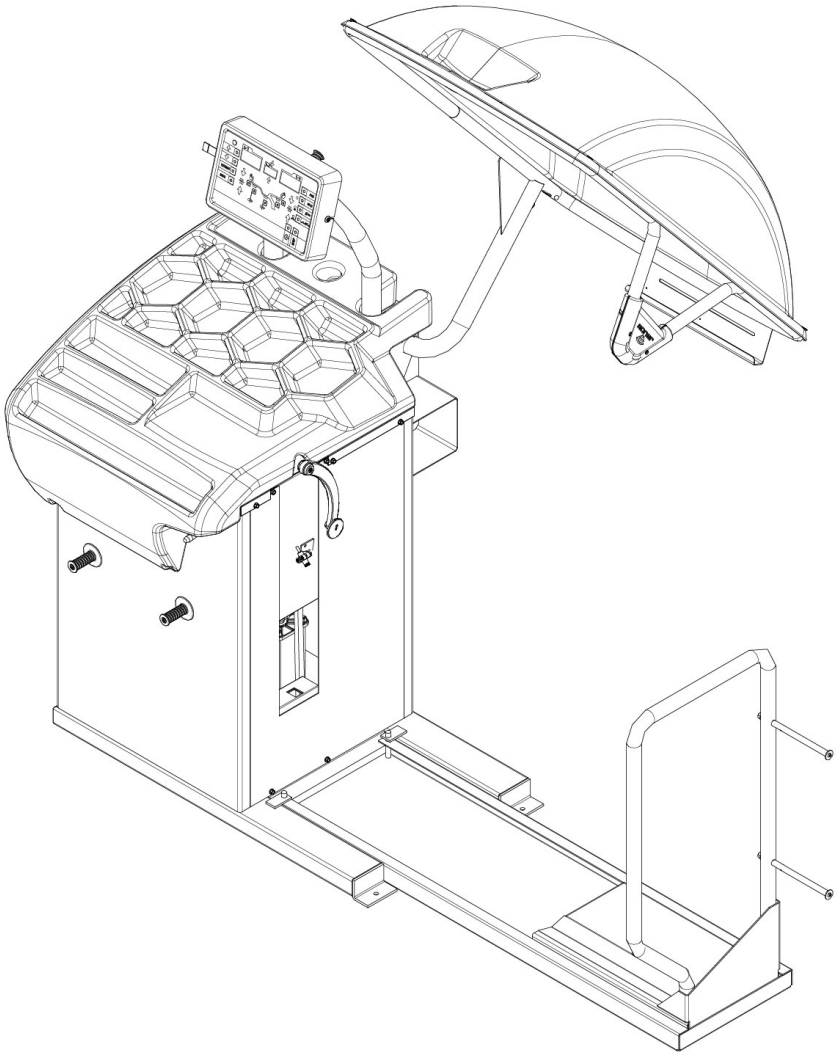
CEMB
BALANCING MACHINES

EN *Service manual*



C330 US

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Istruzioni originali
Translation of the original instructions
Traduction de la notice originale
Übersetzung der Originalanweisungen
Traducción de las instrucciones originales
Tradução das instruções originais

Safety

⚠ **WARNING: WEAR PERSONAL PROTECTIVE EQUIPMENT DURING HANDLING! (SAFETY BOOTS WITH RUBBER SOLE AND REINFORCED TOE CAPS (EN345 STANDARD) (ANSI Z41.1-1991), PROTECTIVE GLOVES (EN388 STANDARD) (ANSI/ISEA 105-2005) (OSHA,1910.138), GOGGLES (EN166 1F STANDARD) (ANSI Z87.1) (OSHA,1910.133) AND WORKWEAR (EN510) (OSHA,1910.132))**

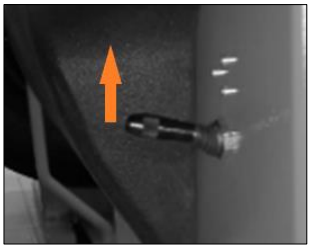
⚠ **WARNING: PAY ATTENTION TO THE INTERNAL ELECTRICAL CONNECTIONS WHEN THE COVERS ARE OPEN: RISKS OF ELECTROCUTION!**

GENERAL INSTRUCTIONS

PNEUMATIC OPERATIONS

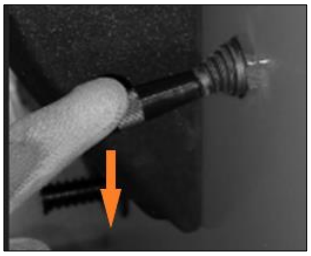
Lift the spin unit

1. Position the valve lever upwards



Lower the spin unit

1. Lower the valve lever

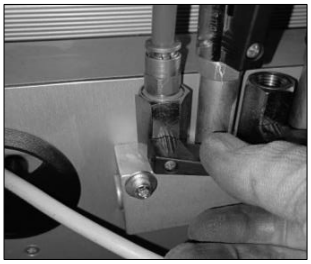


Spin unit stopped in intermediate position

1. Position the valve lever in intermediate position

Close the pneumatic circuit

1. Fully lower the spindle
2. Close the compressed air circuit
   ⚠ **DANGER! THE SPINDLE COULD MOVE**



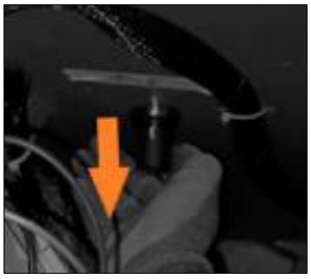
Open the pneumatic circuit

1. Valve lever in intermediate position
2. Open the compressed air circuit
   ⚠ **DANGER! THE SPINDLE COULD MOVE**

Holding pressure adjustment

⚠ **WARNING! CARRY OUT THIS OPERATION ONLY IF, WHEN THE VALVE LEVER IS POSITIONED IN INTERMEDIATE POSITION, THE SPINDLE TENDS TO MOVE UPWARDS**

1. Remove the weight tray shelf and the gauge plate (see relevant instructions)



⚠ **WARNING! CARRY OUT THIS OPERATION WITH THE ADAPTER FLANGE INSTALLED ON THE SPINDLE**

2. Extract the pressure regulator knob
   a. Rotate by one turn counterclockwise

💬 THE SPINDLE MUST REMAIN STATIONARY

   b. Push the pressure regulator knob
   c. Install the gauge plate and the weight tray shelf (see relevant instructions)

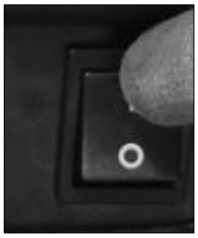
ACCESS THE SELF-DIAGNOSTIC PAGE

a. Digital machines: Menu > SETUP > Diagnostics
b. Video machines: Menu > Special functions > Self-diagnostics

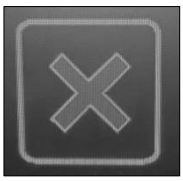
MONITOR CALIBRATION AND INIT NOVRAM

Touch video machines

1. Press on any point on the monitor and simultaneously switch the machine on



2. Carry out the monitor calibration
   a. Press on the points shown on the monitor
   b. After touching the fourth point
      i. Keep the monitor pressed on any points until the screen shown an X

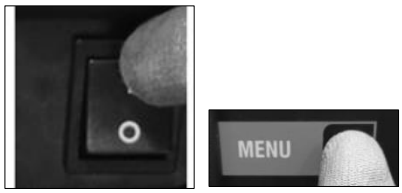


3. At the INIT NOVRAM request, press confirm to carry it out

⚠ **WARNING! ALL CALIBRATIONS ARE RESET**
⚠ **WARNING! CARRY OUT THE SPINDLE RESET**
⚠ **WARNING! CALIBRATE THE GAUGE AND THE MEASUREMENT SENSORS**
⚠ **WARNING! CARRY OUT THE SELF-CALIBRATION**

Digital machines

1. Keep MENU key pressed and use the switch to start the machine
    a. Release the MENU key after switching on

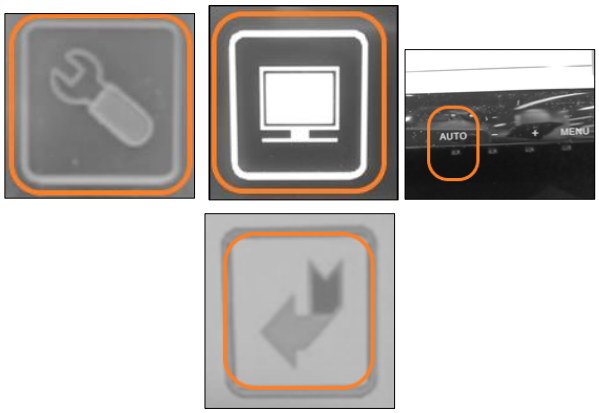


2. At the “INIT NOVRAM” or “INIT?” request
    a. Press ENTER to carry it out
    b. Press STOP to skip

⚠ **WARNING! ALL CALIBRATIONS ARE RESET**
⚠ **WARNING! CARRY OUT THE SPINDLE RESET**
⚠ **WARNING! CALIBRATE THE GAUGE AND THE MEASUREMENT SENSORS**
⚠ **WARNING! CARRY OUT THE SELF-CALIBRATION**

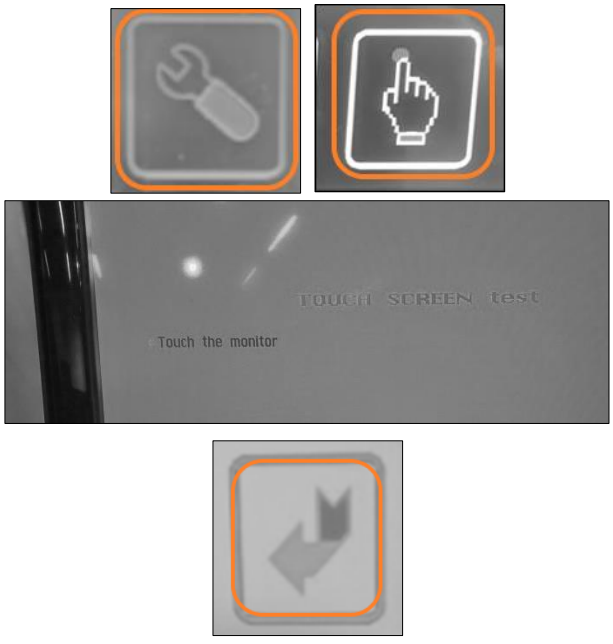
MONITOR SELF-TUNING

1. Access the self-diagnostic page
    a. Click on the spanner
    b. Enter password 1-3-5-7
    c. Click ‘Monitor’
    d. Press Auto on the screen
    e. At the end of the procedure, press Back



TOUCH SCREEN MONITOR CHECK

1. Access the self-diagnostic page
    a. Click on the spanner
    b. Enter password 1-3-5-7
    c. Press the Hand icon
    d. Slide a finger on the monitor and see whether it detects the points
    e. At the end of the procedure, press Back



GAUGE POTENTIOMETERS REPLACEMENT

Distance potentiometer replacement and calibration

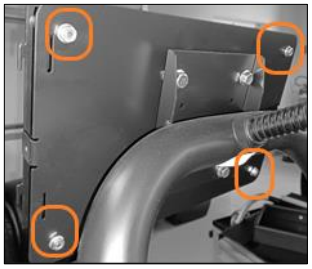
Disassembly

⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

1. Remove the weight tray shelf and the gauge plate (see relevant instructions)

   TAKE PHOTOS OF THE CABLE PASSAGES AND FASTENING POINTS WITH RETAINERS FOR A CORRECT POSITIONING DURING REINSTALLATION

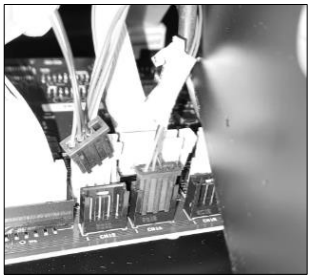
   

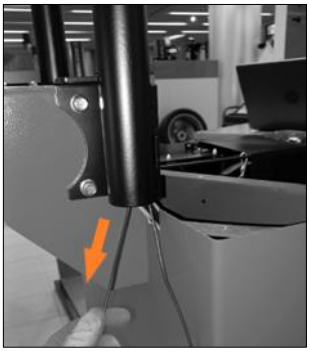
   

   FOR VIDEO MODELS, GO TO STEP 3

2. (Only for digital models) Extract the potentiometer connector from the frame
   a. Unscrew the fastening screws of the frame
   b. Unscrew the fastening screws of the panel
   c. Disconnect the connectors from the board

   REFER TO THE WIRING DIAGRAMS

   d. Extract the potentiometer cable from the frame

   ⚠ **WARNING! DO NOT FORCE THE CABLE IN ORDER NOT TO DAMAGE THE OTHER WIRING IN THE PIPE**

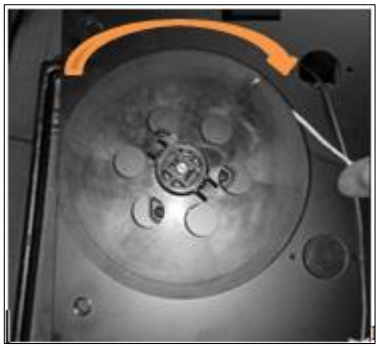
   CONTINUE TO STEP 4

3. (Only for video models) Disconnect the distance potentiometer cable from the board

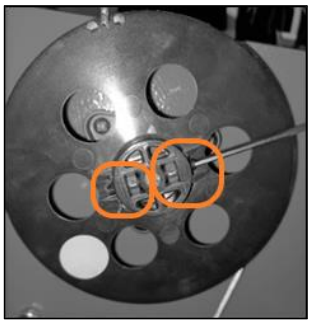
   REFER TO THE WIRING DIAGRAMS

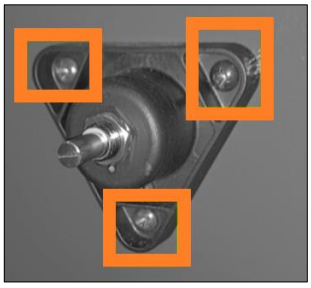
4. Remove the braid from the pulley

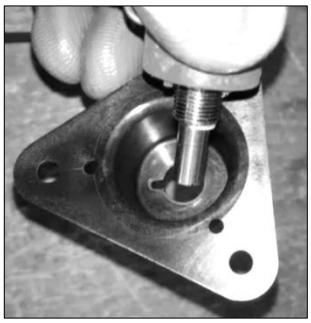
5. Loosen the two 2.5mm socket head dowels securing the pulley
    a. Remove the pulley
    b. Remove the pulley spring



6. Use a crosshead screwdriver to unscrew the three screws securing the spring guide
    a. Extract the potentiometer cable from the baseplate

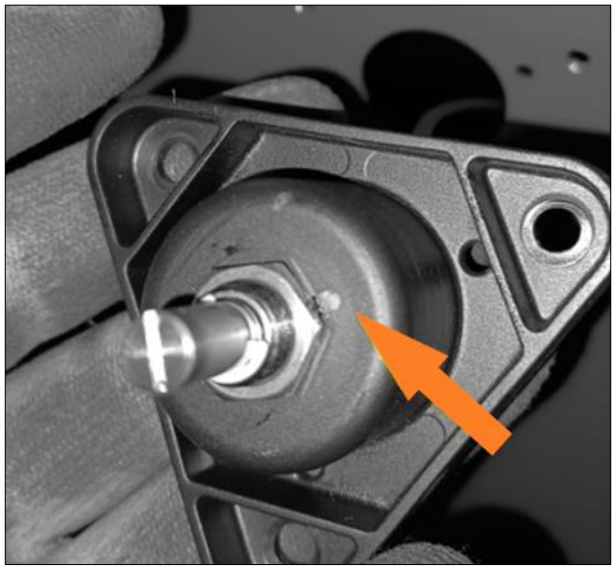


7. Unscrew the 13mm hexagonal nut securing the potentiometer
    a. Remove the potentiometer

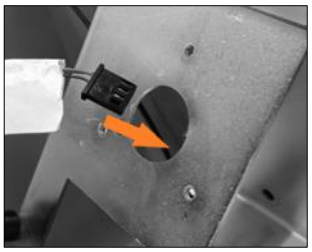


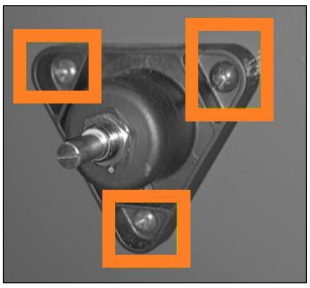
Assembly

1. Insert the new potentiometer in the spring guide
    ⚠ **WARNING! POSITION THE PIN AT THE CENTRING HOLE**
    a. Position the new serrated washer
    b. Secure the 13mm hexagonal nut



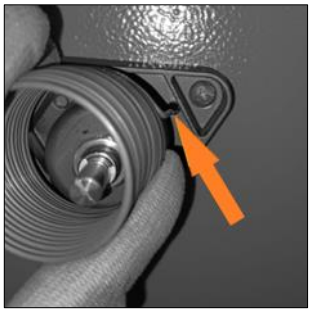
2. Insert the potentiometer cable in the spring guide support hole
    a. Secure the spring guide with the three crosshead screws





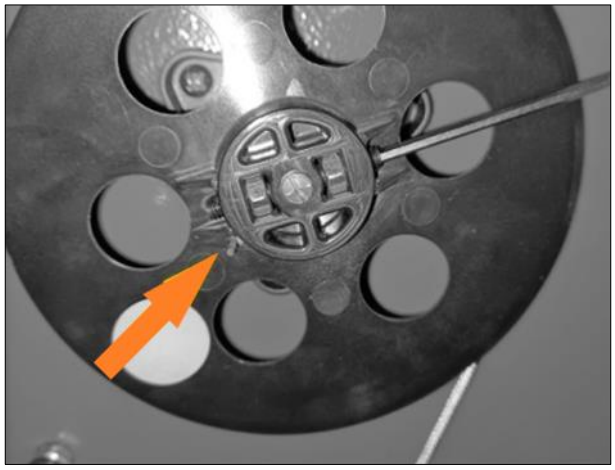
3. Position the gauge return spring

⚠ **WARNING! INSERT THE PIN IN THE SPECIAL HOLE OF THE SPRING GUIDE**



4. Position the pulley inserting the pin of the spring into the special hole
    a. Point the 2.5mm hexagonal head dowels

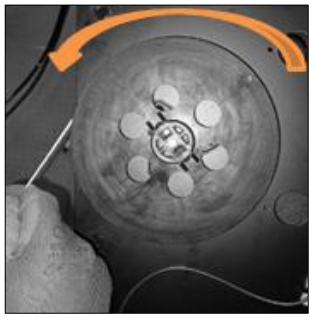
THEY ARE TIGHTENED ONLY AFTER CALIBRATING THE POTENTIOMETER

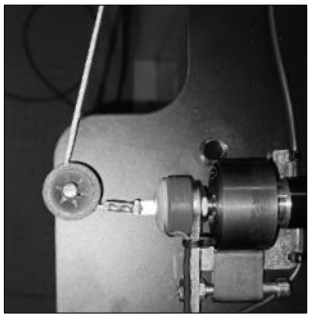


5. Wind the braid on the pulley by 2 full turns counterclockwise

USE THE BRAID CABLE ENDS AS A REFERENCE

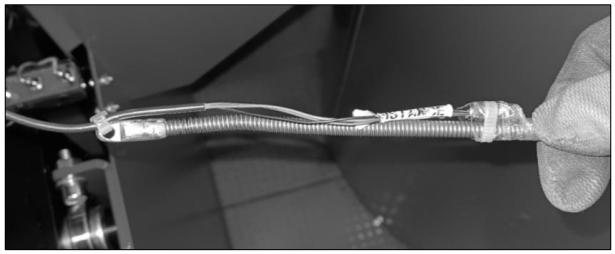
    a. Position the braid on the gauge transmission pulley





FOR VIDEO MODELS, SKIP TO STEP 7

6. (Only for digital model) Insert the potentiometer cable with probe
    a. Insert the probe in the pipe
    b. Secure the cable to the probe using the retainers
    c. Insert the potentiometer cable in the pipe

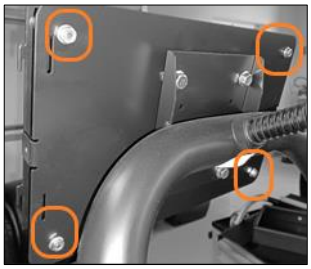


7. Connect the cable of the distance potentiometer to the board

WARNING! REPEAT THE CABLE LAYOUT AS SHOWN IN THE PHOTOS TAKEN AT STEP 1 OF DISASSEMBLY

WARNING! REFER TO THE WIRING DIAGRAMS

8. (Only for digital models) Install the display head
    a. Secure the panel nuts
    b. Secure the frame screws

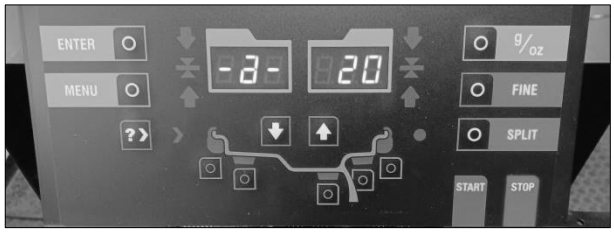


9. Install the gauge plate (see relevant instructions)

WARNING! CARRY OUT THIS OPERATION WHILE THE WEIGHT TRAY IS DISASSEMBLED

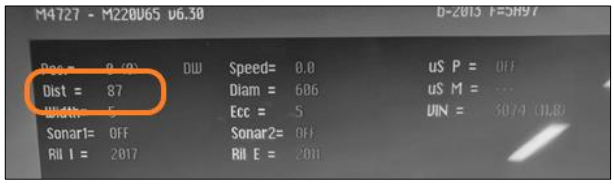
10. Switch on the machine

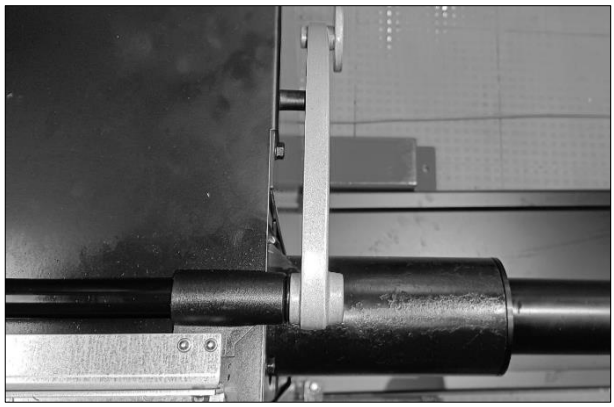
DANGER! LIVE CIRCUITS

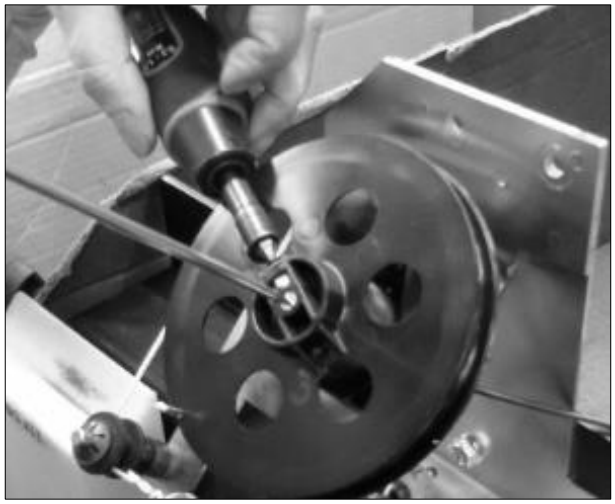


FOR DIGITAL BALANCING MACHINES
- ACCESS SELF-DIAGNOSTICS (SEE RELEVANT INSTRUCTIONS)
- PRESS ENTER UNTIL THE VALUE "A" OF THE DISTANCE IS DISPLAYED

FOR VIDEO BALANCING MACHINES
- ACCESS SELF-DIAGNOSTICS (SEE RELEVANT INSTRUCTIONS)
- CHECK THE "DIST" VALUE







⚠ **WARNING! ADJUST WITH THE INDEX AT REST**

11. Use a flat blade screwdriver to adjust the potentiometer
    - FOR DIGITAL BALANCING MACHINES, SET THE VALUE BETWEEN 5 (MINIMUM) AND 25 (MAXIMUM)
    - FOR VIDEO BALANCING MACHINES, SET THE VALUE BETWEEN 50 (MINIMUM) AND 250 (MAXIMUM)

    a. Tighten the 2 dowels considering that the manufacture specification value is 0.6 Nm
    b. Extract the gauge fully to the end of stroke

    ⚠ **WARNING! MAKE SURE THAT THE VALUE NEVER CROSSES THE ZERO**

    c. Shut down the machine
12. Install the weight holder shelf (see relevant instructions)
13. Perform the calibrations of:
    a. Distance (CAL a) (see operation manual)
    b. Diameter (CAL d) (see operation manual)

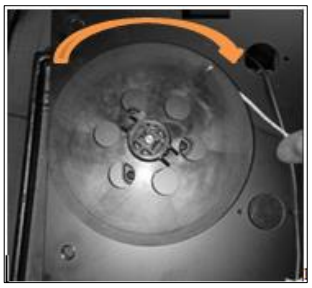
Diameter potentiometers replacement

Disassembly

⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

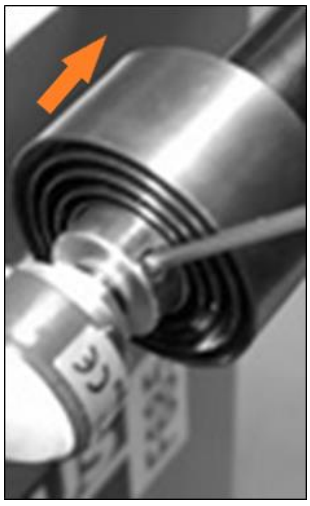
1. Remove the weight tray shelf and the gauge plate (see relevant instructions)
   - BEFORE STARTING THE PROCEDURE, IT IS ADVISABLE TO TAKE PHOTOS IN THE CABLE FASTENING POINTS WITH RETAINERS
   - FOR VIDEO MODELS, GO TO STEP 3
2. (Only for digital models) Extract the potentiometer connector from the frame
   - FOLLOW THE INDICATIONS DISTANCE POTENTIOMETER REPLACEMENT AND CALIBRATION DISASSEMBLY STEP 2 PAGE 5
   - CONTINUE TO STEP 4
3. (Only for video models) Disconnect the distance potentiometer cable from the board
   - REFER TO THE WIRING DIAGRAMS

4. Remove the braid from the pulley
    a. Release the spiral spring from the stop screw

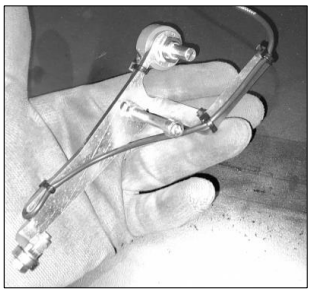


5. Rotate the rod to access the 2mm socket head screw
    a. Remove the 2mm socket head screws securing the plate

6. Move the spring inwards until seeing the 2mm hexagonal socket head dowel
    a. Loosen the dowel



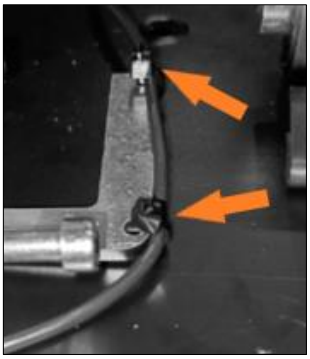
7. Remove the potentiometer with the anti-rotation bracket and plate from the rod
    a. Cut the cable retaining clamps
    b. Unscrew the 13mm hexagonal nut



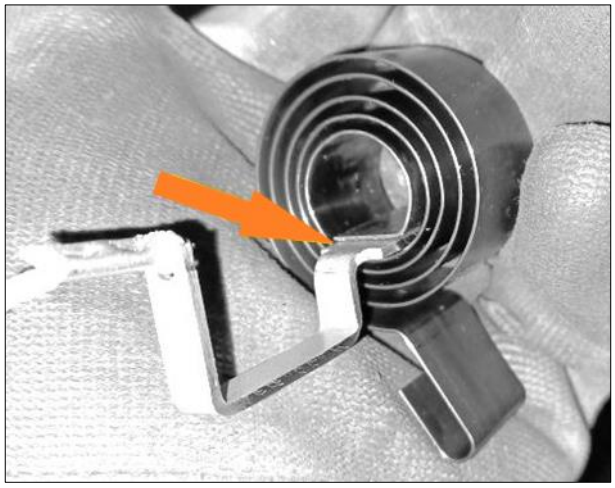
Assembly

1. Use cutting pliers or scissors to remove the plastic pin
    a. Position the new serrated washer
    b. Secure the potentiometer with the new nut on the bracket
    c. Secure the potentiometer cable with fasteners on the bracket

⚠ **WARNING! THE RETAINERS MUST BE POSITIONED ON THE UPPER PART OF THE BRACKET**

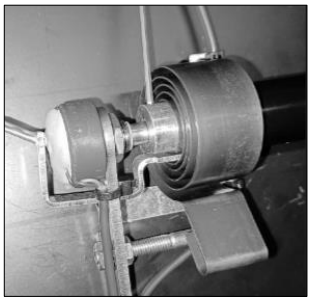


2. Insert the braid plate in the spring as shown in the photo



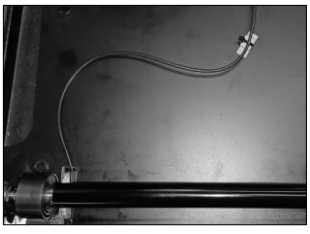
3. Insert the potentiometer pin in the spring centre
    a. Position the bracket on the gauge plate rail

4. Insert half of the potentiometer pin in the gauge rod
    a. Point the 2mm hexagonal socket head dowel



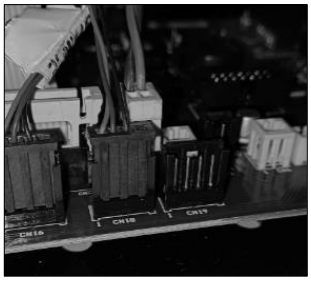
5. Engage the spring to the screw on the potentiometer bracket
    a. Secure the cable with the retainer on the gauge plate

⚠ **WARNING! THE CABLE MUST NEVER BE TENSIONED ALONG THE ENTIRE GAUGE STROKE**

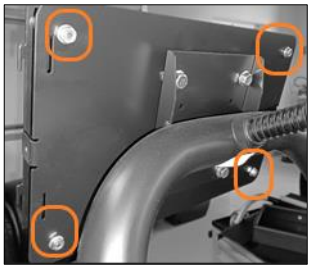


FOR VIDEO MODELS, SKIP TO STEP 7

6. (Only for digital model) Insert the potentiometer cable with probe
   SEE INSTRUCTIONS DISTANCE POTENTIOMETER REPLACEMENT AND CALIBRATION ASSEMBLY STEP 6



7. Connect the connector of the diameter potentiometer to the board
   WARNING! REFER TO THE WIRING DIAGRAMS



8. (Only for digital models) Install the display head
   a. Secure the panel nuts
   b. Secure the frame screws

9. Assemble the gauge plate on the baseplate (see relevant instructions)

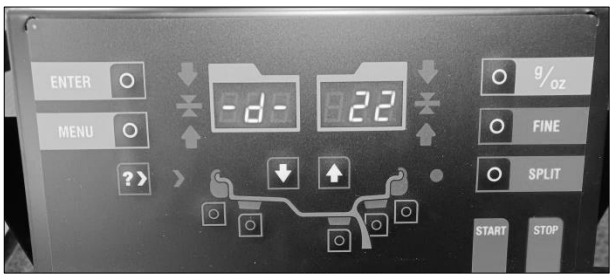
10. Rest the index over the spindle sleeve (position P1)

WARNING! CARRY OUT THIS OPERATION WHILE THE WEIGHT TRAY IS DISASSEMBLED

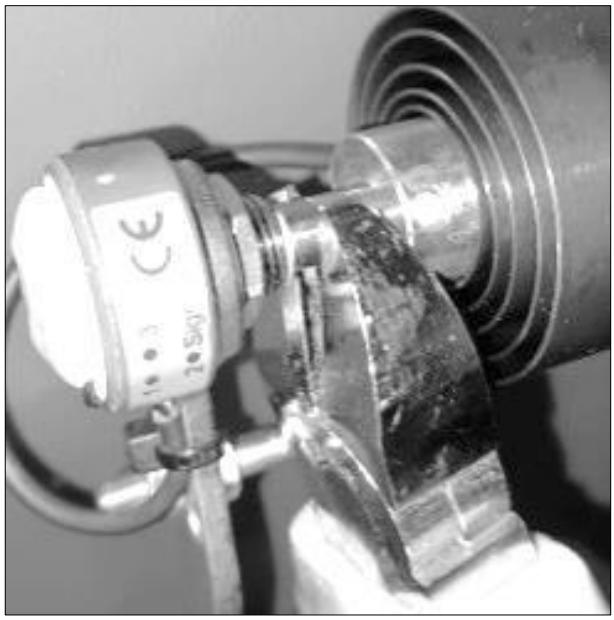
11. Switch on the machine
    DANGER! LIVE CIRCUITS

FOR DIGITAL BALANCING MACHINES
- ACCESS SELF-DIAGNOSTICS (SEE RELEVANT INSTRUCTIONS)
- PRESS ENTER UNTIL THE VALUE 'D' OF THE DIAMETER IS DISPLAYED

FOR VIDEO BALANCING MACHINES
- ACCESS SELF-DIAGNOSTICS (SEE RELEVANT INSTRUCTIONS)
- CHECK THE 'DIAM' VALUE

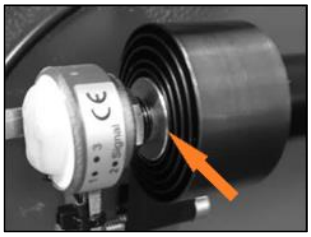


⚠ **WARNING! CARRY OUT THIS OPERATION WITH INDEX IN POSITION P1**



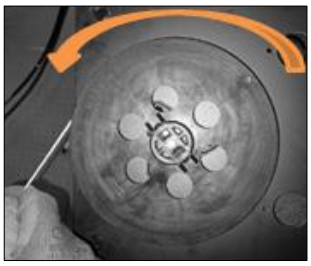
12. Use cutting pliers to rotate the pin of the potentiometer
    - FOR DIGITAL BALANCING MACHINES, SET THE VALUE BETWEEN 5 (MINIMUM) AND 25 (MAXIMUM)
    - FOR VIDEO BALANCING MACHINES, SET THE VALUE BETWEEN 50 (MINIMUM) AND 250 (MAXIMUM)

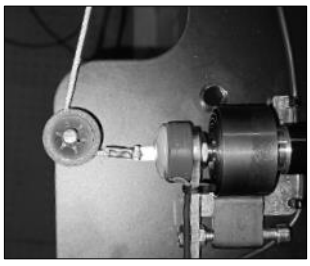
    a. Position the potentiometer fully inserted in the gauge rod
    b. Secure the 2mm hexagonal socket head dowel
    c. Make sure that, along the entire stroke of the diameter, the measured value never goes to zero
    d. Shut down the machine



13. Move the spring towards the left to gain access to the plate mounting screw hole
    - THE SPRING EDGE MUST BE IN CORRESPONDENCE WITH THE ROD FACE

    a. Rotate the rod to gain access to the screw
    b. Tighten the 2mm hexagonal socket head screw to secure the plate on the gauge rod





14. Wind the braid on the pulley by 2 full turns counterclockwise
    - USE THE BRAID CABLE ENDS AS A REFERENCE

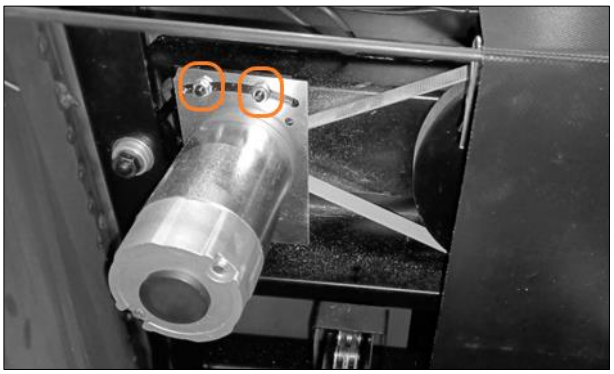
    a. Position the braid on the gauge transmission pulley

15. Install the weight holder shelf (see relevant instructions)
16. Perform the calibrations of:
    a. Distance (CAL a) (see operation manual)
    b. Diameter (CAL d) (see operation manual)

BELT TENSIONING

⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

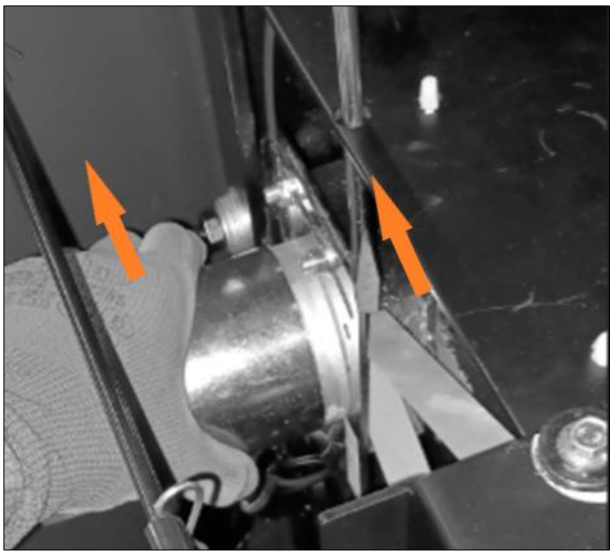
1. Remove the weight tray shelf and the gauge plate (see relevant instructions)



2. Loosen the two upper nuts securing the motor support plate

⚠ **WARNING! THE PLATE MUST SLIDE WITH NO CLEARANCE**

3. Tension the belt
   a. Use a flat blade screwdriver to pry on the bracket through a special hole on the housing



PUSH THE MOTOR BY HAND TO REACH THE CORRECT TENSION

   b. Tighten the 10mm hexagonal nuts of the motor plate
   c. Turn the spindle by hand to settle the belt
   d. Measure the belt tension

IF POSSIBLE USE A TENSION METER, OR A SPECIAL SMARTPHONE APP (PANO TUNER).

THE BELT PULL IN OPERATIONAL CONDITIONS IS 220 HZ

WHEN INSTALLING A NEW BELT, OVERTENSION UP TO 240 HZ IN ORDER TO RECOVER THE NATURAL ELONGATION

⚠ **WARNING! A TOO HIGH BELT TENSION COULD DAMAGE THE MOTOR BEARINGS, WHILE A TOO LOW TENSION COULD CAUSE SLIPPAGE, JEOPARDISING THE BALANCING.**

4. Install the gauge plate and the weight tray shelf (see relevant instructions)
5. Carry out 100 spins with medium car wheel (16-inch) to settle the belt
6. Carry out the following operations:
   a. Reset the spindle (see technical service manual)
   b. Self calibration (see operation manual)

SPINDLE RESET

BEFORE RESETTING THE SPINDLE IT IS ADVISABLE TO CARRY OUT A FEW SPINS WITH THE TRUCK WHEEL INSTALLED ON THE SPINDLE IN ORDER TO SETTLE ALL COMPONENTS

WARNING! RESET THE SPINDLE IN AUTO MODE
WARNING! MAKE SURE THAT NO WHEELS OR CONES ARE INSTALLED ON THE TERMINAL.

1. Carry out the spindle reset
    - Digital models
        - Select AUTO mode
        - Press MENU
        - Press arrow DOWN until reaching Setup
        - Press ENTER
        - Press arrow DOWN until reaching CAL
        - Press MENU
        - Press ENTER
        - CAL ON,
        - Press ENTER
            - (if present) lower the guard
            - Press START pushbuttons

THE SPINDLE CARRIES OUT A SPIN

    - Touch video models
        - Select AUTO mode
        - Menu
        - Calibrations
        - Password 1357
        - Self-calibration
        - Key 
        - Password 1357
        - Lower the guard

THE SPINDLE CARRIES OUT A SPIN

SPINDLE RESET VALUES CHECK

⚠ **WARNING! THE RESET VALUE MUST BE CHECKED AFTER SELF-CALIBRATION**

1. Check the reset value
    a. Digital models
        i. Menu
        ii. Setup
        iii. Enter
        iv. CAL press MENU
        v. ENTER
        vi. CAL ON, arrow UP,
        vii. Ris.on press enter to see the reset values
    b. Touch video models
        i. Menu
        ii. Calibrations
        iii. Password 1357
        iv. Self-calibration
        v. Key 
        vi. Password 1357
        vii. Keep the key pressed 

⚠ **WARNING! THE RESET VALUE MUST BE LESS THAN 6 GRAMS**

BALANCING MACHINE SELF-DIAGNOSTICS

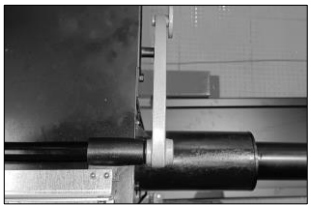
1. Access the self-diagnostic page (see relevant instructions)
2. (Only for digital machines) Check the processor board LED operation
3. Encoder check

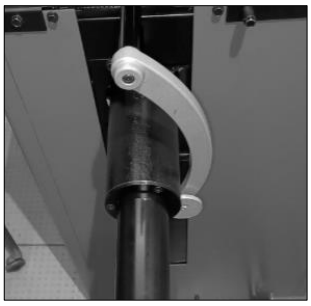
💬 WHEN ROTATING THE SPINDLE CLOCKWISE BY HAND ONE "DEGREE" AT A TIME, THE SYSTEM MUST SHOW ALL NUMBERS BETWEEN 0 AND 255 (AND BETWEEN 255 TO 0 WHEN ROTATING COUNTERCLOCKWISE)

4. Inc (digital models) Phase (video models)
    a. This value must be between 350 and 10 or between 170 and 190
5. Piezoelectric sensors (static and dynamic) check
    a. Digital models R.1 and R.2: value approx. 200
    b. Video models Ril I and Ril E: value approx. 2000
    c. Press on the flange to change the value.

💬 IF YOU STOP PRESSING ON THE FLANGE, THE VALUE RETURNS TO THE INITIAL VALUE

6. Check
    a. Gauge at rest
        i. Digital machines, value -a-:5-25
        ii. Video machines, Dist value: 50-250
    b. Extract the rod to the stroke end
        iii. The value must never go to zero





7. Check
    a. Gauge in position P1
        i. Digital machines, value -d-:5-25
        ii. Video machines, Diam value: 50-250
    b. Rotate the gauge along the entire stroke
        iii. The value must never go to zero

8. (If present) LA (sonar1) and EMS (sonar2) sonar operation check
    a. Put a hand in front of the sonar, the value should change

THE FULL-SCALE VALUE IS 65,000

9. (If present) Laser line operation check
    a. Digital machines
        i. Press arrow UP or DOWN
        ii. With LSr.On the LED switches ON
        iii. With LSr.Off the LED switches OFF
    b. Video machines
        i. Click OUTPUT
        ii. Click Laser
10. Lifted spin unit microswitch operation check
    a. Digital machines bP
    b. Video machines (self-diagnostic page) uS M
        i. ON spindle up
        ii. OFF spindle down

AUTOMATIC SPINS

WARNING! CARRY OUT ONLY WITH AUTO WHEEL

1. Select tyre type (AUTO)
2. Access the automatic spins page
    a. Digital balancing machines:
        i. MENU> SETUP> DIAGNOSTIC> CAL> press MENU> STOP> MENU >SPINS.
        ii. Select the number of spins to be carried out
        iii. Start the cycle
            1. (if present) Lower the guard
            2. Press Start cycle pushbuttons
    c. Video and video touch balancing machines
        i. Access the self-diagnostics > Spanner > enter password 1357 > Automatic spins (Key 4) 
        ii. Set the number of spins and pause time
        iii. Lower the guard

WARNING: AS DURING ANY OTHER TYPE OF SPIN, IT IS IMPORTANT NOT TO TOUCH THE MACHINE

IT IS ADVISABLE TO CARRY OUT 3 CYCLES OF 20 SPINS,
USE A MEDIUM SIZE (16-INCH) STEEL WHEEL AND DYNAMIC UNBALANCE OF APPROXIMATELY 0 GRAMS.

3. Check the measured weight change

THE MAXIMUM CHANGE THAT CAN BE AUTOMATICALLY ACCEPTED IS 2 GRAMS

TEST SPINS

1. Fit the CAR wheel with steel rim
    a. Balance it at 0g of dynamic unbalance
    b. Carry out the following operations:
        i. 5 spins without additional weights
        ii. 5 spins with a 60g weight on the internal side
        iii. 5 spins with a 60g weight on the external side

⚠ **WARNING! NEVER CHANGE THE WHEEL POSITION BETWEEN SPINS**

2. After each spin, check the measured unbalance
    a. The difference between two spins must be less than 5g
    b. Pressing END or press on the unbalance in case of touch machine

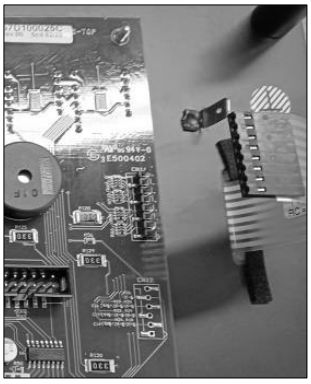
⚠ **WARNING! AUTOADAPTIVE® FUNCTION DISABLED**

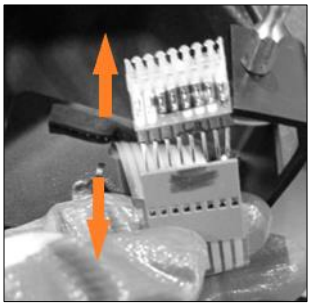
INITIAL CALIBRATIONS RESET

1. Carry out the following operations:
    a. Init novram
    b. Spindle reset (see service manual)
    c. Gauges calibration: distance, diameter (see operation manual)
    d. Laser line calibration (see operation manual)
    e. LA sonar calibration (see operation manual)
    f. Machine self calibration (see operation manual)

LEXAN PANEL REPLACEMENT

1. Access the panel
    a. Remove the flat cable from the board or extension





2. Detach the keyboard adhesive from the support panel and remove it

⚠ **WARNING! CLEAN THE SUPPORT PANEL WITH ALCOHOL SO THAT THE NEW PANEL WILL STICK CORRECTLY**

3. Install the new panel
    a. Detach the bi-adhesive protection
    b. Insert the flat cable in the slot on the frame
    c. Stick the new panel respecting the slots for the displays

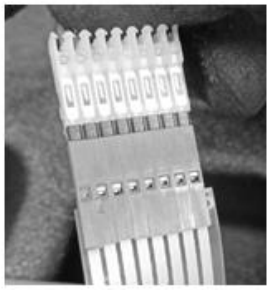
⚠ **WARNING! THERE SHOULD BE NO AIR BUBBLES LEFT BETWEEN ADHESIVE AND SUPPORT PANEL**

    d. Connect the flat cable to the board or extension

⚠ **WARNING! FOR MODELS WITH EXTENSION, SECURE THE COUPLING WITH INSULATING TAPE**

⚠ **WARNING! DO NOT BEND THE FLAT CABLE**

    e. Install the panel on the machine



TROUBLESHOOTING

Date:	Technician:	
Model:	Serial number:	Software version:

The purpose of this form is to guide a qualified technician through a series of basic checks on balancing machines with problems not caused by clearly faulty components.

It collects also the full range of information required for any communication with the manufacturer.

Fault found (Describe in detail the problem found on the machine)

Error code

> THE ERROR CODES AND THEIR RELEVANT MEANING AND TROUBLESHOOTING ARE LISTED AT THE END OF THE INSTRUCTION MANUAL: PROCEED AS INDICATED

Instruments required for checks and calibrations:

- Medium-size wheel, steel rim, standard tyre, central hole in good conditions.
- Clamp-on type weight, 60 grams
- Full manual of the balancing machine: instructions, maintenance, and exploded views.

> ⚠ **WARNING! DEACTIVATE THE AUTO ADAPTIVE FUNCTION DURING THE CHECKS**
> ⚠ **WARNING! REACTIVATE THE AUTO ADAPTIVE FUNCTION AFTER TROUBLESHOOTING**

General mechanical checks

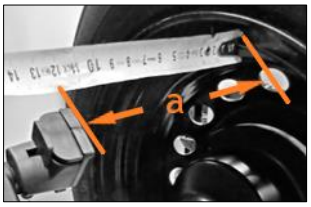
1. Check the flange and the shaft: they must be clean and in good conditions.
2. Cones and/or accessories are in good conditions
3. Disassemble and reassemble the terminal; clean the coupling surfaces
   > THE CONES MUST SLIDE WITH NO INTERFERENCE
4. The machine is firmly resting on the floor
5. Check the correct operation of the guard (see guard microswitch and spring setting)
6. The wheel keeps its position during the spin
   a. Use a marker pen to mark the tyre and flange in the same position
   b. Carry out 3 spins
   c. Check that the references are in the same position
7. Measure the motor belt tension (see belt tensioning)
8. Check the motor magnetic brake (see magnetic brake setting)
9. The gas springs are in position.

Check the correct operation of the components of the balancing machine (see balancing machine self-diagnostics)

1. Encoder
2. Crossing value:……
3. Check the correct operation of the piezo
4. Distance potentiometer –a-:
    a. Value with gauge at rest:……
    b. Value with gauge at end of stroke:……
5. Diameter potentiometer –d-
    a. Value in position P1:……..
    b. Value at end of stroke:……..
6. LA sonar
    a. Value with guard open:……..
    b. Value with wheel on spindle and guard closed:…….

Wheel measurement check

1. Take the steel wheel and fit it on the balancing machine
    a. Measure the wheel with a manual gauge
        i. Width……..
        ii. Diameter……
        iii. Distance between wheel and gauge index……
    b. Measure the wheel with the balancing machine gauge
        i. Diameter……
        ii. Width……..
        iii. Distance between wheel and gauge index……



Measure the distance between wheel and gauge index

Repeatability test (see automatic spins)

1. Repeatability on 20 spins, test 1
    a. I_{max}=.....
    d. E_{max}=.....
2. Repeatability on 20 spins, test 2
    a. I_{max}=.....
    e. E_{max}=.....
3. Repeatability on 20 spins, test 3
    a. I_{max}=.....
    f. E_{max}=.....

Steel wheel balancing

⚠ **WARNING! AUTOADAPTIVE DISABLED AND CHECK WITH 1-GRAM RESOLUTION**

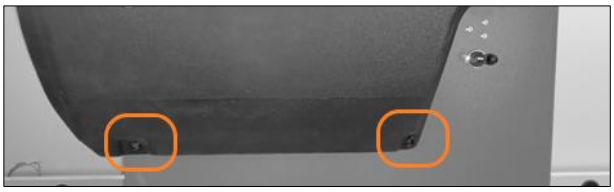
1. Centre the wheel with the cone from the outside, and carry out the balancing
    a. Internal unbalance……
    b. External unbalance……
2. Add the correction weights
    a. Internal weight added……..
    b. External weight added……..
3. Check the residual unbalance
    a. Internal residue……..
    b. External residue……..

Aluminium wheel balancing

⚠ **WARNING! AUTOADAPTIVE DISABLED AND CHECK WITH 1-GRAM RESOLUTION**

1. Centre the wheel with the cone from the inside, and carry out the balancing
    a. Internal unbalance……
    b. External unbalance……
2. Add the correction weights
    a. Internal weight added……..
    b. External weight added……..
3. Check the residual unbalance
    a. Internal residue……..
    g. External residue……..

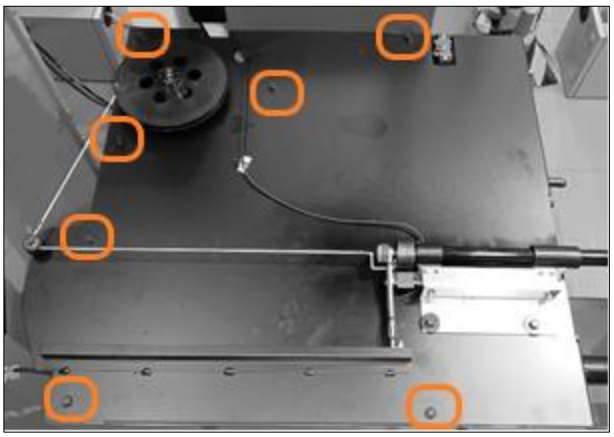
WEIGHT TRAY AND GAUGE PLATE REMOVAL



⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

1. Unscrew the weight tray shelf fastening screws

2. (If present) Disconnect the cycle start button faston connectors
    a. Remove the weight tray shelf



3. Unscrew the gauge plate fastening screws
    a. Rest the gauge plate on a stable support to prevent tearing the potentiometer cables

4. Install the gauge plate and the weight tray shelf following the disassembly instructions in the reverse order

⚠ **WARNING! NO CABLES SHOULD REMAIN STUCK TO THE BASEPLATE**

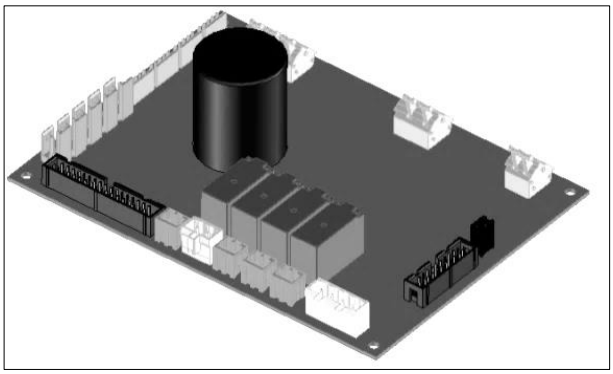
ELECTRICAL MAINTENANCE

⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

1. Remove the weight tray shelf and the gauge plate (see relevant instructions)
2. Power board
   a. Disconnect all cables
   b. Act on the white mounting clips to remove the board from the support plate.

   ⚠ **WARNING! CARRY OUT THE WIRING AS SHOWN ON THE WIRING DIAGRAM**

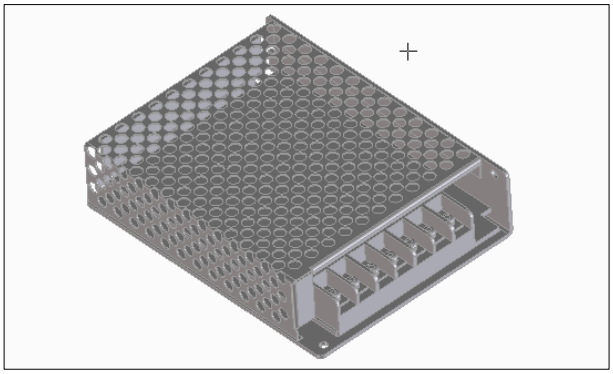
   c. Reset the spindle (see technical service manual)
   d. Carry out the self calibration (see operation manual)



3. Power supply
   a. Disconnect all cables from the power supply.
   b. Unscrew the fastening screws on the plate

   ⚠ **WARNING! CARRY OUT THE WIRING AS SHOWN ON THE WIRING DIAGRAM**

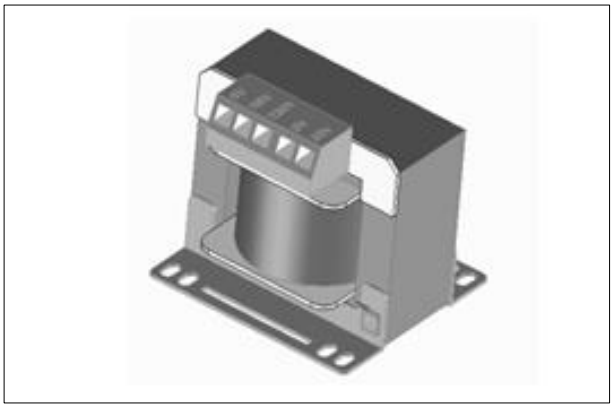
   c. Reset the spindle (see technical service manual)
   d. Carry out the self calibration (see operation manual)



4. Self-transformer
   a. Disconnect all cables from the transformer.
   b. Unscrew the fastening screws on the plate

   ⚠ **WARNING! CARRY OUT THE WIRING AS SHOWN ON THE WIRING DIAGRAM**

   c. No calibration to be carried out



FUSES REPLACEMENT

⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

1. Extract the fuse support
    a. Replace the fuses

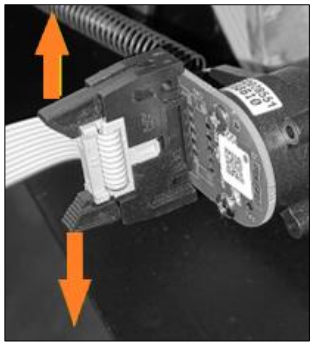
⚠ **WARNING! MAKE SURE THAT THE NEW FUSE HAS THE CORRECT AMPERAGE**

ENCODER REPLACEMENT

⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

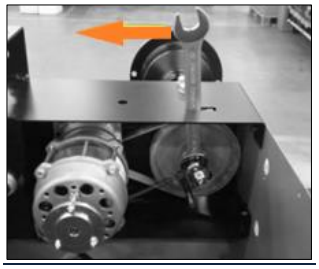
FOR TRUCK BALANCING MACHINES, GO TO STEP 2

1. Remove the weight tray shelf and, if present, the flame guard plate (see the relevant instructions)
   CONTINUE TO STEP 3
2. Lift the spin unit (see relevant instructions)
   a. Remove the weight tray shelf and the flame guard plate (see relative instructions)
   b. Disassemble the mat from the upper part of the spin unit (see relevant instructions)
3. Open the clips securing the flat cable
   a. Disconnect the flat cable from the encoder board

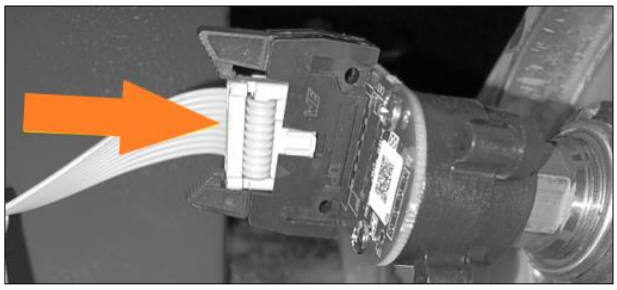


4. Remove the encoder board spring

5. Unscrew the 15mm nut of the encoder
   ROTATE THE CUP IN THE DIRECTION SHOWN BY THE ARROW
   THE SCREW HAS A LEFT HAND THREAD



6. Install the encoder following the disassembly instructions in the reverse order

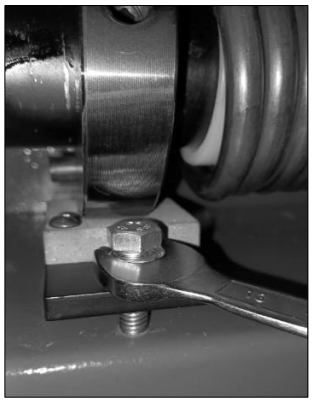


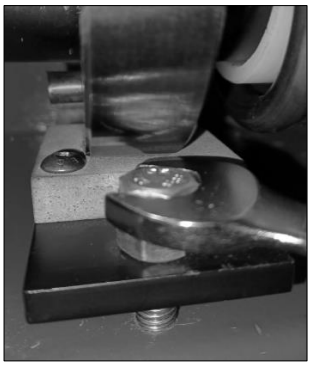
7. Carry out the following operations:
   a. Reset the spindle (see service manual)
   b. Machine self calibration (see operation manual)

GUARD CLOSURE ADJUSTMENT

1. Adjust the position of the guard brake lever
    a. Unscrew the lock nut
    b. Adjust the screw
    c. Secure the lock nut

⚠ **DANGER! THE GUARD SHOULD CLOSE ONLY IF LOWERED BY THE OPERATOR**





GUARD MICROSWITCH REPLACEMENT

⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

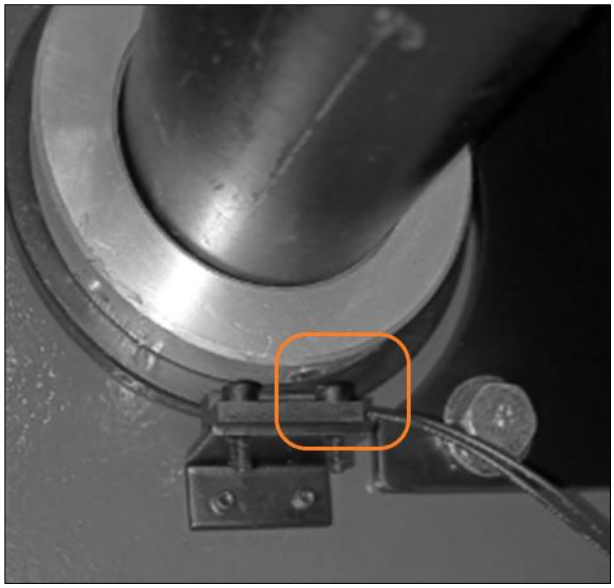
1. Remove the weight tray shelf and the gauge plate (see relevant instructions)

2. Disconnect the guard closed from board microswitch connector
    a. Unscrew the microswitch securing screws
    b. Replace the microswitch

⚠ **WARNING! REFER TO THE WIRING DIAGRAMS**

⚠ **WARNING! WITH THE GUARD CLOSED, MAKE SURE THAT THE MAGNET IS IN CORRESPONDENCE OF THE SCREW NEAR THE BASEPLATE**

    c. Install the gauge plate and the weight tray shelf (see relevant instructions)

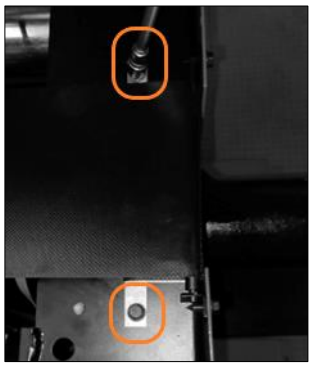


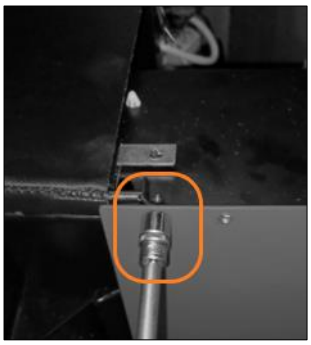
MAT REPLACEMENT

DISASSEMBLY

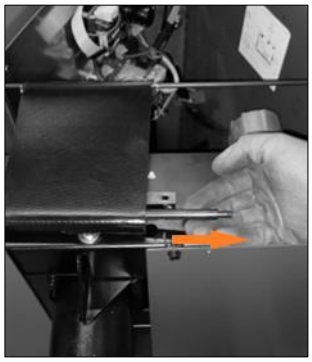
⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

1. Lift the spin unit (see relevant instructions)
2. Remove the weight tray shelf and the gauge plate (see relevant instructions)





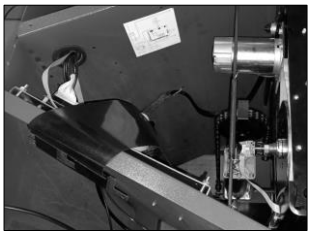
3. Disassemble the mat from the upper part of the spin unit
    a. Unscrew the screws fastening the plate for the mat
    b. Unscrew the screws fastening the square for the right side roller



    c. Remove the roller sliding pin

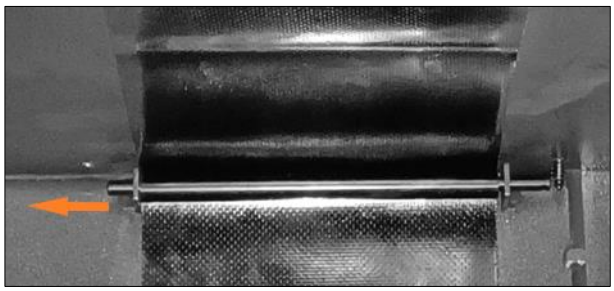
💬 FOR THE SOLE ACCESS TO THE VARIOUS COMPONENTS OF THE SPIN UNIT
- REST THE MAT ON THE ELECTRONIC BOARD WALL

💬 TO REFIT THE MAT SEE THE INSTRUCTIONS AT STEP 5 OF THE INSTALLATION PARAGRAPH

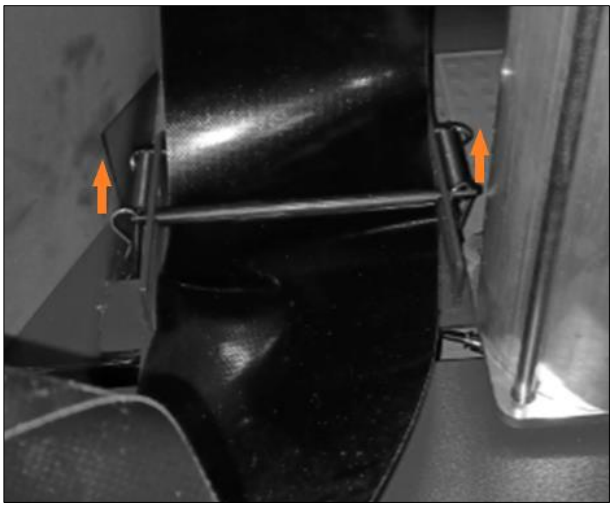


4. Unscrew the roller sliding pin stop screws
    a. Remove the roller sliding pin from the internal supports

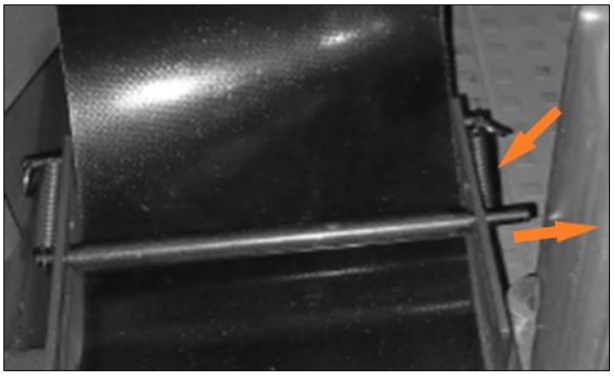
💬 IT IS ADVISABLE TO ACCESS MANUALLY THROUGH THE SLOT ON THE SIDE OF THE SPINDLE



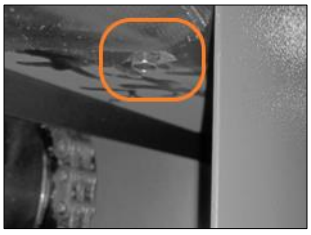
5. Remove split pins securing the roller sliding pin
   - IT IS ADVISABLE TO ACCESS MANUALLY THROUGH THE SLOT ON THE SIDE OF THE SPINDLE



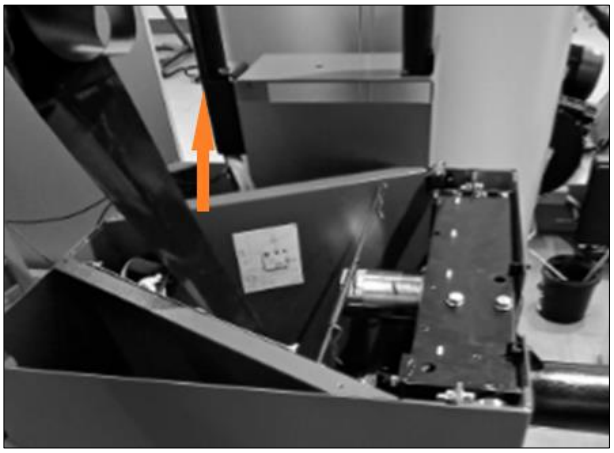
6. Remove the springs
   a. Remove the roller sliding pin



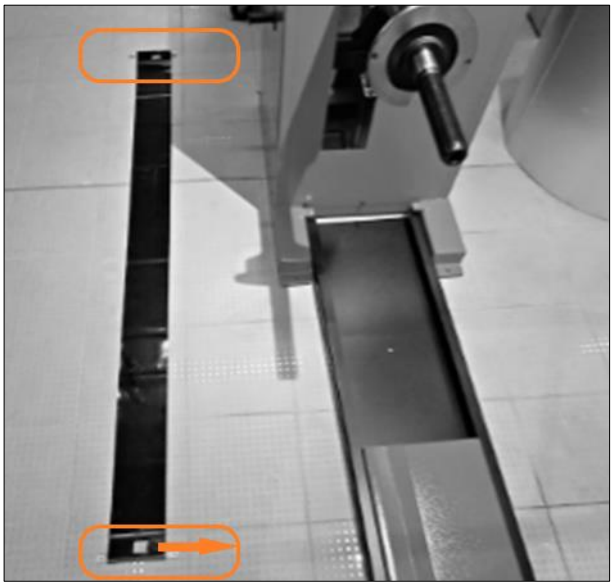
7. Unscrew the mat fastening screws from the lower part of the spin unit



8. Extract the mat from the baseplate



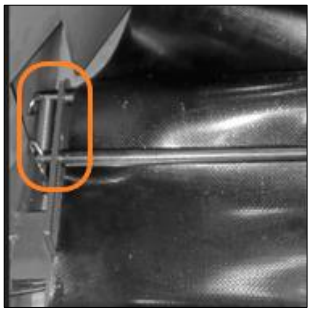
ASSEMBLY



- CARRY OUT THIS OPERATION ON A CLEAN PLANE IN ORDER NOT TO CONTAMINATE THE MAT

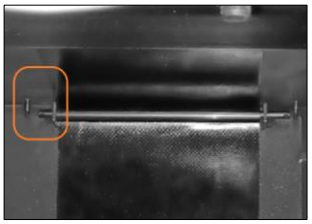
1. Identify the correct installation position for the mat
   - **WARNING! POSITION THE NEW MAT WITH THE POLISHED SIDE FACING UPWARDS**
   - **WARNING! POSITION THE SLOT CUT ON THE MAT (IT IS NOT CENTRED ON THE CENTRELINE) TOWARDS THE FRONT OF THE BALANCING MACHINE**

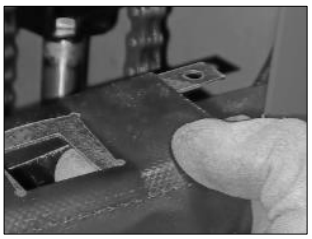
2. Insert the mat into the baseplate
   - **WARNING! MAKE SURE THAT THE MAT IS NOT TWISTED**
   - IT IS ADVISABLE TO ACCESS MANUALLY THROUGH THE SLOT ON THE SIDE OF THE SPINDLE

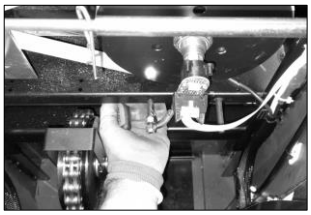


   a. Insert the roller sliding pin and the roller
   b. Position the spring on the roller
   c. Secure the pin with spin pins
   d. Repeat the spring positioning and the split pin fastening on the other side of the pin

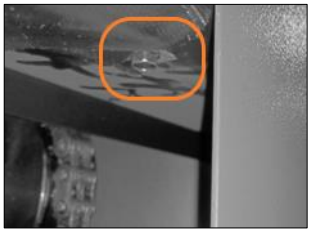
3. Insert the pin with the roller in the supports on the baseplate
   a. Secure the pin stop screw
   - ACCESS FROM THE SIDE TO THE SPINDLE, LIMITED ACCESS SPACE



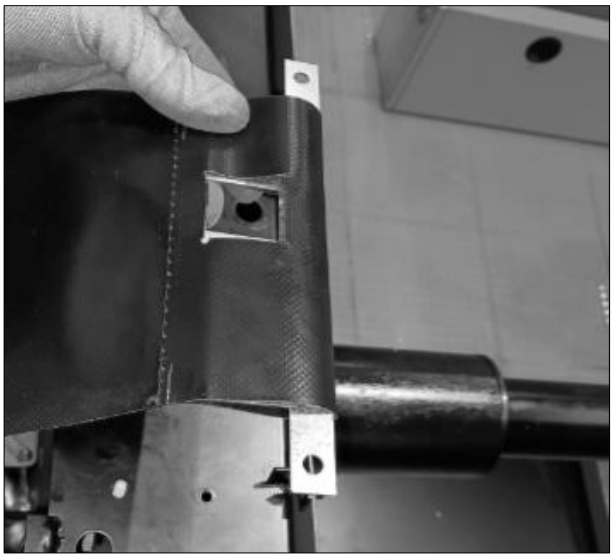




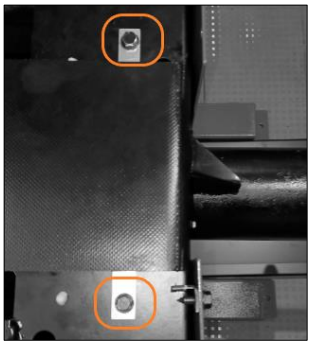
4. Secure the mat on the lower holes of the spin unit
   - TIGHTEN THE SCREWS FROM INSIDE THE BASEPLATE



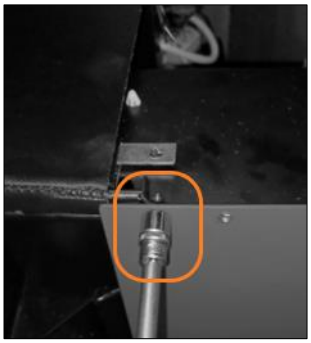
5. Install the mat from the upper part of the spin unit
    a. Insert the mat plate in its seat



    b. Fold the mat over the edge of the plate as shown in the photo
    c. Fasten the two plate fastening screws

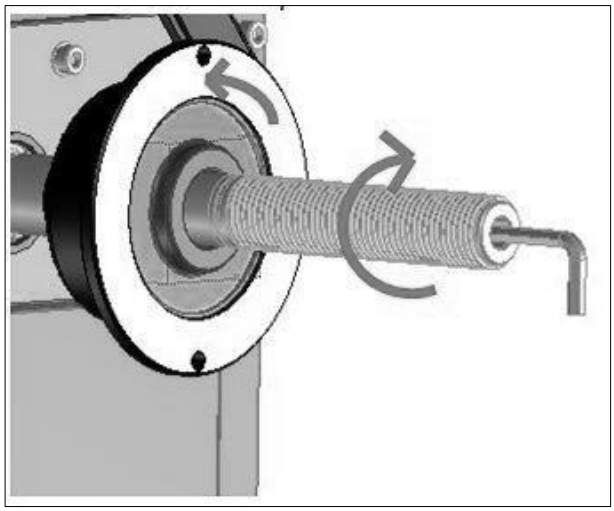


d. Insert the pin with roller in the fold created on the mat
e. Insert the pin on the two supports
f. Tighten the screw fastening the square for the right side roller
g. Lift and lower the spindle a few times to check that the mat slides correctly



6. Install the gauge plate and the weight tray shelf (see relevant instructions)

THREADED TERMINAL REPLACEMENT



⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

1. Install the terminal on the central hole of the shaft, inserting it fully.

   ⚠ **WARNING! THE COUPLING BETWEEN SHAFT AND TERMINAL IS VERY PRECISE**

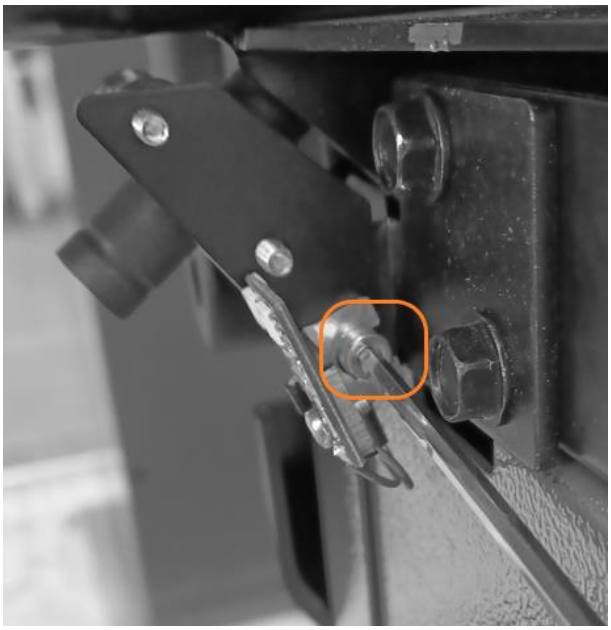
   THE ROTATIONS SHOWN IN THE PHOTO REFER TO THE INSTALLATION OF THE THREADED TERMINAL ON THE SPINDLE

2. Carry out the following operations:
   a. Reset the spindle (see service manual)
   b. Self calibration (see operation manual)

RIM LIGHTING LED REPLACEMENT

⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

1. Remove the weight tray shelf and, if present, the flame guard plate (see the relative instructions)
   - TAKE PHOTOS OF THE CABLE PASSAGE TO BE USED AS A REFERENCE FOR THE SUBSEQUENT INSTALLATION.
2. Disconnect the internal lighting LED connections from the circuit board
   - REFER TO THE WIRING DIAGRAM



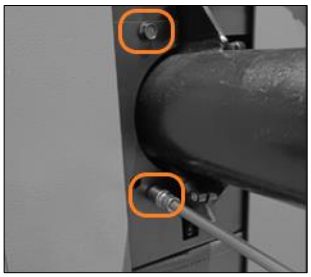
3. Extract the lighting LED from the baseplate
   a. Unscrew the fastening screw
   b. Replace the internal lighting LED

   ⚠ **WARNING! REFER TO THE WIRING DIAGRAM**
4. Install the flame guard plate and the weight tray shelf (see relevant instructions)
5. Check the wheel lighting LED
   a. Access the self-diagnostics
   b. Click ‘OUTPUT’
   c. Click ‘RIM INTERNAL LIGHT’ icon
      i. ON LED switched on
      ii. OFF LED switched off

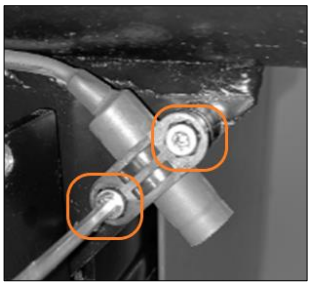
LASER LINE REPLACEMENT AND ADJUSTMENT

- FOR A CORRECT CALIBRATION IT IS ADVISABLE TO USE THE LASER CALIBRATION TOOL CODE 22RS88368
- **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

1. Lift the spin unit (see relevant instructions)
2. Unscrew the cover fastening screws



3. Use a 3 mm hexagonal socket head key to loosen the 2 screws
   a. Disconnect the connector
   b. Replace the laser
   c. Point the new laser with the two screws
   d. Secure the cover

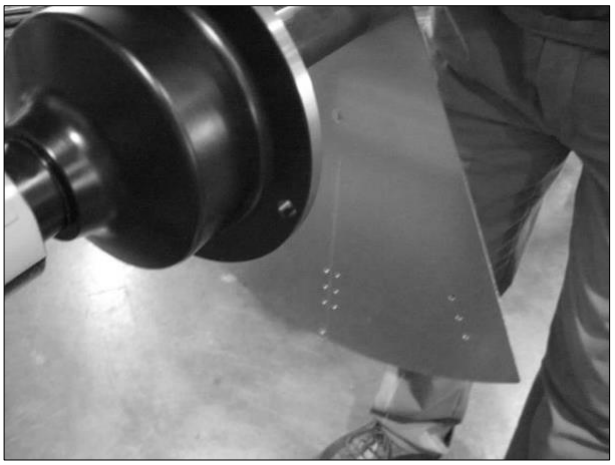


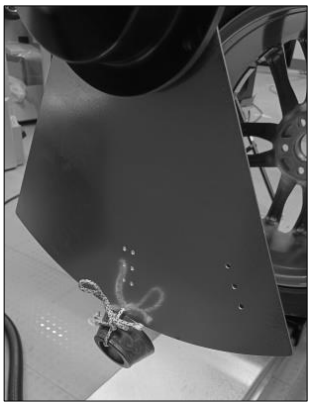
4. Switch on the machine
   a. Access self-diagnostics (see relevant instructions)
   b. Lsr on to switch on the laser line
   - FOR DIGITAL BALANCING MACHINES
     - ACCESS SELF-DIAGNOSTICS (SEE RELEVANT INSTRUCTIONS)
     - PRESS ENTER UNTIL THE VALUE "LSR" IS DISPLAYED
   - FOR VIDEO BALANCING MACHINES
     - ACCESS SELF-DIAGNOSTICS (SEE RELEVANT INSTRUCTIONS)
     - CLICK 'OUTPUT'

   c. Click 'Laser' (key 5)

- IF THE CALIBRATION TOOL IS NOT AVAILABLE, GO TO STEP 8

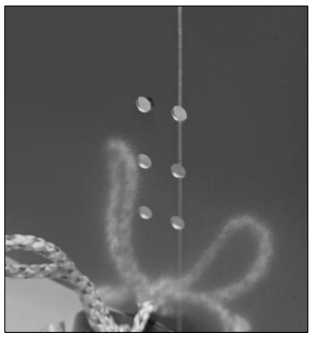
5. Fit the calibration tool on the spindle (without locking it).



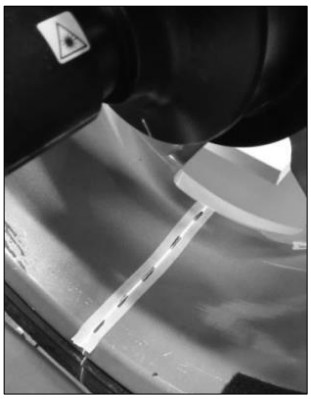


6. Apply a weight to the lower hole of the tool
   - (MAKE SURE THAT THE FLOOR UNDER THE MACHINE IS LEVELLED)

7. Rotate the laser to adjust it
   - THE LIGHT BEAM MUST BE DIRECTED ON THE SET OF 3 HOLES, AS SHOWN IN THE PHOTO.
   - ACCORDING TO THE MACHINE MODEL, ALIGN TO THE 6 O'CLOCK OR 5 O'CLOCK HOLES
     a. Tighten the laser support screw.
   - TURN ALTERNATIVELY THE TWO SCREWS BY A QUARTER OF A TURN



8. (without calibration tool) Take an alloy rim and use a marker pen to draw a line parallel to the spindle
   a. Adjust the laser position; once aligned with the line, tighten the screws
   - TURN ALTERNATIVELY THE TWO SCREWS BY A QUARTER OF A TURN

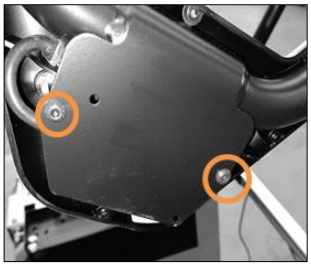


LA SONAR REPLACEMENT

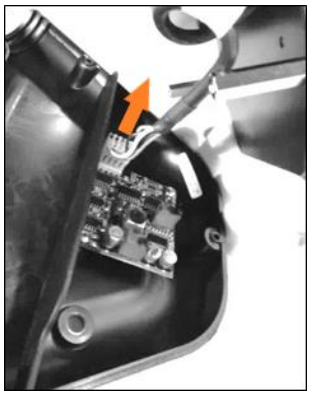
⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

1. Use a crosshead screwdriver to unscrew the 4 screws
    a. Remove the outer shell

2. Unscrew the 2 sonar holding screws



3. Disconnect the cable from the board



4. Install the sonar carrying out the disassemble instructions in the reverse order
    ⚠ **WARNING! RESPECT THE CABLE PASSAGE TO AVOID CUTTING IT**

5. Carry out the following operations:
    a. LA sonar calibration (see operation manual)

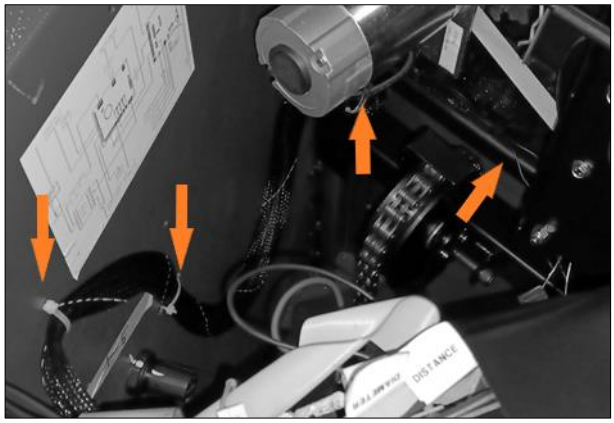
BRAKE REPLACEMENT

DISASSEMBLY

⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

1. Lift the spin unit (see relevant instructions)
2. Remove the weight tray shelf and the gauge plate (see relevant instructions)
3. Remove the mat from the upper part of the spin unit (see relevant instructions)
4. Disassemble the encoder (see relevant instructions)

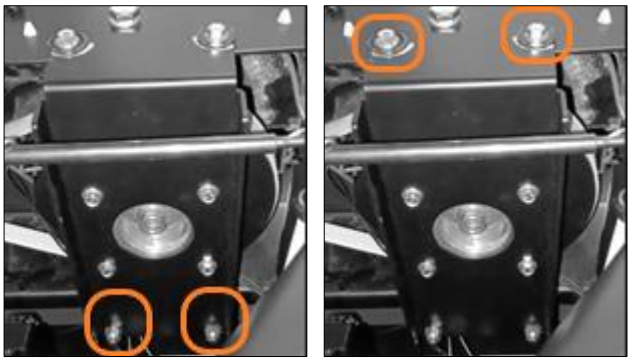
   IT IS ADVISABLE TO TAKE PHOTOS OF THE CABLE PASSAGE TO BE USED AS A REFERENCE FOR THE SUBSEQUENT INSTALLATION



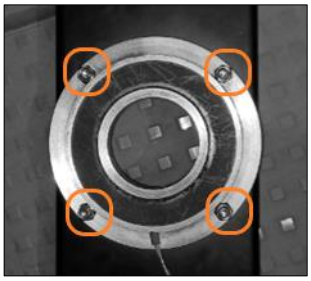
5. Cut the cable grip securing clamps from the baseplate
   a. Cut the clamps securing the brake cable to the spin unit
   b. Remove the brake connector from the board

   REFER TO THE WIRING DIAGRAMS

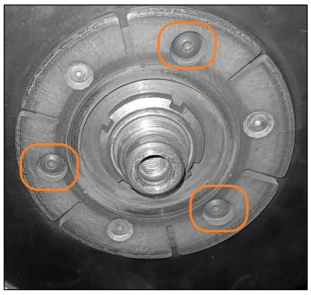
   c. Remove the brake cable from the cable grip



6. Disassemble the spindle brake support from the spin unit
   a. Unscrew the hexagonal nuts
   b. Unscrew the upper screws
   c. Extract the support



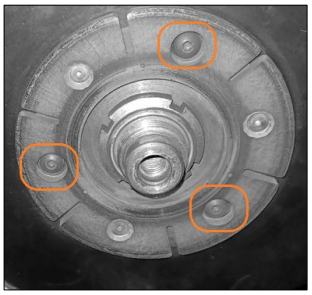
7. Unscrew the brake fastening screws and nuts

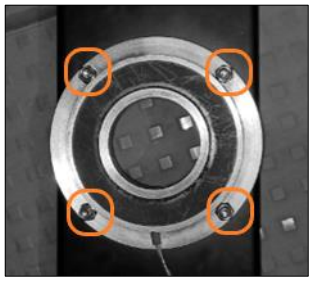


8. Unscrew the bowed screws securing the brake disc on the pulley

ASSEMBLY

1. Secure the brake on the pulley using the bowed head screws

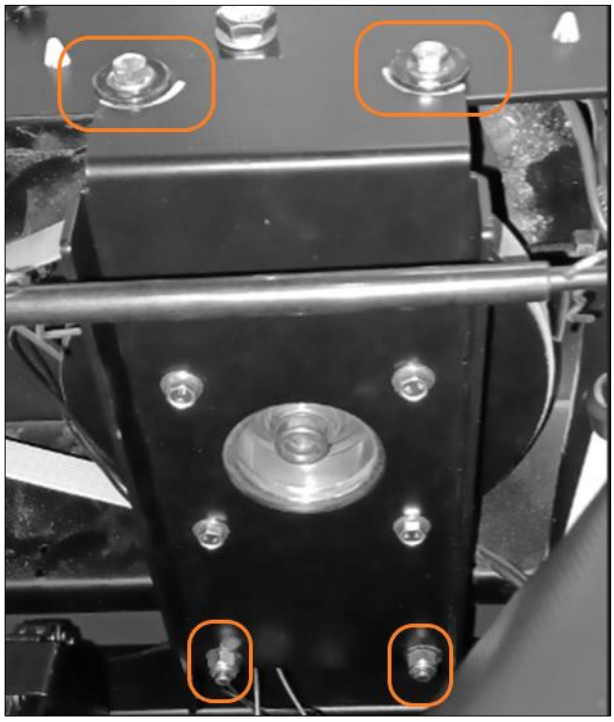




⚠ **WARNING! INSERT THE SERRATED WASHERS PROVIDED WITH THE BRAKE**

   a. Secure the brake on the support using screws and nuts

2. Install the brake support on the spin unit
   a. Secure the nuts
   b. Secure the screws



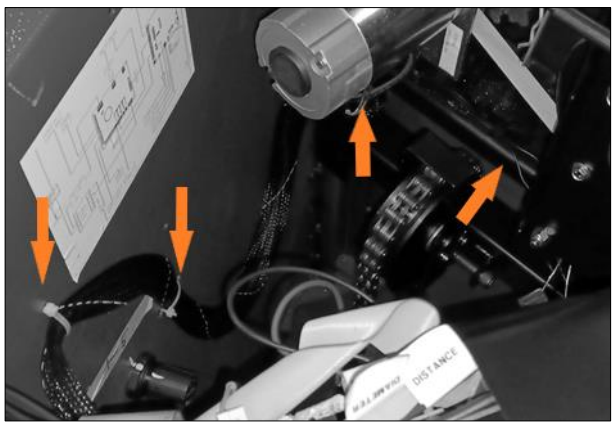
3. Insert the spindle brake cable in the cable grip
   a. Connect the brake cable connector on the board

⚠ **WARNING! REFER TO THE WIRING DIAGRAMI**

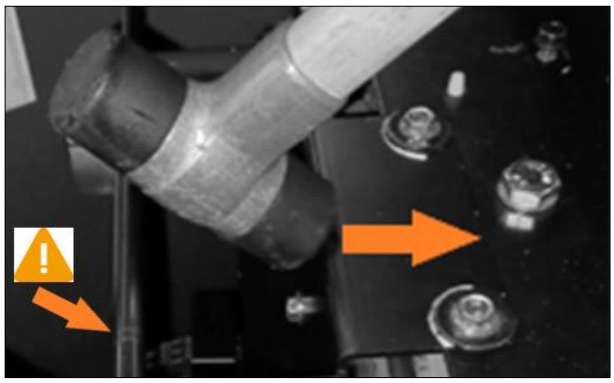
   b. Secure the cable grip on the walls of the baseplate using the retainers

⚠ **WARNING! REFER TO THE PHOTOS TO ENSURE A CORRECT LAYOUT OF THE CABLES**

   c. Secure the brake cable using retainers on the spindle frame

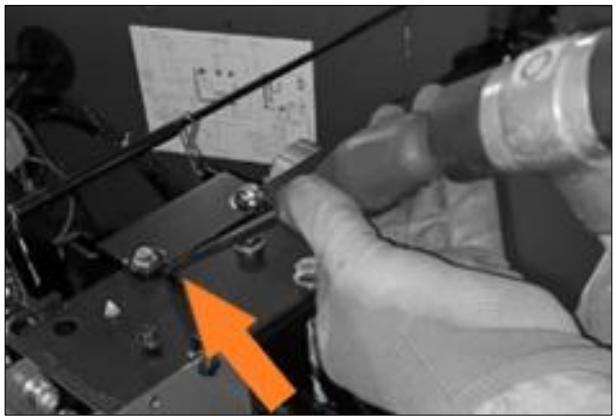



4. Check the distance of the brake from the disc
    a. Use a 0.2mm thickness gauge
    b. The shim must pass evenly on the entire surface of the disc
    c. Adjust the position if necessary
        i. Use a rubber hammer to move the brake support



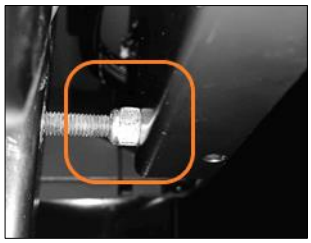
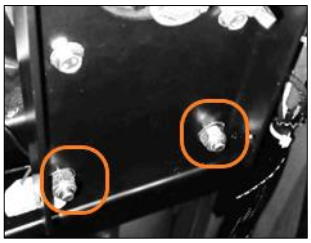
⚠ **WARNING! DO NOT HIT THE MAT TRANSMISSION PIN**

        ii. Acting on the lower nuts with a wrench



⚠ **WARNING! CAREFULLY ADJUST THE BRAKE DISTANCE**

- **IF THE BRAKE REMAINS IN CONTACT DURING THE SPIN, INCORRECT VALUES WILL BE DETECTED**
- **IF THE BRAKE IS TOO FAR, THE DISC ON THE PULLEY WILL BREAK**

5. Switch on the machine

⚠ **DANGER! LIVE CIRCUITS**

    a. Manually lock and release the brake a dozen times
    b. Check again the distance between brake and disc

Video machines

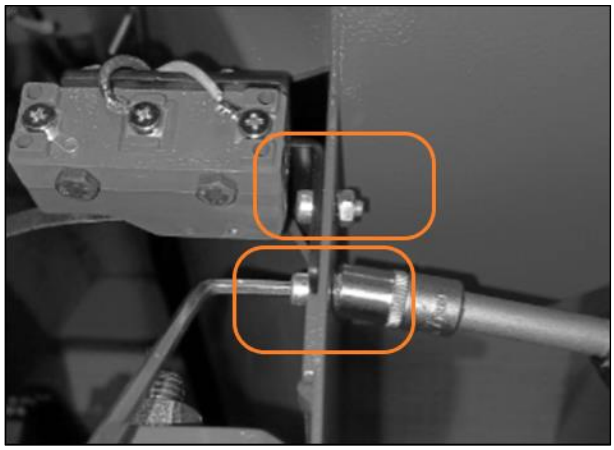
Digital machines

6. Install the encoder (see relevant instructions)
7. Install the mat on the upper part of the spin unit (see relevant instructions)
8. Install the gauge plate and the weight tray shelf (see relevant instructions)
9. Carry out the following operations:
    a. Reset the spindle (see technical service manual)
    b. Self calibration (see operation manual)

SPINDLE POSITION MICROSWITCH REPLACEMENT

⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

1. Close the pneumatic circuit (see relevant instructions)
2. Remove the weight tray shelf and the gauge plate (see relevant instructions)



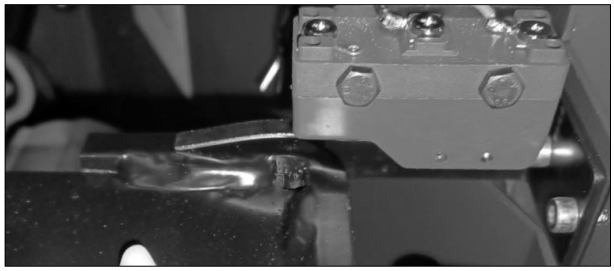
3. Disconnect the spindle limit microswitch connector from the board

   REFER TO THE WIRING DIAGRAMS

   a. Unscrew the microswitch securing screws
   b. Replace the microswitch

4. Open the pneumatic circuit (see relevant instructions)

   ⚠ **DANGER! THE SPINDLE COULD MOVE**



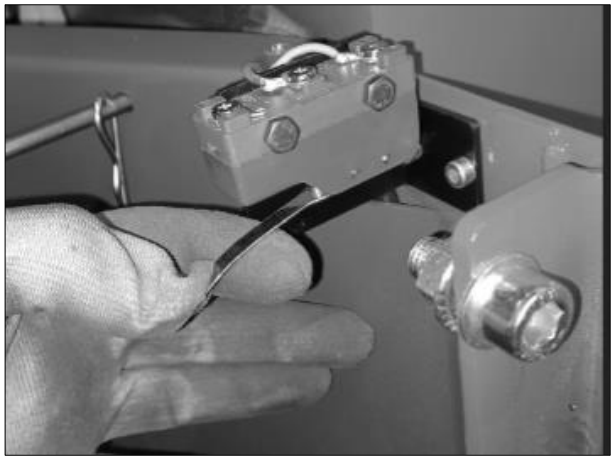
5. Lift the spindle (see relevant instructions)
   a. When the spindle reaches the end of stroke, a ‘click’ should be heard when the microswitch trips

   IF IT DOES NOT TRIP

   a. Lower the spindle (see relevant instructions)
   b. Bend the microswitch lever downwards
   c. Lift the spindle (see relevant instructions)

   ⚠ **DANGER! THE SPINDLE COULD MOVE**

   d. Make sure that the microswitch ‘clicks’



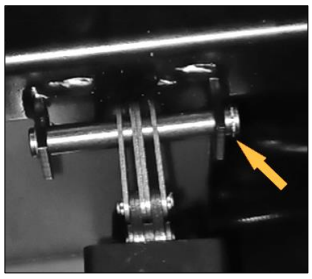
6. Install the gauge plate and the weight tray shelf (see relevant instructions)

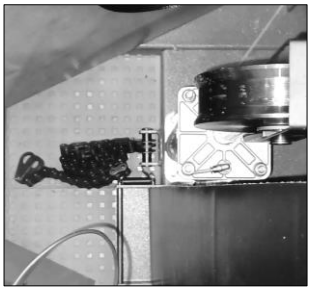
PULLEY SUPPORT REPLACEMENT

⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

1. Remove the weight tray shelf and the flame guard plate (see relative instructions)

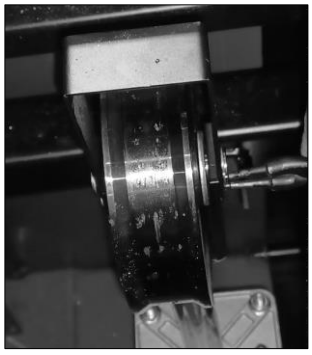
2. Position a stable mount to support the spindle
3. Close the pneumatic circuit (see relevant instructions)

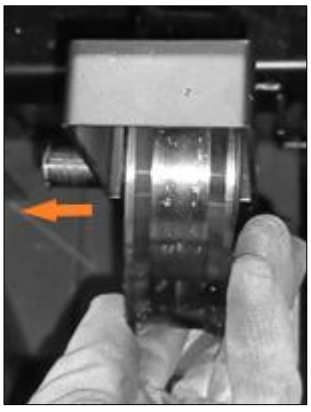




4. Remove the Seeger ring from the spindle chain pin
    a. Remove the pin
    b. Remove the chain from the pulley
5. Open the pneumatic circuit (see relevant instructions)

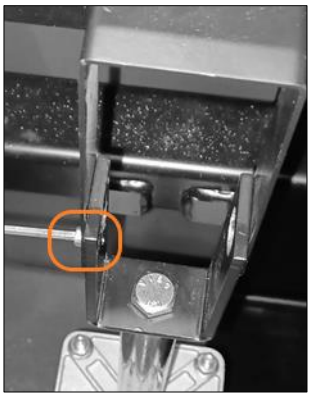
💬 THE CYLINDER RISES, GIVING BETTER ACCESS TO THE SUPPORT



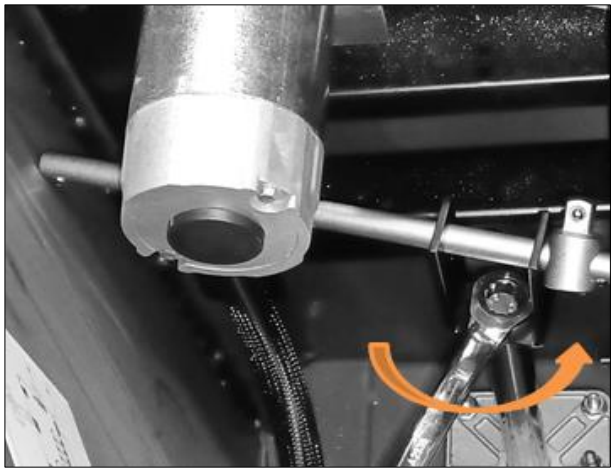


6. Remove the Seeger ring from the pulley pin
    a. Extract the pulley pin
    b. Remove the washers and the pulley

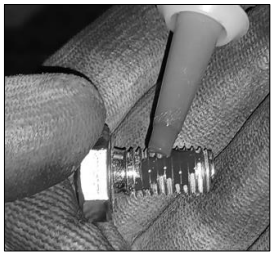
7. Unscrew the bracket securing screw



8. Insert a lever into the hole on the pulley support
    a. Unscrew the screw securing the support



9. Install the pulley support by following the removal instructions in the reverse order
    - ⚠ **WARNING! PUT SOME THREAD LOCK ON THE BRACKET MOUNTING SCREW (BLUE LOCTITE)**
    - ⚠ **WARNING! THE SUPPORT SHOULD NOT MOVE**



REPLACING THE SPINDLE

DISASSEMBLY

> ⚠ **DANGER! TO CARRY OUT THIS MAINTENANCE OPERATION IT IS MANDATORY TO USE A LIFTING DEVICE AND M12 EYEBOLT TO LIFT THE SPIN UNIT**

> ⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

1. Lift the spin unit (see relevant instructions)
2. Remove the weight tray shelf and the gauge plate (see relevant instructions)

> ⚠ **WARNING! TAKE PHOTOS OF THE CABLE PASSAGES AND FASTENING POINTS WITH RETAINERS FOR A CORRECT POSITIONING DURING REINSTALLATION**

3. Disassemble the terminal (see relevant instructions)
4. Disassemble the lifted spindle microswitch (see relevant instructions)
5. Disassemble the mat (see relevant instructions)
6. Disassemble the encoder (see relevant instructions)
7. Disassemble the spindle brake (see relevant instructions)

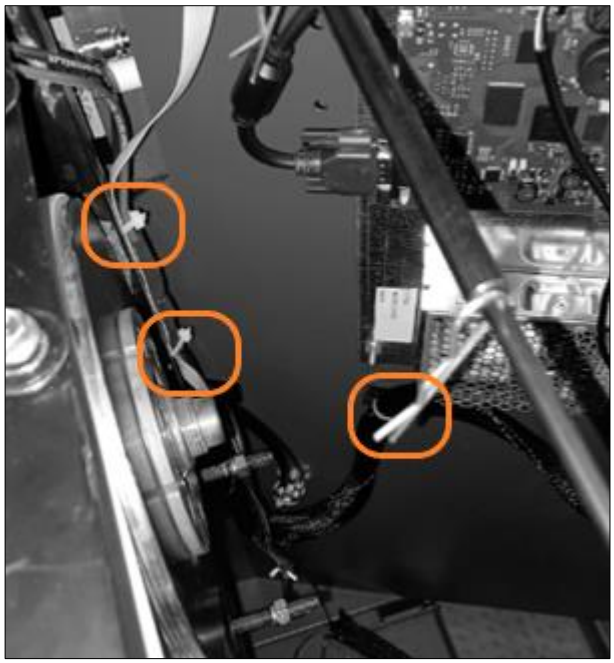
8. Disconnect the motor electric cables from the board

> REFER TO THE WIRING DIAGRAMS

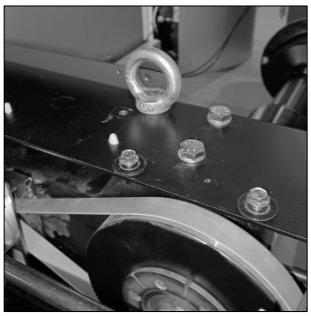
9. Disassemble the laser line (see relevant instructions)
10. Disassemble the internal lighting LED (see relevant instructions)

11. (If necessary) Disassemble the wheel positioning platform

12. Cut the retainers securing the cable grip containing piezo, encoder, internal lighting LED and laser line cables
    a. Disconnect the following connectors from the board:
    b. Piezoelectric
    c. Encoder
    d. Internal lighting LED
    e. Laser line



13. Insert the eyebolt on the spindle to lift the spin unit

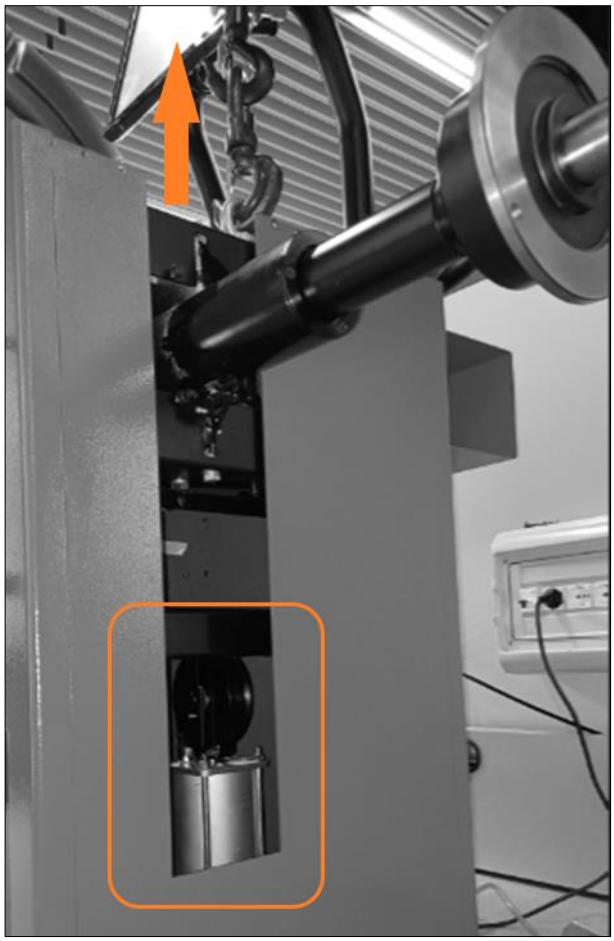


14. Engage the spin unit to the lifting means
    a. Lift the lifting means until tensioning the spindle

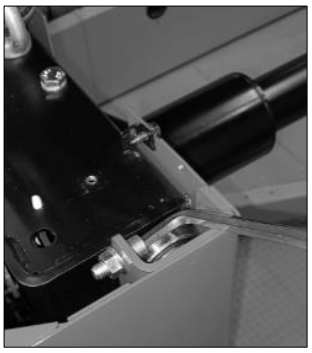
⚠ **DANGER! PAY ATTENTION, RISK OF CRUSHING**

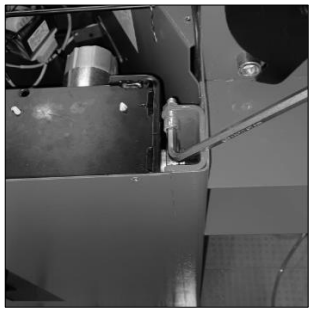
    b. Close the air circuit
    c. Lower the spin unit

THE CYLINDER LOWERS TO THE STROKE END, BUT THE SPINDLE REMAINS LIFTED BY THE LIFTING MEANS

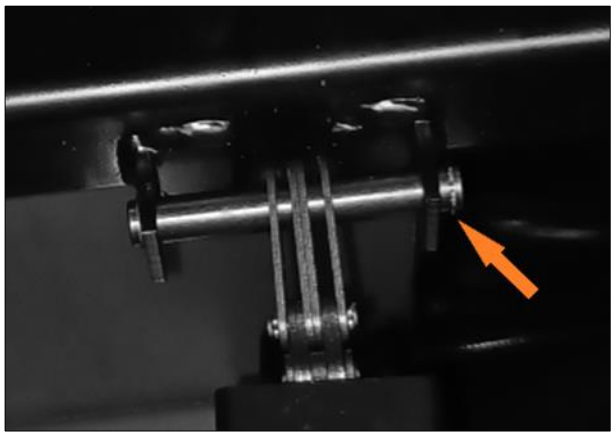


15. Unscrew the spindle fastening screws





16. Remove the seeger from the spindle chain pin
    a. Remove the pin

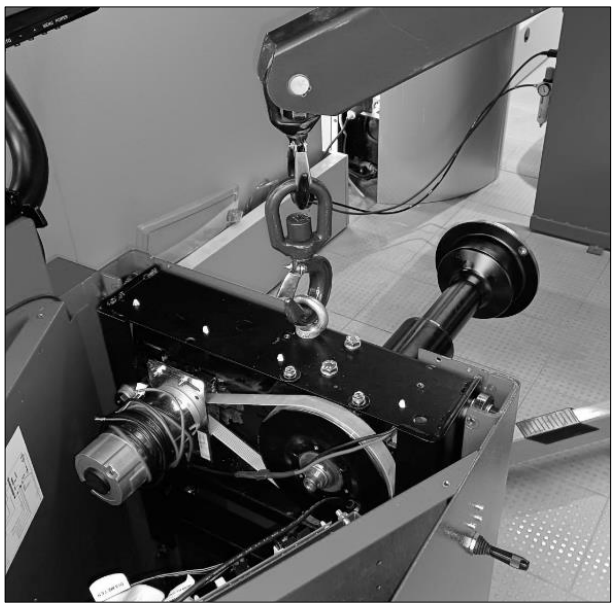


17. Remove the split pin and remove the mat transmission pin

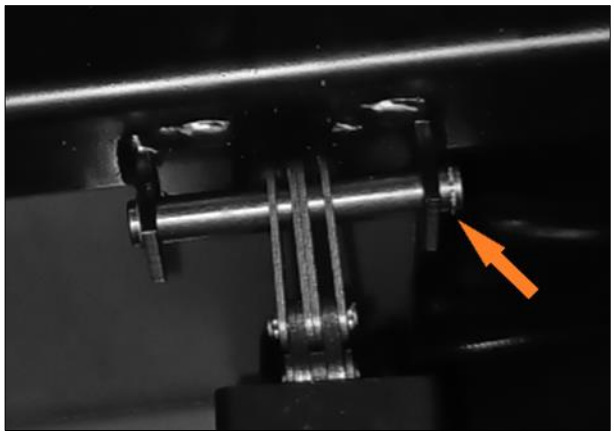
18. Extract the spin unit from the baseplate
    - ⚠ **WARNING! DURING THE REMOVAL, DO NOT DAMAGE THE WHEEL GUARD OR THE MACHINE MONITOR**
        a. Remove the following cables from the cable grip:
        b. Piezo sensors cable
        c. Motor cable

ASSEMBLY

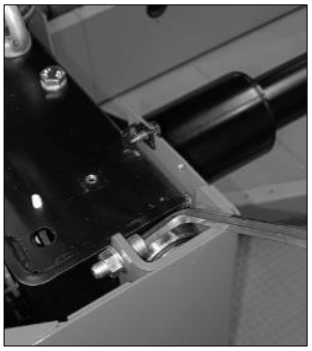
1. Insert the new spin unit in the baseplate

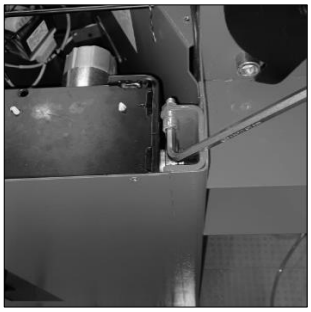


2. Insert the pin securing the chain to the spindle
    a. Secure using a seeger



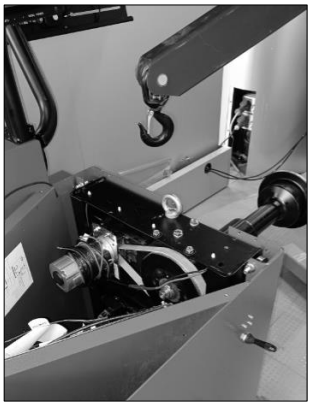
3. Install the spindle fastening screws



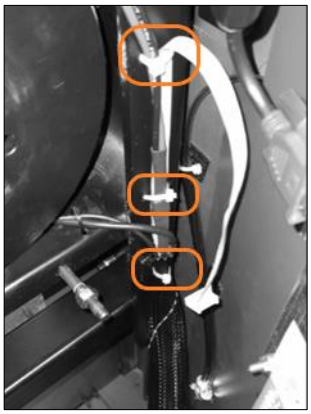


4. Open the pneumatic circuit (see relevant instructions)
    a. Lift the spindle (see relevant instructions)

5. Release the lifting means from the eyebolt
    a. Remove the eyebolt



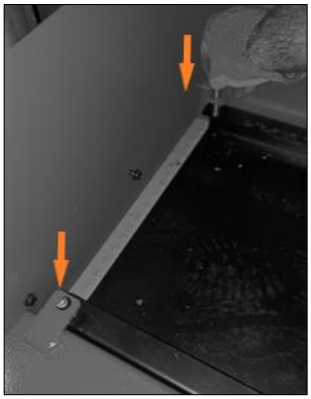
6. Install the internal lighting LED (see relevant instructions)
    a. Install the laser line (see relevant instructions)
    b. Insert the piezo, encoder, laser line and internal lighting LED cables in the cable grip
    c. Secure the cable grip and cables with the retainers to the spin unit and to the baseplate
    d. Insert the electrical connections in the boards



⚠ **WARNING! REFER TO THE WIRING DIAGRAMS**

7. Install the brake (see relevant instructions)
   - INSERT THE BRAKE CABLE AND THE MOTOR CABLE IN THE CABLE GRIP
     - INSERT THE MOTOR AND BRAKE CONNECTIONS IN THE BOARD

   WARNING! REFER TO THE WIRING DIAGRAMS
8. Install the encoder (see relevant instructions)
9. Install the spindle position microswitch (see relevant instructions)
10. Install the terminal (see relevant instructions)
11. Install the wheel positioning platform



12. Install the mat (see relevant instructions)
13. Install the gauge plate and the weight tray shelf (see relevant instructions)
14. Carry out 100 spins with medium car wheel (16-inch) to settle the belt
15. Carry out the following operations:
    a. Spindle reset
    b. Calibration of distance (CAL a) (see operation manual)
    c. Calibration of diameter (CAL d) (see operation manual)
    d. (If present) LA sonar check (see operation manual)
    e. (If present) EMS sonar check (see operation manual)
    f. Laser line alignment (see operation manual)
    g. Self calibration (see operation manual)

MOTOR AND BELT REPLACEMENT

DISASSEMBLY

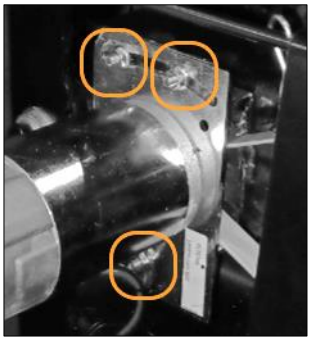
DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION

1. Lift the spin unit (see relevant instructions)
2. Remove the weight tray shelf and the gauge plate (see relevant instructions)
3. Disassemble the mat from the upper part of the spin unit (see relevant instructions)
4. Disassemble the encoder (see relevant instructions)
5. (If present) Disassemble the spindle brake support from the spin unit (see relevant instructions)

WHEN REPLACING ONLY THE BELT, GO TO STEP 7

6. Disconnect the motor wiring from the board
    a. Remove the ferrite from the motor cables
    b. Cut the cable grip retainers securing it to the baseplate
    c. Extract the motor cables from the cable grip

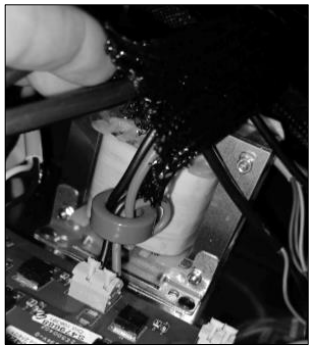
7. Remove the 10 mm hexagonal head nuts securing the motor plate
    a. Remove the motor or the belt



ASSEMBLY

WHEN REPLACING ONLY THE BELT, GO TO STEP 2

1. Insert the motor cables into the cable grip
    a. Wind one turn of motor cables on the ferrite
    b. Connect the motor cables to the board
    c. Secure the cable grip on the baseplate using retainers



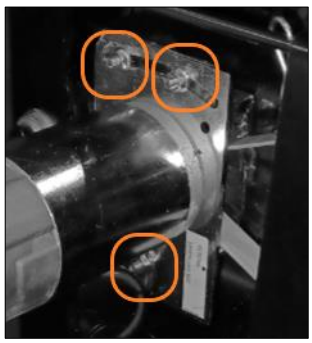
2. Fit the belt on the spindle pulley
    a. Fit the belt on the motor pulley

WARNING! THE BELT MUST OCCUPY THE FIRST RIM OF THE MOTOR PULLEY

WARNING! THE BELT MUST FULLY REST ON THE SPINDLE PULLEY

3. Point the three 10mm hexagonal nuts securing the motor holder plate

THE PLATE MUST SLIDE WITH NO CLEARANCE



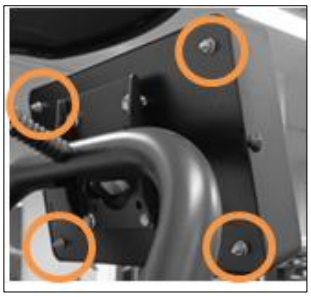
4. Tension the belt (see relevant instructions)
5. (if present) Install the spindle brake support (see relevant instructions)

6. Install the encoder (see relevant instructions)
7. Install the mat on the upper part of the spin unit (see relevant instructions)
8. Install the gauge plate and the weight tray shelf (see relevant instructions)
9. Carry out 100 spins with medium car wheel (16-inch) to settle the belt
10. Carry out the following operations:
    a. Reset the spindle (see technical service manual)
    b. Self calibration (see operation manual)

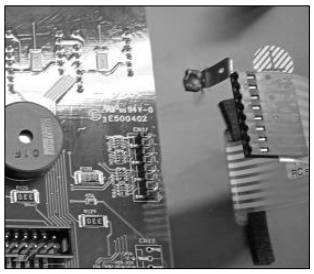
PROCESSOR BOARD REPLACEMENT

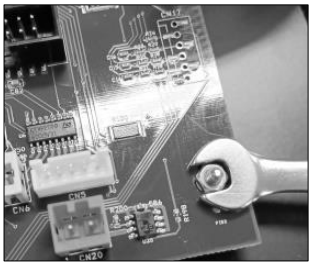
⚠ **DANGER! SWITCH THE MACHINE OFF AND DISCONNECT THE POWER SUPPLY CABLE BEFORE CARRYING OUT ANY ELECTRICAL OR MECHANICAL OPERATION**

1. Unscrew the two crosshead screws until extracting the cover



2. Unscrew the four 10mm hexagonal screws securing the panel
    a. Extract the panel
    b. Remove the electrical connections from the processor board





3. Disconnect the keyboard's flat cable
    a. Unscrew the four 5.5mm hexagonal nuts
    b. Replace the processor board

4. Repeat the disassembly operations in the reverse order to install the processor board
    ⚠ **WARNING! CENTRE THE GRAPHICAL DISPLAYS ON THE OPENINGS**
    ⚠ **WARNING! CARRY OUT THE WIRING AS SHOWN ON THE WIRING DIAGRAM**
    ⚠ **WARNING! CLOSE THE COVER WITHOUT BREAKING THE PLASTIC**

5. Carry out the following operations:
    a. Init novram (see technical service manual)
    b. Reset the spindle (see technical service manual)
    c. Calibration of distance (CAL a) (see operation manual)
    d. Calibration of diameter (CAL d) (see operation manual)
    e. (If present) Laser line check
    f. (If present) Spotter calibration (see operation manual)
    g. LA sonar check (see operation manual)
    h. Self calibration (see operation manual)