H2642

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THANK YOU,

On behalf of everyone at HYD·MECH Group Limited, we would like to thank and congratulate you on your decision to purchase a HYD·MECH bandsaw.

Your new machine is now ready to play a key role in increasing the efficiency of your operation, helping you to reduce cost while boosting quality and productivity.

To ensure you are maximizing the power and versatility of your new HYD·MECH bandsaw, please take the time to familiarize yourself and your employees with the correct operation and maintenance procedures as outlined in this manual. Please keep this instruction manual for future reference in a known location and easily accessible to all users of the device.

HYD·MECH offers a great variety of options, components, and features for its various models. Therefore, some of the equipment described in this manual (various illustrations and drawings) may not be applicable to your particular machine.

The information and specifications provided in this manual were accurate at the time of printing. HYD·MECH reserves the right to discontinue or change specifications or design at any time without notice and without incurring any obligation.

Thank you.

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SECTION 0 - SAFETY INSTRUCTIONS

SUMMARY

All persons operating this machine must have read and understood all of the following sections of this Manual:

Section 0 SAFETY
Section 2 OPERATING INSTRUCTIONS

However, as a memory aid, the following is a summary of the Safety Section.

Put Safety First

Mandatory Information – What operators and maintenance people must have read and understood.

Signatures – Everyone involved with this machine must sign to confirm they have read and understood mandatory information.

Basic Rules – only use this machine when

- It is in good working order.
- All safety equipment is in place and functional.
- Operations are in compliance with this manual.
- Materials are within designed specifications and are non-hazardous.

Owner is responsible to

- Keep Manual accessible at the machine.
- Ensure only reliable, fully trained personnel work with the machine.
- Clearly define responsibilities of all personnel working with the machine.
- Keep the machine in good working order.

Operator and Maintenance Personnel are responsible to:

- Keep all safety equipment in order, check its function at the beginning of each shift, and report any shortcomings.
- Shut down machine and report any faults or malfunctions that could impair safety.
- Understand and obey safety hazard labels.
- Not to wear un-restrained long hair, loose clothing or jewellery.
- Wear all required personal protective equipment.
- Not to wear gloves within 24 inches of moving blade.
- Maintain a clean working area and machine.
- Always use Lock-out when performing maintenance or repairs.

FOREWORD

Put Safety First!

This Safety Section contains important information to help you work safely with your machine and describes the dangers inherent to bandsaws. Some of these dangers are obvious, while others are less evident.

It really is important to PUT SAFETY FIRST. Make it a habit to consider the hazards associated with any action BEFORE you do it. If you feel any uncertainty, stop and find a safer approach to the action. If you're still uncertain, ask for advice from your supervisor.

The SAFETY FIRST approach is particularly necessary when you do something new, or different, and most people instinctively recognize this, although impatience may still cause them to take unnecessary risks.

Danger also lurks in the routine task that we have done over and over. Here, familiarity, boredom, or tiredness may lull us into unthinking, automatic repetition. Be alert for this, and when you feel it happening, stop and take stock of your situation. Review the safety hazards associated with what you are doing. That should get your brain working again.

Certainly production is important, but if you think you're too busy to put safety first, think how much production you'll lose if you get hurt.

You owe it to yourself, your family, and your co-workers to PUT SAFETY FIRST.

Mandatory Information

All persons operating this machine must have read and understood all of the following sections of this Manual:

Section 0 SAFETY

Section 2 OPERATING INSTRUCTIONS

Personnel involved in installation and maintenance of the machine must have read and understood all sections of the manual

Persons who have difficulty reading, or for whom English is not their first language, must receive particularly thorough instruction.

Signatures

Everyone involved in operation of this machine must sign below to confirm that:

I have read and understood all parts of Section 0 – Safety, and Section 2 – Operating Instructions.

Name	Date	Signature

Everyone involved in the installation, inspection, maintenance, and repair of this machine must sign below to confirm that:

I have read and understood all parts of this Operation and Maintenance Manual.

Name	Date	Signature

BASIC RULES

Intended Use

Our machines are designed and built in line with the state of the art, and specifically in accordance with American National Standards Institute Standard B11.10 *Safety Requirements for Metal Sawing Machines.* However, all machines may endanger the safety of their users and/or third parties, and be damaged, or damage other property, if they are operated incorrectly, used beyond their specified capacity, or for purposes other than those specified in this Manual.

Exclusion of Misuse

Misuse includes, for example:

Sawing hazardous materials such as magnesium or lead.

Sawing work pieces which exceed the maximum workload appearing in the Specifications.

Operating the machine without all original safety equipment and guards.

Liability

The machine may only be operated:

When it is in good working order, and

When the operator has read and understood the Safety and Operating Instructions Sections of the Manual, and

When all operations and procedures are in compliance with this Manual.

Hyd-Mech Group cannot accept any liability for personal injury or property damage due to operator errors or non-compliance with the Safety and Operating Instructions contained in this Manual.

RESPONSIBILITIES OF THE OWNER

Organization of work

This Operation and Maintenance Manual must always be kept near the machine so that it is accessible to all concerned.

The general, statutory and other legal regulations on accident prevention and environmental protection must also be observed, in addition to the Manual material. The operators and maintenance personnel must be instructed accordingly. This obligation also includes the handling of dangerous substances and the provision and use of personal protective equipment.

Choice and qualification of personnel

Ensure that work on the machine is only carried out by reliable persons who have been appropriately trained for such work.

Training

Everyone working on or with the machine must be duly trained with regard to the correct use of the machine, the correct use of safety equipment, the foreseeable dangers that may arise during operation of the machine, and the safety precautions to be taken.

In addition, the personnel must be instructed to check all safety devices at regular intervals.

Define responsibilities

Clearly define exactly who is responsible for operating, setting-up, servicing and repairing the machine.

Define the responsibilities of the machine operator and authorize him to refuse any instructions by third parties if they run contrary to the machine's safety.

Persons being trained on the machine may only work on or with the machine under the constant supervision of an experienced operator. Observe the minimum age limits required by law.

Condition of Machine and Workplace

Ensure that the machine and its safety equipment are kept in good working order.

Ensure that the work area is well lit, and protected from the elements, such as rain, snow, abrasive dust, and extremes of temperature.

Ensure that the machine is installed with sufficient clearance around it for the safe loading and unloading of work pieces.

RESPONSIBILITIES OF THE OPERATOR AND MAINTENANCE PERSONNEL

Safety equipment

All machines are delivered with safety equipment that must not be removed or bypassed during operation.

The correct functioning of safety equipment on the machine must be checked:

- At the start of every shift.
- After maintenance and repair work
- When starting for the first time, and after prolonged shutdowns

Emergency Stop Button (E-Stops)

Always be aware of the location of the Emergency Stop Button(s). Do not allow material or objects to block your access to an Emergency Stop.

Damage

If any changes capable of impairing safety are observed in the machine or its operation, such as damage, malfunctions, or irregularities, then appropriate steps must be taken immediately, the machine switched off, locked-out, and the fault reported to the responsible person.

Safe operation

The machine may only be operated when in good working order and when all protective equipment is in place and operational.

Keep a safe distance from all moving parts – especially the blade and vises.

Stock should not be loaded onto the saw if the blade is running.

Long and heavy stock should always be properly supported in front of and behind the saw.

Faults

The machine must be switched off and locked-out before starting to remedy any faults.

Safety hazard labels

Safety hazard labels and other instructional labels on the machine must be observed. They must be clearly visible and legible at all times. If they become damaged they must be replaced.

Clothing, jewellery, protective equipment

Personnel operating or working on the machine must not wear un-restrained long hair, loose-fitting clothes and dangling jewellery.

When operating or working on the machine, always wear suitable, officially tested personal protective equipment such as safety glasses and safety boots and any other equipment required by plant regulations.

Gloves

Experience has shown that careless use of gloves around machinery is a major factor in serious hand injuries.

Gloves should not be worn when operating or adjusting the machine, except:

Wear protective gloves when handling bandsaw blades at blade changes.

Gloves may be worn when handling work pieces, only if the machine is in Manual Mode and the bandsaw blade is not running.

If the machine is running in Auto Mode, and only if the cut parts are greater than 24 inches long, it may be possible to safely wear gloves for handling the cut parts, but the wearer of the gloves must never put his hands near the blade for any reason. If the cut parts are less than 24 inches long, it is required to arrange their automatic flow into a parts bucket or other suitable arrangement to avoid the necessity to pick them off the machine by hand.

Hearing protection

Ear protection must be worn whenever necessary.

The level and duration of noise emission requiring hearing protection depends upon the national regulations in the country in which the machine is being used.

The actual level of noise emission by band sawing machines depends upon work piece size, shape and material, blade type, blade speed and feed rate.

The only practical course of action is to measure the actual noise emission levels for the type of work that is typically done. With reference to national standards, decide upon the necessary hearing protection required.

In the absence of such measurements, it is advisable for anyone exposed to long periods of moderate to loud noise to wear hearing protection. It is important to understand that hearing loss is gradual and easily goes un-noticed until it is serious and irreversible.

Workplace

A clear working area without any obstructions is essential for safe operation of the machine. The floor must be level and clean, without any build-up of chips, off-cuts, coolant, or hydraulic oil.

The workplace must be well lit, and protected from the elements, such as rain, snow, abrasive dust, and extremes of temperature

Nothing may ever be placed on, or leaned against the machine, with the obvious exception of the work piece on the table and conveyor of the machine.

Master Disconnect

Lock-out the machine before undertaking any maintenance or repair work on it. ‘Lock-out’ refers switching off the master electrical disconnect switch, and locking it out so that it cannot be switched on again without authorization.

On Hyd-Mech machines the Master Disconnect Switch will be of one of four types:

- Rotary switch mounted in electrical control cabinet door and inter-locked with door.
- Rotary switch mounted on the side of the operator interface console.
- Lever switch mounted in separate box mounted on the machine.
- Supply disconnect switch supplied by user at installation and usually wall-mounted within sight of the machine, depending upon local regulations.

In almost all jurisdictions, it is required that owners of industrial equipment establish and post lock-out procedures. Know and use the lock-out procedures of your company or organization.

Residual Risks

The machine is still not completely de-energized if an electrical cabinet door type switch is locked-out.

The line side of the disconnect switch itself remains energized.

Variable speed blade drives store dangerous voltage in their capacitors, and this requires time to dissipate. After locking out power, wait 3 minutes before beginning to work on machine electrical circuits.

If compressed air is supplied to the machine to power a mist lubrication system or other devices, it should be disconnected, and any stored air pressure released before working on the machine.

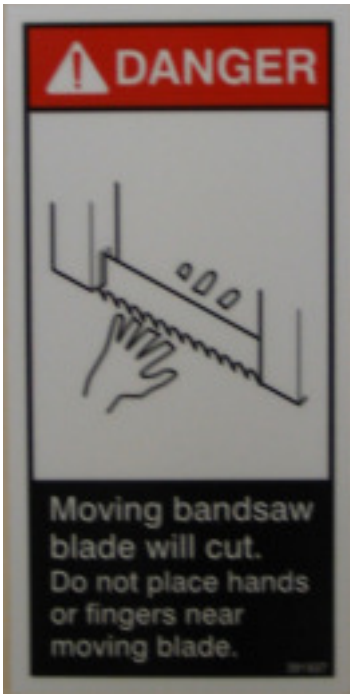
The weight of individual machine components represents stored potential energy that can be released if they fall when disconnected. Secure these components with adequate hoisting gear before disassembly.

SAFETY HAZARD LABELS

The safety hazard labels attached to your machine represent important safety information to help you avoid personal injury or death.
All supervisors, operators, and maintenance personnel must locate and understand the safety information associated with each hazard label prior to operating or servicing the machine.
The safety hazard labels shown below are located at various positions on the machine to indicate possible safety hazards. The location and re-order part number of all the safety labels associated with this particular model of bandsaw are indicated at the end of this section of the manual. It is important to replace any safety hazard label that becomes damaged or illegible.

HAZARDOUS VOLTAGE INSIDE

Contact with high voltage may cause death or serious injury. Never perform maintenance on, or near, electrical components until the machine’s electrical power source has been disconnected. Lock-out power in accordance with your company’s lock-out procedures before any such maintenance. The “Stop” or “Emergency Stop” push button does not disconnect the machine’s power supply. Hazardous voltage is still present in the machines electrical circuits.
The machine’s Electrical Disconnect Switch does disconnect voltage from the machine’s circuits; however hazardous voltage is still present inside the main electrical cabinet, on the infeed (line) side of the main fuses. Therefore keep hands and tools away from the infeed side of the control panel main fuses. If these fuses need to be replaced, use a fuse puller.
Allow three minutes after locking-out power before opening any electrical enclosures. Your machine may be equipped with a variable frequency drive that stores high voltage within its capacitors. Three minutes will allow sufficient time for this voltage to safely discharge.
Never spray coolant directly at electrical components or cabinets.



MOVING BANDSAW BLADE WILL CUT

Do NOT operate with guard removed.
Do NOT place hands or fingers near moving bandsaw blade.
For blade changing, always follow the proper Blade Changing Procedure, as given in Section 3 of this manual.

PINCH POINT

Machine parts may move without warning, either because the machine is operating automatically, or because another person initiates the motion. Keep hands clear of all labelled pinch points, whenever the machine is running. Machine vises can exert great force and cause severe injury. Keep hands clear of vises and work piece when vises are opened or closed. Be aware that vise closing or opening may result in potentially dangerous work piece movement. Be aware also that the opening motion of a vise may create potential pinch points.

MOVING PARTS CAN CRUSH AND CUT

Keep hands clear of chip auger. Lock-out power in accordance with your company's lock-out procedures before attempting to clear a jam in the chip auger.
Be aware that the chip auger may start unexpectedly, either because the machine is operating automatically, or because another person initiates the motion.
If the chip auger is stalled because of a jam, it may start without warning when the jam is cleared, unless the machine power is locked out.

Item N0. 391938

Item No 391335

Item N0. 391937

Item N0. 391340

SECTION 1 – INSTALLATION

Upon delivery of your new H-26/42 saw, it is imperative that a thorough inspection be undertaken to check for any damage that could have been sustained during shipping. Special attention should be paid to the electrical and hydraulic systems to check for damaged cords, hoses and fluid leaks. In the event of damage caused during shipping, contact your carrier to file a damage claim.

SAFETY PRECAUTIONS

The H-26/42 has been designed to give years of reliable service. It is essential that operators be alerted to the safe operation of this saw and the practices to avoid that could lead to injury. The following safety rules are at the minimum necessary for the safe installation, operation, and maintenance of the saw. Take every precaution for the protection of operators and maintenance personnel.

- POWER HOOK-UPS AND REPAIRS SHOULD ONLY BE ATTEMPTED BY QUALIFIED TRADESMEN.
- THE SAW SHOULD BE LOCATED IN AN AREA WITH SUFFICIENT ROOM TO SAFELY LOAD STOCK INTO THE SAW. SECURE THE SAW TO THE FLOOR.
- THE AREA AROUND THE SAW SHOULD BE MAINTAINED IN A CLEAN AND TIDY CONDITION TO AVOID OBSTACLES OPERATORS COULD TRIP OVER.
- THE H-26/42 SHOULD ONLY BE OPERATED ACCORDING TO THE SPECIFICATIONS OF THE SAW. AVOID UNSAFE USAGE PRACTICES.
- IF AT ANY TIME THE SAW DOES NOT APPEAR TO BE OPERATING PROPERLY IT SHOULD BE STOPPED IMMEDIATELY AND REPAIRED.

OPERATOR :

- THE SAW SHOULD NEVER BE OPERATED UNLESS ALL GUARDS AND DOORS ARE IN PLACE AND CLOSED.
- KEEP A SAFE DISTANCE FROM ALL MOVING PARTS - ESPECIALLY THE BLADE AND VISES.
- LOOSE CLOTHING AND GLOVES SHOULD NEVER BE WORN WHILE OPERATING THE SAW. COVER LONG HAIR.
- STOCK SHOULD NOT BE LOADED ONTO THE SAW IF THE BLADE IS RUNNING.
- LONG AND HEAVY STOCK SHOULD ALWAYS BE PROPERLY SUPPORTED IN FRONT OF AND BEHIND THE SAW.
- NEVER ATTEMPT TO DISLODGE OR MOVE STOCK WHILE THE BLADE IS MOVING. TAKE THE TIME TO STOP THE SAW BLADE, REMOVE OBSTRUCTIONS, AND START THE BLADE.
- MUST WEAR EYE PROTECTION.
- MAINTAIN PROPER ADJUSTMENT OF BLADE TENSION, BLADE GUIDES, AND BEARINGS
- HOLD WORKPIECE FIRMLY AGAINST TABLE.
- DO NOT REMOVE JAMMED CUTOFF PIECES UNTIL BLADE HAS STOPPED.

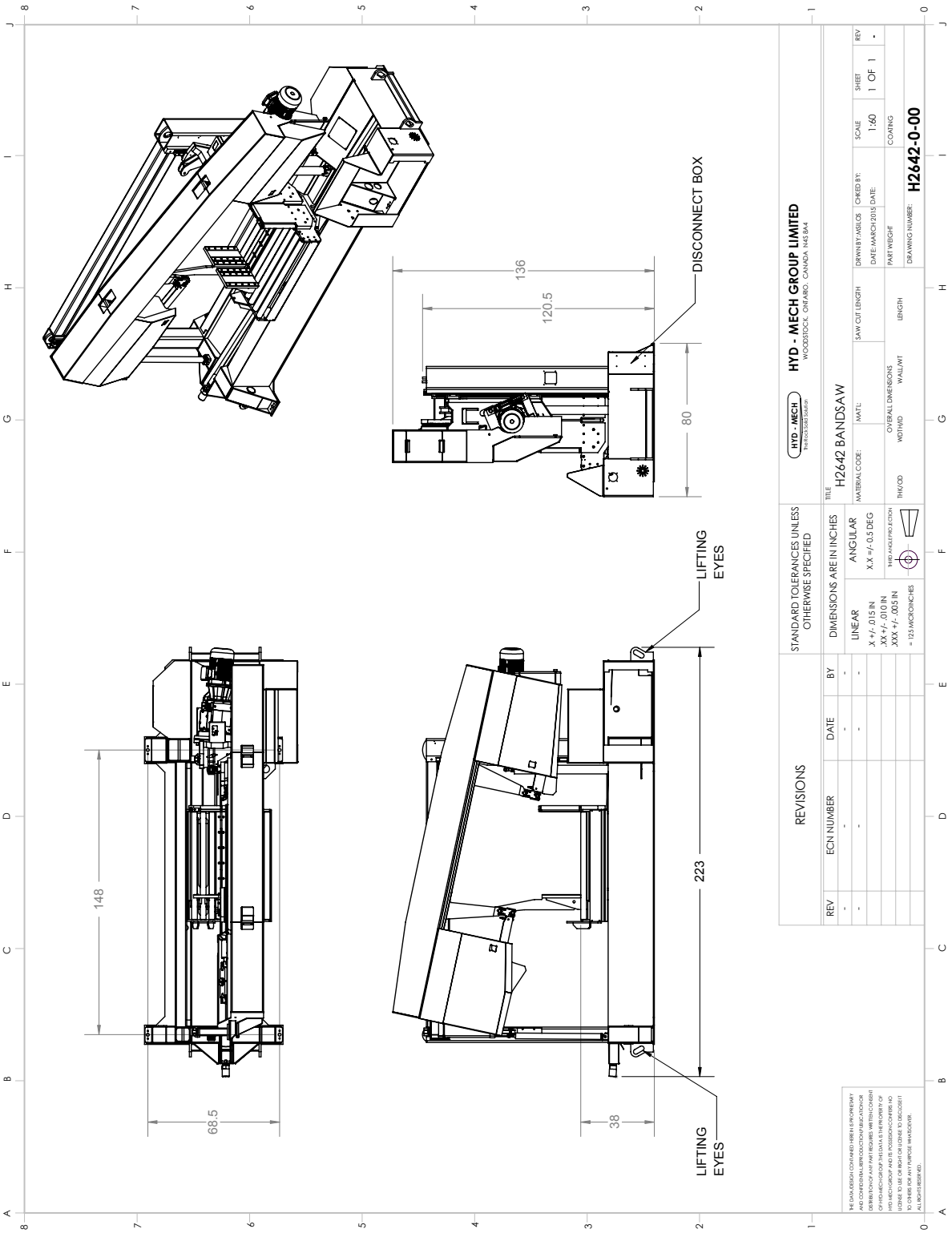
NO MODIFICATIONS TO THE MACHINE ARE PERMITTED WITHOUT PRIOR APPROVAL FROM HYD-MECH. ANY APPROVED MODIFICATIONS SHOULD ONLY BE UNDERTAKEN BY TRAINED PERSONNEL.

LIFTING INSTRUCTIONS

The H-26/42 machine is designed to be lifted in one, fully assembled piece. In order to lift the machine it needs to be in the following condition:

- ✓ Saw head to be in the bottom position
- ✓ Coolant tank emptied
- ✓ An experienced rigger should select the rigging based on the weight of the saw (28,000 lb or 12,600 kg)

Use the four lifting points on the base (Lifting eyes) to install the chains to lift the machine.



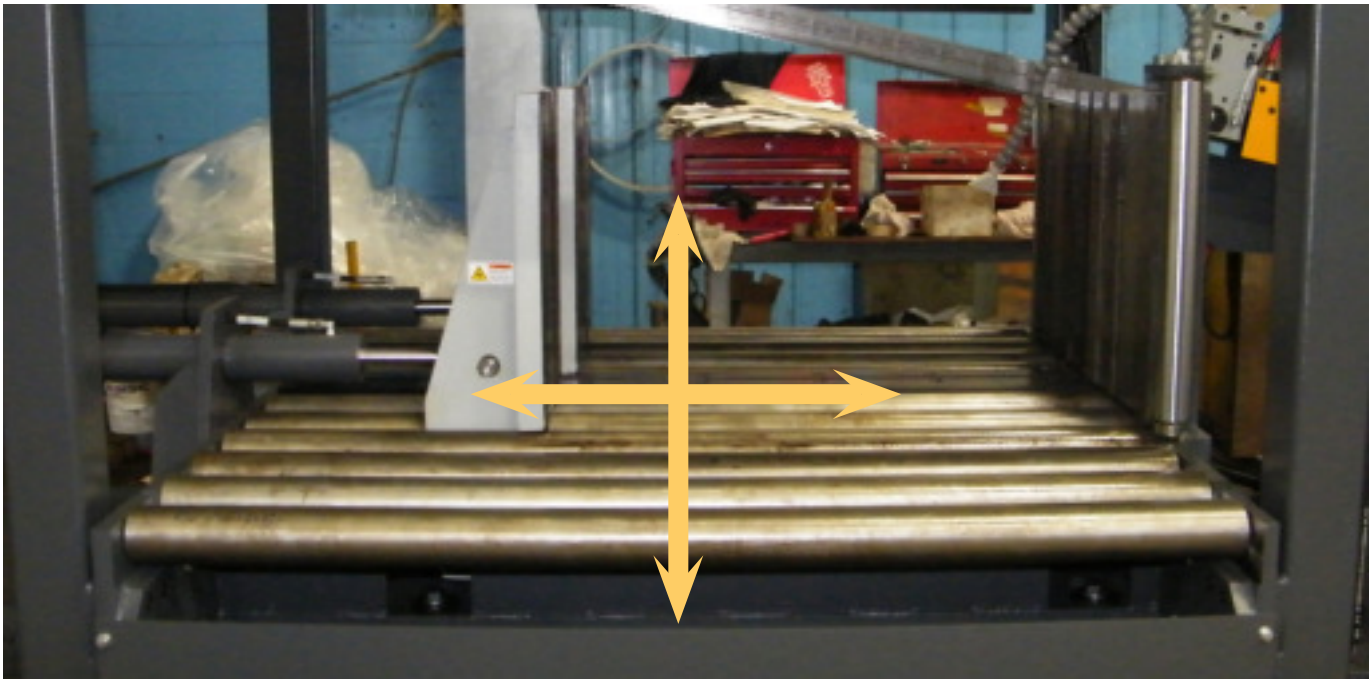
FOUNDATION, LEVELLING AND ANCHORING

The machine location should be carefully selected. A flat concrete floor area should be chosen. It should have enough free space surrounding the machine to enable free access for safe operation and maintenance.

Machine should be leveled in both directions i.e. along and across its in-feed conveyor especially when machine is to be inserted into a larger conveyor system.

Four leveling screws are provided, one in each corner of the machine base plus one in the hydraulic cabinet. Steel plates are to be placed under each screw to prevent their sinking into the concrete floor. In cases where the machine is to be anchored permanently, anchoring holes are provided. They are located next to the leveling screws.

NOTE:
In some cases leveling the saw in-feed and auxiliary conveyor with a slight slope towards blade is recommended. This will prevent coolant from running down the raw stock. (This is especially true when cutting tubing or bundles).



WIRING CONNECTIONS

After the machine is leveled and anchored the necessary power hook-up needs to be performed. In order to provide safe operation as well as to prevent potential damage to the machine, only qualified personnel should make the connections.

BEFORE START-UP THE FOLLOWING TWO POINTS SHOULD BE CHECKED:

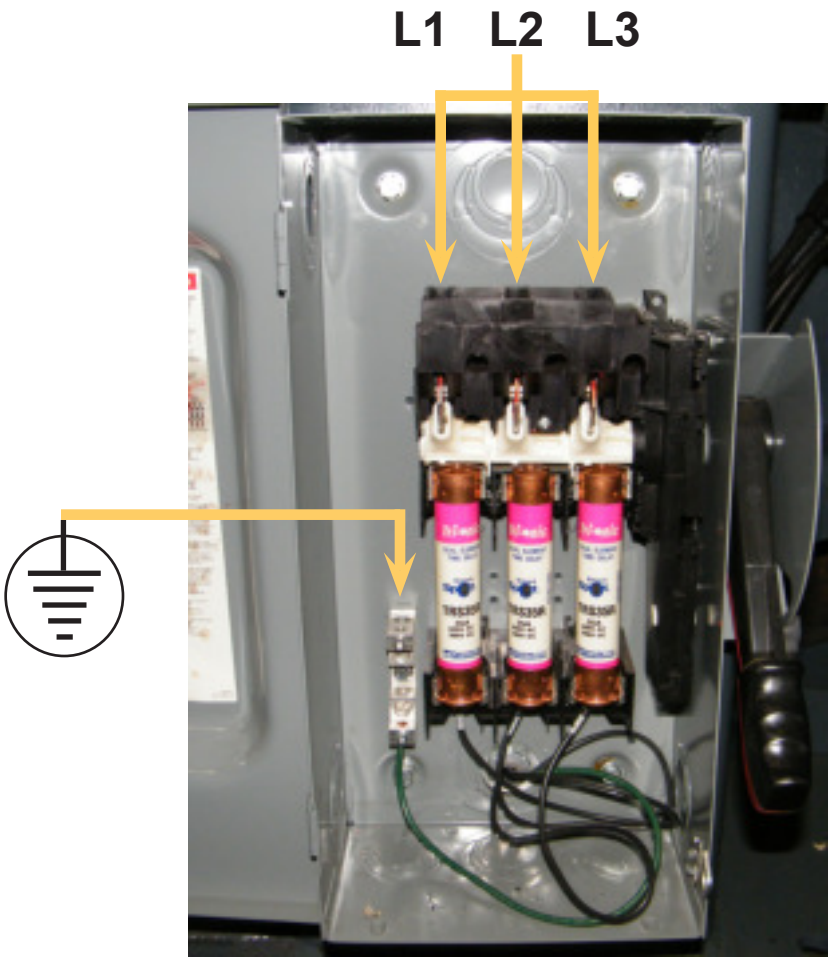
1. Signs of damage that may have occurred during shipping to the electrical cables and the hydraulic hoses.
2. The hydraulic oil level is between the upper and lower lines on the level gauge.

As supplied, the machine is set to run on three phase voltage as indicated on the serial plate and voltage label.

Power connection to the machine is made to L1, L2, L3 and ground terminals in the main disconnect box. (See photo below) For machines equipped with a variable frequency drive unit, an earth ground is recommended.

During the initial hook-up it is very important to check that the phase order is correct. This is indicated by the hydraulic pressure gauge registering a pressure rise and the blade running in a counter clockwise direction. If the hydraulics do not register an immediate pressure rise, shut the hydraulics off and change the phase order.

ATTENTION: Running the hydraulics “backwards” can damage the hydraulic pump



EARTH GROUNDING PROCEDURE

1. The customer is to provide and install a ground rod approximately .60 (15mm) diameter, copper clad steel, to be driven no less than 8’ (2.5m) into the ground, no more than 10’ (3m) away from control enclosure.

2. The ground rod is to be connected to customer’s in plant ground system. This connection shall be made directly at the ground rod. (If applicable).

3. It is desirable that the overall resistance to ground measured at the ground rod does not exceed 3 ohms. Customer is advised to consult local power company for further information on grounding.

4. The ground rod is to be connected to the ground terminal in the control enclosure using insulated, stranded copper wire. The wire gauge size is to be determined according to the electrical code of the customers local electrical authority.

5. An additional point to check is to ensure continuity of all ground within the control enclosure. Start with the main power entrance ground terminal where the internal ground conductors should originate and then connect to, the DIN terminal strip, control transformer, and the lid of control enclosure. Also, the PLC and Interface units should have their own ground conductors connected to one of the main ground terminals.

6. A properly functioning ground system will:
   - provide safety for personnel.
   - ensure correct operation of electrical/electronic apparatus.
   - prevent damage to electrical/electronic apparatus.
   - help dissipate lightning strikes.
   - divert stray radio frequency (RF) energy from electronic/control equipment.

HYDRAULIC OIL AND CUTTING FLUID

The H-26/42 bandsaw is supplied with Texaco Rando HD46 hydraulic oil. If it is necessary to change the oil to a different brand, see the HYDRAULIC SECTION for an equivalent grade of oil.

No cutting fluid is supplied with the machine. There are two types of coolant available:
- Oil-based; dilute 1:10 ratio (one part concentrated coolant to 10 parts water)
- Synthetic; dilute as recommended by the manufacturer

SECTION 2 - OPERATING INSTRUCTIONS

This section has been prepared to give the operator the ability to set up the saw for most cutting situations. Before cutting any material, the operator should be familiar with all operations and controls as well as the basic cutting theory described below. The saw is equipped with variable blade speed and hydraulic feed control, as well as an extensive door chart to guide the operator to the correct setting of these controls.

BLADE BASICS

Technology is rapidly changing all aspects of production machining. Metal cutoff is no exception. The advances made in the bandsaw blade industry have definitely brought down the cost per cut, despite the three fold higher price of high technology blades. Variable pitch, bi-metal blades last much longer, cut faster, and more accurately than conventional carbon steel blades. In order to take advantage of the superiority of bi-metal blades, it is critical to properly “break-in” a new blade. This is accomplished by taking two or three cuts through solid four or five inch diameter mild steel at an extremely slow feed rate. (It is also advisable to utilize a slow blade speed)

These two or three slow cuts sufficiently lap (polish) the teeth on the new blade so that it does not snag the material being cut. Proper break-in will alleviate blade vibration; improve surface finish, accuracy, and blade life.

After “break-in”, the following six points must be closely monitored to ensure long blade life:

1. Proper blade tension should be maintained. (See Section 3, Maintenance and Troubleshooting)
2. Generous coolant application is essential with most materials. A high quality and well mixed coolant will extend blade life, and also increase cutting rate and quality. On those materials where coolant is undesirable for cutting, a slight coolant flow or periodic oiling of the blade is necessary to prevent the blade from being scored by the carbide guides.
3. The stock being cut must be securely clamped in the vises.
4. The proper feed force should be chosen. (see Saw Cutting Parameters: Step 2)
5. The proper blade speed must be selected. (see Saw Cutting parameters: Step 4)
6. The proper feed rate must be applied. (see Saw Cutting Parameters: Step 5)

VARIABLE SPEED CONTROL

Blade speed can be adjusted between 75 to 300 SFM(Surface Feet/Minute) (23 to 91m/min) Adjustment should be made only when the blade is running. Clockwise rotation of the knob increases blade speed while counter clockwise rotation decreases blade speed.

THE CONTROL PANEL

START-UP

The control console has been designed to simplify the operation of the saw, to give the operator the ability to stop any function at any time, and to be able to control all the functions remotely. We cannot overstress the importance of familiarizing yourself with the controls prior to starting the machine.

NOTE:

1. ALL SWITCHES MUST BE IN THE CENTER NEUTRAL POSITION TO START THE MACHINE!
2. WHEN STARTING THE MACHINE FOR THE FIRST TIME MAKE SURE THAT BLADE IS MOVING IN A COUNTERCLOCKWISE DIRECTION, AND THAT THE HYDRAULIC PRESSURE IS 1300 - 1500 PSI (8970 - 10350 kPa). IF THERE IS NO IMMEDIATE PRESSURE, SHUT THE SAW DOWN AND CHANGE THE PHASE ORDER.

FRONT VISE
This switch has three positions, OPEN, HOLD and CLOSE. With the switch held in the OPEN position the vise will open all the way or until the switch is released. With the switch in the HOLD position, the vise will stay where it is and will not move freely although it will not resist a large force indefinitely without creeping. In CLOSE, the vise will close all the way, or until it encounters enough resistance to stop it.

HEAD CONTROL
This switch has three positions: UP, HOLD and DOWN. The switch is inactive unless the PLC is in manual mode. In the UP position, the head will rise until it trips the head up limit, which is adjustable. In the HOLD position the head will stay still. In the DOWN position the head will descend until it reaches the bottom of the stroke. The speed of descent is controlled by the Head Feed and Head Force Limit controls.

BLADE START
The blade can be started only when the hydraulics are running in either manual or auto mode. NOTE: In automatic Mode the head will not descend until the blade has been started, which the PLC will prompt the operator to do so.

HYDRAULIC START
To start the hydraulic system, the switches for the head and both vises must be in the “NEUTRAL” position. The “HYDRAULIC START” button must be depressed and held in momentarily until the PLC display becomes active.

CYCLE START / PAUSE
This button starts the cutting cycle and will stay illuminated until the cycle is completed. The PLC control system will prompt you to start the blade if it is not running. The machine will then begin the automatic cycle until completed when it will shut itself off. The current cycle can be PAUSED by pressing this button at any time during a cycle and restarted by pressing it again.

COOLANT
This switch has three positions, AUTO, OFF, and ON. In the ON position, the coolant system will operate when there is power to the machine; this allows using the wash gun to clean the machine. In the OFF position, the coolant system is inactive. In the AUTO position the coolant system will only run when the blade is on. The coolant system can also be run only when both the blade is on and the head is descending by selecting this option in the PLC parameters.

AUXILIARY VISE OPTION (OUTBOARD VISE OPTION)
This switch has three positions, OPEN, HOLD and CLOSE. With the switch held in the OPEN position the vise will open all the way or until the switch is released. With the switch in the HOLD position, the vise will stay where it is and will not move freely although it will not resist a large force indefinitely without creeping. In CLOSE, the vise will close all the way, or until it encounters enough resistance to stop it.

BLADE SPEED

Adjustment should be made only when the blade is running. Clockwise rotation of the knob increases blade speed while counter clockwise rotation decreases blade speed.
The blade speed will be displayed on the PLC display.

BLADE STOP
Stops the blade. If the blade is stopped during a cycle, the cycle will continue but will not let the head descend until the blade is started.

EMERGENCY STOP
This mushroom button stops the blade and hydraulic motors. Both vises will hold their position but, pressure will begin to fall off. Long pieces of work should always be supported so they will not become loose over time and fall while the machine is shut down. This is a latched button and must be pulled out to start the machine.

COOLANT: FLOOD - MIST
This option switch has two positions:
FLOOD - Only coolant flows and the flow is controlled by the coolant selector switch.
MIST - Only mist flows and the flow is controlled by the coolant selector switch.

WORK LAMP
This option switch has two positions, OFF and ON.

LASER GUIDE
This option switch has two positions, OFF and ON.

BLADE CHANGE MODE
This lock is provided for the safety of the operator during the blade changing procedure. When the lock is in the “ON” position, the door interlocks are disabled and the only functions that are active are the HEAD and BLADE TENSION controls. All other controls are inactive. After the blade has been changed the lock must be switched to “OFF” in order to operate the machine.

OPERATION OVERVIEW

The PLC is a programmable logic controller which allows the operator to run the machine in both manual and automatic modes.

In manual mode, all functions can be operated by using a combination of selector switches on the control console and the PLC function buttons. Also the operator has the ability to execute a single cut utilizing a pre-programmed "Single Part Cycle".

In automatic mode, the machine will cycle for one cut and be ready for the next cut when finished.

All machine operators should be familiar with the entire operation instructions prior to operating the machine.

FUNCTION BUTTON DESCRIPTIONS

If a red LED above a function button is illuminated, it means that the function printed in red at the top of the button is enabled. No lit LED indicates the function printed in black at the bottom of the function button is enabled. The following are the function keys for AUTO and MAN modes:

HOME	AUTO MODE	No function.
	MAN MODE	If pressed and held in for a few seconds, the HEAD HOME cycle will be initiated. NOTE: Before using AUTO MODE, it is necessary to “HOME THE HEAD”. This must be repeated any time the hydraulic system has been shut down so the machine knows where its HOME position is. While the head fast approach can be used during this operation, it is recommended the lever be released so that the head meets it home position gently.
AUTO MAN	AUTO / MAN MODE	This button will toggle between MAN and AUTO modes. Auto mode cannot be accessed unless the vise is closed. Also used to stop an automatic job in progress by switching to MANUAL mode.
P	AUTO MODE	No function, both keys.
	MAN MODE	Used to access the PARAMETERS. When these two keys are pressed simultaneously, the display will change to the password (# obtained from Hyd·Mech) screen before the parameters are displayed. The vise must be closed and the PLC in “INCH” to access the parameters. To exit the “PASSWORD” back to “MAN”, press AUTO MAN or METRIC INCH To exit the “PARAMAETERS” mode, press at any time. NOTE: Consult the Hyd-Mech Service department before entering the parameters.
	AUTO MODE	No function.
	MAN MODE	No function.
METRIC INCH	AUTO / MAN MODE	This button toggles to allow values to be displayed either in millimeters or inches and the blade speed in either surface feet per minute or meters per minute. It becomes disabled once an AUTO cycle is initiated.

MANUAL MODE OPERATION

In MAN mode, the PLC allows the operator to make a single cut. To accomplish this, take the following steps.

1. Open the vise.
2. Raise the head so that the blade is above the material to be cut.
3. Load the material and position it for a cut, close the vise.
4. Set the feed rate (displayed) and feed force (not displayed) as described on page 2.7.
5. Start the blade and set the desired speed (displayed).
6. Turn on and adjust the coolant as required.
7. Turn the head switch to DOWN and the cut will begin.
8. When the cut is completed, raise the head.
9. To cut another piece, repeat steps 2 through 8.

NOTES:

- The blade speed, feed force, and feed rate can all be adjusted during a cut if necessary.

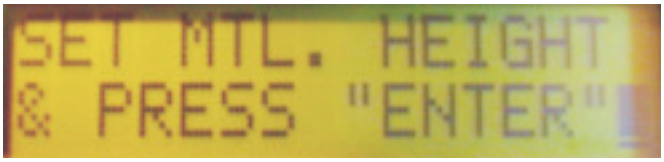
AUTOMATIC OPERATION

NOTE: Before entering AUTO mode, the head should be “HOMED” as the operator will be prompted to do so when the “AUTO MODE” is accessed. See function button description for [HOME]

1. Open the vise.
2. Raise the head so that the blade is well above the material to be cut. This should be done to minimize the possibility of damage to the blade while loading material.
3. Load the material and position it for a cut , close the vise.
4. Set the feed rate (displayed) and feed force (not displayed) as described on page 2.7.
5. If the blade speed must be adjusted, start the blade and set the desired speed (displayed).
6. Press the [AUTO / MAN] key, the blade will stop if it is running, and the display will change to that shown below.

When the AUTO/MAN button is pressed, the red indicator light above it will come on, and the blade will stop if it has been running and all manual functions will be disabled.

7. Press the “CYCLE START/PAUSE” button, the vise must be closed, and the display will change as shown below. If the head has not been “HOMED”, you will be prompted to do so.



8. The HEAD switch is now enabled, move the head to a position just above the material to be cut. When the head is in position, turn the switch to “HOLD”.
   NOTE: If the switch is left in “DOWN” and the ENTER key is used while the head is moving, do not change the PLC to “MAN” mode. The HEAD switch should ALWAYS be turned to “HOLD” as the head will begin to MOVE IMMEDIATELY when the [AUTO / MAN] key is pressed to switch to “MAN” mode.
9. Press the ENTER key and the cut will begin. If the blade is not running, the head will not move, the display will prompt you to start the blade.
10. When the cut is complete, the head will rise to the set material height and the blade will stop.
11. To cut another piece, repeat steps 3 through 9.

NOTES:

1. To “PAUSE” the cut, press the “CYCLE START/PAUSE” button, press it again to “RESUME”.
2. The blade speed, feed force and feed rate can all be adjusted during a cut if necessary.
3. To reset the material height, change the PLC to “MAN” and back to “AUTO”.

HYDRAULIC FEED CONTROL

The Hydraulic Feed Control is located to the left of the control panel. These controls allow independent control of Feed Force (FF) and Feed Rate (FR)

FEED FORCE KNOB
Used to set feed force limit (counterclockwise rotation to increase and clockwise rotation to decrease).

FAST APPROACH LEVER.
Depress for fast head descent

EXTRA FINE METERING VALVE (OPTIONAL)
Used to set feed rate (counterclockwise rotation to increase and clockwise rotation to decrease).

FEED RATE KNOB (Fine Metering)
Used to set feed rate (counterclockwise rotation to increase and clockwise rotation to decrease).

The FINE METERING DDF VALVE is equipped with two Feed Control Knobs. Extra fine Micrometer style Knob and Fine Metering Knob. The main difference between both Feed Controls is that the Extra Fine Metering valve does not work with the Feed Force Limit Valve. It is recommended to use only one feed control at a time with the second control valve shut. The choice of control is arbitrary and a matter of trial.
In some cases Extra fine Metering provides better results in others Fine Metering Control.
As a rule of thumb:
Extra Fine metering valve should be used

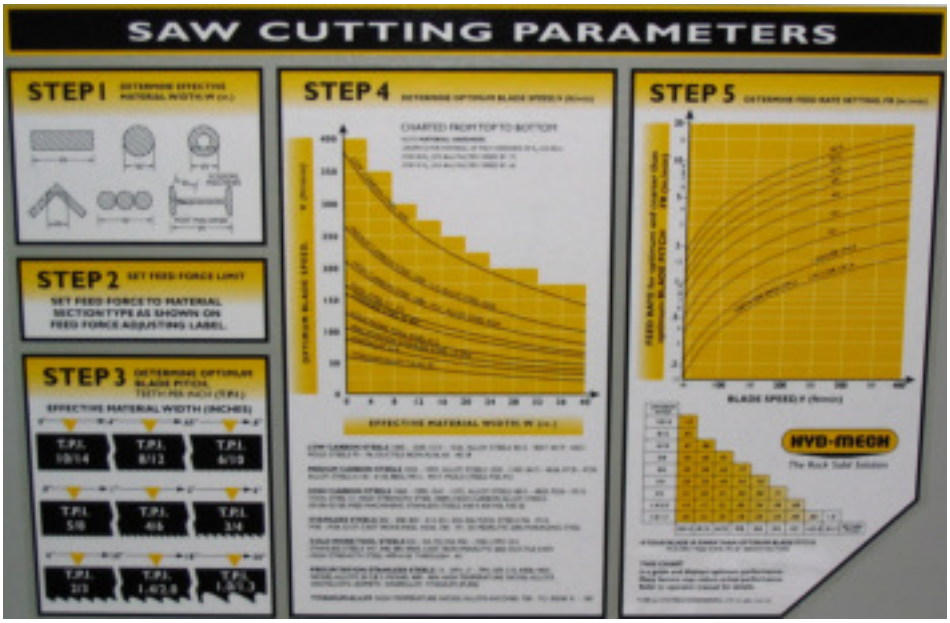
- if required feed is in a range of .12-.25”/min
- and/ or when cutting hard material
- or when work hardening may occur.

Fine metering valve should be used

- When cutting structural steel
- and/ or bundles
- High feed rates required

CUTTING PARAMETERS CHART

A full size CUTTING PARAMETERS CHART is mounted on the front of the saw. The chart contains five steps for the operator to follow in order to achieve optimum performance of the saw. These steps are detailed on the following pages.



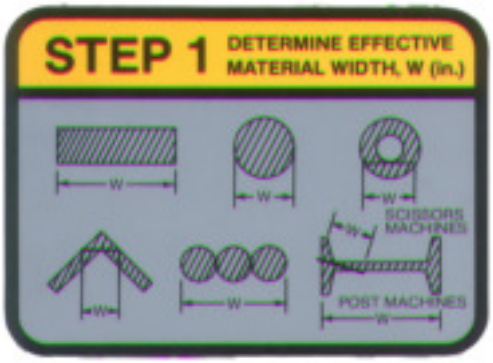
Saw Cutting Parameters Chart

CHART EXAMPLE #1

We will use the parameters chart to set up the saw for cutting 8” (200mm) Diameter #1045 Carbon Steel.

STEP 1: DETERMINE EFFECTIVE MATERIAL WIDTH - W (inches) or (mm)

Effective material width, W (in.) for most common shapes of materials, is the widest solid part of the material to be in contact with blade during cutting. For simple shapes, as illustrated on the chart, this can be directly measured. For bundles of tubes and structurals, measuring the effective width is difficult. Effective width is 60% to 75% of the actual material width.



Material Width Chart

NOTES:

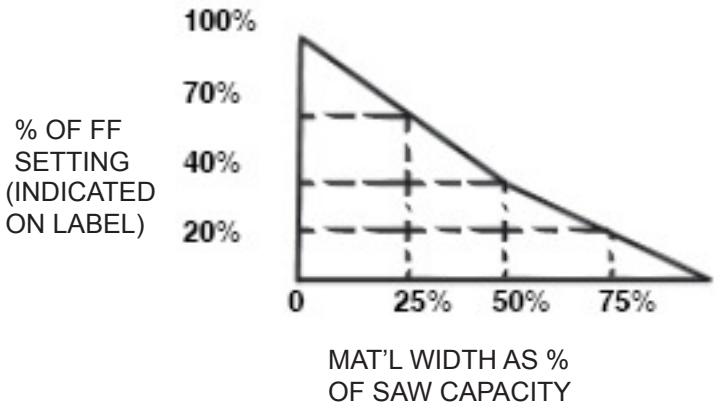
1. Effective material width, as determined here in STEP 1, can be thought of as the average width of material “seen” by each tooth, and it is used in STEPS 3 and 4.
   In Example #1, for an 8” (200 mm) diameter solid, Effective Material Width is 8” (200mm).

STEP 2: SET FEED FORCE LIMIT

The Feed Force Limit is the maximum amount of force with which the head is allowed to push the blade into the work-piece.

CUTTING SOLIDS

For cutting solids, the wider the section, the less FF should be set, to avoid blade overloading. See the graph below.



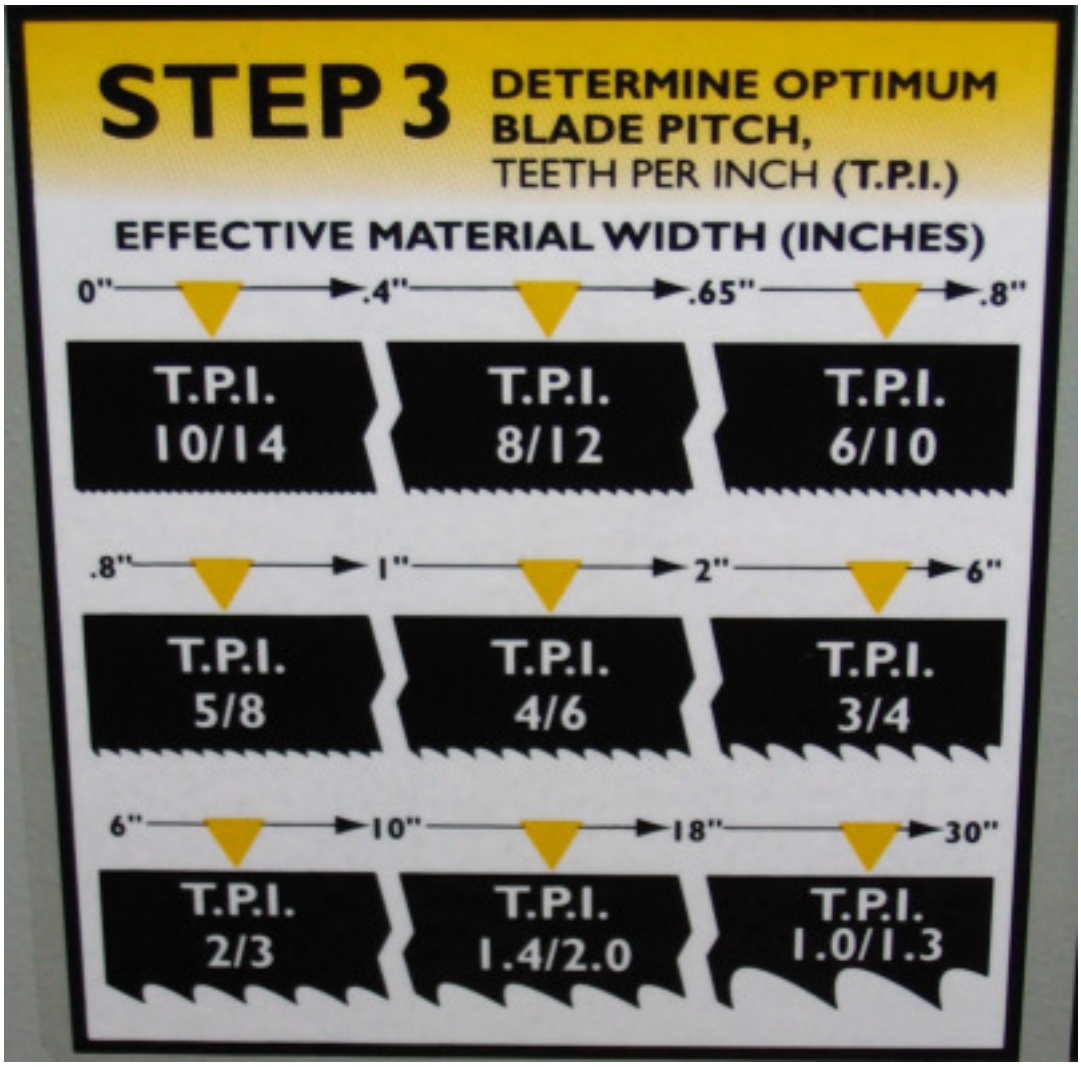
EXAMPLE: When cutting a solid which is 1/2 of machine capacity using the graph, locate 50% on the horizontal line and travel upwards to the plotted line and then travel directly across to the vertical FF Setting line. The point that you have arrived at shows a setting of 40% for a piece 50% of capacity.

CUTTING STRUCTURALS: A reduced Feed Force Setting is used when cutting structurals.

STEP 3: DETERMINE OPTIMUM BLADE PITCH - TEETH PER INCH (T.P.I.)

Selecting a blade with proper tooth pitch is important in order to achieve optimal cutting rates and good blade life.

For cutting narrow or thin wall structural materials a fine blade with many teeth per inch (T.P.I.) is recommended. For wide materials a blade with a coarse pitch should be used. The sketch can be referenced for the blade pitch changes for differing effective material widths.



Optimum Blade Pitch (T.P.I) for Material Width (Inches)

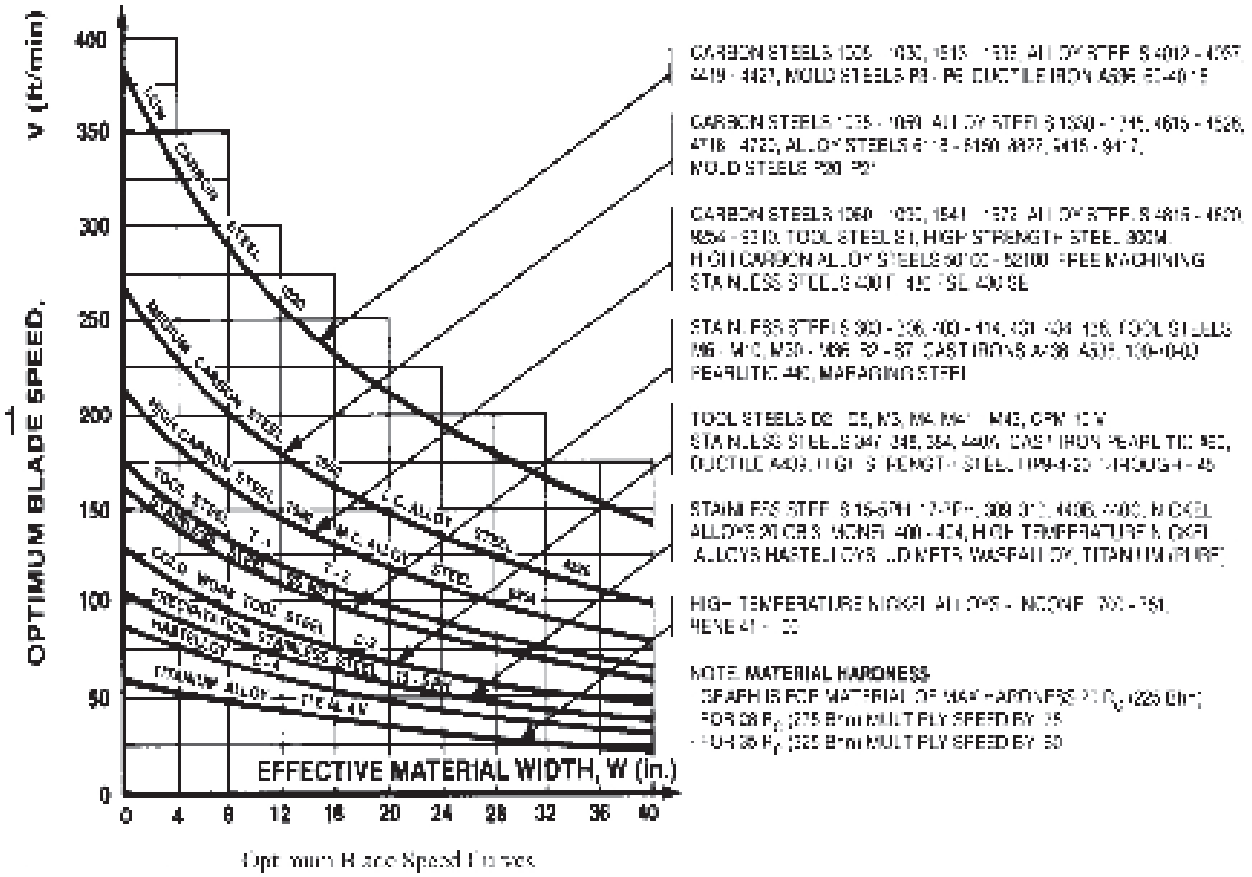
It is impractical to change the blade to the proper pitch every time a different width of material is cut and it is not necessary, but remember that the optimum blade will cut most efficiently. Too fine a blade must be fed slower on wide material because the small gullets between the teeth will get packed with chips before they get across and out of the cut. Too coarse a blade must be fed slower because it has fewer teeth cutting and there is a limit to the depth of a cut taken by each tooth. Allowance for the use of a non-optimum blade is made in STEP 5.

Example #1: Effective material width of 8” (200 mm):

Optimum blade has 2/3 teeth per inch.

STEP 4: DETERMINE OPTIMUM BLADE SPEED, V (ft/min) (m/min)

The relationship between optimum blade speed and effective material width for various materials is represented on the graph shown.



Optimum Blade Speed Curves

The graph shows that as effective material width gets wider or as material gets harder, lower blade speeds are recommended. If material is narrow or soft, higher blades speeds should be selected.

Example #1

1. 8” (200mm) diameter #1045 Medium Carbon Steel solid bar is to be cut.
2. On the graph above find the Medium Carbon Steel Curve which represents the optimum blade speeds for 1045 Carbon Steel.
3. On the horizontal axis (effective material width axis) find number 8 which represents effective material width of an 8” (200mm) diameter solid.
4. Find the point where a vertical line from 8” (200mm) intersects the Medium Carbon Steel Curve.
5. From this intersection point run horizontally left to the vertical axis (optimum blade speed axis) and find the point marked “200”.
6. For 8” (200mm) diameter, 1045 Carbon Steel solid bar 200 ft/min (60m/min) is the optimum blade speed.

NOTE:

1. Higher than optimum blade speed will cause rapid blade dulling. Lower than optimum blade speeds reduce cutting rates proportionately and do not result in significantly longer blade life except where there is a vibration problem. If the blade vibrates appreciably at optimum speed as most often occurs with structurals and bundles, a lower blade speed may reduce vibration and prevent premature blade failure.

2. Material Hardness - The graph above illustrates blade speed curves for materials of hardness 20 RC (225 Bhn) or lower. If the material is hardened then the multipliers need to be used. These multipliers are given in the NOTE at the bottom right of the graph. As the hardness increases the optimum blade speed decreases.

The following table gives examples of the optimum blade speeds for different materials.

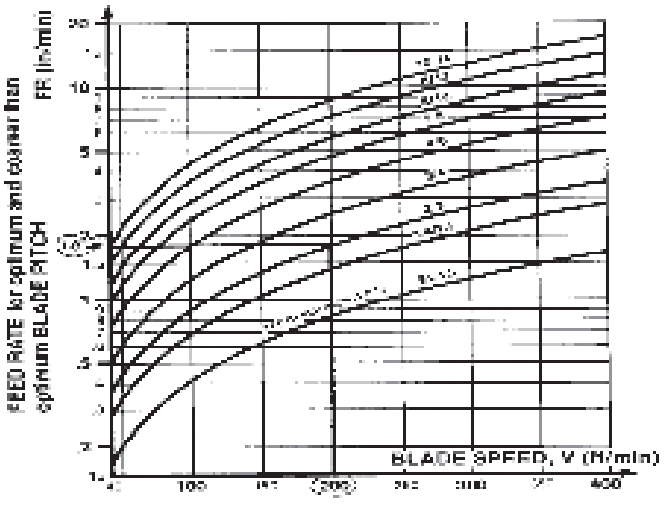
#	MATERIALS	OPTIMUM	BLADE SPEED
		(ft/min)	(m/min)
1	5” (125mm) Diameter Solid Carbon Steel	225	70
2	12” (300mm) I-Beam	290	90
3	4” x 4” (100mm x 100mm) Rect. Tube 1/4” (6mm) Wall	350	110
4	4” (100mm) 400 Stainless Steel	140	45
5	2” x 2” (50mm x 50mm) Rect. Tube 1/4” (6mm) Wall		
	Bundle 5” x 5” pcs. 10” x 10” (500mm x 500mm)	325	100
6	3” x 3” (75mm x 75mm) Inconel	60	20

Materials and Blade Speed

STEP 5: DETERMINE FEED RATE SETTING, FR (in/min) (mm/min).

FEED RATE is the vertical speed at which the blade descends through the work-piece.

The FEED RATE Knob controls FEED RATE of the blade descent. The FEED RATE should be adjusted only in one direction (from “O” to required value). If you go too far, go back to “O” and come back up. To set FEED RATE for particular cutting situations use the graph below, which represents the relationship between FEED RATE, blade speed and blade pitch.



Feed Rate Calculation

Example #1: It is known from Step 3 that optimum blade pitch is 2/3, and from Step 4 that blade speed is 200 ft/min (60mm/min). From the Graph on the left, the FEED RATE is determined in the following way:

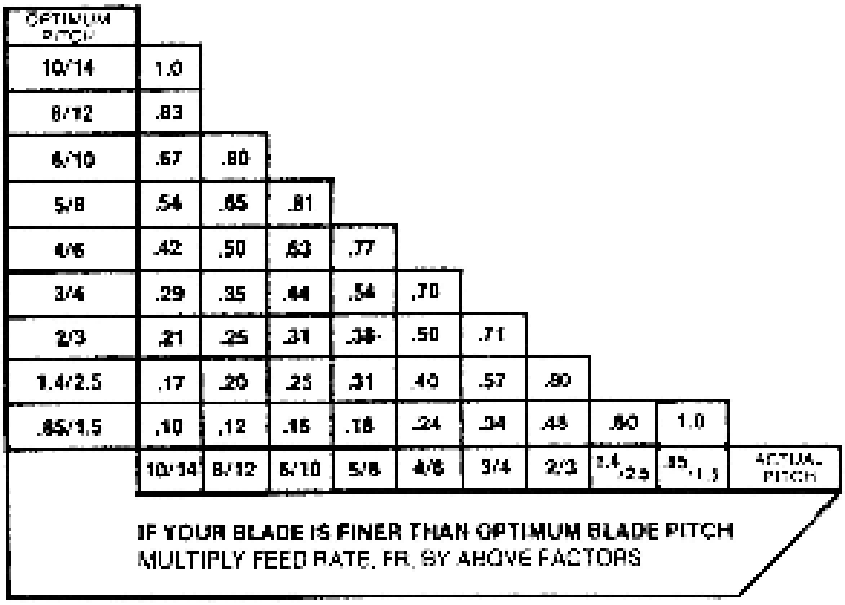
1. On the horizontal axis (blade speed axis), find 200 ft/min (60mm/min).

2. Find the point where a vertical line from 200 ft/min (60mm/min) would intersect the 2/3 blade pitch curve

3. From this intersection point run horizontally left to the vertical (FEED RATE) axis, to arrive at 1.8 in/min (45mm/min) FEED RATE. Thus 1.8 in/min (45mm/min) is the FEED RATE for cutting 8” (200mm) diameter 1045 Carbon Steel when the optimum 2/3 pitch blade is used.

FEED RATE, continued

If the saw is fitted with a blade coarser than optimum (e.g.: 1.4/2.5 TPI) we can still use the graph, but we go to the 1.4/2.5 curve. As a result we find that the FEED RATE is decreased to 1.3 in/min (133mm/min) for this blade. If however, the machine is fitted with a finer than optimum blade (e.g. 3/4 TPI) we use the graph for the optimum blade as before, and then use a multiplier given by the table below.



Optimum Vs Actual Blade Pitch

ADDITIONAL CUTTING SETUP EXAMPLES

EXAMPLE # 2

Material:

Round Steel Tube SAE 4320 - Hardened to 35 RC (325 Bhn)
Dimensions - 6” O.D. x 4” I.D. (150mm O.D. x 100mm I.D.)

Step 1 Effective Material Width: 4 1/2” (.75 X 6) 114mm (19 x 6)

Step 2 Feed Force limit setting for 6” Diameter material (Refer to Feed Force Limit, Setting in Step 2)

Step 3 Optimum blade pitch (TPI): 3/4 T. P. I.
Actual blade pitch on the saw: 4/6 T. P. I.

Step 4 Optimum blade speed for 4 1/2” effective 225 ft/min (70m/min) material width
Blade speed reduced by hardness factor: 225 ft/min X .60 = 135ft/min (70m/min x .60 = 42m/min)

Step 5 Feed Rate for 3/4 TPI blade: 1.8 in/min (45mm/min)
Feed Rate for 4/6 TPI blade: 1.8 in/min X .70 = 1.3in/min
(reduced by finer than optimum blade pitch factor) (45mm/min x .70= 31.5mm/min)

ADDITIONAL CUTTING SETUP EXAMPLES, continued

EXAMPLE # 3

Material:

Bundle low carbon steel 2” x 2” Tube with 1/4” wall, 12 piece bundle (50mm x 50mm with 6mm wall)

Dimensions: 6” x 8” (150mm x 200mm)

Step 1 Effective Material Width: 5” (.6 X 8”) 120mm (.6 x 200)

Step 2 Feed Force limit setting for 8” Diameter material. (Refer to Feed Force Limit, Setting in Step 2)

Step 3 Optimum blade pitch (TPI): 3/4 T. P. I.

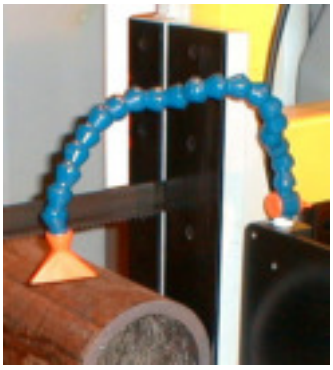
Step 4 Optimum blade speed for 5“ effective material width: 320 ft/min (100m/min)

Step 5 Feed Rate for 3/4 TPI blade: 4.0 in/min (100mm/min)

ADDITIONAL CONTROLS

COOLANT FLOW

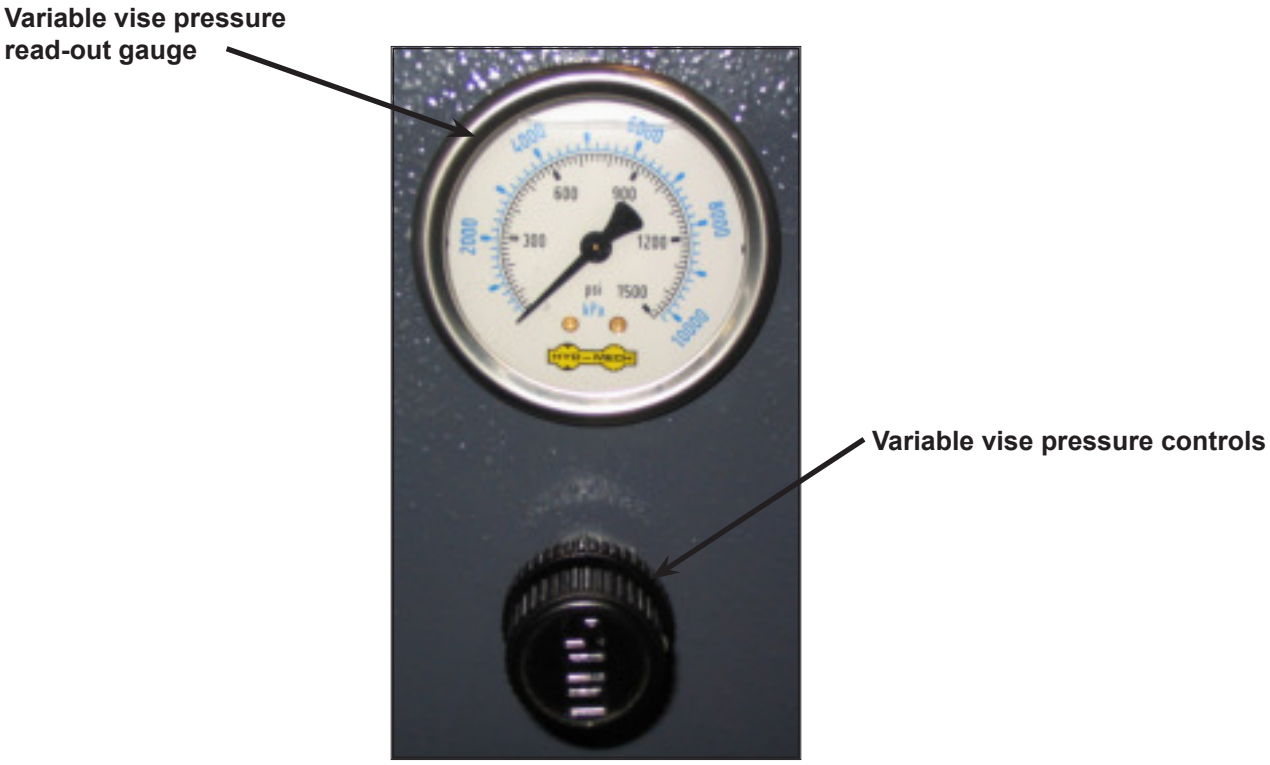
The main coolant control is found on the control panel.



WASH: Coolant flows any time the machine is under power, permitting wash down with spray nozzle without running machine.
OFF: No coolant flow.
ON: The coolant flows only when the blade is running or when the blade is running and the head is descending. This is selectable via the PLC parameters.
The bandsaw is equipped with two independently controlled coolant spouts that are capable of supplying a generous flow of coolant to the blade.
The left guide arm supplies a flow of coolant that should flood the blade as it moves through the carbide pads into the material to be cut. The adjustable spout on the left guide arm should be set with the blade speed to provide the flood of coolant necessary.
The right guide arm provides a coolant flow through the flexible hose that can be pointed directly where necessary. This flexible hose should be used when cutting solid bars, bundles, or wide structurals. Set the flow of coolant directly into the opening in the material where the blade is cutting.
NOTE:
When cutting materials that do not need constant coolant, such as Cast Iron, some coolant flow is required for blade lubrication to prevent blade scoring by the carbide pads as the blade moves through them.

VARIABLE VISE PRESSURE (OPTION)

This option allows the operator to adjust the vise pressure. This can be valuable when cutting light structurals and tubes. By reducing the vise pressure from the system (H18=1000, H22=1100psi) pressure, distortion of materials is prevented. The controls are located at the drive end of the machine next to the hydraulic compartment.



BUNDLING OPERATION (OPTION)

The bundling vises can be operated in direct conjunction with the front and auxiliary vises. Either bundling can be turned on or off at any time.

FRONT BUNDLING ON/OFF VALVE LOCATED ON SIDE OF HYDRAULIC ENCLOSURE

OBV BUNDLING ON/OFF VALVE LOCATED ON FRONT/ TOP SIDE OF HYDRAULIC ENCLOSURE

SECTION 3 – MAINTENANCE

SAFETY DURING MAINTENANCE AND TROUBLESHOOTING

“Lock-out”, or “Lock-out Tag-out” are terms that refer to procedures taken to prevent the unexpected start-up, or other release of energy, by a machine, whenever anyone is required to remove or bypass safety guards or devices, or whenever anyone is required to place part of his body in a hazard area.
In almost all jurisdictions, it is required that owners of industrial equipment establish and post lock-out procedures. Know and use the lock-out procedures of your company or organization. In the absence, of such posted procedures, use the following procedure.

LOCK OUT PROCEDURE

Whenever work is to be performed on a machine, which requires removal or bypassing of safety guards or devices, or the placement of part of anyone’s body in a hazard area, the following steps shall be taken:

1. Operator shuts down the machine.
2. The supervisor in charge of the machine must be informed of the intention to Lock-out the machine.
3. The Machine Power Disconnect Switch must be turned OFF, and locked in the OFF (0) position by means of a padlock. The key for this padlock must be kept by the person performing the work on the machine. If more than one person is performing work on the machine, then a multiple lock hasp shall be used, and each person shall apply his or her own lock to the hasp.
4. Prior to starting any work on the locked-out machine, the supervisor shall attempt to start the machine to ensure that the lock-out device provides adequate protection. Operating controls must be reset to the “OFF” position after this test.
5 Work on the locked-out machine may now proceed.

Machine Power Disconnect is located at the back of the machine mounted on the drive side post.

1. Ensure switch is in the OFF position.
2. Install padlock and lock it.

RESTORING MACHINE TO USE

After completion of all repairs or maintenance to the locked-out machine, it shall be restored to use as follows:

The person(s) who performed the work shall verify that all areas around the machine are safe, before the machine is re-energized. No-one shall be permitted in un-safe areas around the machine. All guards and covers shall be properly installed.

Each lock-out padlock shall be removed by the person who applied it.
After the lock-out padlocks are removed, and before the machine is started, the supervisor and all other employees who use the machine, shall be informed that the lock-out has been removed. After notification is made, the machine may be re-started.

BLADE CHANGE MODE PROCEDURE

Wear safety glasses, gloves, and a long sleeve shirt for protection when handling band saw blades during blade change. NOTE THAT GLOVES SHOULD NEVER BE WORN NEAR A RUNNING BANDSAW BLADE. When handling new blades or ones that will be re-used, it is important to keep the teeth out of contact with concrete floors.

This machine is equipped with hydraulic blade tension and a 'Blade Change Mode' key switch, located on the operator control panel.

This key has two positions:

OFF – All normal operations of the band saw are operative.

ON – Hydraulic motor can be started.
Blade tension is operative.

BLADE REMOVAL

1. With the blade change mode key switch in ‘OFF’, the blade stopped and the hydraulics ON, raise the saw head until the drive door will clear the electrical control panel.
2. Open the front vise about 12”. This will provide room between the two guide arms to easily grasp the blade with two hands, BUT DO NOT TOUCH THE BLADE UNTIL THE BLADE CHANGE MODE SWITCH IS TURNED TO THE ‘ON’ POSITION.
3. Turn the blade change key switch to the ‘ON’ position. The hydraulics will continue to run, but only the blade tension switch is functional. The blade wheel doors can be opened without the hydraulics shutting down.
4. Remove the blade guard.
5. Open both blade wheel doors.
6. Release the blade tension by turning the switch briefly to ‘ – ‘. By jogging the switch between ‘HOLD’ and ‘ – ‘, it is possible to regulate the degree of tension on the blade.
7. Pull the top strand of the blade down out of its slot above the cutting area and forward out of the slots on the inside walls of the blade wheel housings.
8. Pull the lower strand of the blade down out of the blade guides.
9. Store and dispose of the used blade.

BLADE INSTALLATION

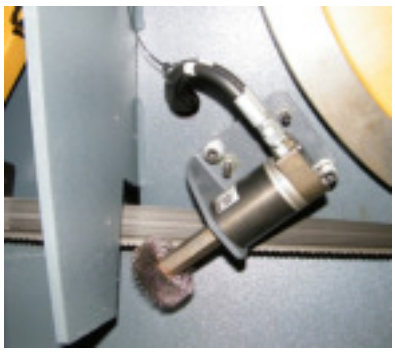
NOTES ABOUT NEW BLADES

- A new blade will come folded into a compact coil. Follow the blade manufacturer’s instructions for safely unfolding the blade.
- The blade must be installed with the teeth facing towards the front of the saw where it passes around the wheels, and with the teeth in the cutting area pointing towards the drive wheel. This may require that the blade be turned inside out before installation.

1. With the blade change mode key switch remaining in the ‘ON’ position, turn the blade tension switch to the ‘ – ‘ position for several seconds until the idler wheel has fully retracted.
2. Insert the lower strand of the new blade into the blade guides.
3 .Lift the upper strand of the blade up into its slot above the cutting area, and place it around the blade wheels.
4. Turn the blade tension switch briefly to ‘+/RUN’ and then leave it in ‘HOLD’ to retain the blade lightly on the wheels.
5. Adjust the blade position on the wheels so that the blade is not crooked on them and the teeth overhang the front edge of the wheels.
6. Turn the blade tension switch to ‘+/RUN’.
7. Close both blade wheel doors.
8. Turn the blade change mode key switch to the ‘OFF’ position. The hydraulics will shut down.
9. Switch the hydraulics on, then start the blade and run for 20 seconds.
10. Stop the blade.
11. Turn the blade change key switch to the ‘ON’ position.
12. Open the blade wheel doors and inspect the blade tracking, plus the position of the blade brush. Refer to the manual for tracking adjustments.
13. Close the blade wheel doors and turn the blade change mode key to the ‘OFF’ position.
14. Blade change procedure is now complete.

BLADE BRUSH ADJUSTMENT

The blade brush is properly set when the machine leaves the factory but it will wear during operation and needs to be adjusted periodically. The blade brush assembly is found behind the drive side door and is shown below. To adjust the assembly, loosen the hex nut, turn the set screw counter clockwise until the wires on the brush touch the bottom of the blade gullets and tighten the hex nut. The brush should be replaced as it becomes worn to approximately 70% of its original 4" diameter. Replacements can be purchased through your Hyd-Mech Group Limited dealer.

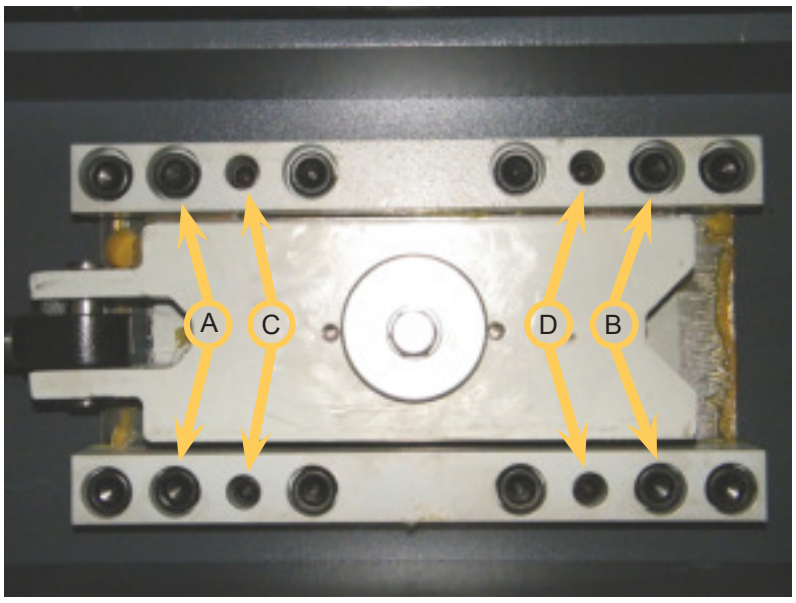


BLADE TRACKING ADJUSTMENT

Blade tracking is set so the teeth of the blade protrude .340" (8.6mm) +/- .01" (.25mm) from the face of the idler and drive wheels. Adjustments should always begin with the wheel that measures farthest out of specification.

IDLER WHEEL TRACKING

Release blade tension before adjusting. Adjust tracking by regulating "push" set screws and "pull" bolts. Loosening bolts "A" and turning in set screws "C" by equal amounts will move the blade OFF the wheel. Loosening bolts "B" and turning in set screws "D" by equal amounts will move the blade ON to the wheel. After each "C" or "D" set screw adjustment, tighten bolts "A" or "B", turn tension switch to "+RUN", run the blade for a moment and recheck the tracking.



Idler wheel tracking bolts & set screws

DRIVE WHEEL TRACKING

Release the blade tension before adjusting. The blade can be adjusted by loosening bolts “A” and then adjusting the two set screws “B”. (See gearmotor picture below) Tighten the bolts after each set screw adjustment. Turn the blade tension switch to “+ RUN” to run the blade for a moment, then recheck the tracking.

GEARBOX LUBRICATION

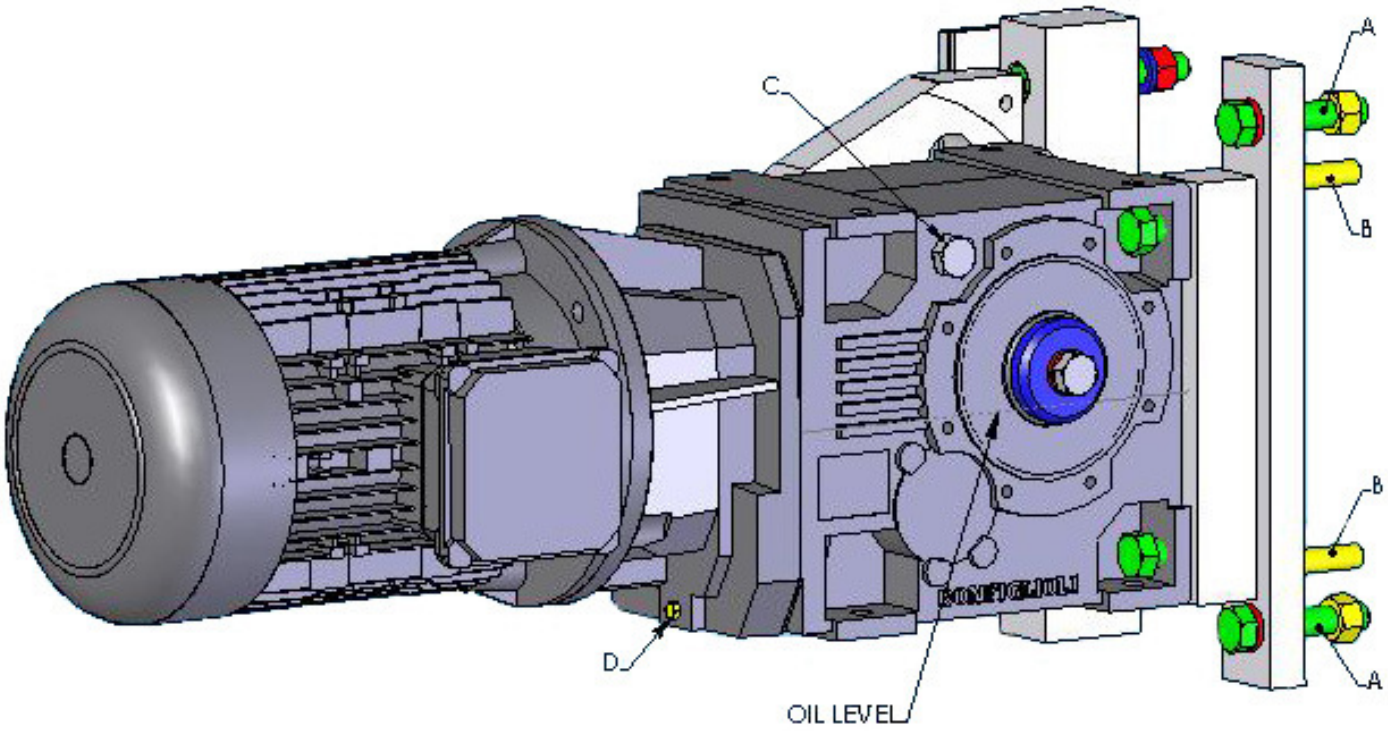
The H-26/42 with the A703 gearbox requires 15 litres (3.96 US gallons) of Mobil SHC 630 synthetic oil.. This oil has an ISO Viscosity Grade of 220 that is optimum for ambient temperatures from 20-40 Deg C [70-104 Deg F]. If the machine will be operated for prolonged periods at ambient temperatures below 20 Deg C [70 Deg F] an oil of ISO Viscosity Grade 150 should be substituted.

Because of the tilted orientation of the gearbox on the H-26/42 saw, the correct oil level is about 1 inch below the level plug, C, shown in the illustration.

The suggested oil change interval is given below:

Oil Temperature	Mineral Oil Interval	Synthetic Oil Interval
Deg C [deg F]	[hours]	[hours]
< 65 [< 150 F]	8000	25000
65-80 [150 F-175 F]	4000	15000
80-95 [175 F-200 F]	2000	12500

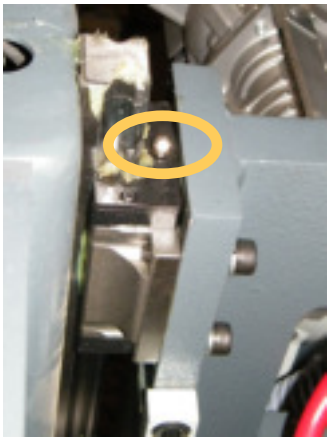
The oil can be changed by draining through the plug, D, and filling at plug C. If the type of oil is being changed, it is advisable to flush the old oil by filling the box with the normal quantity of the new oil, and running it briefly at a moderate speed. Drain the box again before re-filling with a fresh quantity of the new oil.



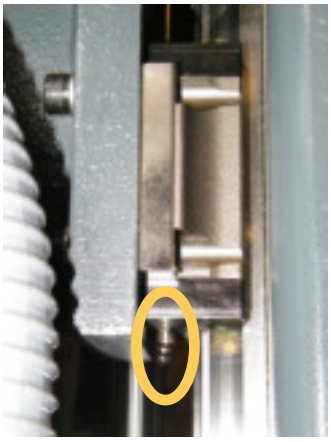
LUBRICATION

The design of the H-26/42 is intended to minimize maintenance, although periodically certain moving parts do require lubrication. We recommend that this periodic lubrication be done once a month using any general-purpose grease. In addition to the grease points shown, vise jaw guides, infeed rollers and bundling assemblies require greasing.

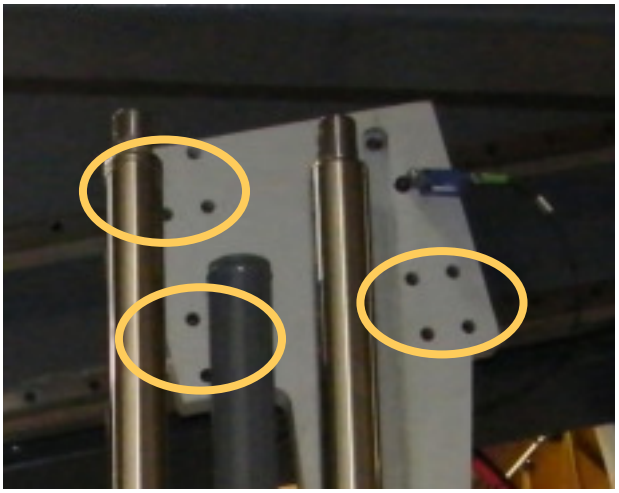
Aux Post - Linear guide block grease nipple



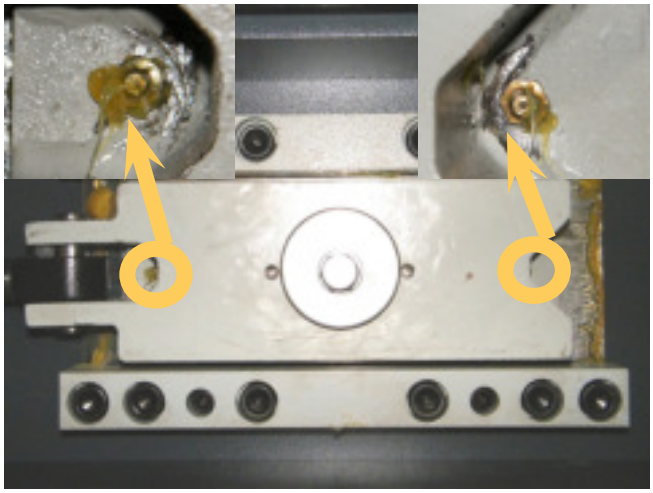
Main Post - Top linear guide block grease nipple



Main Post - Bottom linear guide block grease nipple



Moveable guide arm linear guide blocks



Idler wheel tension slider grease nipple

HYDRAULIC MAINTENANCE

There are only FIVE items of routine maintenance associated with the hydraulic system:

1. OIL FILTER – Ten-micron filtration of the hydraulic oil is provided by a spin-on type filter mounted on the tank return line. The element should be changed after the first 50 Hours of operation and then every 500 working hours. Suitable replacement elements are:

CANFLO	RSE-30-10
GRESEN	K-22001
PARKER	921999
ZINGA	AE-10

2. OIL LEVEL - The oil level should be maintained in the upper half of the level gauge. Normally the rate of oil consumption will be very low and it should be unnecessary to add oil more often than at filter changes. Add oil only to the top line on the gauge. Hydraulic tank capacity is approximately 9.5 US gallons (36 Litres).

NOTE: The H-26/42 is shipped from the factory with TEXACO RANDO HD46 hydraulic oil. Generally any brand of recognized mineral hydraulic oil with the same properties should be compatible with TEXACO RANDO HD46 oil, but to avoid any risk we suggest staying with TEXACO RANDO HD46. If it is desirable to change brands, it is necessary to drain the tank and to fill to 1/3 with the new oil. Operate through several full strokes of each cylinder, drain the tank again, and finally fill the tank with the new brand.

It is recommended to change the oil every 3000 hours of operation on once a year.

Recommended replacement oils:	Chevron	AW Hydraulic Oil 46
	ESSO	NUTO H46
	Mobil	Mobil DTE 25
	Texaco	Rando HD 46
	Shell	Tellus 46

3. OIL TEMPERATURE – Oil temperature is indicated by a thermometer contained in the level gauge. Oil temperature during steady operation should stabilize at about 50-55°F (10-12° C) above room temperature. Thus in a 70° F (20° C) shop one might expect an oil temperature of about 120° F (50°C) Oil temperature should never exceed 160°F (70°C).

4. OIL PRESSURE – Oil pressure is factory set and should not require further attention except precautionary observation at start-up and every few days thereafter.

5. BLADE TENSION – Is preset at the factory and should under normal conditions not require attention. For adjustments, see the hydraulic schematic.

CLEANLINESS

The heavy-duty design should endure heavy operating conditions and provide the customer with flawless machine performance. To extend good performance some care is required especially as cleanliness is concerned.

The following areas should be kept clean:

- Control console free of dirt and grease
- Door charts free of dirt and grease
- Wheel boxes free of chips
- Blade guides free of chips
- Outfeed table free of chips
- A large chip build-up should be avoided in the base of the saw

NOTE: All parts must be cleaned before any repair service can be performed on them.

TROUBLESHOOTING

	PROBLEM		PROBABLE CAUSE		SOLUTION
1	Saw is cutting out of square vertically.	1a.	Blade worn.	1a.	Replace blade.
		1b.	Low blade tension.	1b.	Tension blade.
		1c.	Blade guides.	1c.	Check for worn guides.
		1d.	Excessive feed rate.	1d.	Reduce.
2	Saw is cutting out of square horizontally.	2	Stock not square in vises.	2	Adjust accordingly.
3	Blade comes off wheels.	3a.	Not enough blade tension.	3a.	Reset blade tension.
		3b.	Improper tracking.	3b.	Set tracking.
4	Blade stalls in cut.	4a.	Not enough blade tension.	4a.	Tension blade.
		4b.	Excessive feed force.	4b.	Reduce.
		4c.	Excessive feed rate.	4c.	Reduce.
5	Blade vibrates excessively.	5a.	Blade speed too fast.	5a.	Reduce.
		5b.	Guide arms too far apart.	5b.	Adjust accordingly.
		5c.	Not enough blade tension.	5c.	Tension blade.
6	Excessive blade breakage.	6a.	Excessive blade tension.	6a.	Reduce blade tension.
		6b.	Excessive feed rate.	6b.	Reduce.
7	Tooth strippage.	7a.	Blade pitch too fine.	7a.	Select coarser pitch.
		7b.	Blade brush not cleaning.	7b.	Adjust or replace blade brush.
		7c.	Excessive feed rate.	7c.	Reduce.
		7d.	Excessive feed force.	7d.	Reduce.
8	No coolant flow.	8a.	No coolant.	8a.	Add coolant.
		8b.	Coolant line blocked.	8b.	Blow out coolant line.
		8c.	Coolant pump inoperable.	8c.	Check, replace if faulty.
9	Saw will not start.	9a.	Safety relay is not energized	9a.	1.Ensure all Emergency Stop push buttons are released. 2.Ensure Door interlock switches are not activated.(Close Drive & Idler doors)
		9b.	Motor overload has tripped.	9b.	1. Depress each of the over-load buttons located in the electrical box. Depressing one button at a time and trying to start the saw will indicate which motor was overloaded. 2. Remove cause of the motor overload
		9c.	Control circuit fuse has blown.	9c.	Replace the fuse in the control panel. Random blowouts may occur but a quickly repeated blowout points to an internal wiring fault.
		9d.	Vise or head selector switch not in the center (neutral) position.	9d.	Turn all switches to the center (neutral) position.
10	INTENTIONALLY LEFT BLANK	10		10	
11	Saw starts but no hydraulic functions.	11a.	If blade wheels run clockwise, wrong phase order in power connection to saw.	11a.	Stop immediately; reverse any two of the three phase connections.
		11b.	If pump is noisy cause may be low hydraulic oil level.	11b.	Stop immediately, add hydraulic oil. (See "Hydraulic Maintenance")
		11c.	Pump-motor coupling has separated.	11c.	Adjust accordingly.

PROGRAMMABLE LOGIC CONTROL

Note:
The PLC is equipped with a lithium battery to keep the program stored while the power is shut down. The battery will need to be replaced every 3 to 5 years, depending on the usage. A visual warning will be displayed on the interface when the battery drains to a certain level. Batteries can be purchased through your Hyd·Mech distributor.

The programmable logic control uses signals from limit switches, control panel switches, encoders (rotary shaft or linear) and information that is programmed into it to supply accurate automatic length control and sawing functions.

The inputs used include:

- Machine function switches and push buttons
- A signal from the auto/manual push button (tells the PLC whether auto or manual operation has been selected).

A proximity sensor is mounted through the rear of the idler wheel box. A target for this sensor is mounted on the back of the idler wheel, or, all six spokes of the wheel may be targets to provide blade speed input to the PLC.

The programmed information includes logic put into the PLC by the manufacturer, as well as information programmed into it, through the keypad during assembly. Information from the plant is referred to as the parameters. The parameters are important for the PLC to provide accurate sawing lengths and blade speed display. The following is a description of each parameter and the procedure to access them.

To view the PLC parameters:

Refer to PLC key description in SECTION 2.

PLC PARAMETERS

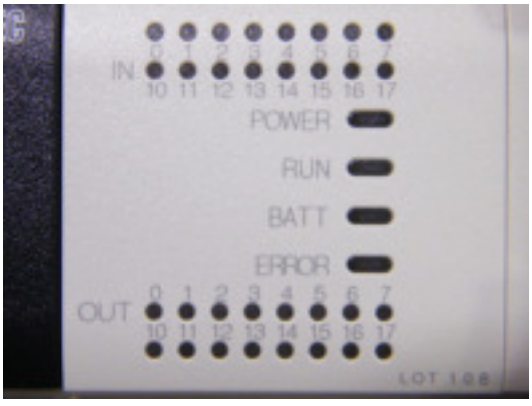
PARAMETER	DEFINITION
ACT HGT	Feed rate display constant value. If the actual feed rate differs from displayed value, enter new Height Constant = old Height Constant x actual feed rate / displayed feed rate.
FVO DWL	Delay time for the opening of the Fixed Vise in seconds.
CLS TIME	Delay time for the closing of the Fixed Vise in seconds.
SPD FCTR	Blade Speed Display adjustment number. If actual blade speed is different than displayed blade speed, a new Speed Constant will need to be calculated. Speed Constant = old Speed Constant x actual speed / displayed speed.
WHEEL TRGS	Number of targets per revolution of the idler wheel. Can be toggled either 1 or 6
BRKN PROX	Allows user to override signal from proximity switch in case it is broken. When set to NO machine will not run with broken proximity sensor. Set to YES allows machine to run, but with out blade speed display, blade breakage, or stall protection.

MITSUBISHI FX3U-32M INPUTS AND OUTPUTS

PLC status indicators:

POWER	On when power exists to the PLC.
RUN	On when the PLC is in run mode. If not, check the run/stop switch. It should be in the run position.
BATT	Battery low voltage. If this LED is on, then replace the PLC battery.
ERROR:	Prog E - Flashing LED indicates a program error.
	Cpu -E - LED on (Solid). Indicates a CPU error.

Input and output terminal identification:
The top row of LED'S correspond to the top row of terminals and the bottom row of LED'S correspond to the bottom row of terminals.



If LED: IN #0 is illuminated, then this corresponds to INPUT X0

If LED: OUT #17 is illuminated, then this corresponds to OUTPUT Y17

Beside each input and output terminal there is a bank of red LED's. Each light corresponds to an input or output. An input LED will light when it's specific input signal is being received at the PLC and output LED's will light when the PLC commands specific outputs. If an output LED is present but the output does not happen, then either the output relay is faulty/stuck or the output (3 amp) fuse is blown. If a fuse is blown, a shorted directional valve coil, shorted noise suppressor at the coil or shorted wiring could be the cause (a good coil will measure between 30 to 40 ohms). If the fuse is good and no output voltage condition still exists, with the output light on, then the relay is defective. If this is the case the PLC will have to be returned to the manufacturer for repair.

FUSES

The PLC outputs are protected with four glass fuses which are mounted on TB1.
Fuse "FU8" is a 2 amp instant blow fuse which feeds power to the input side of the PLC thorough input terminal "L"
Fuses "FU3" to "FU6" are 3 amp time delay fuses which each supply power to a specific bank of output relays through that bank of relays "COM" terminal:

FU3 is wired to terminal "COM1" supplying outputs	-Y0, Y1, Y2, Y3
FU4 is wired to terminal "COM2" supplying outputs	-Y4, Y5, Y6, Y7
FU5 is wired to terminal "COM3" supplying outputs	-Y10, Y11, Y12, Y13
FU6 is wired to terminal "COM4: supplying outputs	-Y14, Y15, Y16, Y17

Problem 1: No Display

Possible Causes:
1. No power to the PLC
2. PLC unit failure
3. Faulty connection of cable between PLC and Interface

Diagnosis:
a. Check the power led. This light should be on when the PLC is switched on.
b. If the light is on, the PLC may have failed. Check for proper connection of the cable at the PLC and at the interface. Also check the PLC fuse.
c. If the fuse is OK, ensure that power is being supplied to the fuse.

Problem 2: No blade speed display

Possible Causes:
1. Fault at the proximity sensor
   a. Bad sensor, misadjusted sensor (the gap should be approx .030" - .040")
   b. Contamination on the end of the sensor.

2. Fault at the PLC
   a.Bad connection of sensor wiring
   b.Faulty PLC unit.

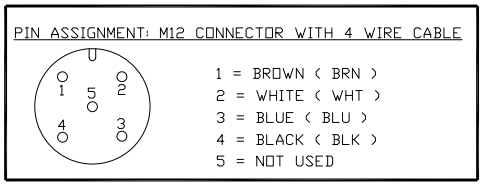
Diagnosis:

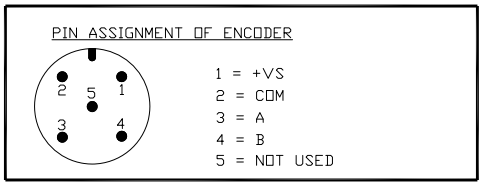
- Check for the LED light on the sensor. The light indicates that the sensor has power and is activated. The problem could be with the sensor, signal wire to the PLC or with the PLC itself. With the blade running, the light on the back of the sensor should "pulse". Likewise, the PLC input LED X2, should also be "Pulsing". If both LED's are pulsing with the blade running, the PLC is the problem. If the sensor is pulsing but the input LED on the PLC is not, there is a problem between the sensor and the PLC unit.

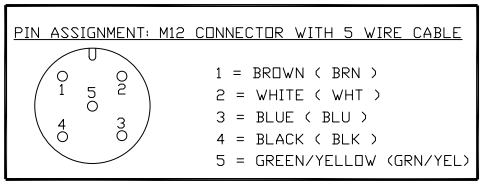
- If the LED on the sensor is not on, the problem is with the sensor wiring or the sensor is at fault.

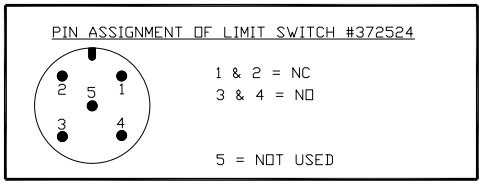
Inputs	X0	Open		X10	Open
	X1	Open		X11	Open
	X2	Blade Speed		X12	Front vise close switch
	X3	Feed rate encoder A		X13	Front vise open switch
	X4	Feed rate encoder B		X14	Head raise switch
	X5	Open		X15	Head lower switch
	X6	Coolant Switch		X16	Blade status
	X7	Coolant Switch		X17	Cycle start
Outputs	Y0	Machine latch		Y10	Front vise close (FVC)
	Y1	Open		Y11	Front vise open (FVO)
	Y2	Open		Y12	Blade motor contactor
	Y3	Open		Y13	Blade Start/Stop
	Y4	Open		Y14	NOT USED
	Y5	Open		Y15	NOT USED
	Y6	Coolant pump on / off		Y16	Head raise (HUP)
	Y7	Cycle on pilot light		Y17	Head lower (HDN)

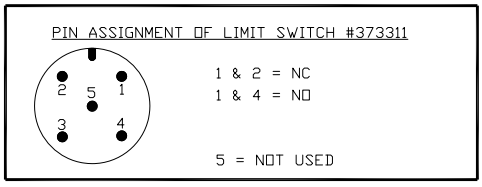
M12 PIN ASSIGNMENTS FOR I/P & O/P DEVICES

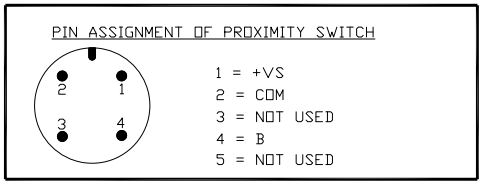












HEAD HEIGHT CALIBRATION PROCEDURE

NOTE:
Head calibration may be achieved in two ways: by inputting “ACTUAL HGT” (actual height) or “HGT CONST” (height constant) parameter.

To determine “Actual HGT” value, the “HGT CLB” (height calibration) procedure must be executed.

1. Enter the PLC parameter screen as per Length Calibration Procedure above.
2. Using the arrow cursor keys scroll down until the screen displays:
3. With the cursor on the word “ENTER”, press the enter key. The cycle start button will begin to flash, the “ENTER” will change to “ON” (indicating self calibration mode) and the head will move to it’s down limit and then will move up to it’s full upper limit.
4. Measure the distance from the vise horizontal wear strip to the blade teeth tips, and enter this value in the ACTUAL HGT parameter. Measurement must be made along the front vise datum jaw. Input this measurement value & press the enter key. Press the AUTO/MAN key to finish the procedure & exit the parameters screen.

NOTE:
To determine if the encoder channels are connected, observe the actual height value parameter for the sign during head up movement while in calibration mode. If the actual height value shows as a negative number, the channels must be reversed and the calibration procedure repeated.

To determine “HGH CONST” value, use this formula;

ACTUAL FEED RATE ÷ Displayed FEED RATE x HGT CONST = new HGT CONST.

5. Input new HGT CONST & press.
6. Press the AUTO/MAN key to exit the parameters screen.

HGT CLB PRESS	ENTER
ACTUAL HGT -	xxxxxx
HGT CONST	xxxxxx

ACTUAL PLC PARAMETERS

PARAMETER	DEFINITION	Current Value
ACT HGT	Feed rate display constant value. If the actual feed rate differs from displayed value, enter new Height Constant = old Height Constant x actual feed rate / displayed feed rate.	
FVO DWL	Delay time for the opening of the Fixed Vise in seconds.	
CLS TIME	Delay time for the closing of the Fixed Vise in seconds.	
SPD FCTR	Blade Speed Display adjustment number. If actual blade speed is different than displayed blade speed, a new Speed Constant will need to be calculated. Speed Constant = old Speed Constant x actual speed / displayed speed.	
WHEEL TRGS	Number of targets per revolution of the idler wheel. Can be toggled either 1 or 6	
BRKN PROX	Allows user to override signal from proximity switch in case it is broken. When set to NO machine will not run with broken proximity sensor. Set to YES allows machine to run, but with out blade speed display, blade breakage, or stall protection.	

SECTION 4 - ELECTRICAL

ELECTRICAL SCHEMATICS: SEE PDF ON ATTACHED CD

SECTION 5 - HYDRAULIC

HYDRAULIC SCHEMATICS & PLUMBING DIAGRAMS: SEE PDF ON ATTACHED CD

SECTION 6 - MECHANICAL ASSEMBLIES

MECHANICAL ASSEMBLY DRAWINGS & PARTS LIST: SEE PDF ON ATTACHED CD

SECTION 7 - OPTIONS

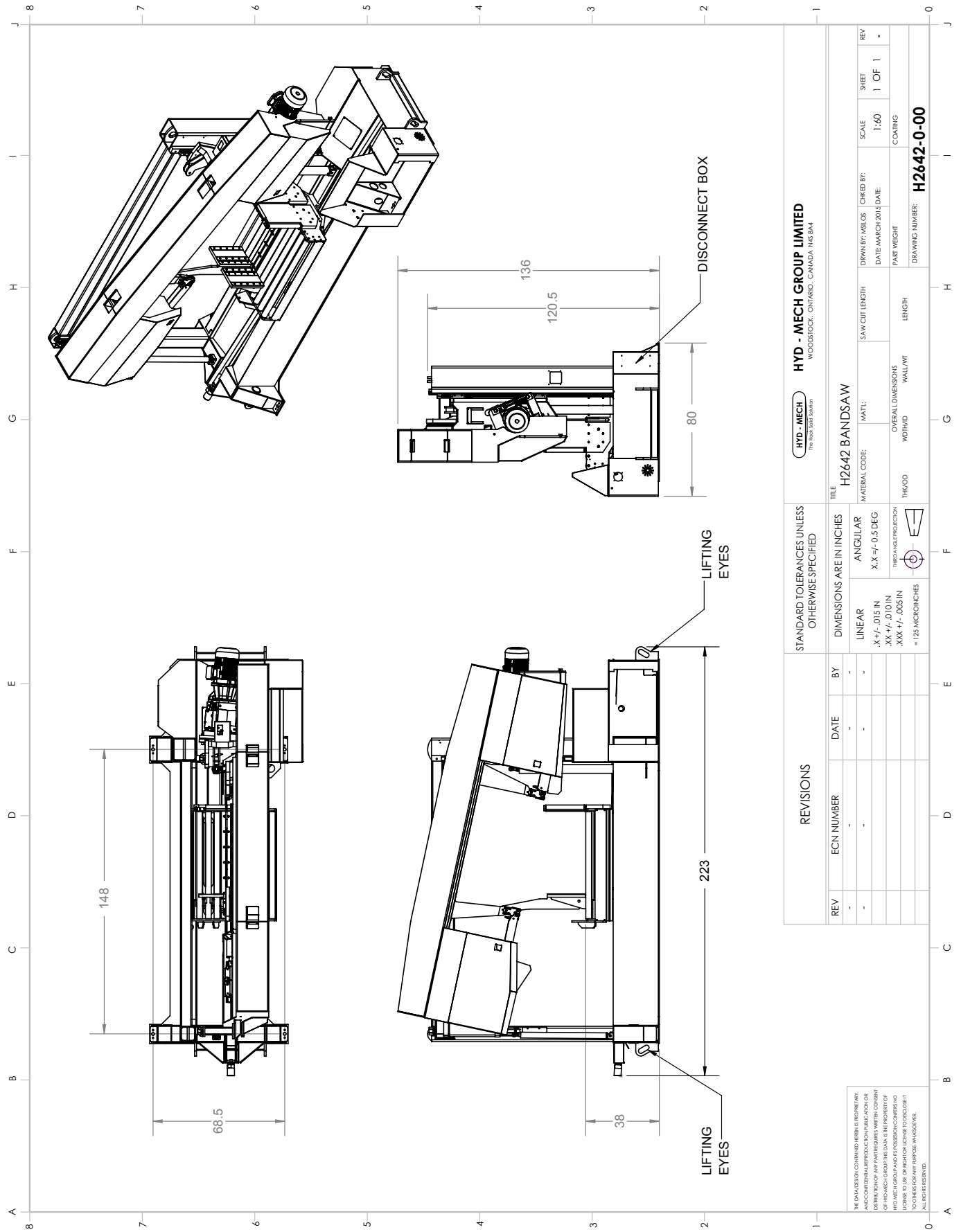
OPTIONAL ASSEMBLY DRAWINGS: SEE PDF ON ATTACHED CD

SECTION 8 - SPECIFICATIONS

H-26/42 SPECIFICATIONS

H-2642 BANDSAW SPECIFICATIONS		
Capacity	Round	30" (762mm)
	Rectangular	26" (660mm) x 42" (1067mm) high
Blade	Length	33' (10060mm)
	Width	2 5/8" (67mm)
	Thickness	.063" (1.6mm)
Blade Tension	Hydraulic	
Blade Speed	VFD	50 - 300 SFM (15 - 91 m/min)
Blade Guides	Carbide inserts (water soluble coolant lubricated)	
Blade Wheel Dia.	38" (965mm)	
Motors	Blade drive	10 HP (7.5 KW)
	Hydraulic pump drive	5 HP (3.7 KW)
Pumps	Hydraulic	6 1/2 U.S. Gal. / min (25 Liters/min) pressure compensated
	Coolant	3 1/2 U.S. Gal. / min (13.5 Liters/min)
Hydraulic Tank	11 U.S. Gallons (42 Liters)	
Coolant Tank	30 U.S. Gallons (114 Liters)	
System Pressure	1300 - 1500 PSI (8970 - 10350 kPa)	
Vise Control	Hydraulic	
Table Height	38" (965mm)	
Machine Weight	28,000 lbs (12700 Kg)	
Maximum Workload	30000 lbs (13608 Kg)	
Overall Dimensions	217" (5511mm) Wide, 82" (2083mm) Long, 137" (3480mm) High	

H-26/42 LAYOUT



SECTION 9 - WARRANTY

WARRANTY

Hyd-Mech Group Limited warrants parts/components on each new H-2642 bandsaw to be free from failure resulting from defective material and workmanship under proper use and service for a period of two years on following the date of shipment from the factory. Hyd·Mech's sole obligation under this warranty is limited to the repair or replacement without charge, at Hyd·Mech's factory, warehouse, or approved repair shop any part or parts which Hyd·Mech's inspection shall disclose to be defective. Return freight must be pre-paid by the user.

This warranty, in its entirety, does not cover maintenance items, including but not limited to lubricating grease and oils, filters, V-belts, saw blades, etc., nor any items therein which show signs of neglect, overloading, abuse, accident, inadequate maintenance, or unauthorized altering.

MOTOR, GEARBOX, PUMP, ELECTRIC COMPONENTS, VALVES, HOSES, FITTINGS, and any other items used in the manufacture of the H-2642 but not originally manufactured by Hyd·Mech are subject to the original manufacturer's warranty. Hyd·Mech will provide such assistance and information as is necessary and available to facilitate the user's claim to such other manufacturer.

Liability or obligation on the part of Hyd·Mech for damages, whether general, special or for negligence and expressly including any incidental and consequential damages is hereby disclaimed. Hyd·Mech's obligation to repair or replace shall be the limit of its liability under this warranty and the sole and exclusive right and remedy of the user.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, WRITTEN OR ORAL, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This warranty may not be changed, altered, or modified in any way except in writing by Hyd-Mech Group Limited

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