



Technical service manual



MT 3100 / MT 3200

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Italiano

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1. MESSAGES ON THE DISPLAYS

The machine can recognise a certain number of malfunction conditions and signals them to the user by visualising the relevant messages on the displays.

- A - Notice Messages

- A 3** wheel not suitable for performing the sensitivity calibration, use a medium sized wheel (for example 5.5"X14") or a larger wheel, but DO NOT exceed a wheel weight of 40 Kg.
- A 5** Dimension settings not correct for an ALU programme. Correct the set dimensions.
- A 7** The machine is temporarily unable to select the requested programme. Perform a wheel spin, then repeat the request.
- A 10** Internal sensor not in the rest position. Return the sensor to the rest position (completely in). If the message does not disappear, internal sensor operation can be disabled by pressing the "Enter" key.
- A 20** Internal sensor in incorrect position during calibration.
• Bring it to the indicated position and repeat the calibration.
External sensor in an incorrect position during calibration.
• Carry out the calibration procedure correctly;
• Check that the external sensor is at 5 +/-1 notch in the rest position;
• In the service function, check that a value of approximately 167+/-30 notches is displayed with the external sensor probe against the flange of the shaft assembly.
• If the above conditions are not met correctly, adjust or replace the potentiometer.
- A 23** Incomplete or incorrect data entry in ALU P.
Repeat the input correctly.
- A 26** Programme available only after selecting one of the following programmes: ALU 1P / ALU 2P / Motorcycle Dynamic / Motorcycle ALU or if selected in the Motorcycle Programme but with the

wheel NOT in the centred position.

- A 41** Incorrect wheel spin procedure on the wheel balancer without guard. The warning appears when the spin button is pressed for more than 10 seconds without pressing the "Start" key at the same time. Release the button and spin the wheel according to the procedure indicated in the "Wheel Spin" paragraph.
Check the proper operation of the spin button and check for damage to the Start key on the keyboard.
- A Stp** Wheel stop during the spin phase. Unit rotation stopped before completion of entire reading cycle.
• Check the weight tray does not touch the unit during the spin;
Wheel movement is not integral with swinging unit movement:
• make sure the wheel is tightened correctly.
- A Cr** The contact of the microswitch associated with the guard casing is open:
• Check the correct working of the automatic start microswitch associated with the wheel guard casing (with the guard lowered, the contact of the switch must be closed);
• If no faults were identified by the checks described above, replace the MBE32F main board.
Spin performed with the guard raised.
• Lower the guard to carry out the spin. In the machine versions without the wheel guard and without the spin push button, check that the JUMPER is correctly connected to the Mother board.

- E - Error messages

- E 1** No sensitivity calibration. Perform the sensitivity calibration procedure.
• MBE32F board has been changed. Perform the sensitivity calibration procedure.
- E 2** Error condition on sensitivity calibration.
Repeat the sensitivity calibration procedure.
Take particular care NOT to knock the machine during calibration.
Error condition on shaft assembly

resetting.

First calibrate sensitivity and then reset the group.

If the message persists, check the following:

- that the search card reads correctly by performing the encoder test (see paragraph “97 Viewing search card function - encoder.”);
- PK modules and phases as indicated in paragraph “96 Viewing pick-up signals and relative phases and speed”.

E 3 I/E 2/3

Error condition at end of sensitivity calibration. Repeat the calibration; if the message persists perform the following checks:

- Check that the sensitivity calibration procedure has been performed correctly;
- Check that the calibration weight is fastened correctly and in the correct position;
- Check mechanical integrity of the calibration weight;
- Check that the search card reads correctly by performing the encoder test;
- PK modules and phases as indicated in paragraph “96 Viewing pick-up signals and relative phases and speed”;

• Geometry of wheel used;
From software version 1.9 loaded on the main board (MBE/CPU), if the display of the first gramme is enabled in the service environment (in this condition, the message “1 ON” is displayed in the specific box) at the end of calibration the following parameters are displayed:

L1= residual wheel unbalance calculated with respect to the barycentre of the calibration weight. The recommended value is less than 100g per side, otherwise balance the wheel before performing the calibration;

L2= unbalance detected with the calibration weight in position as indicated in the second calibration spin. This value must be 100g +/-5 on the inner side and less than 5g on the outer side;

L3= unbalance detected with the calibration weight in position as indicated in the third calibration spin. This value must be less than 5g on the inner side and 100g +/-5 on the outer side.

When error “E 3” is displayed, this means that the grammes acquired by the machine during the second (L2) and/or third spin (L3), are out of tolerance, therefore the previously described checks must be performed.

E 4 Error condition on calibration of the internal sensor and/or external sensor (if present). Calibrate the internal sensor and the external sensor, if present.

E 6 Error condition when executing optimisation program.

Repeat the procedure from the beginning.

E 12 a) Width sensor not in the rest position when machine was switched on. Switch the machine off, return the sensor to the correct position and switch back on.
b) External sensor not present or faulty. Visualisation of this error can be disabled by performing the following procedure:

- Select the “Sensor calibration” icon and press Enter.

E 16 motor temperature too high. Wait before performing a new spin (do not switch off the machine).

E 27 Excessive braking time. Check: that relay “RL1”, which inverts current for braking, is working correctly. If the relay functions correctly, at the beginning of braking, you will hear a mechanical tone coming from the power supply card. If not, replace the Main board.

E 28 Encoder counting error. In this case, check the following:

- the state of the encoder disc;
- that the search card reads correctly by performing the encoder test (see paragraph “97 Viewing search card function - encoder.”);
- that the search card and the Main board are connected correctly with the 8 pole ribbon cable;
- if necessary, replace the search card or the Main board.

- E 30** Wheel spin device failure. Error condition related to the non-rotation of the unit after pressing the START key.
If the wheel begins to rotate:
- check that the encoder card is working with the respective test.
- If the motor does not start up:
- check the motor power supply cable is correctly connected to the Main board;
 - check the Main board is working;
 - check that the motor is working.
- E 32** The wheel balancer has been jolted during the reading phase. Repeat the wheel spin.
The wheel balancer makes checks on the disturbances; if the machine suffers excessive jolts during the reading of the unbalances, it displays this error.
If such disturbances are absent however, check inside whether:
- the wheel balancer is resting firmly on the floor;
 - the swinging unit has noisy bearings;
 - the securing ring nut is fastened tightly.
 - check the correct reading of the research by the test card encoder (see "97 Visualisation of search card functions (encoder)");
 - PK test modules (see "96 visualisation of pick up signals and phases").

Other messages

- CAL GO** Wheel spin for calibration.
- GO ALU** Wheel spin with Alu programme selected.
- GO d15** Wheel spin with Motorcycle dynamic programme selected.
- GO A15** Wheel spin with Alu Motorcycle programme selected.
- St** Wheel spin with Static programme selected.
- Hid n** Setting of number of spokes in "Hidden Weight" programme.
- CCC CCC** Unbalance values greater than 999 grams.

2. TROUBLESHOOTING

The wheel balancer is equipped with self-test and self-diagnosis programmes supplying information about most possible faults and the relative interventions (refer to the list of error messages and the paragraph "Troubleshooting" in the User Manual).

There are, however, irregular working conditions that the machine is not able to recognise, and which are listed below.

CAUTION!

For all electrical irregularities, before replacing a card you are advised to check:

- the effectiveness of the wiring between those components probably involved in the malfunctioning. In particular, check:
- that the connectors are correctly inserted;
- that the contacts are correctly fixed to the ends of the individual wires of the cables;
- the stability of the mains voltage in the area where the machine is installed and the efficiency of the earthing system of the shop;
- for damage to the protection fuses installed in the power supply panel.

The table below summarises the general wiring diagram.

The machine does not switch on.

Using a voltmeter, check there is a power supply voltage on the terminal board of the Mother board.

- 1) If there is no voltage on the Mother board, check:**
 - that the power socket and the relative protection fuses are in proper working order;
 - the correct connection of the plug to the machine power supply cable;
 - the mains cable is not damaged;
 - the main switch is working correctly.
- 2) If there is voltage on the Mother board, check:**
 - the presence of the voltages envisaged on the Mother board, i.e. from 90V to 253V;
 - that the relative signalling LED "LD1" lights up;
 - the correct wiring of the power supply cable of the MBE32F Mother board, and the correct insertion of its connectors;
 - any short-circuits on the peripheral devices.
 - correct wiring of the internal and external sensor cables (if installed), i.e.: connector

JSA3 external sensor cable, JDSI2 internal distance sensor cable.

For this purpose, detach all the cables of the connectors of the Mother board, apart from the power supply one, and try to switch on the machine; If the above checks have not pointed out any faulty components, the MBE32F Mother board should be replaced.

Pressing the START key and/or lowering the guard, the machine does not perform the spin
In this case, the different causes can be distinguished on the basis of the display indications.

1) If the graphics remain on the display with the unbalance values previously calculated.

The Mother board is not receiving or perceiving the START signal arriving from the keypad or the microswitch.

Check:

- the correct operation of the automatic start microswitch associated with the wheel guard casing (with the guard lowered, the contact of the switch must be closed);
- the correct wiring of the automatic start microswitch;
- the correct operation of the START key.

If the above checks have not pointed out any faulty components, the MBE32F Mother board should be replaced.

2) If the geometric data of the wheel appear on the display.

The Mother board receives the signal from the START key or the microswitch, but the subsequent command is not carried out.

Check:

- for damage to the spin motor, checking that it is powered with the relative mains voltage. Carry out this check using a multimeter on the PHOENIX connector connected to the main board:

PIN3 - PIN6 mains voltage (230/115vac) while spinning or braking

PIN4 - PIN5 mains voltage (230/115vac) while spinning or braking

PIN1 - PIN2 zero voltage, i.e. termoswitch closed, spin correct

PIN1 - PIN2 voltage approx. 3VDC, i.e. termoswitch open, spin NOT performed and error message "E 16"

PIN1 GND

PIN2 TERMOSWITCH

If there is NO voltage at the ends of Pin3-Pin6

and/or Pin4-Pin5, main board fault, whereas if there is voltage but the machine does NOT spin, spin motor fault.

- for damage to the coil of relay "RL2", which is used to power the spin motor. If the relay operates correctly, after pressing START (or lowering the guard) there will be a mechanical tone coming from the Mother board. Otherwise, replace the MBE32F board.

If the above checks have not pointed out any faulty components, replace the Mother board.

3) The displays show the message "A Cr".

The START button was pressed on the keypad
Check:

- that the guard is lowered when a spin is performed (pressing the START button);
- the correct operation of the automatic start microswitch associated with the wheel guard casing (with the guard lowered, the contact of the switch must be closed).
- in machine versions without a wheel guard but with an additional START button. Check soundness of the START button and, if necessary, check soundness of the START key on the keyboard.
- in machine versions without a wheel guard and without an additional START button. Check the condition of the jumper in the Mother board's JMCR1 connector.

If the above checks have not pointed out any faulty components, replace the Mother board.

4) The displays show the message "E 30".

If you hear a strange noise, check the status of the pinion.

If the wheel starts to rotate normally, check the operation of the encoder card, see paragraph "Service programmes".

If the motor does not start up:

- check that the motor power supply cable is connected correctly;
- check motor operation.

Pressing the START button and key, the machine does not perform the spin (wheel balancer version without the guard).

In this case, the different causes can be distinguished on the basis of the display indications.

1) The displays continue to show previously calculated unbalance values.

The Mother board is not receiving or perceiving the START signal arriving from the START button and key.

Check:

- the correct wiring of the START microswitch;
- the correct operation of the microswitch and the Start key.

If the above checks have not pointed out any faulty components, replace the Mother board.

2) If the geometric data of the wheel appear on the display.

The Mother board receives the signal from the Start button or key, but the subsequent command is not carried out.

Check:

- for damage to the coil of relay “RL2”, which is used to power the spin motor. If the relay operates correctly, after pressing START (or lowering the guard) there will be a mechanical tone coming from the Mother board. Otherwise, replace the MBE32F board;
- for damage to the spin motor, checking that it is powered with the relative mains voltage. In the case of damage, replace the motor.

If the above checks have not pointed out any faulty components, replace the Mother board.

3) The displays show the message “A Cr”.

- Either the Start button or key (or both) was released when the machine was in the spin or acquisition phase.

4) The displays show the message “E 30”

If you hear a strange noise, check the status of the pinion.

If the wheel starts to rotate, check the operation of the encoder card, see paragraph “Service programmes”.

If the motor does not start up:

- check that the motor power supply cable is connected correctly;
- check motor operation.

If when commanding the spin (or when lowering the guard or pressing the Start key and the button) the wheel turns in the opposite direction (i.e. toward the operator), replace the Mother board.

In fact this irregularity is caused by the incorrect operation of the relay “RL1”, which manages the inversion of current for wheel braking.

When switched on, the machine is blocked (it does not accept any command)

Check:

- that all keys on the keypad are undamaged, i.e. that none of them remains constantly closed due to damage. In this case replace

- the defective key or the entire Mother board;
- that no key remains pressed down permanently due to the incorrect assembly of the Mother board on the support panel.

Every time a new board is mounted on the panel, maximum attention is required so that the keys, which are directly welded on the Mother board, work correctly. To do so, the following is necessary:

- tighten the four nuts fixing the boards, which are located near its corners;
- rub the two nuts located near the keys;
- press down on all panel keys and check their working condition;
- tighten the two nuts carefully so that the keys remain in contact with the polyester film, but without being excessively tightened.

When the machine is switched on, the motor is powered

Probably, the relay “RL2” which is used to power the spin motor does not function correctly, i.e. it remains activated permanently. In this case, replace the MBE32F Mother board.

The diameter and/or distance values acquired automatically with the sensors diverge from the real values.

Within the service environment, check the efficiency of the sensors (paragraph “Internal sensor”).

For slight variances (maximum one inch), noted above all with alloy rims of greater thickness than usual, bear in mind the consideration already outlined in the paragraph specified above.

The width value acquired automatically with the sensors diverges from the real value.

If the potentiometer presents no irregularities, it may be sufficient to carry out a correct calibration of the external sensor.

The wheel balancer supplies non-repetitive unbalance values for a series of spins (differences greater than 3 grams with unbalances of around 30 grams)

Check (in this order):

- the machine is resting firmly on the floor and the feet are undamaged;
- the weight tray is correctly positioned i.e. not rubbing against the bell of the swinging unit during the spin;
- the wheel is well blocked on the shaft i.e. there is no sliding between the wheel and the

resting flange during the spin phase.

- To check this condition, make two reference marks with a piece of chalk, one on the flange and the other on the wheel, perfectly in line with each other. Check there has been no reciprocal movement between the two reference points after a few spins;
- the two pick-ups are correctly tightened (refer to the values of the signals visualised on the service page);
- the efficiency of the Mother board, replacing it with a new one.

If the above checks have produced a favourable result, replace the swinging unit and, if necessary, check for any noise from the bearings.

It is impossible to balance the wheel: applying the weights indicated by the wheel balancer, and performing a check spin, new unbalance values appear at random

Make the checks listed in the previous point.

Check also:

- that the geometric dimensions set are correct;
- the machine is not out of calibration (carry out the sensitivity calibration procedure);
- the cable connecting the search card (encoder) to the Mother board is correctly inserted and wired;
- the search card (encoder) is working correctly (via the values visualised in Function 97 - see the paragraph "Service programmes"). An operational defect in the search card prevents the machine from correctly calculating the position of the unbalances. In this case it is necessary to check:
 - that the photodiodes of the search card are clean;
 - the mechanical adjustment of the research board in relation to the research disk.

If the irregularity persists, replace the search card and, if necessary, the search disk (if damaged).

If the fault still does not disappear, replace the Mother board.

The motor remains activated, keeping the wheel in traction, and the current spin does not end

Perform all checks on the Mother board that were listed in the previous point.

Probably, the relay "RL2" which is used to power the spin motor does not function correctly, i.e.

it remains activated permanently. In this case, replace the MBE32F Mother board.

If instead after sampling (i.e. acquisition of wheel unbalance signals) in fall, the machine continues to spin the wheel instead of braking, check the operation of the relay "RL1" which inverts the current for braking.

If the relay functions correctly, at the beginning of braking, you will hear a mechanical tone coming from the Mother board. Otherwise, replace the MBE32F board.

During a spin:

* the machine remains blocked with the beeper activated;

* unknown characters appear on the display;

• the machine resets.

The fault (usually sporadic) can arise due to the temporary absence of a power supply to the Mother board, or owing to a disturbance or malfunctioning of the Mother board.

Check:

- the correct wiring of the power supply cable of the Mother board, and the correct insertion of its connectors;
- check especially the available power supply voltage values (power supply values between 90Volts and 270Volts);
- the decoupling of the motor power supply cables from the signal cables;

If the above checks have not pointed out any faulty components, replace the Mother board.

The brake at the end of the cycle is too long, or noisy

Check:

- If the bell of the swinging unit or the motor pulley slides on the belt during the braking phase. Then check the tension of the driving belt (nominal frequency 200Hz);
- check the operation of the relay "RL1", which inverts the current for braking.

If the relay functions correctly at the end of the cycle, you will hear a mechanical tone coming from the Mother board. Otherwise, replace the MBE32F board.

The spin device is noisy:

Check:

- if the bell of the swinging unit or the motor pulley slides on the belt during initial acceleration. Then check the tension of the driving belt (nominal frequency 200Hz);
- the motor is not mechanically damaged.

- after having removed the belt from the spin motor, check for excessive clearance between the pulley and drive shaft.

If the result is positive, check for wear of the pin and seats on the shaft and pulley.

Replace all parts found to be worn.

Check that all the parts indicated in Figure 1 are in place:

Code 2-00209 washer 4x9mm thickness 1mm;

Code 2-91679 washer 4X12mm thickness 1mm;

Code 2-02080 M4X10.

Now fix the pulley following the order given in the figure and put some medium strength Loctite on the M4X10 screw.

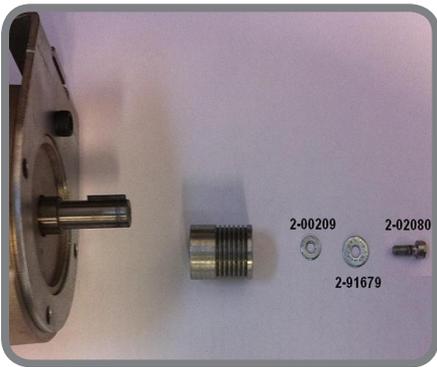


Fig.1

Touching the metal parts of the wheel balancer, you get an electric shock

Check the efficiency of the earthing connection of the socket (essential for the correct operation of the machine as well as for safety purposes).

- The earth cable is correctly connected inside the machine and on the internal machine parts.

3. SOFTWARE CONFIGURATION SUMMARY TABLE

ENCODER NOTCH	HIDDEN FUNCTIONS
0	Function for electronically resetting the shaft assembly using a medium/large wheel. Procedure described in the service manual paragraph "ZERO-SETTING OF THE SWINGING UNIT"
50	Function for enabling/disabling wheel spin with the "Str on/off " button for versions without a wheel protective casing. Procedure described in the service manual paragraph "MACHINE SOFTWARE CONFIGURATIONS".
60	Function for enabling/disabling the weight tray clip. Procedure described in the service manual paragraph "MACHINE SOFTWARE CONFIGURATIONS".
100	Function for enabling/disabling the automatic inner sensor. Procedure described in the service manual paragraph "INTERNAL SENSOR CALIBRATION".
131	Function for changing the unbalance thresholds depending on the market Jap (Japan)/USA/EUr. Procedure described in the service manual paragraph "MACHINE SOFTWARE CONFIGURATIONS"
200	Function for calibrating the automatic inner sensor. Procedure described in the service manual paragraph "INTERNAL SENSOR CALIBRATION".
244	Function for enabling wheel spin simulation. Procedure described in the service manual paragraph "MACHINE SOFTWARE CONFIGURATIONS".

4. SERVICE PROGRAMMES

The aim of these programmes is to make some data available, to allow the quick and easy checking of the efficiency of the various parts of the machine.

The selection is done as follows:

- press either arrow key and then, within two seconds, press the specific key to set wheel dimensions. In this way, the first service programme is preselected (89);
- press the "arrow up" and "arrow down" keys to select the next (or previous) programmes available, until you reach the desired programme. Each preselection determines the visualisation of the code 9X (with X varying according to the programme) on the left display and the message "Ent" flashing on the right display to indicate that "Enter" must be pressed to confirm the preselection;
- press the "Enter" key to confirm.

If the preselection is not confirmed within about three seconds, you will automatically exit the Service environment.

91 Thresholds and rounding-offs

Remove/restore:

- the visualisation of the first gram of unbalance;
- rounding-off to the nearest inch for the diameter measured with the automatic sensor (only for versions with an internal automatic sensor).

The selection of the programme determines the visualisation:

- of the "1 oF" message on the right display;
- of the "on .5" message on the left display (only for versions with an internal automatic sensor).

During normal operation, also when the "gr x 1" unbalance visualisation mode is selected, the first gram of unbalance is not shown. In this condition, the message "1 oF" appears on the right display when programme "91" is selected. When the key is pressed, the first gram is then displayed and it is possible to amplify machine sensibility (the message "1 on" appears on the right display). By pressing the key again, you can set the two modes

alternatively.

When the machine is turned on (**only for versions with an internal automatic sensor**), it prepares to display the diameters measured with the automatic sensor, rounding-off to the nearest inch. In this condition, the message “on .5” appears on the left display when programme “91” is selected. When the key is pressed, the diameter (**only for versions with an internal automatic sensor**) measured with the automatic sensor is then displayed with the precision of a tenth of an inch (the message “oF .5” appears on the left display). By pressing the key again, you can set the two modes alternatively.

Important

Pressing the key changes the setting shown on the display, in correspondence of which the central part of the centred position indicator lights up. To transfer the control from one display to the other, press either of the two arrow keys. You can exit the programme (and the service environment) by pressing the “F” key.

The programme is used to

- display the unbalance values with the maximum precision allowed, so you can balance a wheel perfectly and then carry out further checks on it;
- display with the maximum precision allowed (tenth of an inch) the correspondence between the diameter values measured with the automatic sensor and the nominal wheel values (**only for versions with an internal automatic sensor**).

93 Visualisation of software version installed

The selection of the programme determines the visualisation:

- of the “rEL” (release) message on the left display;
- of the numerical “XX.Y” message on the right display, corresponding to the programme version installed.
- By pressing the “Enter” key you can visualise: the date of the software version (in the format day, month, year), the model of wheel balancer and the market where it is used.

You can exit the programme (and the service environment) by pressing the “F” key.

The programme is used for

checking the CPU software version and updating it, if necessary.

95 Visualisation of phase calibration coefficient

The selection of the programme determines the visualisation:

- of the “F” string on the left display
- of the phase calibration coefficient on the right display.

The datum is expressed in notches (whole part) and eighths of a notch (decimal part) of the encoder (a notch corresponds to about 0.7 degrees).

You can exit the programme (and the service environment) by pressing the “F” key.

The programme is used for

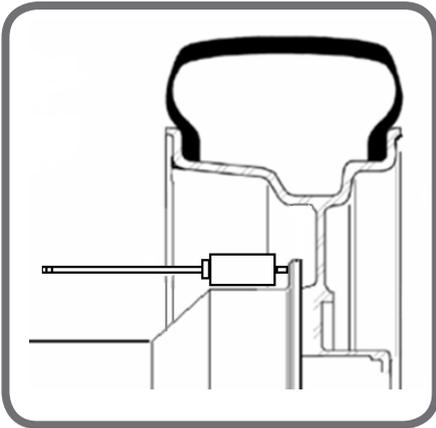
checking that the phase calibration coefficient values that are displayed are within the foreseen range (from -2.0 to +2.0).

96 Visualisation: pick-up signals and relative phase, average speed of the last spin, number of discarded periods.

When this programme is selected, the message “96” appears on the left display and the message “GO” will flash on the right display.

After selecting the programme, proceed as follows:

- to calibrate with the 100 g weight, mount a previously balanced medium sized wheel (5.5”X14”) shaft assembly and apply the calibration weight (100 g) on the external side;
- to calibrate with the SLUG calibration counterweight, mount a previously balanced medium sized wheel (typically 5.5”X14”) or a larger wheel, but with a mass NOT exceeding 40 Kg. Apply the SLUG (calibration weight) in the position indicated in the figure:



- perform a spin.
- The machine acquires the unbalance signals and visualises (in sequence):
- the phase displacement F between the pick-up signals in relation to the ideal value of 180° . The datum is expressed in notches (whole part) and tenths of a notch (decimal part) of the encoder (a notch corresponds to about 0.7 degrees);
 - the values proportional to the levels of the signals arriving from the internal and external pick-ups: - the indication "Spd" of the number of rpms at which the last spin was performed;
 - the number of discarded periods "Scr" in relation to the total number of periods acquired (X) "0 - X". Normally, the number of discarded periods is equal to 0. When it is other than 0 means that the spin was disturbed (machine accidentally bumped and/or mechanical parts that scrape against the shaft while it rotates).

Notes

- The values visualised do not depend on the dimensions set.
- With the wheel still, it is possible to visualise the relative data alternately by pressing the "Enter" key.
- Pressing the "Enter" key it is possible to display the listed information immediately after programme selection; the displayed data obviously refer to the last spin performed.
- It is possible to carry out the next spins while still within the programme.
- You can exit the programme (and the service environment) by pressing the "F" key.

The programme is used for checking that the displayed values are within

the foreseen range, i.e.:

Check	Range
phase displacement F	-2.0 - +2.0
INT pick-up signal	> 200
EXT pick-up signal	> 100
no. of discarded periods	$0 \div X$

97 Visualisation of search card functions (encoder).

The selection of the programme determines the visualisation:

- of the "POS" message on the left display;
- of a numerical value between 0 and 511, with the variation in the angular position of the shaft, on the right display.

If the programme is recalled immediately following the machine switch-on, the message "A 7" appears on the displays, to indicate the need to turn the shaft until the zero reference of the encoder has passed in front of the search card: at this point, the message disappears.

A spin can be performed (the message "97 GO" appears on the display), during which the impulses relative to the search card are counted. At the end of the spin, the expected value for the count (XXX) is shown on the left display and the right display (flashing) shows the actually counted value. These values remain displayed for about five seconds, after which the current angular position of the shaft reappears.

If these two values do not coincide after the spin, make sure that the encoder disk is not damaged and replace it if necessary as follows:

- switch off the machine;
- remove the weight tray;
- disassemble the research board;
- unscrew the 4 fixing screws then disassemble the disk (Figs.2 and 3), after using nippers to cut the two junction teeth in line with the "0" notch;

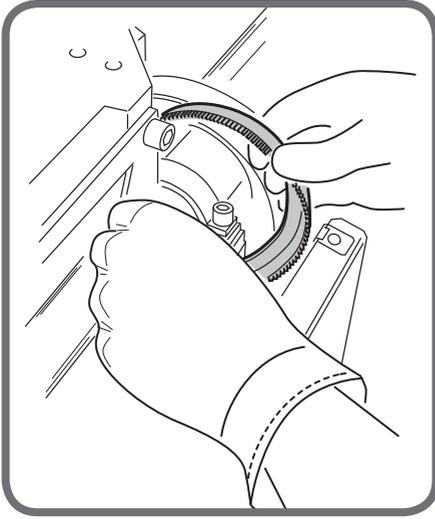


Fig. 2

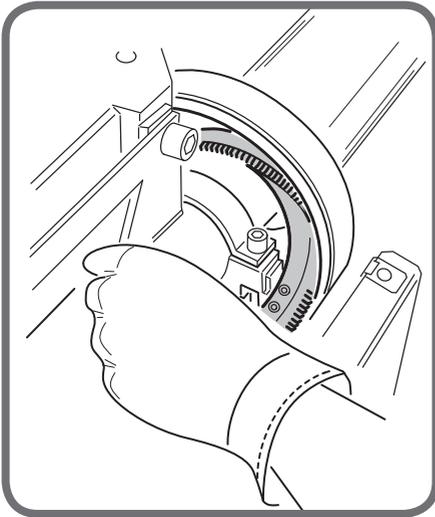


Fig. 3

- on the new disk, use nippers to cut the two junction teeth in line with the "0" notch. Insert the disk in the appropriate seat and tighten the 4 screws (previously loosened) but without blocking them. Adjust the disk so that the gap on the "0" notch is 0.9mm/1mm, as shown in figure 4. To check the width of the gap on the "0" notch you can use a normal feeler gauge;

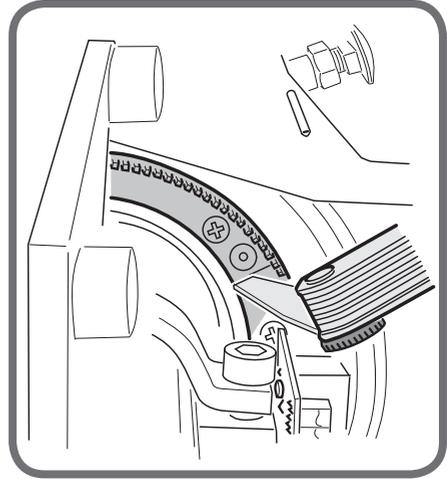


Fig. 4

- remount the research board.
If this operation does not produce a positive result, check the research board cable connection on the Mother board and on the encoder card and replace it if necessary.
If the result remains negative replace the encoder card as follows:
 - remove the encoder card by unscrewing the two motor support fixing screws;
 - fix the new encoder card so that its base is resting on the step on the motor support.
 You can exit the programme (and the service environment) by pressing the "F" key.

The programme is used for checking the efficiency of the search card. Turning the shaft in the two directions, the count must be continuously updated from 0 to 511.

98 Visualisation of sensor functions (version with internal automatic sensor)

- The selection of the programme determines the visualisation:
- of the "di" message on the left display;
 - of the value in notches deriving from the diameter sensor on the right display.
- Moving the lever of the sensor, the value is continuously updated.
Pressing the key to set the keypad wheel data, you will see:
- the message "d" on the left display;

- the value in notches deriving from the distance sensor (1 notch = 0.5mm).

This value is updated by moving the sensor "in - out".

Pressing the key to set the keypad wheel data, you will see:

- the message "Lr" on the left display;
- the (converted) voltage value deriving from the width potentiometer from 5 to 255 with external sensor present.

This value is updated by moving the external sensor towards and away from the operator.

If the measuring sensor is not present, the (converted) voltage value deriving from the width potentiometer is equal to 245.

This value remains fixed, and is NOT updated as the external sensor is missing.

Pressing the key to set the keypad wheel data, you will see:

- the message "rd" on the left display;
- the message "oFF" on the right display that indicates the status of the zero sensor used for the zero-setting of the automatic sensor (in versions where installed).

This message changes to "on" when the internal sensor is extracted and returns to "oFF" when it returns to the rest position. In the machine version with an automatic sensor, if this update does not occur, carry out the checks as described in the "internal sensor" chapter.

In the machine version with a manual sensor, the message always remains "OFF" even when moving the sensor itself.

- You can exit the programme (and the service environment) by pressing the "F" key.

The programme is used to

check the efficiency of the sensors used for automatic data input. Moving the sensor, the values displayed must vary continuously within the following intervals:

diameter sensor see chapter

"internal sensor" paragraph "diameter sensor"

distance sensor from 0 to 720

101 Performed spin counter

The selection of the programme determines the visualisation:

- the "LAN" message on the left display;
- of the "tot" message on the right display, i.e. the number of total spins performed by the machine.

By pressing the "Enter" key on the keypad you will see:

- the "LAN" message on the left display;
- the "CAL" message on the right display, i.e. the number of spins performed since the last sensitivity calibration performed.

By pressing the "Enter" key on the keypad you will see:

- the "LAN" message on the left display;
- the "PAR" message on the right display, i.e. the number of partial spins performed since the last machine switch-on.
- You can exit the programme (and the service environment) by pressing the "F" key.

5. SWITCH CONFIGURATION MBE32F MOTHER BOARD

On the cards used in the wheel balancer, there are certain hardware and software settings that allow them to be used on different models. Depending on the code of the spare part requested, the card is configured in the factory so further interventions by the installer are not necessary.

6. MACHINE SOFTWARE CONFIGURATIONS

When replacing the MBE32F CPU board or carrying out the board reset diagnostic test "t4", the wheel balancer must be configured based on the machine version.

For this configuration, proceed as follows:

Enabling of the wheel spin with a button

- access the function 97F and, turning the unit, position it to notch 50;
- remaining on this notch, hold down the Dimensions button (manual wheel data entry) for approx. 5 seconds. The message "Str" will appear on the left display, and "oFF" will appear on the right display;
- press Enter to enable the wheel spin with a button; the message "on" will appear on the right display;
- press the F key to exit.

Modification of the Hidden Weights programme procedure selecting the plane in the 6 o'clock position:

- access the function 97F and, turning the unit, position it to notch 333;
- remaining on this notch, hold down the Dimensions button (manual wheel data entry)

- for approx. 5 seconds. The message “Hld” will appear on the left display, and “Prc” will appear on the right display;
- press Enter to enable the Hidden Weights programme selecting the spokes in the 6 o'clock position, the message “ESY” will appear on the right display;
 - press the F key to exit.

IMPORTANT: as of software version 01.3, this setting will NOT be available any longer.

Enabling the accessory weight tray device:

- access the function 97F and, turning the unit, position it to notch 60;
- remaining on this notch, hold down the Dimensions button (manual wheel data entry) for approx. 5 seconds. The message “HAN” will appear on the left display, and “oFF” will appear on the right display;
- press Enter to enable the device, the message “on” will appear on the right display;
- press the F key to exit.

IMPORTANT: from software version 01.7, certain configurations may be set as follows:

- press either of the two cursor buttons, then press the wheel size setting button within two seconds. This preselects the first service programme (89);
- Press and hold the STOP button for at least 10 seconds. The text “CFG” is shown on the left hand display and the number “X” of the configuration installed on the board is shown on the right hand display;
- Use the cursor buttons or enter key to change the type of machine configuration;
- Press F to confirm the selection. The machine resets the board automatically;
- The following table lists the selectable configurations:

Configuration Number	CFG1 (DEFAULT)	CFG2	CFG3	CFG4
CALIBRATION TYPE	SLUG	SLUG	SLUG	100g
MARKET: EUROPE/USA/JAPP	EUROPE	USA	JAPP	EUROPE
UNBALANCE UNIT OF MEASURE: GRAMS/OUNCES	GRAMS	OUNCES	GRAMS	GRAMS

Changing the unbalance threshold based on the market:

- Access the function 97F and, turning the unit, position it to notch 131;
- Remaining on this notch, hold down the Dimensions button (manual wheel data entry) for approx. 5 seconds. The message “SEL” will appear on the left display and “EUR” (factory setting) on the right display;
- Press Enter to change the market (refer to the working zone), the message “USA” or “JAP” (Japan) will appear on the right display;
- Press the F key to exit and confirm the selection.

Enabling wheel spin simulation:

This programme makes it possible to perform subsequent wheel spins in automatic mode by setting a fixed time (seconds). This setting may be used to check over time if there are any mechanical or electronic machine anomalies.

- Access the function 97F and, turning the unit, position it to notch 244;
- Remaining on this notch, hold down the Dimensions button (manual wheel data entry) for approx. 5 seconds. The message “dEL” will appear on the left display, and “10” (seconds) will appear on the right display;
- Press the arrow keys to change the pause time between one spin and the next one. It is possible to change this time from a minimum of 5 seconds and a maximum of 90 seconds.

- Press Enter to start the wheel spin simulation cycle.
- Press the F key to stop the cycle and exit.

7. E2PROM (T4) MEMORY RESETTING PROGRAMME

Proceed as follows to perform the test t4 for resetting the E2PROM calibration parameters:

- With the machine off, set the deep-switch (A, fig. 5) which is necessary for entering the diagnostic mode, i.e:
MBE32F: SW1 DSW2 to ON.
- Turn the wheel balancer on.
- Use the arrow keys to select the test until the following appears on the display:
"t 4" on the left display
"- - -" on the right display.
- Press the Enter button to confirm the selection. The card will automatically reset the calibration parameters.
- When the operation is complete the following will appear on the display:
"t 4" on the left display
"PAS" on the right display.
- Turn off the machine and return the deep-switch to its original position (all switches are OFF).

8. ZERO-SETTING OF THE SWINGING UNIT

If the main board MBE32F and/or the shaft assembly need to be replaced, reset the shaft assembly as follows after sensitivity has been calibrated:

- mount a wheel of average dimensions (ex. 5.5"X14") on the machine with a rim preferably in steel and with a maximum residual unbalance of 10 grams per side;

Important: to properly perform the zero-setting of the swinging unit, the wheel rim must be in perfect condition, without deformations or abrasions or dirt in the centring hole or on the plane that rests on the swinging unit. In addition, the centring accessories must be correct for the wheel type and be clean and in perfect condition.

- block the wheel on the unit by keeping the valve in the 12 o'clock position;
- enter the wheel dimensions (in manual mode

- English -

- or automatic mode in versions with a digital sensor);
- go to Function 97 as indicated in the paragraph "97 Visualisation of search card functions (encoder)";
- turn the unit until the notch "0" appears on the right display;
- keep this position and at the same time keep the "MAM" key pressed down (dimension input) for approx. 5 seconds, on the display you will see:
"GrP" on the left display "0" on the right display;
- perform a spin;
- at the end of the spin, on the display you will see:

"GrP" on the left display "180" flashing on the right display;

- move the wheel valve to the 6 o'clock position, **then keeping the unit in this position**, loosen the ring nut and return the wheel valve to the 12 o'clock position;
- spin a second time;
- at the end of the spin, the machine prepares for Function 97;
- you can exit the programme (and the service environment) by pressing the "F" key;

- check the effectiveness of the zero-setting of the unit, proceeding with wheel balancing. Then, move the wheel valve to the 6 o'clock position and, keeping the unit in this position, loosen the ring nut and return the wheel valve to the 12 o'clock position;
- perform a spin. The residual unbalance obtained must be max. 3 grams per side, otherwise, repeat the procedure, paying attention to the indicated positions and the residual unbalance of the used wheel.

9. DISASSEMBLING THE WEIGHT TRAY

- Unscrew the four M6 fixing screws of the weight tray.

UPDATING THE CONTROL UNIT OF THE MBE32 CARD

Card description

- MBE32F card. Processing board and interface

- with LED display.
- The card is controlled by a microprocessor with relative firmware.
- The MBE32F card firmware can be updated during servicing.

It should be pointed out that:

- The MBE firmware release is identified in the programme 93 with the name CPU.

DOWNLOADING THE SOFTWARE AND FIRMWARE FROM THE INTERNET FOR CARD UPDATING

If one or more cards needs to be updated, the FIRMWARE that is required can be downloaded from the internet.

To download the updated firmware and graphics versions from the internet, proceed as follows:

- Connect to the manufacturer's WEBSITE
- Select "Private area"
- Enter your username, password and select "Enter"
- When the new screen appears, select "Software Updates"
- In the "Keyword" field, enter the keyword that corresponds to what you want to download. For example:
- If you want to download the programming (**wbs**) software for the update via PC enter "**wbs**"
- If you want to download the MBE/CPU FIRMWARE enter the name of the machine to be updated.

NB:

The downloaded files are in a compressed format (.zip) and must therefore be unzipped before they can be used.

UPDATING THE MBE32F FIRMWARE

To update the MBE32F firmware, the **wbs** programme is necessary. If it is not already installed on the PC to be used for the update, it can be downloaded as explained in the previous paragraph. Then start the installation procedure by launching the "setup.exe" programme.

Important:

the **wbs** programme is only compatible with Windows operating systems 98SE, 2000 and XP Professional.

- With the machine switched off set the deep-switch (A, fig. 5) which is necessary for the programming based on the card to be updated, i.e.:
- MBE32F: SW1 DSW1 to ON;



Fig.5

- connect the serial cable code 8-21100224 to the "JPS1A" connector of the card itself (B, fig. 5). The other end of the cable is connected to the RS232 serial port on the PC. If the PC does not have a RS232 port use the USB/RS232 adapter code 8-21100226.
- Turn the wheel balancer on.
- Start the **wbs** programme.
- The following control window for the **wbs.exe** programme will now open.

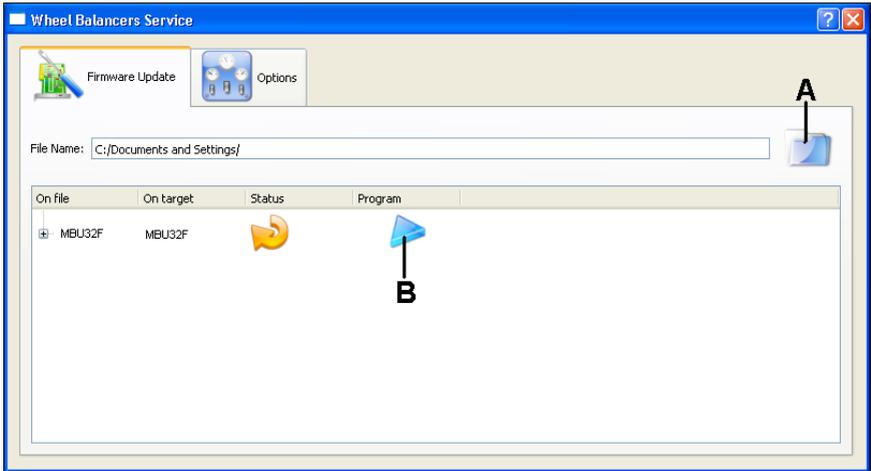


Fig.5a

- Select the folder icon A of figure 5a and upload in the programme the file with the .cef extension relative to the firmware version to update, previously downloaded from the web.
- Select the Options tab and the COM serial port where the programming cable is connected to the PC, see figure 5b.

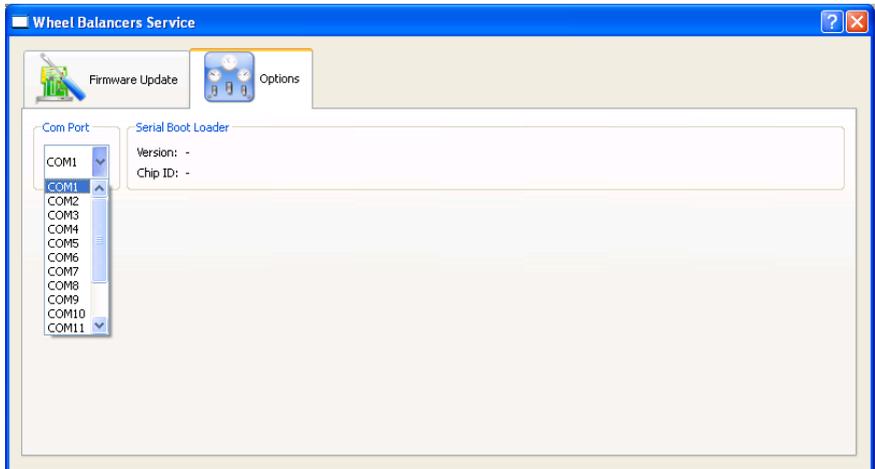


Fig.5b

- Activate the Firmware Update and select the icon B, figure 5a to start the programming procedure.

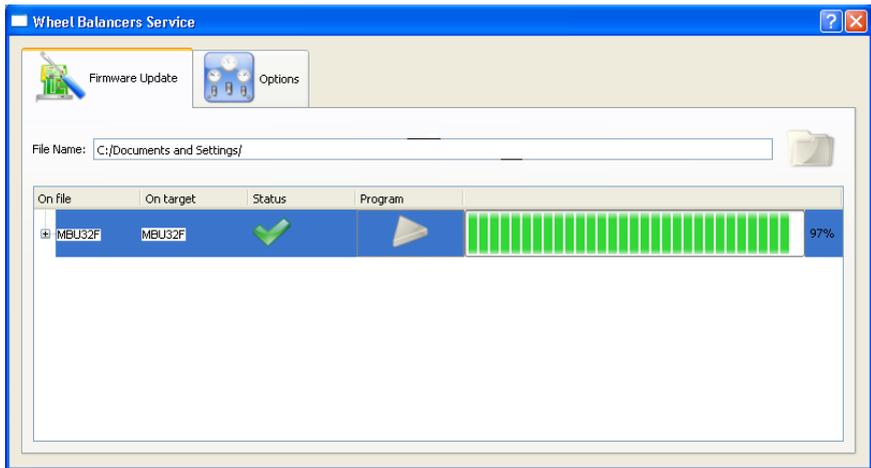


Fig.5c

“100%” is displayed when the programming procedure has been completed successfully.

After the programming procedure, close the application, switch off the machine and return the dip switch to the original position (all switches OFF).

- If an error message is displayed, check the serial cable wiring harness and repeat the programming procedure, turning the machine off and then on.

IMPORTANT: when the board FIRMWARE update is complete, test the E2PROM to reset the calibration parameters as described in the paragraph “E2PROM (T4) MEMORY RESETTING PROGRAMME”.

After this test, the following operations must be repeated in this order:

1. configure the machine based on the machine version as described in the paragraph “MACHINE SOFTWARE CONFIGURATIONS”;
2. calibrate the internal sensor as described in the paragraph “INTERNAL SENSOR CALIBRATION”;
3. calibrating the external sensor, if installed;
4. calibrating machine sensitivity;
5. resetting the group, see paragraph “shaft assembly resetting”.

10. INTERNAL AND EXTERNAL SENSOR

(ONLY for versions with the automatic sensor)

To visualise the signals of the sensors, select Function 98.

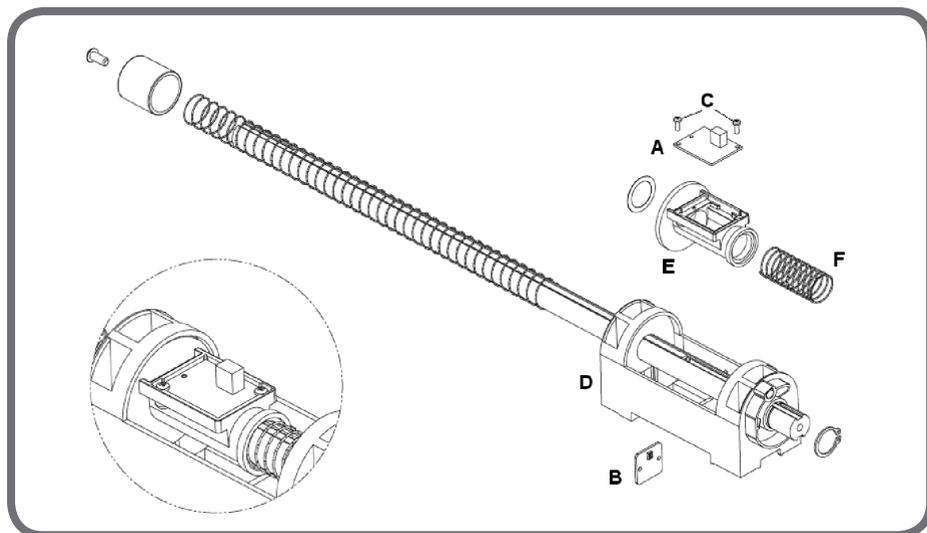


Fig. 6

Diameter sensor [di]

Check that the stroke is made up of -110 notches with the lever resting on the bell of the swinging unit see Fig. 7 (maximum error allowed +/- 5 notches in the position indicated).

If the sensor (B, Fig.6) does not read, check:

- the connection flat;
- that the sensor is correctly assembled in its housing.

If the checks above produce a negative result, replace the sensor (B, Fig. 6) as follows:

- remove the weight tray;
- remove the sensor lever;
- disassemble the measuring sensor support (D, Fig. 6), using the 4 fixing screws, from the internal plane;
- disconnect the Picoflex from the sensor;
- disassemble sensor B, removing it from its seat;
- replace the sensor, assembling it by following the disassembly directions in the reverse order;
- check the sensor reads correctly, as indicated above.

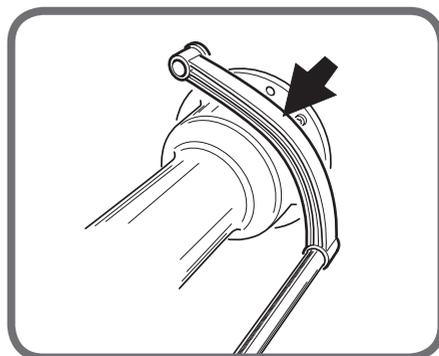


Fig. 7

Distance sensor [d]

Check that the total stroke is 720 notches (maximum permitted error +/- 5 notches along the entire stroke);

If the sensor (A, Fig. 6) does not read, check:

- the connection flat;
- the correct mounting of the sensor in its housing (Picoflex connector in the direction of the swinging unit);

If the sensor needs to be replaced:

- remove the weight tray;
- disconnect the Picoflex connector;
- unscrew the two self-threading screws (C, fig. 6) then remove the sensor from the sensor support (E, Fig. 6);
- mount the new sensor, paying attention to the correct fixing direction of the sensor itself;
- check the functioning in programme 98 "Visualisation of sensor functions".

Replacing the zero sensor (detects the rest position of the sensor arm)

In the case of an incorrect reading of the value of the distance and the diameter, check the proper operation of the zero sensor as described in chapter "98 Visualisation of sensor functions".

If the sensor (A, Fig. 6) does not read, check:

- the connection flat;
- the correct mounting of the sensor in its housing (Picoflex connector in the direction of the swinging unit);

If the zero sensor must be replaced, proceed as described in the paragraph "Distance sensor".

In fact, the zero sensor is mounted on the distance sensor card.

Note:

- if the sensor A flat must be replaced, check that the flat is reconnected correctly (see Fig. 8) on the card. Also, the fixing of the flat on the base must be done so that it is long enough for moving the sensor without having the cable risk to twist around the inside of spring F figure 6.

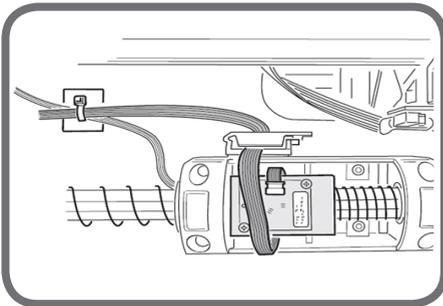


Fig. 8

Width potentiometer

Check it is at 5 +/- 1 notches in the rest position. If the resting value obtained is different from this, adjust the potentiometer:

- remove the cap from the sensor support box and use a screwdriver to turn the shaft of the potentiometer until a value of 5 +/- 1 appears on the display.

If the value visualised does not change, check:

1. connector cable on main board JSA3 connector;
2. the potentiometer;
3. the Mother board.

If the potentiometer needs to be replaced:

- loosen the screws of the external sensor cover in order to remove it;
- disconnect the potentiometer cable;
- unhook the spring from the grommet of the potentiometer support plate;
- loosen the fixing screws of the potentiometer support plate;
- disassemble the gears and reassemble them on the new potentiometer, tightening the screw so that they rub against the shaft, thus permitting the subsequent adjustment;
- reassemble the new potentiometer with its relative gears on the plate and fix everything, ensuring that the teeth of the gears are aligned;
- re-hook the spring in the appropriate hole;
- reconnect the cable to the potentiometer;
- tighten the screw to block the gears onto the potentiometer shaft;
- turn the sensor completely towards the wheel resting flange of the machine, checking the electrical continuity of the potentiometer and the correct coupling of the gears along the entire stroke;

as the travel of the potentiometer corresponds to about 250 numbers, if the potentiometer has been adjusted with a resting value of 5, the value at the end stop will be about 255;

- calibrate the external sensor as indicated in the User Manual;
- check the widths obtained are correct, using wheels with known dimensions (or a special tool).

To set the aforementioned values with a precision of a tenth of an inch, on the display, select "OFF" for rounding to the nearest inch of the diameter values read by the automatic sensor display as described in chapter "91 Thresholds and rounding".

The maximum error allowed for a wheel with a steel rim and of medium dimensions is +/- 0.2 inches.

Notes

Bear in mind that the rated width and diameter of the wheel (e.g. 6"x14") refer to the resting planes of the tyre beads, that are obviously inside the rim. On the other hand, the data measured refer to external planes, so they will be lower than the rated values because of the thickness of the rim. The correction value therefore refers to an average thickness of the rim. This means that the data measured on wheels with different thicknesses may vary slightly (2 or 3 tenths of an inch maximum) from the rated values. This is not a lack of accuracy of the measuring devices, but reflects reality.

11. INTERNAL SENSOR CALIBRATION

The internal sensor must be calibrated in the following cases:

- the machine displays the message E 4 (sensor calibration not performed);
- the Mother board MBE32F was replaced.

In this case, the setting must be performed to enable the operation of the internal automatic sensor, proceeding as follows:

- access the function 97F and, turning the unit, position it to notch 100;
 - remaining on this notch, hold down the Dimensions button (manual wheel data entry) for approx. 5 seconds. The message "tAS" will appear on the left display, and "oFF" will appear on the right display;
 - press Enter to enable the sensor, the message "on" will appear on the right display;
 - press the F key to exit.
- the swinging unit has been replaced;
 - it was necessary to disassemble the internal sensor due to the diameter sensor replacement.

The procedure for calibrating the internal sensor is as follows:

- access the function 97F and, turning the unit, position it to notch 200;
- remaining on this notch, hold down the Dimensions button (manual wheel data entry) for approx. 5 seconds. The "CAL" message will appear on the left display, and two flashing "E"s will appear on the right one;
- move the lever of the internal sensor so it

rests against the swinging unit bell as shown in figure 9;

- press "Enter" to calibrate the diameter;
- move the lever of the internal sensor so it rests against the swinging unit flange as shown in figure 9a;
- press "Enter" to calibrate the distance;
- return the sensor to the rest position.

Exit the sensor calibration programme by pressing the F key.

If the calibration has been performed successfully, an acoustic consent signal is emitted. If the message A 20 is displayed, this indicates that the position of the sensor during the calibration phase is incorrect. Position it correctly, as already described, and repeat the procedure. If this message remains displayed, access the function 98F to check the correct reading of the distance, the diameter and the zero-setting in the rest position as described in the paragraph, "98 Visualisation of sensor functions (version with internal automatic sensor)"

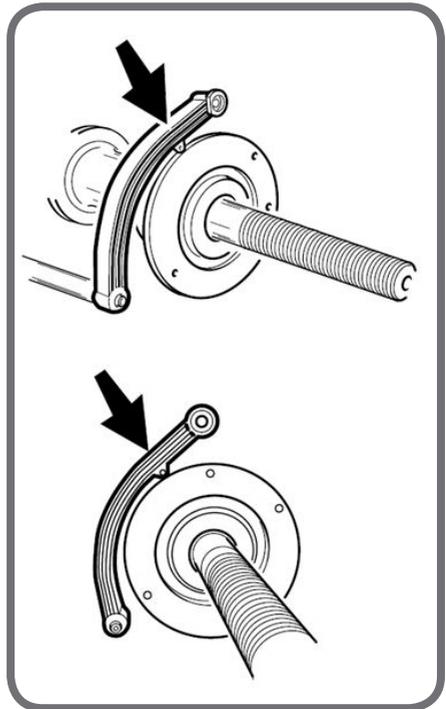


Fig. 9

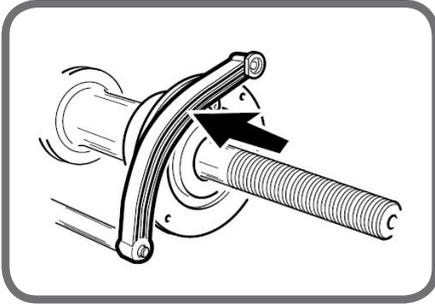


Fig. 9a

12. PICK-UP REPLACEMENT AND ADJUSTMENT

To replace the pick-ups, follow this procedure:

- disconnect the connection between the pair of pick-ups from the MBE32F board;
- loosen the pick-up pre-load springs completely (A, Fig. 10);

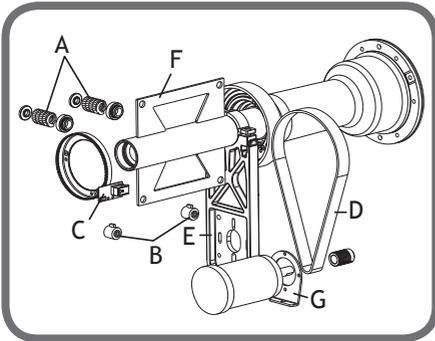


Fig. 10

- unscrew the two M10 dowels and replace the pick-ups (B, Fig. 10) with the new ones;
- assemble the new pair of pick-ups, ensuring that the spheres are correctly positioned inside the appropriate niches, and that the pick-up marked with the letter I (internal) is assembled on the right and the one with the letter E (external) is on the left (assuming you will work from in front of the machine);
- tighten the fixing dowels so that the pick-ups are slightly rubbed;
- tighten the locknuts as far as the blocking point, then unscrew them slightly (by about one side of the hexagon) so that the Belleville washers are working;
- manually tighten the two screws fixing the

- washers, recovering all the axial play;
- use an Allen spanner to tighten the two screws with the washers, making four complete turns with the spanner;
- reconnect the connector of the pick-ups.
- perform some settling spins;
- perform the sensitivity calibration procedure.

13. REPLACEMENT OF THE COMPLETE SWINGING UNIT

After checking that the unit is the real cause of the machine irregularities, replace it as indicated below.

- remove the weight tray;
- disconnect the power supply cable of the motor from the Mother board;
- completely unscrew the 2 screws that hold the pre-load springs (A, Fig. 10) of the pick-ups;
- unscrew the two M10 dowels that fix the pick-ups (B, Fig. 10);
- disconnect the Picoflex connector of the encoder card then disassemble the card itself;
- remove the belt (D, Fig. 10) as described in the paragraph "Replacement and adjustment of the belt";
- disassemble the motor support (E, Fig. 10), unscrewing the two M8 fixing screws;
- remove the swinging unit (F, Fig. 10) after unscrewing the four M12 fixing screws and the relative locknuts;
- mount the new swinging unit, tightening the 4 screws (recommended rotation torque of 72Nm);
- remount the motor support, and then the encoder card on the support itself;
- remount and adjust the 2 pick-ups as described in the paragraph "Replacing and adjusting the pick-up";
- remount and adjust the belt as described in the paragraph "Replacing and adjusting the belt";
- close the weight tray again;
- perform the unit zero-setting procedure (see paragraph "Zero-setting of the swinging unit") and the sensitivity calibration procedure.

If it is necessary to disassemble the spring located inside the unit bell, proceed as follows:

- insert a cone on the threaded hub;
- compress the spring by means of the securing ring nut;

- using a screwdriver, remove the ring as shown in figures 11 and 12.

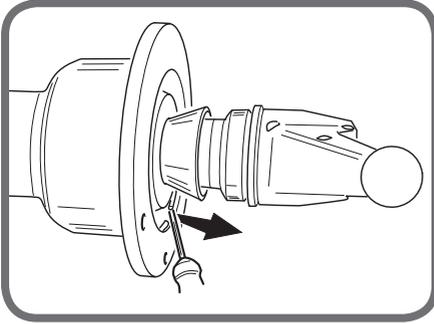


Fig. 11

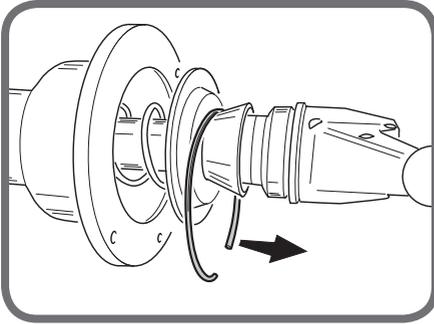


Fig. 12

14. SPIN DEVICE

Replacing and adjusting the belt

- remove the weight tray;
- unscrew the fixing screws of the side closing panel on the motor compartment;
- unscrew the nut and locknut used to tighten the belt (A1, A2, Fig. 13);
- loosen the three motor fixing screws (B, Fig. 13) on the motor support;
- disassemble the belt (C, Fig. 13) and replace it with the new one;
- tighten the belt by screwing the nut A1. The belt is correctly tightened when the oscillation frequency of one of the two branches is equal to 200Hz. The tension must be measured using the specific instrument. Only in the case that suitable equipment is not available, approximate tension can be performed so that when pressing your finger on the middle of one of the two branches, the belt flexion is approx. 10mm;

- English -

Warning: excessive belt tension can cause, with machine use, damage to the motor bearings and/or motor shaft failure. a too slow belt can cause a decrease in performance, excessive noise at the beginning and when braking and rapid wear to the belt itself.

- block the locknut A2;
- block the motor fixing screws (B, Fig. 13).

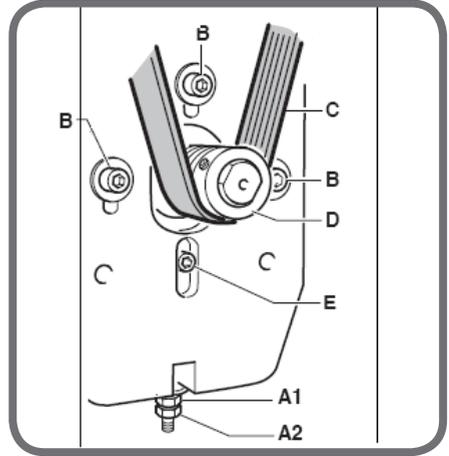


Fig. 13

Replacing the motor

- Remove the weight tray;
- disconnect the power supply cable of the motor from the Mother board;
- unscrew the fixing screws of the side closing panel on the motor compartment;
- unscrew the two nuts of the belt tightening screw (A, Fig. 13);
- loosen the three motor fixing screws (B, Fig. 13);
- disassemble the belt (C, Fig. 13) from the motor pulley (D, Fig. 13);
- completely unscrew the three motor fixing screws previously loosened;
- remove the motor with the flange (G, Fig. 10) from the aluminium support (E, Fig. 10);
- unscrew the screw fixing the motor (E, Fig. 13) to the flange (G, Fig. 10);
- remove the pulley, then replace the motor when the new one;
- assemble it by following the demounting directions in the reverse order, applying medium thread-lock loctite 243 to fix the pulley;
- mount the belt, referring to the paragraph "Replacing and adjusting the belt";

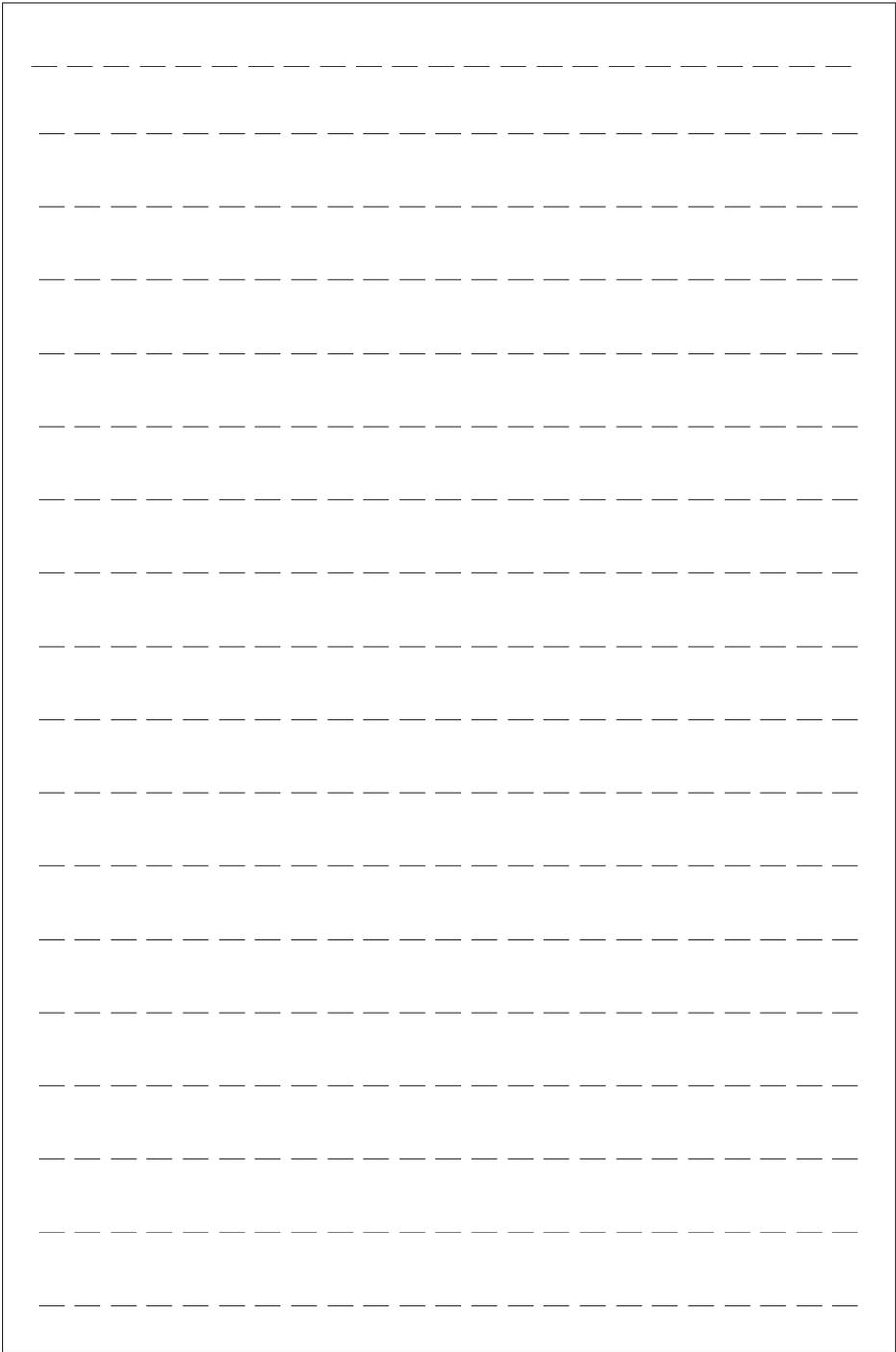
15. MOUNTING AND DEMOUNTING THE WHEEL GUARD

To assemble and disassemble the wheel guard, refer to the user and maintenance manual.

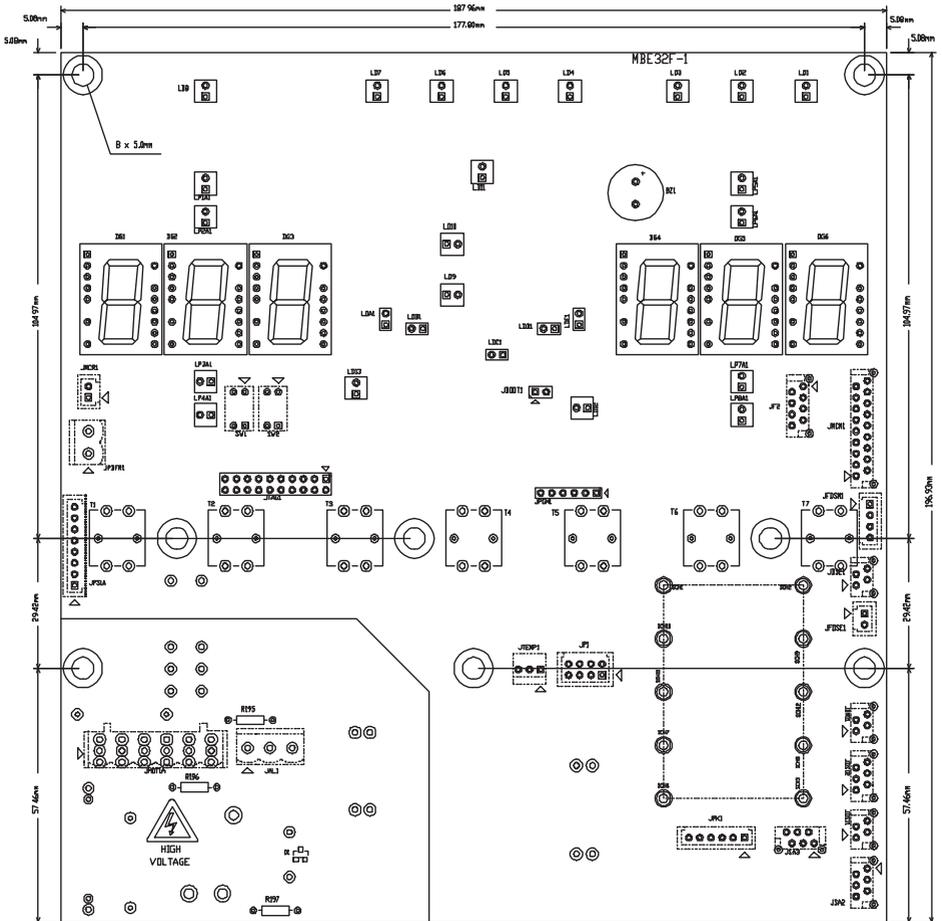
If there the guard works incorrectly (e.g. when the guard is lowered, the machine does not spin, or vice versa), check:

- The connection of the microswitch cable and, if necessary, the connection to the MBE32F card.
- the correct operation of the micro switch.

If the check has a NEGATIVE result, replace the micro with a new one, removing the two fixing screws.



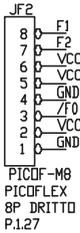
ATTACHED DRAWINGS AND DIAGRAMS



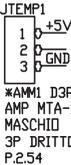
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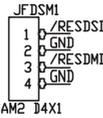
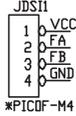
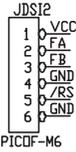
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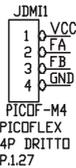
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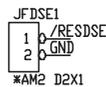
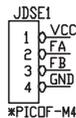
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DISTANZA
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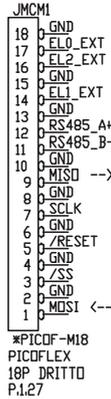
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DIAMETRO
INTERNO



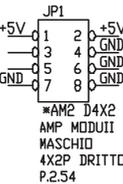
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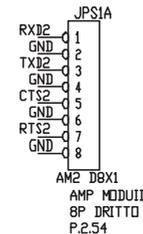
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CONTR. MOTORE



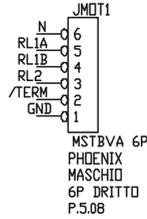
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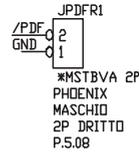
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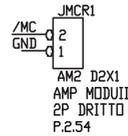
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MOTORE
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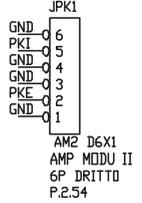
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PEDALE
FRENO



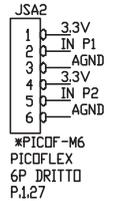
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MICRO
CARTER



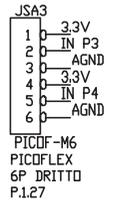
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PICK-UP



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TASTATORI
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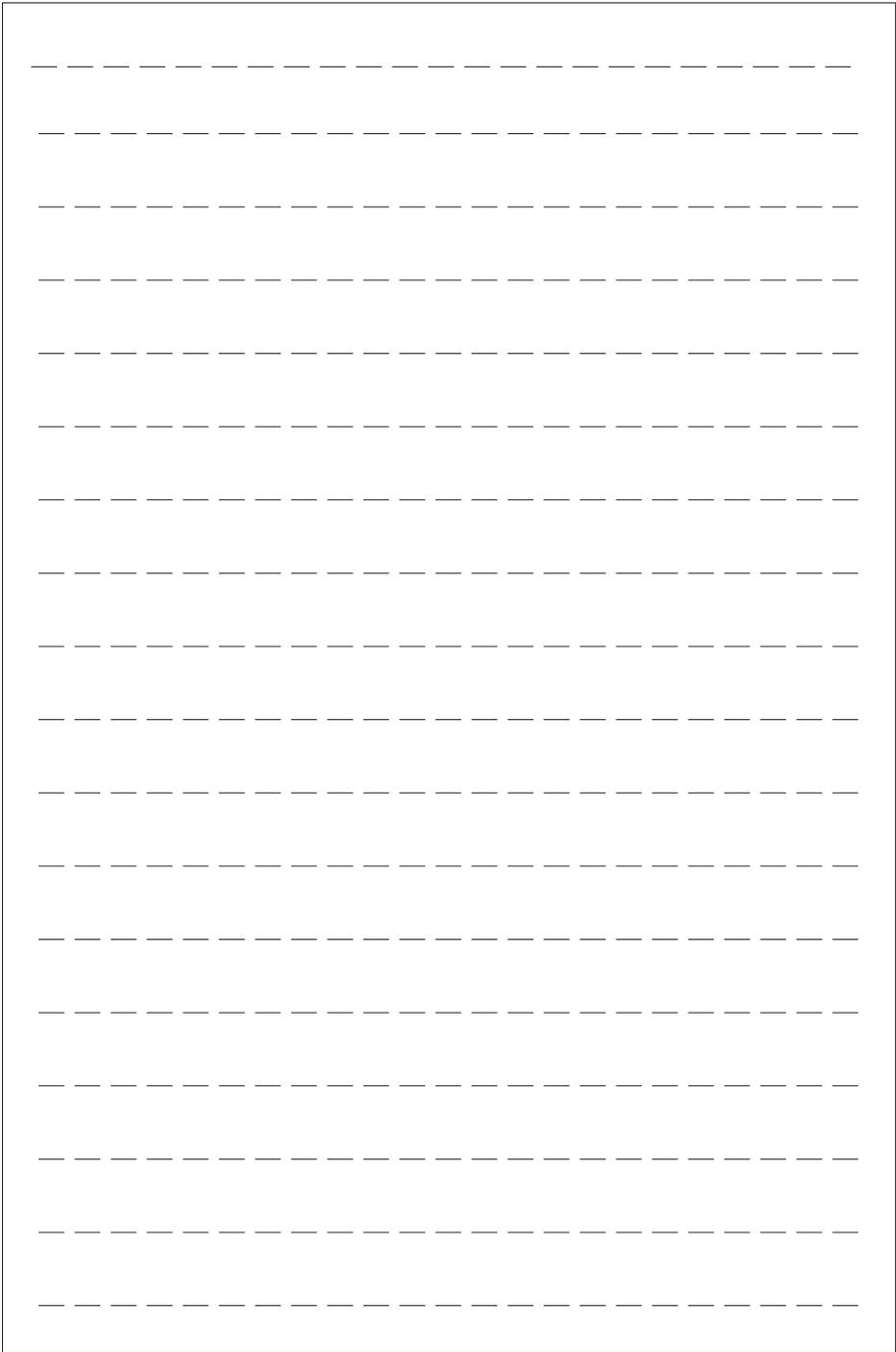


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TASTATORI
ESTERNI



Card name: MBE 32F
Code 4-108084 A

A large rectangular box containing 20 horizontal dashed lines, intended for handwriting practice. The lines are evenly spaced and extend across the width of the box.





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