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Certified System
Quality
ISO 9001

PRODUCT AND MAINTENANCE MANUAL

PAB280 FULLY AUTOMATIC PLC CONTROLLED BANDSAW MACHINE

SAFETY WARNINGS

GENERAL WARNINGS

- Please read the instruction manual before operating the Band Saw machine and advise all staff to carefully read the instructions prior to operating the saw. Please keep the User Manual in a close proximity to the saw where it is easily found.
- Keep work area clean and free of any objects which might cause obstruction or injury.
- Do not stand on the driver rollers and/or on the other accessories.
- Always keep labels clean and in good condition.
- Please examine and apply all safety precautions prior to operating saw.
- Please apply all instructions given in this Instruction Manual to get maximum efficiency from your Bandsaw.
- This machine was designed for cutting general metal materials (ferrous & non-ferrous metals). Do not cut wood, radioactive metals, flammable materials etc. Our company will not accept any responsibilities for the harm/injury caused while cutting such materials.
- Our company has no responsibility against any damages or risks caused as the result of changing or adding parts on the saw.
- The Band Saw machine should be used only by experienced and capable staff.
- The machine should be used in a closed area and in a dry environment.
- The electrical connection and maintenance of electrical system should be maintained by a certified electrician.

OPERATION AND MAINTENANCE OF MACHINE

- Please keep enough space between you and the saw during operation to prevent contact with the blade and clamping area.
- In an emergency or during any problem please stop the machine immediately by pushing the emergency stop button.
- Please do not leave any keys, tools etc. on the machine.

- Please cut the electricity connection and lock the main switch on the electricity panel before undertaking any maintenance or repair.
- Do not start the machine if the guards and covers are not in place.
- Maintenance and repair should be done by experienced mechanics/fitters/electricians.
- Before any repair/maintenance is undertaken on the hydraulic system, make sure to decompress the hydraulic pressure and keep the Band Saw head in the lowest position to prevent injury or damage due to falling risk.

- Please use original spare parts for maintenance and repair of the saw, otherwise our company will not accept any responsibility for warranty issues.

PREVENTATIVE WEAR

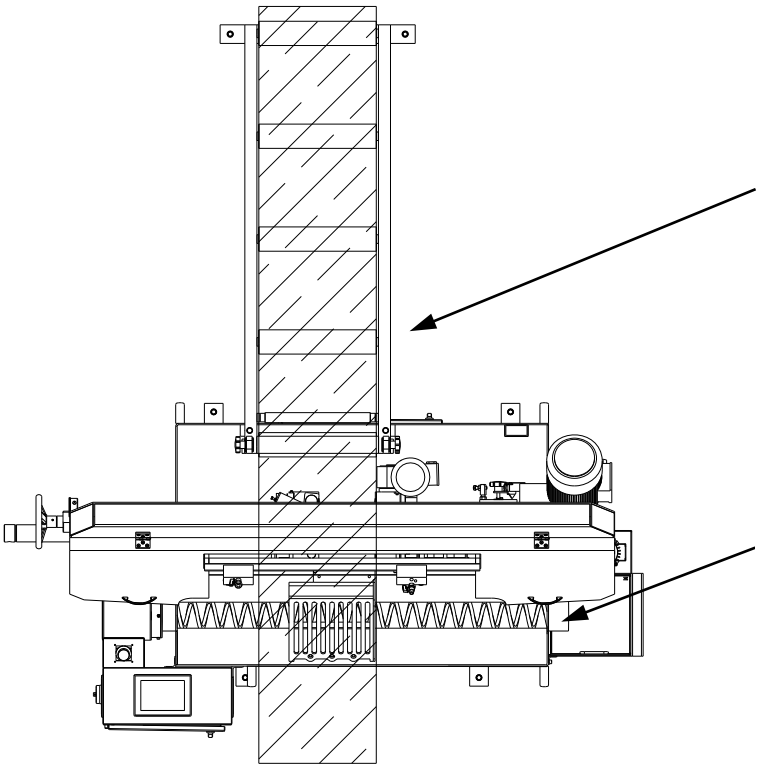
- It is very important for the machine operator to be wearing safety clothes. All safety wear should be buttoned/zipped up.
- Long hair must be tied back while operating machinery. Do not wear loose clothing, loose neckwear or exposed jewelry while operating machinery.
- Protective footwear with steel protectors and non-slip soles should be worn when operating machinery.
- Please use safety gloves when carrying the material, placing the material on the machine, cleaning the machine, changing the band saw and changing the shaving cleaning brush.
- Safety glasses must be worn at all times while operating machinery to protect your eyes from airborne hazards.
- Please use a suitable ear protection is worn while operating machinery to protect from high intensity noise which can cause permanent hearing loss.

PROTECTING DEVICES

- Ensure machinery is safe to use and will not cause harm. Ensure all safety equipment (covers, guards, limit switches etc.) are installed correctly and functional, if not do not start the machine.

- Never open the guard covers during the operation of the machine. Do not by-pass covers and guards, they must be functional at all times.
- If a safety device is out of service, immediately push the emergency stop switch. Do not start the machine again before repairing it.
- Ensure the machine is at a complete stop, main switch locked and machine turned off at power supply before taking the safety devices out.
- Please check all safety and guard devices monthly
- The cutting liquids include chemical additives that can be harmful to your health.
- Clean work floor area regularly, as liquid on the floor increases slipping and fall risks.
- The band saws teeth are very sharp. Ensure gloves are worn when carrying and changing the band saw blade.
- Cut materials may have sharp edges and corners which can cause accidents or harm. Make certain materials are safely carried, placed and well ordered to prevent injury.
- Use suitable lifting devices for carrying heavy materials.
- Pay attention when clamping parts, ensure no clothing or body parts are not in close proximity of vice when clamping parts.

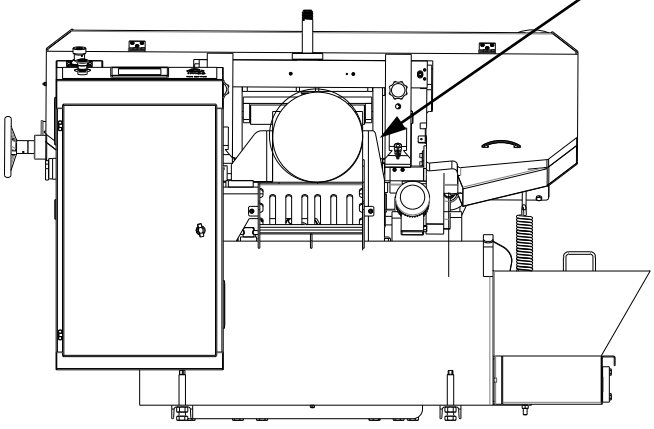
1.1 FEEDING UNIT AND BANDSAW CONVEYOR



Protect yourself during the moving of metal material. Falling metal materials may cause injuries or harm.

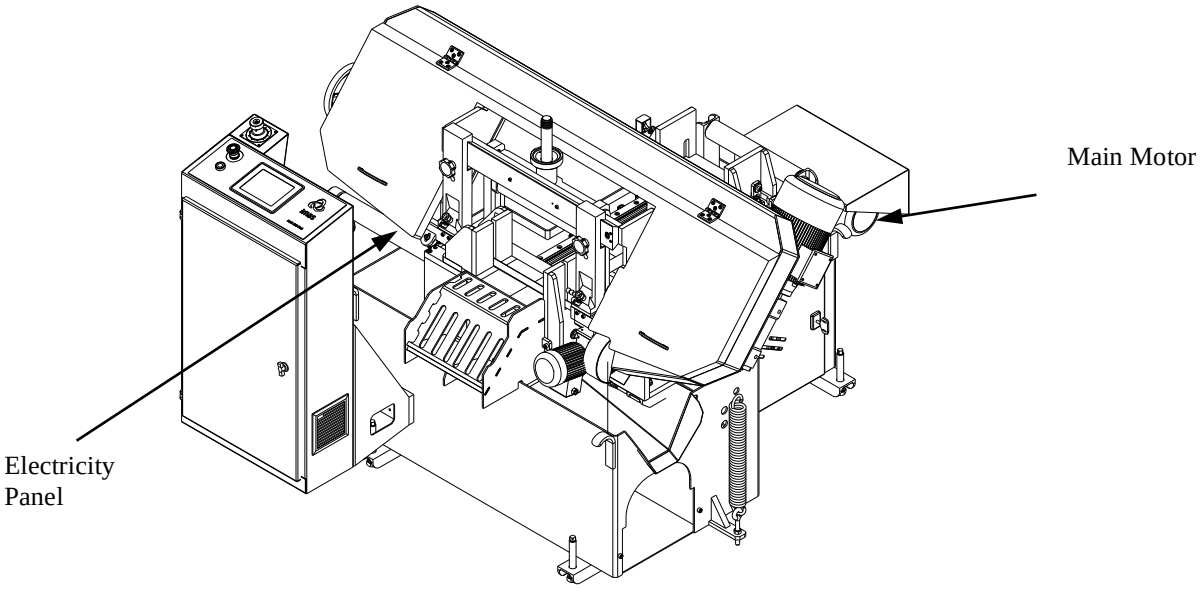
Do not clean the swarf while machie is in operation or put your hand/ fingers near the conveyor.

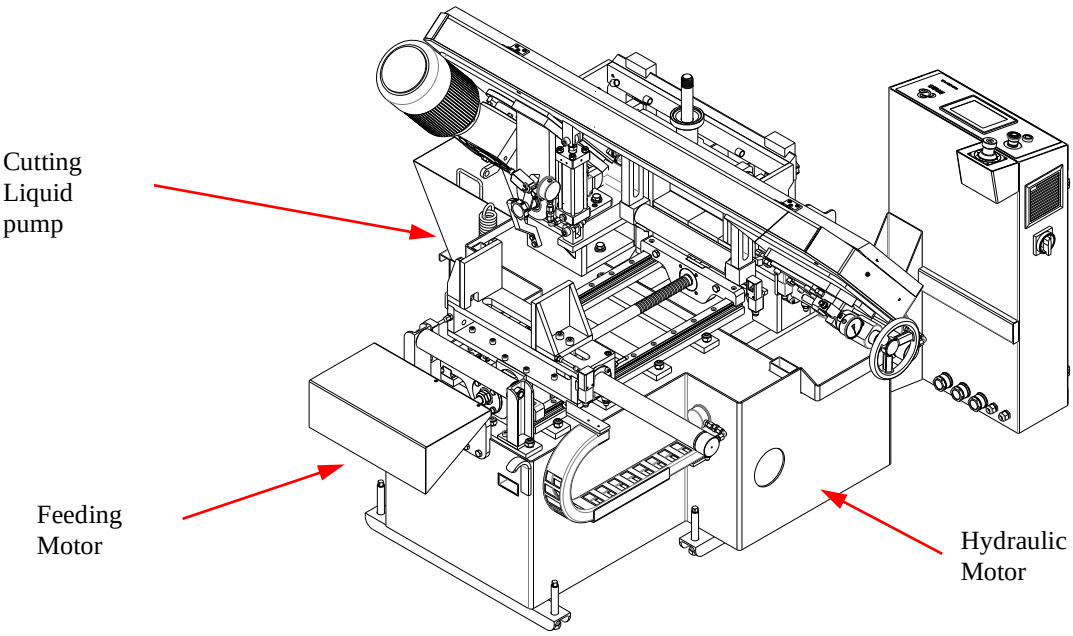
1.2 CUTTING SECTION



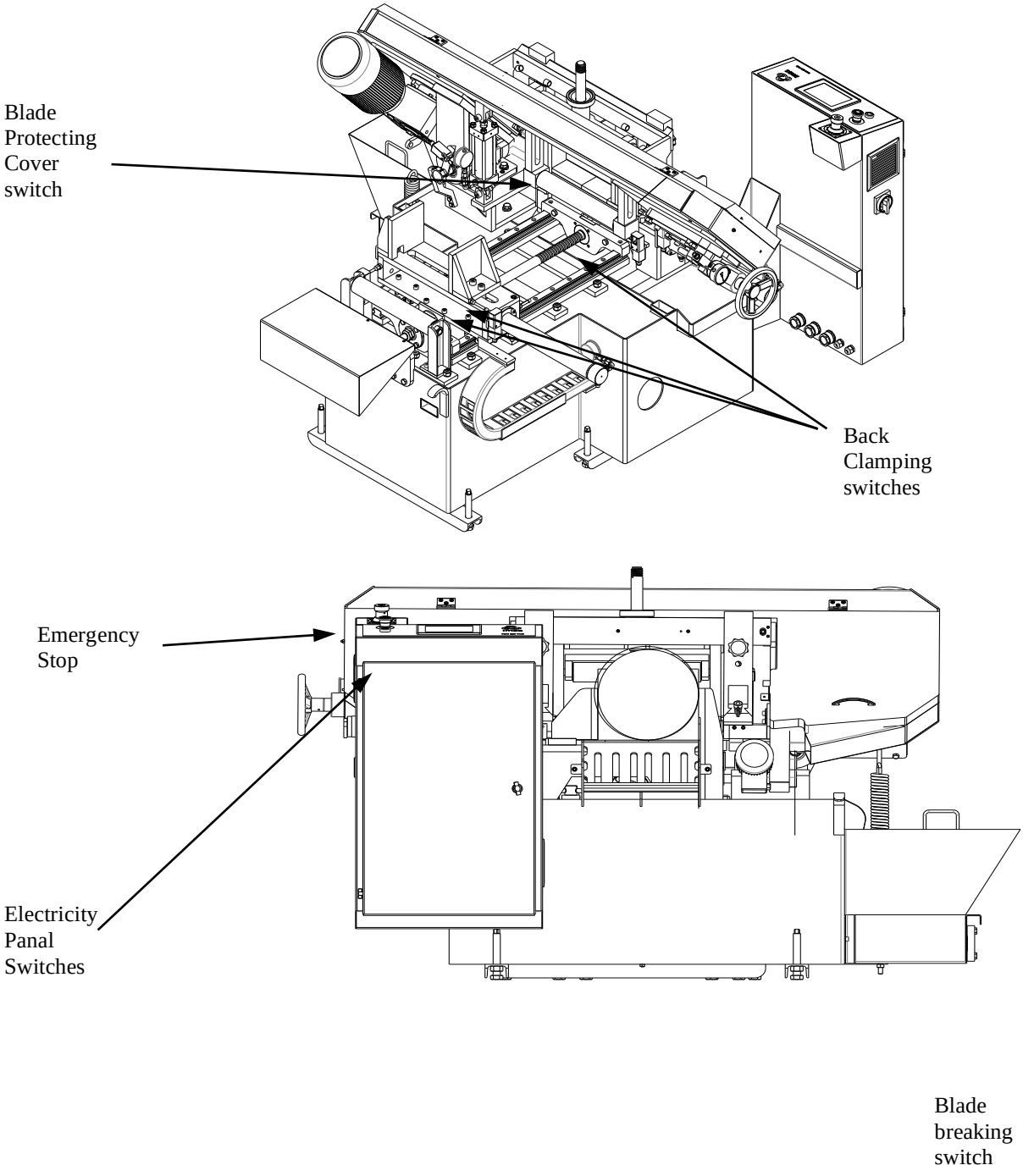
Protect yourself from the band saw head, clamps and other moving parts of the machine. Keep your hands and fingers clear from the band saw while in operation.

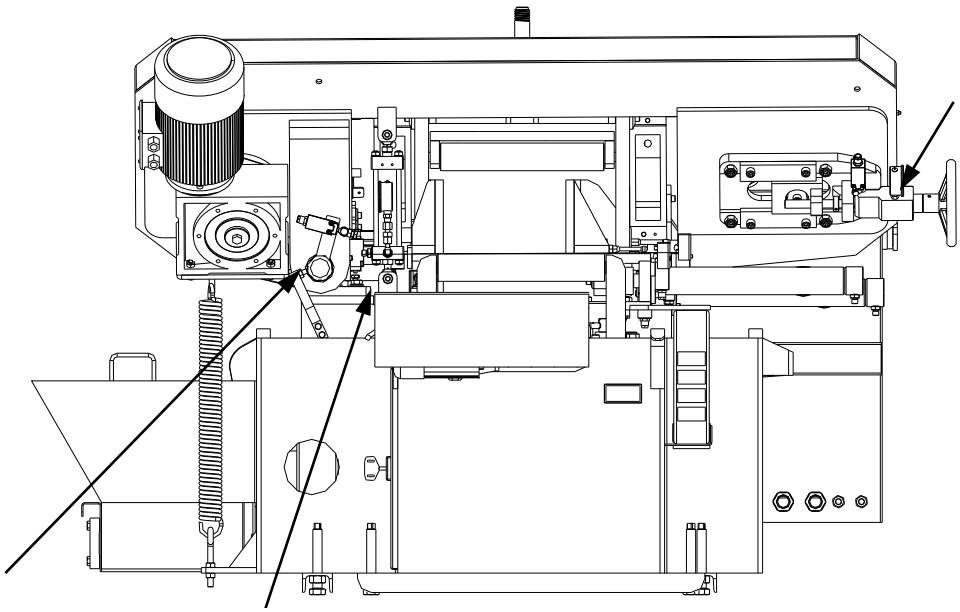
1.3 ELECTRICITY DANGER





1.4 SWITCHES


Blade
Protecting
Cover
switch
Back
Clamping
switches
Emergency
Stop
Electricity
Panal
Switches
Blade
breaking
switch



Top limit switch

Bottom limit switch

2.1 GENERAL SPECIFIC

- PLC controlled cutting specification
- Touch control panel
- 10 different cutting program specification
- Sequential cutting specification between the programs
- Non-gradual bandsaw speed adjustment on touch screen
- Saw dust conveyor
- Easy cleaning mobile cutting liquid tank and saw dust bin
- Material driving mechanism with gearing system
- Manual and automatic operating specification
- Counting the cut and to be cut material, automatic stop after cutting and hydraulic head lifting
- Hydro-mechanic blade stretch
- Hydraulic material tightening
- Adjustable material tighten pressure
- Material conveyor table with 9 rollers
- Adjustable manual top pressing roller installed on material table
- Saw dust cleaning with pressurised water
- Sensitive control lowering speed
- Safety switch on panel and bandsaw cover
- Adjustable band saw feet and carbide bandsaw guides
- Cooling liquid and hydraulic oil level indicators

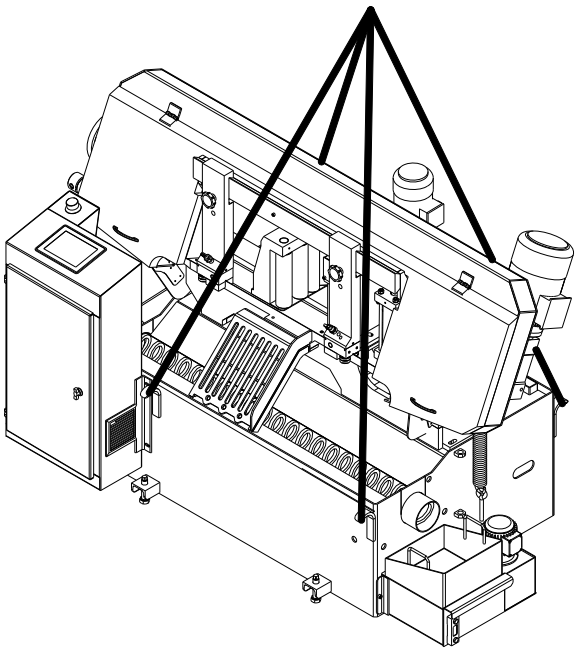
2.2 TECHNICAL SPECIFICATIONS

		PAB 280 PLC
MAIN MOTOR	**kW**	**2,2**
MATERIAL DRIVING MOTOR	**kW**	**0,55**
CUTTING LIQUID MOTOR	**kW**	**0,12**
HYDRAULIC MOTOR	**kW**	**0,37**
CONVEYOR MOTOR	**kW**	**0,09**
OPERATION PRESSURE	**Bar**	**60**
BANDSAW TIGHTEN PRESSURE	**Bar**	**200-250**
MATERIAL TIGHTEN PRESSURE	**Bar**	**10 - 50**
CUTTING SPEED	**m/dk**	**15….130**

CUTTING CAPACITY	●	**mm**	**280**
	■		**220x280**
BANDSAW SIZE		**mm**	**27x0,9x3670**
VOLTAGE		**V (AC)**	**415**
FASE NUMBER			**3**
FREQUENCY		**Hz**	**50**
MAX. POWER		**kW**	**3,33**
MAX. CURRENT		**A**	
MATERIAL FEEDING HEIGHT		**mm**	**700**
MACHINE SIZES		**mm**	**2010x1950**
MIN. HEIGHT		**mm**	**1260**
MAX. HEIGHT		**mm**	**1890**
WEIGHT		**kg**	**950**

2.3.1 TRANSPORTATION

- Ensure the transportation of machinery is done in a safe manner and that the transportation devises are capable.
- Lift the machine from the four lifting hooks (on the machine) by means of strong lifting rope. **Drawing 1**
- Please lower and fix the machine head in the lowest position before the transportation. **Picture 2**

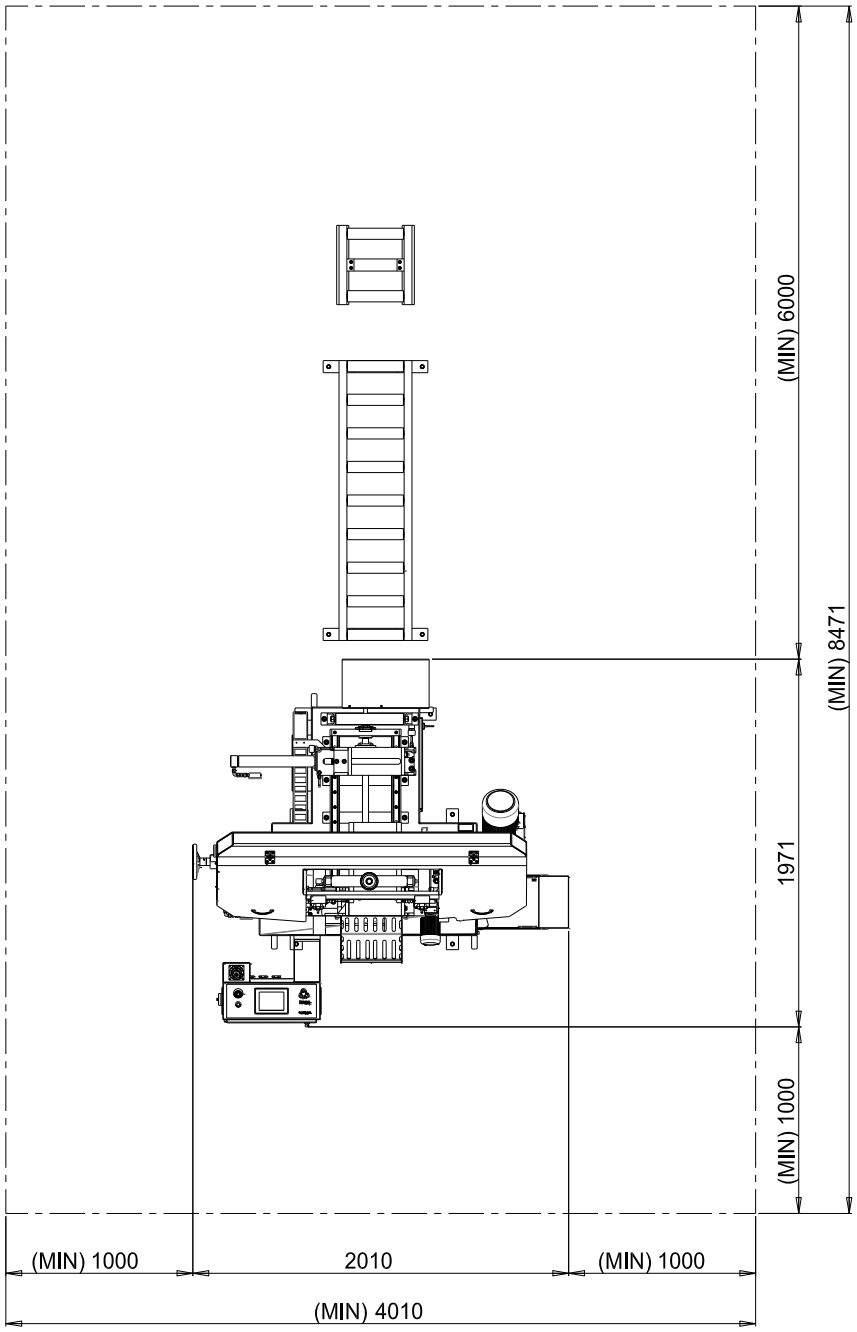


Drawing 1

Picture 2

2.3.2 WORKING AREA AND SIZES

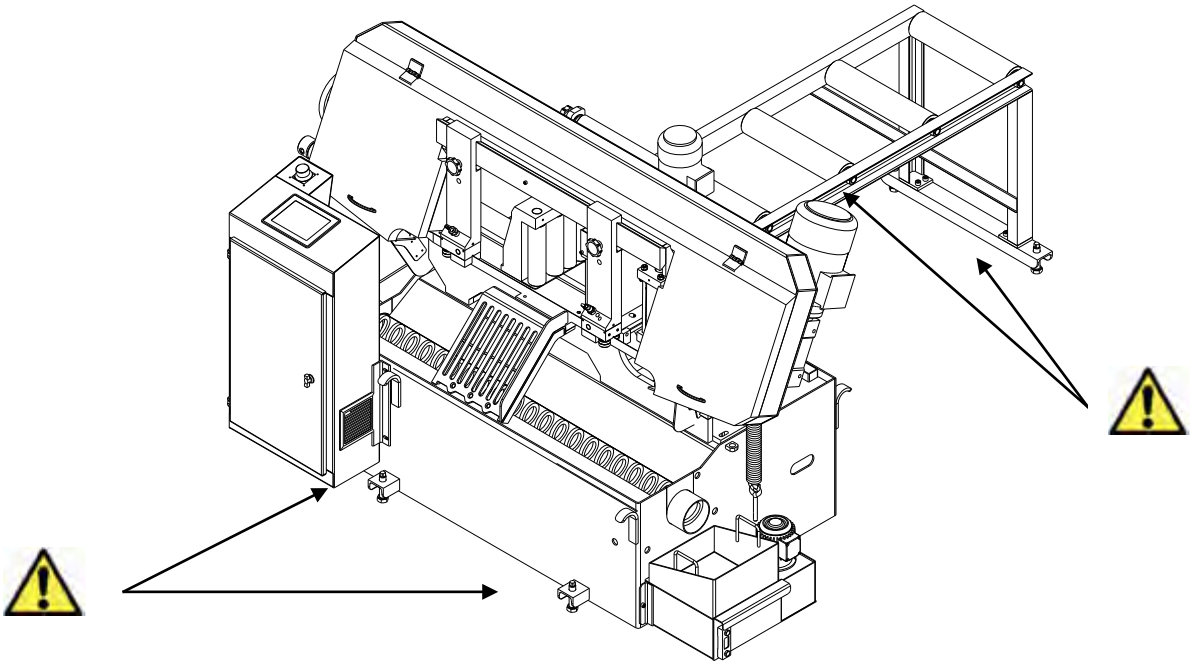
Note: All sizes given in mm.



Please prepare a space in the abovThThe working area floor should be uncluttered and strong enough to safely carry the weight of the saw.

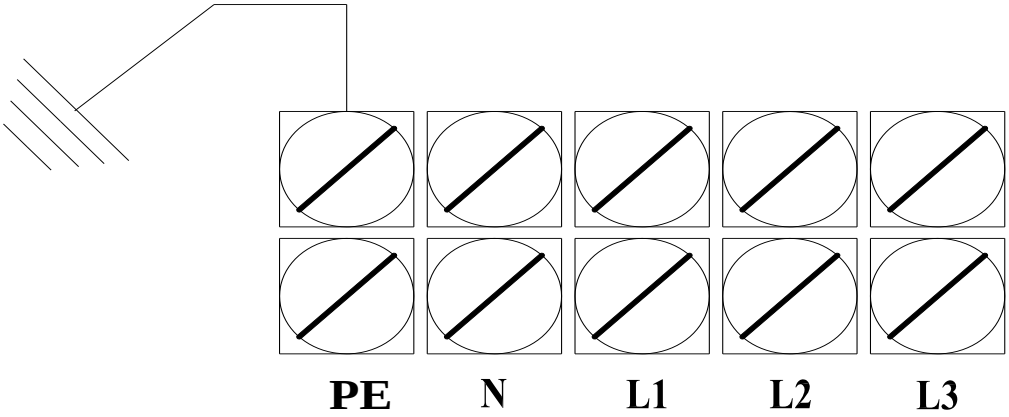
2.3.3 LAYOUT AND INSTALLATION

- Place the machine on strong flooring and fix with chassis adjustment bolts. The chassis adjustment bolts have been placed inside the electricity panel.
- Un-pack the machine and clean the guard oil.
- Take the safety part out which is fixed to the machine head middle body. Drawing 2
- Put and fix the material table in a suitable place, recommended behind the machine.
- The material table rollers and the machine central body should be at the same level and balanced. This adjustment can be done by bolting in-front and behind of machine and bolting the table. (Drawing 3)

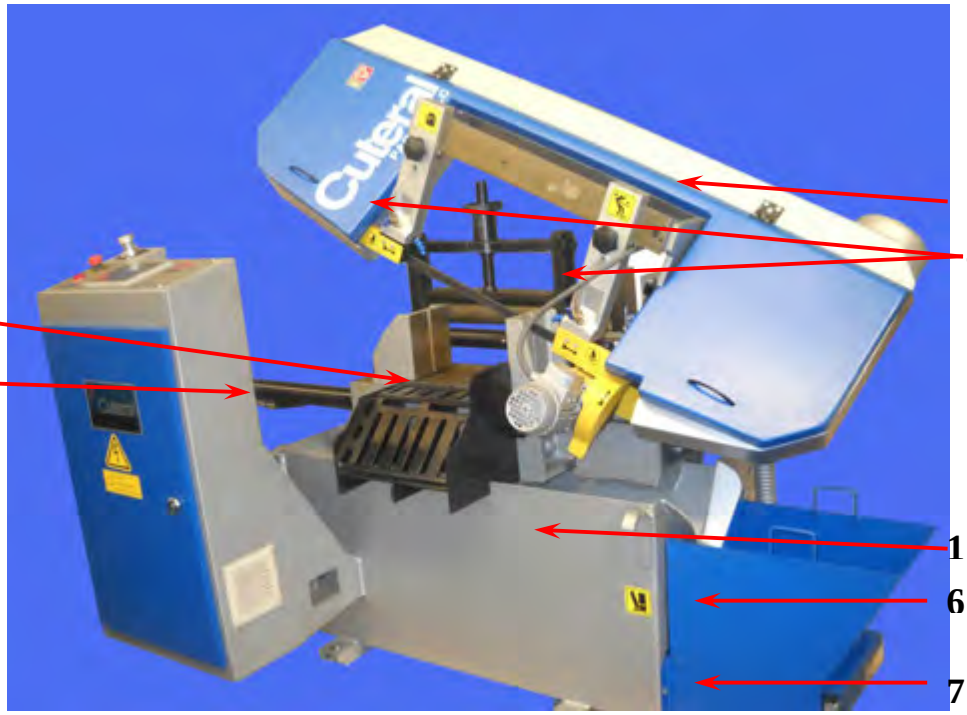


Drawing 3

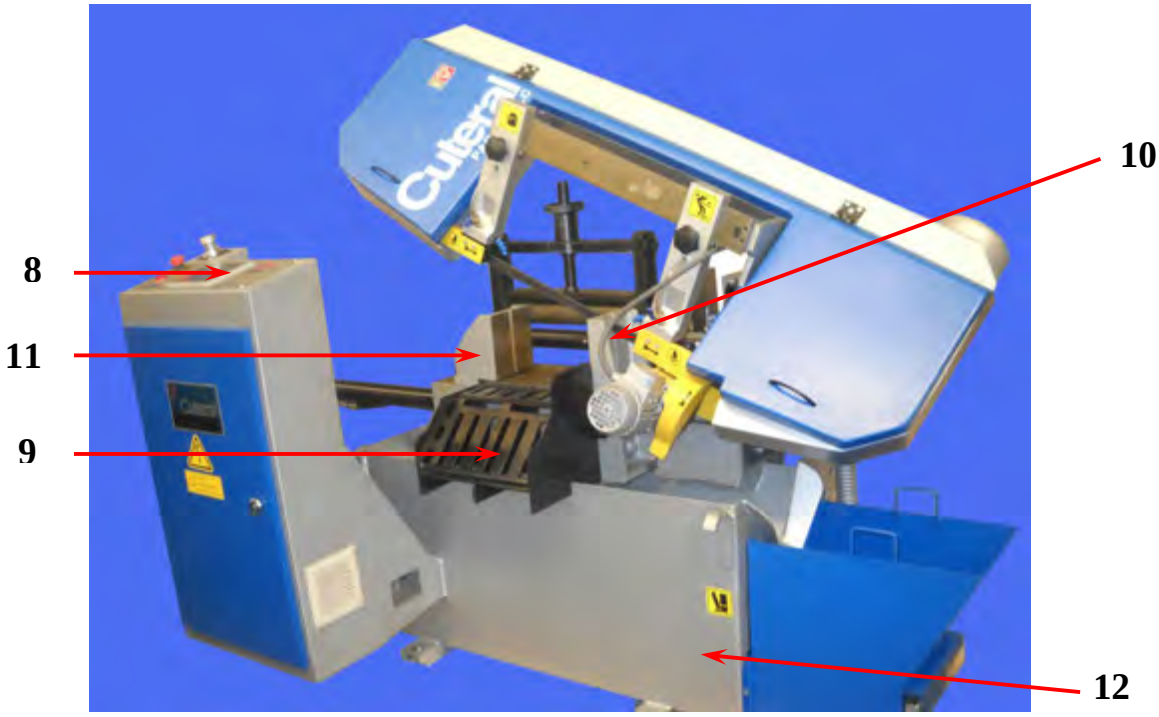
- The machine must be supplied with the suitable attached electricity schematic. The grounding connection must be done. The network should be V (AC) 50Hz.
- Plug the machine cable in and turn-on the main switch beside the electricity panel. The signal lamp on the panel will light up and the touch-screen will now be ready to use. If unable to switch on or error occurs, please try again by changing the connection of L1, L2 and L3 cable ends. *Before stating the changing process, please unplug the electricity cable and cut all power supply to the machine.*



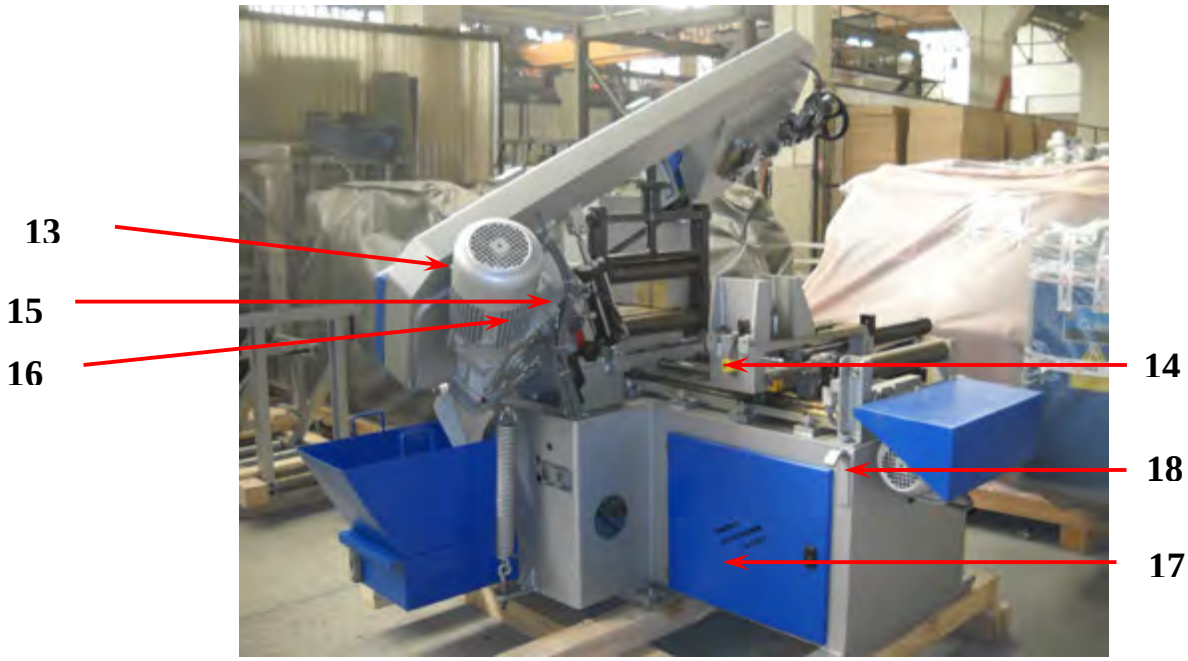
4.0 MAIN PARTS OF THE MACHINE



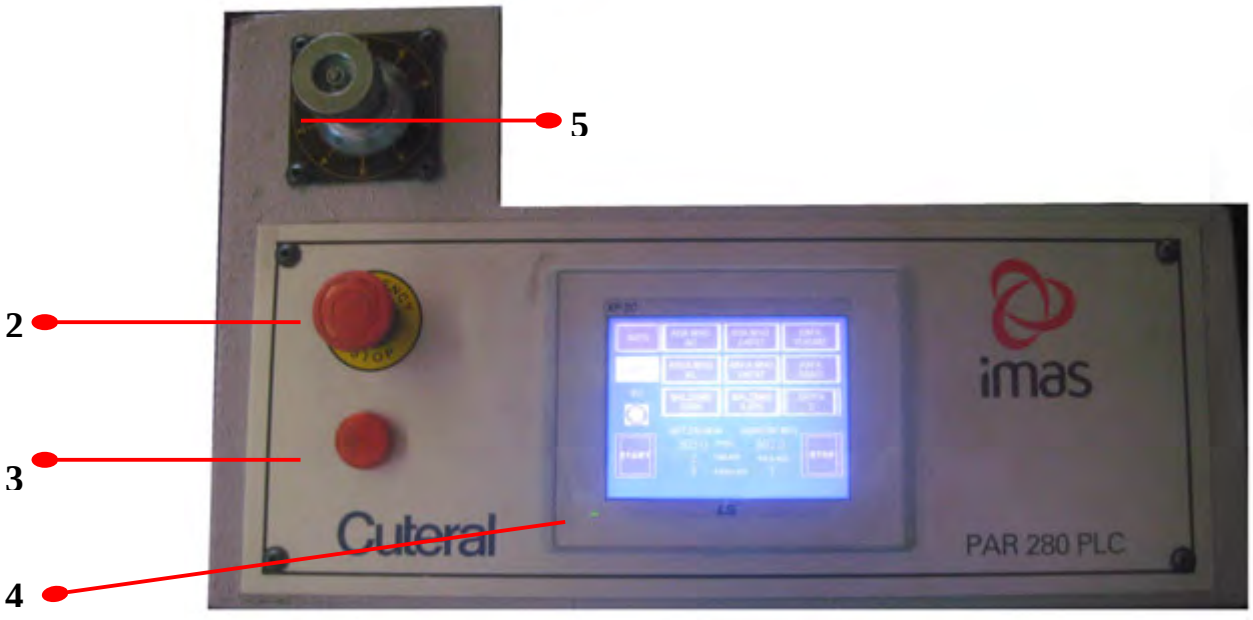
1- Bottom Chasis
2- Material Clamping Cylinder
3- Middle Body
4- Blade straightening Guide
5- Top Head
6- Chip Box
7- Cutting Liquid Tank
8- Control Panel
9- Material Grill
10- Fixed Clamping
11- Moving Clamping
12- Cutting Liquid Motor



13-Blade Gear Box
14-Feeding Clamping System
15- Bottom Limit Swich
16- Top Limit Swichi
17- Hydraulic Unit
18- Feeding GeraBox



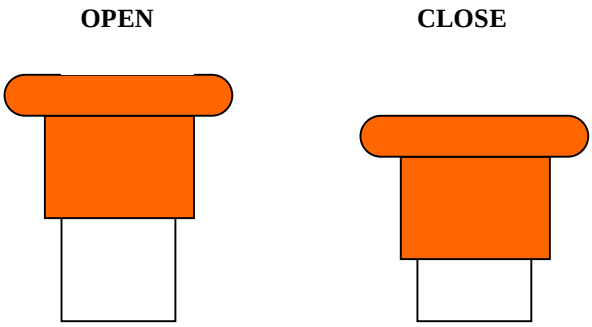
CONTROL PANEL



MAIN SWITCH (AT THE SIDE OF THE CONTROL PANEL)

It is used to transmit energy to buttons on and inside the electric panel.

EMERGENCY BUTTON



When button is pushed the machine switches off. This button can be pressed in an emergency and the machine will stop immediately. When the button is pushed close, the energy lamp does not light on and all other buttons on the panel will not function. Release emergency button by turning button in the direction of the arrow (on switch) and energy lamp re-lights up and the saw is ready to use once again.

When in maintenance, breakdown or bandsaw blade changing situations push the emergency stop button for safety. Switch off the main switch and cut all electricity supply to the machine.

ENERGY LAMP

This lamp light is on when the main switch is on (if emergency button is open) and shows that the system has power. In this case the machine is ready for starting.

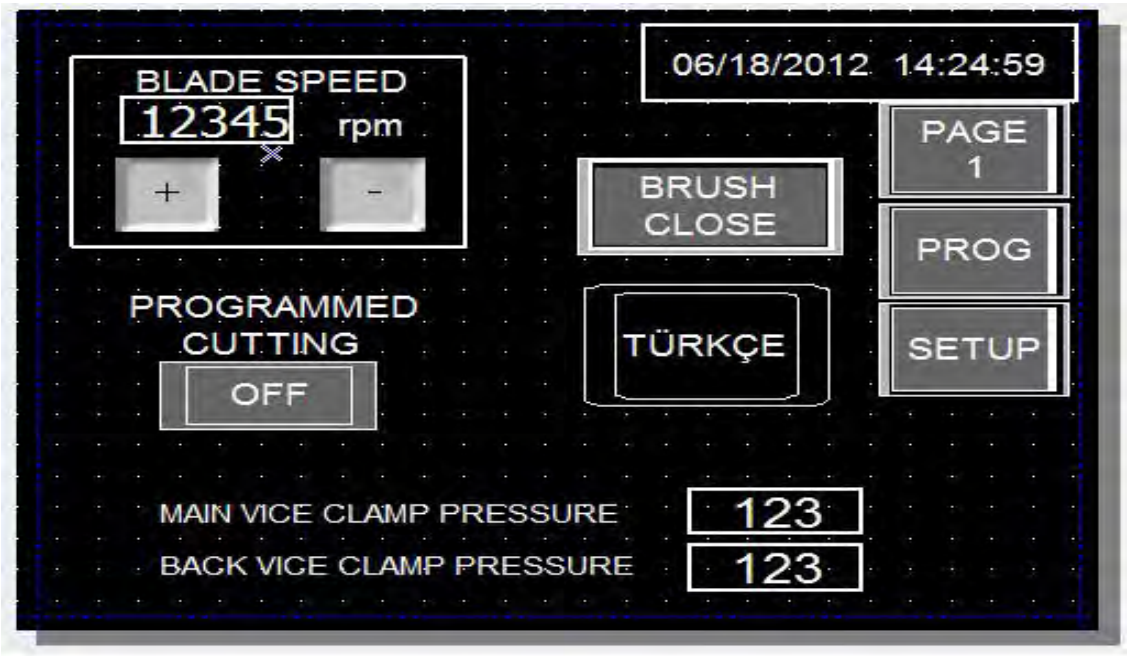
If light is out of order, please change as soon as possible.

5.0 CONTROL PANEL

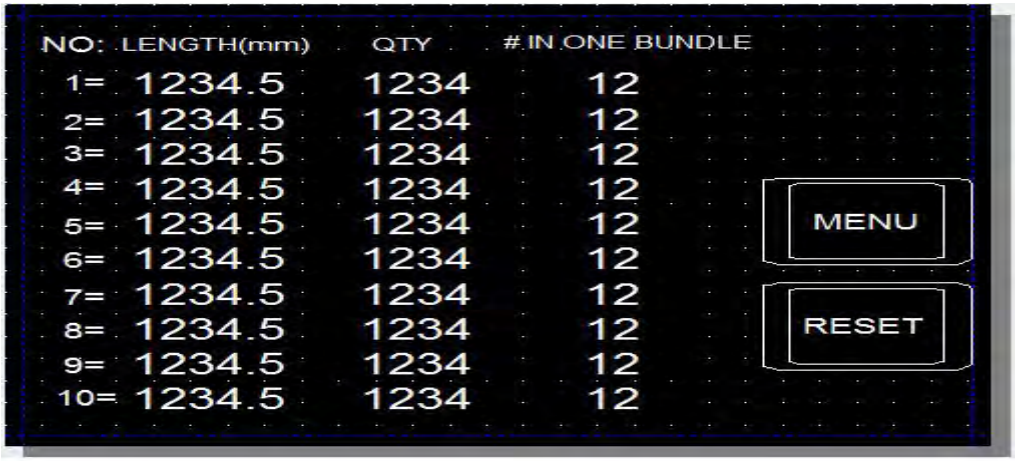
INITIAL SCREEN

MAIN CONTROL PANEL

SECOND CONTROL PANEL



PROGRAM SCREEN



Buttons and their functions are as follows:

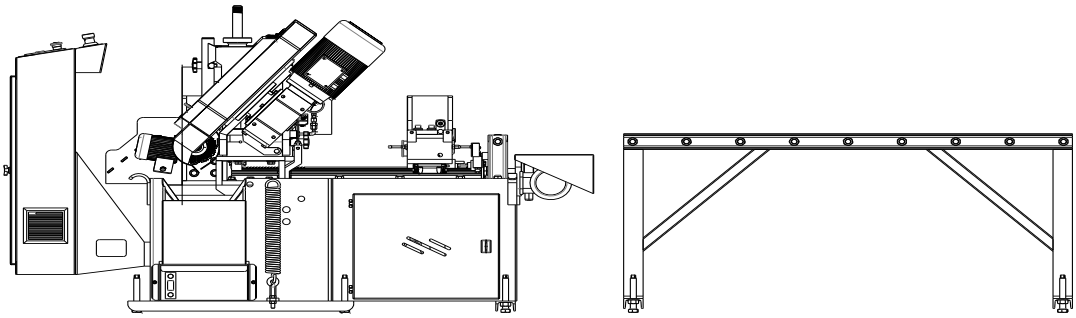
NUMBER	:To be chosen numbers at the cutting process.
LENGTH (mm)	: Material lenght.
UNIT	: Material Unit.
# IN ONE BUNDLE	: Number of pieces between the vices. Number of pieces cut increases by the multiple of the value entered here
RESET	: Clears all values on the program screen
MENU	: Opens control screen

HEAD DESCENDING SPEED ADJUSTMENT

The below dial is used to adjust the descending speed of the head.

6.0 THINGS TO DO BEFORE STARTING THE MACHINE

PRE-CONTROLS



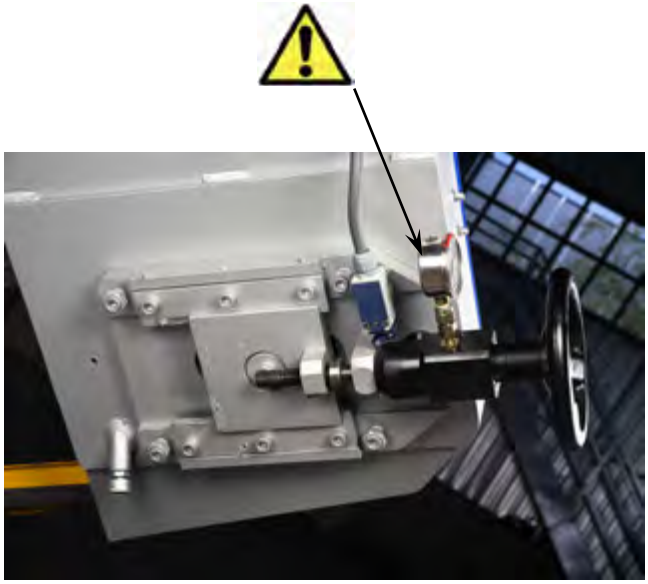
- Fill the cutting liquid reservoir with 25 lt. cooling liquid.
- Remove safety bracket which is fixed to the machine head an main body (Picture 1)

Picture 1

- Check the hydraulic oil tank for oil level. The tank capacity is 12 lt. If oil is at a low level, refill. The oil should be No 46 hydraulic system oil. (Picture 2)

Picture 2

- Check the bandsaw stretching pressure system. The pressure seen on manometer should be between 100-150 bar. (Picture 3)



Picture 3

CHOOSING A BLADE

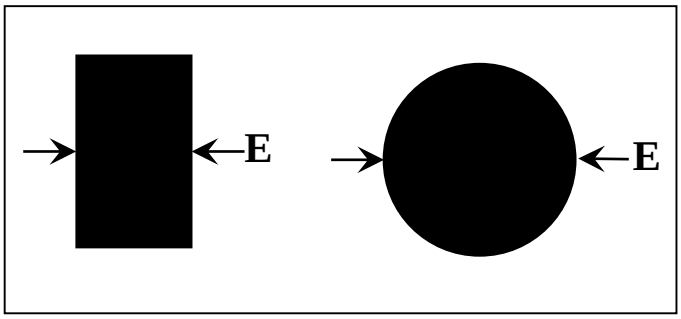
The following steps should be followed for choosing the correct bandsaw blade:

CHOOSING TEETH

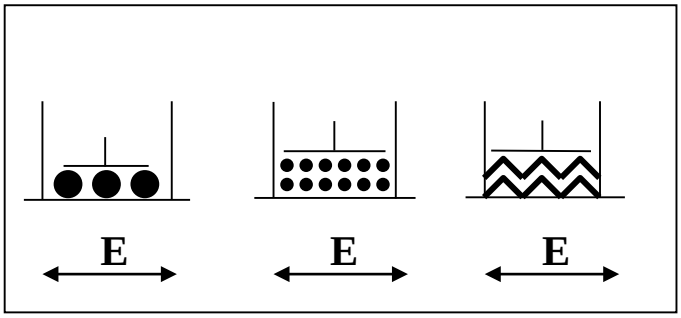
Two selective criteria are to be considered:

- The teeth number in one inch (25.4 mm)
- Grade angle

a) Single Cutting



b) Multiple Cutting

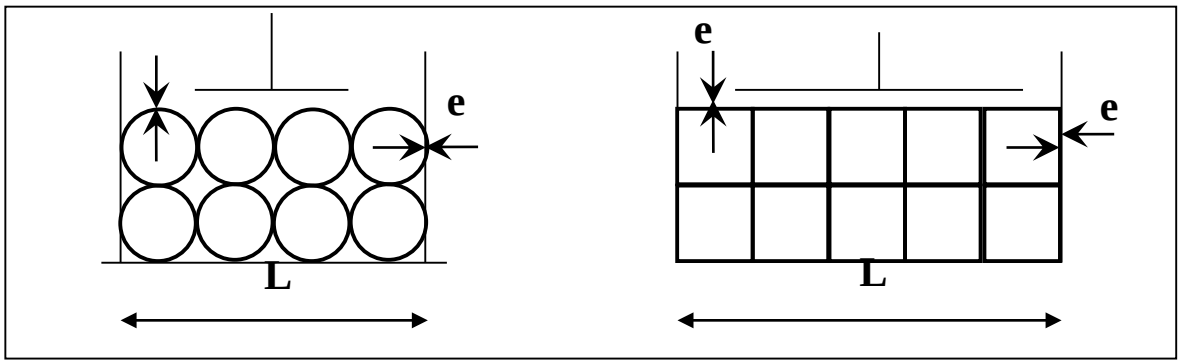


L (mm) E (mm)	20	40	60	80	100	120	150	200	300	500
2	14	14	10/14	10/14	10/14	10/14	10/14	8/12	6/10	6/10
3	10/14	10/14	10/14	10/14	8/12	8/12	8/12	6/10	6/10	5/8
4	8/12	8/12	8/12	8/12	8/12	6/10	6/10	6/10	5/8	5/8
5	8/12	8/12	8/12	6/10	6/10	6/10	6/10	5/8	5/8	4/6
6	6/10	6/10	6/10	6/10	6/10	6/10	5/8	5/8	4/6	4/6
8	6/10	6/10	6/10	6/10	5/8	5/8	5/8	4/6	4/6	3/4
10		5/8	5/8	5/8	5/8	5/8	4/6	4/6	4/6	3/4
12		5/8	5/8	5/8	4/6	4/6	4/6	4/6	3/4	3/4
15		4/6	4/6	4/6	4/6	4/6	3/4	3/4	3/4	2/3
20			4/6	4/6	3/4	3/4	3/4	3/4	2/3	2/3
30				3/4	3/4	3/4	2/3	2/3	2/3	2/3
50						2/3	2/3	2/3	2/3	1,2/2

Please choose the teeth from the above given table according to the material diameter (L) and the thickness (E).

FOR INSTANCE: The material diameter is (L) = 60 mm and the thickness is E = 6 mm.
The teeth should be; 6/10 teeth bandsaw according to above given sample.

Multiple Cutting



e: The thickness of the material
L: The quantity of multiple cutting materials in "L" dimension
E: The thickness taken for teeth choosing

$$E = \frac{e \times \text{"L" quantity in this dimension}}{2}$$

Please choose the teeth according to the above given values for multiple cutting process.

FOR INSTANCE: The material diameter is 30 mm.
"L" quantity in this dimension = 4

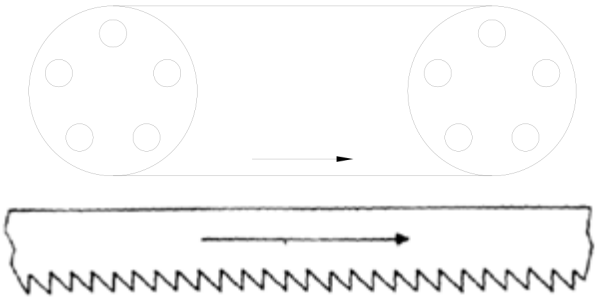
L = 4x30 L = 120 mm

$$E = \frac{e \times \text{"L" quantity in the dimension}}{2} = \frac{3 \times 4}{2} = \frac{12}{2} = 6 \text{ mm}$$

According to the values L = 120 mm and E = 6 mm , 6/10 teeth band saw should be choosen from the table.

6.1 STARTING

- Please read the instruction manual before operating the Band Saw machine. Please keep the User Manual beside the machine where it is easily accessible.
- Complete all control checks before operation, as advised previously in sections of this manual.
- Follow all safety precautions to prevent any harm or injury.
- Please check if the correct and suitable bandsaw was fixed on the machine. If not, please choose the correct band saw by following selection process, as advised previously in manual.
- Supply power to machine by switching on the main switch, in which the signal lamp will come on.
- Please adjust the cutting head 10cm from the material to be cut by adjusting the top limit switch and then tightening the bolt.
- Lift up the machine head by pushing the Head Lifting Button.
- Open the active clamp by pushing the Clamp Opening button. Clasp the material between the clamps by pushing on the front pedal. The pressure seen in the manometer on the material clasping hydraulic cylinder should be around 20 bar.
- Make sure the speed adjustment valve is closed, level (0). Push the start button, the bandsaw blade direction should be in the same direction seen in the below drawing.



6.2 MANUAL CUTTING

- Stop the machine by pushing stop button. The speed adjustment valve should be closed and the manual cutting mode should be chosen. Push the Forward button as long as you would like to cut the material.
- If the length of material is longer than you need, you can take it back by pushing the backward button.
- Start the machine by pushing the Start button. Open the second control panel by pushing Page 2, here you can adjust the speed to suit material type. Use the Annex table for the advised values.
- Go back to main control panel by pushing Page 1. Here activate the cutting liquid button. After this the cutting liquid pump is going to start and pump cutting liquid on the blade.
- Lower the machine head and start to cut the material by gradually opening the speed

adjustment valve. After the cutting finishes the bandsaw is going to stop and the head is going to lift up until the top limit button is pushed which it will then stop.

6.3 AUTOMATIC CUTTING

- Open the Program panel by pushing the program button on (second control panel). Here there are 10 different cutting programs. Enter the length and cutting number for each program. If you are going to do multiple cutting, enter the cutting number into the multiple numbers section.

- To automatically continue from first program to the second without the machine stopping; activate the sequential cutting button on (second control panel).

- Choose the automatic cutting mode on (main control panel). Choose any program you did before on the Program No section. Activate the cutting liquid button.

- Start the cutting process by opening the speed adjustment valve a little. The initial cut of the automatic process will be a cleanup/end leveling of the material which is not deducted from the set total of pieces to be cut. After cutting finishes the bandsaw is going to stop and the head is going to lift up till pushing the top limit button. Later the material is driven as long as it was programmed and the cutting starts again. This continues till the programmed total cutting number is cut.

6.4 INFORMATION ABOUT THE OPERATION OF MACHINE

- If the top limit switch is not pushed, the machine will be non-functional. For starting, the top head should be lifted up and the top limit switch pushed/activated for proper functioning.

- The clamp between switches should be active for proper functioning. The bandsaw stops if switch is out of service. Reasons may be; the material finishes, the material surface is damaged or the movable clamp is not able to give enough pressure for tightening the material. In this case the “material finished” message is seen on the screen.

- If the band saw blade breaks or is very loose, the machine will stop. Message “Bandsaw break” will be seen on the panel screen. In such cases check the band saw blade.

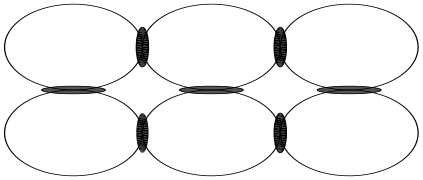
- The saw will automatically stop if any of the motor thermics are out of service. The related message is seen on the panel screen.

- The machine will automatically stop if the band saw guard cover or electricity panel cover are opened. The related message is seen on the panel screen.

- In an emergency, stop the machine by pushing the stop button. When pushed the machine will be non-functional and the “Emergency Stop” message is seen on the panel screen.

- Cleaning of the encoder rollers is very important to maintain sensitivity of the bandsaw. Ensure saw dusts/swarf is regularly cleaned and collected.

- In multiple material cutting processes, it is very important that the materials are clasped strongly between the clamps. In such cases it is advised to spot-weld the materials to each other from the back sides.



7.0 ADJUSTMENTS & MAINTENANCE

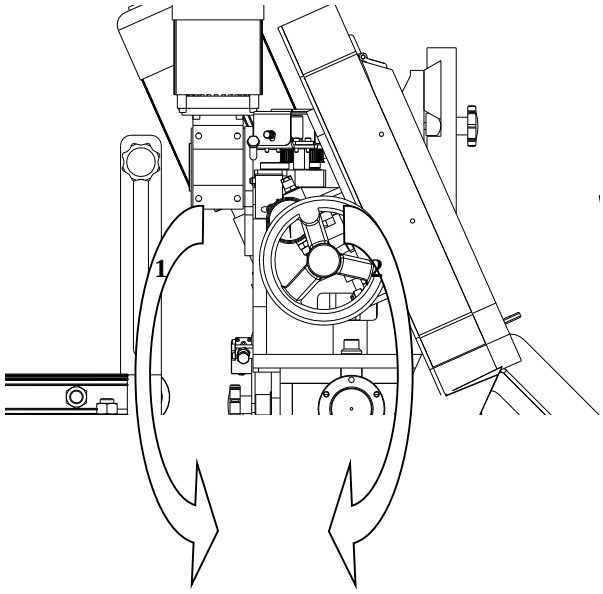
CHANGING THE BANDSAW BLADE

Removing the Blade:

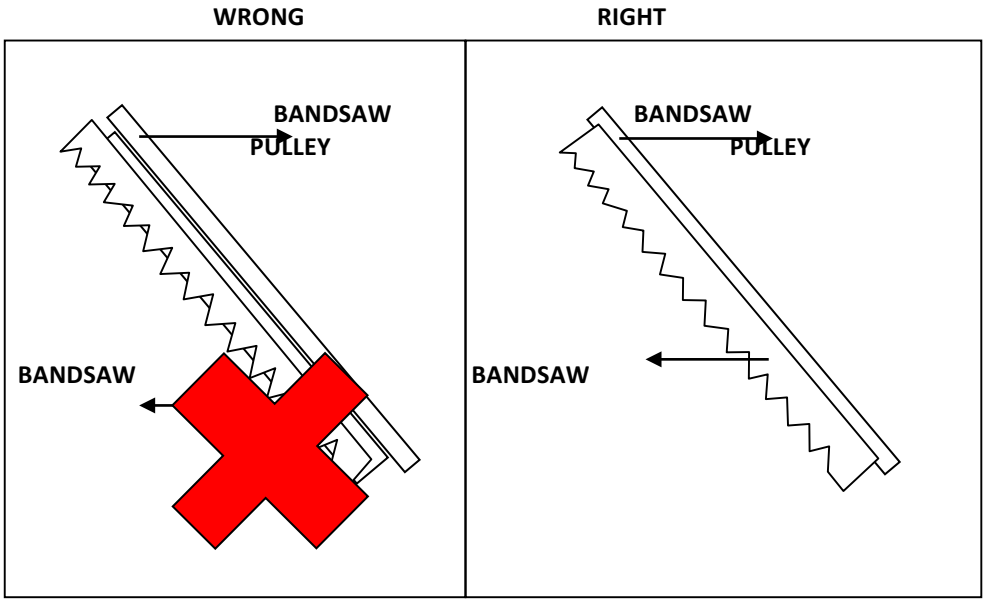
- Please use suitable safety gloves when removing the blade
- Lift the machine head as much as you can to allow for easy removal.
- Cut the electricity connection by switching off the main switch.
- Open the band saw pulley covers. Take the guards out.
- Loosen the blade by turning the bandsaw stretching hand wheel in the direction of **1** as seen in the below drawing.
- Take the blade out from the bandsaw channel on the guiding feet.

Replacing the Blade:

- Please use suitable safety gloves when installing new blade.
- Cut the electricity connection by switching off at the main switch.
- Choose suitable band saw blade for the material type (diameter,etc).
- Pay attention that the blade is fixed in the correct cutting direction.
- Place the blade on the free and driver pulleys.
- Place the blade in the bandsaw blade channel on the bandsaw guiding feet.
- Stretch the blade by turning the stretching hand wheel in the direction of 2 as seen in the below drawing. The manometer pressure should be between 100–150 Bar.
- Close the band saw pulley cover and fix the guards.



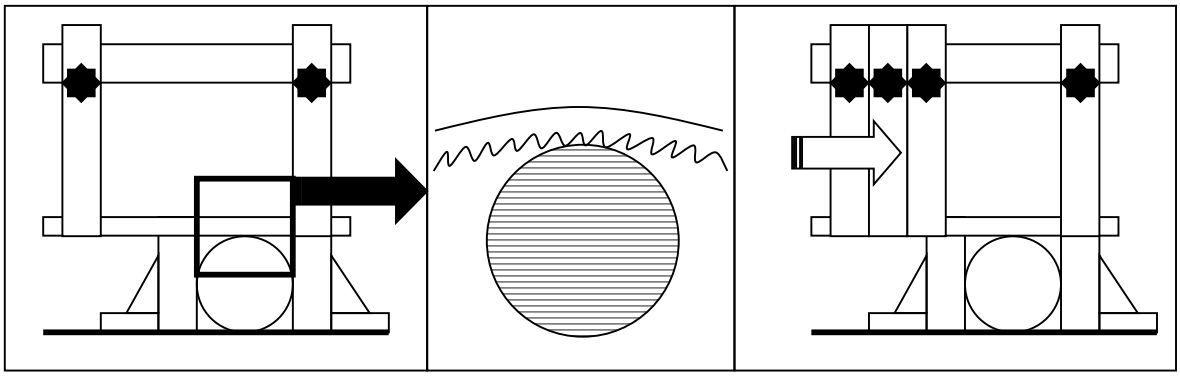
NOTE: Please take the plastic guard on the bandsaw out just after fixing on the machine.



The blade should be fixed on the machine as seen in the above drawing. Ensure that the blade is placed well on the pulley nest.

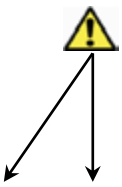
BANDSAW GUIDING FEET

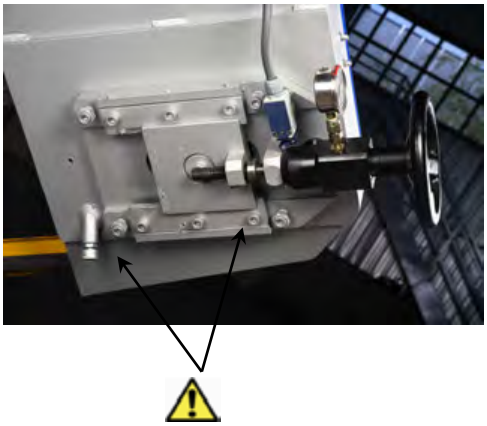
Adjust the bandsaw guiding feet to cut material to required size. Close the free guiding foot by loosening the knob on the bandsaw free guiding foot. Otherwise the cutting quality and band saw lifetime will be effected negatively.



ADJUSTMENT OF BANDSAW PULLEYS

The bandsaw free and driver pulleys should be at the same level. For this, adjust the balance of the pulleys with the adjustment bolts on the bandsaw stretching mechanism.

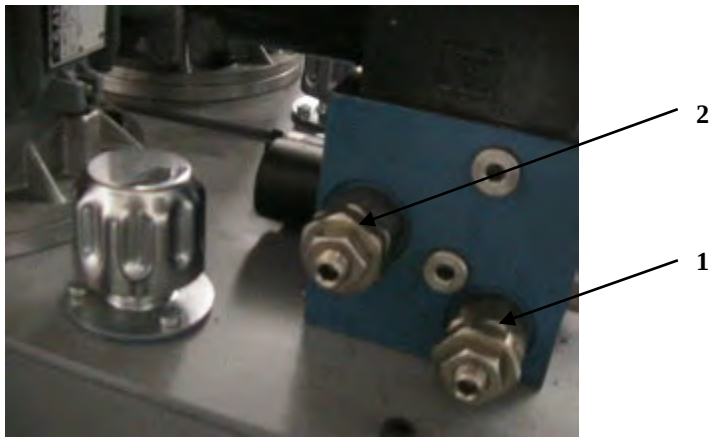




HYDRAULIC PRESSURE ADJUSTMENT

The hydraulic system pressure is adjusted by the pressure adjustment valve on the hydraulic unit, on the side of the saw. Here the head lifting pressure and material clamping pressure is shared.

- Lift the machine head to top level.
- Loosen the No 1 valve, and tighten the No 2 valve.
- Place any material between the clamps and push the clamp close valve. Tighten No.1 valve slowly and observe the pressure from the manometer on the material hydraulic cylinder. Tighten the No.1 valve till the pressure reaches 30-35 bar, then fix the contra-nut. Thus, the machine hydraulic and head lifting pressure is adjusted.
- Open the clamp by pushing the Clamp Open button. Loosen the No1 valve gradually and observe the pressure tightening the clamp. Do this process till seeing 20bar pressure. Thus, the material tightening pressure is adjusted.



HEAD LOWERING SPEED ADJUSTMENT

Please use the speed adjustment valve on the electricity panel for adjusting the head lowering speed.

Adjust the cutting speed and head lowering speed according to the saw dust/swarf coming out from the cutting process.

	Very thin and dust like shaving type. Decrease the cutting speed and increase the head lowering speed.
	Thick and/or blue color shaving type. Shows over-force on bandsaw. Decrease the cutting and head lowering speed.
	Long and spiral shavings. This kind of shaving is obtained on ideal cutting process. The cutting and head lowering speed is normal.

DAILY MAINTENANCE

- General cleaning should be done daily (swarf shavings, etc).
- Check thes stretch of the bandsaw blade before starting.
- Check the square of a minimum of 3 cut pieces/ parts daily for accurate cutting.

WEEKLY MAINTENANCE

- Grease the greasing nipple on the bandsaw free pulley.
- Oil the skids of the bandsaw stretching system with lubricator.
- Clean the fixed and mobile clamps and lubricate the body surface under the clamps.
- The blade should always be checked for any cracks or brakes. If any cracks or brakes, the blade should be changed immediately.
- Lubricate the helical gear system on the fixed clamp.
- Grease the joint connection greasing nipple.
- Change the cooling liquid if needed.
- If the same size material is constantly cut on the machine the top part of the cylinders can become oxidized due to not being lubricated. To prevent this, please operate machine free without cutting any material 10 or 15 times weekly or lubricate the cylinders by taking the stopper out by the lubricator.

MONTHLY MAINTENANCE

- The hydraulic oil level should be checked, if any decrease, it should be filled.
- The bandsaw guiding jaws and ball bearings should be checked. If any wear and corrosion, they should be changed with new ones.
- The joint connection spring and the head weight should be checked.
- Oil leakage on hydraulic system and reducers should be checked.

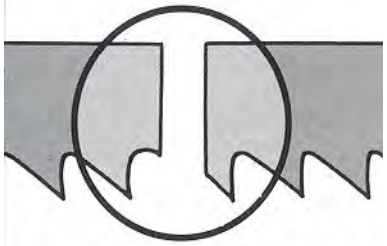
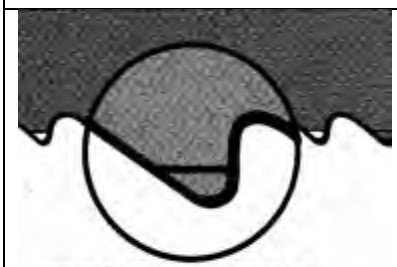
SIX MONTH MAINTENANCE

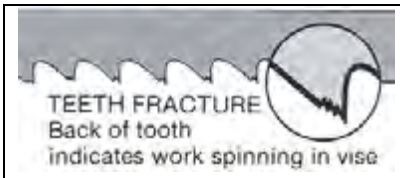
- The hydraulic oil should be checked every 6 months. The oil should be changed if it is spoiled.

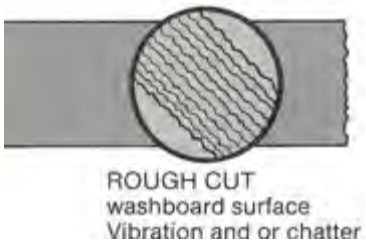
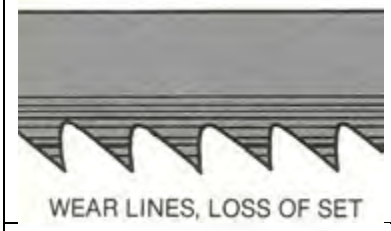
  Oil Type : No 46
  Oil Amount : 12 Liter
  Next Oil Change : 6 months

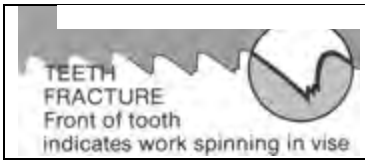
- The clamp system, driver (feeding) system and motors should be maintained every 6 months.
- The main reducer oil should be emptied completely and filled up again with the new oil.

  Oil Type : MOBILGEAR No 636634
  Oil Amount : 1.5 Liter
  Next Oil Change : 6 months

Blade Damage	Probable Reason	Solution
 BLADE BREAKAGE Straight Break indicates fatigue	• Incorrect Blade used • Blade tightness set too high • High lowering speed of head • Wrong cutting liquid • Blade rubbing against pulley flange • Blade touching material prior to engaging cut	• Please check whether the blade teeth choice is correct • Lower blade tightness according to the operation and maintenance instructions. • Decrease the head lowering speed. • Use the advised cutting liquids • Align the pulleys • Keep space between the band saw and material to be cut
 PREMATURE DULLING OF TEETH	• Blade turning in wrong direction • Blade incorrectly installed • Hard material or rough surface • Very hard material • Unsuitable cutting liquid or incorrect mixture. • High cutting or head lowering speed	• Correct blade rotating direction • Re-install blade correctly • Check the material hardness and rough material surface. • Prepare a suitable cutting liquid mixture. • Check the cutting specifications
 INACCURATE CUT	• The space between the blade supporters is too wide • Blade has worn out • Wrong head lowering speed • Wrong teeth choice • The cutting liquid is not applied to material well • Band saw diamonds worn out or loose.	• Adjust the space between blade supporters • Change the blade • Check the cutting specifications • Use suitable tooth configuration • Make sure cutting liquid is flowing on cutting surface. • Renew the diamonds or tighten them
 BAND LEADING IN CUT	• Overloaded bandsaw. • Loose blade • Saw set is damaged • Blade supporters are set too wide	• Check the cutting conditions • Adjust blade stretch • Check the material hardness • Adjust the bandsaw and diamonds
 CHIP WELDING	• Worn out or un-functional saw dust brush • Wrong or missing cutting liquid • Wrong cooling liquid mixture • High cutting or head lowering speed • Wrong teeth choice on blade	• Change the brush or adjust it • Check the cutting liquid level • Check the cutting liquid type • Decrease the cutting or head lowering speed. • Check the correct teeth choice

	• The band saw diamonds not adjusted well • Wrong head lowering or cutting speed • Wrong band saw blade • The material is not tightened well between the vices	• Adjust the bandsaw diamonds • Check the cutting specifications • Use suitable band saw blade and suitable tooth configuration • Check the clamps and adjust

Blade Damage	Probable Reasons	Solution
	• Blade fitted incorrectly • Blade speed is too low • Head lowering speed is too high • Teeth are tightened during the cutting • Poor cutting liquid application • Hard material or rough surface • Wrong teeth choice • The material is turning or no top clasping • Blade running backwards	• Refit blade correctly • Check the cutting specifications • Decrease the head lowering speed • Adjust the cutting liquid amount • Check the material hardness • Check the tooth configuration • Tighten the clamps or apply top clasping • Change the blade direction
	• Too much pressure on the back of the blade • Blade is loose • Wrong type of blade for application (carbon steel type) • High head lowering speed or pressure • Space is set too wide between blade supporters • Blade friction on pulleys	• Check the band saw supporter ball bearings. • Adjust the blade stretch • Use bimetal blade • Decrease the head lowering speed • Adjust bandsaw blade supporter space accordingly • Balance the pulleys level
	• Blunt or damaged blade • Wrong head lowering or cutting speed • Bandsaw blade not supported well • Loose blade • Wrong teeth choice • Space is set too wide between blade supporters	• Replace the blade • Check the cutting specifications • Adjust the bandsaw diamonds or tighten them • Do the adjustment according to the operation and maintenance instructions. • Check the correct tooth configuration • Adjust the space between the bandsaw blade supporters according to the material size
	• The blade diamonds are too tight • The teeth rubbing against the diamonds • Teeth rubbing against the pulley surface • Unsuitable blade width • Swarf build up • Lack of cooling liquid	• Adjust the blade diamonds • Adjust the bandsaw ball bearings. • Adjust the bandsaw pulleys or replace them • Adjust the sawdust brush or replace with new one • Adjust the amount of cooling liquid
	• Band saw diamonds are too tight • The material is not clasping well • The head lowering pressure is too high • Space is set too wide between blade Supporters	•
	• Incorrect blade for application • High head lowering pressure or high cutting speed • Missing cutting liquid • Blade running backwards	• Check the cutting specifications & choose correct blade for application • Adjust the amount and mixture of cutting liquid • Change blade direction • Adjust lowering head pressure & cutting speed

	• The material is not clasping well between the clamps • Wrong teeth choice on blade • High head lowering speed • High cutting speed	• Adjust the clamps • Check the teeth choice • Decrease the head lowering speed • Decrease cutting speed • Check the cutting specifications

8.0 PROBABLE PROBLEMS AND SOLUTIONS

HYDRAULIC PROBLEMS AND SOLUTIONS

- If the top head of the machine is not lifting up;

- First check the joint connection spring. If the joint spring is broken the top head will not go up. Change joint spring.
- Check the pressure adjustment valve in the system of the hydraulic pump. If this valve is fastened the top head lifting speed increases, if the valve is loosened, the top head lifting speed is decreased.
- The hydraulic unit coupling gear could be damaged. Check the coupling system.
- The hydraulic unit oil could be low. Check the oil level.

- If the top head is not going down ;

- If the poppet valve spindle (the spindle that the electricity bobin is fixed on) is damaged, such as bent, crushed, etc, the top head will not come down. Change the poppet valve.
- If the poppet valve is unclean, such as dust inside the valve, the top head does not come down. Clean the poppet valve carefully.
- Check if the poppet valve is functioning well or not. The bobin is taken out and the head lowering button is pushed by a test light or screw driver from the bobin hole. After pushing the button if there is electro-magnetize, the bobin is functioning well.
- Check the director valve sockets. The socket may have been taken out or may not be reflecting electricity.
- The hydraulic lowering speed adjusting key cannot function in the “0” position. Check un-leakage elements by taking the key spindle out.

- If the top head is coming down and bouncing;

- Check the tightness elements by taking out the hydraulic lift. Before removing the hydraulic lift, take safety precautions with the top head. If the tightness elements are damaged, they will need to be changed.
- The hydarulic lift pipe inside may be damaged. Change the hydraulic lift pipe.

- If the hydraulic lift has an exhale;

- Take the hydraulic lift connection to the top and remove the chassis. Loosen the hydraulic hose sleeve or manometer indicator. Apply pressure with your hand to the hydraulic lift spindle. With this pressure, some oil and air will come out. Repeat this several times and then reinstall all removed parts.

PROBABLE ELECTRICAL SYSTEM PROBLEMS AND SOLUTIONS

- The material is driven longer than desired length.

- Check the encoder ball, there could be tightening.
- The encoder ball could press on the material.
- The encoder could be faulty.

- “Encoder Breakdown” warning is seen on the screen.

- Check the encoder ball, there could be tightening.
- Check the encoder coupling.
- The encoder could be faulty.

- Thermic Fault is seen on the screen.

- Check the motor thermics.
-

- There is electricity but the bandsaw is not starting.

- Check the main power cable of the machine. Are the cables intact?
- Is the plug wired correctly.

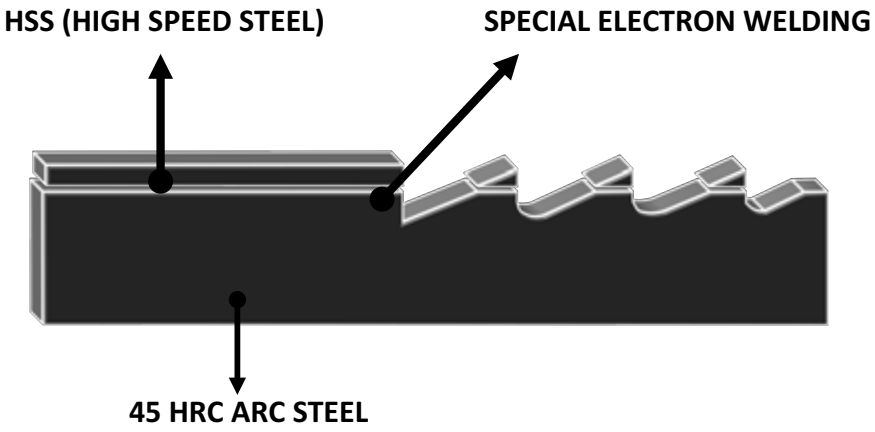
- The buttons are not functioning even though the buttons are pushed. The communication warning is alarming on the screen.

Check the communication cable between the screen and PLC. The cable may be broken or the sockets could be taken out.

9.0 BANDSAW LEAF/CUTTING SPEEDS & LIQUID RATES

INFORMATION ABOUT BLADES

Blades that are used in bandsaw machines are manufactured by welding two different metals with a electron-welding method and teething. This method can be seen on the figure below:

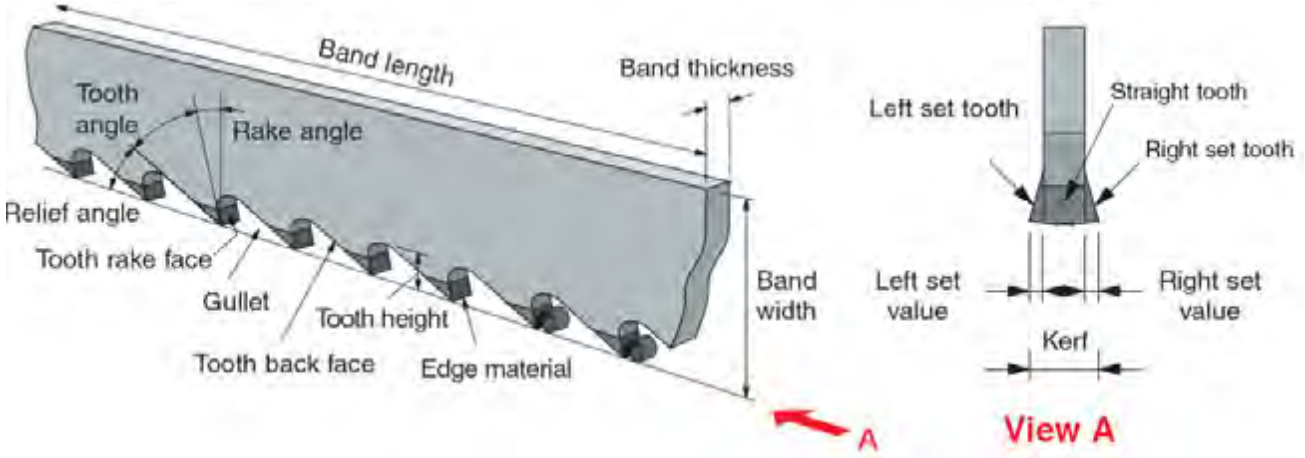


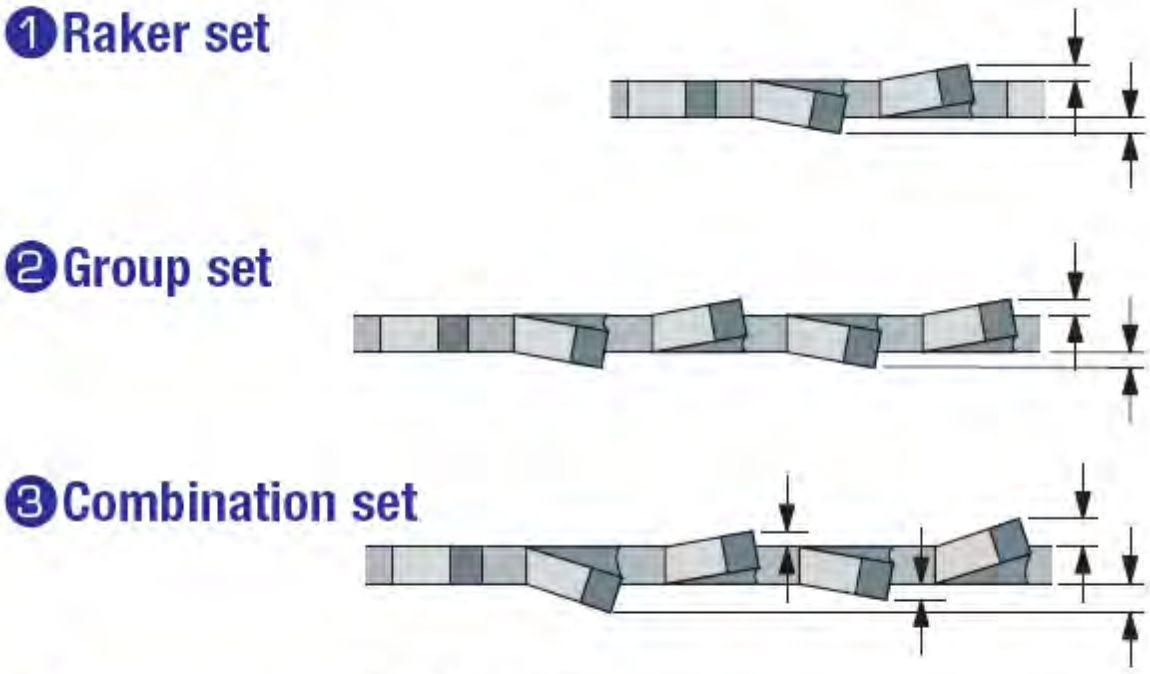
Teeth of Bi-Metal HSS (Material Number 1.3247) and Bi-Metal HSS M51 (Material Number 1.3207) blades are at 67-69 HRC hardness and backs of the blades are at 45-48 HRC hardness. Bi-Metal blades contain about 8% cobalt. They are grouped according to crossing forms and cutting angles of teeth. Straight teeth cross (one tooth right and one tooth left) is used with constant pitch blades. Straight Raker teeth crossing is only used with variable pitch blades. This crossing is used extensively. Raker teeth crossing (No crossing at 3^{rd} 5^{th} or 7^{th} teeth) is used with constant pitch blades. This crossing is preferred when cutting iron alloy metals. Wave teeth crossing is also used with constant pitch blades and is preferred for cutting pipes and profiles.

Blades are grouped according to cutting angles as follows: 0 (zero) degree cutting angle cuts the material at 90 degrees. This is ideal for cutting big solid materials. Positive cutting angles are designed so the cutting angle of teeth is at 10-15 degrees, this kind of blade is efficient at cutting all types of large steel material.

There are also different types of blades according to the material that will be cut. Naming the blades is made according to the number of teeth per inch. There are constant pitch blades like 4 teeth, 6 teeth, 10 teeth and variable pitch blades like 3/4 teeth, 4/6 teeth, 5/8 teeth, etc. Blade manufacturers advise that constant pitch should be used for cutting solid materials whereas they

advise variable pitch for cutting pipes and profiles. If one type of blade is to be used for all types of material/profiles then the best choice is to use variable pitch.





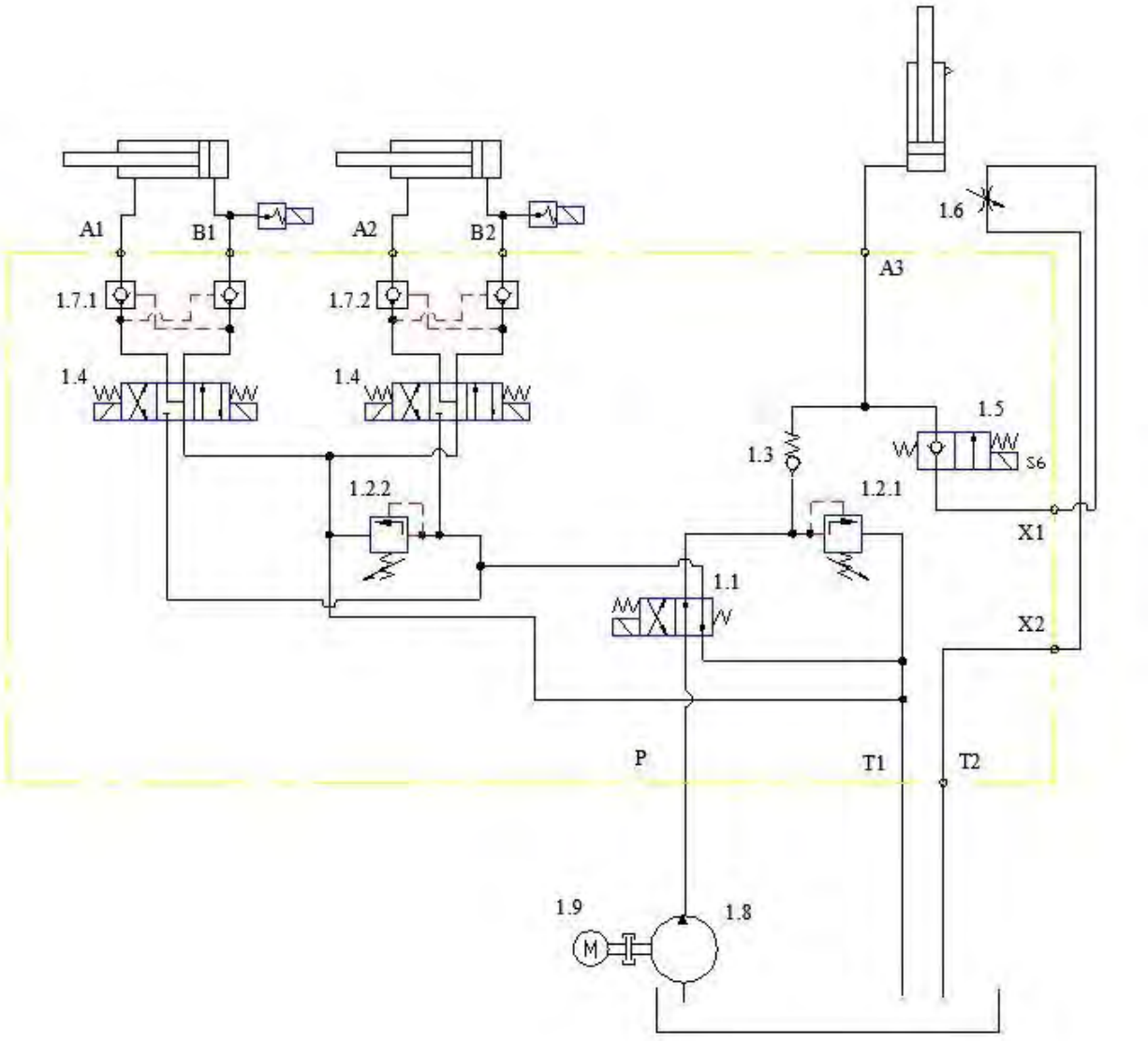
CUTTING SPEEDS FOR MATERIALS AND CUTTING LIQUID RATES

Material Group	DIN	Material Number	USA	Cutting Speed m/min. $\phi < 100$ mm	Cutting Speed m/min. 100-500 mm	Cutting Speed m/min. $\phi >$500 mm	Cutting Liquid
Construction Steel	St37/42	1.0037/1.0042	A570	90-100	70-90	50-70	10%
	St52/60	1.0050/1.0060	A572	90-100	50-70	40-50	10%
Cementation Steels	C10/C15	1.0301/1.0401	M1010/M1016	95-110	80-95	60-80	15%
	16MnCr5	1.7131	5115	65-75	55-65	40-55	10%
	20CrMo5	1.7264	-	65-75	55-65	40-55	10%
	21NıCrMo2	1.6523	8620	55-65	45-55	35-45	10%
Nitric Steels	34CrAl6	1.8504	-	40-45	30-40	20-30	5%
Automat Steels	9S20	1.0711	1212	100-130	80-120	60-80	15%
Annealed Steels	C35/45	1.0501/1.0503	1035/1045	75-90	60-75	40-60	5%
	42CrMo4	1.7225	4140	60-70	50-60	40-50	5%
	34CrNPAR6	1.6582	4340	60-70	50-60	40-50	5%
Bearing/ Ball Bearing Steels	100Cr6	1.3505	52100	65-75	55-65	30-50	3%
	100CrMo7 3	1.3536	-	50-60	40-50	30-40	3%
Spring Steel	65St7	1.5028	9260 H	60-70	40-60	30-40	3%
	50CrV4	1.8159	6150	60-70	40-60	30-40	3%
Non-alloyed Carbon Steels	C125W	1.663	W112	50-65	40-50	30-40	3%
	C80W1	1.1525	W108	55-70	45-55	35-45	3%
Cold Carbon Steel	125Cr1	1.2002	-	50-65	40-50	30-40	3%
	X210Cr12	1.2080	D3	30-40	20-30	15-20	Dry
	X155CrVMo12 1	1.2379	D2	30-40	20-30	15-20	Dry
	90MnCrV8	1.2842	O2	35-45	30-35	20-30	3%
Hot Carbon Steel	40CrMnMo7	1.2311	-	25-35	20-25	15-20	5%
	X40CrMoV51	1.2344	H 13	22-30	18-22	12-18	5%
	56NiCrMoV7	1.2714	L6	30-40	25-30	20-25	5%
	40CrMnNiMo 8 6 4	1.2738	-	25-35	20-25	15-20	5%
High Speed Steels	S 6-5-2	1.3343	M 2	45-50	35-45	25-35	3%
	S 3-3-2	1.3333	-	50-55	40-50	30-40	3%
	S 2-10-1-8	1.3247	M 42	40-45	30-40	20-30	3%
	S 10-4-3-10	1.3207	-	40-45	30-40	20-30	3%
	S 18-0-1	1.3355	T 1	40-45	30-40	20-30	3%
The steels resistant to oxide and acid	X5CrNi18 10	1.4301	304	40-50	30-40	20-30	10%
	X6CrNiMoTi 17 12 2	1.4571	316 Ti	40-50	30-40	20-30	10%
	X20Cr13	1.4021	420	40-50	30-40	25-35	10%
Valve Steels	X45CrSi 9 3	1.4718	HNV 3	45-55	35-45	25-35	5%
	X45CrNiW 189	1.4873	-	40-50	30-40	20-30	5%
High Temperature Steel	X12CrCoNi 21 20	1.4971	HEV 1	25-30	20-25	15-20	10%
	X20CrMoWV 12 1	1.4935	HNV 8	35-40	30-35	25-30	10%
Temperature resistant steel	X15CrNiSi 25 20	1.4841	314	20-25	15-20	10-15	15%
	X12NiCrSi 36 16	1.4864	330	20-25	15-20	10-15	15%
Special Alloy	NıCr19NbMo	2.4668	Inconel 718	15-20	10-15	8-12	20%
	NPAR30	2.4810	Hasrelloy B	20-25	15-20	10-15	12%
	NıCr13Mo6Ti3	2.4662	Nimonic 901	15-20	10-15	8-12	20%
	NiCo20Cr20 MoTi	2.4650	Nimonic 263	17-22	12-17	10-14	15%

	X8CrNiAlTi20 20	1.4847	Incoloy 840	18-23	13-18	11-15	15%
Tempered Steels							
1000-1200 N/mm2	-	-	-	30-35	25-30	20-25	5%
1200-1400 N/mm2	-	-	-	25-30	20-25	15-20	5%
1400-1600 N/mm2	-	-	-	20-25	15-20	10-15	5%
Hard-drawn steels							
50 HRC							
55 HRC	-	-	-	-	-	-	5%
60 HRC	-	-	-	-	-	-	5%
	-	-	-	-	-	-	5%
Steel Casting	GS-38	-	-	60-70	50-60	40-50	3%
	GS-60	-	-	50-60	40-50	35-40	3%
Iron Casting	GG-30	-	-	50-60	40-50	30-40	Dry
	GGG-50	-	-	45-55	35-45	25-35	Dry
Alloy	NıCrMo	-	-	30-40	20-30	15-25	Dry
Titanium	Ti 1	3.7025	-	-	-	-	10%
Alloy zirconium	G-TlAl 6V4	3.7164	-	-	-	-	12%

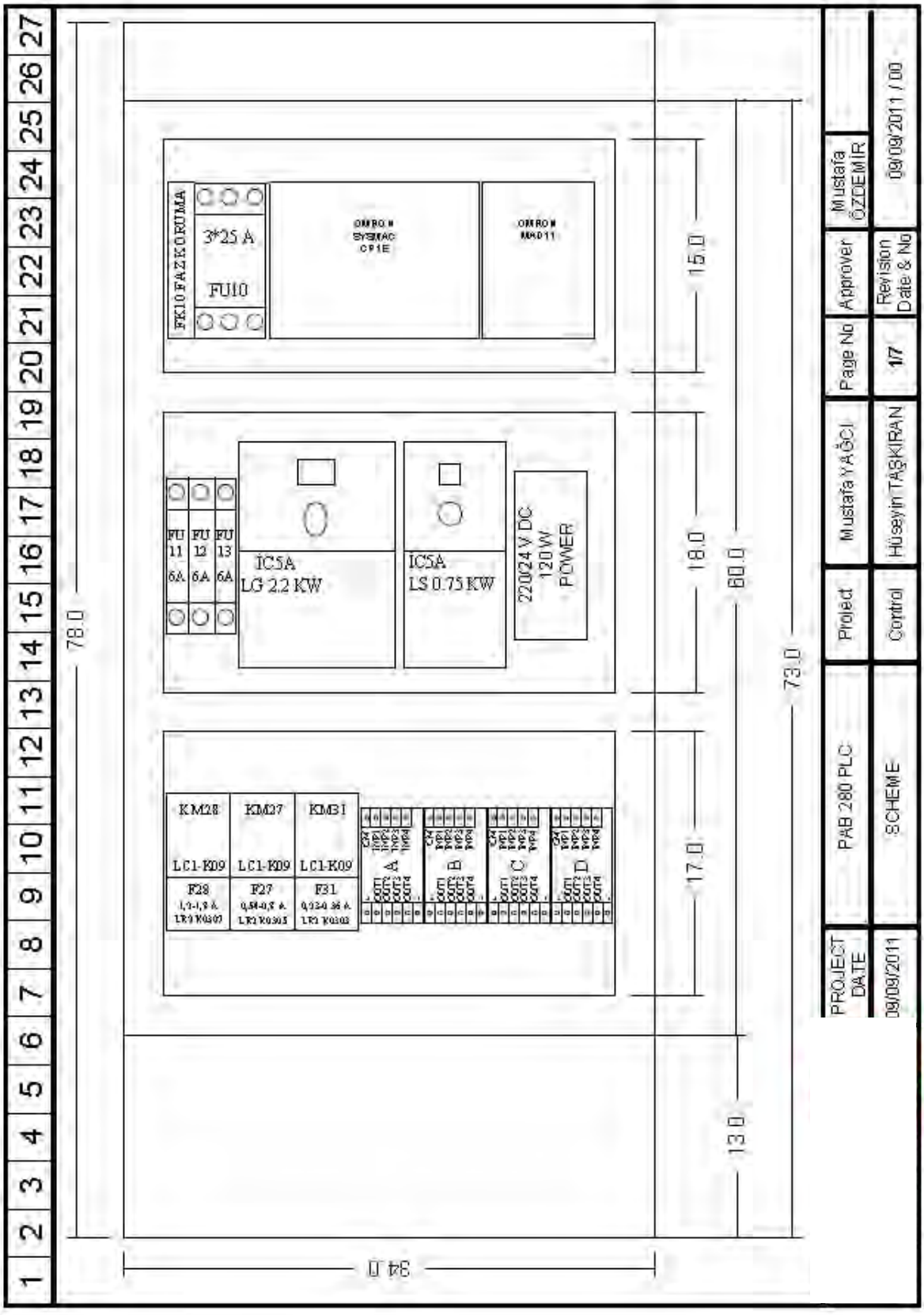
Material Group	DIN	Material Number	USA	Cutting Speed m/min.	Cutting Liquid
Copper	KE-Cu	2.0050		60-100	10%
Brass	CuZn 40	2.0360		80-120	3%
	CuZn 40 Pb 2	2.0402		80-120	3%
	CuZn 15 Si 4	2.0492		80-120	3%
Bronze	CuSn 6	2.1020		80-120	3%
Tin	CuSn8	2.1030		80-120	3%
Red Casting	CuSn5 ZnPb	2.1095		60-100	3%
	CuSn 10 Zn	2.1086		60-100	3%
Aluminium/Bronze	CuAl8	2.0920		40-60	15%
	CuAl 10 Fe	2.0940		30-40	15%
	Ampco 18			40-65	15%
	Ampco 25			30-50	15%
Tin/Lead/ Bronze	CuPb 20 Sn 5	2.1818		80-120	3%
Aluminium Non-Processed Metal Alloy	Al 99,8	3.0285		80-120	25%
	AlMg3	3.3535		80-120	25%
	AlMg 4,5 Mn	3.3547		80-120	25%
Casting Metal Alloy	G-AlSi 5Mg	3.2341		80-120	25%
	G-AlSi 12	3.2581		80-120	25%
Piston Metal Alloy	AlSi21 CuNiMg			80-120	25%
Thermoplastics	PVC			80-120	Dry
	Teflon			80-120	Dry
	Hostalen			80-120	Dry
	Fibre-glass reinforced			50-80	Dry
Duroplastics	Polyurethane			80-120	Dry
	Polystyrol			80-120	Dry
	Polyester			80-120	Dry
	Fabric-reinforced			80-120	Dry
Aerated Cement ,				80-120	Dry

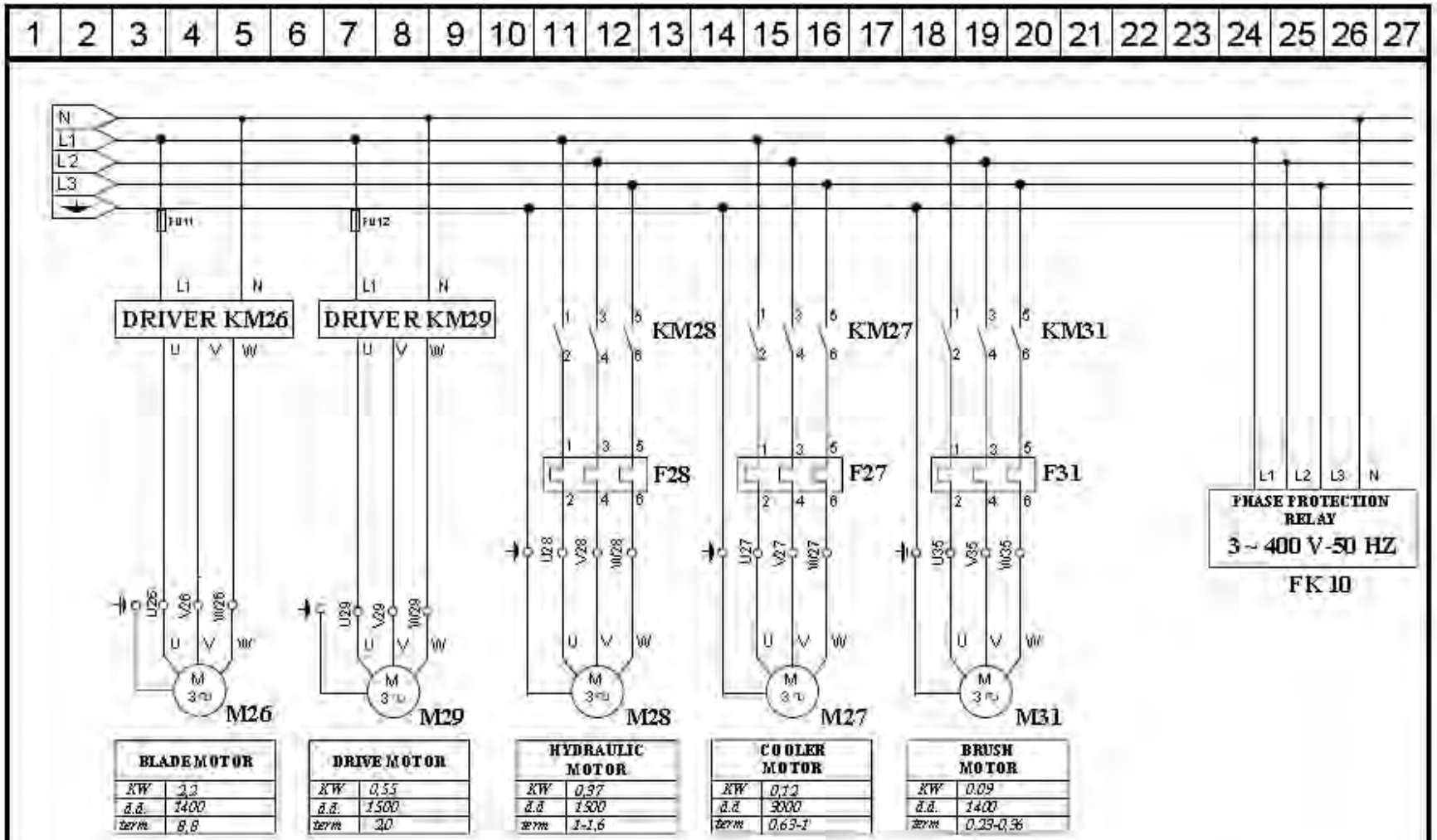
HYDRAULIC SCHEMATIC



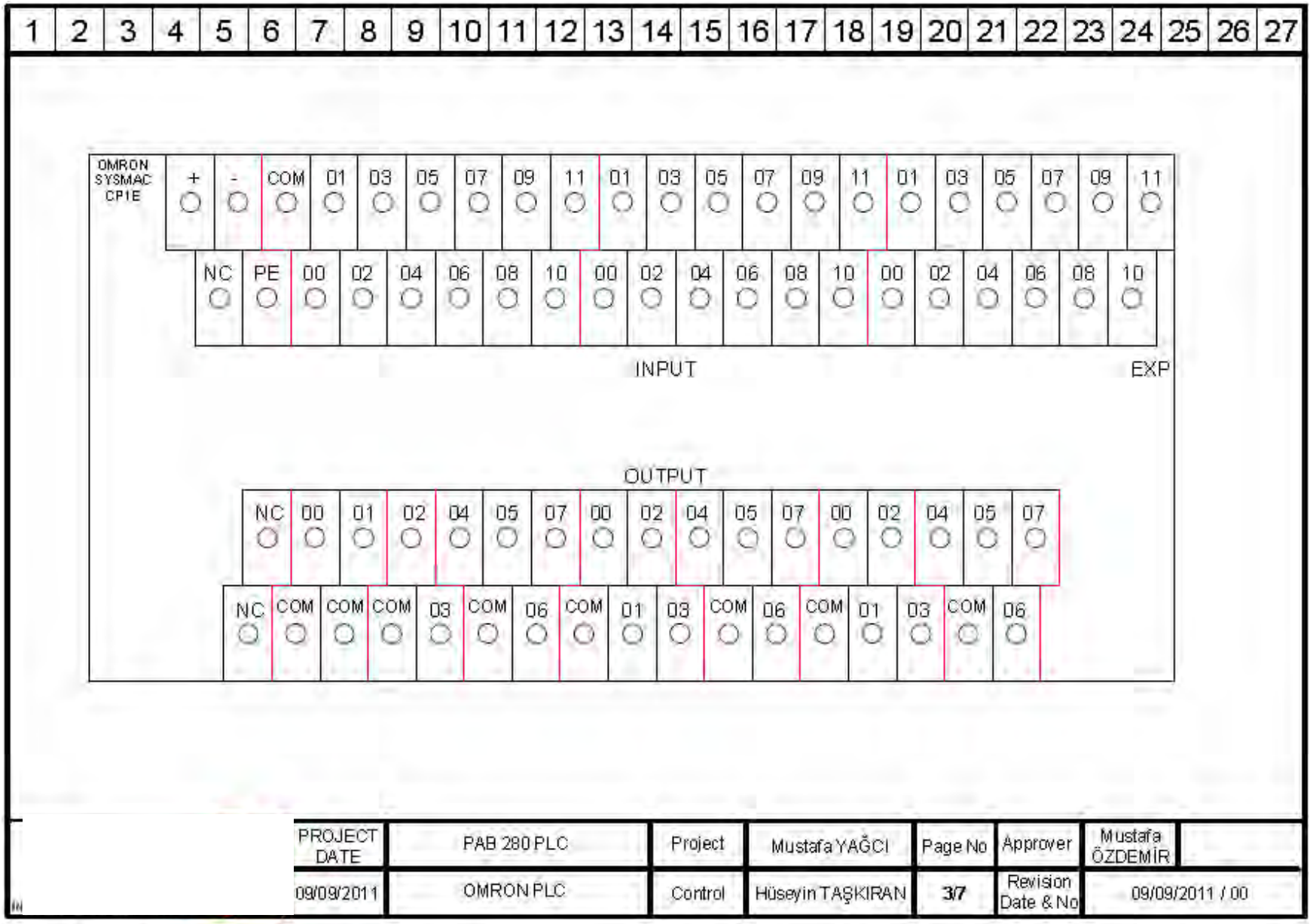
NO	DESCRIPTION	UNIT
1	DFA-02-2B3-DC24V	1
2	VMP-20	2
3	RV-08-A-50-N	1
4	DFA-02-3C4-DC24V	2
5	VE-NC-20- DC24V	1
6	HASSAS HIZ AYAR	1
7	MPC-02-W-50-N	2
8	1PF 2,1F01Z02SS	1
9	0,37KW-1500D/DK	1

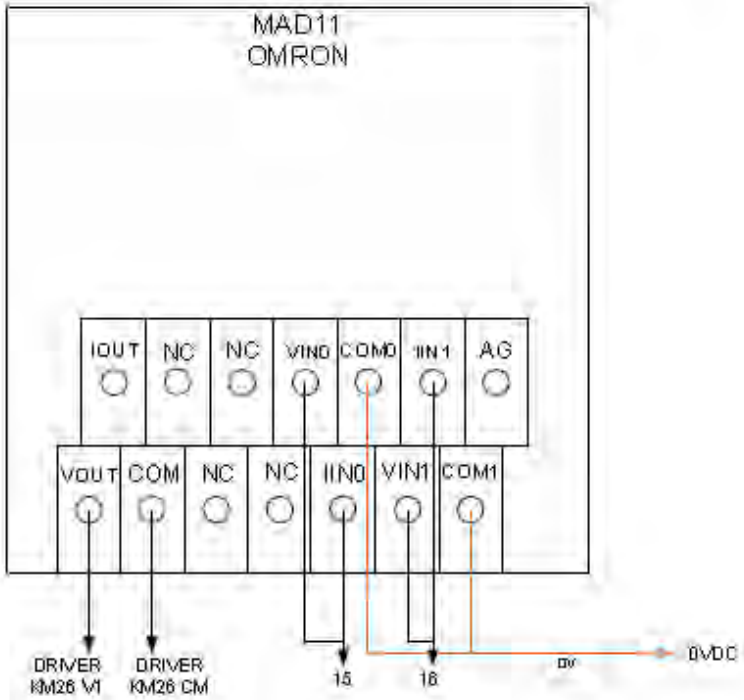
ELECTRICAL SCHEMATIC



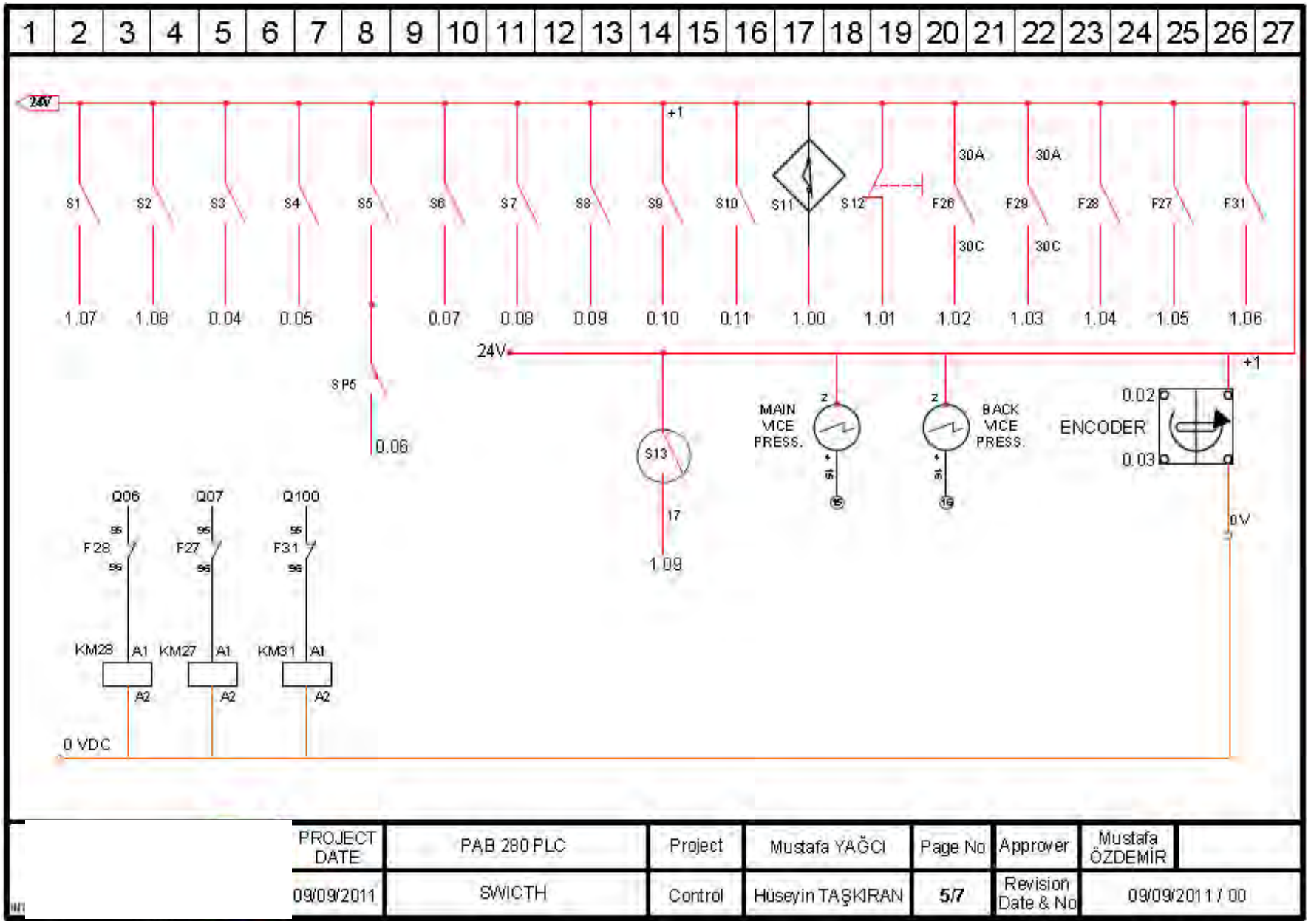


PROJECT DATE	PAB 280 PLC	Project	Mustafa YAĞCI	Page No	Approver	Mustafa ÖZDEMİR	
09/09/2011	MOTOR	Control	Hüseyin TAŞKIRAN	27	Revision Date & No	09/09/2011 / 00	

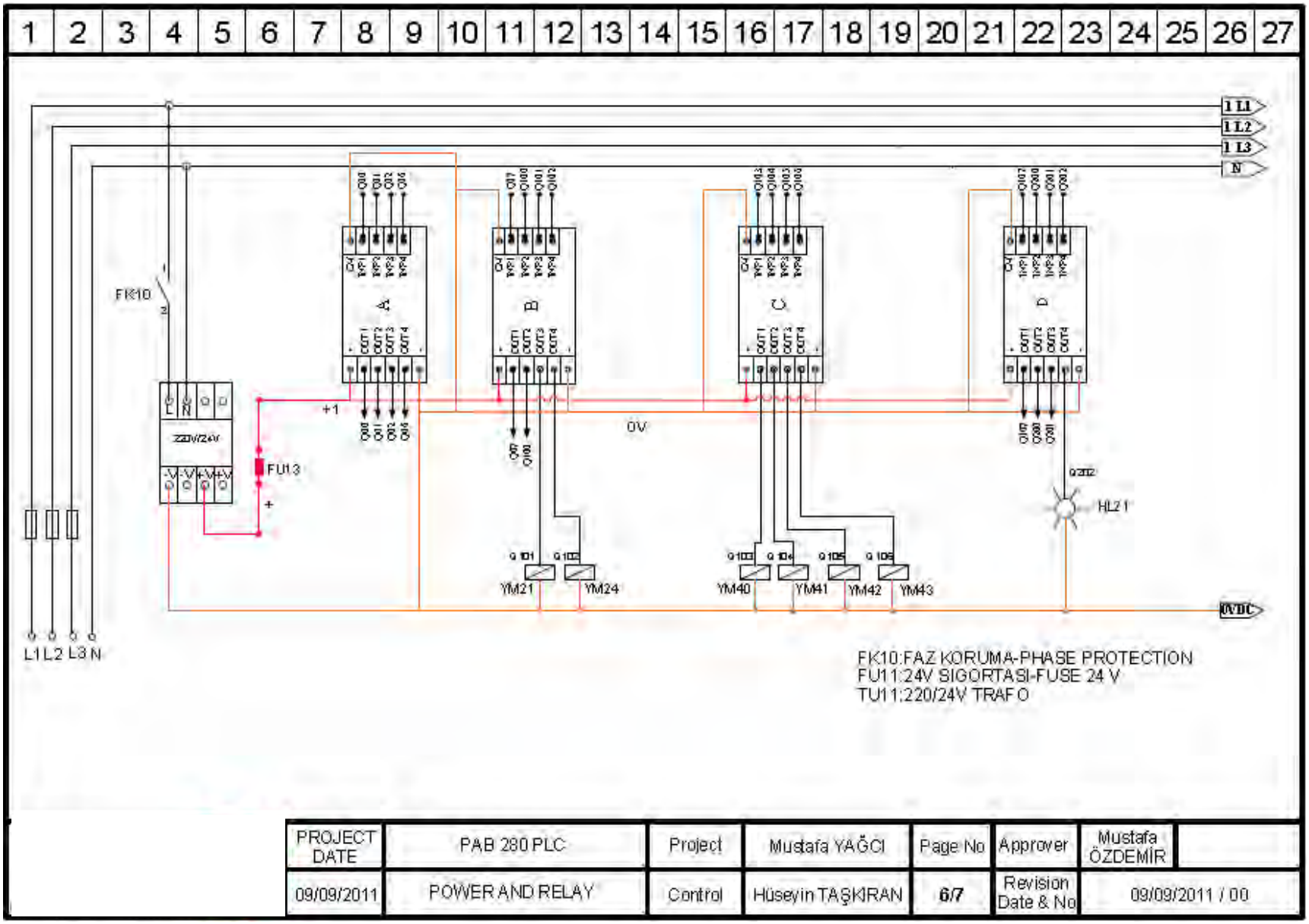

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
OMRON SYSMAC CP1E
+ - COM 01 03 05 07 09 11 01 03 05 07 09 11 01 03 05 07 09 11
NC PE 00 02 04 06 08 10 00 02 04 06 08 10 00 02 04 06 08 10
INPUT
EXP
OUTPUT
NC 00 01 02 04 05 07 00 02 04 05 07 00 02 04 05 07
NC COM COM COM 03 COM 06 COM 01 03 COM 06 COM 01 03 COM 06
PROJECT DATE
PAB 280 PLC
Project
Mustafa YAĞCI
Page No
Approver
Mustafa ÖZDEMİR
09/09/2011
OMRON PLC
Control
Hüseyin TAŞKIRAN
3/7
Revision Date & No
09/09/2011 / 00



PROJECT DATE	PAB 280 PLC	Project	Mustafa YAĞCI	Page No	Approver	Mustafa ÖZDEMİR	
09/09/2011	OMRON ANALOG PLC	Control	Hüseyin TAŞKIRAN	4/7	Revision Date & No	09/09/2011 / 00	



	PROJECT DATE	PAB 280 PLC	Project	Mustafa YAĞCI	Page No	Approver	Mustafa ÖZDEMİR	
	09/09/2011	SWICTH	Control	Hüseyin TAŞKIRAN	5/7	Revision Date & No	09/09/2011 / 00	

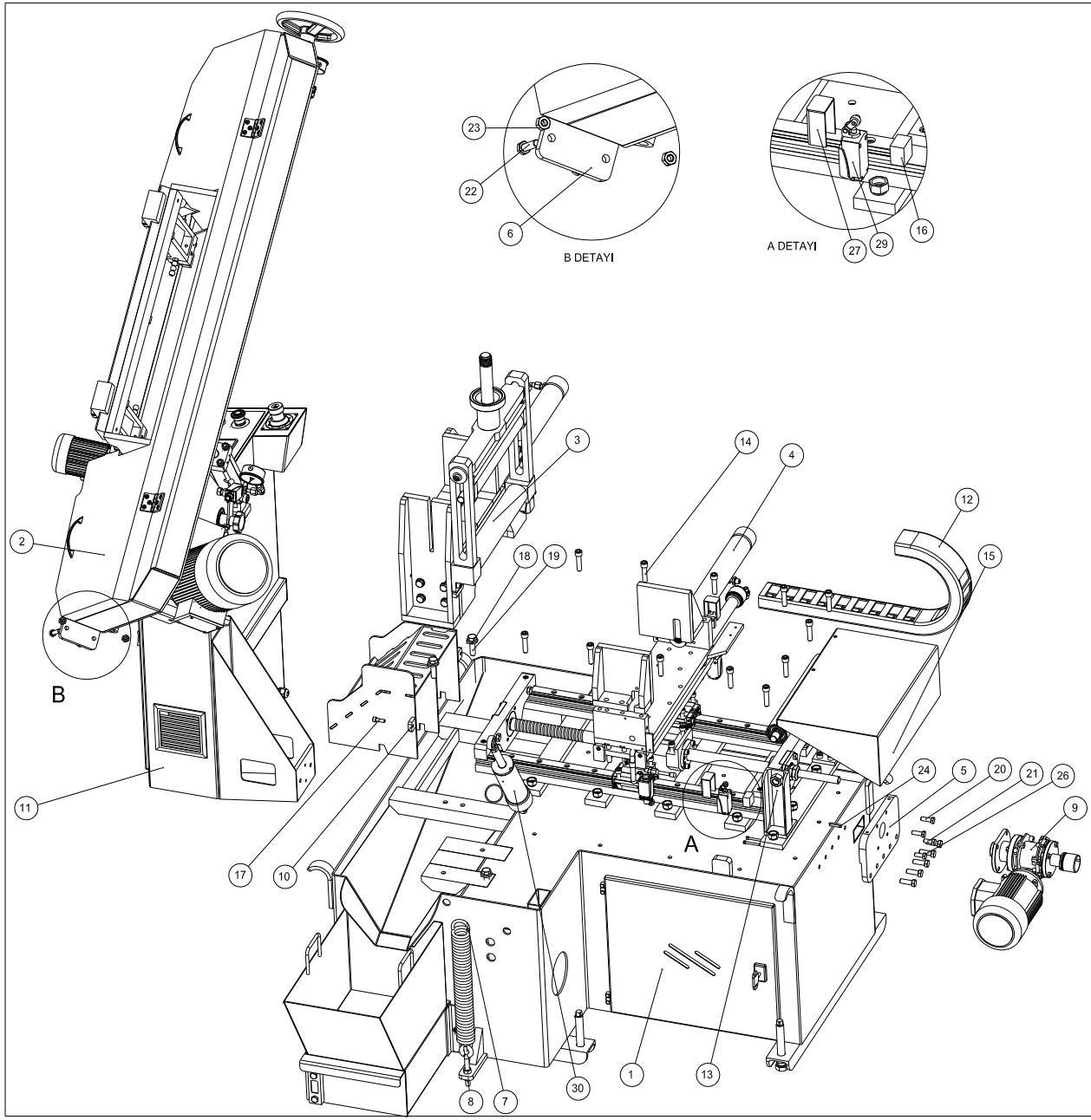


PROJECT DATE	PAB 280 PLC	Project	Mustafa YAĞCI	Page No	Approver	Mustafa ÖZDEMİR	
09/09/2011	POWER AND RELAY	Control	Hüseyin TAŞKIRAN	6/7	Revision Date & No	09/09/2011 / 00	

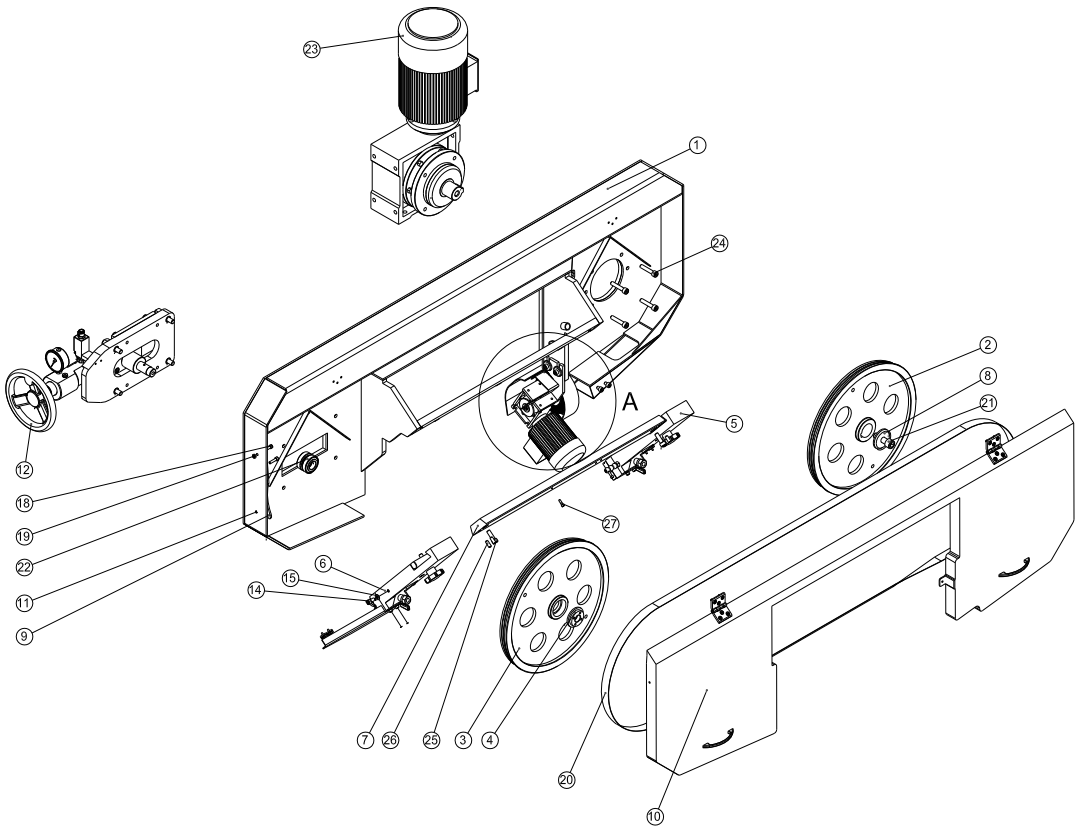
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27

ÜST SİVİÇ - TOP SWITCH	S1
ALT SİVİÇ - BOTTOM SWITCH	S2
ANA MENGENE SİVİCİ - MAIN VICE SWITCH	S3
ARKA MENGENE SİVİCİ - BACK VICE SWITCH	S4
KAPAK SİVİCİ - GATE SWITCH	S5
ŞERİT KOPMA SİVİCİ - BLADE BROKEN SWITCH	S6
ROLO İLERİ SİVİCİ - ROLL FORWARD SWITCH	S7
RULO İLERİ YAVAŞ SİVİCİ - SLOW ROLL FORWARD SWITCH	S8
RULO GERİ SİVİCİ - ROLL BACK SWITCH	S9
RULO GERİ YAVAŞ SİVİCİ - SLOW ROLL BACK SWITCH	S10
MALZEME SENSORU - MATERIAL SNSOR	S11
ACİL STOP - EMEGENCY STOP	S12
ŞERİT MOTORU ARIZASI - BLADE ENGINE FAILURE	F26
SÜRÜCÜ MOTOR ARIZASI - DRIVE ENGINE FAILURE	F29
HİDROLİK MOTOR ARIZASI - HYDRAULIC ENGINE FAILURE	F28
SOĞUTUCU MOTOR ARIZASI - COOLING ENGINE FAILURE	F27
FIRÇA MOTOR ARIZASI - BRUSH ENGINE FAILURE	F31
ANA MENGENE BASINÇ ŞALTERİ - MAIN VICE PRESSURE SWITCH	S13
HİDROLİK MOTOR KONDAKTOR - HYDRAULIC ENGINE RELAY	KM28
SOĞUTUCU MOTOR KONDAKTOR - COOLING ENGINE RELAY	KM27
FIRÇA MOTOR KONDAKTOR - BRUSH ENGINE RELAY	KM31
ORTAK VALF - COMMON VALVE	YM21
ASAĞI VALFİ - DOWN VALVE	YM24
ANA MENGENE AÇMA VALFİ - MAIN VICE OPEN VALVE	YM40
ANA MENGENE SIKMA VALFİ - MAIN VICE CLOSED VALVE	YM41
ARKA MENGENE AÇMA VALFİ - BACK VICE OPEN VALVE	YM42
ARKA MENGENE SIKMA VALFİ - BACK VICE CLOSED VALVE	YM43
ARIZA SINYAL LAMBASI - FAILURE LAMP	HL21

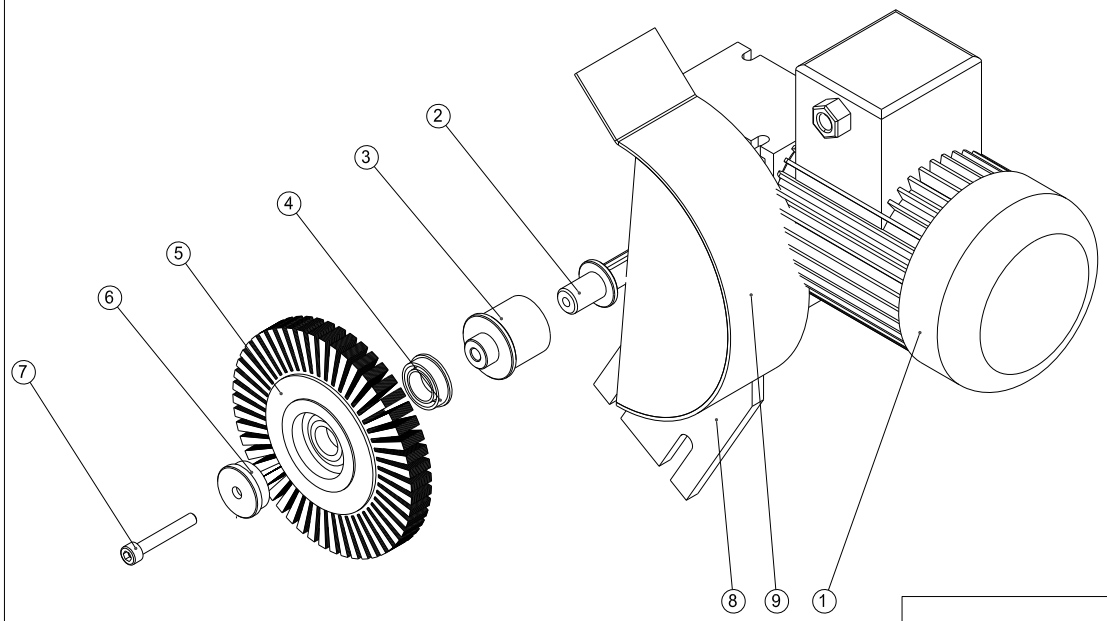
PROJECT DATE	PAB 280 PLC	Project	Mustafa YAĞCI	Page No	Approver	Mustafa ÖZDEMİR	
09/09/2011		Control	Hüseyin TAŞKIRAN	7/7	Revision Date & No	09/09/2011 / 00	



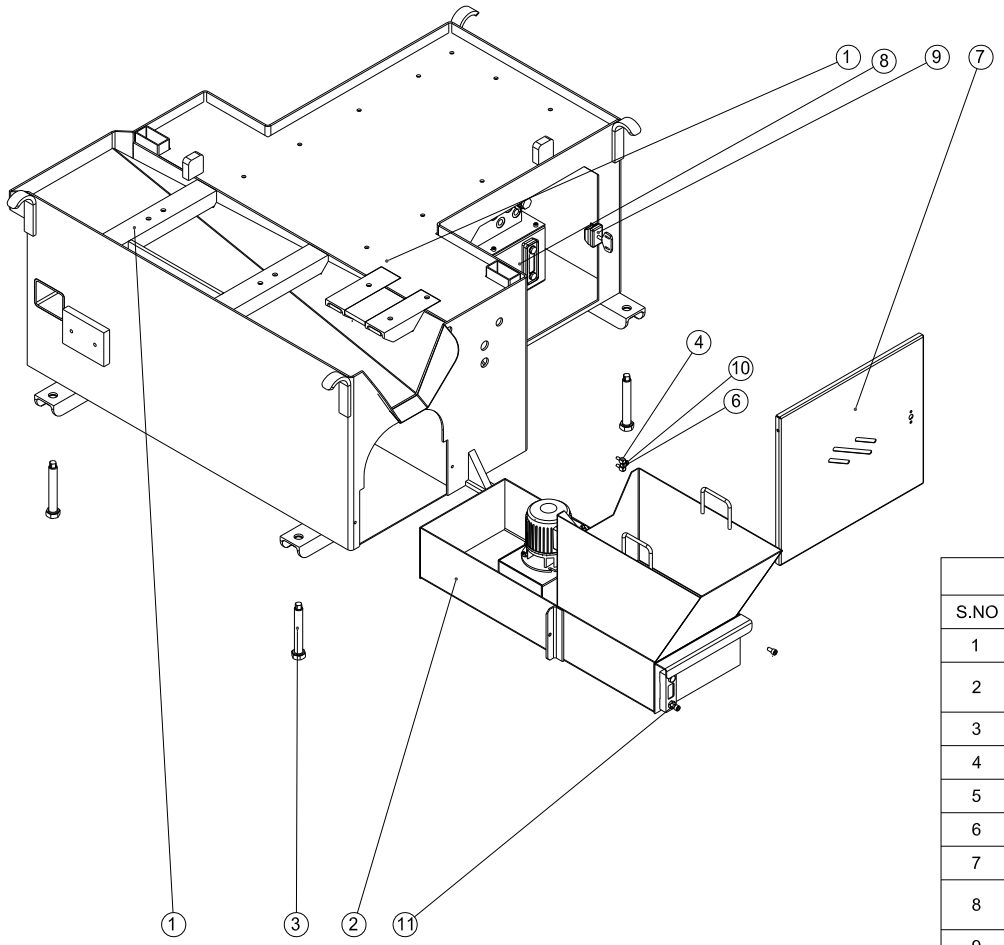
026000-0000 PAB 280 KOMPLE MONTAJ			
S NO	MRP NO ve PARCA ADI	ADET	ACIKLAMA
1	026010-0001 ALT SASE KOMPLE MONTAJI PAR 280	1	
2	UST KAFA MAFSAL MONTAJI PAR 280	1	
3	026059-0002 ORTA GOVDE MENGENE MONTAJI PAR 280	1	
4	026115-0001 SURUCU MENGENE KOMPLE PAR 280	1	
5	026153-0000 SURUCU ARABA LINEAR BILYA MILI RULMAN BAGLANTI KAIDESI ARKA PAR 280	1	
6	026033-0001 UST KAFA YAY BAGLANTISI KAYNAKLI PAR 280	1	
7	018564-0000 YAY CEKME MAFSAL	1	
8	002085-0000 MAFSAL YAY GERDIRME MILI	1	
9	026154-0001 SURUCU ARABA VIDALI MIL MONTAJI PAR 280	1	
10	026046-0000 ALT SASE MALZEME IZGARASI PAR 280	1	
11	026165-0000 ELEKTRIK PANOSU KOMPLE PAR 280 MONTAJLI	1	
12	HIDROLIK LIF HORTUM MUHAFAZASI 30x60	1	
13	026150-0002 SURUCU ARABA ARKA RULO MONTAJLI PAR 280	1	
14	002204 M12x50 ALYAN BASLI CIVATA	12	
15	026158-0001 SURUCU ARABA REDUKTOR MUHAFAZA GOVDE SACI KAYNAKLI PAR 280	1	
16	026145-0000 SURUCU ARABA ARKA SWITCH BAGLAMA LAMASI	1	
17	001036 M8x25 ALYAN BASLI CIVATA	2	
18	000262 PUL MENGENE IC Ø14.5	7	
19	001002 M14x50 ALTIKOSE BASLI CIVATA	7	
20	000983 M10x30 ALTIKOSE BASLI CIVATA	2	
21	000982 M10x25 ALTIKOSE BASLI CIVATA	2	
22	000985 M10x40 ALTIKOSE BASLI CIVATA	4	
23	001122 M10 ALTIKOSE SOMUN	4	
24	KAMA AB 6x6x35	1	
25	001123 M12 ALTIKOSE SOMUN	2	
26	000992 M12x35 ALTIKOSE BASLI CIVATA	5	
27	026163-0001 SURUCU ARABA SWITCH MUHAFAZA GOVDE SACI KAYNAKLI PAR 280	1	
28	001021 M5x40 ALYANBASLI CIVATA	2	
29	TELEMECANIGUE XCKD21 - 21g11 SWITCH ON	1	
30	026340-0000 KAFA KALDIRMA HIDROLIK LIFI KOMPLE PAR 280	1	



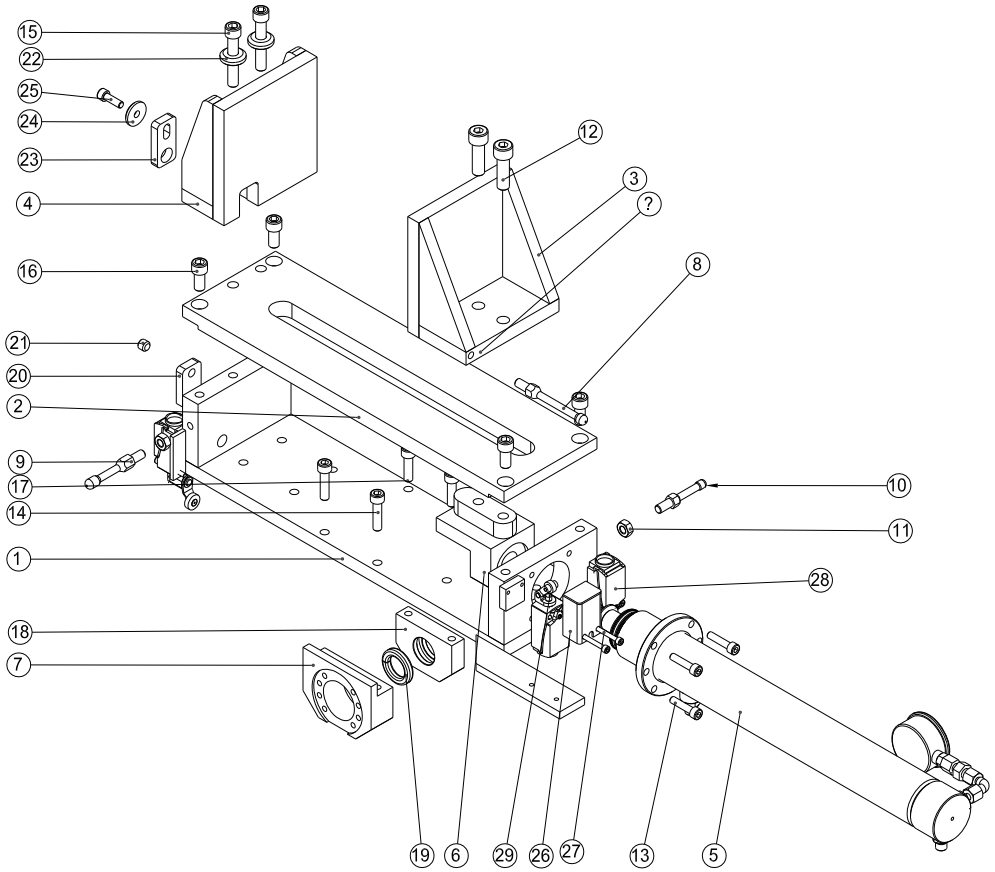
026180-0001 UST KAFA MONTAJI			
S.NO	MRP NO ve PARCA ADI	ADET	ACIKLAMA
1	026180-0000 UST KAFA SASESI PAR 280	1	
2	003626-0000 SERIT TAHRIK KASNAGI (KAMALI)	1	
3	003618-0000 SERIT SERBEST KASNAGI	1	
4	003628-0000 SERIT SERBEST KASNAGI RULMAN KAPAGI	1	
5	021651-0001 SERIT DUZELTME AYAGI SAG KOMPLE	1	
6	021650-0001 SERIT DUZELTME AYAGI SOL KOMPLE	1	
7	003102-0000 DESTEK KİZAGİ PAR-PSM 280	1	
8	003621-0000 PUL SERIT TAHRIK KASNAGI	1	
9	004553-0000 SERIT KASNAK KAPAK ASKI LAMASI 350	1	
10	018583-0002 SERIT KASNAK KAPAGI MONTAJLI	1	
11	002146-0000 KAPAK ASKİ LAMASİ CİVATASİ KİSA GALVANİZLİ	1	
12	018759-0000 SERİT GERDİRME SİSTEMİ (PAR-PSM 280 M - HD NC - YENİ MODEL)	1	
13	TALAS FIRCASI MONTAJLI PAR 280	1	
14	001034 M8x16 ALYAN BASLI CIVATA	1	
15	002525 PUL DEMİR Ø8 GALVANİZLİ (Ø8xØ16x1)	1	
16	PUL Ø30xØ8.5x5mm	2	
17	001036 M8x25 ALYAN BASLI CIVATA	2	
18	001028 M6x25 ALYAN BASLI CIVATA	2	
19	001120 M6 ALTIKOSE SOMUN	2	
20	SERİT 27'LİK(PAR 280 HD NC)	1	
21	001063 M16x50 ALYANBASLI CIVATA	1	
22	000727 KONİK MAKARALI RULMAN SKF 30205 (Ø25xØ52x16,25)	2	
23	002930 TAHRİKSAN REDUKTORLU MOTOR(SFA 80 M 1-21 2.2KW 1500d d)	1	
24	002495 M10x50 ALYAN BASLI CIVATA	4	
25	001047 M10x30 ALYAN BASLI CIVATA	2	
26	001089 M8x20 ALYANBASLI VIDALI PIM	4	
27	001022 M5x16 ALYANBASLI CIVATA	2	
28	026212-0000 SERIT MUHAFAZA SACI SAG PAR 280	1	
29	026213-0000 TALAS FIRCASI ARKA MUHAFAZASI PAR 280	1	
30	001033 M8x10 ALYAN BASLI CIVATA	2	



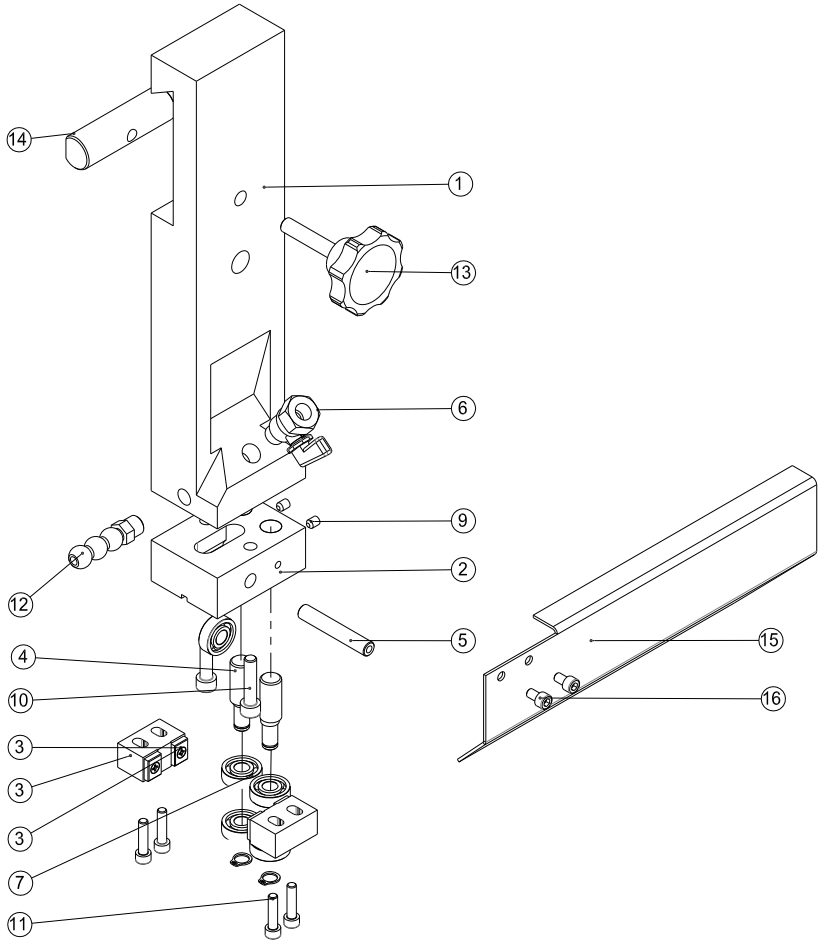
TALAS FIRCASI MONTAJI			
S.NO	MRP NO vE PARCA ADI	ADET	ACIKLAMA
1	012258 EV 030 01-56-40 0,09 1500 d-d YİLMAZ REDUKTORLU MOTOR MİLİ SOL(TALAS FIRCASI)	1	
2	023546-0000 TALAS FIRCASI MOTOR MILI	1	
3	019015-0000 FIRCA BAGLANTI YATAGI MILI	1	
4	TALAS FIRCASI SIKMA LASTIGI	1	
5	002179 TALAS FIRCASI Ø125	1	
6	019016-0000 FIRCA BAGLANTI ALIN PULU	1	
7	001031 M6x40 ALYAN BASLI CIVATA	1	
8	026209-0001 FIRCA BAGLANTISI KAYNAKLI	1	
9	026210-0001 TALAS FIRCASI MUHAFAZASI PAR 280	1	



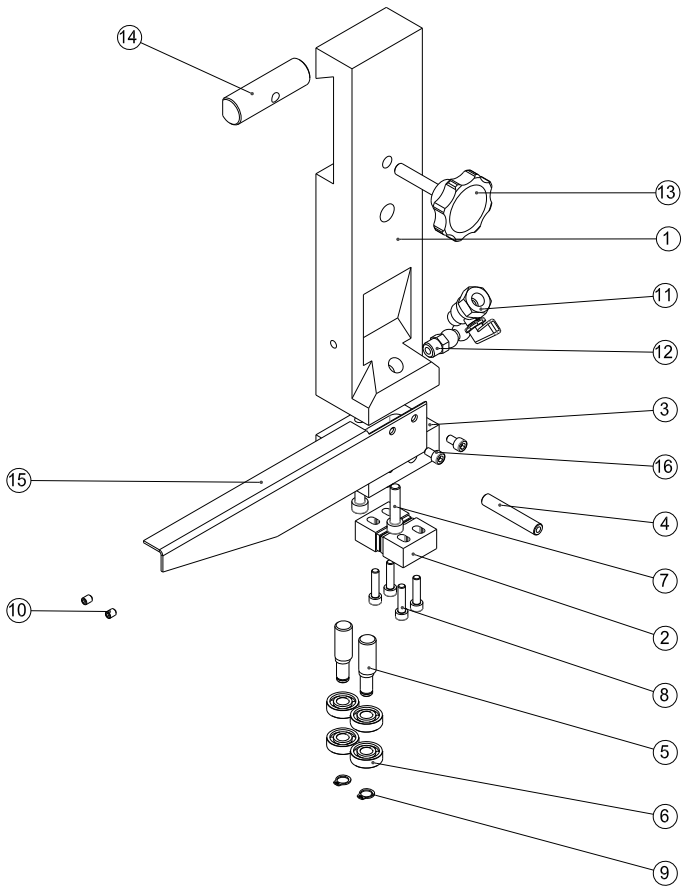
026010-0001 ALT SASE KMPLE MONTAJI			
S.NO	MRP NO ve PARCA ADI	ADET	ACIKLAMA
1	026010-0000 ALT SASE KAYNAKLI PAR 280	1	
2	018726-0001 SU MOTORU CEKMECESI TALAS HAZNELI MONTAJI	1	
3	026045-0000 SASE AYAR MILI PAR 280	6	
4	002160 KAPAK ERKEK MENTESESI	4	
5	002162 KAPAK DISI MENTESE PIMI	2	
6	002161 KAPAK DISI MENTESESI	2	
7	026041-0000 ALT SASE HIDROLIK MOTOR KAPAGI	1	
8	026195-0000 HİDROLIK YAG TANKI MONTAJLI (HIDTEK) (HIDTEK) HIDTEK28.BH.1615	1	
9	000936 KAPAK KILIDI	1	
10	001120 M6 ALTIKOSE SOMUN	6	
11	001034 M8x16 ALYAN BASLI CIVATA	4	



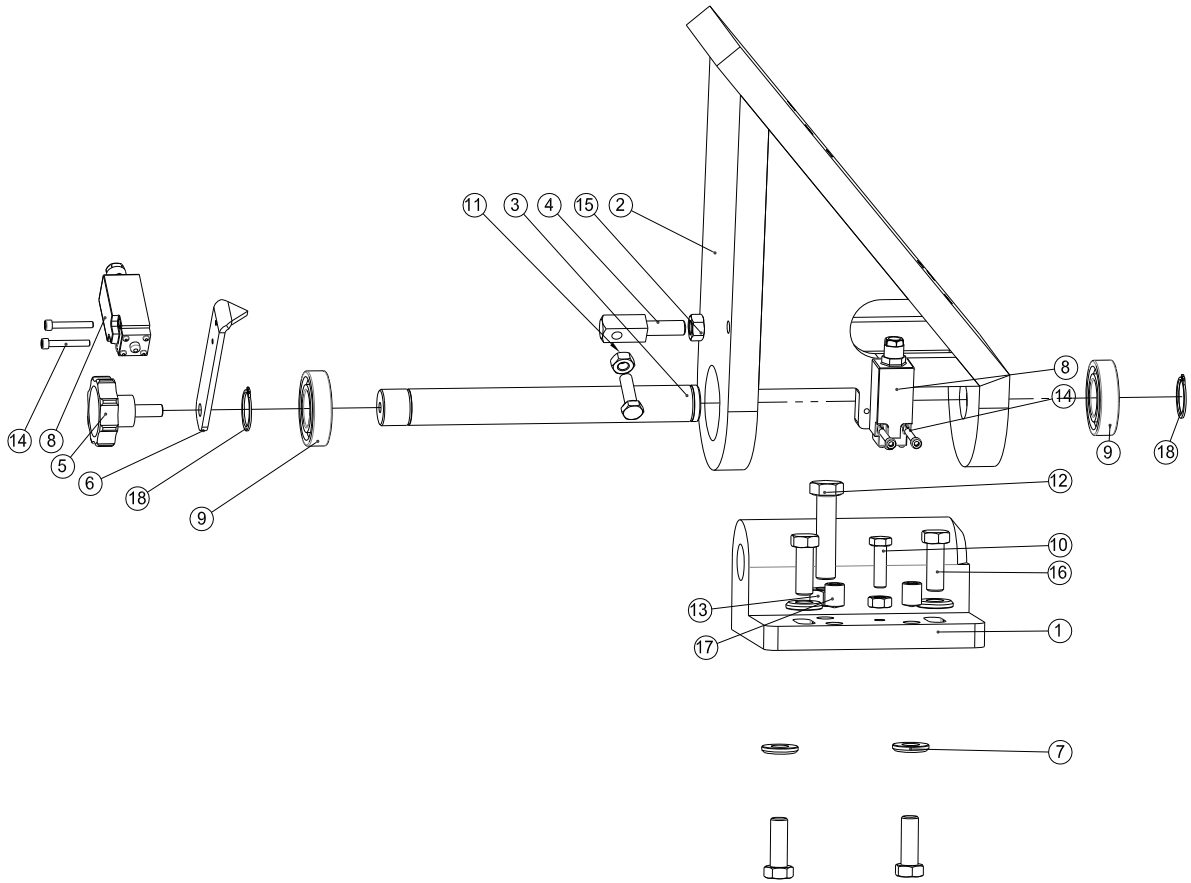
026106-0001 SURUCU MENGENE MONTAJ			
S.NO	MRP NO ve PARCA ADI	ADET	ACIKLAMA
1	026106-0000 SURUCU MENGENE KIZAK TABLASI BAGLANTISI PAR 280	1	
2	026122-0000 MALZEME SURME SEHBASI MENGENE KİZAK TABLASI GOVDESI PAR 280	1	
3	026227-0000 MALZEME SURME SEHBASI HAREKETLI MENGENESI	1	
4	026228-0000 MALZEME SURME SEHBASI SABIT MENGENESI	1	
5	026110-0002 MALZEME SIKMA HIDROLIK LIFI KOMPLE PAR 280	1	
6	026129-0000 MALZEME SURME SEHBASI HAREKETLI MENGENE SOMUNU PAR 280	1	
7	026132-0000 SURUCU MENGENE KİZAK TABLASI BAGLANTISI LINEAR BILYA YATAGI YUVASI PAR 280	1	
8	026133-0000 SURUCU ARABA HAREKETLI MENGENE SWITCH BASMA KOLU PAR 280	1	
9	026134-0000 SURUCU ARABA SWITCH BASMA KOLU PAR 280	1	
10	026143-0000 SURUCU ARABA ON SWITCH BASMA KOLU PAR 280	1	
11	001122 M10 ALTIKOSE SOMUN	2	
12	M14x45 ALYAN BASLI CIVATA	2	
13	001038 M8x35 ALYAN BASLI CIVATA	4	
14	001048 M10x40 ALYAN BASLI CIVATA	2	
15	002696 M12x70 ALYAN BASLI CIVATA	2	
16	002337 M12x25 ALYAN BASLI CIVATA	4	
17	002693 M10x35 ALYAN BASLI CIVATA	2	
18	026146-0000 SURUCU ARABA LINEAR BILYA MILI SIYIRICI KECE YATAGI PAR 280	1	
19	026148-00000 SURUCU ARABA LINEAR BILYA MILI SIYIRICI KECESI PAR 280	1	
20	026161-0000 SABIT MENGENE DAYAMA LAMASI PAR 280	2	
21	M12x10 ALYANBASLI VIDALI PIM	2	
22	002133 PUL MENGENE Ø12,5mm	2	
23	026162-0000 SURUCU ARABA MENGENE SENSOR BAGLANTI LAMASI PAR 280	1	
24	PUL Ø30xØ8.5x5mm	1	
25	001036 M8x25 ALYAN BASLI CIVATA	1	
26	026165-0000 SURUCU ARABA SWITCH MUHAFAZA GOVDE SACI KAPALI KAYNAKLI PAR 280	1	
27	001021 M5x40 ALYANBASLI CIVATA	6	
28	TELEMECANIGUE XCKD 2118-ZCP21 SWITCH ON	2	
29	TELEMECANIGUE XCKD21 - 21g11 SWITCH ARKA	1	



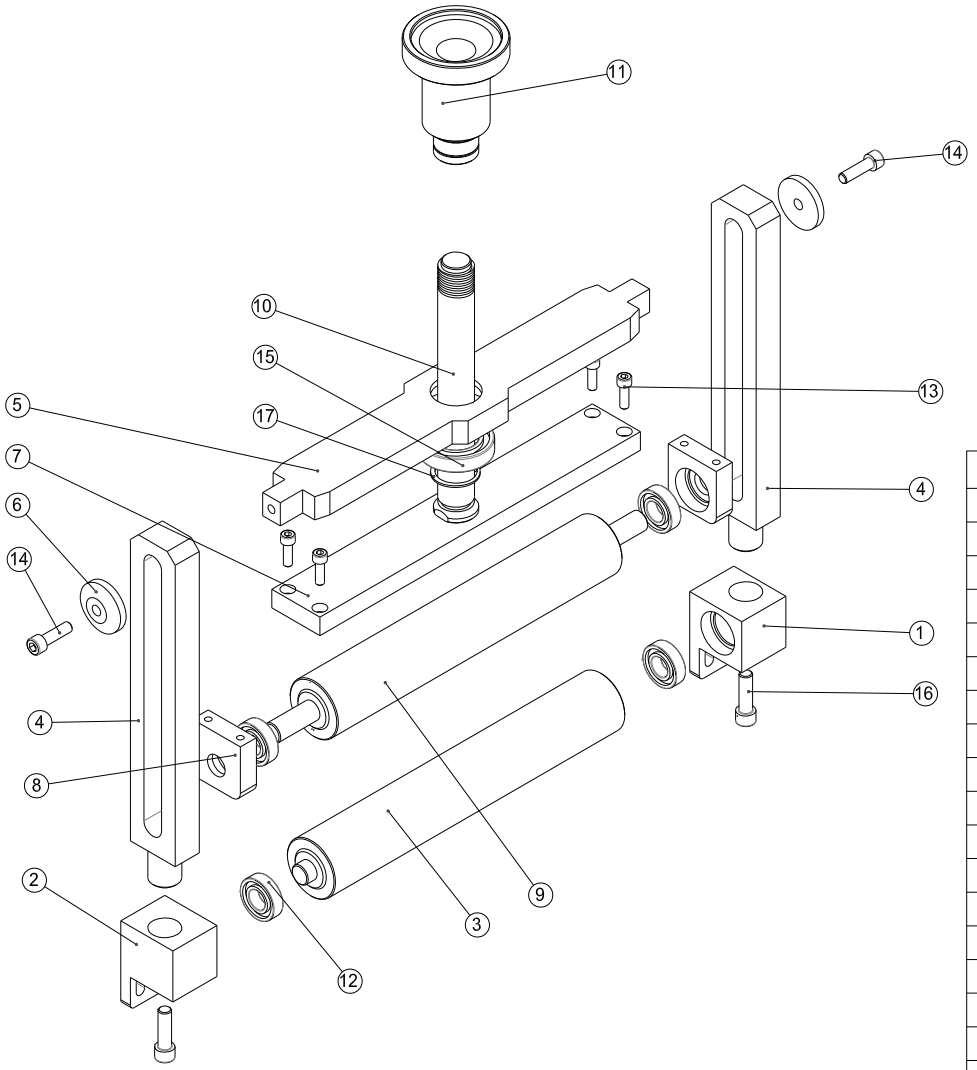
021651-0000 SERIT DUZELTME AYAGI SAG			
S.NO	MRP NO ve PARCA ADI	ADET	ACIKLAMA
1	021651-0000 SERIT DUZELTME KOLU SAG NC	1	
2	003547-0000 SERIT YONLENDIRME TAKOZU	1	
3	003550-0000 SERIT ELMAS CENESI KOMPLE	2	
4	003161-0000 SERIT DUZELTME KOLU EKSANTRIK MILI	2	
5	002207-0000 SERIT DUZELTME KOLU RULMAN MILI	1	
6	001230 VANA MINI 1-4	1	
7	000698 SABIT BILYALI RULMAN 6000 2RSR Ø10xØ26x8	5	
8	001173 SEKMAN MIL UST 471-10 Ø10	2	
9	001083 M6x8 ALYANBASLI VIDALI PIM	2	
10	001038 M8x35 ALYAN BASLI CIVATA	2	
11	001028 M6x25 ALYAN BASLI CIVATA	4	
12	000961 SPIRAL BONCUKLU SU	1	
13	000945 PLASTIK ERKEK TOPUZ Ø60 (M10x50)	1	
14	003624-0000 DESTEK KAMASI	1	
15	003384-0000 SERIT MUHAFAZA SACI SAG	1	
16	001025 M6x10 ALYAN BASLI CIVATA	2	



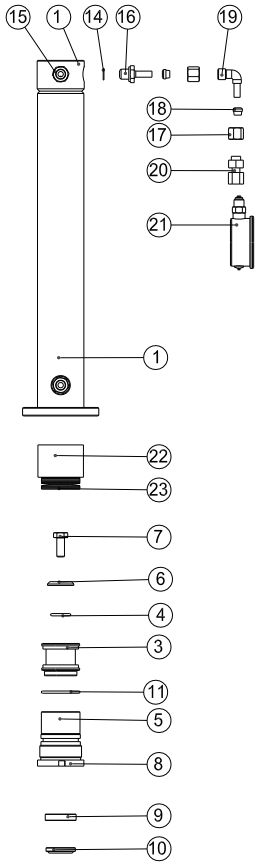
021650-0001 SERIT DUZELTME AYAGI SOL			
S.NO	MRP NO ve PARCA ADI	ADET	ACIKLAMA
1	021650-0000 SERIT DUZELTME KOLU SOL NC	1	
2	003550-0000 SERIT ELMAS CENESI KOMPLE	2	
3	003547-0000 SERIT YONLENDIRME TAKOZU	1	
4	002207-0000 SERIT DUZELTME KOLU RULMAN MILI	1	
5	003161-0000 SERIT DUZELTME KOLU EKSANTRIK MILI	2	
6	000698 SABIT BILYALI RULMAN 6000 2RSR Ø10xØ26x8	5	
7	001038 M8x35 ALYAN BASLI CIVATA	2	
8	001028 M6x25 ALYAN BASLI CIVATA	4	
9	001173 SEKMAN MIL UST 471-10 Ø10	2	
10	001083 M6x8 ALYANBASLI VIDALI PIM	2	
11	001230 VANA MINI 1-4	1	
12	000961 SPIRAL BONCUKLU SU	1	
13	000945 PLASTIK ERKEK TOPUZ Ø60 (M10x50)	1	
14	003624-0000 DESTEK KAMASI	1	
15	021521-0000 SERIT DUZELTME AYAGI SERIT MUHAFAZA SACI SOL	1	
16	001025 M6x10 ALYAN BASLI CIVATA	2	



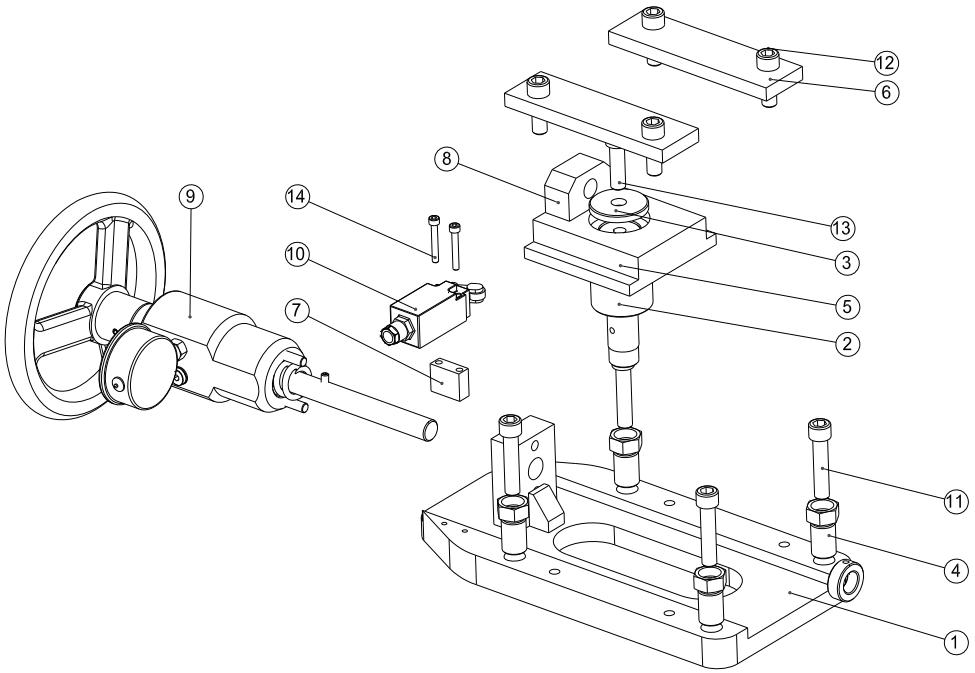
021693-0000 MAFSAL MONTAJLI PATLATILMIS			
S.NO	MRP NO ve PARCA ADI	ADET	AÇIKLAMA
1	021692-0000 MAFSAL MILI YATAGI	1	
2	021693-0000 MAFSAL KOLU	1	
3	021699-0000 MAFSAL MILI	1	
4	021715-0000 MAFSAL SWITCH AYAR VIDASI DESTEGI	1	
5	000948 PLASTIK ERKEK TOPUZ (M10x25)	1	
6	021516-0000 YUKSEKLIK SWITCH GOSTERGESI	1	
7	021830-0000 MAFSAL RULMAN YATAGI SIKMA PULU	4	
8	000394 XCK-P SWICH	2	
9	000720 SABIT BILYALI RULMAN SKF 6206 (Ø30xØ62x16)	2	
10	000984 M10x35 ANAHTARBASLI CIVATA	2	
11	001122 M10 ALTIKOSE SOMUN	2	
12	001008 M16x70 ALTIKOSE BASLI CIVATA	1	
13	001125 M16 ALTI KOSE SOMUN	1	
14	001024 M5x35 ALYANBASLI CIVATA	4	
15	001123 M12 ALTIKOSE SOMUN	1	
16	001001 M14x40 ALTIKOSE BASLI CIVATA	4	
17	002348 M16x20 ALYANBASLI VIDALI PIM	2	
18	001167 EMNIYET SEGMANI (Ø30)	2	



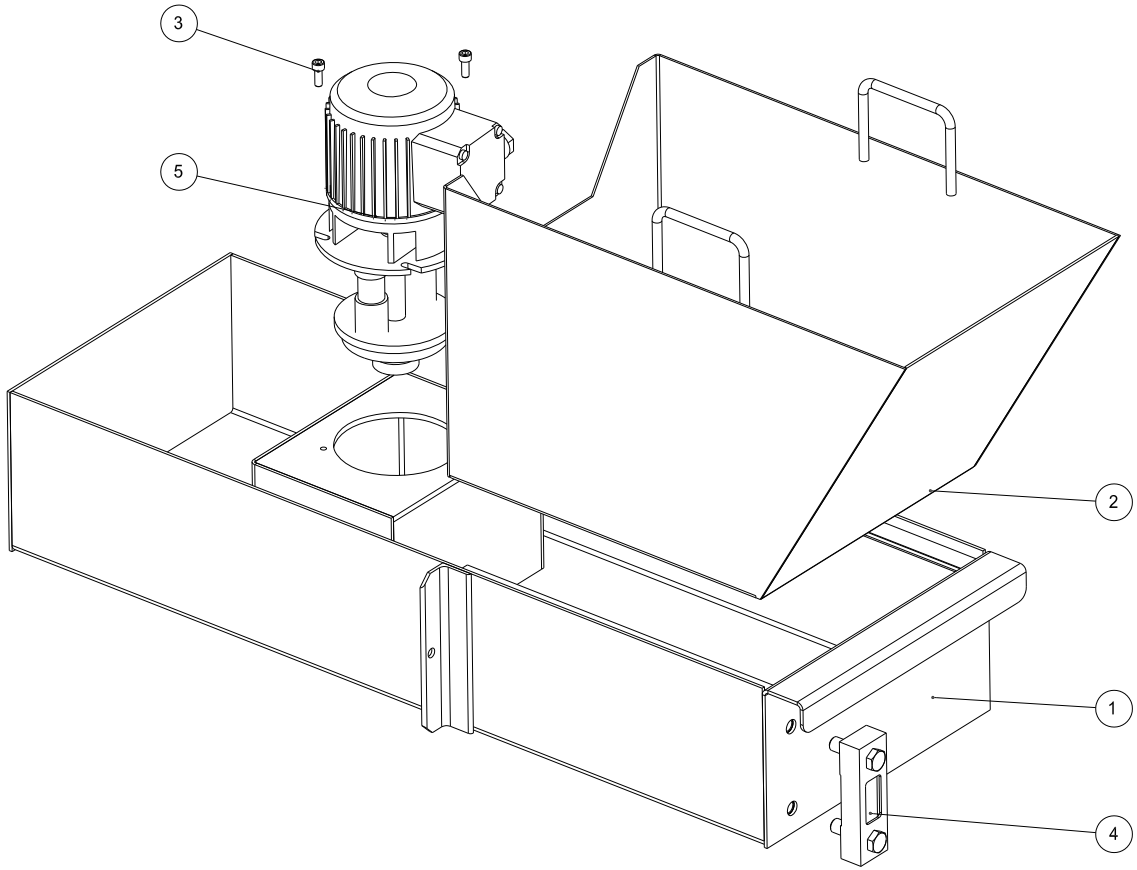
026095-0000 ORTA GOVDE RULOUST BASKI			
S.NO	MRP NO ve PARCA ADI	ADET	ACIKLAMA
1	026095-0000 ORTA GOVDE UST BASKI ALT RULO YATAGI SAG	1	
2	026096-0000 ORTA GOVDE UST BASKI ALT RULO YATAGI SOL	1	
3	026097-0000 ORTA GOVDE UST BASKI ALT RULOSU	1	
4	026098-0000 ORTA GOVDE UST BASKI YARGILI PLATINASI	2	
5	026099-0000 UST BASKI KARE VIDA BAGLANTI PLATINASI	1	
6	026100-0000 UST BASKI KARE VIDA BAGLANTI PLATINASI PULU	2	
7	026101-0000 UST BASKI RULOSU RULMAN YATAGI GOVDESI	1	
8	026102-0000 UST BASKI RULOSU RULMAN YATAGI	2	
9	026103-0000 ORTA GOVDE UST BASKI UST RULOSU	1	
10	026104-0000 UST BASKI KARE VIDA MILI	1	
11	026105-0000 UST BASKI KARE VIDA TOPUZU	1	
12	000703 SABIT BILYALI RULMAN SKF 6004 (Ø20xØ42x12)	4	
13	001036 M8x25 ALYAN BASLI CIVATA	4	
14	002693 M10x35 ALYAN BASLI CIVATA	2	
15	SKF - 6008 - 16,SI,NC,16_68	1	
16	001055 M12x40 ALYAN BASLI CIVATA	2	
17	001171 EMNIYET SEGMANI Ø40	1	



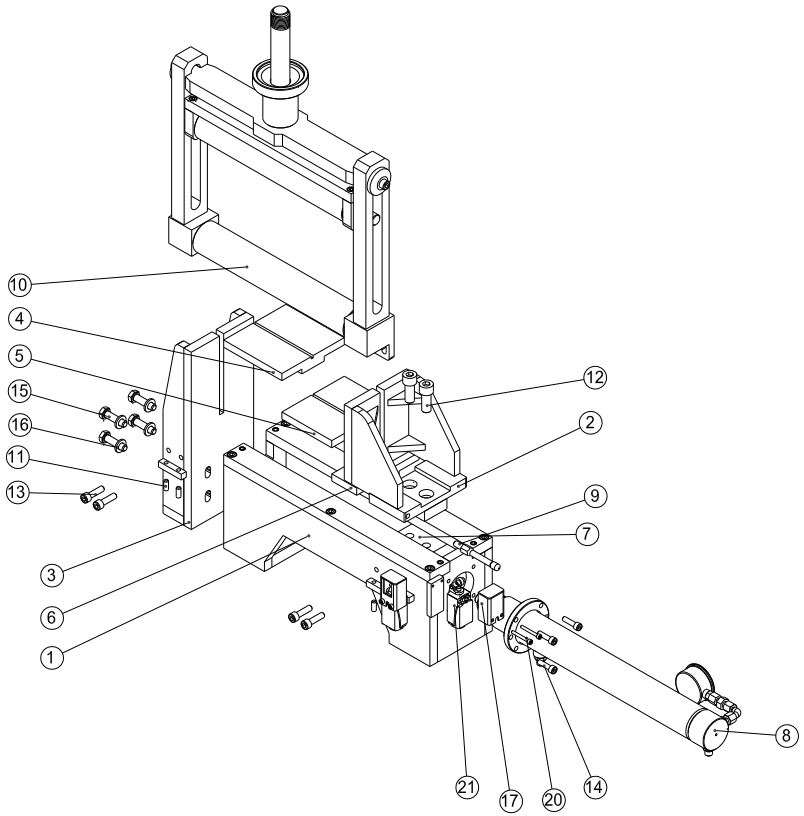
026110-0002 MALZEME SIKMA HIDROLIK LIFI			
S.NO	MRP NO ve PARCA ADI	ADET	ACIKLAMA
1	026231-0000 MALZEME SIKMA HIDROLIK LIFI BORU KOMPLE PAR 280	1	
2	026112-0000 MALZEME SIKMA HIDROLIK LIFI PISTON MILI PAR 280	1	
3	021631-0000 MALZEME SIKMA HIDROLIK LIF PISTONU	1	
4	002933 ORING K0 0202926 (ÿ 20xÿ 2,62)	1	
5	002535 KECE KOMPAKT SET K18 050-038	1	
6	018052-0000 HAREKETLI MENGENE PISTON MILI PULU	2	
7	000982 M10x25 ALTIKOSE BASLI CIVATA	1	
8	002935-0000 MALZEME SIKMA HIDROLIK LIFI ON KAPAGI	1	
9	000857 KECE NUTRING BOGAZ K22-30	1	
10	000732 TOZ KECESI K06-030 WIPER	1	
11	002934 ORING K0 0440435 (ÿ 44xÿ 3,53)	1	
12	001157 PUL TIRTILLI ÿ 10	1	
13	001047 M10x30 ALYAN BASLI CIVATA	1	
14	020054 PUL BAKIR 1-4	3	
15	000708 RAKOR 1-4 8mm GOVDE	2	
16	002243 RAKOR TERS GOVDE 8mm 1-4	1	
17	018811 SOMUN ÿ 8mm BORUYA GORE	2	
18	018808 YUKSUK ÿ 8mm BORUYA GORE	2	
19	000719 RAKOR TERS DIRSEK 8mm GOVDE	1	
20	002242 RAKOR 8mm MANOMETRE BAGLANTISI 8mm 1-4 GOVDE	1	
21	002670 MANOMETRE ÿ 63x100 GOVDE	1	
22	026114-0000 MALZEME SIKMA HIDROLIK LIFI TAS YAYI KOVANI PAR 280	1	
23	026113-0001 MALZEME SIKMA HIDROLIK LIFI TAS YAYI MONTAJLI PAR 280	1	



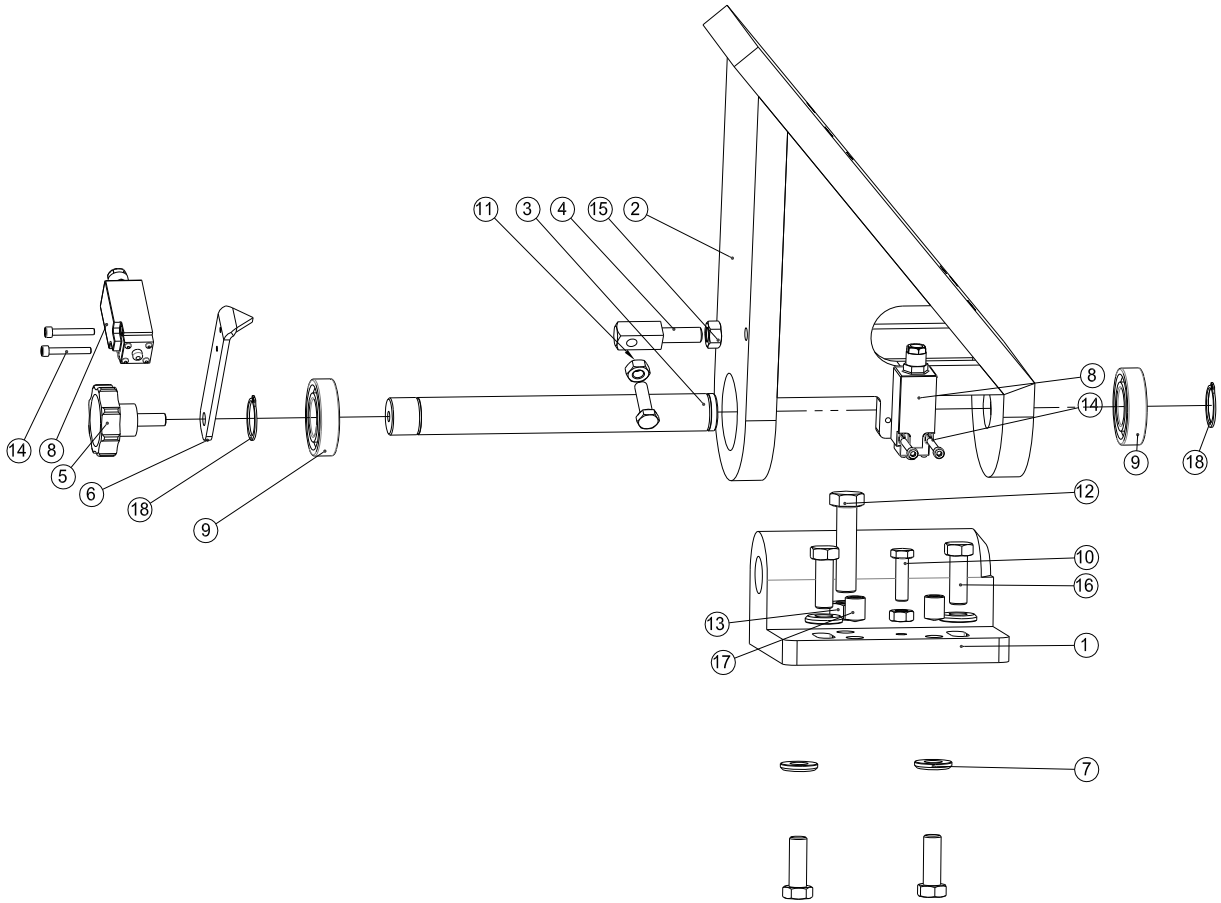
S.NO	MRP NO ve PARCA NUMARASI	ADET	ACIKLAMA
1	018645-0001 SERİT GERDİRME GOVDE PLATİNASİ KAYNAKLI (PAR-PSM 280 YENİ MODEL - M - HD NC)	1	
2	021542-0000 SERIT SERBEST KASNAK MILI	1	
3	021543-0000 SERİT SERBEST KASNAK MİLİ SİKMA PULU	1	
4	021545-0000 SERİT GERDİRME GOVDE PLATİNASİ AYAR VİDASİ	4	
5	021581-0000 SERIT GERDIRME KAIDESI	1	
6	018644-0000 SERİT GERDİRME KAİDESİ KİZAK LAMASİ	2	
7	018642-0000 SERIT GERDIRME LIFI SWITCH ALT LAMASİ	1	
8	004785-0000 SERIT GERDIRME MIL SOMUNU	1	
9	018055-0000 SERIT GERDIRME HİDROLIK LIFI	1	
10	000393 XCK-P MAKARALİ SWİCH 2121 P 16 (SOL)	1	
11	018764 M12x55 ALYANBASLI CIVATA	4	
12	002181 M12x35 ALYAN BASLI CIVATA	4	
13	001055 M12x40 ALYAN BASLI CIVATA	1	
14	001024 M5x35 ALYANBASLI CIVATA	2	
15	001048 M10x40 ALYAN BASLI CIVATA	2	



018726-0001 SU MOTORU CEKMECESI TALAS HAZNESI			
S. NO	MRP NO ve PARÇA ADI	ADET	AÇIKLAMA
1	018726-0000 SU MOTORU CEKMECESI	1	
2	018697-0000 SU MOTORU CEKMECESI TALAS HAZNESI	1	
3	001028 M6x25 ALYAN BASLI CIVATA	2	
4	001237 YAG GOSTERGESI (10cm)	1	
5	000332-0001 SU MOTORU (TEM (TIP 63-TP) 0.12 KW 2850 d-d)	1	

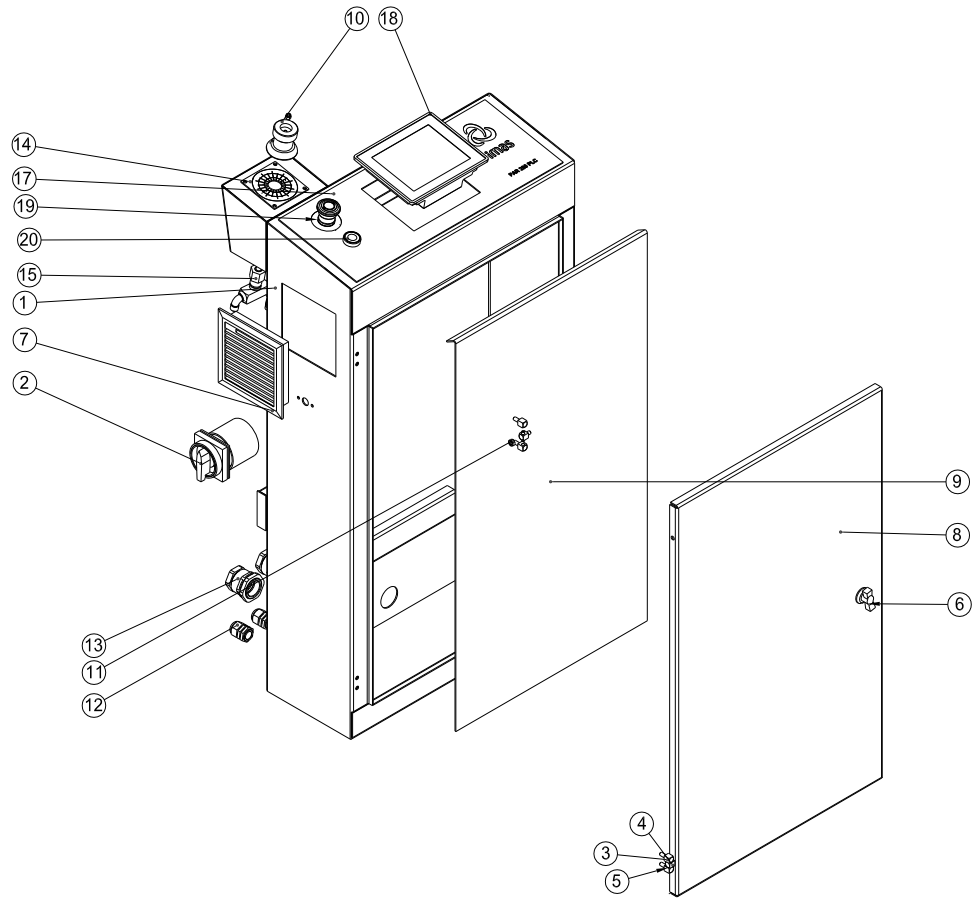


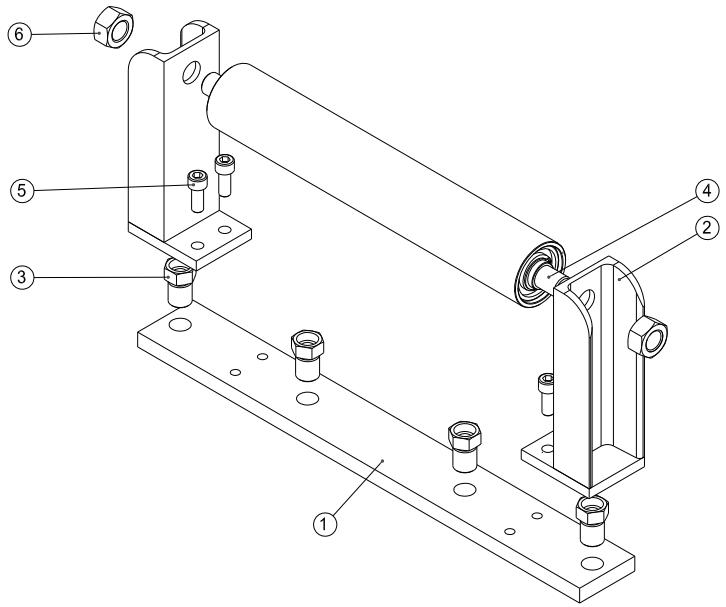
026059-0002 ORTA GOVDE MENGENE MONTAJI			
S.NO	MRP NO ve PARCA ADI	ADET	ACIKLAMA
1	026059-0001 ORTA GOVDE KOMPLE PAR 280	1	
2	026230-0000 HAREKETLI MENGENE KOMPLE PAR 280	1	
3	026091-0001 SABIT MENGENE KOMPLE PAR 280	1	
4	026066-0000 KESIM AGZI PLATINASI PAR 280 (140mm)	1	
5	026067-0000 KESIM AGZI PLATINASI PAR 280 (120mm)	1	
6	026068-0000 KESIM AGZI PLATINASI PAR 280 (60mm)	1	
7	026229-0000 ORTA GOVDE HAREKETLI MENGENE SOMUNU PAR 280	1	
8	026110-0002 MALZEME SIKMA HIDROLIK LIFI KOMPLE PAR 280	1	
9	026082-0000 HAREKETLI MENGENE SWITCH BASMA KOLU PAR 280	1	
10	026095-0001 ORTA GOVDE RULO UST BASKI MONTAJLI	1	
11	001089 M8x20 ALYANBASLI VIDALI PIM	4	
12	001062 M16x40 ALYAN BASLI CIVATA	2	
13	002693 M10x35 ALYAN BASLI CIVATA	4	
14	001037 M8x30 ALYAN BASLI CIVATA	4	
15	000994 M12x45 ALTIKOSE BASLI CIVATA	4	
16	001140 PUL DEMIR Ø12	4	
17	026165-0000 SURUCU ARABA SWITCH MUHAFAZA GOVDE SACI KAPALI KAYNAKLI PAR 280	1	
18	026163-0001 SURUCU ARABA SWITCH MUHAFAZA GOVDE SACI KAYNAKLI PAR 280	1	
19	TELEMECANIGUE XCKD21 - 21g11 SWITCH ON	1	
20	001021 M5x40 ALYANBASLI CIVATA	4	
21	TELEMECANIGUE XCKD21 - 21g11 SWITCH ARKA	1	



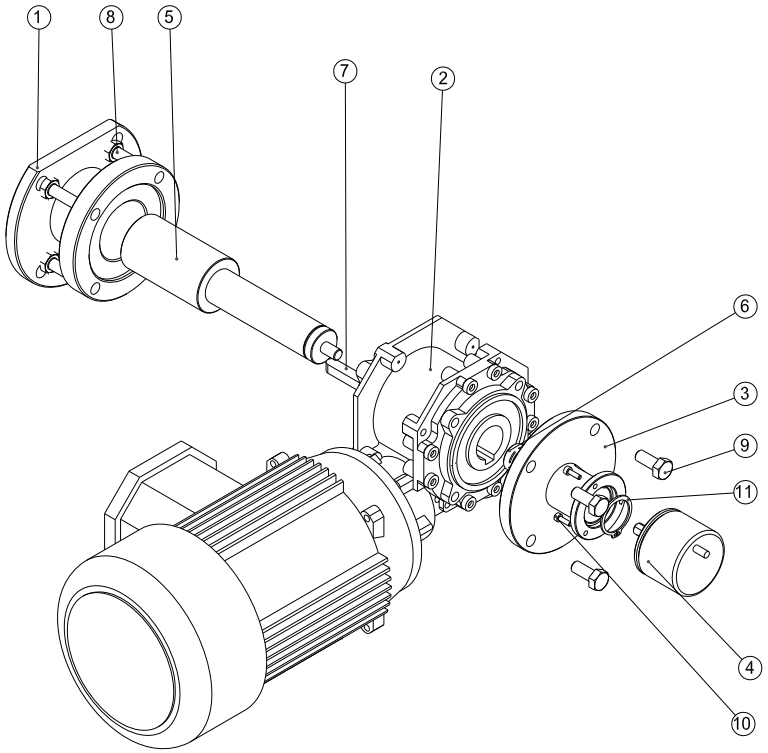
021693-0000 MAFSAL MONTAJLI PATLATILMIS			
S.NO	MRP NO ve PARCA ADI	ADET	AÇIKLAMA
1	021692-0000 MAFSAL MILI YATAGI	1	
2	021693-0000 MAFSAL KOLU	1	
3	021699-0000 MAFSAL MILI	1	
4	021715-0000 MAFSAL SWITCH AYAR VIDASI DESTEGI	1	
5	000948 PLASTIK ERKEK TOPUZ (M10x25)	1	
6	021516-0000 YUKSEKLIK SWITCH GOSTERGESI	1	
7	021830-0000 MAFSAL RULMAN YATAGI SIKMA PULU	4	
8	000394 XCK-P SWICH	2	
9	000720 SABIT BILYALI RULMAN SKF 6206 (Ø30xØ62x16)	2	
10	000984 M10x35 ANAHTARBASLI CIVATA	2	
11	001122 M10 ALTIKOSE SOMUN	2	
12	001008 M16x70 ALTIKOSE BASLI CIVATA	1	
13	001125 M16 ALTI KOSE SOMUN	1	
14	001024 M5x35 ALYANBASLI CIVATA	4	
15	001123 M12 ALTIKOSE SOMUN	1	
16	001001 M14x40 ALTIKOSE BASLI CIVATA	4	
17	002348 M16x20 ALYANBASLI VIDALI PIM	2	
18	001167 EMNIYET SEGMANI (Ø30)	2	

026165-0000 ELEKTRIK PANOSU			
S.NO	MRP NO ve PARÇA ADI	ADET	AÇIKLAMA
1	026166-0000 ELEKTRIK PANOSU KOMPLE PAR 280	1	
2	018253 SHARTEL YKL 301025 3x25 3x25 AC-KAPA OPAS	1	
3	002160 KAPAK ERKEK MENTESESI	4	
4	002161 KAPAK DISI MENTESESI	2	
5	002162 KAPAK DISI MENTESE PIMI	2	
6	012106 KAPAK KILIDI	1	
7	MESAN FAN PANJURU	2	
8	026175-0000 ELEKTRIK PANOSU KAPAGI PAR 280	1	
9	026174-0000 ELEKTRIK PANO SACI PAR 280	1	
10	003338-0000 KISICI TOPUZU	1	
11	001120 M6 ALTIKOSE SOMUN	6	
12	000652 RAKOR NO 13.5 ORTAC (PG 13.5)	2	
13	000656 RAKOR NO 29 SUNTAS (PG 29)	3	
14	001257 ETIKET KISICI GOSTERGE	1	
15	KISICI MONTAJI	1	
16	ISO 7041-M5-N	1	
17	PANEL ETIKETI (PAR 280 YENI MODEL SURUCU ARABALI)	1	
18	PANEL PAR 280 PLC	1	
19	018240 BUTON XB5 AS542 (ACIL STOP)	1	
20	018243 BUTON XB5-AA 42 KIRMIZI TELEMECANIQ	1	

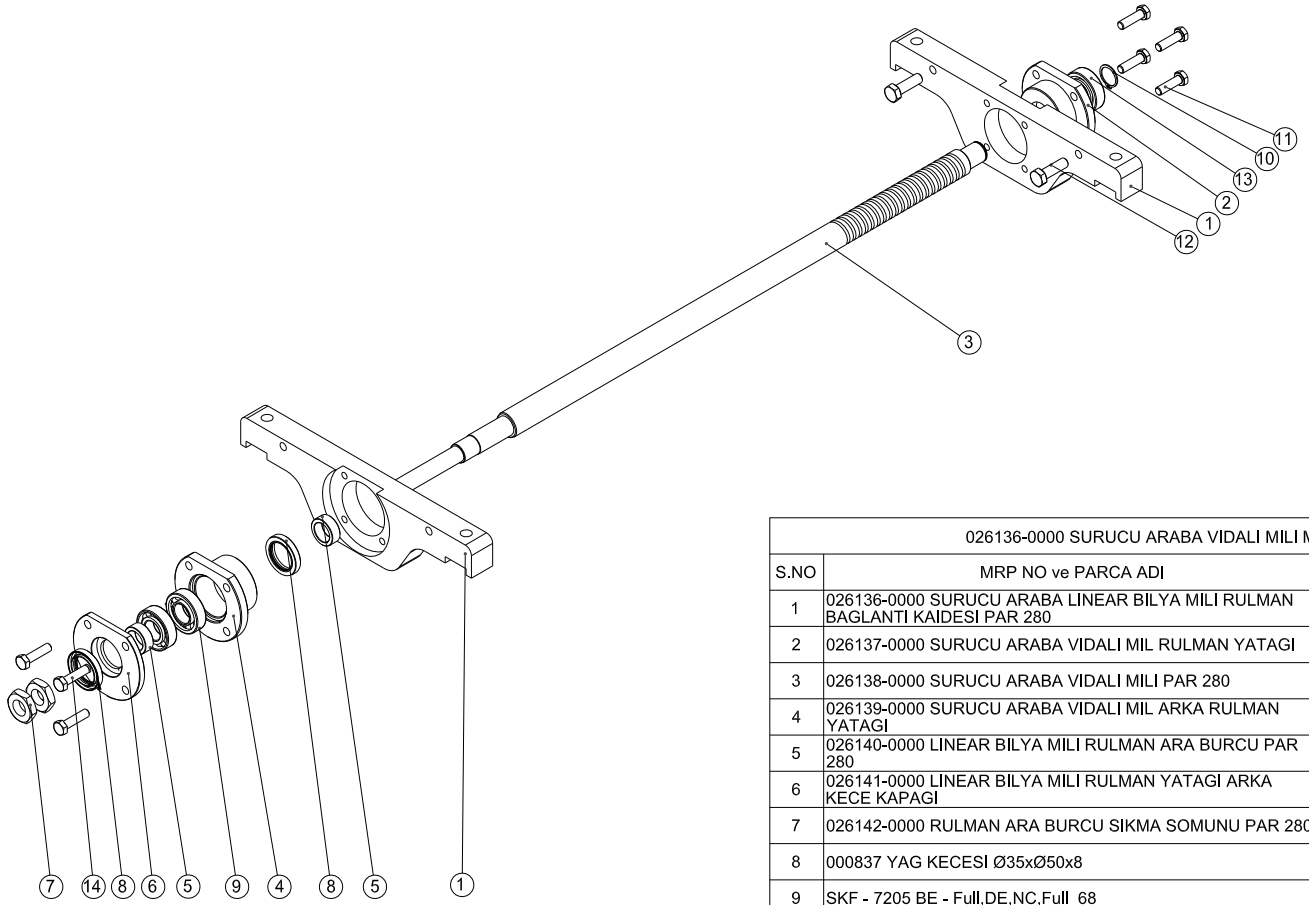




026150-0002 SURUCU ARABA ARKA RULO			
S.NO	MRP NO ve PARCA ADI	ADET	ACIKLAMA
1	026149-0000 SURUCU ARABA ARKA RULO TABAN AYAR PLATİNASİ PAR 280	1	
2	026150-0001 SURUCU ARABA ARKA RULO DİK U SU KAYNAKLI PAR 280	2	
3	026135-0000 SURUCU ARABA BAGLANTI PLATİNASİ AYAR VİDASİ PAR 280	4	
4	026151-0001 SURUCU ARABA RULO MONTAJLI PAR 280	1	
5	001046 M10x25 ALYAN BASLI CIVATA	4	
6	001126 M20 ALTİKOSE SOMUN	2	



026154-0000 SURUCU ARABALI VIDALI MIL			
S.NO	MRP NO ve PARCA ADI	ADET	ACIKLAMA
1	026154-0000 SURUCU ARABA VIDALI MIL REDUKTOR BAGLANTI KAPAGI PAR 280	1	
2	012009 POLAT REDUKTOR (0.55KW 1400 D-D NMRV 050 İ=10)	1	
3	026155-0000 SURUCU ARABA VIDALI MIL ENKODER BAGLANTI FLANSI PAR 280	1	
4	LS ROTARY ENKODER S48-8-0500ZT(TK1) SBOC-2308 (030)	1	
5	026156-0000 SURUCU ARABA VIDALI MIL ENKODER BAGLANTI MILI PAR 280	1	
6	ENCODER KAPLINI (TRD-J500-RZ)	1	
7	KAMA A 8x7x52	1	
8	000975 M8x25 ALTIKOSE BASLI CIVATA	4	
9	000974 M8x20 ALTIKOSE BASLI CIVATA	4	
10	M3x10 ALYANBASLI CIVATA	3	
11	001174 EMNIYET SEGMANI Ø25	1	



026136-0000 SURUCU ARABA VİDALI MİLİ MONTAJI			
S.NO	MRP NO ve PARCA ADI	ADET	ACIKLAMA
1	026136-0000 SURUCU ARABA LİNEAR BİLYA MİLİ RULMAN BAGLANTI KAIDESİ PAR 280	2	
2	026137-0000 SURUCU ARABA VİDALI MİL RULMAN YATAGI	1	
3	026138-0000 SURUCU ARABA VİDALI MİLİ PAR 280	1	
4	026139-0000 SURUCU ARABA VİDALI MİL ARKA RULMAN YATAGI	1	
5	026140-0000 LİNEAR BİLYA MİLİ RULMAN ARA BURCU PAR 280	2	
6	026141-0000 LİNEAR BİLYA MİLİ RULMAN YATAGI ARKA KECE KAPAGI	1	
7	026142-0000 RULMAN ARA BURCU SİKMA SOMUNU PAR 280	2	
8	000837 YAG KECESİ Ø35xØ50x8	2	
9	SKF - 7205 BE - Full,DE,NC,Full_68	2	
10	001174 EMNIYET SEGMANI Ø25	1	
11	000984 M10x35 ANAHTARBASLI CIVATA	4	
12	000993 M12x40 ALTIKOSE BASLI CIVATA	2	
13	000718 SABIT BİLYALİ RULMAN 6205 (Ø25xØ52x15)	1	
14	000985 M10x40 ALTİKOSE BASLİ CIVATA	4	