Semi-Auto BANDSAW

BS-760M

INSTRUCTION MANUAL

TÜV Rheinland Approved

TÜV CERT ISO9001

MEGA MACHINE CO., LTD.

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FOREWORD

We hope that the owner of this heavy-duty bandsawing machine will have years of trouble-free service. The machine has been built to the highest standards to enable fast accurate cutting to be obtained.

In order that the best results can be achieved from your MEGA band saw we would ask all operators and maintenance engineers to READ THIS MANUAL CAREFULLY BEFORE STARTING UP THE MACHINE. The manual contains full instructions on installation, operation, lubrication, maintenance and trouble-shooting.

As MEGA MACHINE COMPANY LIMITED is constantly improving the design of its machines, there may be some instance where this book differs somewhat from the machine with which you are concerned. So, always quote the Serial Number of your machine, when ordering spare parts or in correspondence relating to the machine.

MODEL : BS-760M

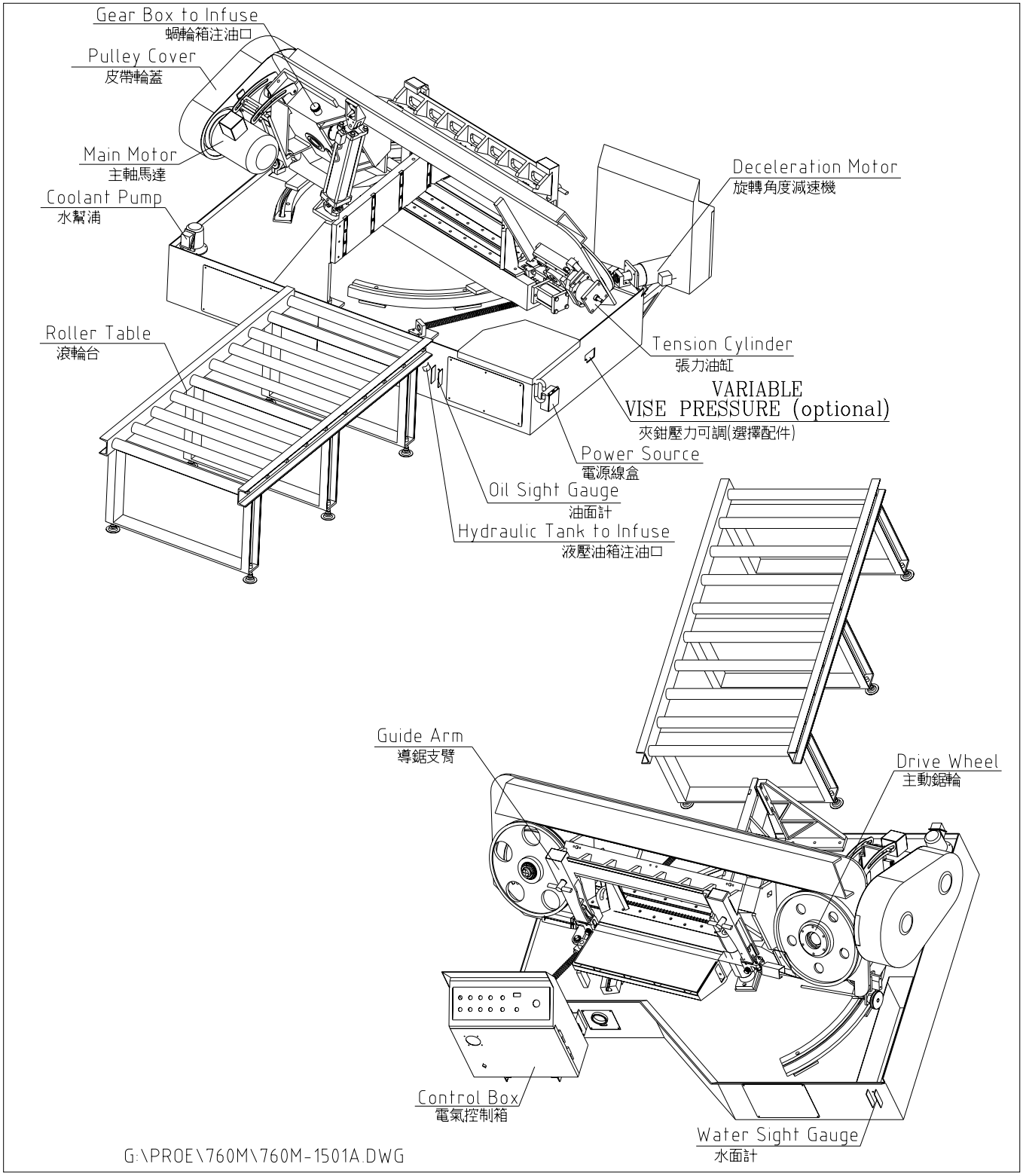
Serial Number :

Request for service and spare parts should be made to :

ADDRESS: NO. 180, INDUSTRIAL ROAD, TAI-PING CITY, 41107 TAICHUNG,
TAIWAN R. O. C.
E-MAIL: mega@ms1.hinet.net; mega@mail.mold.net.tw
http: www.bandsaw.com.tw
TEL: 886 4 22712877(PRES.) FAX:886 4 22715016

1. INTRODUCTORY ILLU1STRATIONS

1.1 Principal Parts



2 SPECIFICATIONS

2.1 SPECIFICATIONS

MODEL PECIFICATION	BS760M
CUTTING CAPACITY AT 90 H BEAMS / PIPES	◯ SOLID 460 MM DIA. □ SOLID 460 SQR. ◎ 460 MM O.D. □ / 760 x 400
MITRE CUTTING AT 60° H BEAMS / PIPES	◯ SOLID 420 MM DIA. □ SOLID 420 MM SQR. ◎ 460 MM DIA. □ / 590 x 400 MM
MITRE CUTTING AT 45° H BEAMS / PIPES	◯ SOLID 330 MM DIA. □ SOLID 330 MM SQR. ◎ 460 MM DIA. □ / 500 x 400 MM
MITRE CUTTING AT 30° H BEAMS / PIPES	◯ SOLID 220 MM DIA. □ SOLID 220 MM SQR. ◎ 220 MM DIA □ / 220 x 400 MM
BLADE SIZE	38*1.3*5500 MM 1.5 x .051 x 209 IN
BLADE SPEED	25 - 80 M/MIN (50/60HZ) 25,32,42,55,70,80 MPM 82 - 260 F/MIN (50/60HZ) 82,105,138,180,230,260
MOTOR OUTPUT	BLADE 7.5 HP (5.62 kW) HYD. 2 HP (1.5 kW) CLNT 1/4 HP (0.19 kW)
SHIPPING VOLUMN	2805 x 2300 x 2100 MM
WEIGHT Net/Gross	2600 / 2900 KGS

Specifications subject to change without notice for improvement and modification.

2.2 STANDARD ACCESSORIES

1. Tools with tool box .....……..……..... 1 set
2. Band-cleaning wire brush ...……..…..... 1 pieces
3. Band saw blade .....……..…..... 1 piece
4. Instruction manual .....…….…..... 1 copy

3. INSTALLATION:

3.1 Moving and lifting:

Unpack your machine carefully, and use a crane or forklift to set it in position. If a crane is used to lift the machine attach the lifting cable carefully to the machine as shown in the fig 2. If forklift is used then fig 3.

Sufficient space should be left around the machine to allow safe handling of materials , and inspection and maintenance operation. Should there be other machinery causing vibration or dust that near your achine ,then precautions must be taken to keep your machine away from of vibration and dust.

(1) Use Crane :

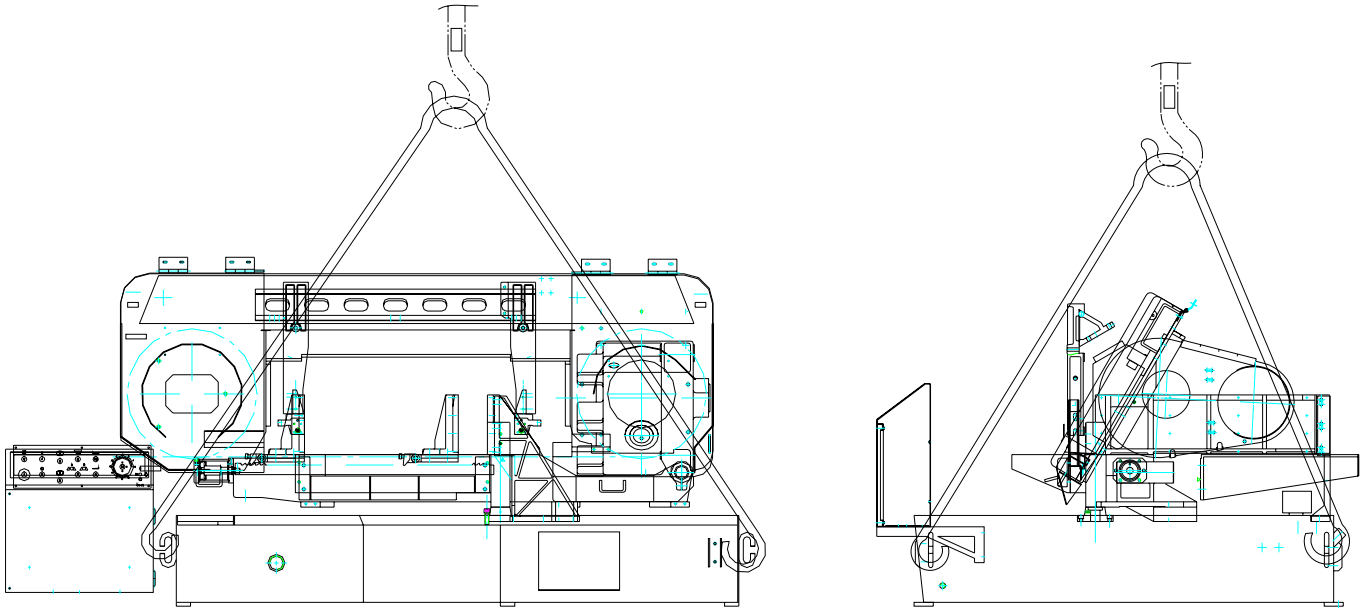


Fig 2

(2) Use Forklift :

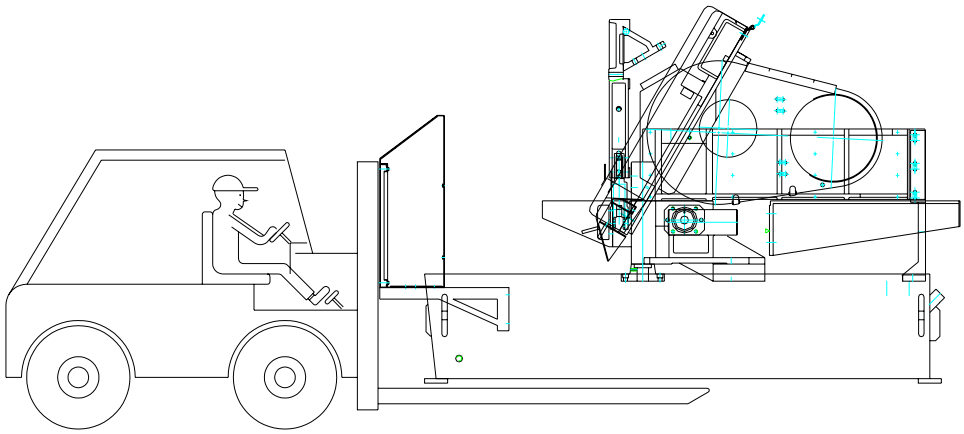
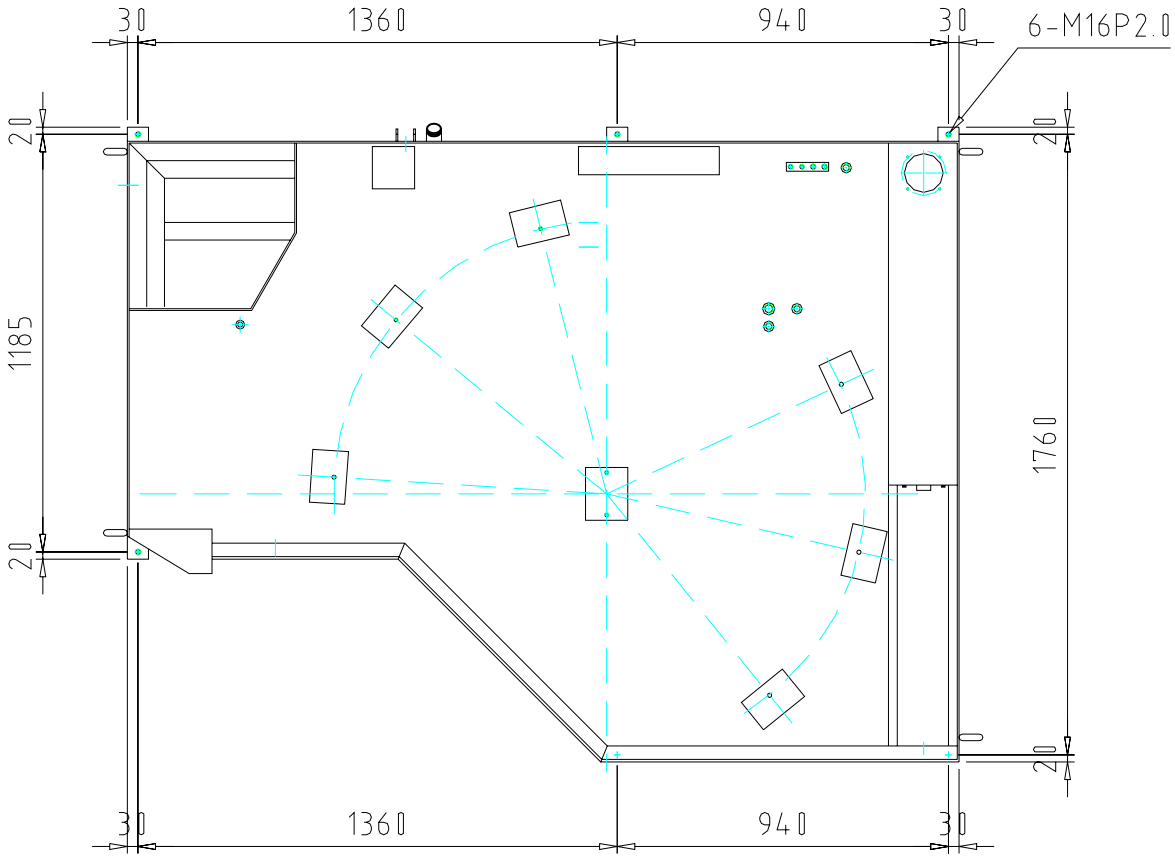


Fig 3

3.2 Foundation layout and set-up:

(1) Foundation:

The foundation should be constructed of reinforced concrete and must be level and flat. After the proper leveling position has been obtained, anchor the machine with anchor bolts. The position of anchor bolts and floor dimensions are shown in fig 4:



□ Contact portion with floor

○ Position of anchor bolts

Fig. 4

※ All leveling bolts should support the weight of the machine evenly .

(2) Leveling:

The production accuracy of all precision machinery depends on the accuracy which the machine is installed . Manufacturing tolerance of the machine can only be guaranteed if the machine is firmly and properly installed . Once the machine is lowered on the prepared foundation . Machinist levels should be Used alternately on the vise slide plates and the work feed table , and adjust the left-and-right and fore-and-aft level of the machine with leveling bolt .

The fore-and-aft level should be adjusted so that the level of the rear end is approximately 10 mm (3/8" - 1/2") higher than the level of the front end , to provide proper return of the cutting fluid , and easy operation of car feeding .

The left-and-right level should be adjusted so that the level of the left end is approximately 3 mm (1/8") higher than the level of the right end , to provide proper return of the cutting fluid , After the proper leveling position has been obtained anchor the machine with anchor bolts .

CAUTION : All leveling bolts should support the weight of the machine evenly .

Leveling as fig 5 below :

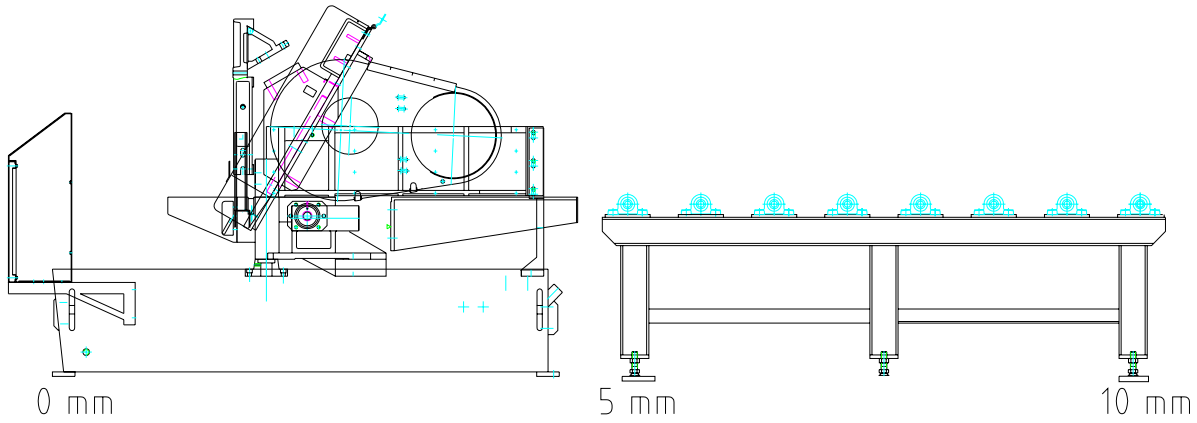


FIG 5

(3) Cleaning and oiling :

After the machine has been placed in position , thoroughly remove its rust preventive coating using a suitable cleaning solvent and then apply a coat of machine oil . To clean the machine, Kerosene is preferable to gasoline . It does not evaporate and level dried slushy compound on finished surfaces. Rags are better than waste as they leave no lint or strings. The machine as received by you. has been completely drained of all oil. Before any attempt is made to run it . Before any motor connections are made .... every detail of the following oiling instruction must be complied with. Refer to the oiling chart in chapter 7. Especially, don't forget to fill up the cutting fluid mixture. Usually, the ratio of cutting fluid to water should be 1:30 - 1:50. Check the sight gauge to ascertain the fluid level in the tank every day. Transmission gear box, bar feed gear box, hydraulic oil tank should to topped up monthly. Oil levels should be strictly observed, for it is of primary importance for proper operation and long lift .

(4) Power Source Connection:

A. Power Source - This machine is equipped with 7.5HP main motor and 2HP hydraulic motor , and 1/8HP Coolant Pump. Connect the power supply cable to the circuit breaker(N.F.B.) terminals. The power supply to your machine should agree with the wring voltage that is indicated on the label attached to the electrical enclosure and main motor.

B. Earth - Be sure to connect the earth cable to the earth terminal.

C. Starting - After making the necessary wiring connections, turn the power switch on the control panel clockwise to turn power on, depress the vise limit switch (if necessary, e.g. if there is no stock bar clamped in the vise) and push the button to see if the saw head moves upward.

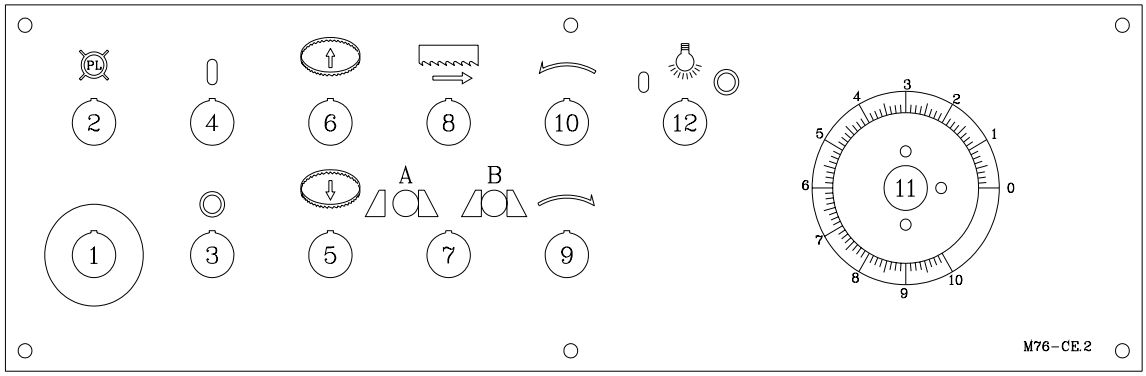
If the saw head does not rise , the hydraulic pump motor is rotating in the wrong direction.

If the motor runs in the wrong direction, turn off the power switch and disconnect the power supply cable, Then interchange any two-phase connections.

Then interchange any two-phase connections.

4. OPERATION

1. Control Panel



(1) Emergency Stop -- This switch is used for emergency case to stop the machine only. Turn this switch clockwise makes power source on. When this switch is pressed, all machine's operation stop immediately.

(2) Pilot Lamp -- This light will comes on when the power supply is on.

(3) Power Switch Off -- This switch is used for turning off the power by depressing it.

(4) Power Switch On -- This switch is used for turning on the power by depressing it.

(5) Quick Approach Button -- While this button is pressed, the saw head descends quickly. This button is used to cause the saw blade to approach the work quickly when the saw blade is at a distance frame the workpiece. When the feeler of the quick approach device comes into contact with the work, the saw head stops descending at that position even this button is still pressed.

(6) Raise Button -- When this button is pressed, the saw blade motor stops and the saw head ascends. The saw head stops ascending at that position when the button is released.

(7) A. Vise Open – Turn Left
B. Vise Clamp – Turn Right

(8) Blade Drive Button

(9) Clockwise angle Control Button

(10) Count Clockwise Angle Control Button

(11) Feed rate counter

(12) Work Beam Light switch

4.2 OPERATING PREPARATION

There are several steps will be taken before start the machine.

(1) CHOOSE PROPER SAW BLADE :

Select the saw blade best suited to the workpiece to be cut, Size and shape of the workpiece , and type of material should all be considered when selecting the saw blade to be used . There is a reference chart in chapter 7 which can help you to select the right saw blade and cutting conditions .

(2) UNPACK THE SAW BLADE :

Usually the saw blade is packed in 3 circle ,unpack it one circle first grip the part to release another 2 circles gradually , tear off the saw-cap protective shield , inspect the blade teeth , make sure that the cutting edge of the blade teeth point to the right . If they point to the left the blade should be turned over.

(3) PLACE THE SAW BLADE ONTO BOTH THE DRIVE AND DRIVEN WHEELS ----

a. Turn the hydraulic blade tension handle clockwise , to fully loosen the driven wheel .

b. Open both the drive and driven wheel covers , place the saw blade onto both the drive and driven wheels. Check the cutting edge of the saw blade , to ensure that it point to the right.

c. Insert the saw blade into both the left and right blade guides so that the back edge of the saw blade touches the back-up roller of each guide .

d. The back edge of the saw blade should make contact with the flange of the drive and driven wheel , turn count -clockwise the hydraulic blade tension handle to tighten the saw blade , Then the blade is properly tensioned .

e. Don't forget to tighten the insert adjusting screw .

(4) WORKPIECE CLAMPING :

a. Raise the saw frame , open the vise , place the workpiece on the roller table .

b. Gently push the workpiece into the roller-feed vise, taking care not hit the feed rollers.

c. Clamp the workpiece in vise.

(5) ADJUST THE BLADE GUIDE ARM :

Properly position the blade guide arms according to the diameter (or the width) of the workpiece to be cut.

a. loosen the insert adjusting screw.

b. loosen the lock lever of the blade guide arm, and manually move the blade guide arm to suit the width of material using the scale provided.

c. After adjusting the blade guide arm position ,tighten the lock lever.

d. Finger tighten the insert adjusting screw.

(6) ADJUST THE POSITION OF THE WIRE BRUSH :

a. loosen the lock lever of the wire brush case.

b. Manually move the wire brush case so that wire brush just contacts the cutting edge of the saw blade.

c. Tighten the lock lever.

(7) ADJUST THE FEED RATE :

Select suitable feed rate for the workpiece to be cut. This varies according to the size and shape of the workpiece, type of material , and what type of saw blade is being used. As a guide hard materials, wide workpiece or structural sections and tubing have to be cut at a slower rate that mild steel bar.

As concerns the saw blade , high speed steel is better than carbon steel, and bi-metal alloy is better than high speed steel. Roughly the ratio of feed speeds could be 1:2:3

(8) SELECT THE SAW BLADE SPEED :

There are 6 speeds provided : 25, 32, 42, 55, 70, 80 M/min

If a optional variable speed drive is equipped the speed to be 20 to 80 M/Min steplessly.

4.3 MANUAL OPERATION :

Place the workpiece to be cut on the work table , decide how long you want the off-cut , and carry out all the procedures as described above in [2] Operating Preparation.

(1) Depress the RAISE button to lift the saw frame until the cutting edge of the saw blade clears the workpiece by 1/2 to 3/4 inch.
(2) Turn the AUTO-MANUAL selector to manual.
(3) Clamp the workpiece.
(4) Adjust the spacing of the blade guide arms.
(5) Preset the required cutting length of the workpiece.
(6) Depress BAR FEED PORWARD button until the workpiece touch the bar stop feeler.
(7) Adjust the FEED RATE.
(8) Depress BLADE DRIVE button to start both the saw blade motor and the cutting fluid pump and the saw frame begins to descend.
(9) After completion of the cut saw blade stops at the lower limit position.
(10) Depress the RAISE button to cut next piece again.

*. Before you start to cut the workpiece, you must inspect that....
*. The workpiece is well clamped.
*. The saw blade is suitable for the material being cut.
*. The feed rate is suitable for the material being cut.
*. The speed of the saw blade is suitable for the material being cut.
*. The insert adjusting screw and the lock lovers of the blade guide arms are all tightened.
*. Sufficient tension is placed on the saw blade.
*. The wire brush is properly positioned.
*. There is sufficient cutting fluid in good condition.
*. The off-cut length is as required.

4.4 SPECIAL OPERATION :

(1) While you are cutting a workpiece, if the saw blade suddenly jams in the workpiece, depress the FRAME RAISE button to lift the saw frame immediately.
(2) The saw blade jamming in the workpiece is most likely because of :
a. Slippage occurring between saw blade and drive wheel. Tension placed on the saw blade is not sufficient.
b. Slippage occurring between drive belt and motor pulley. Tension on drive belt is not sufficient or belt is worn.
c. Broken teeth on saw blade.
d. Too blunt saw blade.
e. Too fine tooth spacing on saw blade for material being cut.
f. Too fast feed rate for material being cut and blade used.

4.5 BREAK-IN OPERATION:

When a new blade is used , be sure to first break in the blade before using it for extended operation.

Failure to break in the blade will shorten the service lift of the blade ,and result in less than optimum

efficiency. To break in the blade ,proceed as follow :

(1) Reduce the blade speed setting to one half of its normal setting .

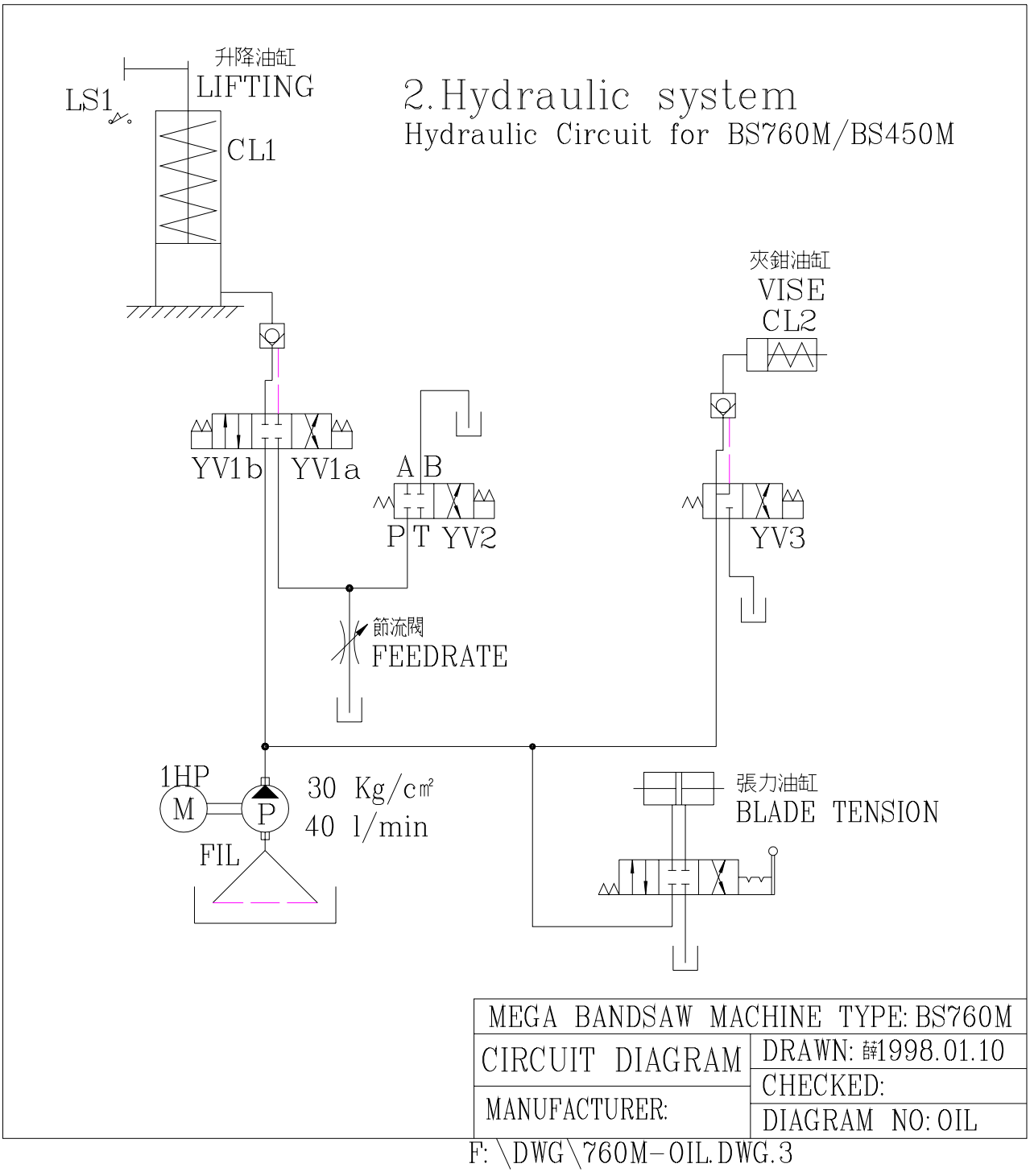
(2) Lengthen the time required for cutting to 2-3 times that of normal.

(3) The break-inoperation can be considered sufficient if all unusual noises or metallic sounds have been eliminated. (For instance, to completely break in the blade, a minimum of five complete cuts of a 200mm (8 ins) diameter work- piece will be required.)

(4) After the break-in operation has been completed, return the blade speed and feed rate to their normal setting.

5.Maintenance

5.1 HYDRAULIC CIRCUIT



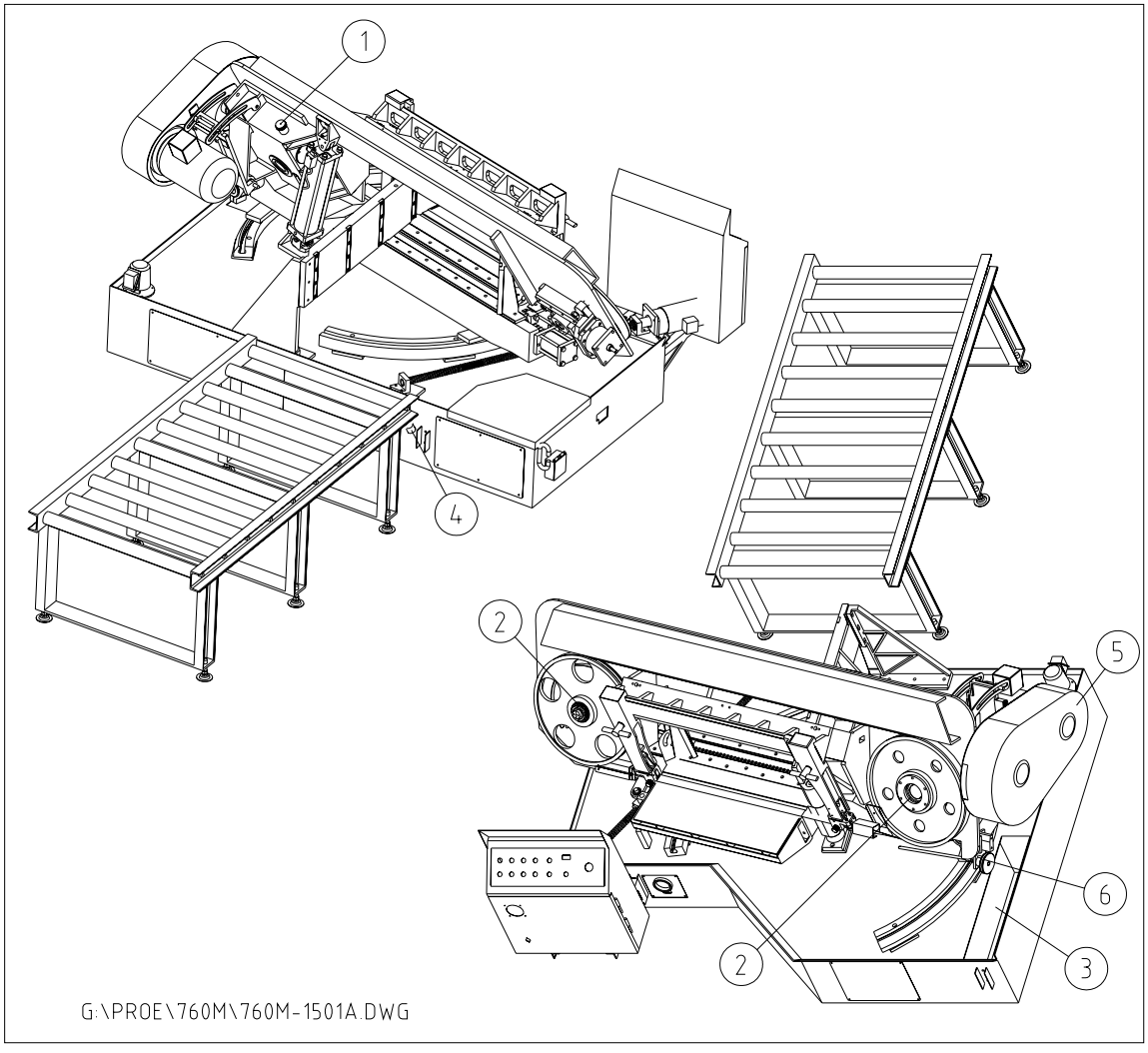
5.2 Oiling and Lubricant

The operator should be responsible for the proper lubrication of the machine. The grade and quality of lubricant are given in the lubrication chart below :

Oil Lubrication chart

	Lubricating Point	Lubricant	Quantity	Oiling Frequency
1.	Transmission Gear Box	DAPHNE GEAR LUBE 320	30 liters	Twice a year
2.	Drive Wheel Bearing Driven Wheel Bearing	Grease	20g 20g	Thrice a year
3.	Cutting Fluid Tank	Cutting Oil Mixture (KH ULTRA COOL EX-2)	65 liters	Daily
4.	Hydraulic Oil Tank	DAPHNE FLUID 32T	55 liter	Twice a year

Belt Size			
	Belt Name	Belt Size	Quantity
5	Motor Belt	50HZ & 60HZ use 3V600 Inverter use 5V600	1
6	Wire Brush Belt	M45	1



5.3 OTHERS

VARIABLES WHICH AFFECT BANDSAW BLADE LIFE

1. The Operator - The operator is the most important variable at any test. He can make or break any test and often has a great deal of influence over whose bandsaw blades are used. He can also be a good source of information on what is going on, competitive situations, relationships with manufacturers or distributors, etc. Don't ignore the operator.

2 . Number of Teeth in the Band - There should always be a minimum of three teeth in the work at all times to avoid straddling. Nine to twelve is the optimum number and anything over 24 is probably too high (although sometimes unavoidable).

3 . Tooth Style - Standard, skip, sabre, Si -Pitch or XL.
The best tooth style for the material being cut should be used.

4 . Tooth Set - Regular, Wavy, E.T.S.,Si - Pitch, Maxi -Sharp. The proper band with the proper set for the material being cut should be used.

5 . Band Tension - Band tension, as measured by Simonds Patented Simometer, is important to the efficient running of a bandsaw blade. Too little tension can cause a blade to "wander" in the cut while too much can actually pull the band apart.

6 . Band Speed - Start with Simonde speed and feed slide chart. Too high a speed can cause too much heat lessening the life of the band. Too low a speed could cause overfeeding. Always reduce the speed when cutting dry.

7 . Break - in Procedure - The normal feed rate should be reduced to about 1/2 for the first 50 square inches or so to hone in the blade. A good example is that of a sharp pencil. You must not bear down hard on it right away or you risk breaking the point. The same holds true for a bandsaw tooth.

8. Feed Rate - Set the feed rate by square inches per minute according to simonds speed and feed slide chart. Watch your chips and adjust accordingly as both overfeeding and underfeeding cut bandsaw life.

9. Band Quality - Carbon steel blades vs. High Speed Blades, M-2 vs. M42, etc. All affect the life you will get from the band. Once again choose the proper type band for the job. There are also differences in quality among manufacturers. Simonds has some of the highest quality standards in the world.

10. Machine Type - Different makes and models with varying horsepower available can affect life. A well made heavy duty machine can greatly enhance band life.

11. Wheels - The Wheels carry the band and it is very important that they be properly aligned and that the bearings be in good shape. Misalign wheels and loose bearings can cause undue stresses on the band and reduce fatigue life. Flanges should also be checked and if extremely worn, the wheel should be replaced. Worn flanges are usually a sign of misalignment or bad bearings.

12. Machine Condition-Whether a machine is old or new, and whether well maintained or not contributes to how well it runs and how long the band last. The better shape a machine is in, the better the bands will run. Poor machines ruin bandsaw blades.

13. Proper Vises - The work must be properly held. Side vises and top vises, if necessary, should be in good shape and able to firmly hold the work. Anything that moves will strip teeth.

14. Guides - The guides must support the band well while in the cut. The guides in conjunction with tension are all that keeps the band straight. Roller guides should be snug against the band and turn freely.

The surface should be flat and not worn at an angle. Solid carbide guides should also be sung against the band and should show no sign of wear. They can be faced off if necessary. Backup guides should not be grooved and should also turn freely if rollers. Be sure the teeth of the band do not ride up into the guides.

15. Guide Arms - The guide arms should be as close to the work as possible. Beam strength is determined by a cubed factor, so increasing the distance between the guides by a factor of 2 decreases the beam strength by a factor of (2)^3 or 8. You lose a lot very quickly.

16. Brushes - A good set of brushes (powered is preferable) aid in the cleaning of chips from the gullets, if available and properly adjusted. One test shows a better than 25% increase in life just by using brushes. Always check the brushes.

17. Coolant - A good coolant will help cool, lubricate and wash the bandsaw blades. Always maintain a good flood of coolant when possible.

18. Material machinability - The tougher the material, the less expected band life. For instance 1018 vs. Inconel 718.

19. Material Hardness - A Rockwell C scale reading of 40 is approaching a machinability of 0. Only recently have we been able to go much beyond this with the introduction of our CT Type III band.

20. Material Shape - Structural and small solids are always harder on a band than large solids.

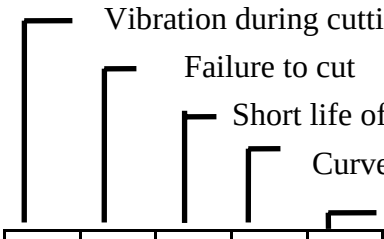
21. Production Requirement - Continuous runs of one size and material is easier than intermittent cutting of various sizes, shapes and materials.

22. Room Temperature - Temperature has a big effect on the hydraulic system of a machine. Always allow the machine to warm up before staring to saw.

6. TROUBLE SHOOTING GUIDE

The following charts contains some typical troubles along with the probable causes and remedies for each.

6.1 Sawing Problems and Solution



Vibration during cutting	Failure to cut	Short life of saw blade	Curved cutting	Broken blade		
○	○	○	○	○	Use of blade with incorrect pitch	Use blade with correct pitch, suited to workpiece
○	○	○	○	○	Failure to break-in saw blade	Perform break-in operation
○	○	○			Excessive saw blade speed	Reduce speed
			○	○	Insufficient saw blade speed	Increase speed
○		○	○	○	Excessive load	Reduce feed rate
○		○	○		Insufficient load	Increase feed rate
		○	○		Insufficient saw blade tension	Increase tension
○		○	○	○	Wire brush not working correctly	Relocate or replace
○		○	○		Blade improperly guided by insert	Check and correct
○	○	○	○	○	Improperly clamped workpiece	Check and correct
	○	○	○		Excessively hard material surface	Soften material surface
		○	○	○	Excessive cutting rate	Reduce cutting rate
	○	○			Non-annealed workpiece	Replace with suitable workpiece
○		○	○	○	Insufficient or lean cutting fluid	Add fluid or replace
○		○	○	○	Vibration near machine	Relocate machine
		○	○		Non-water soluble cutting fluid used	Replace
○		○	○		Air in lift cylinder	Bleed air
		○		○	Broken back-up roller	Replace
○	○	○	○	○	Use of non-specified saw blade	Replace
○	○	○	○	○	Fluctuation of line voltage	Stabilize
○		○	○		Adjustable blade guide arm too far from workpiece	Bring blade guide arm close to workpiece
		○	○	○	Loose blade guide	Tighten
		○		○	Blue or purple saw chips	Reduce cutting rate
○		○		○	Accumulation of chips at inserts	Clean
		○			Reverse positioning of blade on machine	Re-install
○		○	○		Workpiece not bundled properly	Re-bundle
○		○		○	Back edge of blade too hard against flange	Adjust wheel so that blade is just firmly against flange
○	○	○			Workpiece of insufficient dia.	Use other machine, suited for diameter of workpiece
	○	○	○		Saw blade teeth worn	Replace

6.2 Minor Operating Troubles and Remedies

Symptom	Probable Cause	Remedy
1. Buttons do not function	(1) Power disconnected (2) Circuit protector OFF (3) Thermal relay activated (4) Safety interlocks that is a. No workpiece is clamped in the vice. b. The saw frame is not fully raised to the height preset. c. The saw frame is raised too high so that the upper limit switch has been touched	(1) Connect (2) Turn on (3)Push reset button a. Load workpiece b. Depress FRAME RAISE button c. Depress QUICK APPROACH switch
2. The saw frame descends out of sequence	(1) Solenoid valve blocked. (2) Piping leakage (3)Packings , O-Rings of cylinder worn or torn	(1) Disassemble the valve and clean thoroughly. (2) Inspect hydraulic piping (3) Replace
3. Short service life of wire brush	(1) Wire brush too heavily in contact with saw blade.	(1) Re-position the wire brush.
4. Bubbles out of fluid taps	(1) The cutting fluid is not sufficient (2) The filter clogged by swarf	(1) fill up take. (2) Clean the tank and filter.

7. REFERENCE CHARTS

7.1 Standard Cutting Chart

Material JIS code	Blade Pitch TPI	Blade Speed m/min	Cutting Rate Sq c ㎡/min	Service Life Sq c ㎡/PCE
S20C-S50C	3M	80	50-70	42000-58000
S9CK-S15C	3M	80	42-60	38500-54000
S53C-S58C	3M	68	42-60	35000-58000
SS-50	3M	80	42-60	38500-58000
SS-41	3M	68	40-55	35000-54000
SM-50	3M	80	40-55	35000-54000
SCM-3	3M	68	45-60	31000-54000
SCR-3.4	3M	54	40-50	30000-50000
SNC-22	3M	54	35-45	28000-50000
SNC-1	3M	54	40-50	31000-50000
SNCM-22	3M	54	35-45	27000-50000
SK-4	3M	54	30-40	26000-50000
SUL-2	3M	40	25-35	26000-44000
SKS-5	3M	54	25-35	25000-42000
SKH-2	3M	27.40	25-35	19000-31000
SUH-33	3M	27.40	25-35	16000-23000
SKD-61	3M	27	15-25	15000-23000
SKD-1	3M	27	8-20	10000-20000
SUS-27	3M	27.40	8-20	10000-20000
SUS-32	3M	27.40	8-20	10000-20000

NOTE:

(1) All conditions described above are based on the use of high speed steel saw blade.

(2) The workpiece is 150 mm round and solid, normalized heat treatment, and there are no hard spots in the material.

(3) The cutting surface concave or convex by 1.0mm is permitted.

(4) The indicated service life of a saw blade stated is based on an average value spread over results from 10 saw blades.

(5) The selection of a correct blade for any one type and size of material being sawn is largely dependent upon trial and error until the desired conditions are fulfilled, i.e. finish cutting time ,blade life, etc. However these charts are offered here for the guidance of users so that these conditions may be obtained.

7.2 Standard Cutting Chart

Material AISI code No.	Brinell hardness Bhn	Blade speed fpm	Cutting rate Sq in/min
1108-1111	150-175	220-260	9.0-12.0
1112-1118	125-150	240-270	10.0-14.0
1115-1132	140-165	220-260	9.0-12.0
1137-1151	155-180	180-200	5.0- 8.5
1212-1213	150-175	240-270	10.0-14.0
1008-1013	150-175	220-260	7.0- 9.0
1015-1035	160-175	240-270	8.0-12.0
1040-1064	160-180	180-210	6.0- 9.0
1065-1095	180-205	120-140	5.0- 6.5
1320-1330	200-220	140-180	5.0- 7.0
1335-1345	200-220	140-180	5.0- 6.5
2317-	180-190	150-190	5.0- 6.0
2330-2345	180-220	130-170	4.0- 5.0
2512-2517	200-220	120-160	3.5- 4.5
3115-3130	180-220	150-190	5.0- 7.0
3135-3150	190-230	120-160	4.5- 5.5
3310-3315	200-230	130-170	3.5- 4.5
4017-4024	170-190	180-230	4.5- 5.5
4027-4042	180-220	180-220	4.5- 5.5
4047-4068	190-210	170-200	3.5- 4.5
4130-4140	190-215	180-220	4.5- 6.0
4142-4150	200-230	130-180	3.5- 4.5
4317-4320	200-225	170-210	4.0- 5.0
4337-4340	230-250	130-180	3.5- 4.5
4608-4621	190-210	180-210	4.0- 5.0
4640	190-230	130-170	3.5- 4.5
4812-4820	220-240	130-170	3.0- 4.0
5045-5046	170-190	180-220	4.0- 5.5
5120-5135	180-200	150-190	4.0- 5.0
5140-5160	200-220	160-200	4.0- 5.0
50100-52100	210-230	80-110	3.0- 4.0
6117-6120	180-210	130-170	4.0- 5.0
6145-6152	180-210	130-170	3.5- 4.5
8615-8627	160-190	130-180	3.5- 4.5
8630-8645	190-220	130-180	3.5- 4.5
8647-8660	190-220	120-160	3.0- 4.0
8715-8750	180-215	140-180	3.5- 4.5
9255-9260	150-180	120-160	2.5- 3.5
9261-9262	200-230	110-150	1.5- 2.5
9310-9317	210-240	110-150	1.5- 2.5
9437-9445	175-200	150-190	3.5-4.5
9747-9763	180-220	130-180	2.5-3.5
9840-9850	210-250	130-180	3.5-4.5

7.3 Standard Cutting Chart

Material AISI code No.	Brinell hardness Bhn	blade peed fpm	Cutting ate sq in/min
Stainless Steels			
302,304	130-170	80-90	2-3
303,303F	150-200	90-100	3-4
308,309,310	160-220	60-80	1-2
314,317,330	160-220	50-80	1-2
316,420	160-220	70-80	2-3
321,347	165-200	90-100	2-3
410,420F	140-185	100-110	2-3
416,430F	155-195	140-150	4-6
430,446	170-215	60-80	2-3
440,A,B,C,	160-190	70-80	2-3
440F,443	175-215	90-100	2-3
High-speed Tool Steels			
T-1,T-2	217-248	80-90	2.0-3.0
T-4,T-5	235-255	75-85	1.0-2.0
T-6,T-8	220-293	60-80	1.0-2.0
T-15	228-255	50-80	1.0-2.0
M-1	217-228	100-120	3.0-4.0
M-2,M-3	217-241	75-85	2.0-3.0
M-10	217-228	60-80	1.0-2.0
Tool Steel (Air, Oil, And Water Hardening)			
A-2	217-241	140-170	2.0-3.0
D-2,D-3	217-241	75-85	2.0-3.0
D-7	228-255	60-80	1.0-2.0
O-1,O-2	187-207	140-170	4.0-5.0
O-6	207-228	140-160	5.0-6.0
W-1 special	156-187	170-190	3.0-4.0
W-1 extra	156-196	170-190	3.0-4.0
W-1 regular	156-196	170-190	3.0-4.0
H-12,H-13,H-21	205-228	140-160	3.0-4.0
H-22,H-24	217-241	100-120	2.0-3.0
S-1	177-212	150-170	3.0-4.0
S-2,S-5	173-228	80-100	2.0-3.0
L-6	190-230	150-170	4.0-5.0
L-7	180-230	110-130	3.0-4.0

NOTE: (1) All conditions described above in chart 2 and 3 are based on the use of Electron Weld Bimetal Blade. 4/3 T.P.I.

(2) The workpiece is 6 inch round and solid ,normalized heat treatment ,and there are no hard spots in the material.

(3) The cutting surface concave or convex by 1.0mm is permitted.

(4) For production Band and Super Electron Weld ,speed may usually be increase up to 10% .

(5) Decrease speeds by 50% for NEO_TYPE and CARBON Bands.

(6) As a guide that "The larger workpiece (compare to the 6 inch),the slower blade speed."