

HORIZONTAL METAL CUTTING BAND SAW

*Study Carefully Before Operating

BS-108G



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NOTE: This manual is only for your reference. Owing to the continuous improvement, changes may be made at any time with no obligation on the part of machine. And please note the local voltage for operating this electric machine.

1 ACCIDENT PREVENTION AND SAFETY REGULATION

This machine has been designed to comply with national and community accident-prevention regulations, Improper use and/or tampering with the safety devices will relieve the manufacturer of all responsibility.

1.1 Advice for the operator

- Check that the voltage indicated on machine motor is the same as the line voltage.
- Check the efficiency of your electric supply and grounding system; connect the power cable of the machine to the socket and the ground lead (yellow-green in color) to the grounding system.
- When the saw frame is in suspended mode (or raised) the blade must not move.
- Only the blade section used for cutting must be kept unprotected. To remove guards operate on the adjustable head.
- It is forbidden to use the machine without its shields.
- Always disconnect the machine from the power socket before blade change or carrying out any maintenance job ,even in the case of abnormal machine operation.
- Always wear suitable eye protection .
- Never put your hands or arms into the cutting area while the machine is operating .
- Do not shift the machine while it is cutting.
- Do not wear loose clothing like:shirts with sleeves that are too long,gloves that are too big, bracelets,chains or any other object that could get caught in the machine during operation.Tie back long hair.
- Keep the area free of equipmen, tools, or any other object.
- Perform only one operation at a time. Never have several objects in your hands at the same time. Keep your hands as clean as possible.
- All internal operations,maintenance or repairs,must be performed in a well-lit area or where there is sufficient light from extra sources so as to avoid the risk of even slight accidents.

1.2 The electrical equipment according to European Standard "CENELEC EN 60 204-1" which assimilates, with some integrating modifications, the publication "IEC204-1(1992)".

- The electrical equipment ensures protection against electric shock as a result of direct or indirect contact.
- The active parts of this equipment are housed in a box to which access is limited by screws that can only be removed with a special tool;the parts are fed with alternating current as low voltage(24v).The equipment is protected against splashes of water and dust.
- Protection of the system against short circuits is ensured by means of rapid fuses and grounding;in the event of a motor overload,protection is provided by a thermal probe.
- In the event of a power cut ,the specific start-up button must be reset.
- The machine has been tested in conformity with point

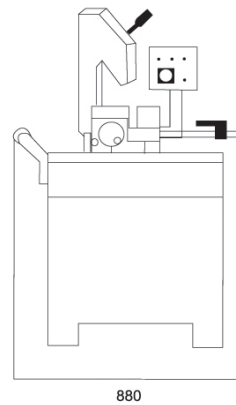
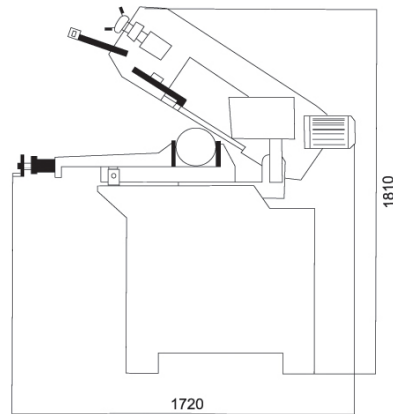
20 of EN 60204.

1.3 Emergencies according to European Standard "CENELEC EN 60 204-1(1992)"

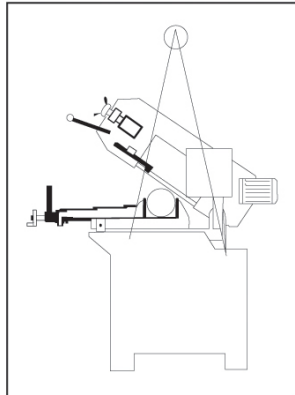
- In the event of incorrect operation of danger conditions, the machine may be stopped immediately by pressing the red mushroom button.
 - The casual or voluntary removal of the blade cover of the flywheels causes the stepping-in of a interlock switch that automatically stops all machine functions.
- NOTE;**Resetting of machine operation after each emergency stop requires specific restart button.

2 MACHINE DIMENSIONS TRANSPORT INSTALLATION DISMANTLING

2.1 Machine dimensions



2.2 Transportation of your machine.



To move the machine, the machine needs to be moved in its own packing, use a forklift truck or sling it with straps as illustrated in the drawing above.

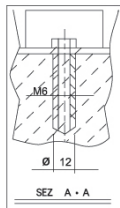
2.3 Minimum requirements for housing the machine

- Main voltage and frequency must comply with the machine's motor requirements.

- Environment temperature should fall within -10°C to +50°C.

- Relative humidity cannot be over 90%.

2.4 Anchoring the machine



Position the machine on a firm cement floor, maintaining, at the rear, a minimum distance of 800 mm from the wall; anchor it to the ground as shown in the diagram, using screws and expansion plugs or tie rods sunk in cement, ensuring that it is sitting level.

2.5 Instructions for assembly of the loose parts and accessories

Fit the components supplied;

Detail 1 Mount bar-stop rod

Detail 2 Mount and align the roll-supporting arm as per the counter-vice table.

Detail 3 Mount the coolant return plate.

2.6 Disactivation of machine

- If the sawing machine is to be out of use for a long

period, it is advisable to proceed as follows;

1) Detach the plug from the electric supply panel

2) Loosen blade

3) Release the arch return spring

4) Empty the coolant tank

5) Carefully clean and grease the machine

6) If necessary, cover the machine.

2.7 Dismantling (due to deterioration and/or obsolescence)

General rules

If the machine is to be permanently demolished and/or scrapped, divide the material to be disposed of according to type and composition, as follows:

1) Cast iron or ferrous materials, composed of metal alone, are secondary raw materials, so they may be taken to an iron foundry for re-smelting after having removed the contents (classified in point 3).

2) Electrical components, including the cable and electronic material (magnetic cards, etc.), fall within the category of material classified as being assimilated to urban waste according to the laws of your local, state, or federal government, so they may be set aside for collection by the public waste disposal service;

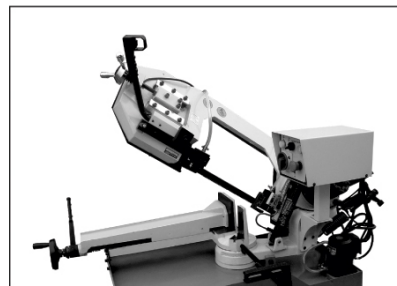
3) Old mineral and synthetic and/or mixed oils, emulsified oils and greases are considered hazardous or special refuse, so they must be collected, transported and disposed of at a special waste disposal service.

NOTE: The standards and legislation concerning refuse is in a constant state of evolution, therefore is subject to changes. The user must keep informed of the regulations at the time of disposal as these may differ from those described above.

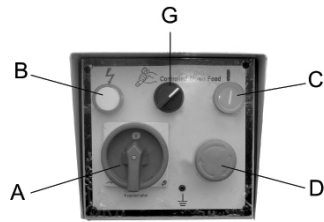
3 THE MACHINE'S FUNCTIONAL PARTS

3.1 The saw arm

Machine's parts consist of drive members (gear motor or variable speed motor, flywheel), tightening and guide (blade tightening slide, blade guide blocks) of tool.

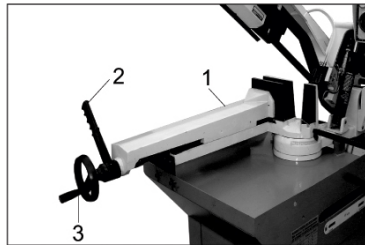


3.2 Controls



- A: Main connect switch
- B: Power Indicator Light
- C: Start push button
- D: Emergency push button
- G: Manual/Hydraulic selector

3.3 Vice adjustment



Clamping the Work Piece

- Rotate lock lever (2) to release the movable vise jaw.
- Place the work piece between the vise jaws and have it rest next to the fixed vise jaw.
- Use hand wheel (3) to approach the workpiece allowing a gap of 3-5mm.
- Clamp the work piece securely using the lock lever (2).
- For multiple cuts of material with the same width, use the locking lever (2) for clamping and releasing.

3.4 Cutting angle adjustment

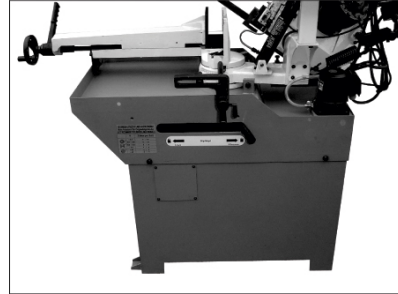
Cutting at angles

- Angle can be cut up to 60°.
- Unlock lever (1) by pushing it to the left side.
- Rotate the saw arm to the desired angle by following the index on the scale.
- Lock lever (1) by pushing to the right side.

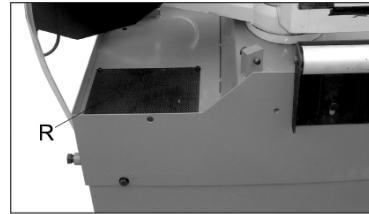
3.5 The stand

A structure supporting the SAW ARM (revolving arm or gradual cutting and respective blocking system), the vice, the bar stop, the roller, and the coolant return plate

for the support of the material, The base houses the cooling liquid tank and pup.



3.6 The coolant return plate



The coolant return plate (R) function to prevent the coolant from flowing off the machine when making an angle cut. It also returns the coolant to back to the coolant system.

3.7 The operation cycle

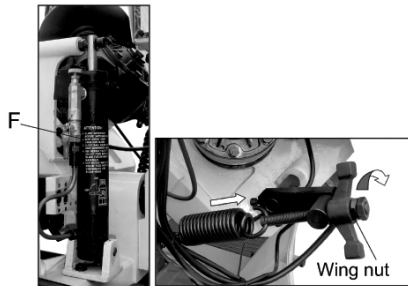
Before operating, all the main organs of the machine must be set in optimum conditions.

The main connect switch is designed with a lock hole. A lock can be attached using the lock hole to prevent machine operation for safety and security reasons.



Operation procedure:

- A .Manual operation

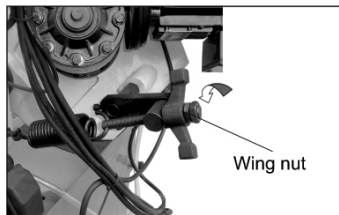


- Check that the hydraulic flow control knob (F) is fully closed.
- Rotate the wing nut clockwise to tighten the spring.
- Load work piece and clamp it properly.
- Turn on main connect switch (A) to the ON position. Check to see that the indicator light (B) is lit.
- Select control switch (G) to manual mode(trigger operation).
- Hold the trigger handle to control the saw bow.
- Fully open the flow control knob (F) by rotating counter-clockwise to the end.
- Press the trigger on the trigger handle to start the blade and lower saw bow to begin cutting.
- When the saw bow reaches the bottom the microswitch will activate and the blade will stop.
- Keep hold of the trigger handle to control the return to the start position.
- Turn the flow control knob (F) clockwise to close.
- The cutting operation is complete. Reset the workpiece to continue the next cutting cycle.

If an emergency should occur

- Press the emergency push button (D) down to shut off all functions. To release the emergency push button, rotate the mushroom shaped button clock-wise. The button will pop up, then the cutting cycle can be restarted.

3.8 Auto cutting operation



WARNING!

Failure to fully close the hydraulic flow control knob (F) can result in serious injury. The saw arm may drop suddenly when changing the spring tension.

- Check that the hydraulic flow control knob (F) is fully close.
- Loosen the spring by turning the wing nut (H) counter clockwise.
- Load work piece and clamp it properly.
- Turn main connect switch (A) to the ON position.
- Check to see that the indicator light (B) is lit.
- Select hydraulic mode on control switch (G).
- Press the start button (C).The coolant system should activate at the same time.
- Slightly turn the hydraulic flow control knob (F) counter-clockwise from 2-3 to control the saw arm's descent rate.
- When the saw bow reaches the bottom the microswitch will activate and the blade will stop.
- Lift the saw arm to the appropriate height close the hydraulic flow control knob(F)by rotating it clockwise all the way to the end.
- The machine is now ready for the next cutting operation.

If an emergency situation should occur.

- Press the emergency push button (D) down to shut off all functions. To release the emergency push button, rotate the mushroom shaped button (D)clock-wise. The button will pop up,then the cutting cycle can be restarted.

BLADE CUTTING DIRECTION

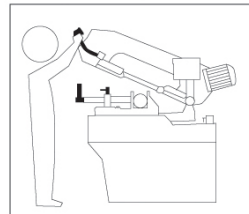


4 ADVICE ON USING YOUR BANDSAW

4.1 Recommendations and advice for using the machine

The machine has been designed to cut metal building materials,with different shapes and profiles,used in workshops, turner's shops and general mechanical structural work.

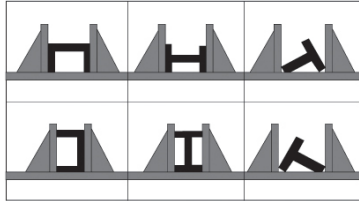
Only one operator is needed to use the machine,that must stand as shown in the picture.



- Before starting each cutting operation,ensure that the part is firmly clamped in the vice and that the end is

suitably supported.

- These figures below show examples of suitable clamping of different section bars, bearing in mind the cutting capacities of the machine in order to achieve a good efficiency and blade durability.



- Do not use blades of a different size from those stated in the machine specifications.
- If the blade gets stuck in the cut, release the running button immediately, switch off the machine, open the vice slowly, remove the part and check that the blade or its teeth are not broken, if they are broken, change the tool.
- Before carrying out any repairs on the machine, consult the dealer.

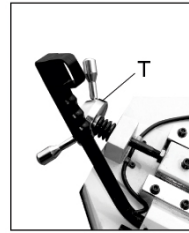
5 ADJUSTING YOUR MACHINE

5.1 Blade tension assembly

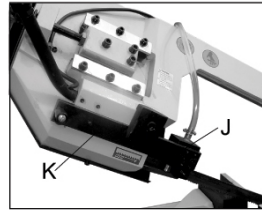
Blade tension is important to the proper operation of the saw. Proper blade tension is 700 to 900 kgs. Per square inch as measured on a blade tension gauge.

To set the blade tension without the use of a tension gauge:

- Disconnect the machine from the power source.
- Install blade between wheel and insert blade between bearing on blade guides.
- Tension blade slightly to remove any sag in blade between blade wheels.
- Turn blade tension knob (T) one and three quarter to two revolutions clockwise. To test press the flat side of the blade with your thumb. If moves with 2mm-3mm range then it is set correctly.
- After blade has been completely installed, close cover, connect the power source, and run saw for two to three minutes so blade can seat properly.
- Disconnect machine from the power source.
- Open cover and loosen blade just until it begins to sag.
- Tighten blade until it becomes straight between blade wheel and all sag has been eliminated.
- Tighten blade by tuning blade tension wheel two full revolutions. Blade is now properly tensioned and ready for use.
- Close covers and connect machine to the power source.



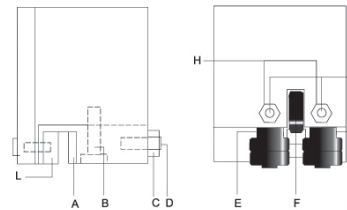
5.2 Adjusting the blade guide



- Disconnect the machine from the power source.
- Loosen handle (J) on the square lock plate.
- Hold the handle (K) and slide blade guide block as close as possible to the material without interfering with the cut.
- Tighten handle (J)
- Reconnect the machine to power source.

Blade guide blocks

The blade is guided by means of adjustable pads set in place during inspection as per the thickness of the blade with minimum play as shown in the figure.



In case the blade needs to be replaced, make sure to always install 0.9mm thick blades for which the blade guide pads have been adjusted. In the case of toothed blades with different thicknesses adjustment should be carried out as follows:

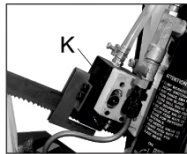
- Loosen nut (C), screw (B) and loosen dowel (D) widening the passage between the pads.
- Loosen the nuts (H) and the dowels (I) and rotate the pins (E-G) to widen the passage between the bearings (F).
- To mount the new blade; place the pad (A) on the blade, loosening the dowel, allow a play of 0.04mm for the sliding of the toothed blade, lock the relative nut

and screw (B), Rotate the pins (E-G) until the bearings rest against the blade as indicated in the figure and then secure the dowels (I) and nut (H).

- Make sure that between the blade and the upper teeth of the pad (L) this is at least 0.2-0.3mm of play; if necessary, loosen the screws that fasten the blocks and adjust accordingly.

BEFORE PERFORMING THE FOLLOWING OPERATIONS, THE ELECTRIC POWER SUPPLY AND THE POWER CABLE MUST BE COMPLETELY DISCONNECTED.

5.3 Changing the blade

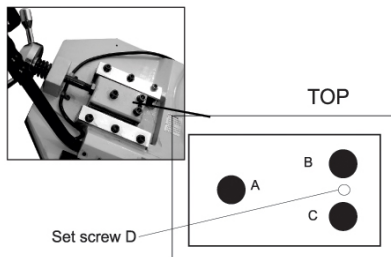


To change the blade:

- Lift the saw arm.
- Loosen the blade with the blade tension hand wheel, remove the mobile blade-guard cover, open the flywheel guards and remove the old blade from the flywheel and the blade guide blocks.
- Assemble the new blade by placing it first between the pads and then on the race of the flywheels, paying particular attention to the cutting direction of the teeth.
- Tension the blade and make sure it perfectly fits inside the seat of the flywheels.
- Assemble the mobile blade-guide end, the flywheel guard, and fasten it with the relative knobs. Check the safety microswitch (K) is activated otherwise when electricity is applied the machine will not start.

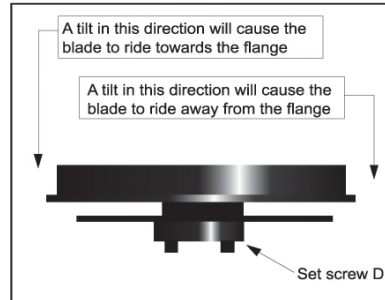
WARNING: Always assemble blades having dimensions specified in this manual and for which the blade guide heads have been set; otherwise, see chapter on "Description of the operating cycle" in the section Starting-up.

5.4 Adjusting the blade to the flywheels

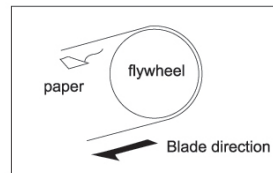


1. Loosen the hex nut screws A, B and C.
2. Use an Allen wrench on set screw D to adjust the tilt of the flywheel.
 - Turning the set screw D clockwise will tilt flywheel so that the blade will ride closer to the flange.
 - Turning the set screw D counter-clockwise will tilt the flywheels that the blade will ride away from the flange. If the blade rides away too far then it will come off.

After the adjustment is finished, fasten the hex nut screws in this order: A, B and C.



Checking the adjustment of the blade



Use a strip of scrap paper and slide it between the blade and the flywheel while it is running.

- if the paper is cut then the blade is riding too close to the flange, re-adjust.
- if you notice that the blade is riding away from the flange, Then re-adjust.

WARNING: Always assemble blades having dimensions specified in this manual and for which the blade guide heads have been set; otherwise, see chapter on "Description of the operating cycle" in the section Starting-up.

6 ROUTINE AND SPECIAL MAINTENANCE

THE MAINTENANCE JOBS ARE LISTED BELOW, DIVIDED INTO DAILY, WEEKLY, MONTHLY AND SIX-MONTHLY INTERVALS. IF THE FOLLOWING OPERATIONS ARE NEGLECTED, THE RESULT WILL BE PREMATURE WEAR OF THE MACHINE AND POOR PERFORMANCE.

6.1 Daily maintenance

- General cleaning of the machine to remove accumulated shavings.
- Clean the lubricating coolant drain hole to avoid excess fluid.
- Top off the level of lubricating coolant.
- Check blade for wear.
- Rise of saw frame to top position and partial slackening of the blade to avoid useless yield stress.
- Check functionality of the shields and emergency stops.

6.2 Weekly maintenance

- Thorough cleaning of the machine to remove shavings, especially from the lubricant fluid tank.
- Removal of pump from its housing ,cleaning of the suction filter and suction zone.
- Clean the filter of the pump suction head and the suction area.
- Use compressed air to clean the blade guides(guide bearings and drain hole of the lubricating cooling).
- Cleaning flywheel housings and blade sliding surfaces on flywheels.

6.3 monthly maintenance

- Check the tightening of the motor flywheel screws.
- Check that the blade guide bearings on the heads are perfect running condition.
- Check the tightening of the screws of the gear motor, pump,and accident protection guarding.

6.4 Six-monthly maintenance

- Continuity test of the equipotential protection circuit.

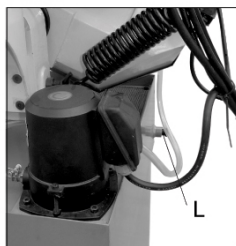
6.5 Oils for lubricating coolant

Considering the vast range of products on the market, the user can choose the one most suited to their own requirements, using as reference the type SHELL LUTEM OIL ECO. THE MINIMUM PERCENTAGE OF OIL DILUTED IN WATER IS 8-10%.

6.6 Oil disposal

The disposal of these products is controlled by strict regulations, Please see the Chapter on "Machine dimensions Transport-Installation" in the section on dismantling.

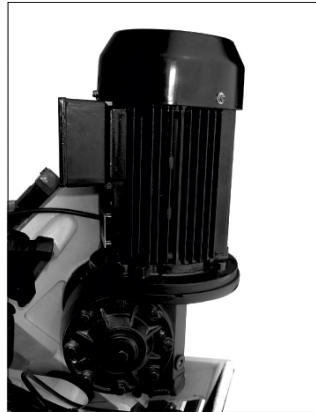
6.7 Coolant system



Cleaning the tank

- Use hex wrench to open the plug (L) to allow the coolant to drain out.
- Remove the filter (M) by loosening the four set screws.
- Remove the pump (N) by loosening the four set screws.
- Use a vacuum cleaner to vacuum chips and debris from the tank.
- Replace the plug (L).
- Thoroughly clean the pump (M) and replace.
- Fill tank with coolant to a level about 25mm below the filter.
- Replace the filter.

6.8 The gearbox



The gear box requires periodic changing of oil. The oil must be changed by the first 6 months of a new machine and every year there after.

To change the gear box oil.

- Disconnect the machine from the power source.
- Raise the saw arm to vertical position.
- Release the drain hold (O) to draw off gear oil by loosening the hex socket screw (P).
- Replace the screw (P) after oil completely flows off.
- Place the saw arm back to horizontal position.
- Fill Gear box with approximately. 3 liter of gear oil through the hole of the vent screw (Q).

For reference,use SHELL type gear oil or Mobile gear oil #90.

6.9 Special maintenance

Special maintenance must be conducted by skilled personnel. We advise contacting your nearest dealer and/or importer. Also the reset of protective and safety equipment and devices (of the reducer), the motor,the motor pump, and other electrical components requires special maintenance.

7 TECHNICAL CHARACTERISTICS

7.1 Table of cutting capacity and technical details

CUTTING CAPACITY			
	0°	45°	60°
	227mm	220 x 220	260 x 110
	150mm	145 x 145	200 x 125
	90mm	85 x 85	

TYPES OF STEEL						CHARACTERISTICS			
USE	I UNI	D DIN	F AF NOR	GB SB	USA AISI-SAE	Hardness BRINELL HB	Hardness ROCKWELL HRB	R=N/mm ²	
Construction steels	Fe360	St37	E24	---	---	116	67	360 ÷ 480	
	Fe430	St44	E28	43	---	148	80	430 ÷ 560	
	Fe510	St52	E36	50	---	180	88	510 ÷ 660	
Carbon steels	C20	CK20	XC20	060 A 20	1020	198	93	540 ÷ 690	
	C40	CK40	XC42H1	060 A 40	1040	198	93	700 ÷ 840	
	C50	CK50	---	---	1050	202	94	760 ÷ 900	
	C60	CK60	XC55	060 A 62	1060	202	94	830 ÷ 980	
Spring steels	50CrV4	50CrV4	50CV4	735 A50	6150	207	95	1140 ÷ 1330	
	60SiCr8	60SiCr7	---	---	9262	224	98	1220 ÷ 1400	
Alloyed steels for hardening and tempering and for nitriding	35CrMo4	34CrMo4	35CD4	708 A 37	4135	220	98	780 ÷ 930	
	39NiCrMo4	36CrNiMo4	39NCD4	---	9840	228	99	880 ÷ 1080	
	41CrAlMo7	41CrAlMo7	40CADG12	905 M 39	---	232	100	930 ÷ 1130	
Alloyed casehardening steels	18NiCrMo7	---	20NCD7	En325	4320	232	100	760 ÷ 1030	
	20NiCrMo2	21NiCrMo2	20NCD2	805 H 20	4315	224	98	690 ÷ 980	
Alloyed for bearings	100Cr6	100Cr6	100C6	534 A 99	52100	207	95	690 ÷ 980	
Tool steel	52NiCrMoKU	56NiCrMoV7C100K	---	---	---	244	102	800 ÷ 1030	
	C100KU	C100W1	---	BS 1	S-1	212	96	710 ÷ 980	
	X210Cr13KU	X210Cr12	Z200C12	BD2-BD3	D6-D3	252	103	820 ÷ 1060	
	58SiMo8KU	---	Y60SC7	---	S5	244	102	800 ÷ 1030	
Stainless steels	X12Cr13	4001	---	---	---	410	202	94	670 ÷ 885
	X5CrNi1810	4301	Z5CN18.09	304 C 12	304	202	94	590 ÷ 685	
	X8CrNi1910	---	---	---	---	202	94	540 ÷ 685	
	X8CrNiMo1713	4401	Z6CDN17.12	316 S 16	316	202	94	490 ÷ 685	
Copper alloys Special brass Bronze	Aluminium copper alloy G-CuAl11Fe4Ni4 UNI 5275					220	98	620 ÷ 685	
	Special manganese/silicon brass G-CuZn36S11Pb1 UNI5038					140	77	375 ÷ 440	
	Manganese bronze SAE43 - SAE430					120	69	320 ÷ 410	
	Phosphor bronze G-CuSn 12 UNI 7013/2a					100	58,5	265 ÷ 314	
Cast iron	Gray pig iron					212	96	245	
	Spheroidal graphite cast iron					232	100	600	
	Malleable cast iron					222	98	420	

ELECTRIC MOTOR- BLADE ROTATION	KW	0.59/ 1.1
FLYWHEEL DIAMETER	mm	295
BLADE DIMENSIONS	mm	27x0.9x2455
BLADE SPEED CUTTING	m/min	36/ 72
OPENING VICE	mm	260
SAW FRAME TILTING	°	40
WORKING TABLE HEIGHT	mm	900
MACHINE WEIGHT	kg	216

considerations and common sense, so as to achieve an optimum condition that does not require countless operations to prepare the machine when there are many variations in the job to be performed. The various problems that crop up from time to time will be solved more easily if the operator has a good knowledge of these specifications.

8.1 Definition of materials

The table above lists the characteristics of the materials to be cut, so as to choose the right tool to use.

8.2 Selecting blade

First of all the pitch of the teeth must be chosen, in other words, the number of teeth per inch (25,4mm) suitable for the material to be cut, according to these criteria:

- Parts with a thin and/or variable section such as profiles, pipes and plate, need close toothing, so that the number of teeth used simultaneously in cutting is from 3 or 6;
- Parts with large transverse sections and solid sections need widely spaced toothing to allow for the

8 MATERIAL CLASSIFICATION AND CHOICE OF TOOL

Since the aim is to obtain excellent cutting quality, the various parameters such as hardness of the material, shape and thickness, transverse cutting section of the part to be cut, selection of the type of cutting blade, cutting speed and control of saw frame lowering. These specifications must therefore be harmoniously combined in a single operating condition according to practical

- greater volume of the shavings and better tooth penetration;
- Parts made of soft material or plastic (light alloys, mild bronze, teflon, wood, etc) also require widely spaced toothing;
 - Pieces cut in bundles require combo tooth design.

8.3 Teeth pitch

- As already stated, this depends on the following factors;
- Hardness of the material.
 - Dimensions of the section.
 - Wall thickness.

BLADE TEETH SELECTION TABLE		
THICKNESS mm	Z CONTINUOUS TOOTH DESIGN	Z COMBO TOOTH DESIGN
TILL 1.5	14	10/14
FROM 1 TO 2	8	8/12
FROM 2 TO 3	6	8/10
FROM 3 TO 5	6	5/8
FROM 4 TO 6	6	4/6
MORE THAN 6	4	4/6

SOUO Ø OR Lmm	Z CONTINUOUS TOOTH DESIGN	Z COMBO TOOTH DESIGN
TILL 30	8	5/8
FROM 30 TO 80	6	4/6
FROM 40 TO 80	4	4/6
MORE THAN 90	3	3/4

8.4 Cutting and advance speed

The cutting speed (m/min) and the advance speed (cm²/min=area traveled by the disk teeth when removing shavings) are limited by the development of heat close to the tips of the teeth.

- The cutting speed is subordinate to the resistance of the material (R=N/mm²), to its hardness (HRC) and to the dimensions of the widest section.
- Too high an advance speed (=lowering of the saw frame) tends to cause the disk to deviate from the ideal cutting path, producing non rectilinear cuts on both the vertical and the horizontal plane.

The best combination of these two parameters can be seen directly examining the chips.

- Long spiral -shaped chips indicate ideal cutting.
- Very fine or pulverized chips indicate lack of feed and/or cutting pressure.
- Thick and/or blue chips indicate overload of the blade.

8.5 Blade running-in

When cutting for the first time, it is good practice to run

in the tool making a series of cuts at a low advance speed (=30-35cm²/min on material of average dimensions with respect to the cutting capacity and solid section of normal steel with R=410-510Nimm²). Generously spraying the cutting area with lubricating coolant.

8.6 Blade structure

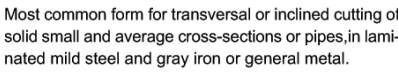
Bi-metal blades are the most commonly used. They consist of a silicon-steel blade backing by a laser welded high speed steel (HHS) cutting edge. The type of stocks are classified in M2, M42, M51 and differ from each other because of their major hardness due to the increasing percentage of Cobalt (Cc) and molybdenum (Mo) contained in the metal alloy.

8.7 Blade type

They differ essentially in their constructive characteristics, such as:

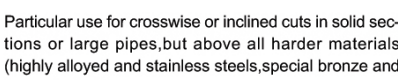
- Shape and cutting angle of tooth
- Pitch
- Set
- Shape and angle of tooth

REGULAR TOOTH: 0° rake and constant pitch.



Most common form for transversal or inclined cutting of solid small and average cross-sections or pipes, in laminated mild steel and gray iron or general metal.

POSITIVE RAKE TOOTH: 9°-10° positive rake and constant pitch.



Particular use for crosswise or inclined cuts in solid sections or large pipes, but above all harder materials (highly alloyed and stainless steels, special bronze and forge pig iron).

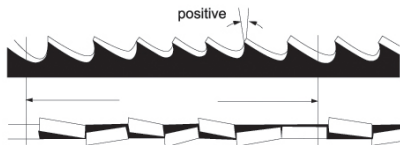
COMBO TOOTH: pitch varies between teeth and consequently varying teeth size and varying gullet depths.



Pitch varies between teeth, which ensures a smoother, quieter cut and longer blade life owing to the lack of vibration.

Another advantage offered in the use of this type of blade in the fact that with an only blade it is possible to cut a wide range of different materials in size and type.

COMBO TOOTH : 9°-10° positive rake.



This type of blade is the most suitable for the cutting of section bars and large and thick pipes as well as for the cutting of solid bars at maximum machine capacity. Available pitches: 3-4/4-6.

SETS

Saw teeth bent out of the plane of the saw body, resulting in a wide cut in the workpiece.



REGULAR OR RAKER SET: Cutting teeth right and left, alternated by a straight tooth.



Of general use for materials with dimensions superior

to 5 mm. Used for the cutting of steel, castings and hard nonferrous materials.

WAVY SET: Set in smooth waves.



This set is associated with very fine teeth and it is mainly used for the cutting of pipes and thin section bars (from 1 to 3mm).

ALTERNATE SET (IN GROUPS): Groups of cutting teeth right and left, alternated by a straight tooth.



This set is associated with very fine teeth and it is used for extremely thin materials (less than 1mm).

ALTERNATE SET (INDIVIDUAL TEETH): Cutting teeth right and left.



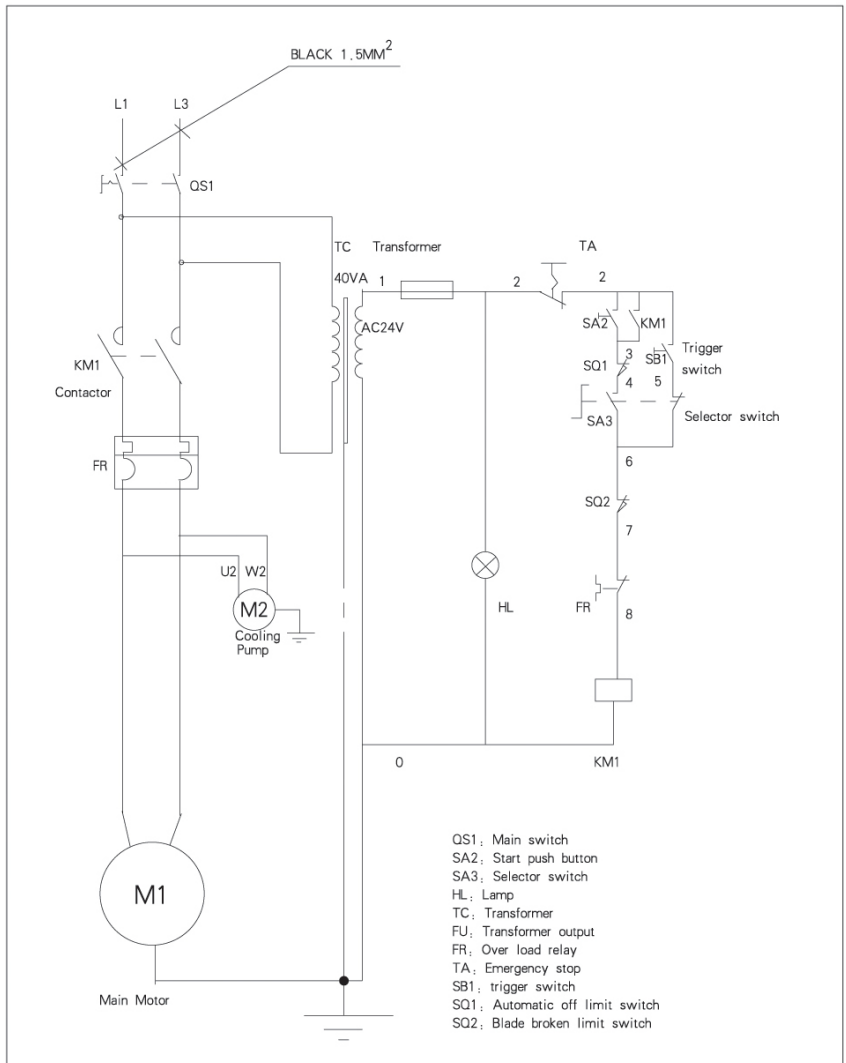
This set is used for the cutting of nonferrous soft materials, plastics and wood.

9 NOISE TESTS

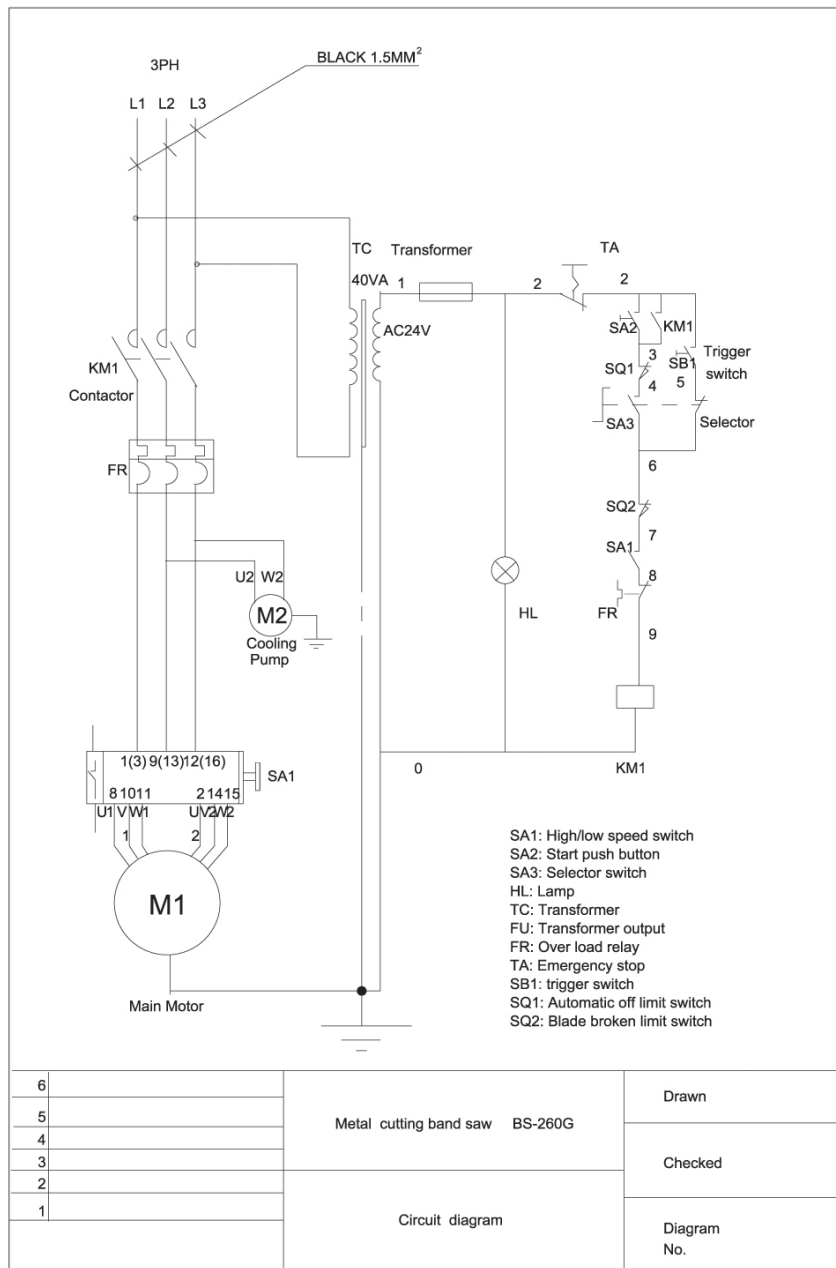
The test was held under environmental noise levels of 65db. Noise measurements with the machine operating unload was 71db. Noise level during the cutting of mild carbon steel was 73db.

NOTE: with the machine operating, the noise level will vary according to the different materials being processed.

The user must therefore assess the intensity and if necessary provide the operators with necessary personal protection, as required by Law 277/1991.



6	Metal cutting band saw BS-260G	Drawn
5		Checked
4		
3	Circuit diagram	Diagram No.
2		
1		

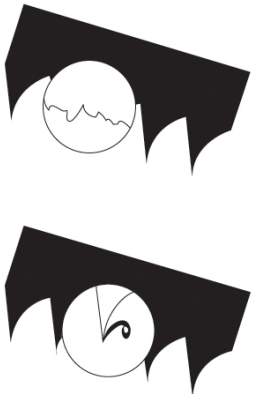


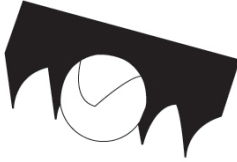
11 TROUBLE SHOOTING

This chapter lists the probable faults and malfunctions that could occur while the machine is being used and suggests possible remedies for solving them.

The first paragraph provides diagnosis for TOOLS and CUTS the second for ELECTRICAL COMPONENTS.

11.1 Blade and cut diagnosis

FAULT	PROBABLE CAUSE	REMEDY
<p>TOOTH BREAKAGE</p> 	<p>Too fast advance</p> <p>Wrong cutting speed</p> <p>Wrong tooth pitch</p> <p>Chips sticking onto teeth and in the gullets or material that gums</p> <p>Defects on the material or material too hard</p> <p>Ineffective gripping of the part in the vice</p> <p>The blade gets stuck in the material</p> <p>Starting cut on sharp or irregular section bars</p> <p>Poor quality blade</p> <p>Previously broken tooth left in the cut</p> <p>Cutting resumed on a groove made previously</p> <p>Vibrations</p> <p>Wrong tooth pitch or shape</p> <p>Insufficient lubricating, refrigerant, or wrong emulsion</p> <p>Teeth positioned in the direction</p>	<p>Decrease advance, exerting less cutting pressure, Adjust the braking device.</p> <p>Change speed and/or type of blade. See chapter on "Material classification and blade selection", in the section blade selection table according to cutting and feed speed.</p> <p>Choose a suitable blade. See Chapter "Material classification and blade selection".</p> <p>Check for clogging of coolant drain holes on the blade-guide blocks and that flow is plentiful in order to facilitate the removal of chips from the blade.</p> <p>Material surfaces can be oxidized or covered with impurities making them, at the beginning of the cut, harder than the blade itself, or have hardened areas or inclusions inside the section due to productive agents used such as casting sand, welding wastes, etc. Avoid cutting these materials or in a situation a cut has to be made use extreme care, cleaning and remove any such impurities as quickly as possible.</p> <p>Check the gripping of the part.</p> <p>Reduce feed and exert less cutting pressure.</p> <p>Pay more attention when you start cutting.</p> <p>Use a superior quality blade.</p> <p>Accurately remove all the parts left in.</p> <p>Make the cut elsewhere, turning the part.</p> <p>Check gripping of the part.</p> <p>Replace blade with a more suitable one. See "Material classification and blade selection" in the Blade types section. Adjust blade guide pads.</p> <p>Check level of liquid in the tank. Increase the flow of lubricating refrigerant, checking that the hole and the liquid outlet pipe are not blocked. Check the emulsion percentage.</p>

FAULT**PREMATURE BLADE WEAR****PROBABLE CAUSE**

Faulty running-in of blade

Teeth positioned in the direction opposite the cutting direction

Poor quality blade

Too fast advance

Wrong cutting speed

Defects on the material or material too hard

Insufficient lubricating refrigerant or wrong emulsion

REMEDY

See "Material classification and blade selection" in the Blade tuning-in section.

Turn teeth in correct direction.

Use a superior quality blade.

Decrease advance, exerting less cutting pressure. Adjust the braking device.

Change speed and/or type of blade. See chapter on "Material classification and blade selection", in the section Blade selection table according to cutting and feed speed.

Material surfaces can be oxidized or covered with impurities making them, at the beginning of the cut, harder than the blade itself, or have hardened areas or inclusions inside the section due to productive agents used such as casting sand, welding wastes, etc. Avoid cutting these materials or perform cutting with extreme care, cleaning and remove such impurities as quickly as possible.

Check level of liquid in the tank. Increase the flow of lubricating coolant, checking that the coolant nozzle and pipe are not blocked, Check the emulsion percentage.

BLADE BREAKAGE

Faulty welding of blade

Too fast advance

Wrong cutting speed

Wrong tooth pitch

Ineffective gripping of the part in the vice

Blade touching material at beginning of cut

Remedy

The welding of the blade is of utmost importance. The meeting surfaces must perfectly match and once they are welded they must have no inclusions or bubbles; the welded part must be perfectly smooth and even. They must be evenly thick and have no bulges that can cause dents or instant breakage when sliding between the blade guide pads.

Decrease advance, exerting less cutting pressure. Adjust the braking device.

Change speed and/or type of blade.

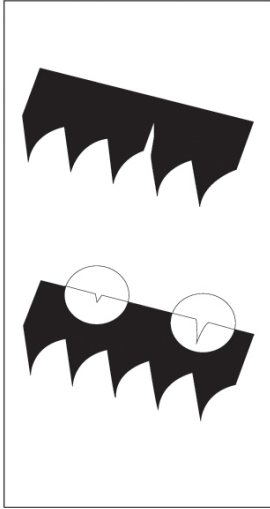
See chapter on "Material classification and blade selection", in the section Blade selection table according to cutting and feed speed.

Choose a suitable blade. See Chapter "Material classification and blade selection".

Check the gripping of the part.

At the beginning of the cutting process, never lower the saw arm before starting the blade motor.

FAULT



PROBABLE CAUSE

Blade guide pads not regulated or dirty because of lack of maintenance

Blade guide block too far from material to be cut

Improper position of blade on flywheels

Insufficient lubricating coolant or wrong emulsion

REMEDY

Check distance between pads (see **"Machine adjustments"** in the Blade Guide Blocks section);extremely accurate guiding may cause cracks and breakage of the tooth. Use extreme care when cleaning.

Approach head as near as possible to material to be cut so that only the blade section employed in the cut is free, this will prevent deflections that would excessively stress the blade.

The back of blade rubs against the support due to deformed or poorly welded bands(tapered), causing cracks and swelling of the back contour.

Check level of liquid in the tank,Increase the flow of lubricating refrigerant, checking that the hole and the liquid outlet pipe are not blocked. Check the emulsion percentage.

STEAKED OR ETCHED BANDS

Damaged or chipped blade guide pads

Tight or slackened blade guide bearings.

Replace them.

Adjust them (see Chapter **"Machine adjustments"** in Blade guide section).

CUTS OFF THE STRAIGHT

Blade not parallel as to the counter service

Blade not perpendicular due to the excessive play between the guide pads and maladjustment of the blocks

Too fast advance

Worn out blade

Wrong tooth pitch


Check fastenings of the blade guide blocks as to the counter-vice so that they are not too loose and adjust blocks vertically;bring into line the position of the degrees and if necessary adjust the stop screws of the degree cuts.

Check and vertically re-adjust the blade guide blocks; reset proper side guide play (see Chapter **"Machine adjustments"** in Blade guide section).

Decrease advance,exerting less cutting pressure. Adjust the braking device.

Approach it as near as possible to material to be cut so that only the blade section employed in the cut is free,this will prevent deflections that would excessively stress the blade.

Replace it. Blade with major density of teeth is being used, try using one with less teeth (see Chapter **"Material classification and blade selection"** in the Blade Types section).

FAULT	PROBABLE CAUSE	REMEDY
	<p>Broken teeth</p> <p>Insufficient lubricating refrigerant or wrong emulsion</p>	<p>Irregular work of the blade due to the lack of teeth can cause deflection in the cut; check blade and if necessary replace it.</p> <p>Check level of liquid in the tank. Increase the flow of lubricating coolant, checking that the hole and the outlet pipe are not blocked. Check the emulsion percentage.</p>
<p>FAULTY CUT</p>	<p>Worn out flywheels Flywheel housing full of chips</p>	<p>The support and guide flange of the band are so worn out that they cannot ensure the alignment of the blade, causing faulty cutting; blade rolling and drawing tracks can have become tapered. Replace them. Clean with compressed air.</p>
<p>STREAKED CUTTING SURFACE</p> 	<p>Too fast advance</p> <p>Poor quality blade</p> <p>Worn out blade or with chipped and/or broken teeth</p> <p>Wrong tooth pitch</p> <p>Blade guide block too far from material to be cut</p> <p>Insufficient lubricating coolant or wrong emulsion</p>	<p>Decrease advance. exerting less cutting pressure. Adjust the braking device.</p> <p>Use a superior quality blade.</p> <p>Replace it.</p> <p>Blade used probably has too large teeth ,use one with more teeth (see "Material classification and blade selection" in the Blade Types section).</p> <p>Approach it as near as possible to material to be cut so that only the blade section employed in the cut is free, this will prevent deflections that would excessively stress the blade.</p> <p>Check level of liquid in the tank. Increase the flow of lubricating coolant, checking that the hole and the liquid outlet pipe are not blocked. Check the emulsion percentage.</p>
<p>NOISE ON GUIDE BLOCKS</p>	<p>Chipped bearings Worn out or damaged pads</p>	<p>Dirt and/or chips between blade and guide bearings. Replace them.</p>

11.2—Electrical components diagnosis

FAULT	PROBABLE CAUSE	REMEDY
<p>THE BAND ROTATION MOTOR DOES NOT WORK</p>	<p>"SA1"two-speed switch (3 phase only)</p> <p>"FR1"band motor over-load relay</p> <p>"SB1"emergency switch</p> <p>"SA2" start push button</p>	<p>It must be exactly turned towards rabbit or turtle sign.</p> <p>Push down FR1 red button . After a motor cooling time of 5 minutes, if there is no current continuity on these two wires, the motor must be replaced.</p> <p>Reset emergency switch (see operation procedure).</p> <p>Check the functioning and/or possible damages. If so, replace it.</p>
<p>MACHINE DOES NOT WORK</p>	<p>Fuses "FU"</p> <p>"SQ1" Automatic shut off limit switch</p> <p>"SQ2"blade cover limit switch</p> <p>"SQ3"blade broken limit switch (optional)</p> <p>Speed switch "SA1" in position "0"</p> <p>Emergency button"SB1"on</p> <p>"SB2"trigger switch</p> <p>Motor "M1"</p>	<p>Check electrical efficiency. if not, replace the fuse.</p> <p>Refer to the operation procedure and adjust the switch if machine doesn't shut off after the material completely cuts. Replace it if damaged.</p> <p>Check closing of the fly wheel cover. Check the efficiency of the device; replace it if damaged.</p> <p>Check the efficiency of the device; replace it if damaged.</p> <p>It must be exactly turned to rabbit or turtle sign.</p> <p>Reset the emergency switch by following steps of Operation Procedure. Check electrical efficiency, if not, replace it.</p> <p>Check the efficiency of the device; replace it if damaged.</p> <p>Check current continuity on the two wires in the prone,if not, replace the motor.</p>
<p>MOTOR STOPPED WITH PILOT LIGHT 尋L2 罨IT</p>	<p>"SB2" trigger switch</p> <p>Motor "M1"</p>	<p>Check the efficiency of the device; replace it if damaged.</p> <p>Check that it is not burnt and that it turns freely. Replace it if damaged.</p>

PART LIST

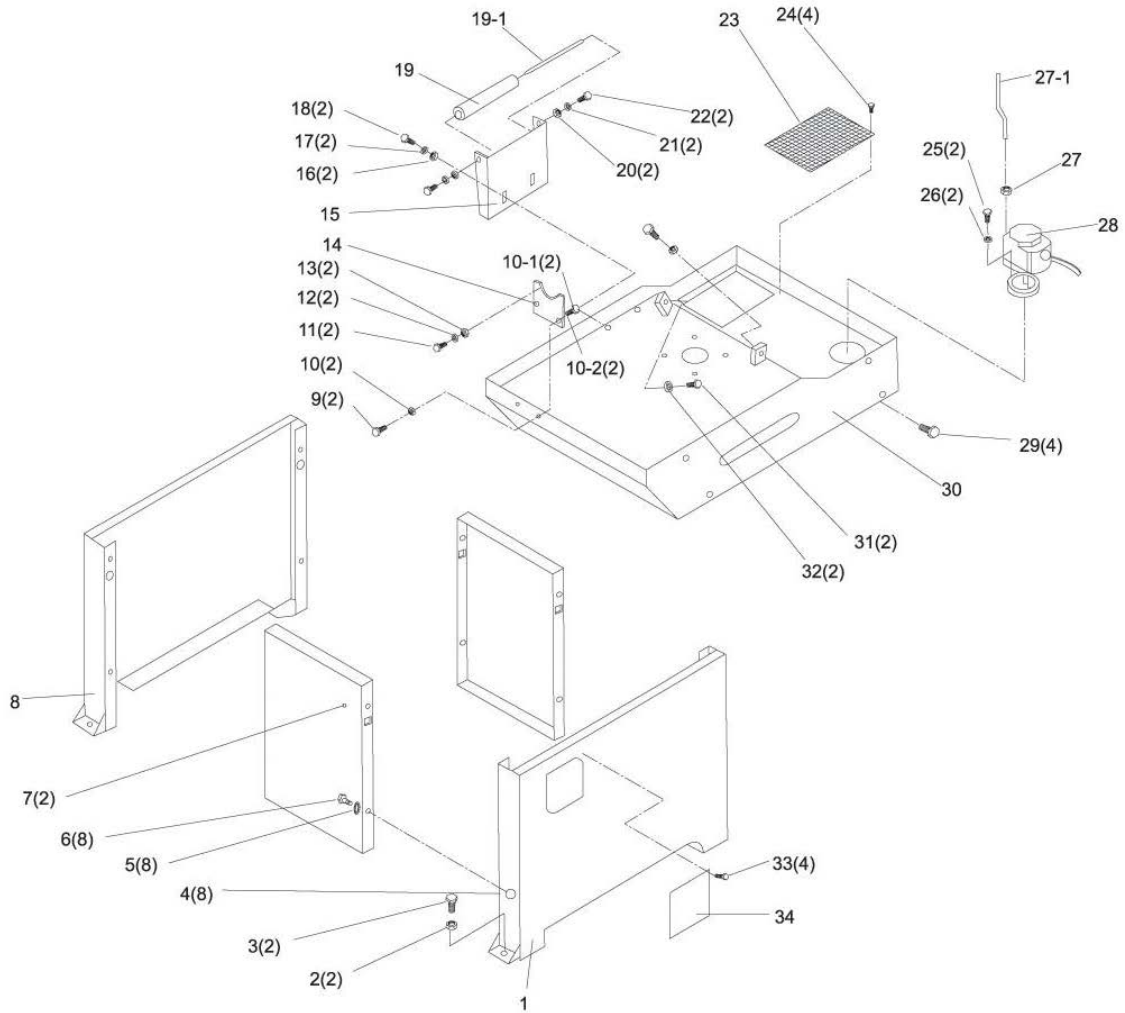
Part No.	Description	Size No.	Q'ty	Part No.	Description	Size No.	Q'ty
1	Base (Right Part)		1	55	Bar Stop-Rod		1
2	Nut	M12	2	56	Bracket		1
3	Hex.Cap Bolt	M12X40	2	57	Butterfly Screw	5/16x3/4	1
4	Nut	M8	8	58	Washer	5/16x3t	1
5	Washer	M8	8	59	Spring Washer	5/16	1
6	Hex. Cap Bolt	M8X16	8	60	Hex. Cap Bolt	5/16x1"	1
7	Base Plate		2	61	Rod		1
8	Base (Left Part)		1	62	Nut	5/16	1
9	Hex.Socket Cap Screw	M8X20	2	63	Hex.Cap Bolt	5/16x2"	1
10	Spring Washer	M8	2	64	Set Screw	M8x10	1
10-1	Nut	M8	2	64-1	Hex. Socket Cap Screw	M5x8	2
10-2	Washer	M8	2	64-2	Scale Point		1
11	Hex. Socket Cap Screw	M8X20	2	65	Pivot		1
12	Spring Washer	M8	2	66	Anti-Dust Cover	M30	2
13	Washer	M8	2	67	Ball Bearing	#32006ZZ	2
14	Supporting Plate		1	68	Nut	M10	2
15	Roller Stand Bracket		1	69	Hex. Cap Bolt	M10X30	2
16	Washer	M10	2	69-1	Hex. Cap Bolt	M10X25	1
17	Spring Washer	M10	2	70	Spring Hook		1
18	Hex. Cap Bolt	M10X20	2	72	Star Washer	M30	1
19	Roller		1	73	Nut	M30	1
19-1	Roller Shaft		1	74	Start Button		1
20	Washer	M8	2	75	Emergency Switch		1
21	Spring Washer	M8	2	76	Main Connect Switch		1
22	Hex. Socket Cap Screw	M8X16	2	77	Power Indicator Light		1
23	Filter Net		1	78	Hex. Socket Cap Screw	M5X8	4
24	Round Head Screw	M5X10	4	79	Washer	M5	2
25	Hex. Socket Cap Screw	M6X15	2	80	Hex. Socket Cap Screw	M5X8	2
26	Washer	M6	2	81	Cover		1
27	Hose Clamp		1	82	Hex. Socket Cap Screw	M5X8	4
27-1	Hose	5/16X130cm	1	83	Control Box Bottom Plat		1
28	Pump	WE90	1	83-1	Transformer		1
29	Hex. Cap Bolt	M10X20	4	83-2	Contacts		1
30	Coolant and Chip Tray		1	83-3	Fuse Seat		1
31	Hex.Cap Bolt	M12X40	2	83-4	Overload Rely		1
32	Nut	M12	2	83-5	Magnetic Connector		1
33	Hex. Socket Cap Screw	M5X8	4	84	Control Box Bottom Part		1
34	Base Front Plate		1	85-H	Control Box Panel		1
38	Hand Wheel		1	85-H1	Manual /Auto Selector		1
39	Set Screw	M8X10	1	86	Support		1
40	Nut		1	88	Hex. Socker Cap Screw	M5X8	4
41	Bearing Bushing		1	89	Hex. Socket Cap Screw	M8X20	2
42	Thrust Ball Bearing	#51104	1	90	Spring Washer	M8	2
43	Lock Handle		1	91	Setting Bracket		1
44	Bushing		1	92	Spring Washer	M8	4
45	Hex.Socket Cap Sctew	M6X100X25	2	93	Hex. Socket Cap Screw	M8X20	4
46	Table		1	94	Swivel Arm		1
47	Plate		1	94-1	Scale		1
48	Flat Head Machine Screw	M6X20	2	94-2	Rivet	2m/m	2
49	Compressed Spring		1	95	Disk		1
50	Lead Screw		1	96	Set Screw	M8X10	1
51	Hex. Socket Cap Screw	M8X20	4	97	Oil Seal	4m/m	1
52	Spring Washer	M8	4	98	Shaft		1
53	Treaded Nut		1	99	Nut		1
54	Vise		1	100	Hex. Socker Cap Screw	M8x25	4

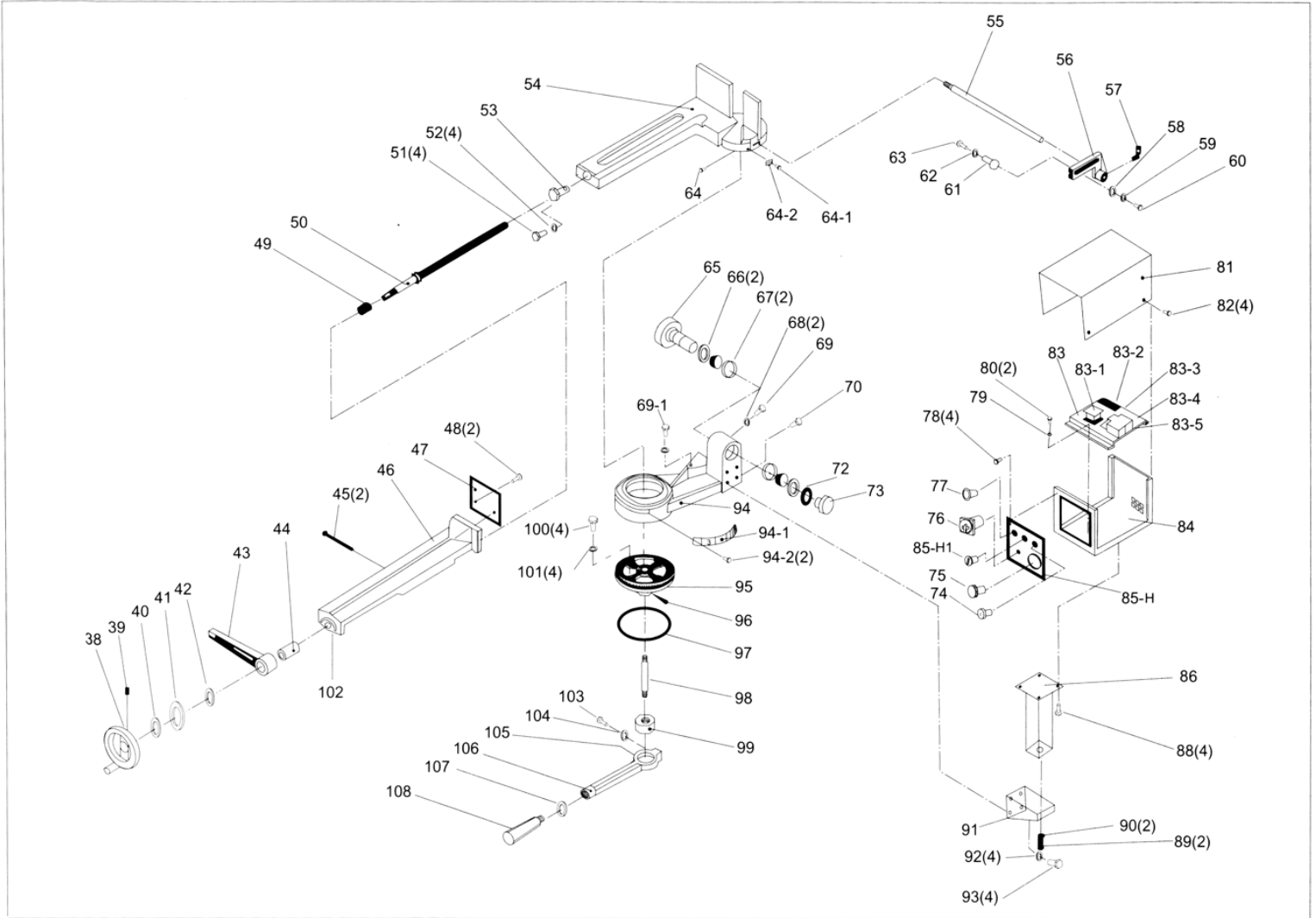
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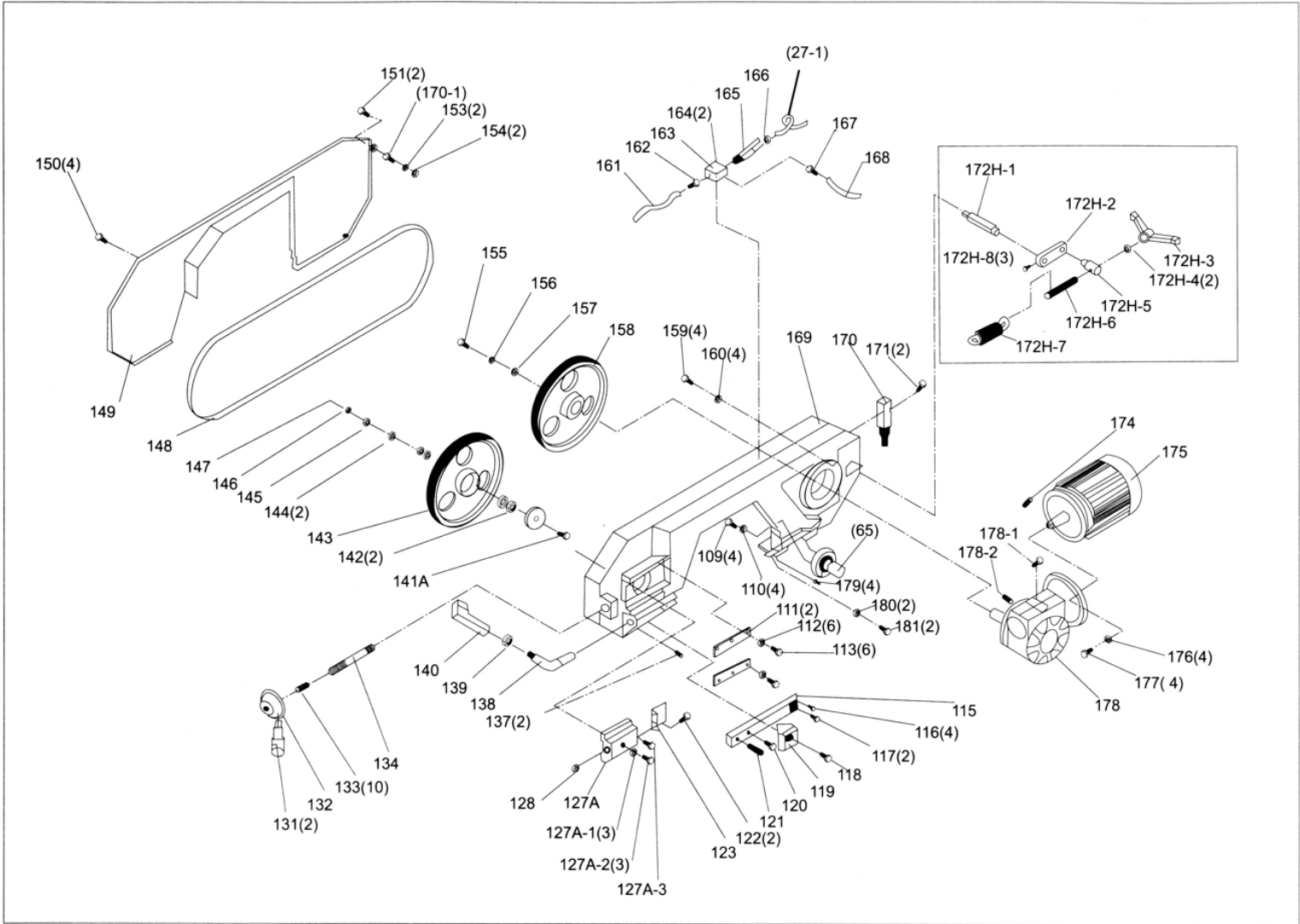
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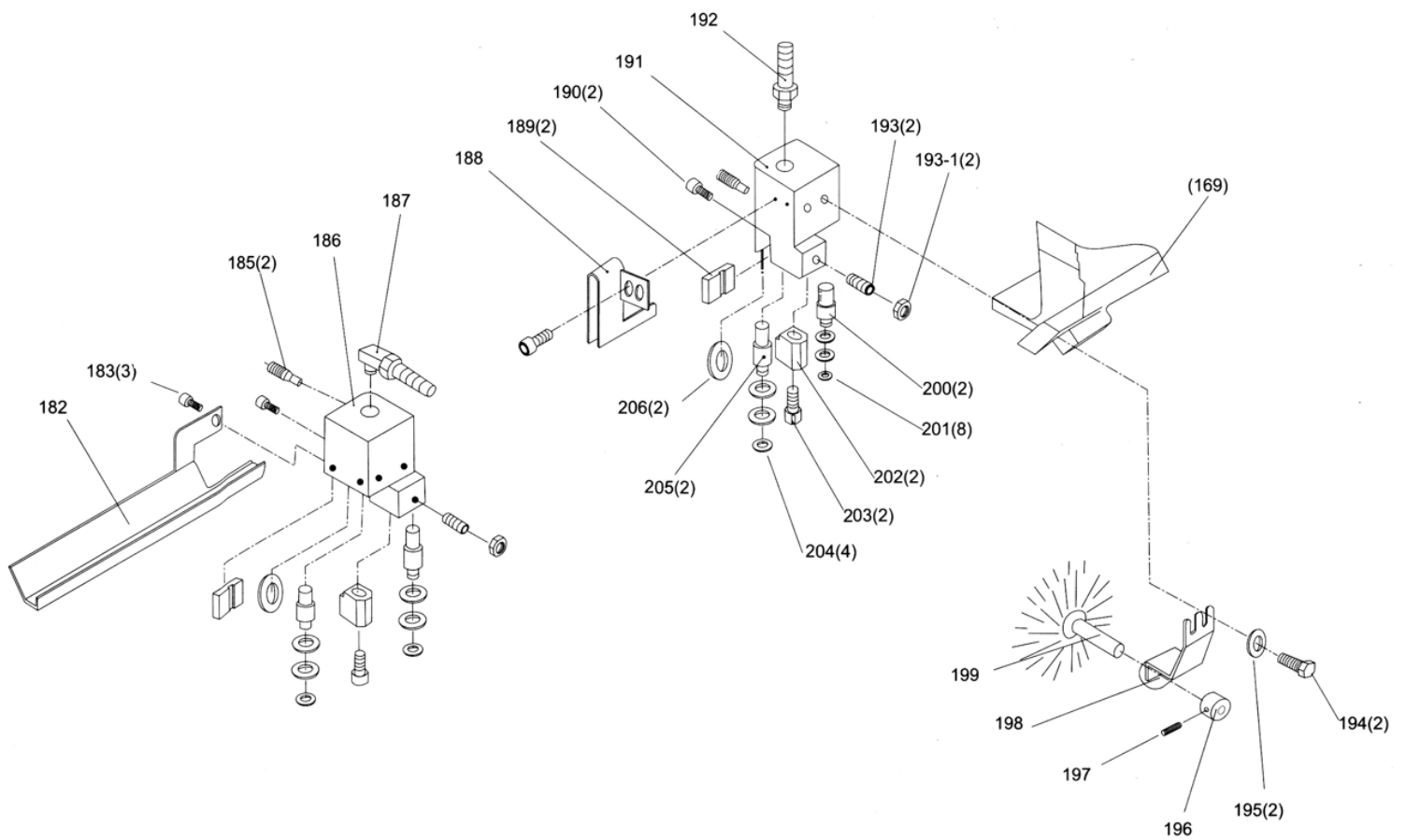
Part No.	Description	Size No.	Q'ty	Part No.	Description	Size No.	Q'ty
101	Spring Washer	M8	4	162	Pipe Fitting	1/4Px5/16	1
102	Set Screw	M8X10	1	163	Pipe Fitting Seat		1
103	Hex.Socket Cap Screw	M10X35	1	164	Hex. Socket Cap Screw	M5Xx30	2
104	Spring Washer	M10	1	165	Coolant Switch	1/4Px5/16	1
105	Set Screw	M10X10	1	166	Hose Clamp		1
106	Locking Lever		1	167	Pipe Fitting	1/4Px5/16	1
107	Nut	M12	1	168	Hose	5/16(40cm)	1
108	Handle		1	169	Saw Arm		1
109	Hex.Socket Cap Screw	M10X30	4	170	Limit Switch	AZD-S11-1A	1
110	Spring Washer	M10	4	170-1	Switch Pin		1
111	Gib		2	171	Hex.Socket Cap Screw	M4x35	2
112	Spring Washer	M8	6	172-H1	Spring Shaft		1
113	Hex. Socket Cap Screw	M8X20	6	172-H2	Adjust Plate		1
115	Front Ball Bearing Bracket		1	172-H3	Handle		1
116	Set Screw	M6X12	4	172-H4	Nut	M16x2.0x8t	2
117	Hex.Socket Cap Screw	M8X25	2	172-H5	Hanger		1
118	Hex.Socket Cap Screw	M12X50	1	172-H6	Lead Screw		1
119	Setting Bracket		1	172-H7	Spring		1
120	Hex.Socket Cap Screw	M6X8	2	172-H8	Set Screw	M8x10	3
121	Plastic Handle		1	174	Key	8x8x35	1
122	Hex. Socket Cap Screw	M6X8	2	175	Motor(1HP)	4/8P(50/400/3)	1
123	Cover Plate		1	176	Spring Washer	M8	4
127A	Slide		1	177	Hex.Cap Bolt	M8x30	4
127A-1	Spring Washer	M10	3	178	Gear Box	70# 1/20A	1
127A-2	Hex. Socket Cap Screw	M10X45	3	178-1	Vent Screw		1
127A-3	Set Screw	M10X16	1	178-2	Key	8x8x35	1
128	Nut	M16X2.0X8t	1	179	Set Screw	M6x12	4
131	Handle		2	180	Spring Washer	M8	2
132	Handle Wheel		1	181	Hex.Socket Cap Screw	M8x25	2
133	Thrust Spring Washer		10	182	Front Blade Guard		1
134	Tension Shaft		1	183	Round Head Screw	M6x8	3
137	Set Screw	M8X30	2	184	Nut	M10	2
138	Rod		1	185	Bolt		2
139	Nut	M16X2.0X8t	1	186	Front Ball Bearing Seat		1
140	Trigger Switch		1	187	Pipe Fitting	1/4Px5/16	1
141A	Shaft		1	188	Rear Blade Guard		1
142	Bell Bearing	#32006ZZ	2	189	Blade Guard(B)		2
143	Idle Flywheel		1	190	Hex.Socket Cap Screw	M6x8	2
144	Anti-Dust Cover	M30	2	191	Rear Ball Bearing Seat		1
145	Star Washer	M30	1	192	Pipe Fitting	1/4PX5/16	1
146	Jam Nut	M30	1	193	Set Screw	M6X20	2
147	Oil Inlet	1/16(1/4x28T)	1	193-1	Nut	M6	2
148	Blade	27x0.9x2455mm	1	194	Hex. Cap Bolt	M6X12	2
149	Blade Cover		1	195	Washer	M6	2
150	Knob Bolt	M6x10	4	196	Brush Set Ring		1
151	Round Head Screw	M4x8	2	197	Set Screw	M5X5	1
153	Spring Washer	M4	2	198	Bracket		1
154	Nut	M4	2	199	Brush	1 1/2 □	1
155	Hex.Cap Bolt	M10X25	1	200	Eccentric Shaft		2
156	Spring Washer	M10	1	201	Ball Bearing	#608ZZ	8
157	Washer		1	202	Blade Guide (A)		2
158	Drive Flywheel		1	203	Hex.Socket Cap Screw	M6X25	2
159	Hex.Socket Cap Screw	M10X40	4	204	E Ring	Ø7	4
160	Spring Washer	M10	4	205	Centric Shaft		2
161	Hose	5/16(100cm)	1	206	Ball Bearing	#608ZZ	2

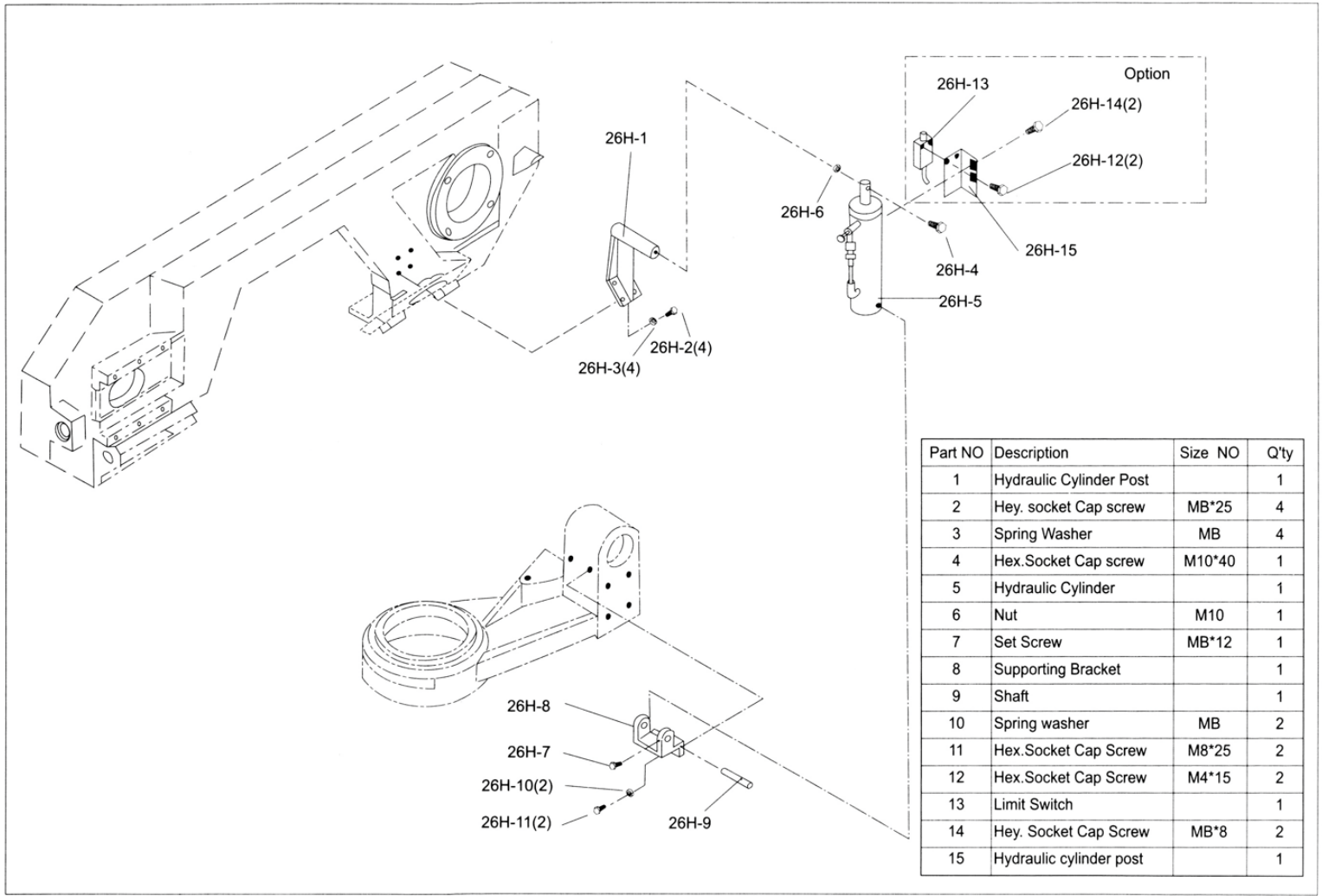
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Part NO	Description	Size NO	Q'ty
1	Hydraulic Cylinder Post		1
2	Hey. socket Cap screw	MB*25	4
3	Spring Washer	MB	4
4	Hex.Socket Cap screw	M10*40	1
5	Hydraulic Cylinder		1
6	Nut	M10	1
7	Set Screw	MB*12	1
8	Supporting Bracket		1
9	Shaft		1
10	Spring washer	MB	2
11	Hex.Socket Cap Screw	M8*25	2
12	Hex.Socket Cap Screw	M4*15	2
13	Limit Switch		1
14	Hey. Socket Cap Screw	MB*8	2
15	Hydraulic cylinder post		1