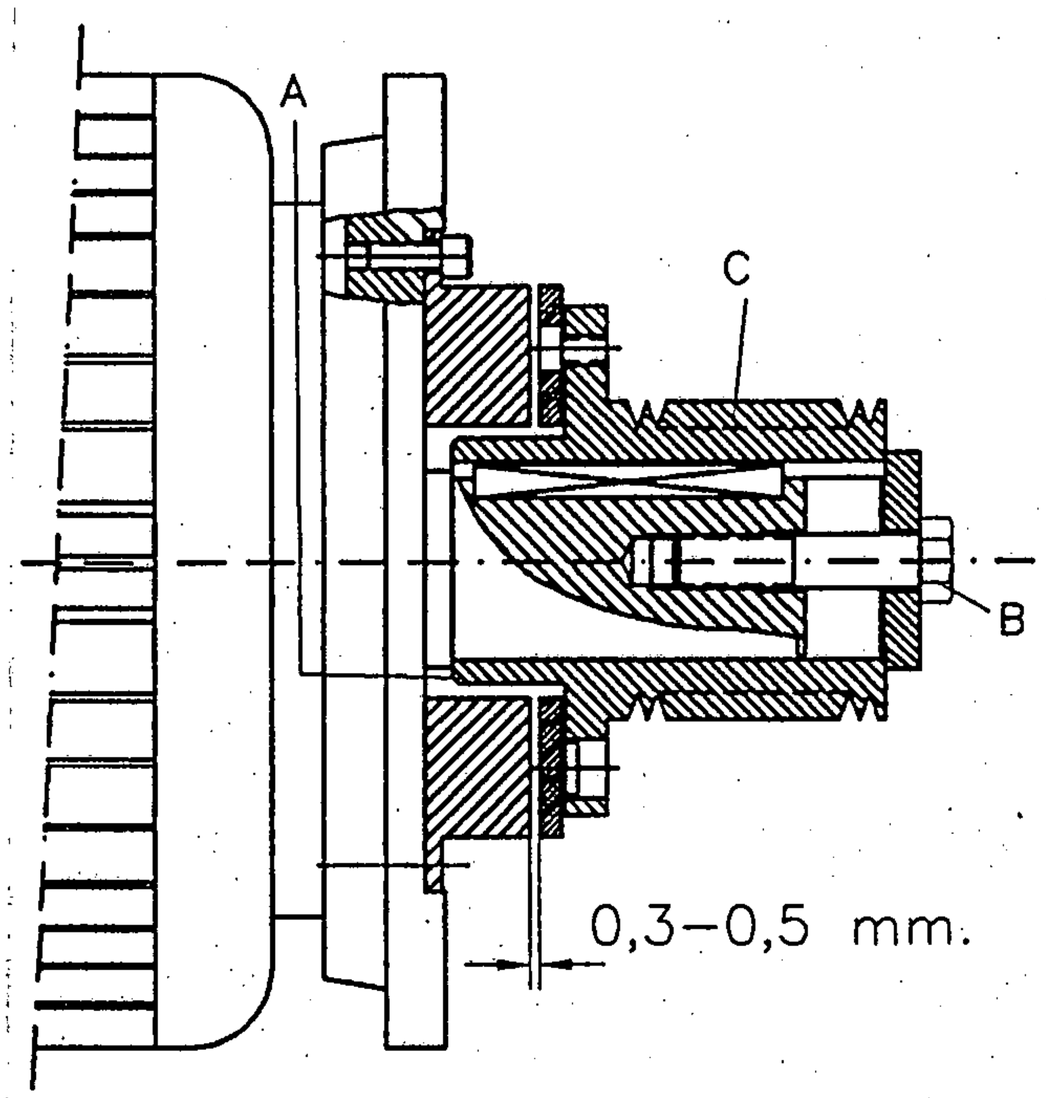
TAILSTOCK SIDE MOVEMENT

- Unlock the tailstock, moving the handle (K) backwards.
- Slacken the grub screws (F).
- Slacken grub screw (G2) and tighten grub screw (G1), if we wish to move the tailstock towards the operator's side.
- Slacken grub screw (G1) and tighten grub screw (G2), if we wish to move the tailstock towards the other side.
- Tighten grub screws (F) again to leave the tailstock secured with the necessary side movement.
- Lock the tailstock by moving the handle forwards (L).

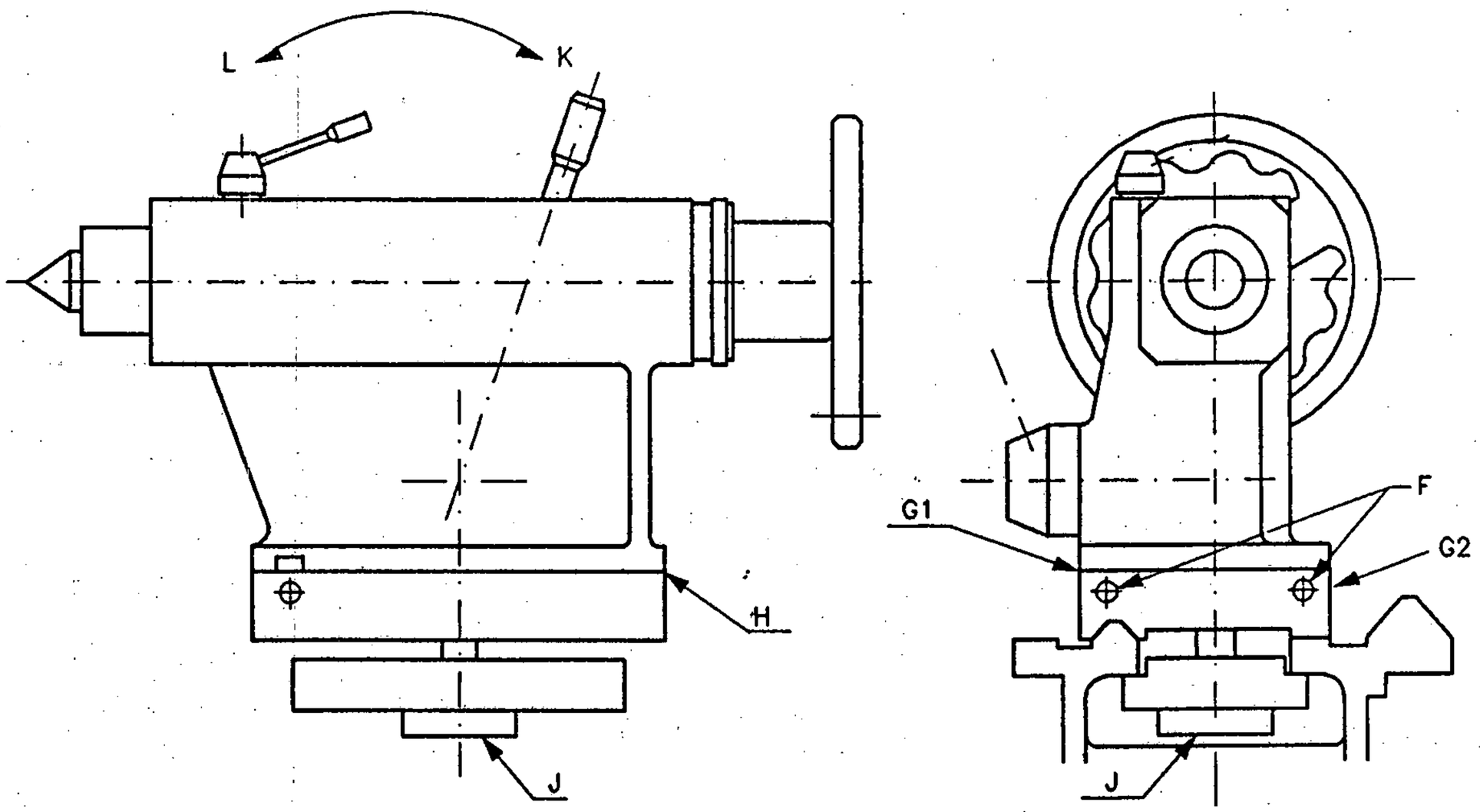
The alignment marks (H) on the right-hand side, can be used as reference to move the tailstock back to its original position again.

TAILSTOCK LOCKING LEVER ADJUSTMENT

- The angular locking position of the lock lever can be adjusted with the tailstock lock released, turning nut (J) to the right (more locking pressure) or the left (less locking pressure).



FRENO ELECTROMAGNETICO
ELECTROMAGNETIC BRAKE
FREIN ELECTROMAGNETIQUE
ELEKTROMAGNETISCHE BREMSE



(G1,G2)
TORNILLO DESPLAZAMIENTO LATERAL
TAPER ADJUSTEMENT SCREW
VIS DE DEPLACEMENT LATERAL
SCHRAUBE ZUM VERSTELLEN DES RETTSTOCKES

(H)
MARCAS DE ALINEACION
ALIGNMENT MARKS
REPERE D'ALIGNEMENT DE LA CONTRE-POINTE
MARKIERUNG ZUN AUSRICHTEN

(J)
FRENO DEL CONTRAPUNTO
ADJUST CLAMPING LEVER POSITION
BLOCAGE DE LA CONTRE-POINTE
VERSTELLUNG DER KLEMMSCHRAUBEN

TOPSLIDE NUT PLAY ADJUSTMENT

To correct the play in the topslide nut:
- Take off nuts (D) and take out whole tool post slide with turret.
- Loosen screw (E) situated on the lower part of the topslide.
- Tighten the grub screw (F) slightly, at the same time as we turn the wheel 90° to the left and right, until we achieve suitable play.
- Tighten screw (E) again to block.
- Check by turning the wheel by hand if the carriage moves smoothly and evenly.
- Mount the whole toolpost slide again in place and tighten nuts (D).

CROSS SLIDE NUT PLAY ADJUSTMENT

To check the play in the nut of the cross slide:
- Loosen screw (A) situated cn the upper part of the cross slide.
- Tighten the grub screw (B) slightly, at the same time as we turn the wheel 90° to the left and right, until we achieve suitable play.
- Tighten screw (A) again to lock.
- Check by turning the wheel by hand, if the cross slide moves smoothly and evenly.

CROSS SLIDE GUIDE ADJUSTMENT

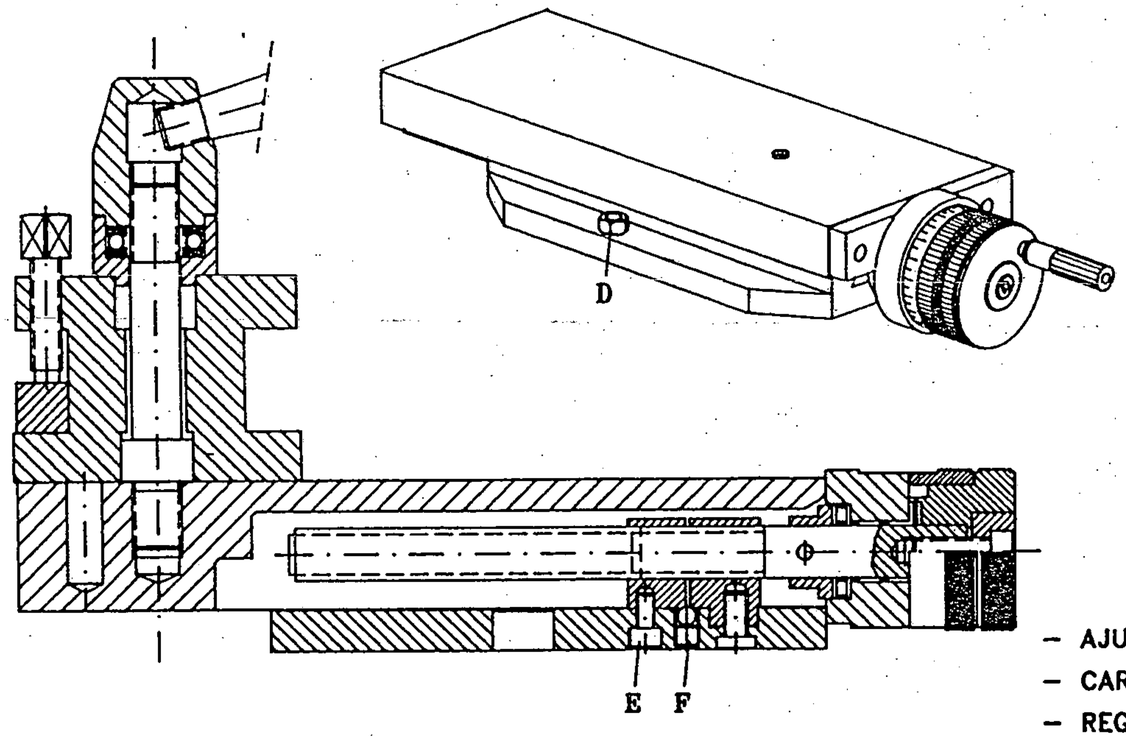
The play in the cross slide guides is corrected by means of the tapered gib, situated on the rigth hand side of the cross slide.
To correct, adjust screw (G) situated on the rear part of the cross slide, loosening it.
Then, we tighten screw (H) situated on the front part of the cross slide, until the suitably adjustment is obtained.
Once suitable adjustment has been obtained, tighten screw (G) again to fix the gib in its proper position.

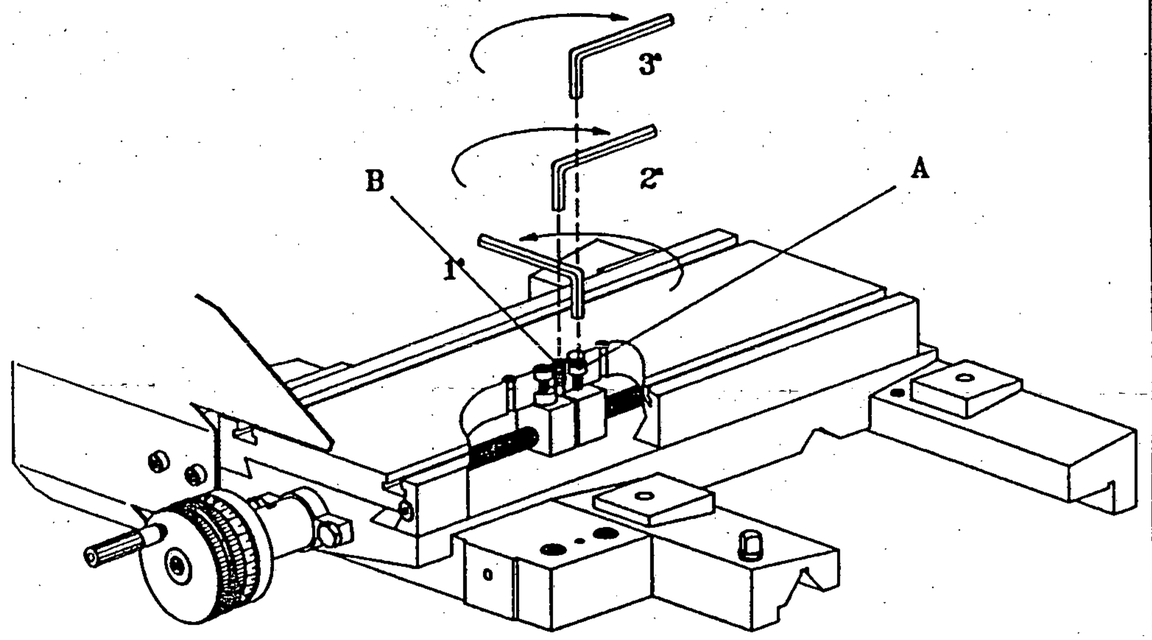
TOPSLIDE CARRIAGE GUIDE ADJUSTMENT

The play in the topslide guides is corrected by means of the gib, situated on the right-hand side.
To correct this, loosen the set nuts (J) and tighten the grub screws (K) until it is suitably adjusted. Tighten the set nuts (J) again.

LEAD SCREW NUT SUPPORT ADJUSTMENT

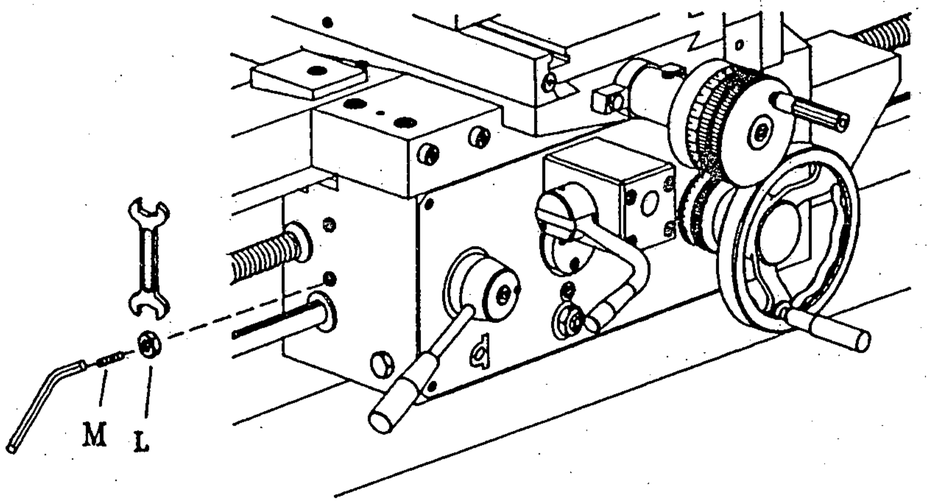
The play in the nut support housing guides is corrected by:
- Loosening lock nut (L).
- Tightening grub screw (M) until suitably adjusted.
- Tighten the lock nuts (L) again.

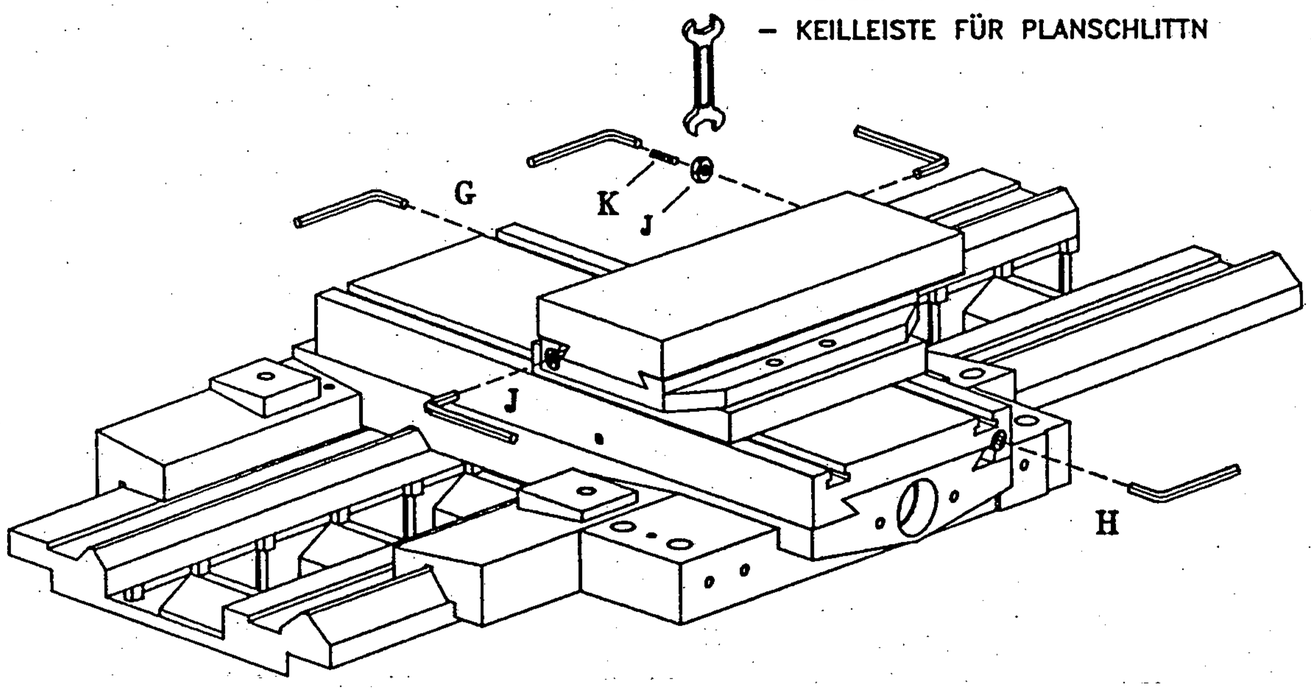




- AJUSTE TUERCAS CARROS
- CARRIAGES NUTS FITTING
- REGLAJE ECROU CHARRIOT
- SCHRAUBEN FUR SPINDELMUTTER-JUSTIERUNG AM, PLANSCHITTEN

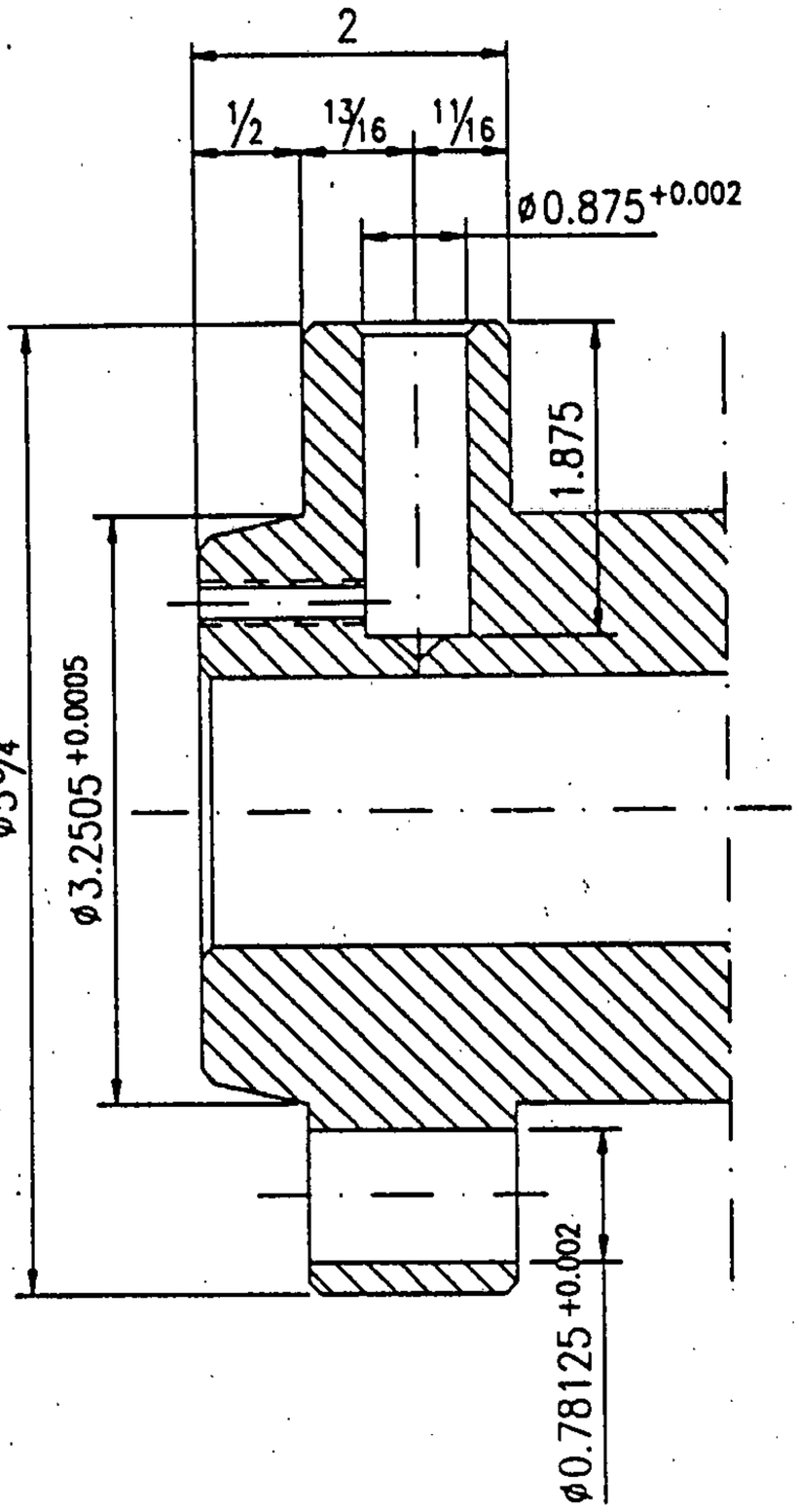
- REGLAS CONICAS DE AJUSTE
- TAPER RULES FOR FITTING
- REGLES CONIQUES DE REAJUSTEMENT
- KEILLEISTE FÜR PLANSCHLITTN

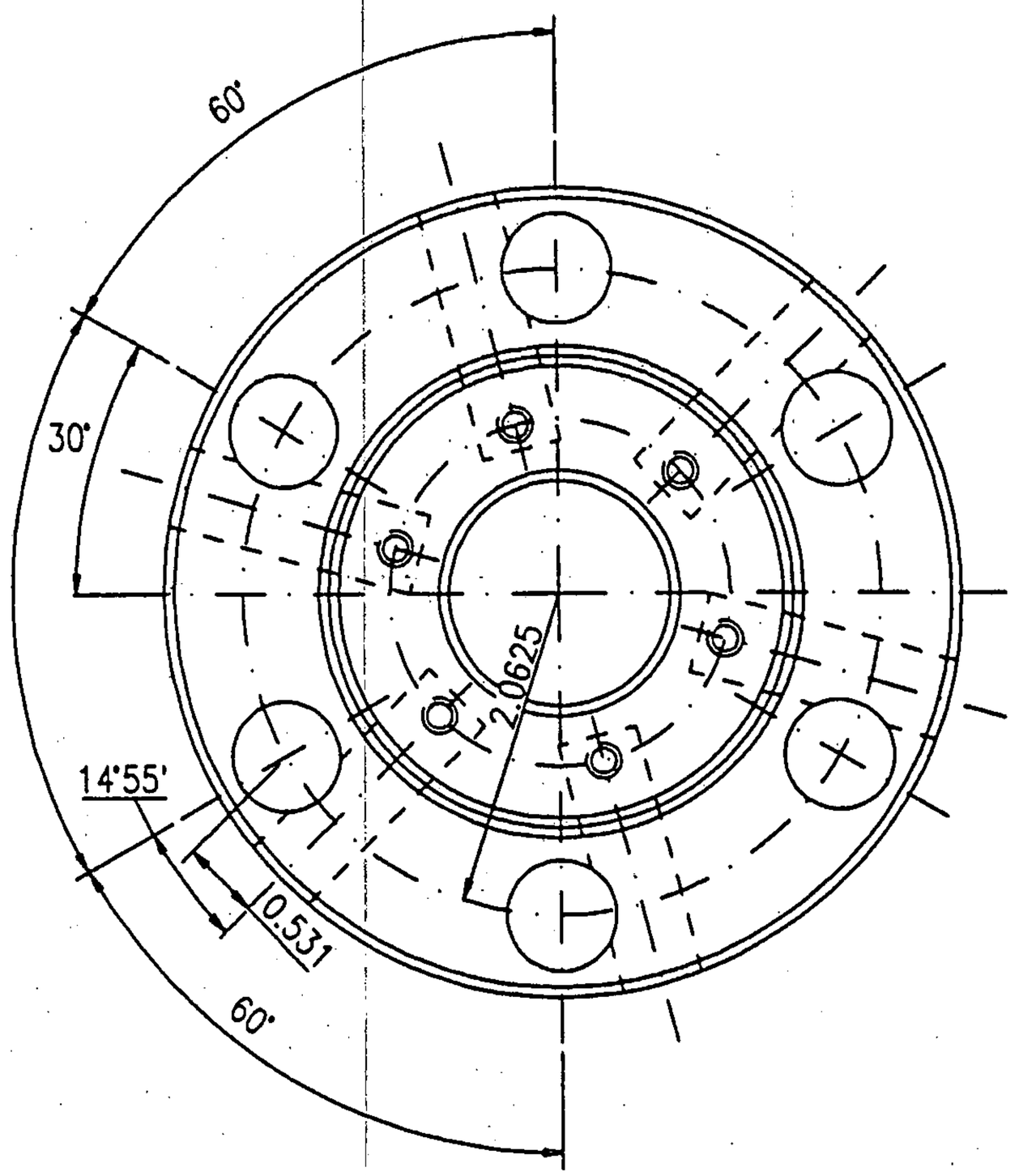




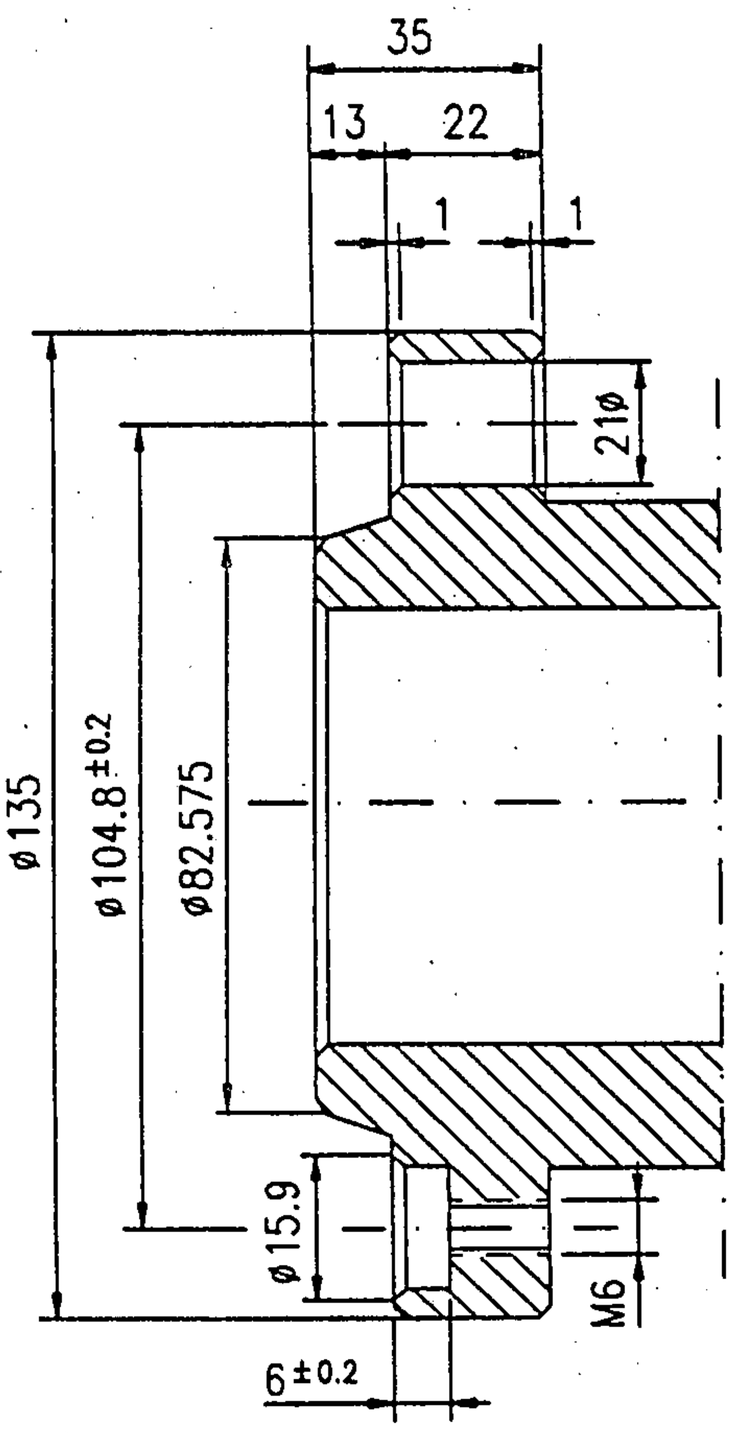
- AJUSTE SOPORTE TUERCA DEL HUSILLO PATRON
- LEAD-SCREW SUPPORT NUT ADJUSTMENT
- AJUSTAGE DU SUPPORT DE MOIX DE LA BARRE DE FILETAGE
- SPIELEINSTELLUNG DER LEITSPINDELMUTTER

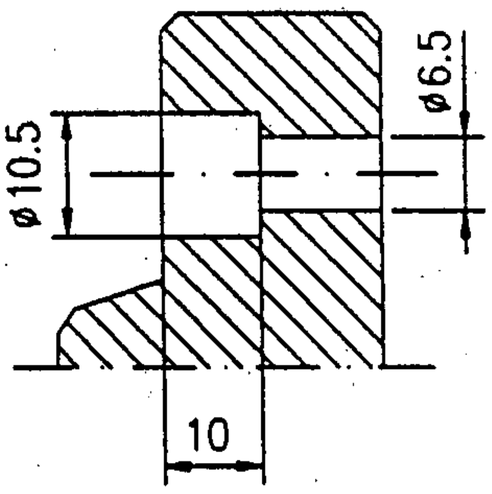
DIN-55029, CAM-LOCK n°5

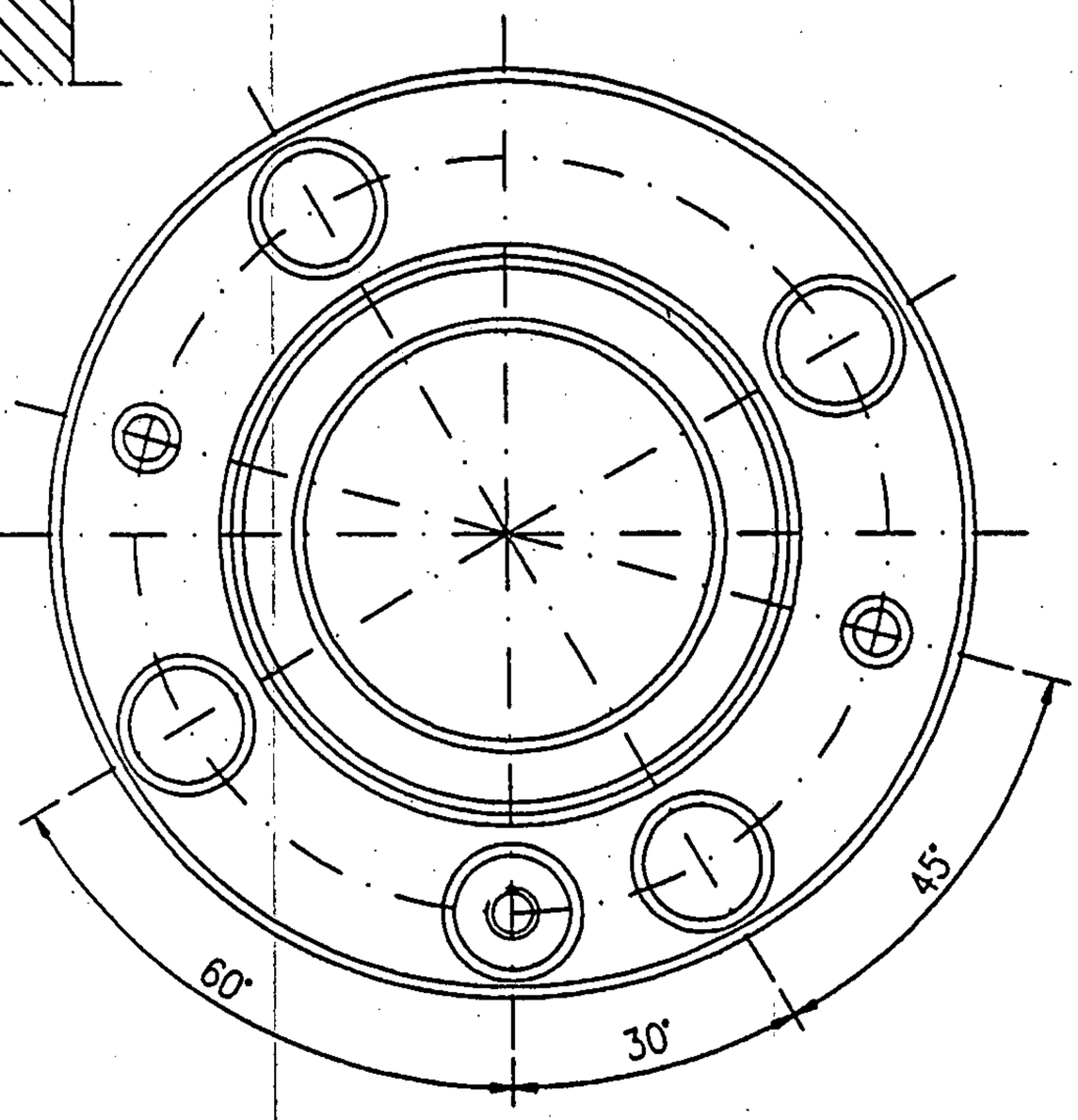




DIN-55022 n°5







metosa

Pinacho

SYMBOL OF PRECISION

SPARE PARTS

PROCEDURE FOR REQUESTING SPARE PARTS

* *INDICATE MACHINE MODEL*
* *INDICATE MACHINE SERIAL NUMBER*

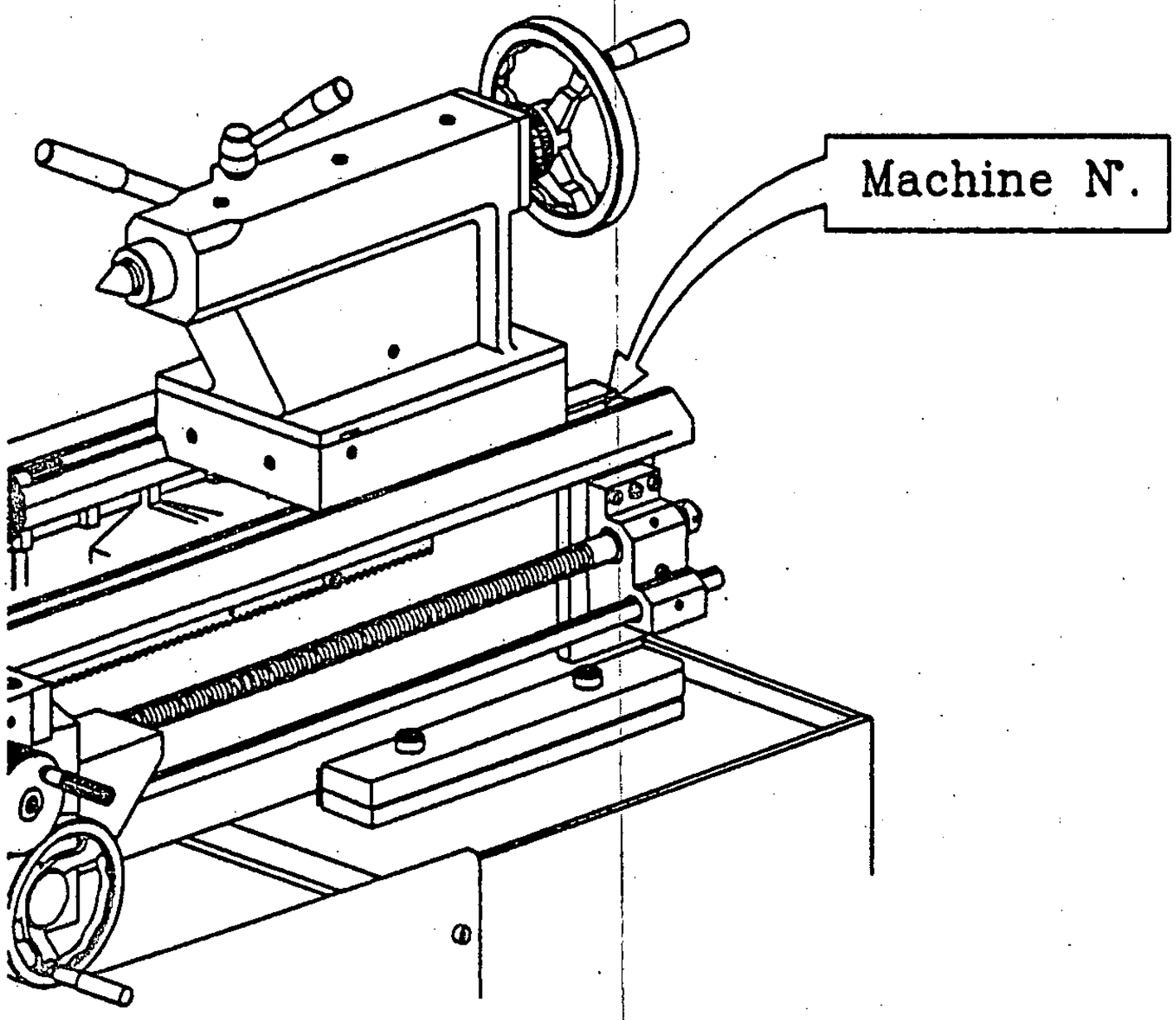
This is engroved on the end of the bed, in the guide free area. (see drowing).

* *MAKING REFERENCE TO THE ASSEMBLY DESIRED*

Indicate:
– Page no. of manual.
– part number and description
Once the part has been located on the illustrative drawing (right hand page), on the previous page or left–hand page you will the part n° and its denomination.
– Indicate Qty. to be supplied.

* *When requesting spare parts which might vary in length, indicate the distance between centres of the machine.*

* *When requesting lead screw or lead screw nut spare, indicate if it is MM or T.P.I.*



SPARE INDEX

ASSEMBLY	PAGES
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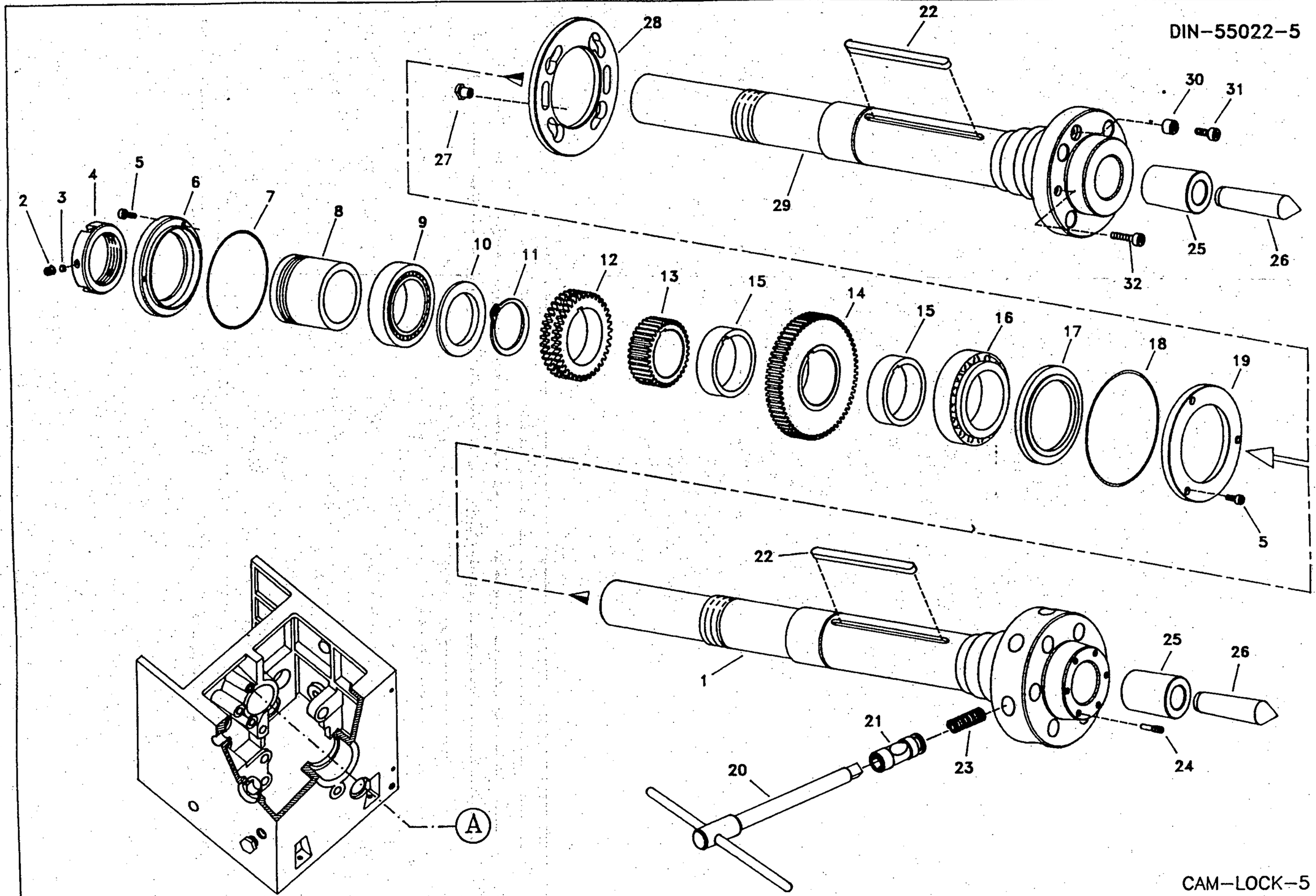
MAIN SPINDLE

MT92084
08-165-01/1

ENE-92

Item	Part N°	Description	Amo.
1	01.01.593A	Main spindle Cam-loock 5	1
2	DIN 913	Allen grub screw M12x12	3
3	01.01.1180	Adjustment nut plug	3
4	01.01.1027	Adjustment nut	1
5	DIN 912	Allen screw M6x12	6
6	01.01.528	Rear cover	1
7	DIN 3770	O-ring 110x115x2,5	1
8	01.01.592	Rear oil slinger	1
9	DIN 720	Bearing 32012	1
10	01.01.582	Oil slinger washer	1
11	DIN 471	Spring ring ø65x2,5	1
12	01.01.591	Double main spindle gear	1
13	01.01.590	Main spindle gear	1
14	01.01.5012	Main spindle gear	1
15	01.01.525	Separator bushing	2
16	DIN 720	Bearing 32014	1
17	01.01.532	Front oil slinger	1
18	DIN 3770	O-ring 130x125x2,5	1
19	01.01.529	Front cover	1
20	01.01.586,587	Eccentric wrench	1
21	01.01.581	Eccentric	6
22	DIN 6885	Main spindle key A 12x6x130	1
23	01.01.588	Srping	6
24	01.01.555A	Eccentric grub screw	6
25	01.01.530	Main spindle taper bushing	1
26	01.01.1042	Fixed centre	1
27	01.01.567	Bayonet disk bushing	2
28	01.01.554	Bayonet disk	1
29	01.01.593	Main spindle DIN 5	1
30	01.01.555	Main spindle nose bushing	1
31	DIN 912	Allen screw M6x12	1
32	DIN 912	Allen screw M6x25	2

DIN-55022-5



CAM–LOCK–5

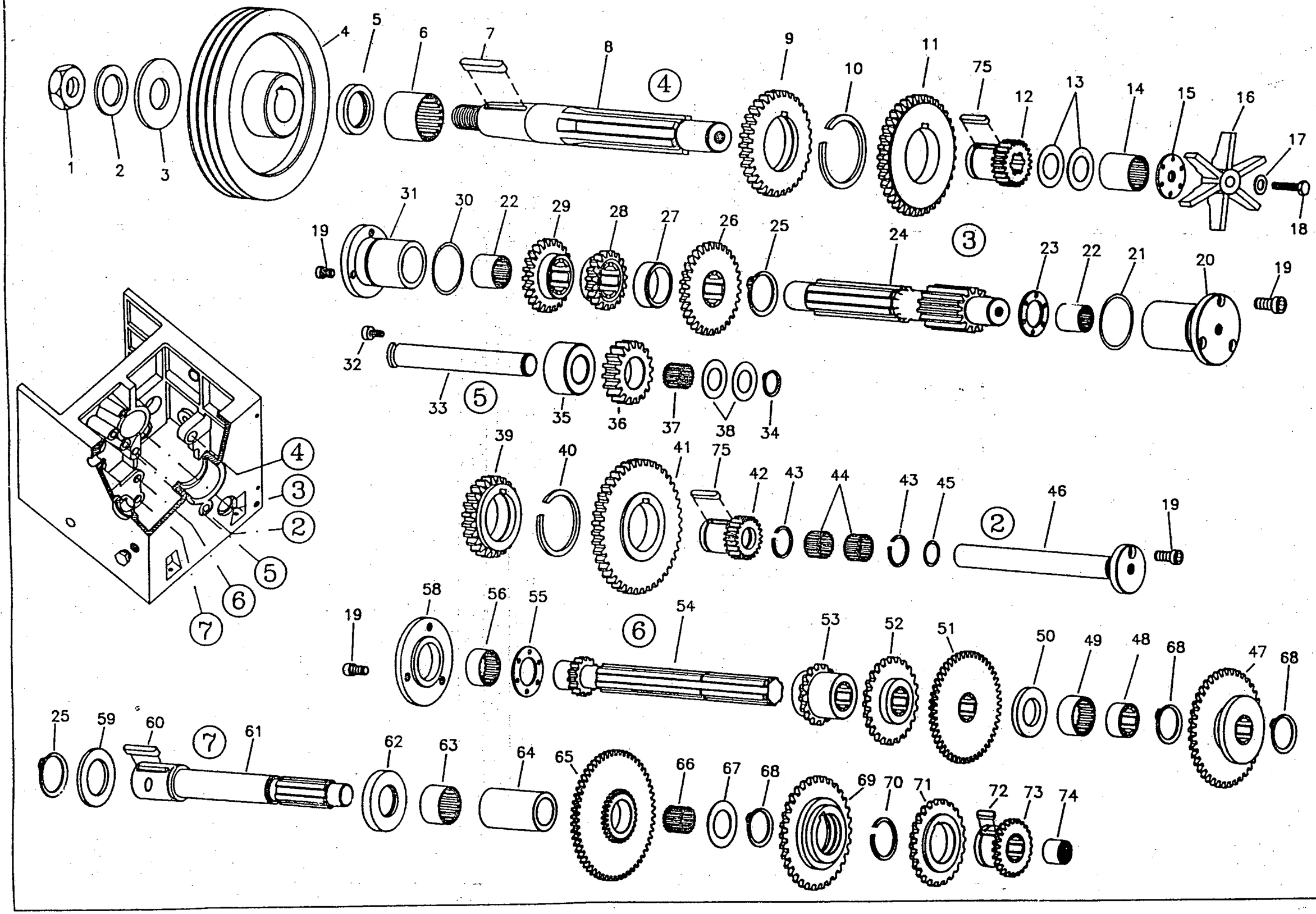
ENE-92

HEADSTOCK PINIONS AND SHAFT

MT92085
08-165-01/2

ENE-92

Item	Part N°	Description	Amo.	Item	Part N°	Description	Amo.
1	DIN 934	Nut M20	1	52	01.01.1066	Headstock feed gear	1
2	DIN 6798	Sring washer A-21	1	53	01.01.1065	Headstock feed gear	1
3	01.01.72	Input shaft wash	1	54	01.01.594	Grooved shaft feeds	1
4	01.01.535	Headstock pulley	1	55	01.01.1176	Grooved shaft washer	1
5	DIN 3760	Retainer 32x47x7	1	56		Bearing RNA 4904	1
6		Bearing RNA 69/28	1	57			
7	DIN 6885	Key A-8x12x42	1	58	01.01.1060	Grooved shaft cover feeds	1
8	01.01.501	Input shaft	1	59	01.01.1020	Output shaft washer	1
9	01.01.5017	Triple gear input shaft	1	60	DIN 6885	Key 8x10x50	1
10		Spring ring SB 45	1	61	01.01.596	Output shaft	1
11	01.01.5003	Triple gear input shaft	1	62	DIN 3760	Retainer 25x37x7	1
12	01.01.5016	Triple gear input shaft	1	63		Bearing RNA 6904	1
13		Washer AS 2542	2	64	01.01.597	Separator bushing	1
14		Bearing RNA 6904	1	65	01.01.1049	Double gear feeds	1
15	01.01.73	Pump washer	6	66	DIN 5405	Bearing K25x30x17	1
16	01.01.64	Lubrication pump	1	67		AS 2542	1
17	DIN 6798	Elastic Washer A-10,5	1	68	DIN 471	Spring ring 25x1,2	3
18	DIN 933	Hexagonal screw M10x45	1	69	01.01.1050	Headstock feed gear	1
19	DIN 912	Allen screw M6x12	10	70		Spring ring SB 38	1
20	01.01.523	Gear shaft cover	1	71	01.01.1051	Headstock feed gear	1
21	DIN 3770	O-ring 36x42x3	1	72	DIN 6885	Key A 8x7x25	1
22	DIN 618	Bearing HK 2526	2	73	01.01.1052	Feed pinion	1
23	01.01.522	Washer shaft gear	1	74		Bearing NK 2016	1
24	01.01.507	Shaft gear	1	75	DIN 6885	Key A 8x7x30	2
25	DIN 471	Spring ring ø32x1,5	2				
26	01.01.5006	Pinion shaft gear	1				
27	01.01.520	Separator bushing	1				
28	01.01.5005	Pinion shaft gear	1				
29	01.01.5004	Pinion shaft gear	1				
30	DIN 3770	O-ring 36x42x3	1				
31	01.01.523	Pinion shaft cover	1				
32	01.01.1095	Screw	1				
33	01.01.1031	Feed reverse shaft	1				
34	DIN 471	Spring ring 20x1,2	1				
35	11.01.81	Separator bushing	1				
36	01.01.513	Feed reverse gear	1				
37	DIN 5405	Bearing K 20x26x17	1				
38		AS 2035	2				
39	01.01.5020	Plain shaft triple gear	1				
40		Srping ring SB 40	1				
41	01.01.5009	Plain shaft triple gear	1				
42	01.01.5019	Plain shaft triple gear	1				
43		Spring ring SB-27	2				
44	DIN 5405	Bearing K 20x26x20	2				
45	DIN 3770	O-ring 15x20x2,5	1				
46	01.01.510	Plain shaft	1				
47	01.01.595	Feed reverse gear	1				
48	01.02.531	Grooved bushing	1				
49	DIN 618	Bearing HK 3016	1				
50	01.01.538	Bushing	1				
51	01.01.1057	Headstock feed gear	1				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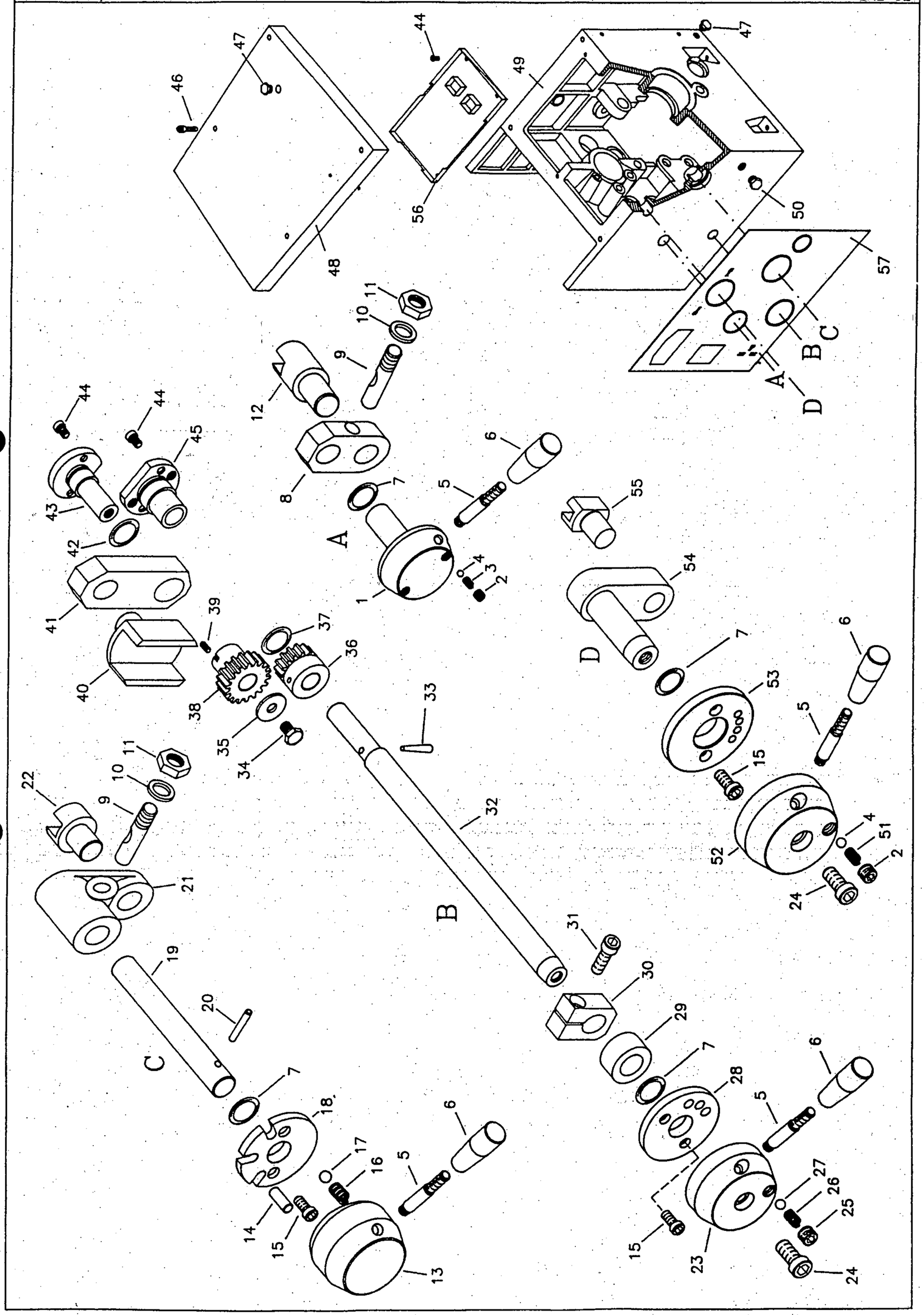
HEADSTOCK CONTROLS

MT92086
08-165-01/3
ENE-92

Item	Part N°	Description	Amo.	Item	Part N°	Description	Amo.
1	01.01.600	Feed reverse control	1	51	01.01.1181	Lubrication tray	1
2	DIN 913	Grub screw M8x8	3	52	01.01.1159	Control	1
3	01.01.1001	Spring	2	53	01.01.1158	Control cover	1
4	DIN 5401	Ball ø 6,35	3	54	01.01.598	Connecting rod	1
5	01.01.47	Handle	4	55	01.01.599	Fork	1
6	01.01.124	Handle knob	4	56	01.01.604	Lubrication tray	1
7	DIN 3770	O-ring 19x26x3,5	4	57		Speed plate	1
8	01.01.543	Connecting rod	1				
9	01.01.570	Pin	2				
10	DIN 6798	Star washer 12,5	2				
11	DIN 934	Nut M12	2				
12	01.01.601	Feed reverse fork	1				
13	01.01.551	Control	1				
14	01.01.583	Tipper screw eye	1				
15	DIN 912	Allen screw M5x10	6				
16	01.01.69	Spring	1				
17	DIN 5401	Ball ø 12	1				
18	01.01.552	Control washer	1				
19	01.01.539	Control shaft	1				
20	DIN 7343	Spring pin 8x60	1				
21	01.01.41	Connecting rod	1				
22	01.01.541	Fork	1				
23	01.01.546	Control	1				
24	DIN 912	Allen screw M10x25	2				
25	DIN 913	Grub screw M12x12	1				
26	01.01.585	Spring	1				
27	DIN 5401	Ball ø 10	1				
28	01.01.561	Control washer	1				
29	01.01.1097	Separator bushing	1				
30	01.01.547	Stop flange	1				
31	DIN 912	Allen screw M8x25	1				
32	01.01.545	Control shaft	1				
33	DIN 1	Taper pin 6x42	1				
34	DIN 933	Hexagonal screwM8x10	1				
35	01.01.565	Washer	1				
36	01.01.563	Change pinion	1				
37	DIN 3770	O-ring 20x25x2,5	1				
38	01.01.564	Change pinion	1				
39	DIN 913	Grub screw M6x8	1				
40	01.01.5050	Fork	1				
41	01.01.549	Connecting rod	1				
42	DIN 3770	O-ring 15x20x2,5	1				
43	01.01.562	Cover shaft	1				
44	DIN 912	Allen screw M6x12	6				
45	01.01.548	Control cover	1				
46	DIN 912	Allen screw M8x35	4				
47		Oil plug T/C4 3/8" Gas	2				
48	01.01.603	Headstock lid	1				
49	01.01.602	Headstock casting L-1/165	1				
49	01.01.610	Headstock casting L-1/180	1				
50		TLT oil level window 1" Gas	1				


A
B
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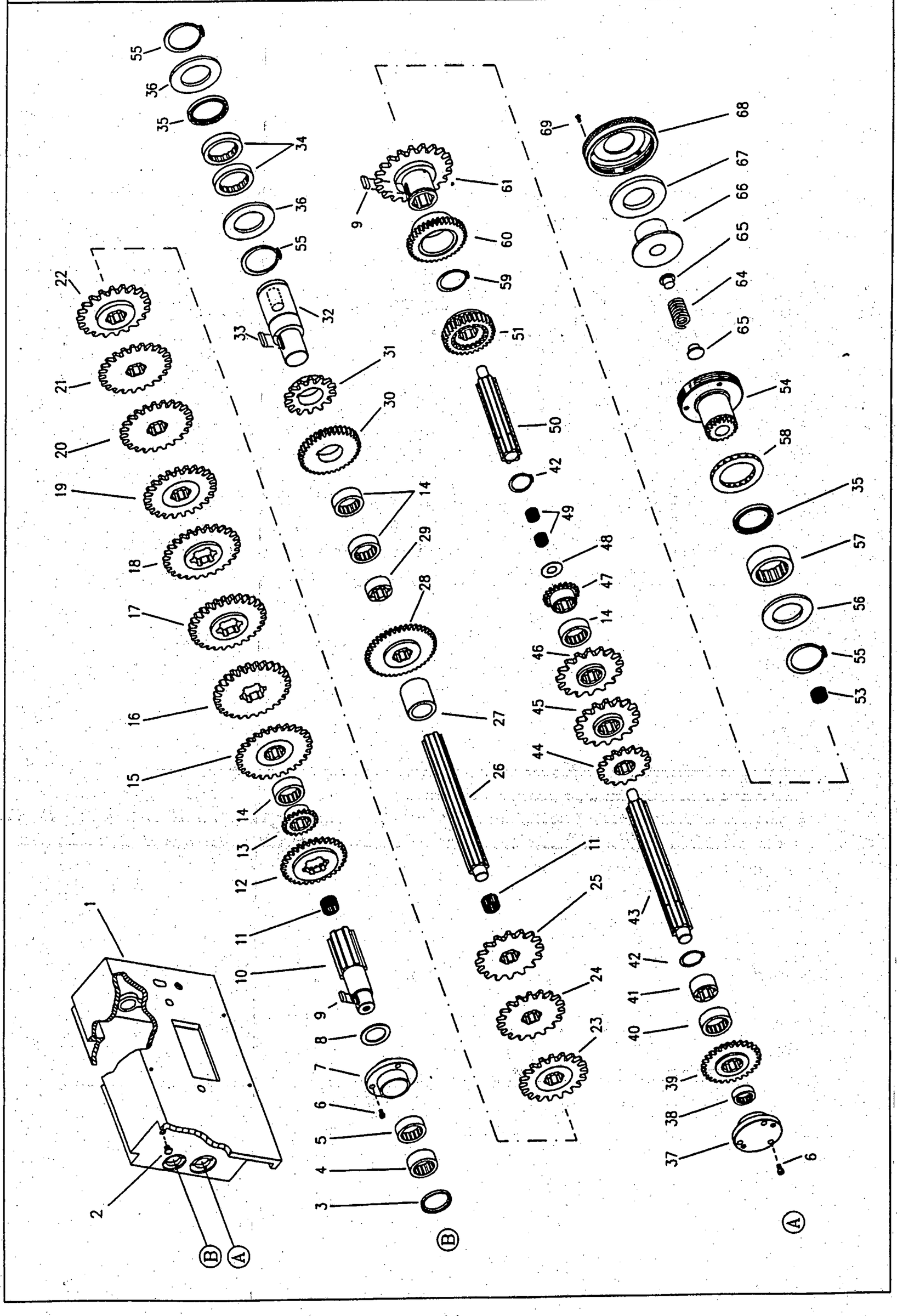
MT92206
*-200-02/1

QC GEARBOX SHAFTS AND PINIONS

NOV-94

Item	Part N°	Description	Amo.	Item	Part N°	Description	Amo.
1	08.02.1064	QC gearbox casting	1				
2	01.02.81	Oil plug 3/8" gas	2	53	DIN 648	Bearing NK 1420	2
3	DIN 3760	Retainer 25x32x4	1	54	08.02.83	Gear output	1
4	DIN 618	Bearing HK 2520	1	55	DIN 471	Spring ring E 40x1.75	1
5	DIN 618	Bearing HK 2516	1	56	08.02.95	Washer	2
6	DIN 912	Allen srew M6x15	12	57	DIN 618	Bearing HK 4020	1
7	08.02.46	Input shaft cover	1	58	DIN 5405	Bearing AXK 4060	1
8	08.02.1049	Input shaft washer	1	59	DIN 471	Spring ring E37x1.75	1
9	DIN 6885	Key A-6x6x20	2	60	08.02.101	Gear 36 Z	1
10	08.02.1001	QC gearbox input shaft	1	61	08.02.100	Gear 22 Z	1
11	DIN 5405	Bearing K-16x20x17	1	62			
12	08.02.09	Gear 34z	1	63	DIN 912	Allen screw M8x20	1
13	08.02.10	Gear 20z	1	64	08.02.71	Clutch spring	1
14	DIN 618	Bearing HK 3016	4	65	08.02.68	Bronze screw eye	1
15	08.02.16	Gear 30z	1	66	08.02.1063	Bar attachment cover	1
16	08.02.17	Gear 28z	1	67	01.02.49	CELOTEX washer	1
17	08.02.18	Gear 27z	1	68	01.02.50	Output shaft nut	1
18	08.02.19	Gear 26z	1	69	DIN 7991	Allen screw M6x20	3
19	08.02.20	Gear 24z	1				
20	08.02.21	Gear 23z	1				
21	08.02.22	Gear 22z	1				
22	08.02.23	Gear 20z	1				
23	08.02.24	Gear 10z	1				
24	08.02.25	Gear 18z	1				
25	08.02.26	Gear 16z	1				
26	08.02.15	Grooved shaft	1				
27	08.02.43	Separator bushing	1				
28	08.02.28	Gear 42z	1				
29	08.02.40	Brushed bushing	1				
30	08.02.33	Gear 36z	1				
31	08.02.32	Gear 14z	1				
32	08.02.87	Lead screw output shaft	1				
33	DIN 6885	Key A6x6x30	1				
34	DIN 618	Bearing HK 4012	2				
35	DIN 3760	Retainer G-40x47x4	1				
36	01.02.73	Upper shaft cover	1				
37	08.02.1041	Lower shaft cover	1				
38	DIN 618	Bearing HK 1616	1				
39	08.02.5	Gear 30z	1				
40	DIN 618	Bearing HK 3020	1				
41	08.02.39	Bruched bushing	1				
42	DIN 471	Spring ring 25x1.2	1				
43	08.02.36	Grooved shaft	1				
44	08.02.12	Gear 16z	1				
45	08.02.13	Gear 16z	1				
46	08.02.14	Gear 16z	1				
47	08.02.10	Gear 20z	1				
48		Washer AS-12x26x1	1				
49	DIN 5405	Bearing K-12x16x13	2				
50	08.02.86	Grooved shaft	1				
51	08.02.29	Cluth gear 30z	1				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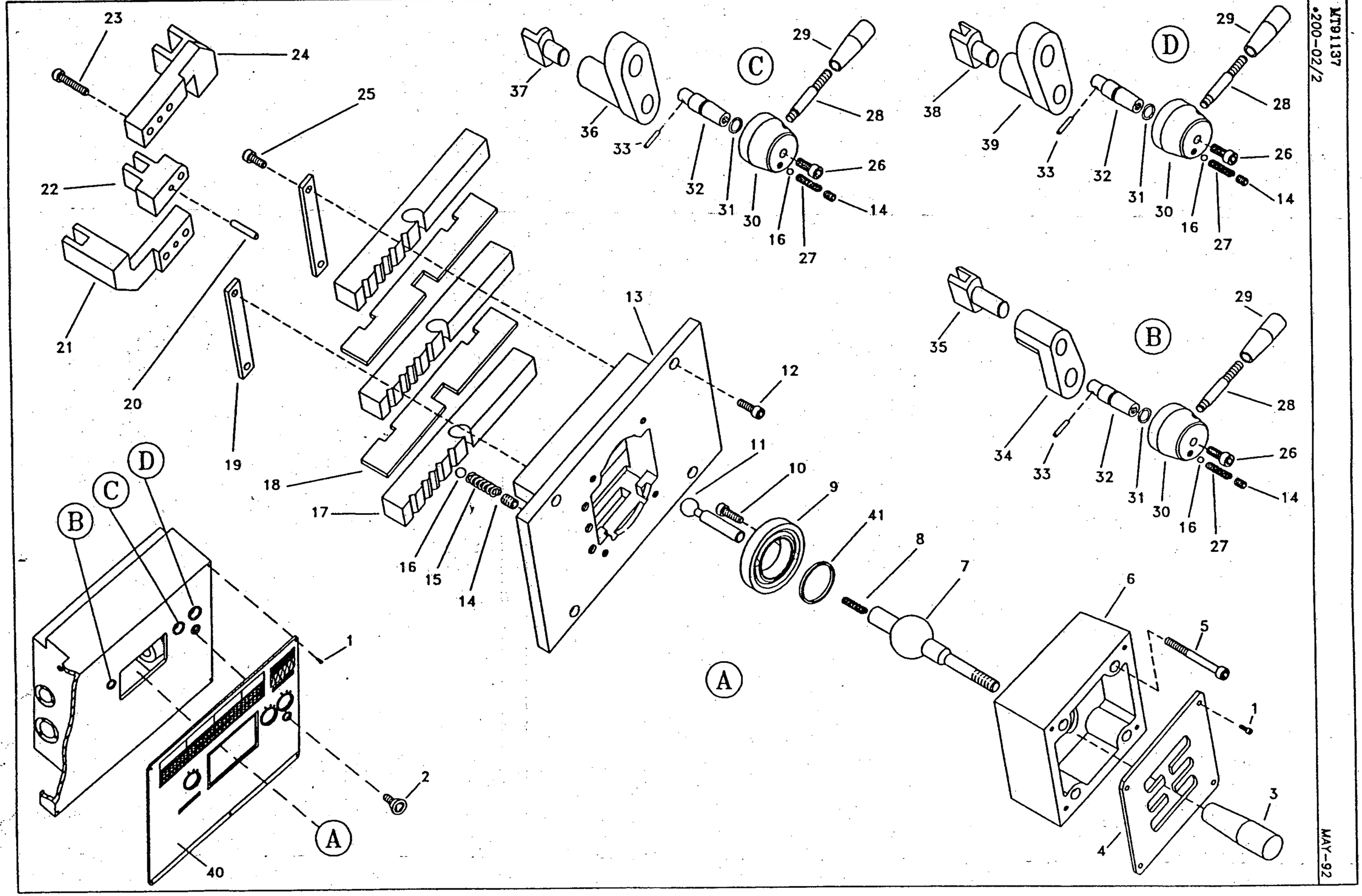
MT92200
*-200-02/2

QC GEARBOX SELECTOR AND CONTROLS

MAY-92

Item	Part N°	Description	Amo.
1	DIN 912	Allen screw M4x10	8
2		TLT oil level window 1/2" gas	1
3	01.01.120	Handle knob	1
4		Selector plate	1
5	DIN 912	Allen screw M6x30	4
6	01.02.52	Selector lever support	1
7	01.02.54	Selector lever	1
8	01.02.69	Spring	1
9	01.02.53	Ball adjustment washer	1
10	DIN 912	Allen screw M6x15	2
11	01.02.55	Selector lever ball	1
12	DIN 912	Allen screw M6x15	4
13	01.02.51	Selector	1
14	DIN 914	Allen grub screw M8x8	9
15	01.02.70	Spring	3
16	DIN 5401	ø 6x35 ball	9
17	01.02.56	Fork rule	3
18	01.02.66	Separation plate	2
19	01.02.67	Stop plate	2
20	DIN7343	Spring pin 5x25	3
21	08.02.95	Selector fork	1
22	08.02.97	Selector fork	1
23	DIN 912	Allen screw M6x25	5
24	08.02.96	Selector fork	1
25	DIN 912	Allen screw M6x12	4
26	DIN912	Allen screw M10x20	3
27	01.04.35	Spring	6
28	01.01.47	Handle	3
29	01.01.124	Control knob	3
30	08.02.65	Control	3
31	DIN 3770	O-ring washer 15x20x25	3
32	08.02.76	Control shaft	2
33	DIN 7343	Spring pin 5x36	3
34	08.02.70	Connecting rod	1
35	08.02.72	Fork	1
36	08.02.78	Connecting rod	2
37	08.02.91	Fork	1
38	08.02.92	Fork	1
39	08.02.67	Control shaft	1
40		QC gearbox plate	1
41	DIN 3770	O-ring washer 34.38.2	1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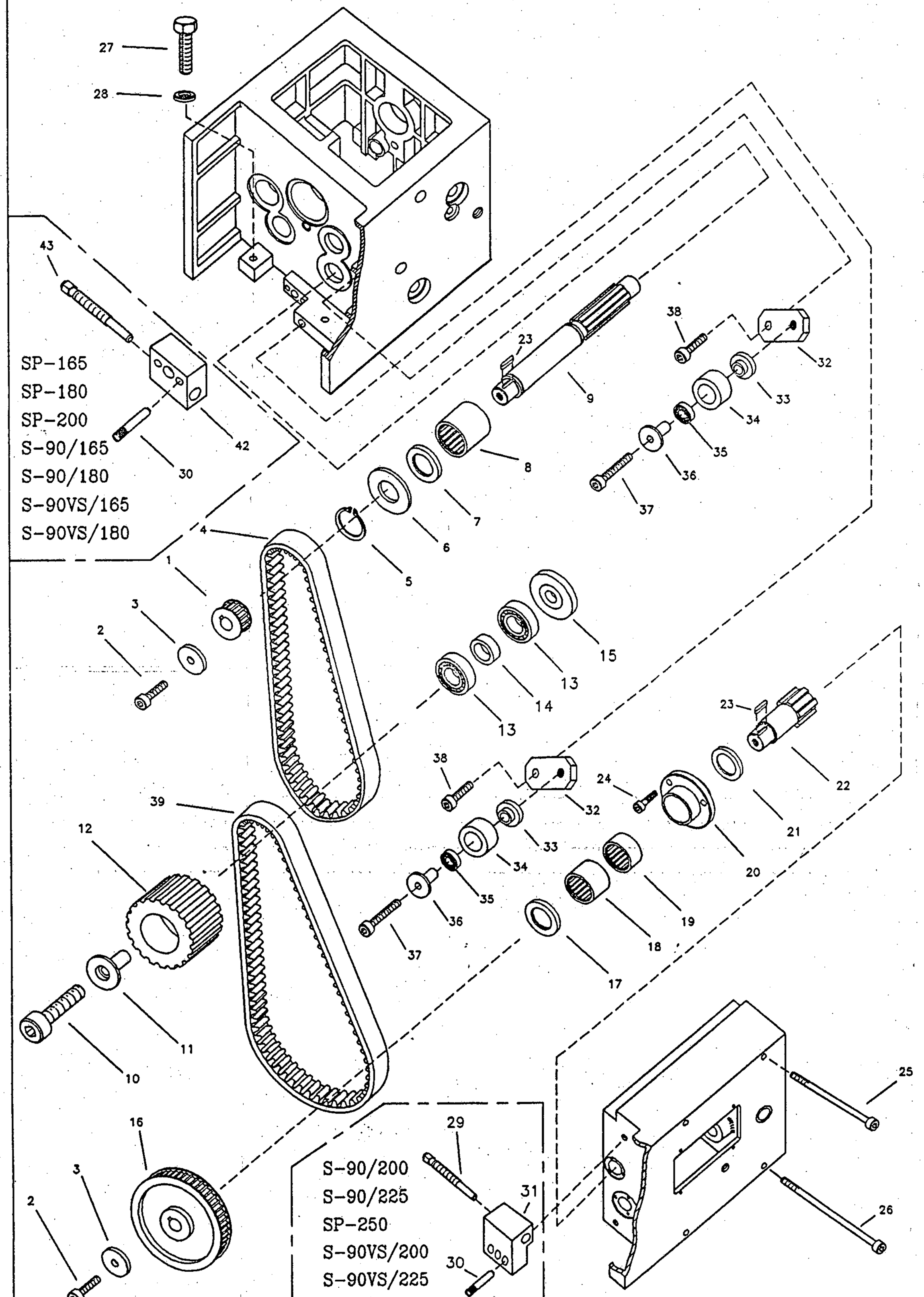
MAY-92

MT970201
*-165/200-03/1

QUADRANT PLANE MM

ABR-97

Item	Part N°	Description	Amo.
1	08.03.01087	Pulley 28-5M25	1
2	DIN 7984	Allen screw M8x20	2
3	08.03.00007	Washer	2
4	DIN 7753/DIN 2215	Belt HTD 375-5M25 (Mod. 165-180-S90/200)	1
4	DIN 7753/DIN 2215	Belt HTD 400-5M25 (Mod. SP/200-S90/225)	1
4	DIN 7753/DIN 2215	Belt HTD 425-5M25 (Mod. SP/250)	1
5	DIN 471	Spring ring 25x1,2	1
6	01.01.01020	Headstock shaft washer	1
7	DIN 3760	Retainer 25x40x7	1
8		Bearing RNA 6904	1
9	08.01.01034	Headstock output shaft	1
10	DIN 912	Allen screw M14x75	1
11	08.03.00081	Bearing holder bush	1
12	08.03.01080	Intermediate pulley 51-5M50	1
13	DIN 625	Ball bearing 6004-2RS	2
14	08.03.00082	Bearing spacer bushing	1
15	10.03.00028	Washer	1
16	08.03.01088	Pulley 84-5M25	1
17	DIN 3760	Retainer G 25x32x4	1
18	DIN 618	Bearing HK 2520	1
19	DIN 618	Bearing HK 2516	1
20	08.02.00046	QC gearbox input spindle cover	1
21	08.02.01049	Washer	1
22	08.02.01001	QC gearbox input shaft	1
23	DIN 6885	Key A-6x6x20	2
24	DIN 7984	Allen screw M8x20	3
25	DIN 912	Allen screw M8x120	2
26	DIN 912	Allen screw M8x150	2
27	DIN 933	Hexagonal screw M14x55	2
28	01.01.01100	Headstock fastening washer	2
29	01.06.00015	Adjusting block (Mod.200-225-SP/250)	1
30	01.06.00028	Dowel pin	2
31	08.06.01017	Headstock adjusting block (Mod.200-225-SP/250)	1
32	08.03.01083	Tightening connecting rod	2
33	08.03.00086	Stop bush	2
34	08.03.01084	Tightening roller	2
35	DIN 625	Ball bearing 6202-2RS	2
36	08.03.00085	Bearing holder bush	2
37	DIN 912	Allen screw M10x50	2
38	DIN 912	Allen screw M10x30	2
39	DIN 7753/DIN 2215	Belt HTD 710-5M25	1
42	01.06.00017	Headstock adjusting block (Mod.165-180-SP/200)	1
43	01.06.01015	Adjusting block (Mod. 165-180-SP/200)	1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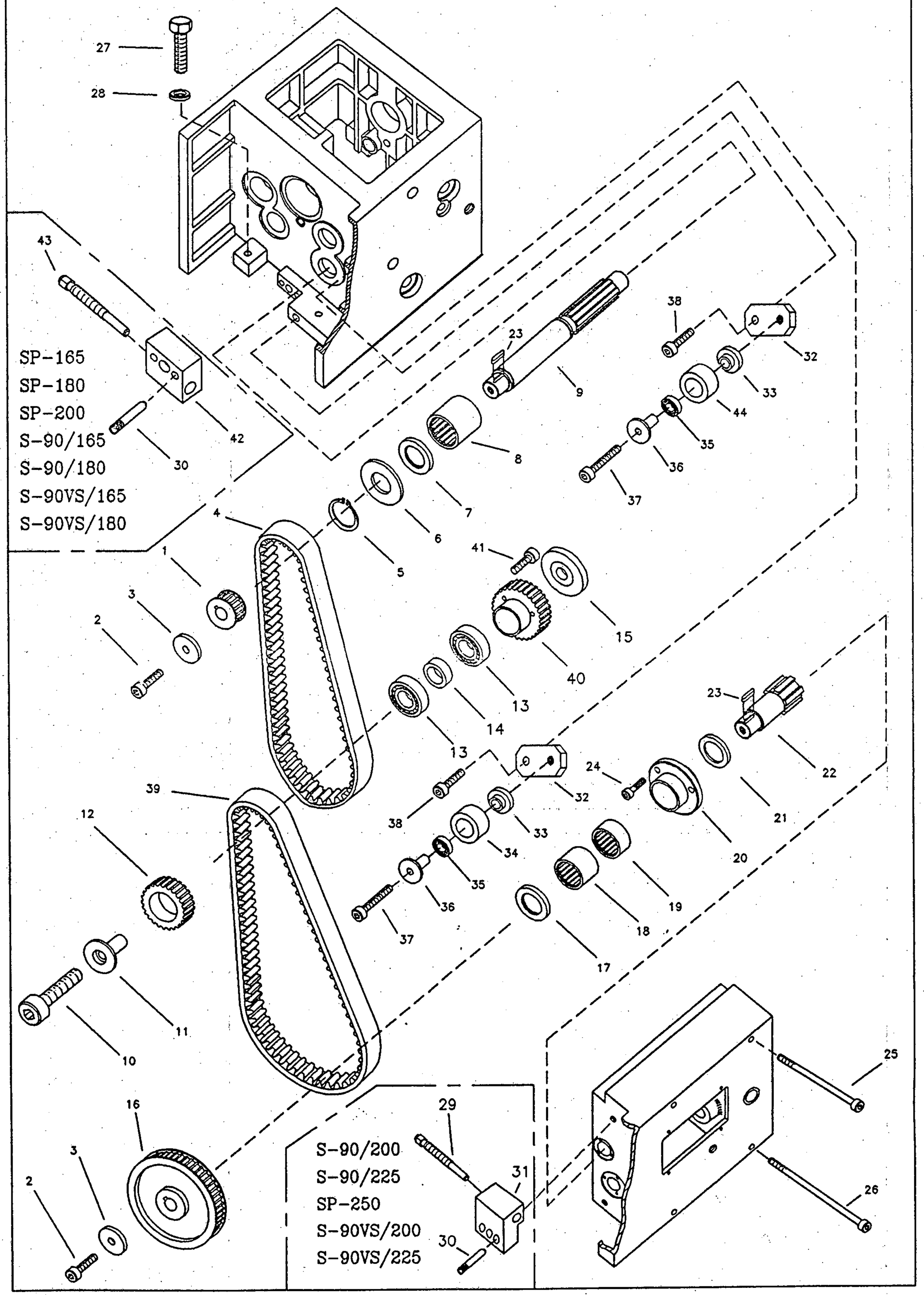
MT970211
*-165/200-03/2

QUADRANT PLANE T.P.I.

ABR-97

Item	Part N°	Description	Amo.
1	08.03.01089	Pulley 27-5M25	1
2	DIN 7984	Allen screw M8x20	2
3	08.03.00007	Washer	2
4	DIN 7753/DIN 2215	Belt HTD 375-5M25 (Mod. 165-180-S90/200)	1
4	DIN 7753/DIN 2215	Belt HTD 400-5M25 (Mod. SP/200-S90/225)	1
4	DIN 7753/DIN 2215	Belt HTD 425-5M25 (Mod. SP/250)	1
5	DIN 471	Spring ring 25x1,2	1
6	01.01.01020	Headstock shaft washer	1
7	DIN 3760	Retainer 25x40x7	1
8		Bearing RNA 6904	1
9	08.01.01034	Headstock output shaft	1
10	DIN 912	Allen screw M14x75	1
11	08.03.00081	Bearing holder bush	1
12	08.03.01090	Intermediate pulley 50-5M25	1
13	DIN 625	Ball bearing 6004-2RS	2
14	08.03.00082	Bearing spacer bushing	1
15	10.03.00028	Washer	1
16	08.03.01088	Pulley 84-5M25	1
17	DIN 3760	Retainer G 25x32x4	1
18	DIN 618	Bearing HK 2520	1
19	DIN 618	Bearing HK 2516	1
20	08.02.00046	QC gearbox input spindle cover	1
21	08.02.01049	Washer	1
22	08.02.01001	QC gearbox input shaft	1
23	DIN 6885	Key A-6x6x20	2
24	DIN 7984	Allen screw M8x20	3
25	DIN 912	Allen screw M8x120	2
26	DIN 912	Allen screw M8x150	2
27	DIN 933	Hexagonal screw M14x55	2
28	01.01.01100	Headstock fastening washer	2
29	01.06.00015	Adjusting block (Mod.200-225-SP/250)	1
30	01.06.00028	Dowel pin	2
31	08.06.01017	Headstock adjusting block (Mod.200-225-SP/250)	1
32	08.03.01083	Tightening connecting rod	2
33	08.03.00086	Stop bush	2
34	08.03.01084	Tightening roller	1
35	DIN 625	Ball bearing 6202-2RS	2
36	08.03.00085	Bearing holder bush	2
37	DIN 912	Allen screw M10x50	2
38	DIN 912	Allen screw M10x30	2
39	DIN 7753/DIN 2215	Belt HTD 710-5M25	1
40	08.03.01091	Intermediate pulley 51-5M50	1
41	DIN 912	Allen screw M6x35	3
42	01.06.00017	Headstock adjusting block (Mod.165-180-SP/200)	1
43	01.06.01015	Adjusting block (Mod. 165-180-SP/200)	1
44	08.03.00584	Tightening roller	1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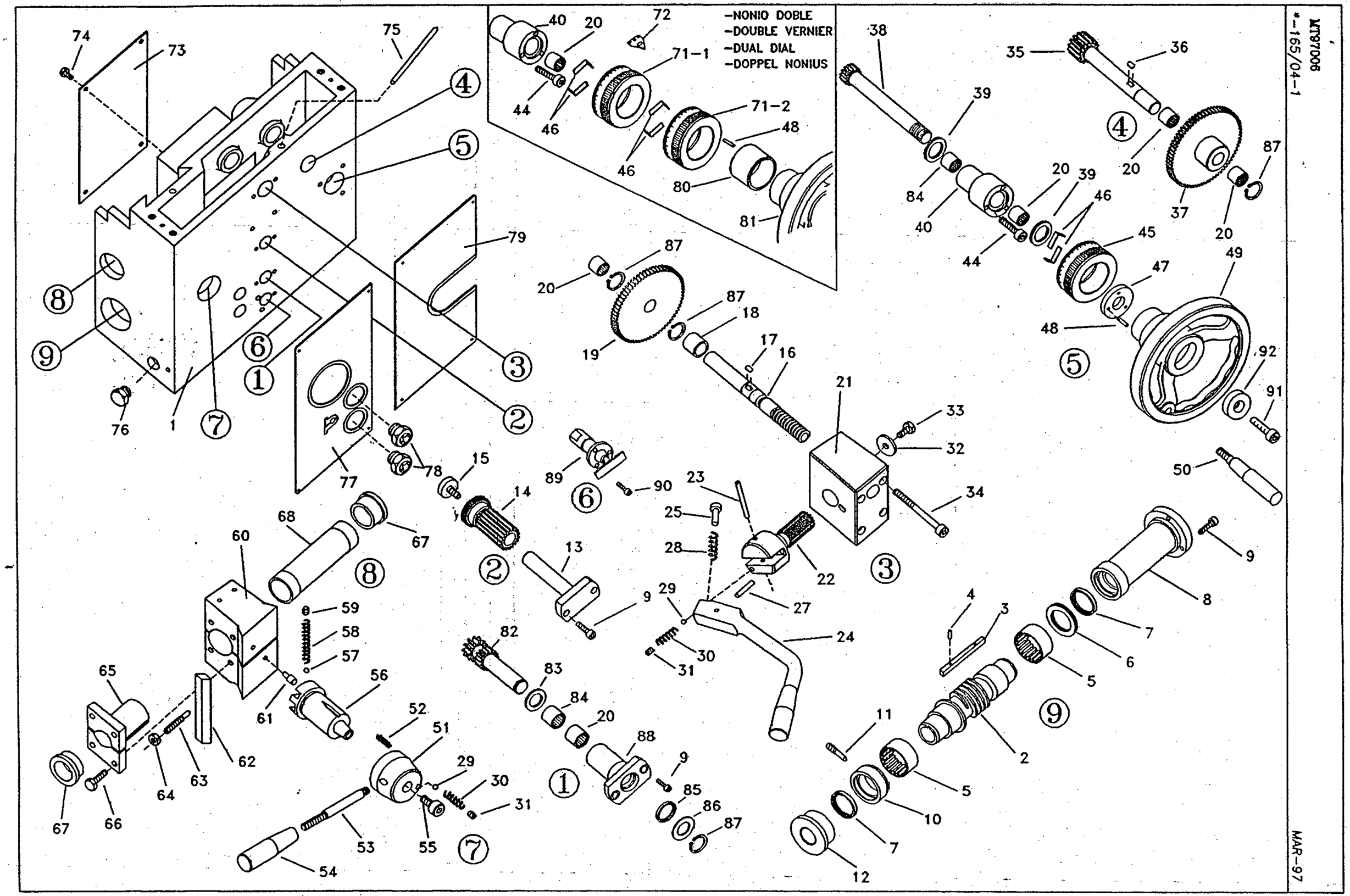
MT970121

RIGHT-HAND APRON

*-165-04/1

MAR-97

Item	Part N°	Description	Amo.	Item	Part N°	Description	Amo.
1	01.04.579	Apron casting	1	52	01.04.55	Spring	3
2	01.04.568	Worm	1	53	01.01.46	Handle lever	1
3	01.04.57	Worm key	1	54	01.01.120	Handle	1
4	DIN 7343	Pin 4x10	2	55	DIN 912	Allen screw M10x20	1
5		Bearing NK 4320	2	56	01.04.1021	Nut control shaft	1
6	DIN 5405	Bearing AXK 3552	1	57	DIN 5401	ø 8 ball	1
7		Retainer G35x42x4	2	58	01.04.537	Spring	1
8	01.04.550	Cover	1	59	DIN 913	Allen grub M10x10	1
9	DIN 912	Allen screw M6x20	7	60	08.04.89	Bronze nut support	1
10	01.04.51	Bushing	1	61	01.04.32	Nut pivot	2
11	01.04.54	Grub screw	1	62	01.04.22	Nut adjustment gib	1
12	01.04.529	Bushing	1	63	01.04.39	Gib tightener grub screw	2
13	08.04.1070	Double gear shaft	1	64	DIN 934	Nut M8	2
14	08.04.1069	Double gear 18-25z	1	65	01.04.531	Lead screw nut	1
15	01.04.1004	Gear ring screw	1	66	DIN 933	Hexagonal screw M8x25	4
16	01.04.1005	Circular rack	1	67	01.04.530	Bronze bushing	2
17	DIN 6885	Key A-6x6x15	1	68	01.04.553	Protection tube	1
18	01.04.44	Bronze bushing	1				
19	08.04.1091	Double gear 68/28 Z	1				
20	DIN 618	Bearing HK 2018 RS	5	71/1	01.04.563	Vernier m/m	1
21	01.04.07	Square plug	1	71/2	01.04.564	Vernier h/m	1
22	01.04.508	Change gear Z	1	72		"O" indicator	1
23	DIN 7343	Spring pin 6x50	1	73	01.04.40	Bottom protection plate	1
24	01.04.10	Feed change handle	1	74	DIN 933	Philips screw M6x10	4
25	01.04.59	Spring handle pin	1	75	01.04.34	Safety rod	1
				76		Oil plug TC 3/8" Gas	1
27	01.04.1058	Safety pin	1	77		Apron plate	1
28	01.04.35	Spring	1	78		LTL level window 1/2" gas	2
29	DIN 5401	ø 6,35 ball	2	79		Apron plate	1
30	01.04.56	Spring	2	80	01.04.562	Wheel bushing	1
31	DIN 914	Grub screw M8x8	2	81	01.04.561	Wheel for double vernier	1
32	01.04.33	Washer	1	82	08.04.1067	Gear ring	1
33	DIN 933	Hexagonal screw M8x15	1	83	08.04.1074	Washer	1
34	DIN 912	Allen screw M8x90	4	84	DIN 618	Bearing HK 2020	2
35	08.04.1092	Rack pinion shaft	1	85	DIN 3760	Retainer 20x28x6	1
36	DIN 6885	Key A-6x6x20	1	86		Washer AS 2035	1
37	08.04.1093	Gear 70z	1	87	DIN 471	Spring ring 20x1,2	1
38	08.04.1094	Wheel gear shaft	1	88	08.04.1071	Cover gear ring shaft	1
39		Bearing AXK 2035	2	89		Lubrication pump	1
40	01.04.515	Wheel support	1	90	DIN 912	Allen screw M4x12	3
				91	DIN 912	Allen screw M12x25	1
				92	08.04.101	Wheel bushing	1
44	DIN 912	Allen screw M6x35	3				
45	01.04.517	Vernier	1				
46	01.05.60	Vernier band	5/10				
47	01.04.516	Wheel washer	1				
49	01.04.518	Apron handwheel	1				
50	01.04.20	Handle	1				
51	01.04.24	Control knob	1				


-NONIO DOBLE
-DOUBLE VERNIER
-DUAL DIAL
-DOPPEL NONIUS

MT97013I
*-165-04/2

LEFT-HAND APRON

MAR-97

Item	Part N°	Description	Amo.	Item	Part N°	Description	Amo.
1	01.04.580	Apron casting	1	51	01.04.24	Control knob	1
2	01.04.568	Worm	1	52	01.04.55	Spring	3
3	01.04.57	Worm key	1	53	01.01.46	Handle lever	1
4	DIN 7343	Pin 4x10	2	54	01.01.120	Handle	1
5		Bearing NK 4320	2	55	DIN 912	Allen screw M10x20	1
6	DIN 5405	Bearing AXK 3552	1	56	01.04.1062	Nut control shaft	1
7		Retainer G35x42x4	2	57	DIN 5401	Ø 8 ball	1
8	01.04.550	Cover	1	58	01.04.537	Spring	1
9	DIN 912	Allen screw M6x20	7	59	DIN 913	Allen grub M10x10	1
10	01.04.51	Bushing	1	60	08.04.89	Bronze nut support	1
11	01.04.54	Grub screw	1	61	01.04.32	Nut pivot	2
12	01.04.529	Bushing	1	62	01.04.22	Nut adjustment gib	1
13	08.04.1070	Double gear shaft	1	63	01.04.39	Gib tightener grub screw	2
14	08.04.1069	Double gear 18-25z	1	64	DIN 934	Nut M8	2
15	01.04.1004	Gear ring screw	1	65	01.04.531	Lead screw nut	1
16	01.04.1005	Circular rack	1	65	01.04.577	Lead screw nut version TPI	1
17	DIN 6885	Key A-6x6x15	1	66	DIN 933	Hexagonal screw M8x25	4
18	01.04.44	Bronze bushing	1	67	01.04.530	Bronze bushing	2
19	08.04.1091	Double gear 68/28 Z	1	68	01.04.553	Protection tube	1
20	DIN 618	Bearing HK 2018 RS	5				
21	01.04.65	Square plug	1				
22	01.04.575	Change gear Z	1	71/1	01.04.563	Vernier m/m	1
23	DIN 7343	Spring pin 6x50	1	71/1	01.04.5650	Vernier h/h version TPI	1
24	01.04.10	Feed change handle	1	71/2	01.04.564	Vernier h/m	1
25	01.04.59	Spring handle pin	1	71/2	01.04.5660	Vernier m/h version TPI	1
				72		"0" indicator	1
27	01.04.1058	Safety pin	1	73	01.04.40	Bottom protection plate	1
28	01.04.35	Spring	1	74	DIN 933	Philips screw M6x10	4
29	DIN 5401	Ø 6,35 ball	2	75	01.04.34	Safety rod	1
30	01.04.56	Spring	2	76		Oil plug TC 3/8" Gas	1
31	DIN 914	Grub screw M8x8	2	77		Apron plate	1
32	01.04.33	Washer	1	78		LTL level window 1/2" gas	2
33	DIN 933	Hexagonal screw M8x15	1	79		Apron plate	1
34	DIN 912	Allen screw M8x90	4	80	01.04.562	Wheel bushing	1
35	08.04.1092	Rack pinion shaft	1	81	01.04.561	Wheel for double vernier	1
36	DIN 6885	Key A-6x6x20	1	82	08.04.1067	Gear ring	1
37	08.04.1093	Gear 70z	1	83	08.04.1074	Washer	1
38	08.04.1094	Wheel gear shaft	1	84	DIN 618	Bearing HK 2020	2
39		Bearing AXK 2035	2	85	DIN 3760	Retainer 20x28x6	1
40	01.04.515	Wheel support	1	86		Washer AS 2035	1
				87	DIN 471	Spring ring 20x1,2	1
				88	08.04.1071	Gear ring shaft cover	1
				89		Lubrication pump	1
44	DIN 912	Allen screw M6x35	3	90	DIN 912	Allen screw M4x12	3
45	01.04.517	Vernier	1	91	DIN 912	Allen screw M12x25	1
45	01.04.576	Vernier version TPI	1	92	08.04.101	Wheel bushing	1
46	01.05.60	Vernier band	5/10				
47	01.04.516	Wheel washer	1				
48	DIN 7343	Spring pin 4x15	3				
49	01.04.518	Apron handwheel	1				
50	01.04.20	Handle	1				

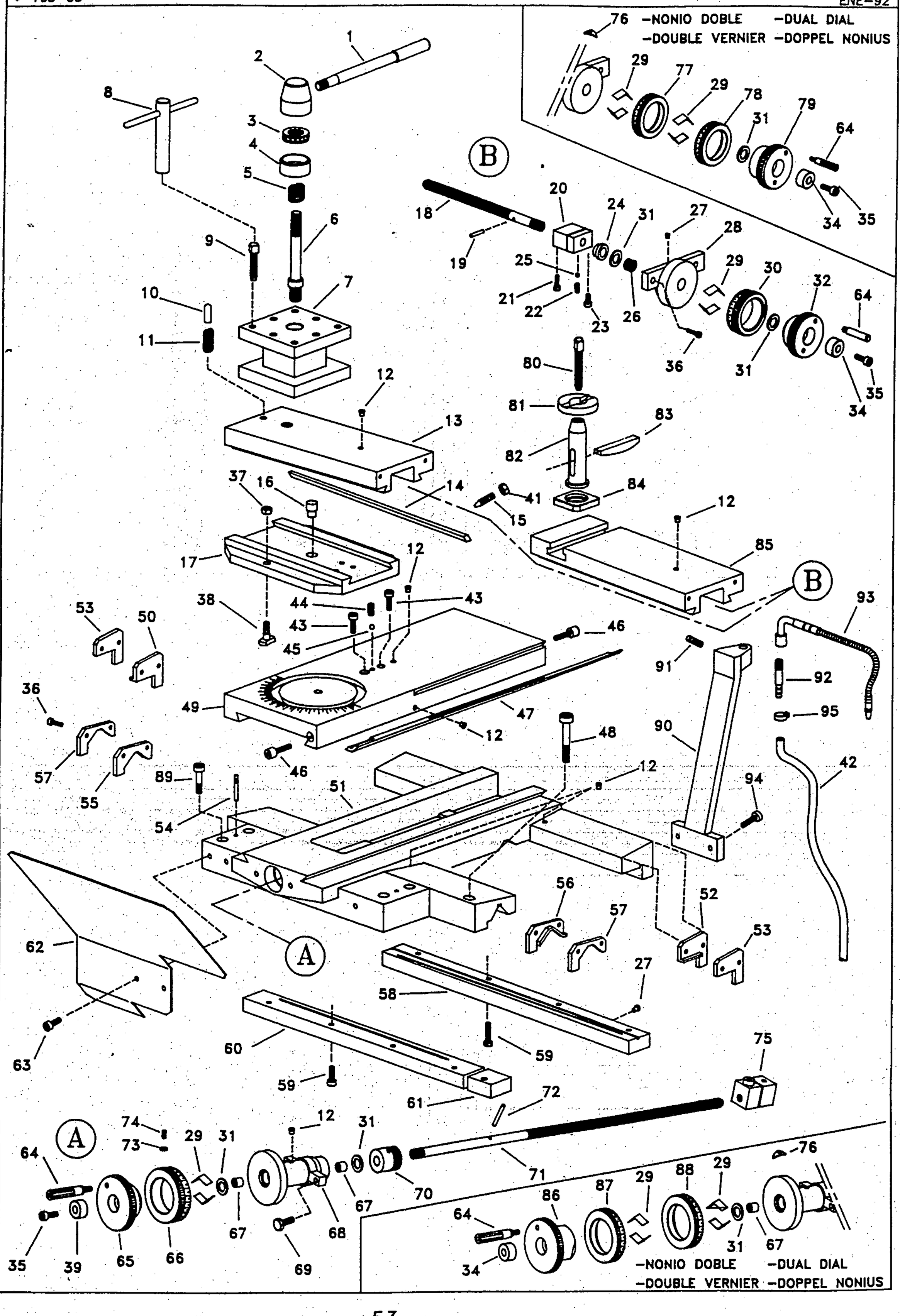
-NONIO DOBLE
-DOUBLE VERNIER
-DUAL DIAL
-DOPPEL NONIUS

CARRIAGES

MT92133
•-165-05

ENE-92

Item	Part N°	Description	Amo	Item	Part N°	Description	Amo
1	01.05.528	Toolpost handle	1	50	01.05.536	Rubber left flat wiper	1
2	01.05.524	Toolpost tightening control	1	51	01.05.501	Carriage	1
3	DIN 711	Ball bearing 51140	1	52	01.05.537.	Rubber right flat wiper	1
4	01.05.525	Washer	1	53	01.05.554	Square metal plate	2
5	01.05.40	Spring 29,5x3,5x18	1	54	01.04.49	Milled pin	2
6	01.05.523	Toolpost shaft	1	55	01.05.539	Left V-wiper	1
6	01.05.5023	Toolpost shaft L-1/180	1	56	01.05.538	Right V-wiper	1
7	01.05.521	Toolpost	1	57	01.05.553	Prism metal plate	2
7	01.05.5021	Toolpost L-1/180	1	58	01.05.526	Rear plain gibe	1
8	01.05.530	Toolpost cock	1	59	DIN 931	Hexagonal screw M8x25	8
9	01.05.529	Blade tightening screw	8	60	01.05.527	Front plain gib	1
9	01.01.5029	Blade tightening screw L-1/180	8	61	01.05.527	Saddle lock	1
10	01.05.48	Sliding screw eye	1	62	01.05.577	Topslide protection	1
11	01.05.50	Spring 7,8x7x34	1	63	DIN 912	Allen screw M6x10	2
12		ø 8 oiler	7	64	01.05.25	Cross slide & charriot wheel handle	2
13	01.05.516	Topslide	1	65	01.05.1024	Cross slide wheel	1
13	01.05.5016	Topslide L-1/180	1	66	01.05.509	Cross slide vernier	1
14	01.05.531	Topslide adjustment gib	1	66	01.05.509A	Cross slide vernier version TPI	1
15	01.05.555	Gib anchor bolt	4	67	DIN 618	Needle bearing HK 1712	2
16	01.05.35	Topslide rotation connecting rod	1	68	01.05.507	Cross spindles support	1
17	01.05.515	Topslide base	1	69	DIN 933	Hexagonal screw M8x20	2
18	01.05.518	Topslide screw	1	70	01.05.506	Spindle gear	1
18	01.05.518A	Topslide screw version TPI	1	71	01.05.504	Cross spindle	1
19	DIN 7343	Spring pin 5x25	1	71	01.05.504A	Cross spindle version TPI	1
20	01.05.519	Topslide nut	1	72	DIN 7343	Spring pin 6x35	1
20	01.05.519A	Topslide nut version TPI	1	73	01.05.70	ø6x2 copper plug	1
21	DIN 912	Allen screw M6x12	1	74	DIN 913	Grub screw M8x8	1
22	DIN 913	Grub screw M8x8	1	75	01.05.505	Cross nut	1
23	DIN 7984	Allen screw M8x12	1	75	01.05.505A	Cross nut version TPI	1
24	01.05.62	Topslide spindle bushing	1	76		-O- indicator	2
25	DIN 5401	ø6,35 ball	1	77	01.05.1088	Topslide vernier m/m	1
26	DIN 5405	Needle bearing k-17x21x13	1	77	01.05.10940	Topslide vernier h/h version TPI	1
27		ø 6 oiler	3	78	01.05.1089	Topslide vernier h/m	1
28	01.05.520	Topslide spindle support	1	78	01.05.10950	Topslide vernier m/h version TPI	1
29	01.05.60	Vernier band spring	7/14	79	01.05.1087	Wheel	1
30	01.05.1066	Topslide vernier	1	80	01.05.529A	Blade tightening screw	1
30	01.05.1066A	Topslide vernier version TPI	1	81	01.05.524A	Toolpost base	1
31	DIN 5405	Axial bearing ASK 1730, 2AS 1730	4	82	01.05.521A	Toolpost	1
32	01.05.1067	Wheel	1	83	01.05.523A	Tongue	1
				84	01.05.525A	Toolpost stop	1
34	01.05.1096	Wheel bushing	1	85	01.05.516A	Topslide	1
35	DIN 912	Allen screw M8x25	2	85	01.05.5016A	Topslide L-1/180	1
36	DIN 912	Allen screw M6x20	10	86	01.05.1084	Cross wheel	1
37	DIN 934	Nut M10	2	87	01.05.564	Cross vernier h/m	1
38	01.05.517	Topslide screw	2	87	01.05.5660	Cross vernier m/h version TPI	1
39	01.05.63	Wheel bushing	1	88	01.05.563	Cross vernier m/m	1
				88	01.05.5650	Cross vernier h/h version TPI	1
41	DIN 934	Nut M6	4	89	DIN 912	Allen screw M10x50	4
42		Coolant hose	1	90	01.08.523	Coolant nozzle support	1
43	DIN 912	Allen screw M8x15	2	91	DIN 913	Grub screw M6x8	1
44	DIN 913	Grub screw M10x10	1	92	01.08.24	Coolant raccord	1
45	DIN 5401	ø8 ball	1	93		Coolant nozzle	1
46	01.05.1061	Cross slide gib tightening screw	2	94	DIN 912	Allen screw M6x12	2
47	01.05.502	Cross slide adjustment gib	1	95		Clamp NPL 16/9 W1	1
48	DIN 912	Allen screw M10x60	1				
49	01.05.503	Cross slide	1				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–DOUBLE VERNIER –DOPPEL NONIUS
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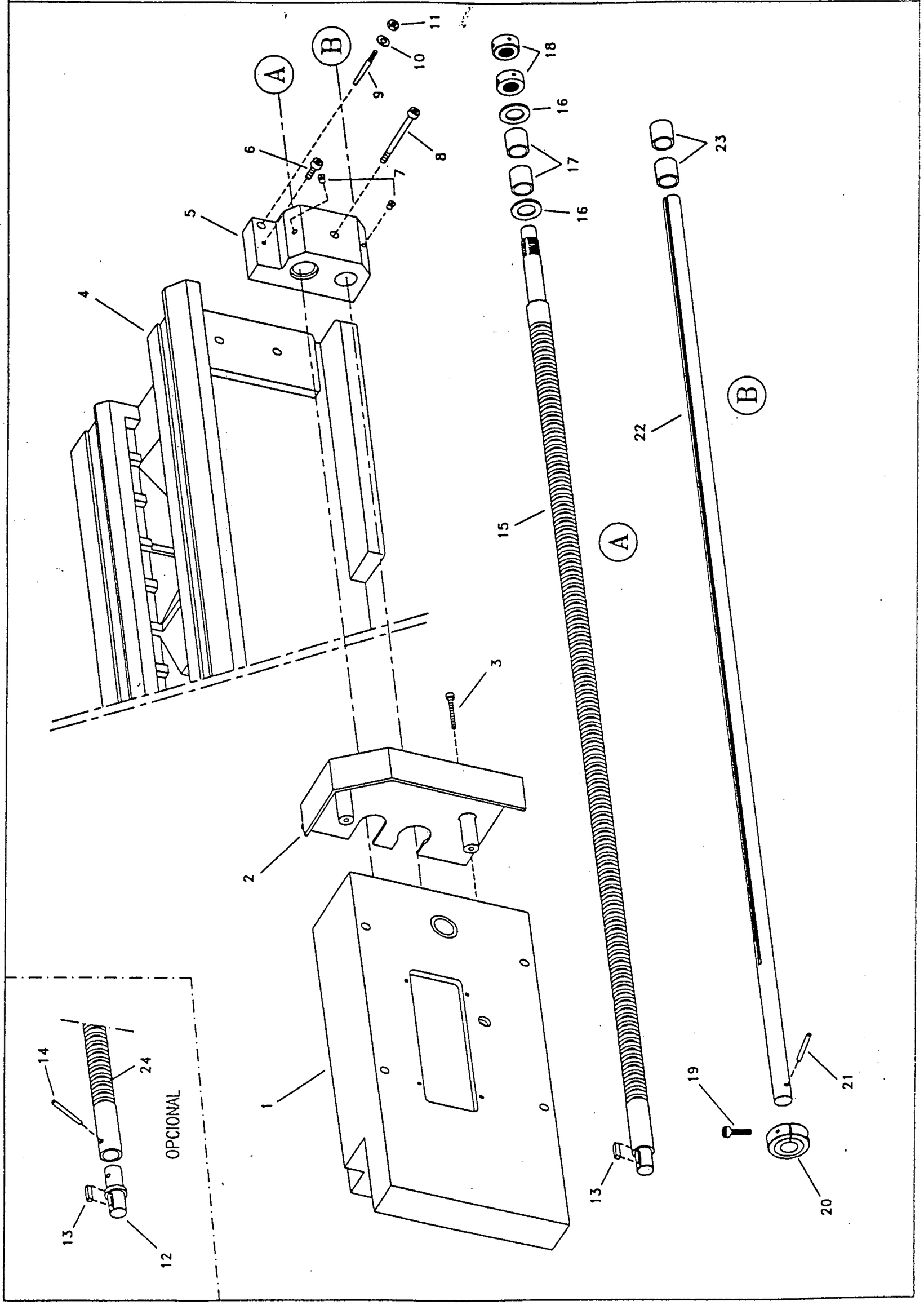
–NONIO DOBLE –DUAL DIAL
–DOUBLE VERNIER –DOPPEL NONIUS

MT92218
*-165-06

THREAD & FEED SHAFTS

MAY-92

Item	Part N°	Description	Amo.
1	01.02.533	QC gearbox casting	1
1	08.02.538	QC gearbox S-90	1
2	01.06.531	Clutch cover	1
3	DIN 912	Allen screw M6x45	2
4		Bed	1
5	01.06.530	Shaft support bracket	1
6	DIN 912	Allen screw M6x30	1
7		ø 8 oiler	2
8	DIN 912	Allen screw M6x65	1
9	01.08.44	Taper pin	1
10	DIN 125	Washer A-7	1
11	DIN 934	Nut M6	1
12	01.06.521	Bar attachment (OPTIONAL)	1
13	DIN 6885	Key A-6x6x20	1
14	01.06.1034	Bronze taper pin (OPTIONAL)	1
15		Lead screw	1
16	DIN 5405	Axial bearing AXK 2035	2
17	01.04.44	Bronze bushing	2
18	01.06.507	Screw adjustment nut	2
19	DIN 912	Allen screw M8x30	1
20	01.06.527	Feed shaft stop	1
21	DIN 7343	Spring pin 5x36	1
22	01.06.512	Feed shaft	1
23	01.04.44	Bronze bushing	2
24		Lead screw (OPTIONAL)	1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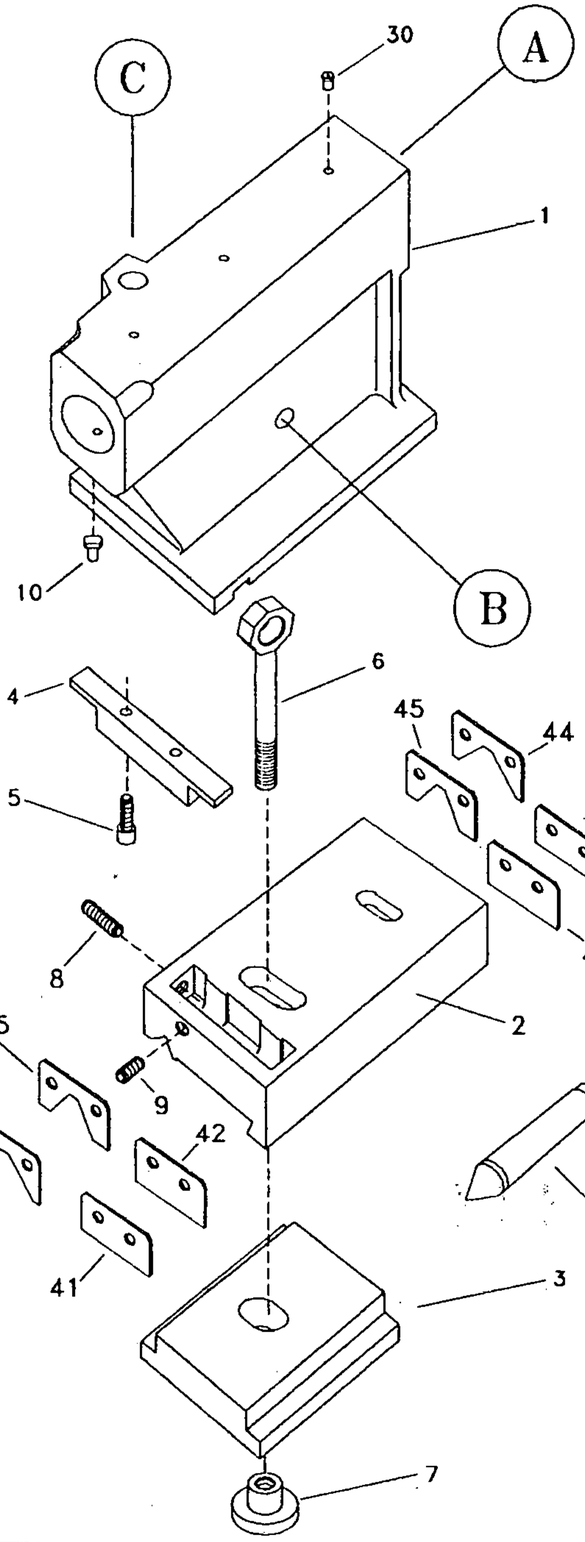
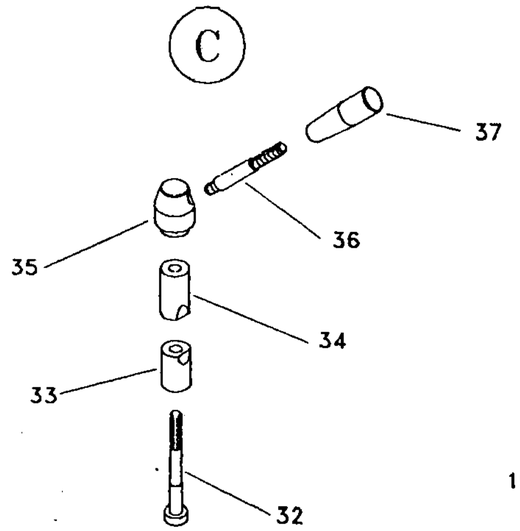
MT92135 CLAUSING
*-165-07

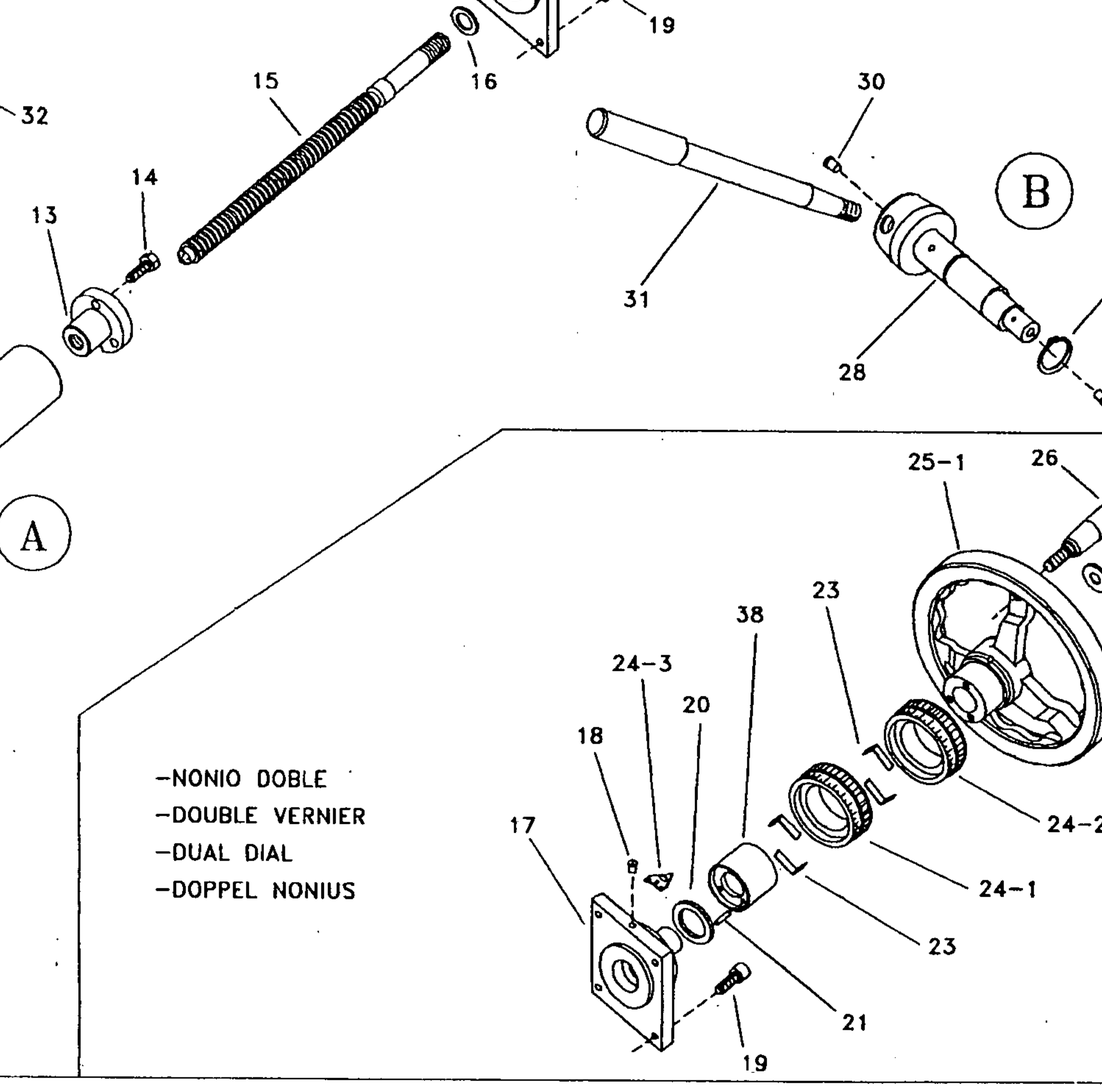
TAILSTOCK

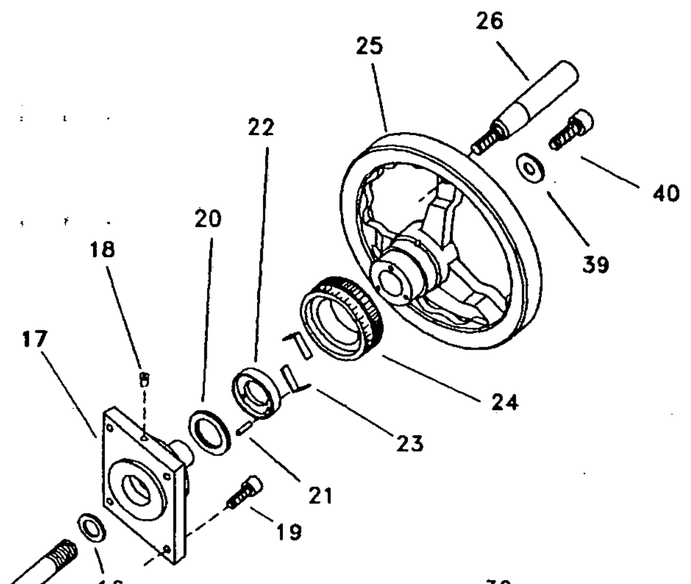
DIC-95

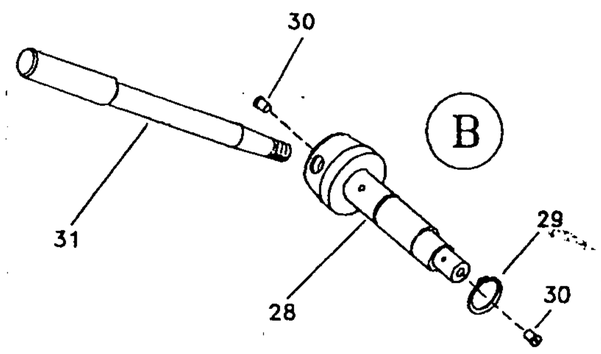
Item	Part N°	Description	Amo.	Item	Part N°	Description	Amo.
1	01.07.501	Tailstock casting	1	41	01.07.1027	Flat bedwipers plate	2
2	01.07.502	Tailstock base	1	42	01.07.1025	Flat bedwipers	2
2	01.07.5002	Tailstock base L-1/180	1	43	DIN 912	Allen screw M4x10	8
3	01.07.503	Attaching flange	1	44	01.07.1026	Square bedwipers plate	2
4	01.07.528	Centering gib	1	45	01.7.1024	Square bedwipers	2
5	DIN 912	Allen screw M8x20	2				
6	01.07.520	Lock screw	1				
6	01.07.5020	Lock screw L-1/180	1				
7	01.07.522	Lock nut	1				
8	DIN 914	Centering grub screw M10x30	2				
9	DIN 914	Attachment grub screw	2				
10	01.07.516	Shank key	1				
11	01.07.530	Dead center	1				
12	01.07.504	Tailstock barrel	1				
13	01.07.505	Barrel nut	1				
13	01.07.505A	Barrel nut version TPI	1				
14	DIN 933	Hexagonal screw M6x20	3				
15	01.07.506	Tailstock screw	1				
15	01.07.506A	Screw version TPI	1				
16	DIN 5405	Axial bearing ASK 1528	1				
17	01.07.507	Screw support	1				
18		ø 6 ball oiler	1				
19	DIN 912	Allen screw M6x15	4				
20	DIN 5405	Axial bearing AXK 2035	1				
21	DIN 7343	Spring pin 4x15	3				
22	01.07.509	Wheel bushing	1				
23	01.05.60	Strip spring	4/8				
24	01.07.508	Vernier	1				
24	01.07.508A	Vernier version TPI	1				
24-1	01.07.543	Vernier m/m	1				
24-1	01.07.5450	Vernier h/h version TPI	1				
24-2	01.07.544	Vernier h/m	1				
24-2	01.07.5460	Vernier m/h version TPI	1				
24-3		"0" indicator	1				
25	01.07.510	Tailstock handwheel	1				
25-1	01.07.541	Double vernier handwheel	1				
26	01.04.20	Wheel handle	1				
27							
28	01.07.517	Tightening eccentric	1				
29	DIN 471	Spring ring 25x1,2	1				
30		ø 6 ball oiler	5				
31	01.07.518	Clamping shaft handle	1				
32	01.07.511	Barrel lock screw	1				
33	01.07.512	Barrel lock bushing	1				
34	01.07.513	Barrel lock bushing	1				
35	01.07.514	Barrel lock knob	1				
36	01.01.47	Barrel lock handle	1				
37	01.01.124	Handle knob	1				
38	01.07.542	Wheel bushing	1				
39	08.07.1050	Washer	1				
40	DIN 912	Allen screw M10x20	1				



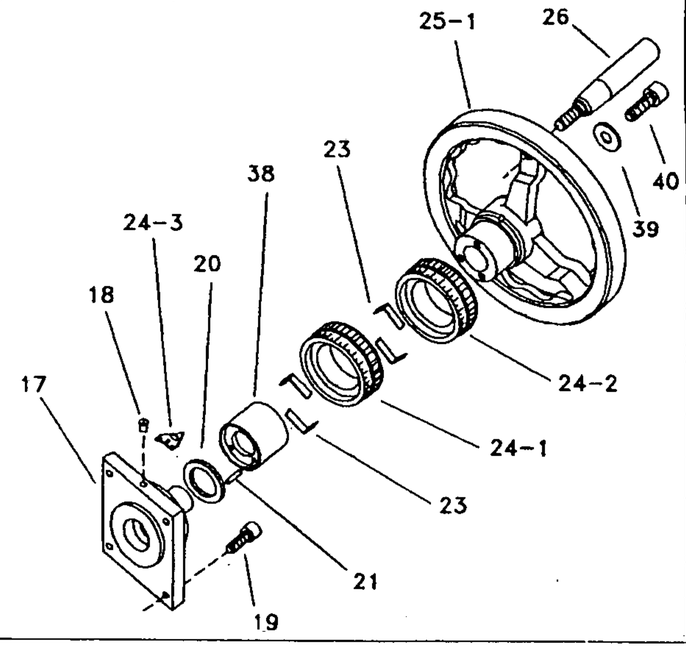








-NONIO DOBLE
-DOUBLE VERNIER
-DUAL DIAL
-DOPPEL NONIUS



MT92136
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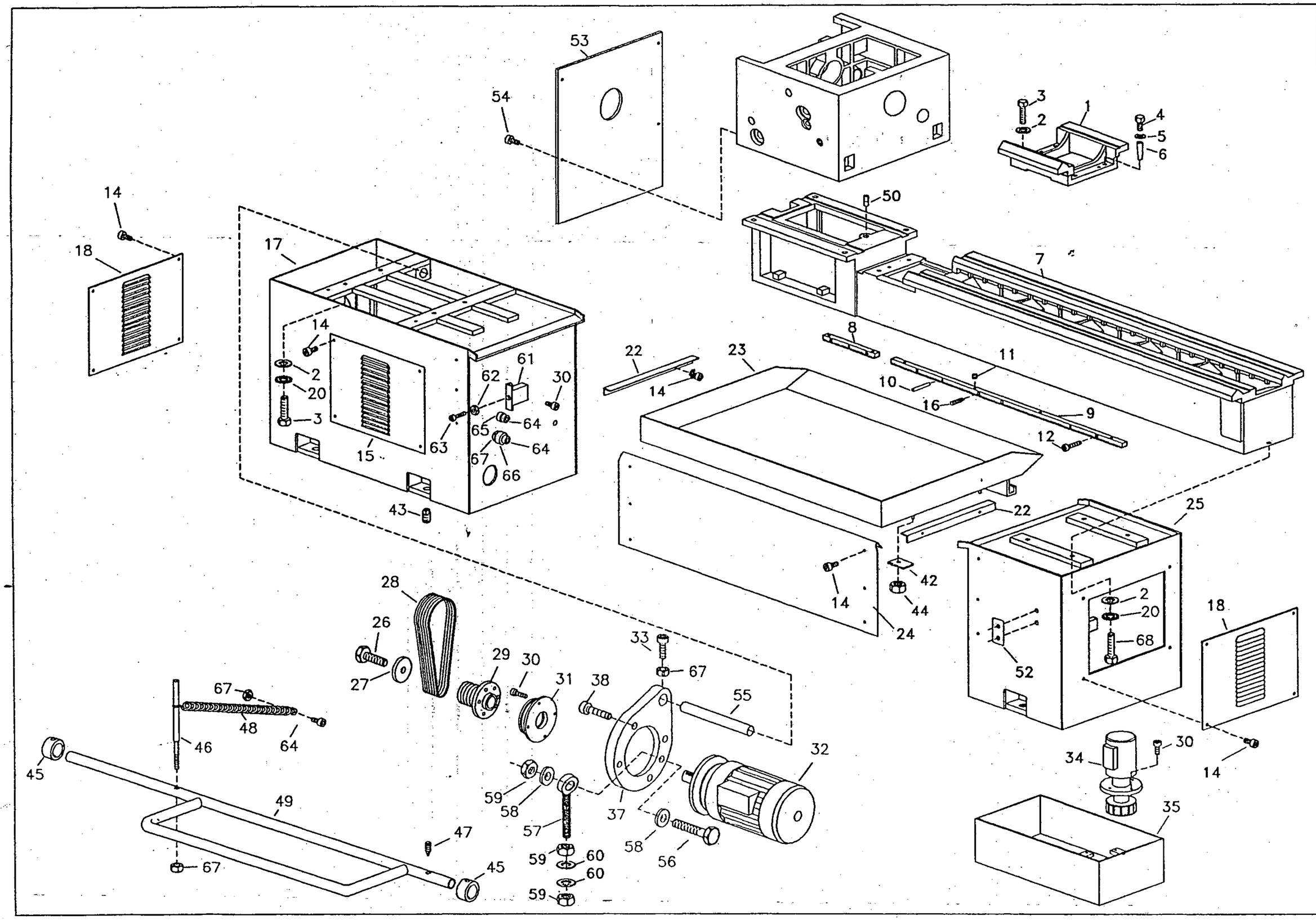
BED - PEDESTALS

ENE-92

Item	Part N°	Description	Amo.	Item	Part. N°	Description	Amo.
1	01.06.504	Gap piece	1	50	01.01.1099	Headstock centering screw eye	1
2	DIN 125	Washer A-13	12	51		Emerg. switch plate version TPI	1
3	DIN 933	Hexagonal screw M12x40	4	52		Cooling switch plate version TPI	1
4	DIN 933	Hexagonal screw M10x15	2	53			
5	DIN 125	Washer A-11	2	54			
6	01.06.16	Taper pin	2	55			
7	01.06.501	Bed	1	56			
8	01.06.1014	Rack (see table)		57			
8	01.06.1014A	Rack version TPI (see table)		58			
9	01.06.1014	Rack (see table)		59			
9	01.06.1014A	Rack version TPI (see table)		60		MECHANICAL BRAKE VERSION	
10	DIN 7343	Spring pin ø 6x30 (see table)		61		End of stroke	1
11	01.06.37	Adjustment screw eye (see table)		62	DIN 934	Nut M-6	1
12	DIN 912	Allen screw M6x20 (see table)		63	DIN 912	Allen screw M6x12	1
13	DIN 913	Hexagonal screw M12x50	8	64	DIN 912	Allen screw M10x20	3
14	DIN 912	Allen screw M8x10	18	65	01.08.45	Bushing	1
15	01.08.509	Motor cover plate	1	66	01.08.75	Rubber bushing	1
16	DIN 914	Grub screw M8x8 (see table)		67	DIN 934	Nut M-10	4
17	01.08.501	Headstock pedestal	1	68		Mechanical brake version pulley	1
18	01.08.508	Cover plate	2	69	01.08.16	Brake shoe	1
19	DIN 934	Nut M16	2	70	01.08.22	Shoe attachment screw	1
20	DIN 6798	Star washer A-13	8	71	01.08.21	Connecting rod rotation bolt	1
21	DIN 125	Washer A-18	2	72	01.08.33	Guide screw eye	1
22				73	DIN 125	Washer A-13	1
23	01.08.503	Chip tray	1	74	DIN 933	Hexagonal screw M12x50	1
24	01.08.505	Skirt	1	75	DIN 912	Allen screw M8x45	2
25	01.08.502	Tailstock pedestal	1	76	DIN 934	Nut M-8	4
26	DIN 933	Hexagonal screw M10x60	1	77	01.08.37	Pedal bar bolt	1
27	01.08.1049	Motor washer	1	78	DIN 912	Allen screw M10x60	1
28		Transmission belt		79	01.08.32	Pedal bar bushing	2
29		Motor pulley	1	80	01.08.34	Tightening spring shaft	1
30	DIN 912	Allen screw M6x12	6	81		Pedal bar	1
31	4.62.04.900	Electromagnetic brake	1	82	DIN 914	Grub screw M10x10	1
32		Motor	1	83	01.08.54	Spring	1
33	01.08.48	Motor support shaft	1	84	01.08.36	Tightening square bar	2
34		Cooling pump motor	1	85	01.08.17	Brake lever	1
35	01.08.506	Coolant tank	1	86	01.08.18	Brake connecting rod	1
36	01.08.48	Motor support shaft nut	1				
37	01.08.512	Motor support	1				
38	DIN 913	Grub screw M14x40	1				
39	DIN 934	Nut M14	1				
40	01.08.25	Motor tightening stud	1				
41	DIN 933	Hexagonaal screw M10x30	4				
42							
43	01.08.07	Levelling tightening device	4				
44	DIN 934	Nut M8	1				
45	DIN 912	Allen screw M6x12	3				
46	01.08.528	Quadrant plate door fastening flat iron	1				
47		Tubular pin hinge	2				
48	01.08.519	Quadrant plate door	1				
49	01.03.20	Quadrant plate door knob	1				

RACKS

TYPE	LENGHT	ITEM					
		8	9	10	11	12	16
APRON	750	-	1	2	4	3	4
	1000	1	1	3	6	5	6
LEFT APRON	30"	1	1	3	6	5	6
	40"	1	1	3	6	5	6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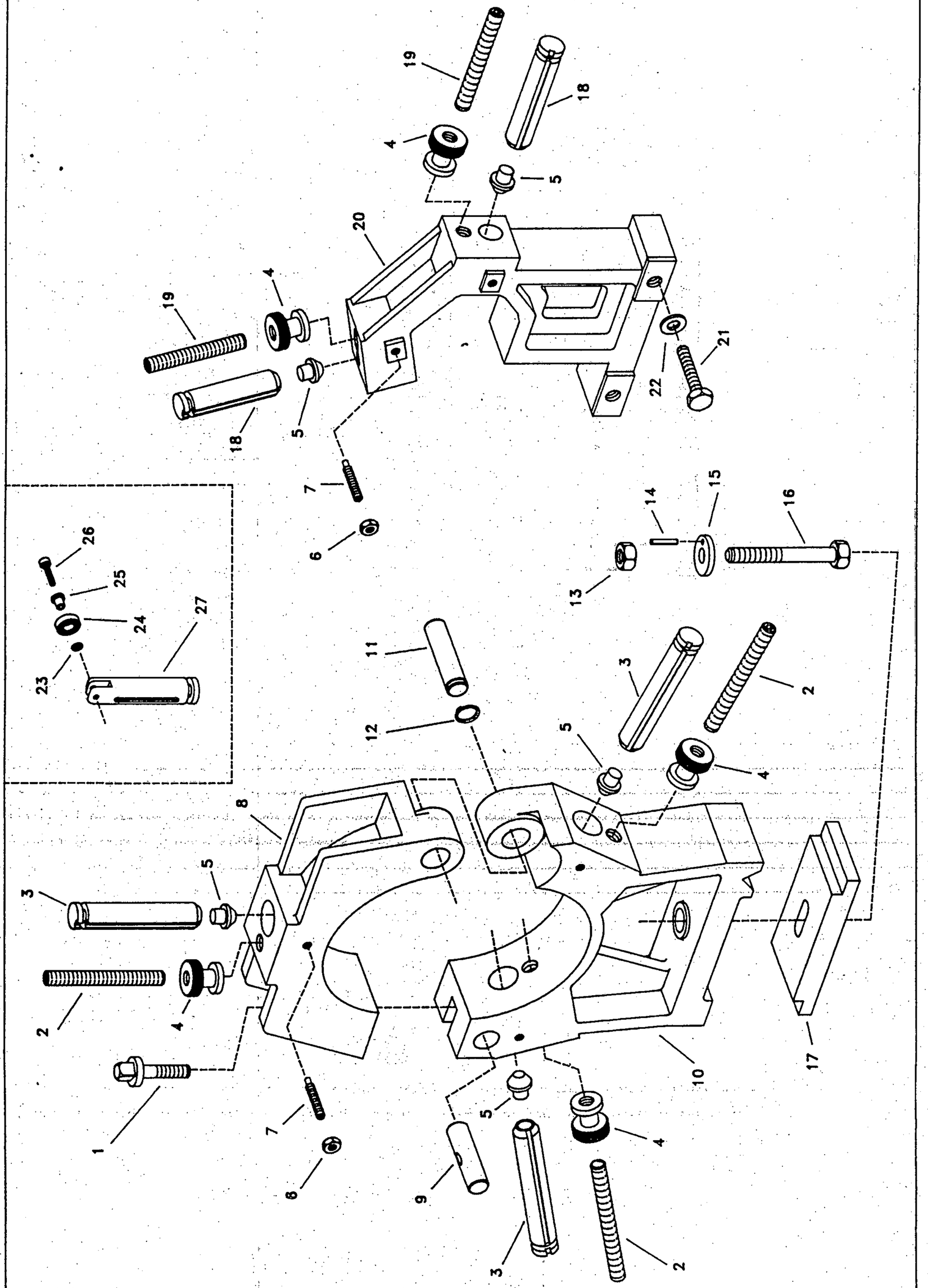
MT92137
•-165-09

STEADIES

ENE-92

Item	Part N°	Description	Amo.
1	01.09.513	Steady lock screw	1
2	01.09.506	Steady M12-90	3
3	01.09.503	Fixed steady fingers (Rollers 9-520)	3
4	01.09.511	Graduated knob	5
5	01.09.507	Bronze screw eye	5
6	DIN 934	Nut M6	5
7	01.09.518	Grub screw	5
8	01.09.512	Fixed steady arm	1
9	01.09.509	Threaded pin	1
10	01.09.501	Fixed steady base	1
10	01.09.5001	Fixed steady base L-1/180	1
11	01.09.508	Pivot pin	1
12	DIN 471	Spring ring 18x1	1
13	DIN 934	Nut M12	1
14	DIN 7343	Spring pin 5x25	1
15	01.09.517	Washer	1
16	DIN 931	Hexagonal screw M12x80	1
17	01.09.510	Clamp plate	1
18	01.09.504	Travelling steady finger (Rollers 9-521)	2
19	01.09.505	Stud M12x70	2
20	01.09.502	Travelling steady casting	1
20	01.09.5002	Travelling steady L-1/180	1
21	DIN 931	Hexagonal screw M10x55	2
22	DIN 125	Washer A-11	2
23	DIN 125	Washer A-5	3
24		Bearing 688 ZZS	3
25	01.09.519	Bushing	3
26	DIN 912	Allen screw M5x15	3
27		Finger for rollers	3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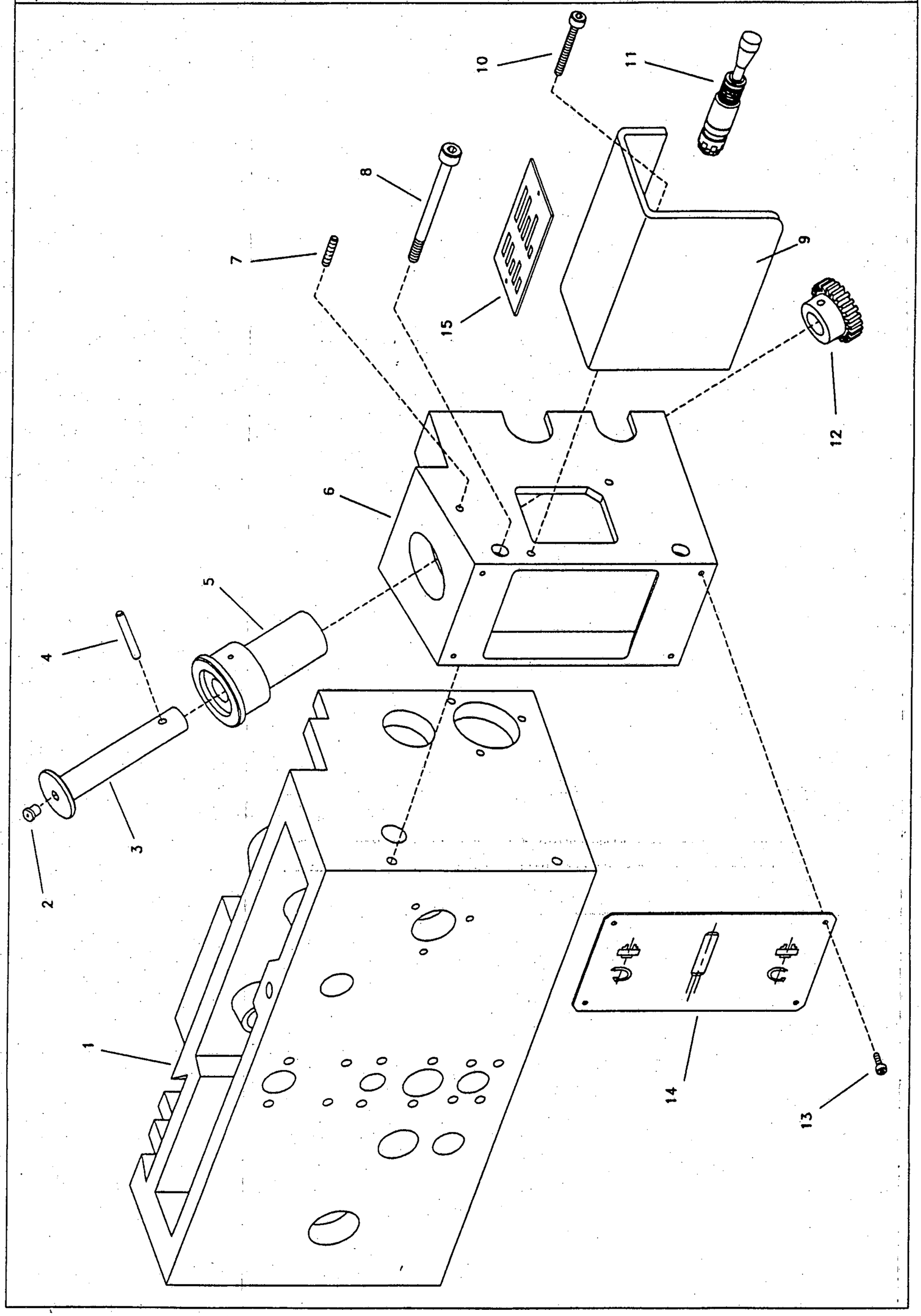
MT92212
*-165-10

THREAD DIAL

MAY-92

Item	Part N°	Description	Amo.
1	01.04.579	Apron casting right	1
1	01.04.580	Apron casting left	1
2		ø 8 ball oiler	1
3	01.10.1003	Thread dial shaft	1
4	DIN 7343	Spring pin 5x36	1
5	01.10.1005	Shank	1
6	01.10.512	Thread dial housing	1
7	DIN 913	Grub screw M6x15	1
8	DIN 912	Allen screw M8x70	2
9	01.10.09	Visor	1
10	DIN 912	Allen screw M6x45	2
11		Spindle reversing switch	1
12	01.10.04	Gear	1
13	DIN 912	Allen screw M4x8	4
14		Spindle direction indicator plate	1
15		Thread entry indicator plate	1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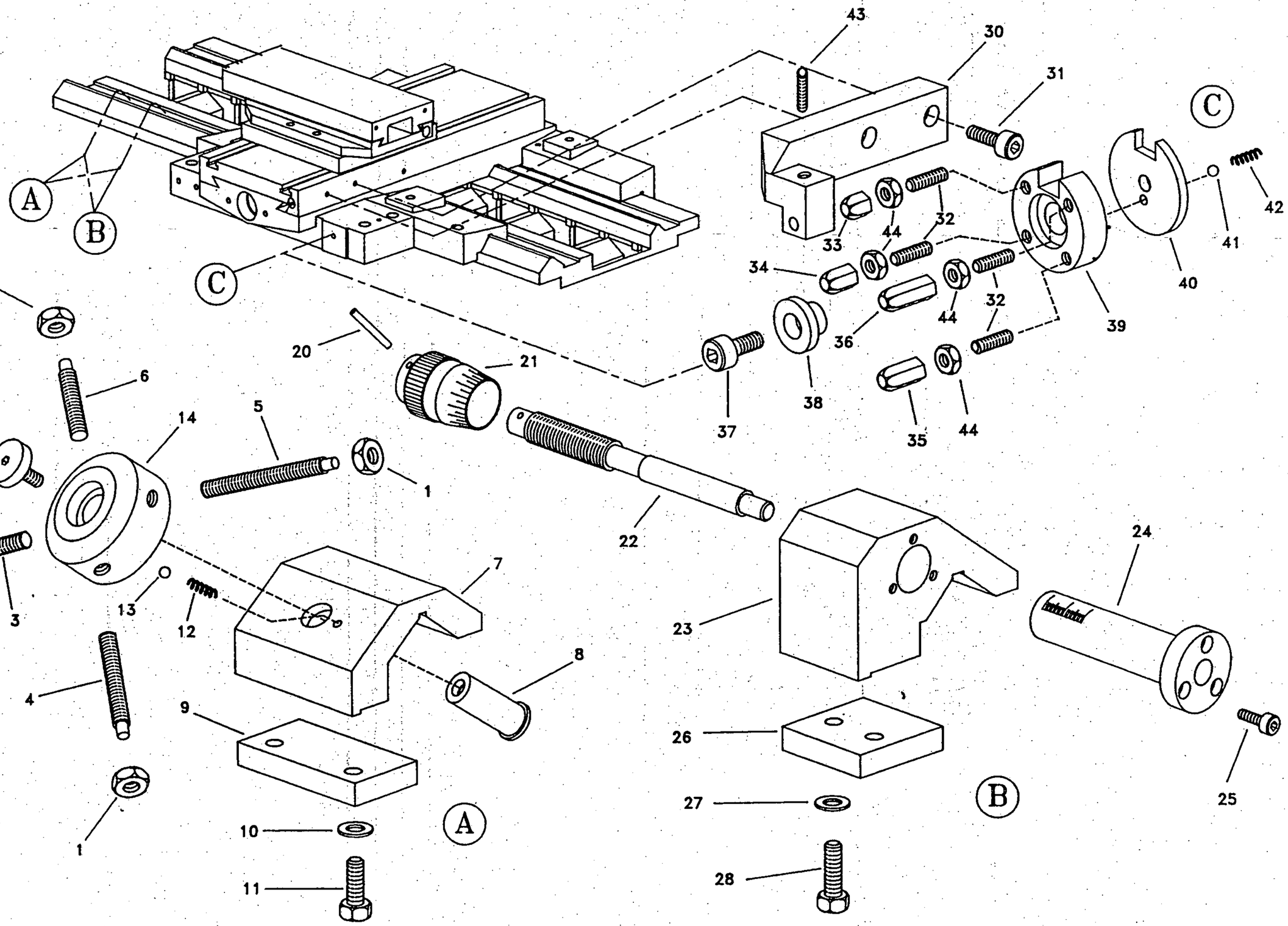
MT92139
*-165-13

STOPS

ENE-92

Item	Part N°	Description	Amo.
		4 POSITION LONGITUDINAL BED STOP	
1	DIN 934	Nut M8	4
2	01.04.1004	Turret screw	1
3	01.13.508	Stop stud	1
4	01.13.507	Stop stud	1
5	01.13.506	Stop stud	1
6	01.13.505	Stop stud	1
7	01.13.501	Turret body	1
8	01.13.502	Turret shaft	1
9	01.13.504	Clamp plate	1
10	DIN 125	Washer A11	2
11	DIN 933	Hexagonal screw M10x30	2
12	01.02.70	Spring	1
13	DIN 5401	ø 6,35 ball	1
14	01.13.503	Collar	1
		MICROMETER BED STOP	
20	DIN 7343	ø4x30 spring pin	1
21	01.21.05	Graduated drum	1
22	01.21.03	Screw	1
22	01.21.03A	Screw version TPI	1
23	01.21.501	Micrometer body	1
24	01.21.04	Graduated barrel	1
24	01.21.04A	Graduated barrel version TPI	1
25	DIN 912	Allen screw M6x15	3
26	01.21.502	Clamp plate	1
27	DIN 125	Washer A11	2
28	DIN 933	Hexagonal screw M10x30	2
		4 POSITION CROSS FEED TURRET STOP	
30	01.14.501	Turret mounting plate	1
31	DIN 912	Allen screw M8x20	2
32	DIN 913	Grub screw M8x25	4
33	01.14.05	Stop rod	1
34	01.14.07	Stop rod	1
35	01.14.06	Stop rod	1
36	01.14.08	Stop rod	1
37	DIN 912	Allen screw M10x20	1
38	01.14.04	Bushing	1
39	01.14.02	Turret	1
40	01.14.03	Turret plate	1
41	DIN 5401	ø 6,35 ball	1
42	01.02.70	Spring	1
43	DIN 913	Grub screw M6x20	1
44	DIN 934	Nut M8	4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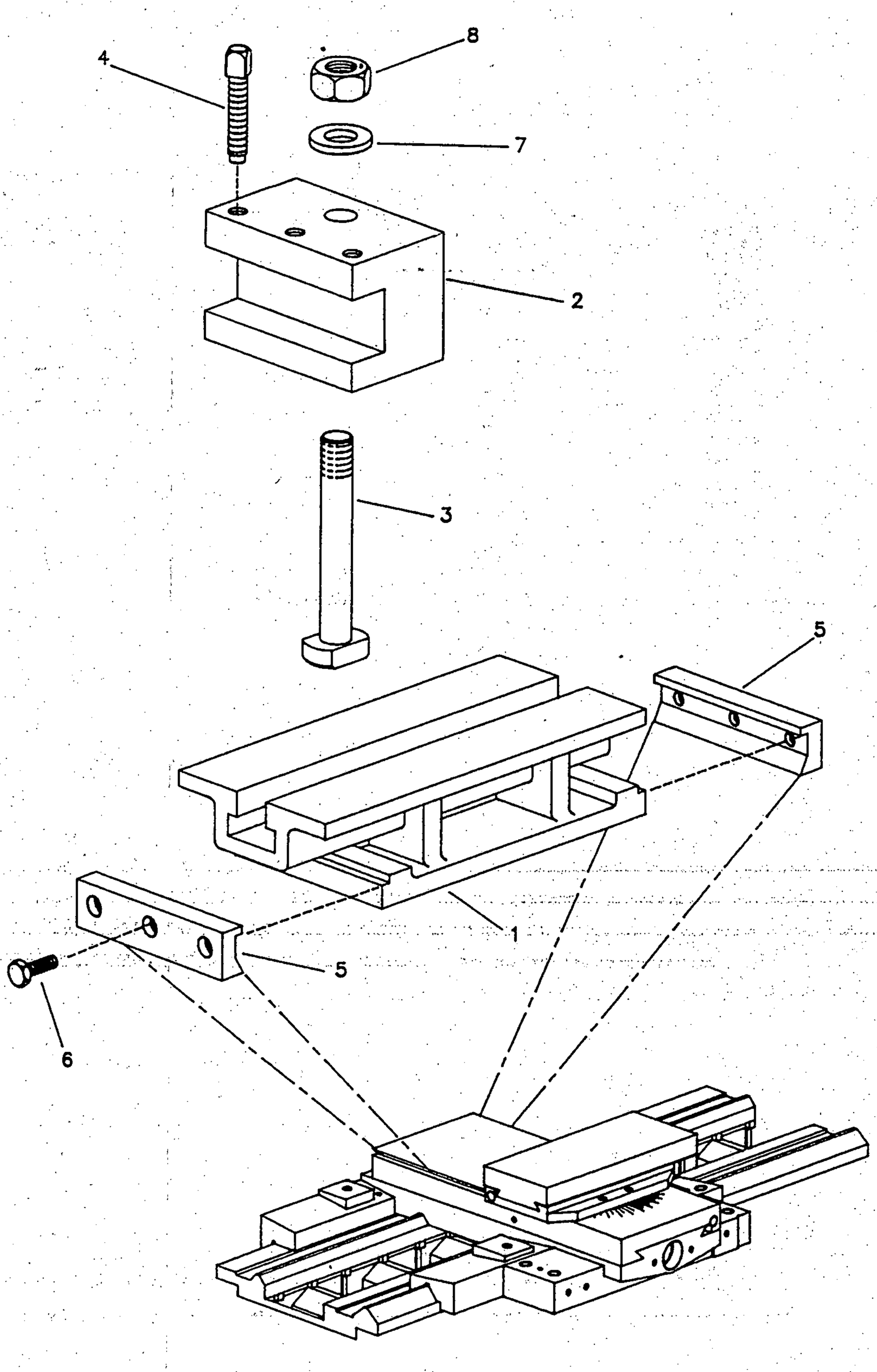
MT92140
*-165-15

REAR TOOLPOST

ENE-92

Item	Part N°	Description	Amo.
1	01.15.501	Rear toolpost base	1
1	01.15.5001	Rear toolpost base L-1/180	1
2	01.15.502	Rear toolpost	1
2	01.15.5002	Rear toolpost L-1/180	1
3	01.15.503	Toolpost bolt	1
3	01.15.5003	Toolpost bolt L-1/180	1
4	01.15.529	Toolpost screw	3
4	01.15.5029	Toolpost screw L-1/180	3
5	01.15.505	Attachment gib	2
6	DIN 912	Allen screw M8x15	6
7	01.01.50	Washer	1
8	DIN 934	Nut M18	1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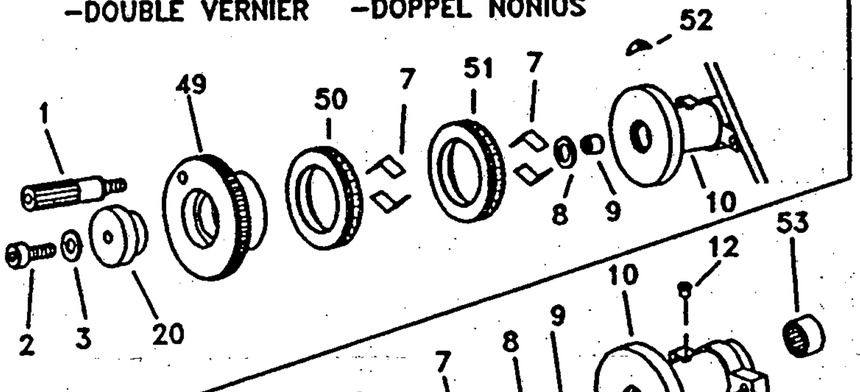
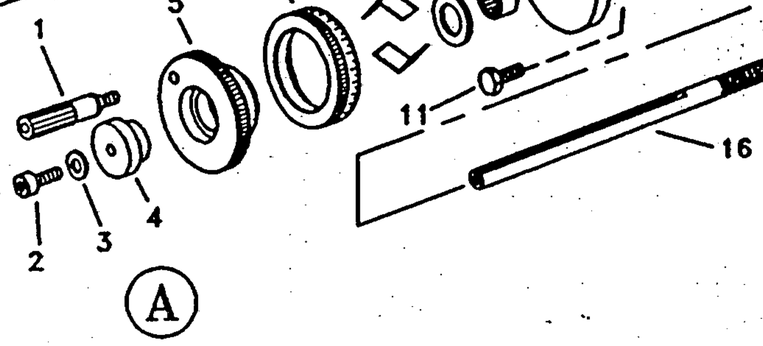
TAPER TURNER

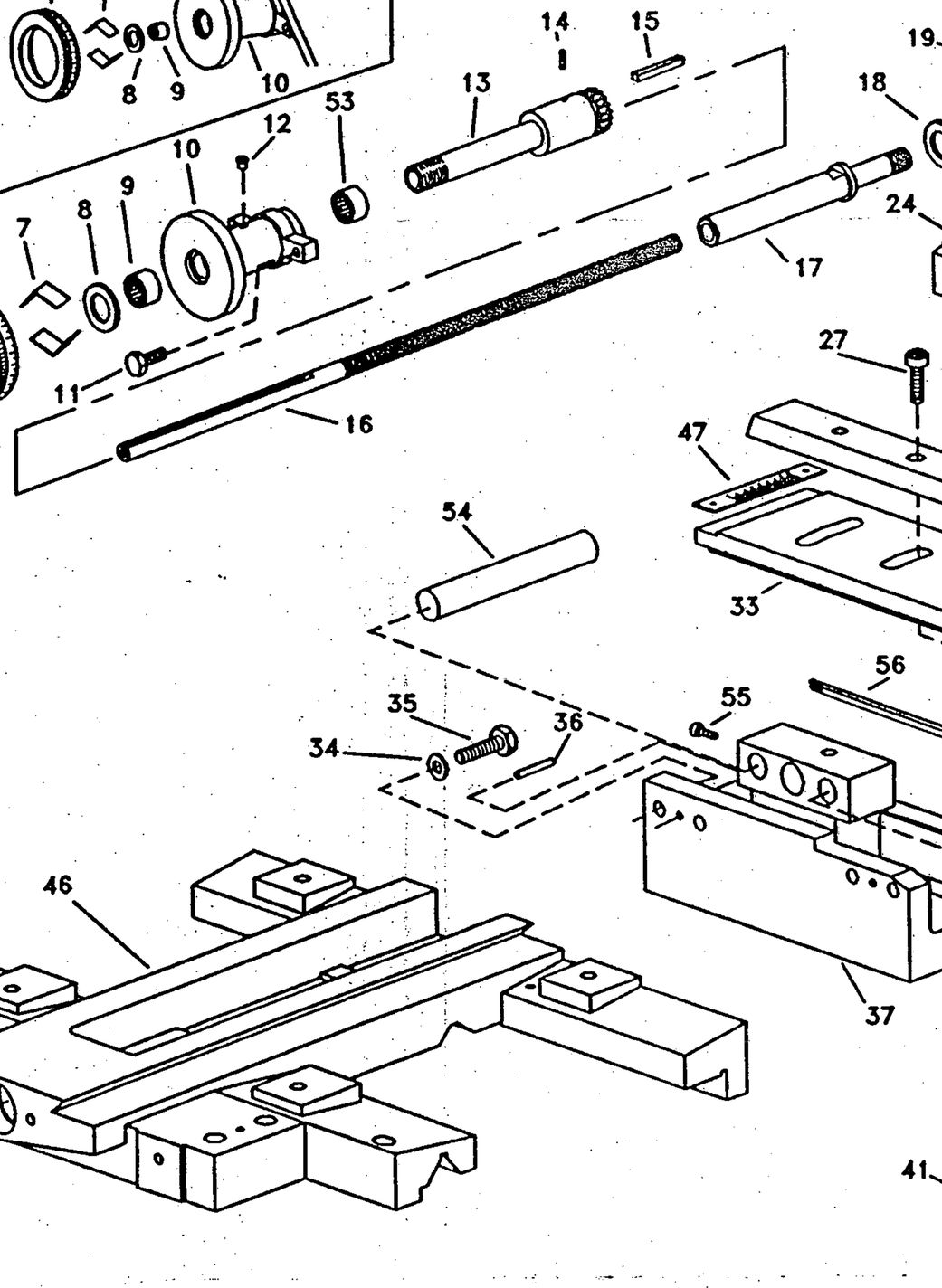
MAY-95

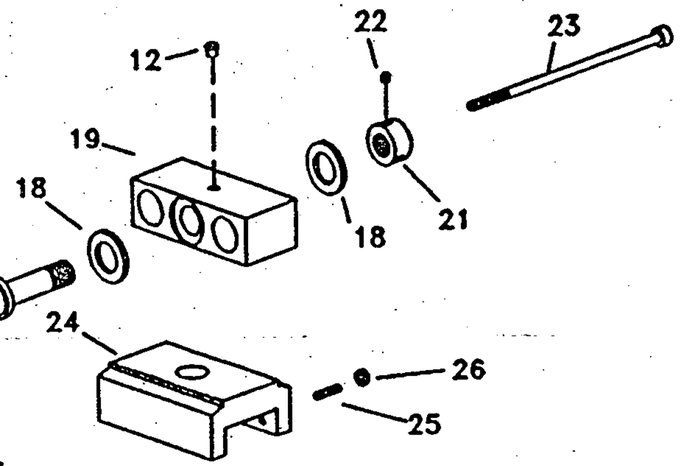
Item	Part N°	Description	Amo.	Item	Part N°	Description	Amo.
1	01.05.25	Handwheel handle	1	50	01.05.564	Vernier h/m	1
2	DIN 912	Allen screw M8x25	1	50	01.05.5660	Vernier m/h version TPI	1
3	DIN 125	Washer A-9	1	51	01.05.563	Vernier m/m	1
4	01.16.520	Handwheel nut	1	51	01.05.5650	Vernier h/h version TPI	1
5	01.16.519	Handwheel	1	52		"0" indicator	1
6	01.05.509	Vernier	1	53		Bearing NX 25	1
6	01.05.509A	Index ring	1	54	08.16.08	Bearing guide bolt	2
7	01.05.60	Vernier strip	4/8	55	01.05.1059	Adjusment screw	2
8	DIN 5405	Bearing AXK 2542	1	56	01.05.1046	Adjusment gib	1
9	DIN 5405	Bearing K 25x30x20	1	57	01.16.578	Taper turner tie rod	1
10	01.16.518	Screw support	1				
11	DIN 933	Hexagonal screw M8x25	2				
12		ø 6 ball oiler	2				
13	01.16.516	Screw gear	1				
14	DIN 7343	ø4x15 pin	1				
15	DIN 6885	Key A-6x6x45	1				
16	01.16.515	Taper turner screw	1				
16	01.16.572	Taper turner screw v. TPI	1				
17	01.16.511	Screw coupling	1				
18	DIN 5405	Bearing AXK 2035	2				
19	01.16.50	Bearing	1				
20	01.16.1071	Wheel nut	1				
21	01.16.12	Coupling nut	1				
22	DIN 914	Grub screw M6x6	3				
23	DIN 912	Allen screw M8x170	1				
24	01.16.46	Yoke	1				
25	DIN 914	Grub screw M6x20	5				
26	DIN 934	Nut M-6	5				
27	DIN 912	Allen screw M10x35	2				
28	01.16.48	Yoke rotation bolt	1				
29	01.16.47	Yoke adjustment gib	1				
30	DIN 913	Allen screw M8x35	2				
31	01.16.44	Gib rotation bolt	1				
32	01.16.545	Slide	1				
33	01.16.41	Plate	1				
34	DIN 125	Washer A-11	4				
35	DIN 933	Hexagonal screw M10x35	4				
36	DIN 7343	ø6x35 spring pin	2				
37	01.16.542	Mounting bracket	1				
38	01.16.60	Nut	2				
39	01.16.62	Nut	2				
40	DIN 125	Washer A-13	6				
41	DIN 912	Allen screw M8x20	2				
42	01.16.564	Clamp gib	1				
43	01.16.554	Clamp	1				
44	01.16.555	Clamp plate	1				
45	DIN 934	Hexagonal screw M12x35	2				
46	01.05.501	Saddle	1				
47		Graduated plate	1				
48		Graduated plate	1				
49	01.16.570	Vernier double wheel	1				

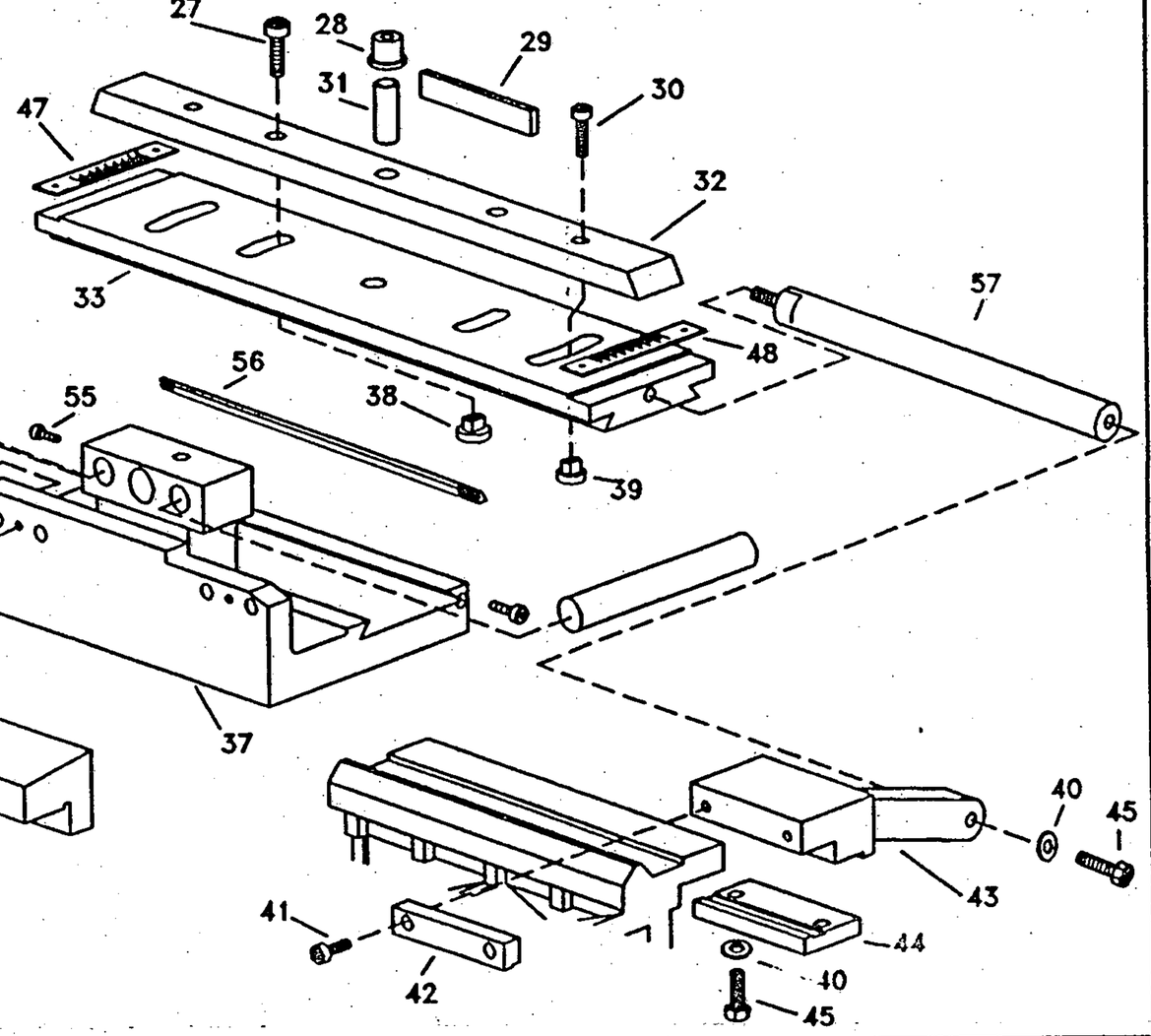
-NONIO DOBLE -DUAL DIAL
-DOUBLE VERNIER -DOPPEL NONIUS

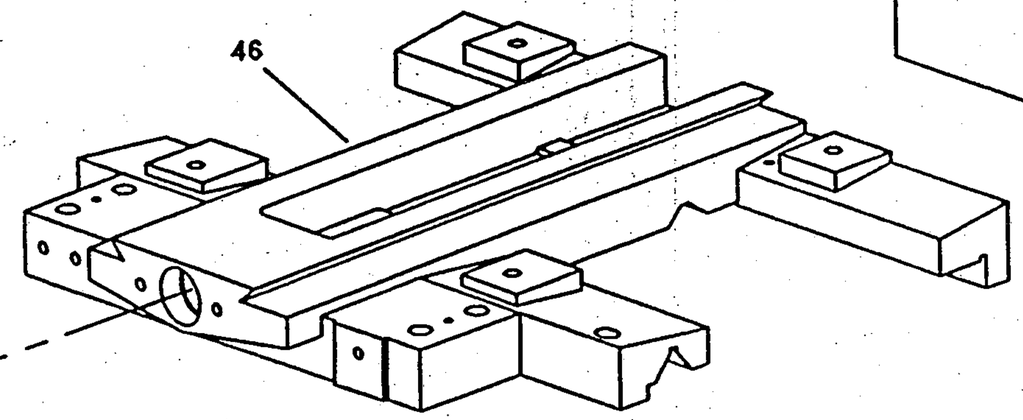












MAY-95

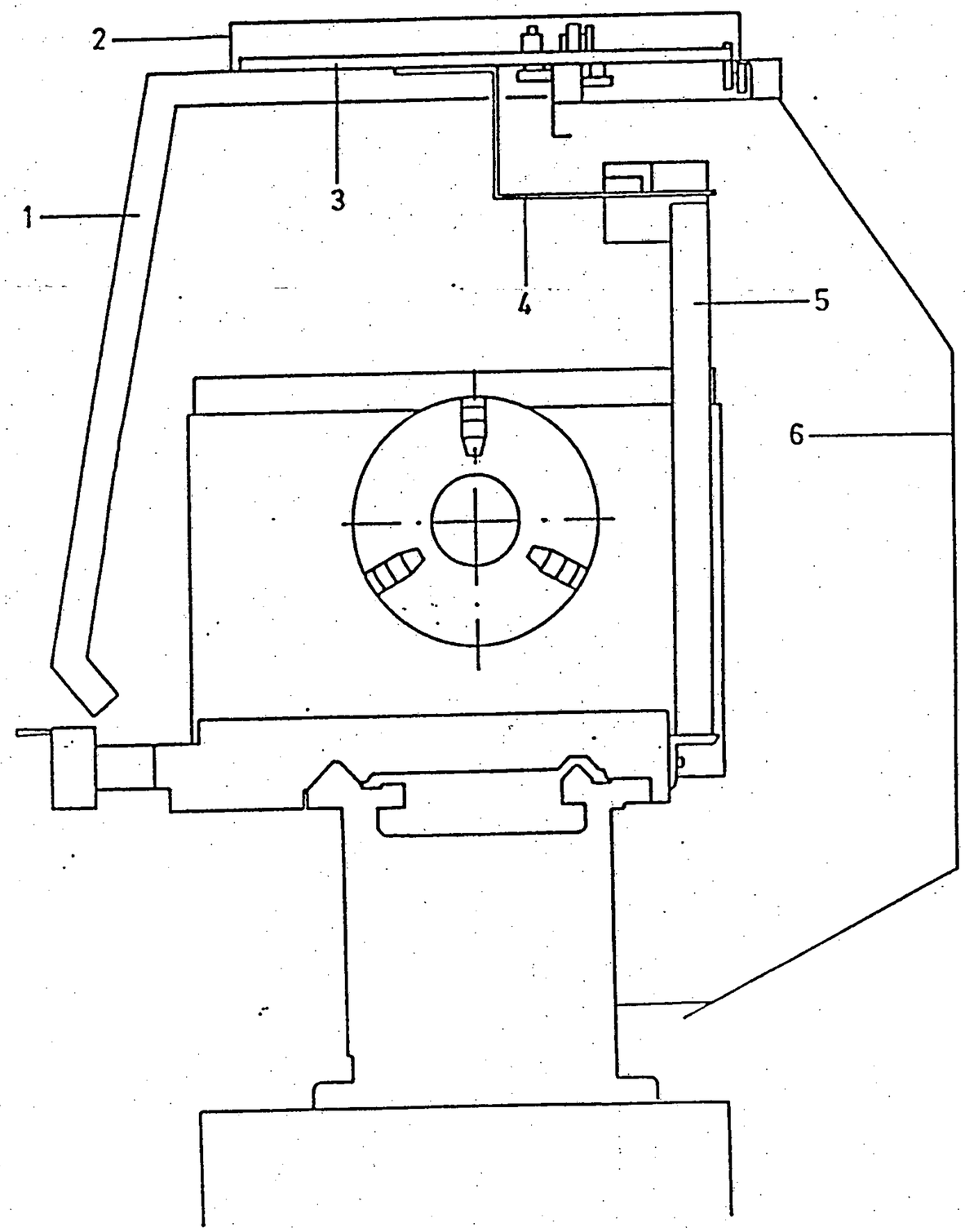
MT96321
01/08-165

FRONT PROTECTION

SP, S-90/165-180

OCT-96

Item	Part N°	Description		Amo.
1	08.08.00600	Protection door		1
2	08.08.01106	Cover of the carriage guard		1
3	08.08.01117	Carriage bracket		2
4	08.08.00605	Micro switch bracket		1
5	08.08.00606	Micro end bracket		1
6	08.08.00601	Protection 750		1
6	08.08.00602	Protection 1000		1
7	08.08.00144	Support bar		1
8	12.08.00043	Bearing Shaft		4
9	DIN 625	Bearing 6004 2RS		6
10	08.03.00007	Washer		4
11	12.08.00044	Eccentric shaft		2
12	DIN 471	Spring ring 20x1'2		6
13	08.08.00140	Washer		2
14	12.08.00045	Bearing shaft		2
15	DIN 625	Bearing 6001 2RS		2
16	DIN 471	Spring ring 12x1		2
17	AZ16 zvr-B1	Safety microswitch		1
18	12.08.00046	Door drive plate		1
19	08.08.00134	Coolant nozzle support		1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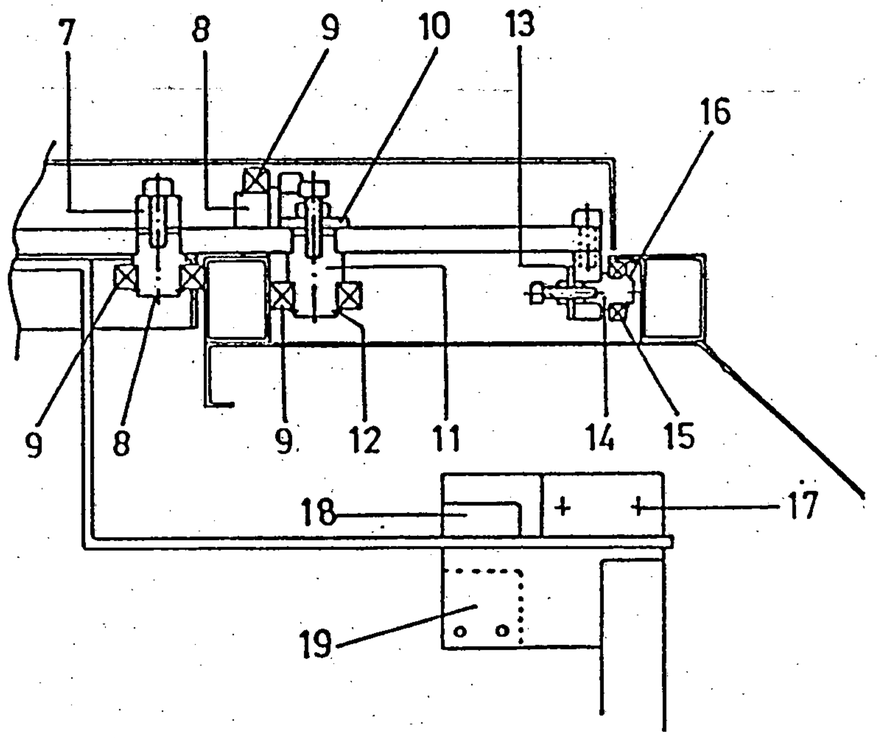
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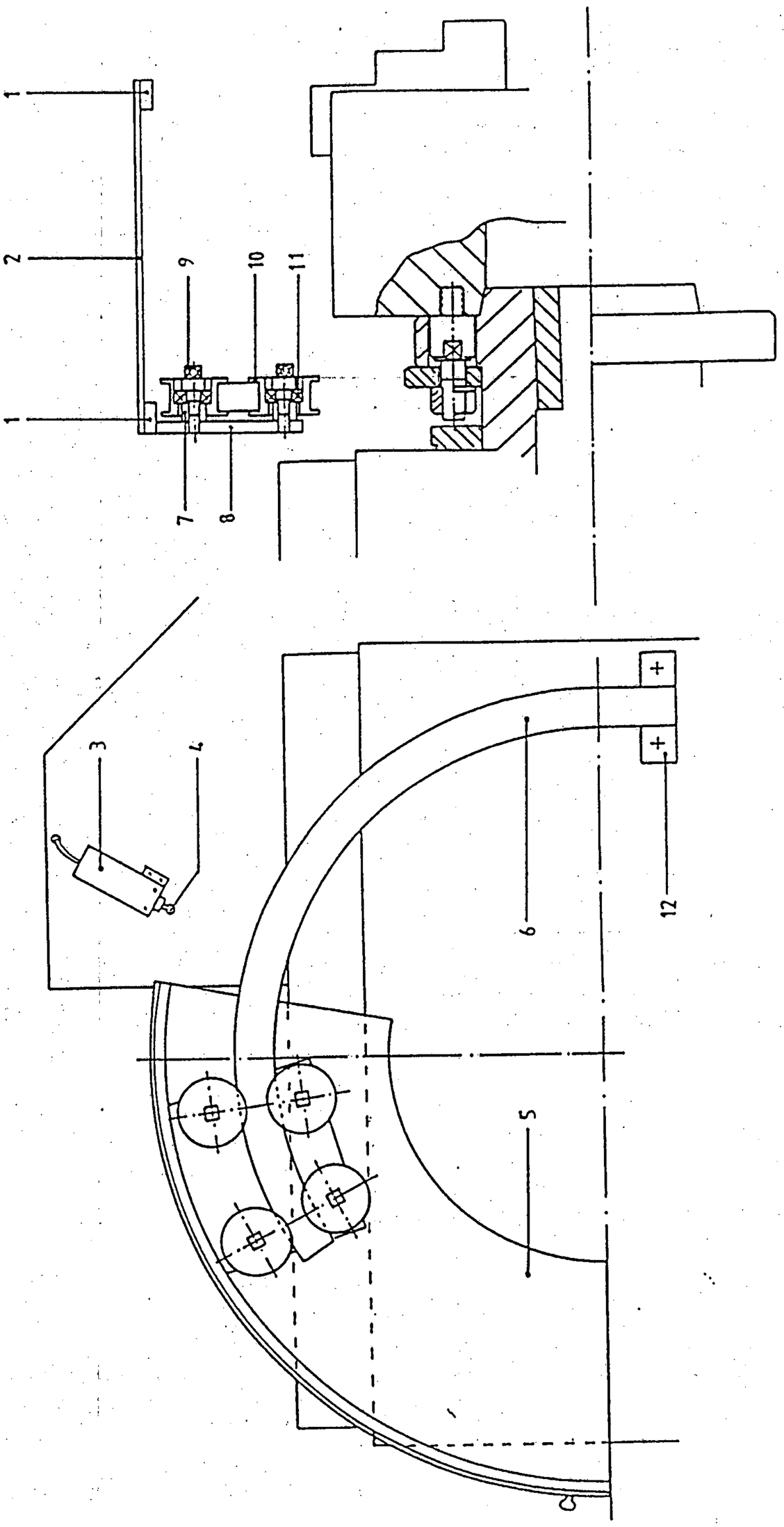
MT96325
01/08-165-18

CHUCK PROTECTION

SP, S-90/165-180

OCT-96

Item	Part N°	Description	Amo.
1	08.18.00509	Support bracket for chuck guard	2
2	08.18.00507	Chuck guard	1
3	08.18.00506	Microswitch support	1
4	3SE3200-0E	Safety microswitch (Siemmens)	1
5	08.18.00508	Lateral protection of the chuck	1
6	08.18.00511	Bracket for guard movement	1
7	08.18.00502	Bush of wheel shaft	4
8	08.18.00510	Plate of wheel support	1
9	08.18.00501	Wheel shaft	4
10	08.18.00504	Wheel	4
11	DIN 625	Bearing 607 2RS	4
12	08.18.00512	Protection plate	1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ESQ.: N25

L1
L2
L3
PE
FU2
T1
FU1
380/24V
FU3
K1
K2
K4
V1
KT1
YB1
S2
S3
K3
HL1
S10
M1
M2
M
3~
U
V
W
A1
A2
S9
E1
24V ≤ 40W (MAX.)

ESQUEMA: N25

LISTA COMPONENTES LISTE DU COMPOSANTS		COMPONENTES LIST ELEKTRISCHE AUSRUSTUNG
K-1 y K-2	Contactores inversores motor cabezal Contac. Reversing keys	Contacteur inverseur Wendeschutze
K-3	Rele enclavamiento freno Relay for brake enclavement	Contacteur frein dárrêt Bremsverriegelungsrelais
K-4	Contactor bomba taladrina Refrigeration Pump Contactor	Contacteur motopompe RF Pumpenschultz
KT-1	Temporizador freno Timing brake	Temporisateur frein Tempo-bremse
T-1	Transformador maniobra Manoeuvring Transformer	Transformateur manoeuvre Betatigungstranformator
FU-1	Fusible maniobra Fuse manoeuvring	Fusible manoeuvre Sicherung betatigung
FU-2	Fusible potencia Fuse Power	Fusible puissance Sicherung leistung
FU-3	Fusible bomba Fuse Pump	Fusible pompe Pumpsicherung
E-1	Luminaria Lantern	Lanterne Licht
S-1	Final carrera freno Travel End Brake	Fin de Course Entriegelungsschalter Bremse
S-2	Mando bomba taladrina Pump control	Levier motopompe Pumpensteuerung
S-3	Mando inversor delantal Reversing Apron control	Levier du tablier d'inversion Steuerung Schlossplatte Umsteller
S-9	Interruptor luz Light switch	Interrupteur de la lumiere Leuchtschalter
HL-1	Señalización marcha bomba Pumpcourse indictor	Indicateur marche de la pompe Pumpesverlauf kennzeichen
V-1	Puente rectificador Rectifying bridge	Pont rectificateur Gleichrichterbruecke
YB-1	Freno eléctrico Electromagnetic brake	Frein Breuse
M-1	Motor cabezal Main Motor	Moteur-poupee Spindelkastensmotors
M-2	Motor Bomba Motorpump	Moteur pompe Motorpump