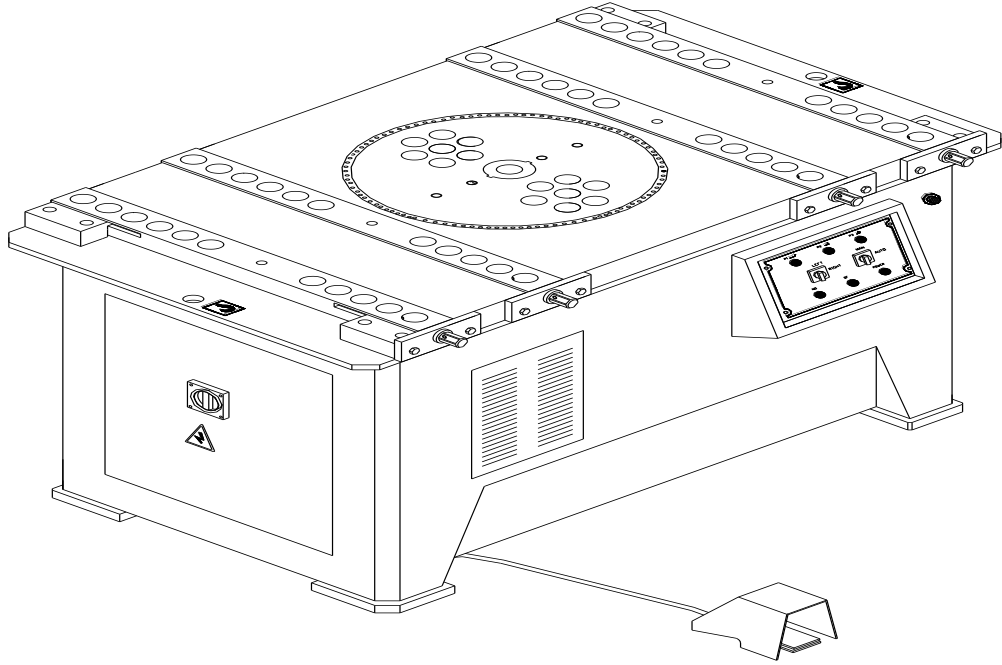
	Name	MECHANICAL BENDING MACHINE FOR CONSTRUCTION IRON (Operating & Maintenance Manual)	Date	22.02.2004
	Model	BS 60	Page	17

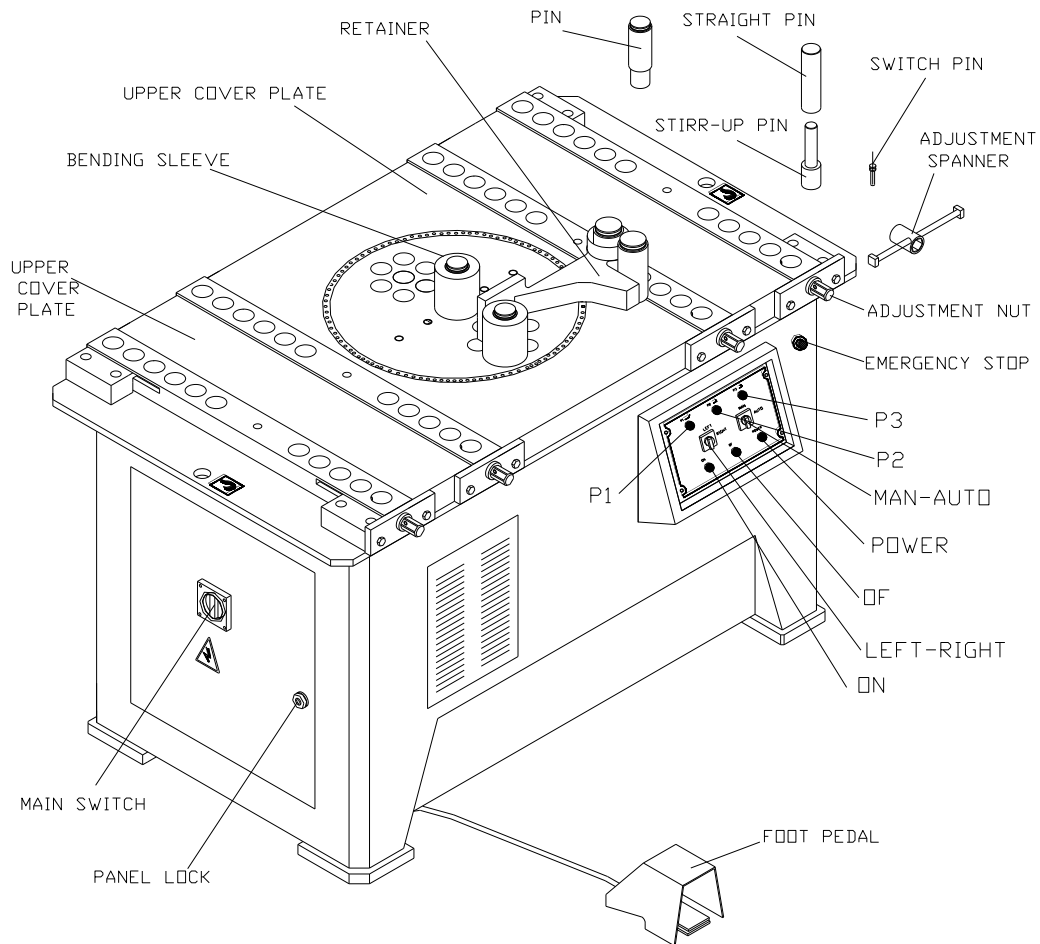


**BS 60 MECHANICAL BENDING MACHINE FOR CONSTRUCTION IRON
OPERATING & MAINTENANCE MANUAL**



GÖÇMAKSAN

CE



Overview

The **BS 60** Mechanical Bending Machine for Construction Iron is designed and manufactured only for bending metallic bar materials. All other purposes of use are not allowed. This machine can be operated with different optional apparatus for various shapes of bending. In order to get the best output from your **BS 60** locate it in such a position so as to be operated easily, and to provide more efficient work from the Operator. Therefore, the site where the machine will be operated is to be near the storage area of construction iron, and to be covered with a shed, which would be more convenient. We recommend you to locate workbenches in both sides of the machine. The length of each bench is to be the longest length of the material to be bent. By means of support of these benches, the Operator will be able to bend any kinds of material without lifting and turning over them, and thus the possibility of more productive work may be obtained from the Operator.

Important Warning

- Prior to operate the machine read through this Operating & Maintenance Manual, carefully.
- Only the qualified personnel are allowed to operate the machine.
- Disconnect the power prior to make checks, maintenance, lubrication, and/or adjustments.
- Observe all guidelines provided in this Operating & Maintenance Manual.

1. INSTALLATION PROCEDURES

- 1.1 Level the machine on a flat and sound ground **(Figure 1)**.
- 1.2 Made the power connection by a qualified electrician.

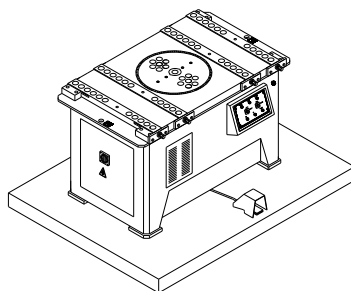
Note: Power Connection

- 1.3 Plug on the power supply cord of 5x4 mm² to the feeding line of main power.
- 1.4 Grounding is to be made for safe. Do not operate the machine without grounded power.

Grounding Connection: Follow the procedure below:

Connect one end of the ground cable to a copper wire (minimum 16 mm) so as to ensure electrical conductivity. The other end of the cable is to be connected to a tube having ability of conductivity dipped sufficiently into the ground (into the damp soil, preferably), or to a copper plate buried under the soil as deeper as possible.

FIGURE 1



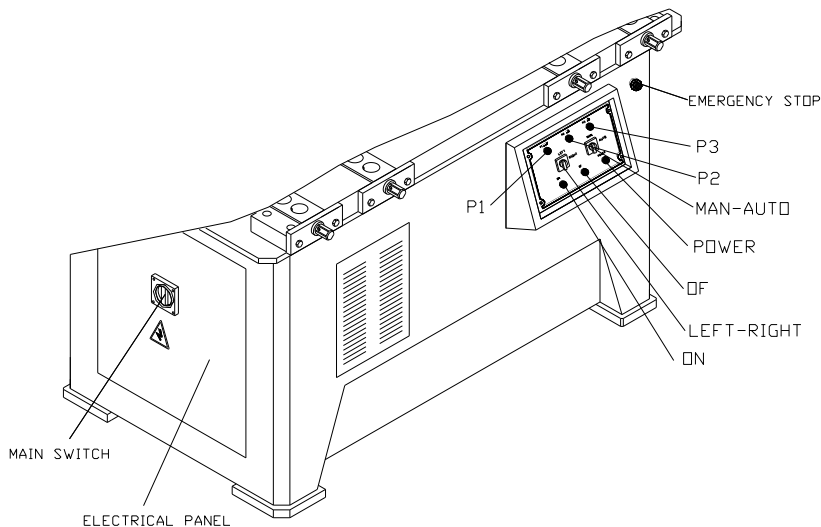
2. START UP PROCEDURE

2.1 Check and ensure that the machine is installed in accordance with instructions. Remove all parts (including bending apparatus) from the top surface of the machine.

2.2. Turn the switch (LEFT/STOP/RIGHT) to the LEFT or RIGHT, and the switch (MAN-AUTO) to the MAN position, and determine the direction of rotation of the machine by pressing the foot pedal down.

Note: The clockwise rotation is accepted as the right rotation and the counter clockwise rotation as the left from the front view (the control panel side) of the machine. If the machine rotates counter clockwise in comparison to the turning direction of switch, it means that the phases of power network are reverse. This situation will not create any problem for the operation of machine. In such cases, you may turn the control switch (LEFT-STOP-RIGHT) to the LEFT or RIGHT, or you may change terminals of the phases by means of a qualified electrician. Start to make bending adjustments by following determination of rotation.

FIGURE 2 Control Buttons



2 . TECHNICAL SPECIFICATIONS

2.1 Bending Capacity

Strength of material	Diameter/ Bendable unit				
45 kg/mm ²	Ø 60x1	Ø 38x2	Ø 34x2	Ø 24x3	Ø 18x4
65 kg/mm ²	Ø 50x1	Ø 34x2	Ø 30x2	Ø 20x3	Ø 16x5
85 kg/mm ²	Ø 42x1	Ø 30x2	Ø 26x2	Ø 18x3	Ø 14x6
DOUBLE BENDING					
Strength of material	Diameter/ Bendable unit				
45 kg/mm ²	Ø 50x1	Ø 34x2	Ø 30x2	Ø 22x3	Ø 16x4
65 kg/mm ²	Ø 46x1	Ø 30x2	Ø 28x2	Ø 18x3	Ø 14x5
85 kg/mm ²	Ø 42x1	Ø 26x2	Ø 22x2	Ø 16x3	Ø 12x6

Model : **BS 60**
 Name : **Mechanical Bending Machine for Construction Iron**
 Motor Input Torque : 50.4 Nm
 Reducer Output Torque : 8600 Nm

Dimensions
 Width : 0,98 m
 Length : 1.490 m
 Height : 0.90
 Weight : 900 kg

Motor Specifications

Power : 7,5 kW
 Rotation : 1430 rpm
 Voltage : 380 V
 Frequency : 50 Hz

3. APPARATUS AND TOOLS SUPPLIED WITH THE MACHINE

- Pin : 5 ea
- Stirr-up Pin : 1 ea
- Straight Pin : 1 ea
- Bending sleeves : 5 ea
- Adjustment Spanner : 1 ea
- SWITCH Pin : 1 ea
- Retainer : 1 ea

Proper Fixing Forms of Construction Iron onto the Machine

FIGURE 3 The fixing form of material to be bent onto the machine by using the retainer

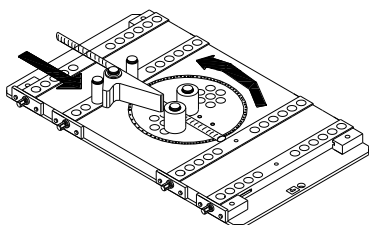


FIGURE 4 The fixing form of material to be bent onto the machine by using the bending sleeves

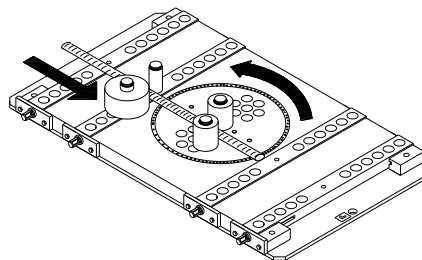


FIGURE 5 The fixing form of material to be bent onto the machine by using the bending sleeves in multiple bending

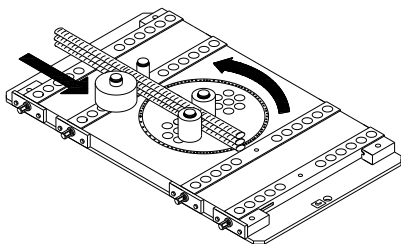
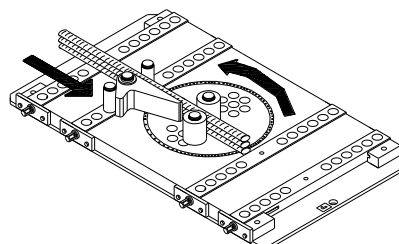


FIGURE 6 The fixing form of material to be bent onto the machine by using the retainer in multiple bending



Improper Fixing Forms of Construction Iron onto the Machine

FIGURE 7 The improper fixing form of single material to be bent onto the machine by using the bending sleeves

FIGURE 8 The improper fixing form of single material to be bent onto the machine by using the retainer

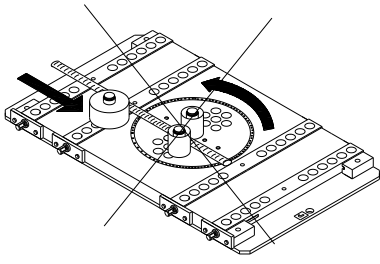


FIGURE 9 The improper fixing form of single material to be bent onto the machine by using the bending sleeves

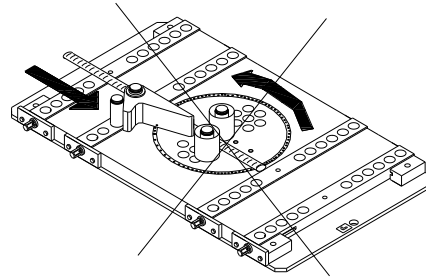


FIGURE 10 The improper fixing form of single material to be bent onto the machine by using the bending sleeves

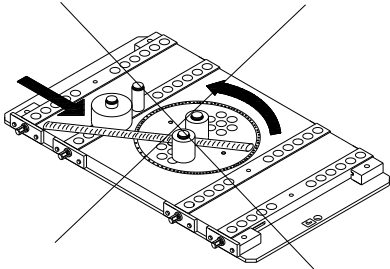


FIGURE 11 The improper fixing form of multiple material to be bent onto the machine by using the bending sleeves

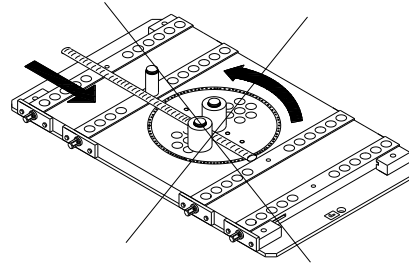


FIGURE 12 The improper fixing form of multiple material to be bent onto the machine by using the retainer

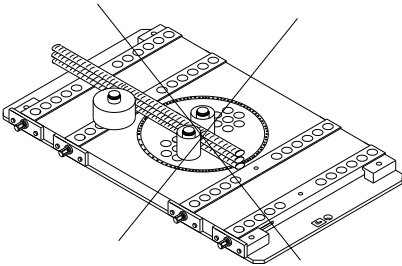
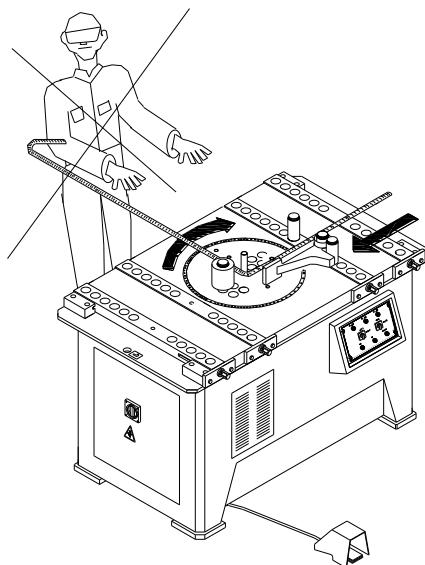


FIGURE 13



4. GUIDELINES FOR SAFE AND EFFICIENT USE

- ▼ Do not allow the people standing in front of the machine during bending process. Keep those out of the machine. (Figure13)

- ▼ Remove all foreign materials such as hammers, adzes, measuring tapes, callipers, levers and/or similar construction tools among the bending apparatus excluding the material to be bent from the top surface of the machine.
- ▼ Do not operate the machine when it is wet.
- ▼ Do not try to make bending using the measurements, dimensions or quantities other than those specified in the name plate.
- ▼ In multiple bending, put the construction iron material in number specified in the name plate one over another, support and fix them against the retainer or bending sleeves, and then bend them. Do not try to make bending other than that of specified. **(Fig.11 and 12)**
- € Do not operate the machine when the cover of electric panel is opened.
- € Do not change the electrical adjustments made in ex works.
- € Do not operate the machine without grounded power.
- ▼ Do not operate the machine when protective covers are opened..
- ▼ Do not allow the machine to be operated by those other than the qualified operators.
- ▼ Do not operate the machine without lubrication oil.
- ▼ Do not allow removing the warning labels stuck onto the machine.
- ▼ Do not allow to use the spare parts and apparatus other than the genuine ones manufactured by the Göçmaksan.
- ▼ Do not try to make bending by using the bent, distorted and cracked apparatus, and/or the sleeves having the inner diameter enlarged.
- ▼ Do not try to make bending material in improper forms. **(Figure 7, 8, 9, 10, 11 and12)**
- ▼ Do not use pressurised air to clean the machine.
- € In case of need to open the lid of the electric panel, ensure that main switch is to be off.
- ▼ Fix the material onto the machine properly. Observe the fixing forms shown in **Figure 3,4, 5, and 6** by using the retainer or bending sleeves and pins.

5. WARRANTY

The producer will only accept the warranty and responsibility subject to the following terms and conditions:

- ▼ Observe all protective precautions.
- ▼ Observe the warning signs.
- € Do not operate the machine without grounded power.
- ▼ Do not replace failure parts and apparatus other than the genuine ones manufactured by the Göçmaksan.
- ▼ Observe the instructions specified in the safety guidelines.
- ▼ Observe the guidelines for safe and efficient use.
- ▼ Observe the instructions for installation.
- ▼ Observe the conditions for loading, transportation, and unloading of the machine.
- ▼ Operate the machine by qualified operators.
- ▼ Observe the measurements, dimensions and the quality of material specified in the nameplate.
- ▼ Use always the machine in conformance with it's production purposes.
- € The power connection is to be made by a qualified electrician.
- ▼ Do not allow the machine to be operated when any of its part is disassembled.
- € Do not change the motor.
- ▼ Observe the instructions for proper service and maintenance.
- ▼ Do not try to bend the material in larger size than the one specified.
- ▼ Follow always the instructions for proper bending forms.

6. PROTECTIVE PRECAUTIONS

6.1 Protective Cloths

- Protective helmets
- Goggles
- Boots with steel heads.
- Gloves

Use the above protective material when you work on the machine. In case of not use these protective materials note that there is always a risk of injury such as hand-cut and/or hand-capture.

6.2. Working Garments

Note that the following are the things and garments **not convenient** to wear against the risk of injury and capture during working with the machine: long hairs, dresses with long arms, identity disks or jewellery, long working aprons etc.

7. TRANSPORTING

Utilize a forklift and/or a mobile, or a bridge-crane for transporting and lifting the machine. Use forklifts only when the machine is in a container. Put the machine in a container using wooden wedges under its wheels so as they do not touch on the bottom of a container, or locate it in a container with its wheels disassembled. Use steel ropes, chains and/or polyester tackle-block for lifting the machine. Use the lifting collets for crane hook to lift it without its container. Employ experienced or specialized people or subcontractors for lifting purposes.

Warning!

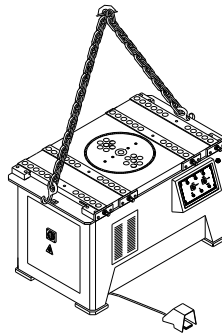
Move the machine without causing any vibration. Do not transport it in wet conditions.

Please forward to the producer a report for the parts lost or damaged during transportation (Figure 14).

- Take maximum capacities of transportation and lifting machinery and equipment into your consideration.
- Take the centre of gravity of the machine into consideration during lifting it.

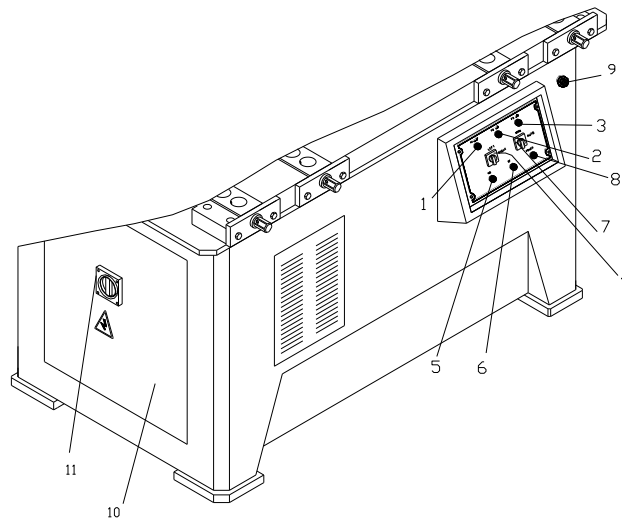
Note: Observe all instructions written on the warning labels

FIGURE 14



8. CHECKS AND ADJUSTMENTS

FIGURE 15



ITEM	BUTTON	FUNCTION
1	P1	Ensures to make adjustment process for the bend-up reinforcement bending
2	P2	Ensures to make adjustment process for the set-square bending
3	P3	Ensures to make adjustment process for the hook bending
4	LEFT/RIGHT	Ensures the machine to rotate to the right or left direction.
5	ON	Ensures the machine to be started.
6	OFF	Ensures the machine to be stopped.
7	MAN/ AUTO	Ensures the machine to be controlled automatically or manually.

8	POWER LED	Indicates the power in the system is on when the button (ON) is pressed on.
9	EMERGENCY STOP	Provides the machine to be stopped in emergency by disconnecting the power.
10	POWER PANEL	It is such a component ensuring and controlling power to be supplied for the machine.
11	MAIN SWITCH	It is such a toggle switch ensuring the power input for the machine (0 means the machine is off, and 1 is on.)

8.1 Adjustment of thermal current field, and motor circuit breaker

It is adjusted by its manufacturer as 25,6 A for 7,5 kW motor with 1.430 rpm. Do not change this adjustment. The motor circuit breaker is installed onto the machine to de-energize the motor in order the machine not to be damaged when it takes excessive current. Turn the switch to the position (1) for re-starting the machine in case of circuit breaking. Under no circumstances the circuit breaker is dismantled.

8.2 Hook-Bending (P3)

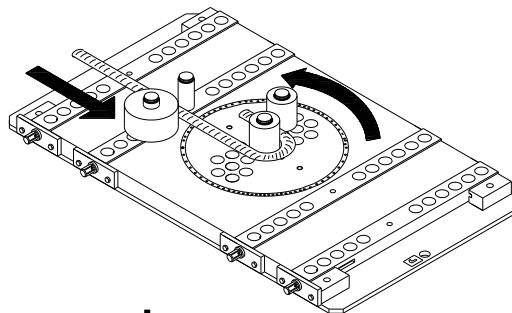


The machine is supplied with the SWITCH pins, two each in three different lengths. Remove all SWITCH pins by leaving the longest one onto the bending disc. Shift the adjustment lever in HOOK position and the machine in MAN position, and check the direction of rotation. Set the bending angle convenient for desired hook-bending by travelling the SWITCH pin over the angle adjustment openings on the adjustment disc in order to realize the hook-bending (Closer the SWITCH PIN to the SWITCH reduces the bending angle, and *vice versa*). Insert the bending sleeve convenient for the diameter of the construction iron onto the pin. Install one of other pins into one of openings on the bending disc, and insert one of bending sleeves into this pin so as to ensure a necessary gap suitable for the thickness of the construction iron to be bent. Put the construction iron to be bent onto the machine, and install, in accordance with the thickness of the material, the retainer or the bending sleeve (if the diameter of material is less, and more than 16 mm, respectively), and insert one of bending pins into one of perforations on the perforated bracket. Then install the bending disk onto the perforated bracket in front of the construction iron in order not to cause any injury during returning of the material after being bent (Figures 1, 2, 3 and 4). Complete the process by moving the perforated bracket slowly back and forward by means of an adjustment spanner, and ensure the material to be parallel to the length of the machine (Figure 12). For serial bending, shift the machine in AUTO position.

Note: Note: Note that the bending disc will continue to rotate as long as the foot pedal is pressed if the machine is in MAN position, and stop when it comes to the waiting position after bending process, and that the bending disc will perform the bending work by pressing the foot pedal only one time, and stop when it comes to the waiting position after bending process if the machine is in MAN position. Moreover, have the bending process is stopped when the foot pedal is pressed while the machine performs bending in AUTO position. In order to re-initiate the bending process, the machine is brought to neutral (zero) position by respectively pressing and releasing of the foot pedal and then by pressing again the hereof.

Warning! Use bending apparatus in sizes as at least 5 times big as of the diameter of the material to be bent. Wait the machine to complete its bending cycle and stop, and press the buttons p1, P2 or P3 to change the bending adjustment. Otherwise you cannot change it by only pressing the said buttons.

FIGURE 16

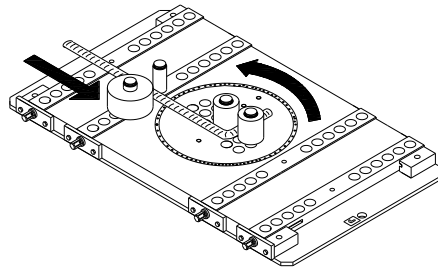


8.3 Set-square bending (P2)



Shift the adjustment lever to the set-square position, insert the medium size switch pins into the openings on the bending disc, and follow the same procedure explained in Paragraph 8.1 for adjustment.

FIGURE 17

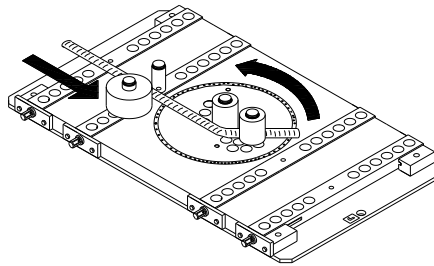


8.4 Bend-up Reinforcement (P1)



Shift the adjustment lever to the set-square position, insert the small size switch pins into the openings on the bending disc, and follow the same procedure explained in Paragraph 8.1 for adjustment.

FIGURE 18



8.5 Stirr-up Bending

Do the first adjustment for the end bending of construction iron to be stirr-up bending so as the bending angle will be 135° by using the same procedure in Paragraph 8.1. Then shift the adjustment lever to the "bending" position, and do the second bending adjustments so as the bending angle will be 90° . Once the adjustment process is completed do the stirr-up bending by observing the sequence of bending (Figure 19, 20, 21, 22, 23, 24, 25 and 26).

Note: Use the bending sleeve, pin, stirr-up pin or straight pin which each of their dimensions are at least 5 times larger than the diameter of the material to be stirr-up bent.

Note: Use the retainer in order to fix the material to be stirr-up bent.

FIGURE 19

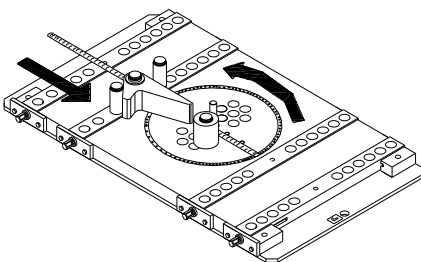


FIGURE 21

FIGURE 20

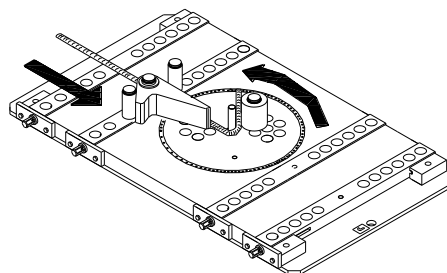


FIGURE 22

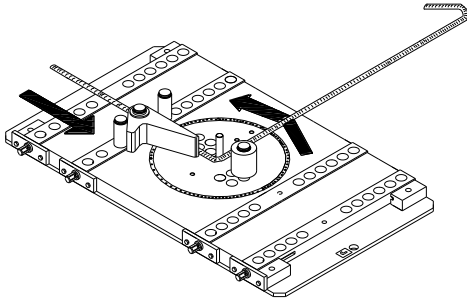


FIGURE 23

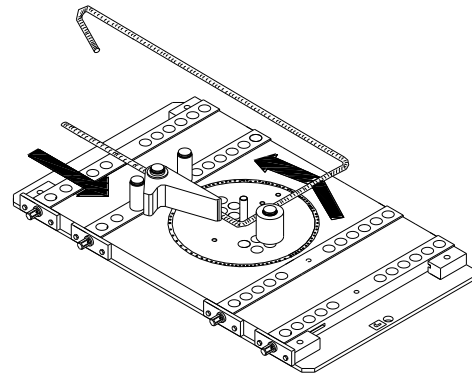


FIGURE 24

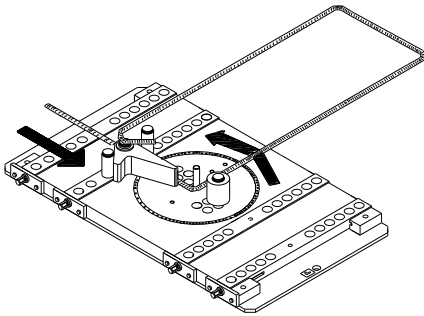


FIGURE 25

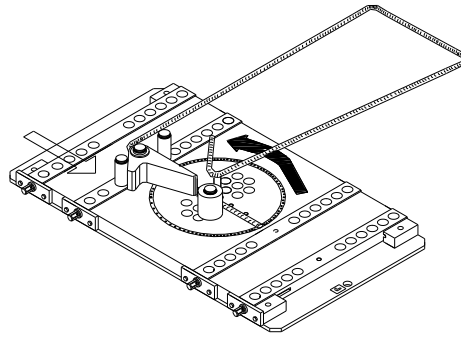
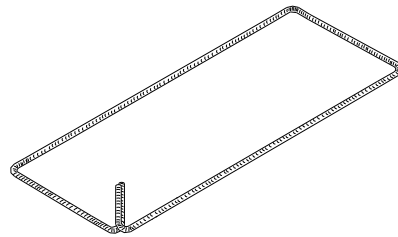
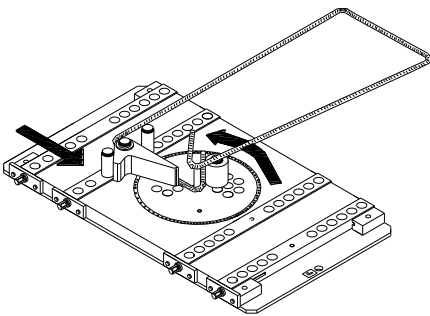


FIGURE 26



Warning! In case of power failure, and the need to open the lid of electric panel, ensure that the main switch is first to be off, and that the electrical troubleshooting is to be made by a qualified electrician.

9. MAINTENANCE AND LUBRICATION

Note that the proper maintenance is very important in order to prolonge the service life of the machine, and to ensure the bending works in safe. We recommend the users are to establish a reliable system to control and maintain the machine. Please refer to the following instructions when you need. Use the lubrication oil no.140 for the gearbox of the machine (12 lt) .

Daily Maintenance

- Clean thoroughly dust and burrs on the machine by brush.
- Use the protective cover against rain should the machine operates in the open air.
- Use brushes to clean the top of machine.
- Check if an abnormal sound from the machine.

Weekly Maintenance

- Drive, clean and grease the bending sheet metals.
- Clean and grease the adjustment level.

Monthly Maintenance

- Check the bending pins and sheet metals. Replace the bent and/or cracked parts.
- Check if any leakage from the gearbox.
- Check if any bent SWITCH pins or not.

Biannual Maintenance

- Check and tighten all bolts and nuts of the machine.

Annual Maintenance

- Change the gearbox lubrication oil.
- Check and replace if any damaged or failure parts.

10. TROUBLESHOOTING

Refer to the Troubleshooting Chart below for the failures, errors and/or troubles, which may be take place during utilization of the machine.

Warning! Disconnect first the power by turning the main switch to the (0) position in case of a need to open the lid of power panel for troubleshooting. Do not allow the people other than a qualified electrician to make a check and/or a repair in the power panel.

NO	SYMPTOM	POSSIBLE CAUSE	SOLUTION
1.	Machinery fails to operate.	1. Power supply is interrupted and/or one of the phases is short. 2. Emergency stop knob is remained pressed. 3. Protection switch is cut-out 4. The Left/Right switch is closed. 5. The lid of power panel is opened or is not closed properly.	1. Check power supply and phases. 2. Check the knob. To open turn it to the arrow direction on the knob if it is remained pressed. 3. Check protection switch. Turn it to Position (1) if it is off. 4. Check the switch. Turn it to right or left if it is on the stop position. 5. Check the power panel lid.
2.	Bending disk rotates continuously.	1. SWITCH pin is bent or broken. 2. The zero adjustment pin and the SWITCH pin are absent. 3. Contactors of direction are defected	1. Check the pins and replace broken and/or bent one. 2. Check the pins. Complete if they are deficient. 3. Check contactors
3.	Protection switch cuts-out continuously.	1. Diode is burned. 2. Motor is burned. 3. Machine bends material with larger diameter than its capacity. 4. Short phase in power supply. 5. Transformer is burned. 6. Short circuit or damage in cables.	1. Check the diode. 2. Check the motor. 3. Check the material in accordance with the information about the kind of material and dimensions on the name plate. 4. Check the phase of power network. 5. Check the transformer. 6. Check the cable and connections

4.	Machinery fails to operate despite the foot pedal is pressed.	<ol style="list-style-type: none"> 1. The plug is off. 2. The pedal is defected. 3. Contactors in electrical system are defected. 	<ol style="list-style-type: none"> 1. Check the plug. 2. Check if the pedal is defected. 3. Check the contactors in the electrical system.
5.	Emergency stop does not operate.	<ol style="list-style-type: none"> 1. The emergency stop contactor is defected. 2. Cable connections are off. 	<ol style="list-style-type: none"> 1. Replace the emergency stop. 2. Check the cable connections
6.	Abnormal sound comes out.	<ol style="list-style-type: none"> 1. Ball-bearings are worn out. 2. Impeller touches with the bonnet. 3. Gears are broken. 4. No oil left in the gearbox. 5. Short phase in power supply. 6. Machine operates overcapacity. 7. The brake in electro magnetic machines does not open or the broken lining of brake touches. 	<ol style="list-style-type: none"> 1. Check the ball-bearings 2. Check the impeller bonnets. 3. Check the gears 4. Check the gearbox oil. 5. Check the phases 6. Check the material in accordance with the dimensions on the name plate. 7. Check the brake and linings if they operate properly.
7.	Oil leakage from the machine	<ol style="list-style-type: none"> 1. The air ventilation plug of gearbox is not installed. 2. The packing O-ring of motor leaks 3. The fixing bolts of the gearbox are loosened. 	<ol style="list-style-type: none"> 1. Check if the plug is screwed. 2. Check the motor from the impeller side. Replace the packing O-ring if it leaks. 3. Check and tighten all fixing bolts.

Note: Should the machine be stopped by pressing the emergency stop knob press on and then off the emergency pedal side of the foot pedal in order to get out the material compressed. Prior to do this, to open the emergency stop turn it to the direction of arrow on the knob. In emergency, pressing one time on the emergency stop side of the foot pedal will be enough to stop the machine. The second one will cause the machine to rotate other direction of bending.