TURRET MILLING MACHINES

WITH VARIABLE SPEED HEAD

INSTRUCTION MANUAL

TEST RECORD SPARE PARTS REFERENCES OPERATION AND MAINTENANCE

> CE 5058 Number 5376



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Republic Machinery Company.

("LAGUN-REPUBLIC" MACHINERY SALES DIVISION)

Machine _____serial___

CERTIFICATEOF GUARANTEE

The builder GUARANTEES the operation of the machine for the period of SIX MONTHS and will respond for the immediate replacement of parts against any imperfection in manufacturing.

_____ of _____197_____

IMPORTANT: For this Certificate of Guarantee to be valid, It will be Necessary that the user fill In the bottom of this document immediately RETURN IT TO THE FACTORY, cutting on the marked part.

(To be filled In by the user and RETURNED TO THE FACTORY)

Machine serial # _____

Seller _____City_____

Date the machine was purchased _____

Did you level and verify the machine, attending to the tolerances indicated in the instruction manual?

Have you studied and understand the instructions for the operation of the machine?

Did you find any irregularity ?.

	Х		
		The User	
Date			
ADDRESS OF USER: Name of company			
Street			
Town			

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This manual has been issued for the Turret milling machine.

At the time of printing this manual, the number of parts, the assembly prints and maintenance instructions correspond totally to the present shape of the machine. Nevertheless, we reserve the right to alter them when improvements are introduced in the machine.

MODEL FTV-2

Serial Number 5374

Customer

Location

Tensión

Cycles

Head motor-power

Cooling pump power

Net weight of the machine

Gross weight of the machine

Shipping case

IMPORTANT: To obtain the maximum efficiency of the various applications of this unique type of machine, we suggest that you request information and a brochure of tooling and accessories from your. supplier.

		VERIFICATION				Page 1	
	Measured object	SCHEME	Measured instruments	Allowable errors	Measured errors	Measure instructions	
1	Flatness of surface of holding table		Buble of 8" to 12" long. and 11/10000" to 2/1000" sensibility	In direction ±15/10000" AB In direction CD ±15/10000"		The holding table in longitudinal or transversal direction to the center positions. Place the bubble as per drawing in longitudinal direction (A - B) and transversal direction (C - D) on the center and both ends of the holding table.	
2	Circular motion of the internal taper of milling spindle		Cilindric measuring boring bar with union taper of 12" length on the calibrated portion Feeling clock	Position A:4/10000* Position B:8/10000*	4/10000	Place the boring bar on the spindle taper and the clock on the gauge contourn. Turn the spindle, reading the indications on the clock. Measure on A and B.	
3	Circular motion of the taper or centering cylinder of milling spindle		Feeling clock	4/10000*	3/10000	Place the clock on the internal taper (perpendicular to the tapered surface). Turn the milling spindle, reading the clock indications.	
4	Parallelism of the holding table surface With its longitudinal motion		Feeling clock. Rule, its length correspon- ding to the maximum longitudinal motion.	Machines with maxi- mum lon- gitudinal motion of the holding table up to 39" 11/10000"	11/10000	Place the rule in longitudinal direction the center of the holding table, and the clock on the spindle taper, with its pointon the rule. Move the table in longitudinal direction, reading the clock indications.	
5	Perpendi- cularity of the holding table surface with the milling spindle		Feeling clock. Turning arm. Rule, its length co- rresponding to holding table width.	In 6" of measuring length, AB= 4/10000" CD= 4/10000" In 12" of measuring length, * AB= 8/10000" CD= 8/10000"	2/10000 3/10000 6/10000 7/10000	Holding table in longitudinal direction and medium posi- tion. Fasten both the turning arm and the clock on the milling spindle. Place the rule on the holding table in position AB or CD with the feeling point on A or C on the rule. Reversion: turn the spindle 180° with the feeling point on B or D. On machines with moving console table, for AB, the holding table (A) in front, only more elevated.	



RECPTION

On receiving the machine and unpacking it, do not remove the boards of the base until it is placed on final location.

Clean the machine, removing all protections and carry out a careful examination to check if any damage arrived in transport.

INSTALLATION AND FOUNDATION

- 1. Select a place, as free as vibrations as possible.
- 2. Carry out the location as per the foundation drawing attached.
- 3.For leveling the machine, use a bubble having a 0-05 mm per meter precision, and when leveling do not use wooden wedges, but iron wedges.
- 4.Once the machine has been leveled, make a wooden encircling and fill with cement grout.
- IMPORTANT.- If the machine must be installed in upper floors be sure to place it near a column, or on main beams.



ELECTRIC CHECKING

It is also convenient to carry out an electric checking of the installation, fuses and the idle operation of contactors.

Also, check that the motor turning is correct; if not change the wires position in the mains.

LUBRICATION

Lubricate daily the-points indicated on the lubrication chart excepting the longitudinal and cross carriages, since their lubrication is carried out by means of a pump.

2 to 4 strokes per day*

Prime this pump when the oil level is under 1/3 on the sight.

The other points daily.

IMPORTANT.- Never start the machine if it has not been previously suitably lubricated.

The knee must be lubricated when it is lifted on its uppermost position.

Use oil sparingly.

Part	METHOD	SHELL	MOBILOIL	ESSO	BP	KLUBER	NEVER – SEEZ U.S.A.	DOW CORNING
Motor bearings	PACKED							
Spindle bearings	CUP	TELLUS 29	DTE MEDIUM OR 25	ESSTIC 50	HL – 75	LAMORA 34		
Table ways	HAND PUMPED	TONNA 33	VACTRA OIL – 2	FEBIS K – 53	HP – 20	LAMORA SUPER POLADD		
Column ways	GUN	TONNA 33	VACTRA OIL – 2	FEBIS K – 53	HP – 20	LAMORA SUPER POLADD		
Gear head	CUP							MOLYKOTE 165 – X
Variable speed pulley						T.K.N.	NEVER – SEEZ CAT No. NS.160	DC – 44
Vertical Lead Screw	GUN	TONNA 33	VACTRA OIL – 2	FEBIS K – 53	HP – 20	LAMORA SUPER POLADD		
Right angle mill attachment	GUN	TONNA 33	VACTRA OIL – 2	FEBIS K – 53	HP – 20	LAMORA SUPER POLADD		
Arbor support	GUN	TONNA 33	VACTRA OIL – 2	FEBIS K – 53	HP – 20	LAMORA SUPER POLADD		
Shaping head attachment	BATH	NASSA 79	600W SUPER CYL OIL	CANTONA LK - 140	AMPER CILINDER 600	LAMORA SUPER 240		
Shaping head attachment slide and bearing	GUN	TONNA 33	VACTRA OIL – 2	FEBIS K – 53	HP – 20	LAMORA SUPER POLADD		



USUAL OPERATIONS

As previously stated, the machine must be totally lubricated.

VARIABLE SPEED MECHANISM

VARIABLE SPEED HEAD

SPEEDS CHANGE – a) Change your speed only when spindle rotates

b) It is a must to run your speed from the low speed of 75 UP to 4000 rpm twice a day to prevent pulley freeze.

c) The head consists of a Variable Speed Head with a high and low range of speeds.

d) The high-low range is obtained by a simple 2 position lever located on the right side of the head which will supply a minimum speed of 75 and 500 rpm and a maximum of 4000 rpm.

e) The variable speeds are obtained by turning the front knob located on the upper part of the head clockwise for the higher speeds, and counter clockwise for the lower speeds. The speeds are shown on the front Dial plates.

TEMPERATURE: It is normal for this type of mechanism to operate at high temperatures sometimes over 70 deg C. Please do not be concerned about heat.

VIBRATIONS: As in every Variable Speed Mechanism a critical vibration point should appear at a particular speed. On this machine this speed appears approximately around 2860 rpm. To stay out of this critical vibration increase or decrease your speed. Please do not be concerned about it.

IMPORTANT: Every machine leaves our factory completely checked and final inspection from our quality control department. You should study this machine and follow instructions before starting operation. The factory can not be responsible for incorrect usage or neglect.

MANUAL OPERATION OF THE QUILL

It is made by means of handle 388. This handle can be locked in eight different positions for a better operation. It can be disengaged by pulling out the handle body.

Once the handle has been depressed it turns to its starting point by means of a flat spiral spring

REMARKS

It may be noted an unusual resistance in the handle operation, and then it is due to the fact that the brake 476 is tight.

In case of such a resistance impeding to operate in any direction, it is due to the fact that the automatic lever 407 is in engaged position, for which reason it is necessary to disengage it.

FINE MANUAL OPERATION OF QUILL

The automatic engaging handle No.407 should be in engaging position, by turning the flywheel 422. Then it is possible to work even with the micrometer stops No.402, since they themselves take care that the stopping be in the same point. The knurled button No.429 must be in neutral.

REMARK

In case of not using this modality of work, be sure to remove the flywheel No.422 from its location.

AUTOMATIC CLUTCH

The selection of feeds is carried out by means of the handle No.3009, which causes the wheel No.3054 to engage with the driving worm cut on the lower portion of the driving shaft No.3013

REMARK

If the automatic feed is not necessary, it is not convenient to engage the feeds.

CHANGE OF THE FEED TRAVEL

In the center of the control for manual fine feeds it is housed a rod the end of which drives a clutching tooth collar, by means of a bolt, engaging with two taper pinions, turning in opposite direction, so that it promotes a change of the feed travel.

These positions are ensured by means of two end channels cut on said shaft 431. The center channel corresponds to neutral, that is, with no feed.

REMARK

This change can be carried out with the machine fully running, provided that it works idle; otherwise it is not recommended to do so because the risk of tooth breakage.

SELECTION OF WORKING FEEDS

This selection is carried out by means of the selecting handle No. 3009. It consists of 3 feeds in geometrical progression to the order of L=2 with feeds of 0.04-0.08-0.16 mm per turn.;

REMARK

As stated in the paragraph corresponding to the selection of feed direction as regards to the fact that the chosen feeds can be carried out when the machine is running idle, do not proceed in this manner when the machine is fully running in order to avoid damages.

MECHANICAL WORK CLUTCHING

IMPORTANT.- Before engage the work clutching, we recommend to carry out the following tests, with the machine stopped:

-.Check-that the stop threaded rod 404 moves easily by hand.

- Placing the handle No.407 in engaging position, see if the micrometer nut No.402 can be pressed down easily. Also, with the handle engaged again promote a pull toward the button No.429 with the help

of a screw driver, a and see if the same resistance is felt.

The purpose of this test is to check if, for any reason, the greases are solidified or the anticorrosive liquid has been inserted between the die setting No.416 or in the groove between the stop and the washer No.413.

If so, we recommend to carry out a careful cleaning.

Whenever the automatic feed is used, be sure that the quill brake is not carrying out an effective work.

SERVICE.- The automatic travel of the quill is stopped in the desired point by means of the contact of the micrometer drum No.402, fastening it firmly on the spindle by means of the knurled locknut No. 403

The value of variation per line on the micrometer drum is as follows:

REMARKS

The machine leaves our plant rated with the foreseen work momentum. In case that, at any time, this momentum has been decreased due to spring weakening, etc. increase it in the following manner:

- 1. Remove the cover No-3037
- 2. Remove the setting screw 374 from the nut No-3035
- 3. Turn the nut No.3035 clockwise.

It is also possible that no trip be carried out promoting the unlocking of the peg 394 by means of the extracting punch No.409 due to dis-adjustement of the rocker No 411.

This out-of-adjustment can be rectified by means of the screw No.410 at the precese extent, in order to carry out a correct disengaging.

CHANGE OF TOOLS AND SPEEDS

In the previous paragraphs, the several services of the machine and the manner of proceeding before starting the machine have been indicated.

It is possible, therefore, to carry out all operations with the machine turning idle in both directions, in order to notice any noise of unusual operation

CHANGING THE TOOLS

To loosen the clamping piece of the tool, lock the spindle by means of the cross lever No-353, turning clockwise or anti-clockwise, and once the convenable pressure has been exerted, turning upward so that it is locked, so maintaining a permanent braking.

In this manner, the operator can carry out his work more easily because he has both hands free.

VARIOUS-HEAD POSITIONS

This Head can be precisely swiveled into two separate positions from the vertical line, and will also rotated around its column.

1) Rotation Around column 360° - (Turret rotation). a) Release four hold down bolts and swivel ram manually around column.-

A 360° scale reading is supplied on column. Reset position and tighten four hold down bolts securely.

2) Back and front . - Accurate movement is obtained by a worm gear combination; a reading scale is supplied. b) Release 3 locking or clamping bolts No.511 located on the right side of the ram and turn worm gear No.-500. Reset position tighten holding bolts securely.

3) Right to left 45° each way . - Accurate movement obtained by a worm gear combination. A reading scale is also supplied. c) Release the four locking or clamping nuts No.432 located on the front of the head and turn worm gear No.477 to desired position then securely tighten the four head bolts to insure stability.

TURNING AND DISPLACEMENT OF THE OVERARM

TURNING THE OVERARM

Loosen the four screws No.-507 and rotate with the hand, being sure that the overarm is centered lengthwise.

DISPLACEMENT OF OVERARM

For displacing the overarm loosen the hexagonal head screws No.-3156 located at the right side and displace the overarm by means of the pinion No.-3065 with the handle provided to this end.

COLUMN – KNEE – TABLE – CROSS SADDLE

COLUMN

All the electric controls are located in the back side-of the machine - a hinged swivel door protects this area.

Also the coolant pump to be serviced from the back by opening a bolted cover No.-3516.

KNEE

The knee has travel limitations by means of two screws N0.-588 located on the column and knee, and a positioning brake operated by means of the handle No-562 located on the front.

TABLE

The table travels can be limited by means of the-fixed stop No.-3089 screwed to the cross carriage and two sliding stops in the T-groove located in the front thereof, which are fastened in position by means of the nut No-358

For braking in positioning, operate the hinged handle No.-571.

CROSS SADDLE

The cross saddle carries at its right side a centralized greasing pump No 586, which provides oil for the longitudinal motion of table and cross motion of carriage. Also, it carries out the lubrication of the longitudinal and cross spindle. It has a locking brake No.571.

IMPORTANT.- When working without using the table, knee or cross motions, be sure that these are braked.

SETTING THE SADDLES

All sliding parts of the saddles carry lengthwise a setting tapered guideway, which can be operated by means of the grooved head screw No-561, under the same denomination on the three setting tapered guideways.

OPERATION

Tighten slowly the screw No.561 effecting the turning of the corresponding handle until a slight resistance in the handle turning will be noticed.

CLEARANCE SETTING ON THE SPINDLE

On the dual supported nut holder No.-3085 for the longitudinal No. 594 and No.580 cross feed spindles, in the nut housings, there are fitted two nuts each separate one from other in order to eliminate all clearances produced at the long run.

To shorten this distance, use the screws No-579 and also the other crews No.578, promoting the locking of No.-579. To remove the spindle clearances, proceed as follows.

TABLE

Loosen and remove the left side of table No.3092 and move the latter by means of the handle NQ-3096 on the right side until being able to remove with a screw driver the stop screws No.578 and eliminate the clearance with the screw No.579, until obtaining a smooth and precise turning.

CROSS SADDLE

Remove the support No.3077 and move with the hand the carriage until being possible to carry out the same operation.

INSTRUCTIONS FOR ORDERING SPARE PARTS

When ordering spare parts, please give the following information:

- 1. Number of part and number of assembly.
- 2. Quantity.
- 3. Serial number of machine.

If ordering any spare part not shown on the assemblies, give a detailed description and, if possible, send a sketch together with the quantity required and the serial number of the machine.















