TORQUE CONVERTER AUTOMATED WELDER SV 10.004

CERTIFICATE
OPERATING MANUAL



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WARNING! Do not operate the WELDER without reading the contents of the certificate.

INTRODUCTION

This certificate, combined with the technical description and operating manual, is a document that certifies main parameters and technical characteristics of the Torque converter automated welder SV 10.004 (hereinafter called Stand) guaranteed by the manufacturer.

The document also contains the description and mode of functioning of the Stand, operating instructions and other information necessary to ensure the full use of the technical capabilities of this welder.

1 USE

The Stand is designed for centering and welding of the top and bottom parts of a torque converter. General view of the stand is shown in picture 1.1.

The stand must be operated in closed heated facilities under the following conditions:

16 Air temperature from +5 to +30 °C

16 Relative humidity 30 to 80%

16 Atmospheric pressure from 84 to 106 kPa

16 The power supply must meet the following requirements: 400±20 V, three-phase, 50±0,5 Hz.



Pic 1.1

2 SPECIFICATIONS*

№ п/п	Parameter	Value
1	Number of simultaneously welded torque converters	1
2	Max diameter of torque converter, mm	~450
3	Minimum speed of turntable, min^{-1}	0,01
4	Max speed of turntable, min^{-1}	3
5	The maximum diameter of the lower clamping chuck, mm	50
6	The maximum diameter of the upper clamping chuck, mm	125
7	Rotation angle control of the turntable	Programmable
8	Measuring method of torque converter's upper part clearance to be adjusted	Automatic Programmable
9	Power, consumed by the stand, not more than kW	9,7
10	Dimensions, mm	840x1120x2010
11	Weight, not more than kg	420

* The manufacturer has the right to make design and technical changes that do not involve degradation of equipment functionality.

3 PACKAGE CONTENTS

Package contents of SV 10.004 includes:

1. Stand SV 10.004 – 1 piece.
2. Certificate, operating manual – 1 piece.
3. Jaw chuck certificate – 2 pieces.
4. Chuck tool – 1 piece.
5. Indicator stand – 1 piece.
6. Needle indicator – 1 piece.
7. Welding machine with separate power source and wire feeder - 1 piece.
8. Welding torch - 1 piece.
9. Reverse chucks – 1 set

4 FUNCTIONAL DESIGN



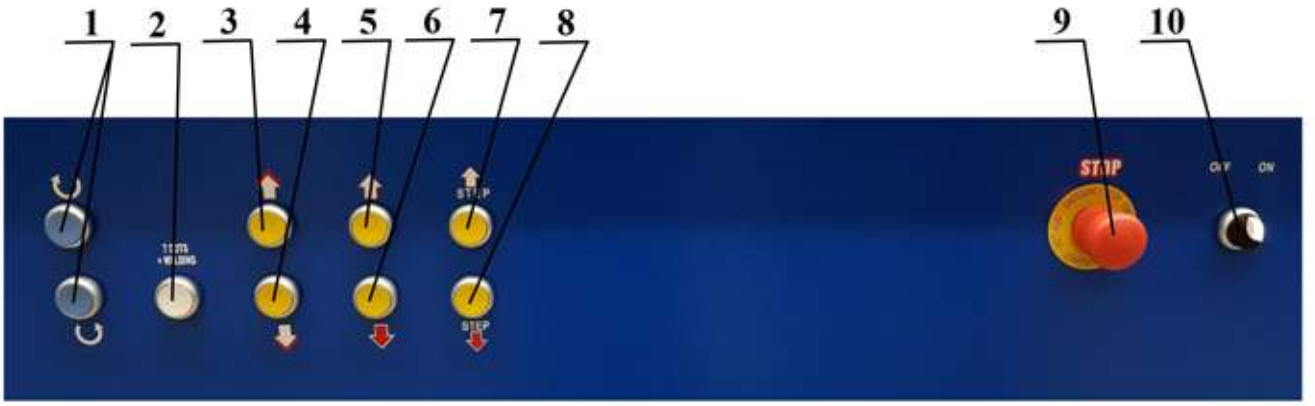
Picture 4.1 – Control elements of the stand

4.1 Composition of machine design:

1 – Body
2 – Chuck spindle
3 – Holder of welding torch pistol
4 – Turntable with face chuck
5 – Horizontal trimming bolts
6 – Lockbolts
7 – Vertical trimming bolts
8 – Welding torch pistol
9 – Touch switchboard (operator terminal)
10 – Welding machine feed device
11 – Control panel of the stand powertrain

4.2 Description of powertrains control panel

The control panel is shown in picture 4.2.



Pic.4.2 – Control panel

1 - rotation of the rotary machine without stopping, duplicates "CONTROL/ROTATE" button

2 - makes welding in automatic mode, setting uniformly in a circle 7 welding spots, then a continuous welding is being done, doubles 7 POINTS + WELDING button

3 – fast lift of the upper spindle. Moves only with pressed button. The speed of movement set in SETTINGS menu, doubles FAST▲ button

4 – fast descend of the lower arbor. Moves only with pressed button. The speed of movement set in SETTINGS menu, doubles FAST▼ button

5 - slow lift of the upper spindle. Moves only with pressed button. The speed of movement set in SETTINGS menu, doubles SLOWLY▲ button

6 – slow descend of the lower arbor. Moves only with pressed button. The speed of movement set in SETTINGS menu, doubles SLOWLY▼ button

7 - upper spindle moves up by a certain value and then stops. The amount of movement is set in the submenu "Settings". Duplicates STEP▲ button

8 - upper spindle moves down by a certain value and then stops. The amount of movement is set in the submenu "Settings". Duplicates STEP▼ button

9 – emergency STOP button

10 – Turn off the main power

5 SAFETY PRECAUTIONS

5.1 When working with the stand general requirements of the technical operation of electrical equipment and electrical appliances must be complied.

5.2 The stand body must be grounded.

6 MAKEREADY AND WORKING ARRANGEMENTS

The stand must be connected to 400V mains and be grounded. Check the connections of the power supply with the wire feeder of welder. Insert the welding wire (copper-coated with a diameter of 0.8 or 1.0 mm) in semiautomatic feeder, connect the burner, the gas cylinder (connect gear heater if necessary), make a trial welding manually on a piece of metal.

Check and if necessary - adjust the alignment of the upper and lower chucks with the procedure described below.

6.1 Work with the touch control panel (operator panel).

Care must be taken when working with the operator panel (Fig. 6.1.)! The operator panel is a complex electronic device with a resistive type touch screen (film sensor, triggered by pressing).

When working in dirty conditions, it is recommended to protect the screen surface with a transparent film; pressing the screen should not be too strong, so as not to push through the liquid crystal display.



Picture 6.1. Touch screen.

Working on operator touch screen involves selecting a menu item or mode, by lightly tapping the screen in the area defined by graphical boundaries with an appropriate inscription or symbol. Let's call this area a «button» for convenience.

After switching on power, the operator panel loads into its memory program for stand control within 10 - 30 seconds (Picture 6.1.1).



Picture 6.1.1 Loading window

Press «KINERGO» to go to the main menu (Picture 6.1.2).

MAIN MENU (Picture 6.1.2)



Picture 6.1.2 Main menu

WELDING button - jump to control menu and configuration of welding modes (Picture 6.1.4)

CONTROL button – jump to control menu and configuration of the stand while measurement of monitored parameters (Picture 6.1.6)

ROD STROKE button - jump to setup and control menu of the movement of the upper spindle with chuck (Picture 6.1.8)

3 IN 1 button - main mode of the stand, which allows to control and manage all functions (welding, rotating, moving the upper spindle) under optimal conditions (Picture 6.1.10)

MAIN SETTINGS button – jump to main settings menu (Pic 6.1.11).

KINERGO button – jump to loading screen (Picture 6.1.1)

STOP (Pic.6.1.3) button (on the whole screen) appears on the panel at the time of execution of continuous operations or programs, by pressing it you can interrupt the process at any time.



Pic.6.1.3

WELDING MENU (Picture 6.1.4):

1 POINT – the stand makes one welding spot specified in length settings

4 POINTS – the stand makes 4 welding spots one-by-one rotating the turntable by 180 degrees and then by 90 degrees and again 180

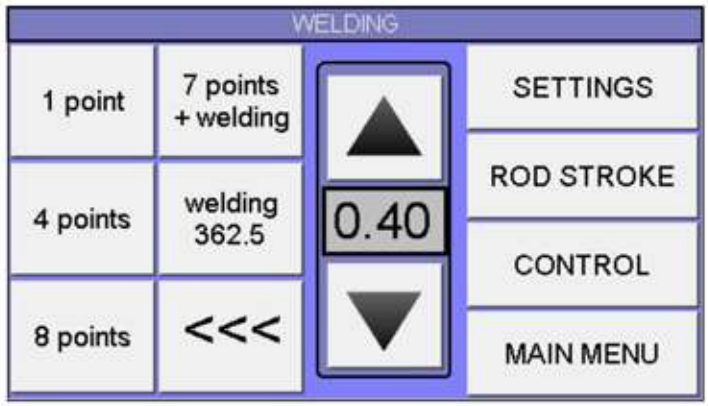
8 POINTS – the stand makes 8 welding spots according to algorithm similar to that described in «4 SPOTS»

7 POINTS + WELDING - makes welding in automatic mode, setting uniformly in a circle 7 welding spots, then a continuous welding is being done.

WELDING 362.5 - continuous welding with turning turntable to a predetermined angle at a predetermined speed.

>>> - «reverse» button - changes the direction of rotation of the turntable

▲ / ▼ - buttons to increase / decrease the speed of rotation of the turntable while welding, selected speed is shown in standard units (from 0.05 – Minimal to 10 - maximum) in the window between arrows.



Picture 6.1.4 "Welding" menu

ROD STROKE and CONTROL buttons – jump to the corresponding program menu (see below), MAIN MENU button - return to the previous page.

SETTINGS - jump to welding modes settings (Picture 6.1.5)



Picture 6.1.5 "Welding/Settings"

WELDING, DEGREE – allows you to set the angle of turntable rotation in automatic welding modes: «7 **SPOTS+WELDING**» и «**WELDING 362.5**»

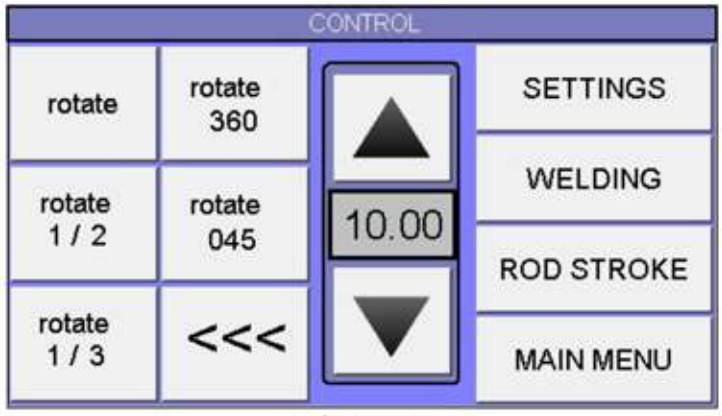
SECTOR WELDING SPEED – allows you to set the speed (in standard units), at which the turntable rotates during welding

WELDING SECTOR, DEGREE - allows you to set the angle in degrees, to which the turntable will rotate during setting welding spots, defining the length of weld joint

ROTATE SPEED - allows you to set speed (in standard units), with which the turntable rotates between spots

EXIT - back to previous menu «WELDING»

CONTROL MENU (Pic. 6.1.6):



Pic. 6.1.6

ROTATE - rotation of the rotary machine without stopping

ROTATE 1/2 - table rotation speed reduced by N times, the parameter N is set in the menu "SETUP" (in this case N = 2)

ROTATE 1/3 - table rotation speed reduced by N times, the parameter N is set in the menu "SETUP" (in this case N = 3)

ROTATE 360 - turn the table on the configured angle

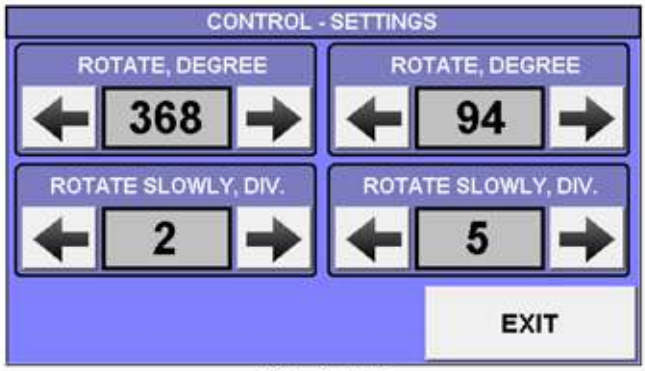
ROTATE 045 - turn the table on the configured angle

>>> - button "REVERSE" - sets the direction of rotation of the table

▲ / ▼ - buttons to increase / decrease the speed of rotation of the turntable, selected speed is shown in standard units (from 0,05 – Minimal to 10 - maximum) in the window between the arrows.

Buttons ROD STROKE and WELDING – jump to the corresponding menu, MAIN MENU- return to the previous page.

SETTINGS - jump "CONTROL" menu settings (Pic. 6.1.7)



Pic. 6.1.7

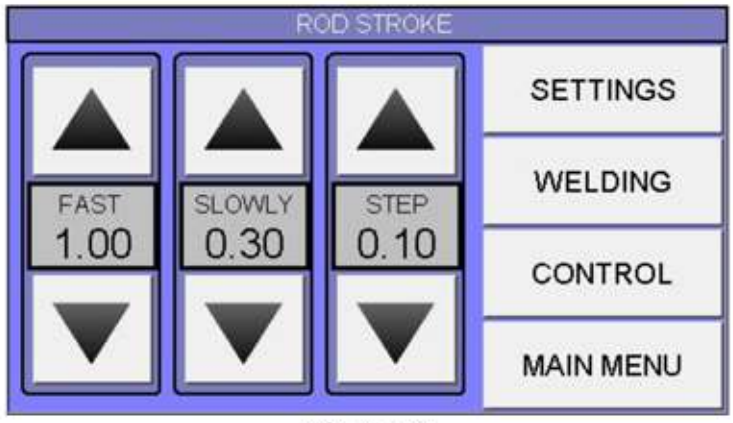
Buttons ROTATE, DEGREE - set desired turning angle of the turntable. Push ⬅ to reduce the value of the divisor, push ➡ to increase the value.

Buttons ROTATE SLOWLY, DIV. – set the speed of the turntable rotation, reduced by N times. Push ⬅ to reduce the value of the divisor, push ➡ to increase the value.

EXIT - return to the previous menu "CONTROL"

MENU ROD STROKE (Pic. 6.1.8)

The stand is equipped with the automatic stop of the spindle when contacting with the metal piece mounted on a turntable, and uplift of the spindle to a set value. The value of the uplift is set in the "ROD STROKE-SETTINGS" menu by the "RETURN DISTANCE" parameter.



Pic. 6.1.8

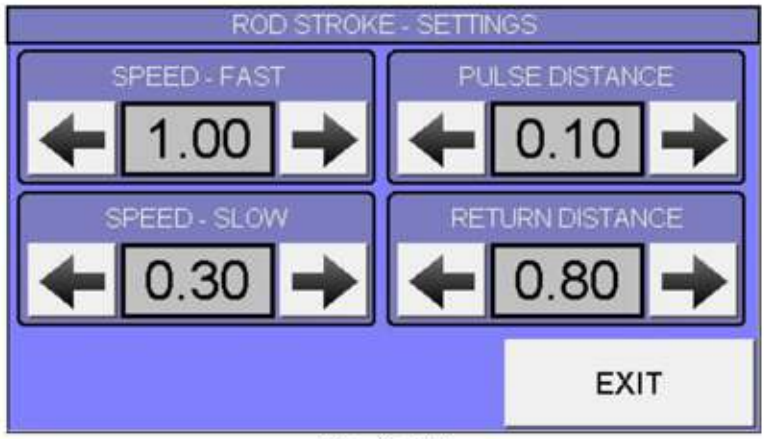
FAST▲ / ▼ - sets rapid movement of the upper spindle with chuck in a set direction (up or down). The operator stops movement by pressing the screen with the word STOP, or by reaching the end position. Moving speed is set in the submenu "Settings".

SLOWLY▲ / ▼ - sets slow movement of the upper spindle with chuck in a set direction (up or down). The operator stops movement by pressing the screen with the word STOP, or by reaching the end position. Moving speed is set in the submenu "Settings".

STEP▲ / ▼ - upper spindle moves up or down by a certain value and then stops. The amount of movement is set in the submenu "Settings".

Buttons CONTROL and WELDING – jump to the corresponding menu, MAIN MENU- return to the previous page.

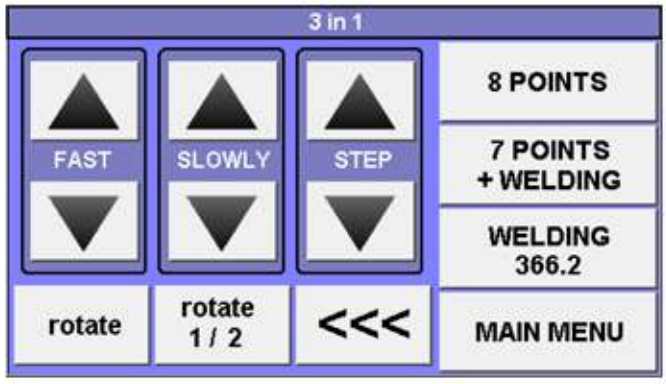
SETTINGS - jump to "ROD STROKE" menu settings (Pic. 6.1.9)



Pic. 6.1.9

SPEED FAST - specifies the amount of movement of the upper spindle in the "FAST" mode.
SPEED SLOW - specifies the amount of movement of the upper spindle in the "SLOW" mode.
PULSE DISTANCE - specifies the amount of movement of the upper spindle in the "STEP" mode.
RETURN DISTANCE - sets the value of spindle lifting, after the contact with the component mounted on a turntable.
EXIT -return to the previous menu "ROD STROKE".

MENU 3 IN 1 (Pic.6.1.10)



Pic.6.1.10

FAST▲ / ▼ - sets rapid movement of the upper spindle with chuck in a set direction (up or down). The operator stops movement by pressing the screen with the word STOP, or by reaching the end position. Travel speed is set in the submenu "Settings".
SLOWLY▲ / ▼ - sets slow movement of the upper spindle with chuck in a set direction (up or down). The operator stops movement by pressing the screen with the word STOP, or by reaching the end position. Travel speed is set in the submenu "Settings".
STEP▲ / ▼ - upper spindle moves up or down by a certain value and then stops. The amount of movement is set in the submenu "Rod Stroke/Settings" (Pic 6.1.9).
ROTATE - rotation of the rotary machine without stopping
ROTATE 1/2 - table rotation speed reduced by N times, the parameter N is set in the menu "Control/Settings" (Pic. 6.1.9).

>>> - Button "REVERSE" - sets the direction of rotation of the table

8 Points – the stand makes 8 welding spots turning table according to the algorithm described above.

7 POINTS+WELDING - makes welding in automatic mode, setting uniformly in a circle 7 welding spots, then a continuous welding is being done.

WELDING 366.2 - continuous welding with turning turntable to a predetermined angle at a speed predetermined in submenu "Welding/Settings". (Pic 6.1.5).

MAIN MENU - return to previous page.

MAIN SETUP MENU (PIC 6.1.11)

MAIN SETUP menu - you can adjust the parameters of the machine in case of replacement of components, repair of the machine or software changes.



Pic. 6.1.11

Russian▼ / English▼ – change the language of control panel.

RESET SETTINGS – return to factory settings.

OTHER CHANGES IN THIS MENU CAN ONLY BE MADE BY TRAINED SPECIALISTS.

6.2 Setting alignment using the method of divergence angle reduction.

6.2.1 To pre-install the lower table (performed only when assembling the machine or after repairs associated with removing and installing the rotary table or spindle unit), it is necessary to loosen the fixing bolts of the lower flange 2 and adjusting bolts 1 and 3 (Fig. 6.13).



Pic.6.13

1 - horizontal adjustment bolts

2 - clamping bolts

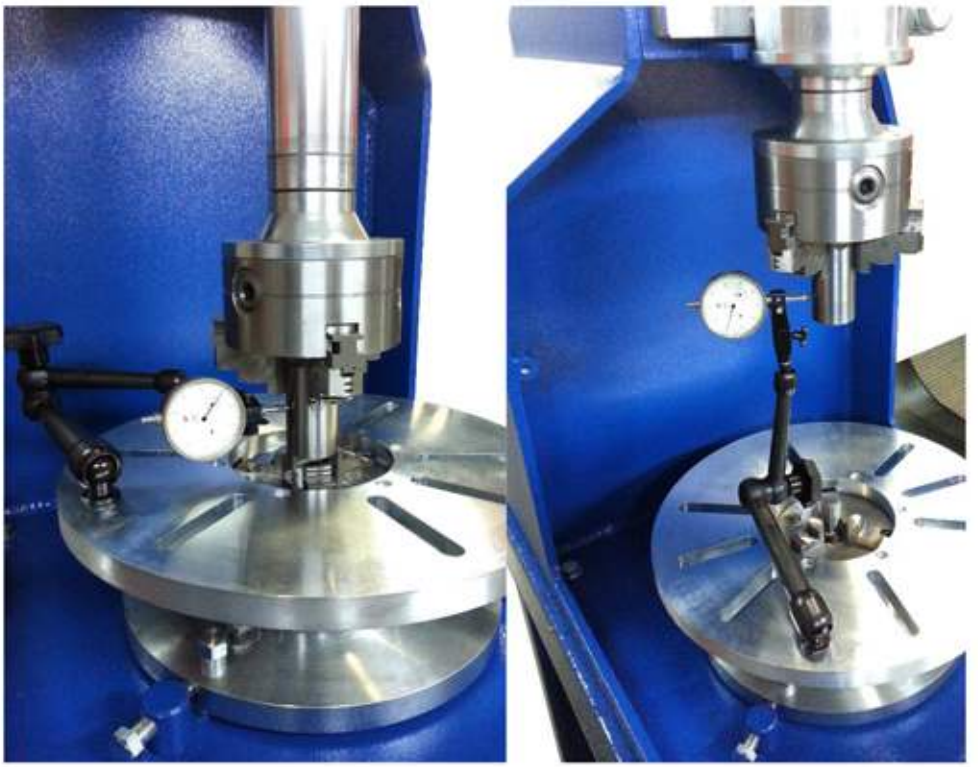
3 - bolts of vertical adjustment

6.2.2 Insert the supplied mandrel into the upper chuck and tighten it. Lower the spindle with the mandrel down to the lower chuck, smoothly clamp the mandrel with the lower chuck, centering the table position manually. Tighten the adjusting bolts from the hand, squeeze the lower chuck and raise the spindle with the arbor to the upper position.

6.2.3 Install the dial indicator on the turntable faceplate, lower the spindle as far as possible within the reach of the indicator, avoiding contact with the lower part of the installation. The indicator probe must be set as perpendicular as possible to the axis of rotation of the workpiece clamped in the upper chuck. After setting the rotary table rotation mode from the operator panel or control panel 5 (Fig. 4.2), check the beat and find the point of greatest deviation from the zero reading. Using the horizontal adjustment bolts 1 (Figure 6.13), set the position of the turntable in the horizontal plane, bringing the runout to a value of no more than 0.02 mm. ATTENTION! All horizontal adjustment bolts must be tightened.

6.2.4 Raise the spindle to the highest possible point (fig. 6.14). Set the indicator and check the runout, as described above, set the position of the turntable in the vertical plane with the adjusting bolts 5 (Figure 6.3) to a runout value of no more than 0.02 mm, without changing the position of the horizontal adjustment bolts.

Move the spindle down and check the runout with the indicator. If the deviations are more than 0.03 mm, the adjustment procedure is repeated starting from clause 6.2.2. Due to these actions, the alignment of the upper and lower cartridges occurs. This is a fairly lengthy process and may take some time. The accuracy of setting by this method is 0.01 ... 0.03 mm.



a) b)

Pic. 6.14 Measurement of run-out while adjusting the stand:

a) lower position of the chuck

b) upper position of the chuck

After adjustment, it is imperative to fix the rotary table with bolts 6 (Fig. 4.1) by evenly tightening them in a circle. In this case, a slight misalignment of 0.05 - 0.1 mm will inevitably occur, which is eliminated by tightening the necessary adjusting bolts in a fixed state, as described in clauses 6.2.2 - 6.2.4. After completing all adjustments, check the runout in different spindle positions. Maximum allowable runout - 0.03 mm.

WARNING! To save the operating settings of the spindles of the installation for a longer time, several rules must be observed:

- the unit must be leveled and stand firmly on the floor;

- avoid shock loads on the turntable faceplate;

- do not carry out extraneous welding work on the installation - traces of metal melting can damage the surface of the faceplate or the jaws of the chuck;

- before welding the torque converter, treat the surface of the faceplate with a spray or other compound that prevents adhesion of metal splashes.

- to maintain the stability of the quality of repair, the alignment of cartridges must be checked weekly.

6.3 Torque converter welding

6.3.1 Rebuilt and ready to weld torque converter is mounted on the turntable, the plug is clamped in the jaws of the lower chuck.
6.3.2 Unclench the chuck of upper spindle for torque converter plug to freely enter into it.
6.3.3 Use the touch panel to lower the spindle down, be careful not to damage the polished surface of torque converter plug and chuck jaws not to bear against the body.
6.3.4 Tighten the plug with sufficient but not excessive force.
6.3.5 Set the necessary clearance by parameter "RETURN DISTANCE" in the menu "ROD STROKE SETTINGS" (Figure 6.1.9).
6.3.6. Raise the spindle by button in the menu "SPEED FAST ▲" until disengagement of the top and bottom of the torque converter
6.3.7. Lower the spindle by button in the menu " SPEED FAST ▼". When the top and bottom of the torque converter touch, the spindle will stop and automatically set a predetermined gap.
6.3.8. Set the gun of welding torch in the tool holder 3 (Fig. 4.1) at the optimal distance and angle, this holder is equipped with a hinged clamp. When installing consider the presence of balancing weights, which can hurt the welding gun nozzle while rotating.
6.3.9 Set in operator panel the required rotation speed of turntable for this type of torque converter (see 6.1 the "Using of operator touch panel").
6.3.10 Set the required current and voltage parameters on the power source of welder.
6.3.11 Perform welding of 2 parts of torque converter according to one of the programs described above.

Note:

- **The interval of time between setting of the welding points must be minimized to avoid excessive warping.**
- **Welding points should be as flat as possible, but at the same time have sufficient fusion area with both parts of the torque converter.**

6.3.12 Drive out the chuck of upper spindle and lift it up.
6.3.13 Be sure to re-clamp a torque converter body in the chuck of turntable.
6.3.14 Check radial run-out of torque converter plug with indicator, which shall not be more than 0.2 mm (for some models - not more than 0.15 mm), by running table rotation from operator panel menus "control" or " 3 in 1 ". In case of exceeding the maximum deviations, check out the stand settings and outside parts of a torque converter, then it must be cut, cleaned and repeat the procedure in article 6.3.1.

Note:

- **The upper part of some models of torque converters covers with overlap the lower part, at that it's difficult to perform welding due to molten metal dripping down. In these cases, it's allowed to fix and weld torque converter upside down with plug, centered in the upper chuck and plug is clamped in the lower chuck of turntable.**

6.3.15 For objectivity of the results of measurements it is recommended to check plug run-out once or twice, by re-clamping a torque converter in the chuck of turntable with rotating to an angle of 30-120 degrees against the faceplate.
6.3.16 Check run-out of torque converter cover by setting the indicator as shown in Figure 6.2.2 and set the rotation of the turntable.



Pic 6.3

6.3.17 If excessive run-out of the cover occurs (more than 0.8 mm - depending on the design) cut a torque converter along the welding joint and repeat the whole cycle of operations.

WARNING! After welding torque converter remains hot for a long time. Take precautions to avoid burns.

7 MAINTENANCE

7.1 Depending on the intensity of use of the stand it is necessary to carry out (every 3-6 months) maintenance (cleaning, lubrication) of chucks.

7.2 Monitor the condition of the faceplate of the turntable - traces of welding and mechanical impacts affect the accuracy of the stand.

7.3 Upper spindle moves in tight spigots with possibility to choose a play. If play is detected it is necessary to remove the top cover of the spindle and screw down upper and lower hubs with four bolts. Excessive clamping of hubs may impair the smooth movement of the spindle while moving slowly up or down.

8 STORAGE AND SHIPMENT PRECAUTIONS

8.1 The stand should be stored at a temperature from +5 °C to +35 °C and a relative humidity up to 80%. There should not be any dust, acid or alkali fumes, corrosive gases and other harmful impurities in the storage that may cause corrosion.

8.2 Stand should be transported in closed transport of any kind. Railway wagons, containers, and truck bodies used to transport devices must not have any trace of cement, coal, chemicals, etc.

8.3 At the time of transportation parts and elements of the stand must be securely fastened to the shipping pallet. Electronic and electrical components must be protected from possible moisture and dust through the ventilation and technological holes.

9 WARRANTY

9.1 The manufacturer guarantees compliance of the stand with all the requirements and the technical characteristics specified in this certificate if the relevant conditions of usage, transportation and storage are met.

9.2 The warranty does not apply to:

— product without the certificate, logos or serial number;
— natural wear;
— consumables (oils, lubricants, belts, etc.);
— damage caused by using the product for purposes beyond its purpose;
— paint products
— defects caused by mechanical damage, improper or careless operation;
— damage caused by unauthorized changes to the product design or its components;

9.3 The warranty period of operation of the stand is 12 months from the date of delivery to the Customer.

9.4 Seller diagnose the cause of a fault on the basis of images or video, provided by the Buyer. If this is not possible, the customer comes to the Seller for warranty inspection and repair of the goods.

The Customer shall bear the costs associated with the arrival of a specialist for repair or shipment of defective parts or assemblies.

9.5 The buyer cannot claim compensation for any incidental, indirect or consequential costs, such as lost profits or revenue, other commercial loss, inconvenience caused by equipment failure etc.

9.6 In the case of warranty replacement of parts or assemblies warranty for replacement item is 90 days or until the end of the initial term (12 months from the date of delivery to the Customer) whichever is longer.

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