

## **H18SV & H22SV**

### **393104**

VALID FOR MACHINES:  
H18SV - #611T onwards  
H22SV - #668T onwards

THANK YOU,

On behalf of everyone at HYDMECH, we would like to thank and congratulate you on your decision to purchase a HYDMECH 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 HYDMECH 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.

HYDMECH 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. HYDMECH reserves the right to discontinue or change specifications or design at any time without notice and without incurring any obligation.

Thank you.

HYDMECH CANADA Corp.  
P.O. Box 1659, 1079 Parkinson Road  
Woodstock, Ontario, N4S 0A9  
Phone : (519) 539-6341  
Service : 1-877-237-0914  
Sales : 1-877-276-SAWS (7297)  
Fax : (519) 539-5126  
e-mail : [info@hydmech.com](mailto:info@hydmech.com)

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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.

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## 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 assess 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

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## 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.

HYDMECH 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 properly 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.

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## 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.

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## 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 workplace 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.

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On HYDMECH 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 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 (Item # 391938)

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 machine's electrical circuits.

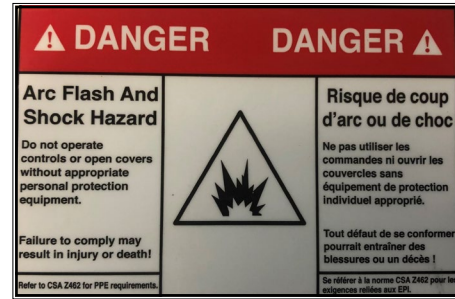
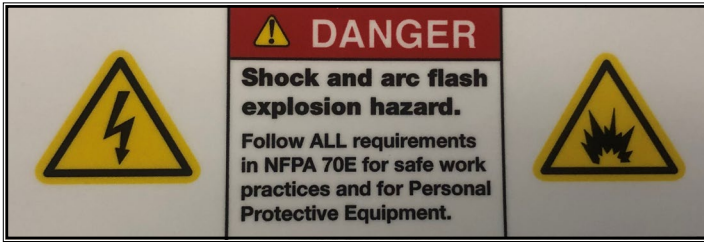
The machine's Electrical Disconnect Switch does disconnect voltage from the machine's circuits; however hazardous voltage is still present inside the main electrical cabinet, on the infeed (line) side of the main fuses. Therefore keep hands and tools away from the infeed side of the control panel main 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.



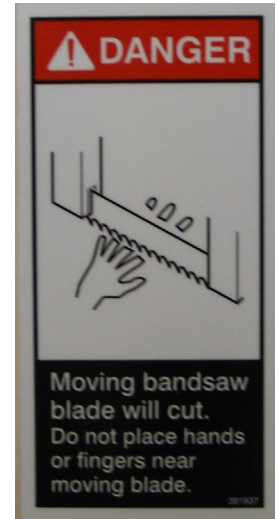
**ARC FLASH HAZARD (Item #395648 and #395647 CSA)**



Do not operate controls or open covers without appropriate personal protection equipment. Refer to NFPA 70E or CSA Z462 for ALL requirements.

**MOVING BANDSAW BLADE WILL CUT (Item #391137)**

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 (Item # 392801)**

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 (Item #391335)**

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.

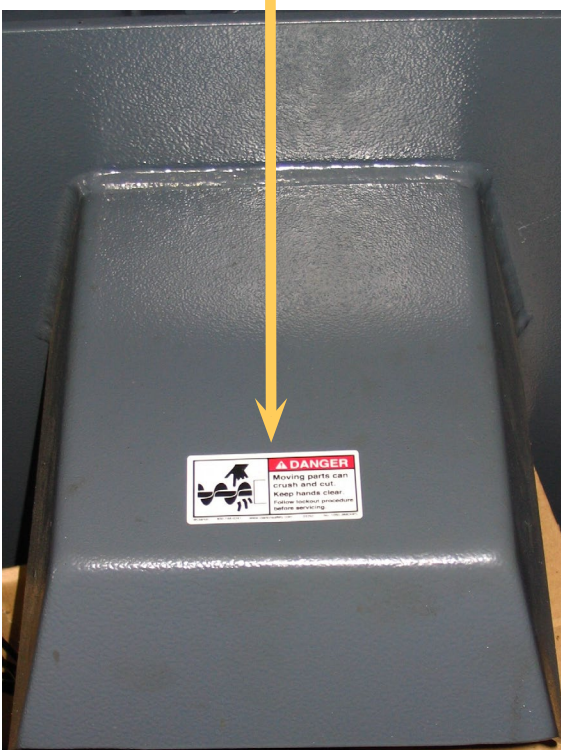






← Item #: 391938

Chip Augar  
Item #: 391335

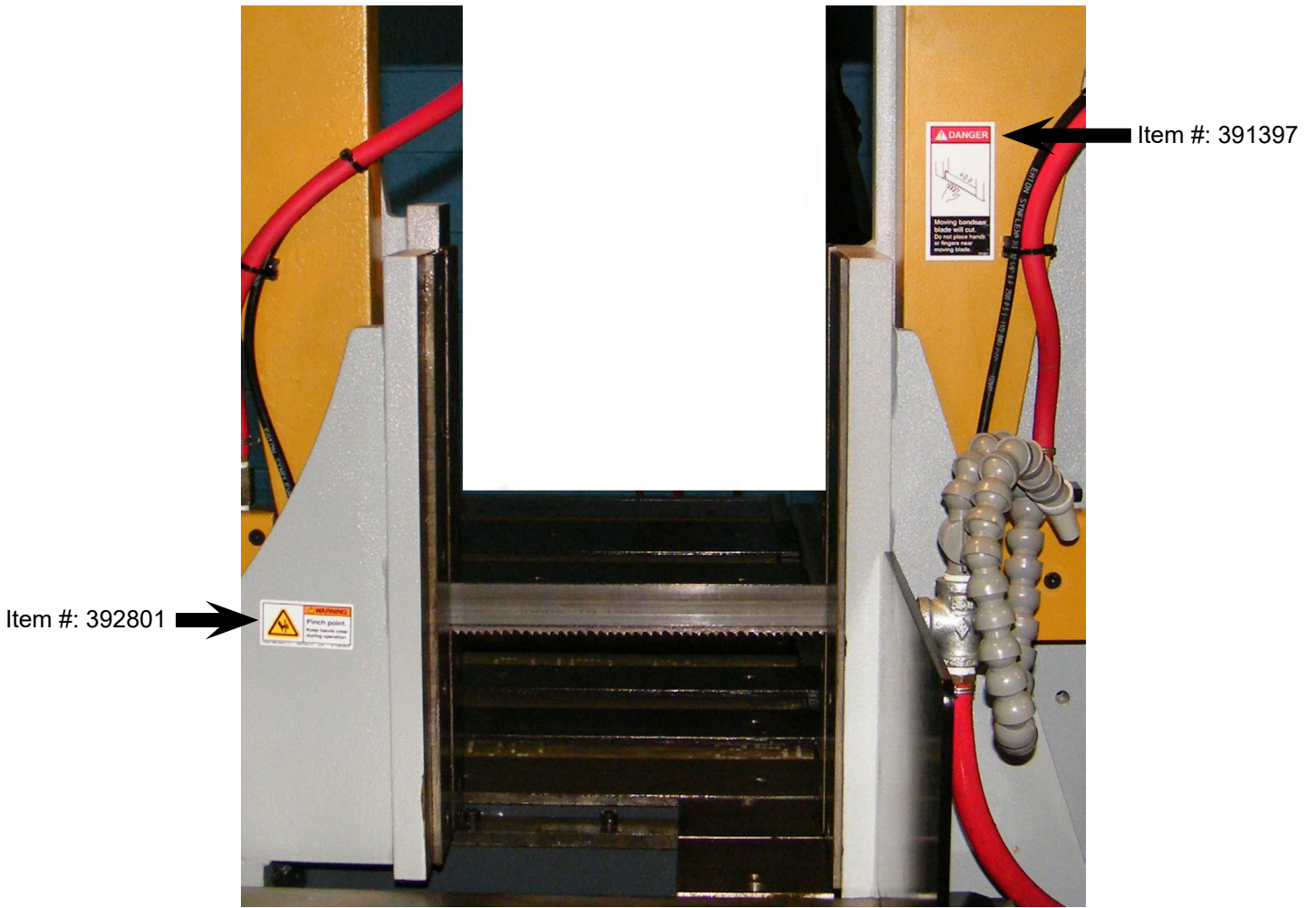


Item #: 391340





Fixed Vise



Shuttle Vise



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# SECTION 1 - INSTALLATION

Upon delivery of your new H-18/22 SV 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 machine 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-18/22 SV 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 HYDMECH. ANY APPROVED MODIFICATIONS SHOULD ONLY BE UNDERTAKEN BY TRAINED PERSONNEL.***



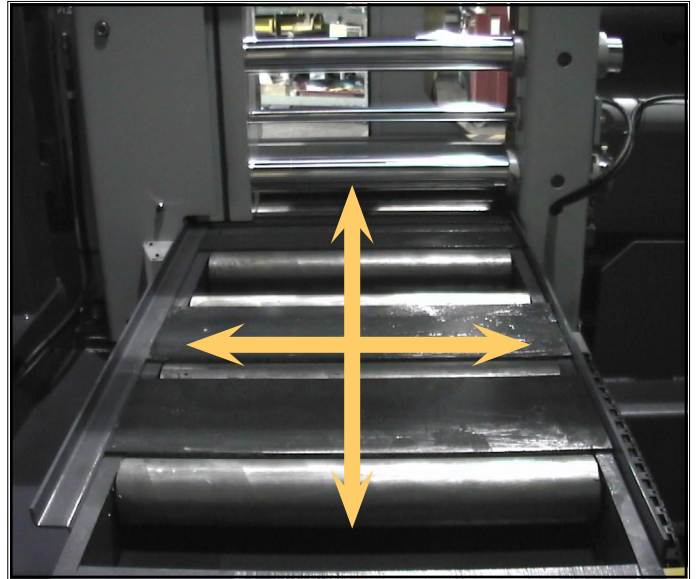


## FOUNDATION, LEVELLING AND ANCHORING

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.

Six 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.

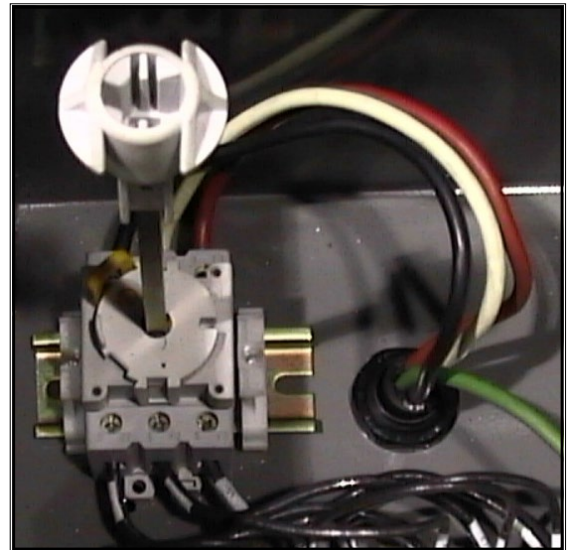
BEFORE START-UP THE FOLLOWING TWO POINTS SHOULD BE CHECKED:

1. Signs of damage that may have occurred during shipping to the electrical cables, conduits 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 at the disconnect switch and Ground terminals in the main electrical box found beside the conveyor on the drive side. For machines equipped with a variable frequency drive unit, an earth ground is also 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.

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## 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 customer's 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-18/22 SV bandsaw is supplied with an AW 46 hydraulic oil. If it is necessary to change the oil to a different brand see the HYDRAULIC SECTION for equivalent grade 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.

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## 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 (like the 4/6 or 3/4 bi-metal blade supplied with the machine) 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 for the H18 infinitely between 50 to 350 SFM(Surface Feet/Minute) (15 to 107m/min) and for the H22, 40 to 300 SFM(Surface Feet/Minute) (12 to 92m/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.

To power up the control panel, the EMERGENCY STOP button must be pulled out. There is a short delay to allow the machine software to load. The interface touch screen will turn on. The MACHINE START key must be pressed to activate the interface, which will also start the hydraulic system. Now all of the control keys have been activated and each key has an LED to indicate which functions are active.

In MANUAL MODE, the operator has the ability to execute a single cut utilizing a pre-programmed SINGLE CUT MODE.

In AUTOMATIC MODE, the PLC has the capacity to program and store 999 jobs. Designated job numbers can be programmed for the quantity required (maximum 999 pieces). Piece lengths range from 0.1” to 500”. Jobs can be run individually or in a QUEUE, which allows a maximum of 10 jobs to run consecutively.

**NOTE:**

If an emergency situation arises during any operation, use the large red mushroom EMERGENCY STOP button located on the control panel to shut down the machine.

**WHEN STARTING THE MACHINE FOR THE FIRST TIME MAKE SURE THAT BLADE IS MOVING IN A COUNTER-CLOCKWISE DIRECTION, AND THAT THE HYDRAULIC PRESSURE IS 1000 PSI (6890kP). IF THERE IS NO IMMEDIATE PRESSURE, SHUT THE SAW DOWN AND CHANGE THE PHASE ORDER.**



**PUSH BUTTON DESCRIPTIONS**



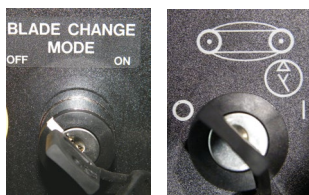
**ENABLE**

The enable button works with the Fixed Vise and Blade Start function as described below. To close the Fixed vise the operator has to simultaneously press the ENABLE Button and the Vise Close key. Releasing either the ENABLE or Vise Close button will stop the vise movement to close. To open the Fixed vise the operator only needs to press the vise open button. To switch from MANUAL to AUTOMATIC MODE the operator will have to close the Fixed Vise first on the material and then press the AUTO button on the interface. If the Fixed Vise Close key is not activated within 15 seconds after pressing the enable button the vise will not close. To start the Saw Blade the operator has to simultaneously press ENABLE and Blade Start keys.



**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.



**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" (I) 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" (O) in order to operate the machine.

## FUNCTION KEY DESCRIPTIONS

<b>MANUAL MODE ONLY CONTROLS</b>	
<b>HEAD CONTROLS</b>	
HEAD UP	Pressing this key will retract the head backward and it will stop and hold its position if the key is released.
HEAD DOWN	Pressing this key will advance the head forward and it will stop and hold its position if the key is released.
<b>SHUTTLE VISE CONTROLS</b>	
SHUTTLE VISE OPEN	Pressing this key will open the shuttle vise and will stop and hold its position if the key is released.
SHUTTLE VISE CLOSE	Pressing this key will close the shuttle vise. To stop and hold its position, press again or press the SHUTTLE VISE OPEN key.
<b>SHUTTLE CONTROLS</b>	
SHUTTLE FORWARD	Pressing this key will move the shuttle to the front (towards the blade) and will stop and hold its position if the key is released.
SHUTTLE REVERSE	Pressing this key will move the shuttle to the back (away from the blade) and will stop and hold its position if the key is released.
SHUTTLE SLOW / FAST	Pressing this key will cause the shuttle to move either fast or slow. The red LED indicates that the shuttle will move FAST. Pressing the key will switch this function back to SLOW.
<b>FIXED VISE CONTROLS</b>	
FIXED VISE OPEN	Pressing this key will open the the fixed vise and will stop and hold its position if the key is released.
FIXED VISE CLOSE	Pressing and holding this key simultaneously with the ENABLE button will close the fixed vise. To stop and hold its position, release either the ENABLE or the Vise Close button.
<b>MANUAL &amp; AUTO MODE CONTROLS</b>	
<b>BLADE CONTROLS</b>	
BLADE START	Pressing this key simultaneously with the ENABLE button will start the blade. 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.
BLADE STOP	Pressing this key will stop the blade.
BLADE SPEED (+)	Pressing this key will cause the blade speed to increase until the key is released or the speed is at the maximum: H18, 350 Surface Feet/Minute (107m/min) H22, 300 Surface Feet/Minute (92m/min) The blade must be running to use this key and the blade speed is shown on the display screen.
BLADE SPEED (-)	Pressing this key will cause the blade speed to decrease until the key is released or the speed is at the minimum: H18, 50 Surface Feet/Minute (15 m/min) H22, 40 Surface Feet/Minute (12 m/min) The blade must be running to use this key and the blade speed is shown on the display screen.



<b>COOLANT CONTROLS</b>	
COOLANT ON	Pressing this key will start the coolant flow.
COOLANT OFF	Pressing this key will stop the coolant flow.
COOLANT AUTO	Pressing this key will cause the coolant to flow only when the blade is running OR when the blade is running and the head is descending. This is selectable via the PLC parameters in the SERVICE MODE.
FLOOD / MIST	Pressing this key will toggle between flood and mist cooling system
<b>MODE CONTROLS</b>	
MANUAL MODE	Pressing this key will enable all of the "MANUAL MODE ONLY CONTROLS."
AUTO MODE	Pressing this key will disable all of the "MANUAL MODE ONLY CONTROLS." To enter AUTO MODE, the operator will have to close the INFEED VISE first on the material and then press the AUTO button on the interface.
SERVICE MODE	The SERVICE MODE allows the user to adjust the various PLC parameters. The user will be prompted for a password. Contact HYDMECH to access this mode.
LASER ON / OFF	Pressing this key will cause the LASER to turn on or off. The red LED indicates that the LASER will be on.
<b>MACHINE &amp; CYCLE CONTROLS</b>	
MACHINE START	Pressing this key will activate the control panel, display, and start the hydraulic system. The EMERGENCY STOP button must be pulled out. This key must be activated to use the machine functions.
MACHINE STOP	Pressing this key will shut down all machine functions including the control display and hydraulic system. The display will not have a backlight on. All jobs will remain in memory as will the QUEUE.
CYCLE START	The user will be prompted by the display to press this key as it is used to initiate an AUTO or SINGLE CUT MODE cycle. Pressing this button will also initiate the QUEUE if pressed when in the QUEUE screen.
CYCLE PAUSE	Pressing this key will pause the CYCLE in progress. If SHUTTLE is in motion and CYCLE PAUSE is activated, the SHUTTLE will complete it's movement and then the CYCLE will PAUSE. To resume the CYCLE, press the CYCLE START key.

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## PLC 100 CONTROL SYSTEMS

NOTE: This instruction manual is applicable to the H-18/22 SV equipped with a MITSUBISHI PLC.

### 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 preprogrammed “Single Part Cycle”.

In automatic mode, the PLC has the capacity to program and store 999 jobs. Designated job numbers can be programmed for quantity required (maximum of 999 pieces) and lengths from 0.1” to 500” (12700mm).

Jobs can be run individually or in a QUEUE which allows a maximum of 10 jobs to run consecutively and the queue can be repeated automatically as well up to 999 times.

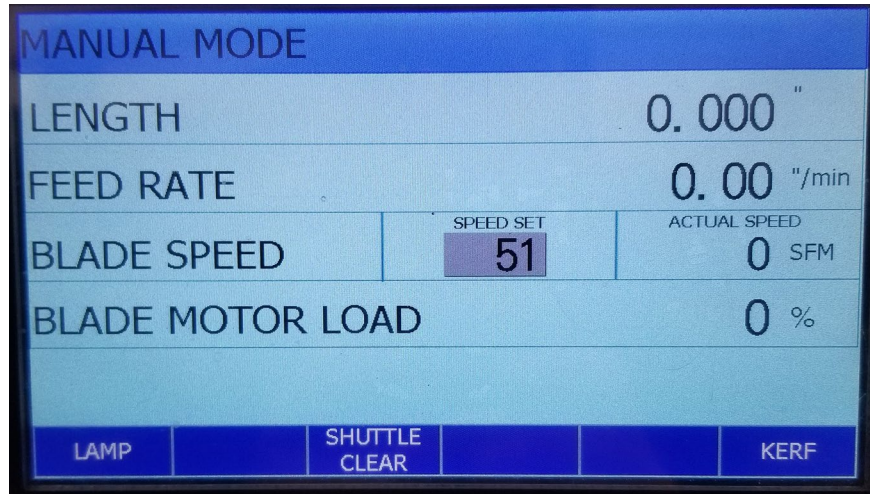
All machine operators should be familiar with the entire operation instructions prior to operating the machine.

NOTE: If an emergency situation arises during any operation, use the large red mushroom “STOP” button located on the control panel to shut down the machine. To operate the machine, the “STOP” button must be pulled out.

---

## ACTIVATING THE PLC

The PLC control will become active when the HYDRAULIC START button is depressed and “held in” momentarily. First, the HMI and PLC’s current revision number will be shown on the display window and finally the MANUAL MODE display window will appear as shown below. The AUTO/MAN green indicator light will be on and all MANUAL controls are enabled. The “LTH” value (shuttle vise position) will always display zero at start up. The “LTH” value can be reset or cleared at any time in MANUAL mode by pressing the CLEAR function button.



## MANUAL MODE FUNCTION KEY DESCRIPTIONS

While in manual mode, the display will show the current function of the unlabelled key. They are shown below.

LAMP - Turns the work light ON/OFF

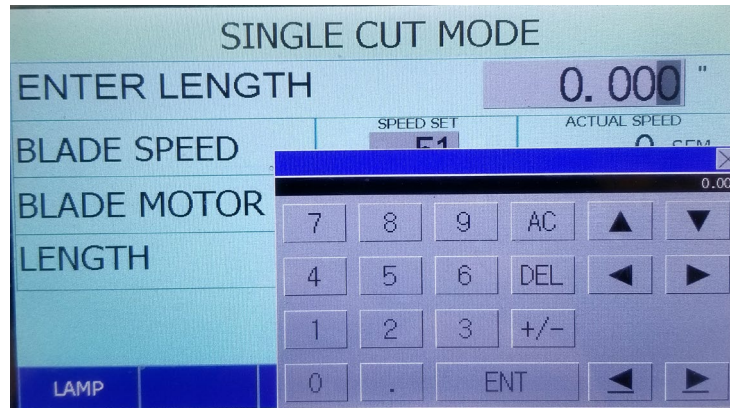
SHUTTLE CLEAR - Resets the length display to 0.000”

KERF - Prompts to enter the Kerf value

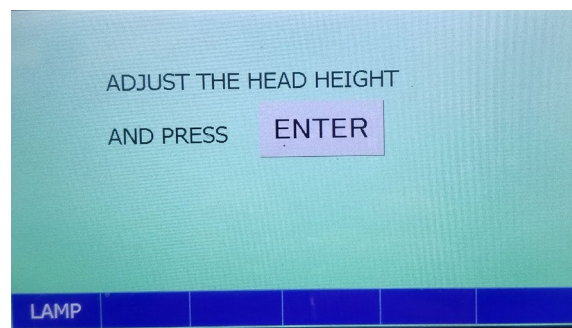
## SINGLE PART CYCLE OPERATION

In MAN mode, the PLC allows the operator to initiate a “Single Part Cycle” to cut one piece at a desired length. To accomplish this, follow the procedure below.

1. A trim cut should be made before initiating the “Single Part Cycle” operation.
2. Simultaneously press the ENABLE and the FIXED VISE Close buttons.
3. Make sure the fixed vise is fully closed on the material.
4. The cursor will be flashing at the LENGTH position. Key in the desired value from 0” to 500” and press enter. If the value is incorrect, re-enter the value and press enter again.



5. If the blade is not running, you will be prompted by the word “BLADE” flashing on the display window. To start the blade simultaneously press the ENABLE and BLADE START push buttons. Adjust the blade speed as required.
6. When the blade is started, the word “BLADE” will change to the word “CYCLE” flashing on the display window. Press CYCLE START push button, and the cycle will begin.
7. After cycle start button is pressed the window to set the head height will be displayed. Using the head up and head down keys on keypad move the head to the required position above the material and press enter on touch screen.



8. Once the head height is confirmed, the shuttle vise will move forward to the home position before executing the length movement. The head will descend and make the cut.
9. When the cut is completed, the blade will stop and the display window will reset for the next cut.
10. To cut another piece, repeat steps 2 through 7.

**NOTES:**

1. To “PAUSE” the “SINGLE CUT CYCLE”, press the “CYCLE START” button. The “CYCLE START” button will begin to flash and the screen will indicate a paused condition. All movements will immediately cease. To continue the cycle, simultaneously press the ENABLE and CYCLE START push buttons again.
2. To cut multiple pieces, switch to AUTO MODE and follow the automatic procedures.

**KERF CORRECTION**

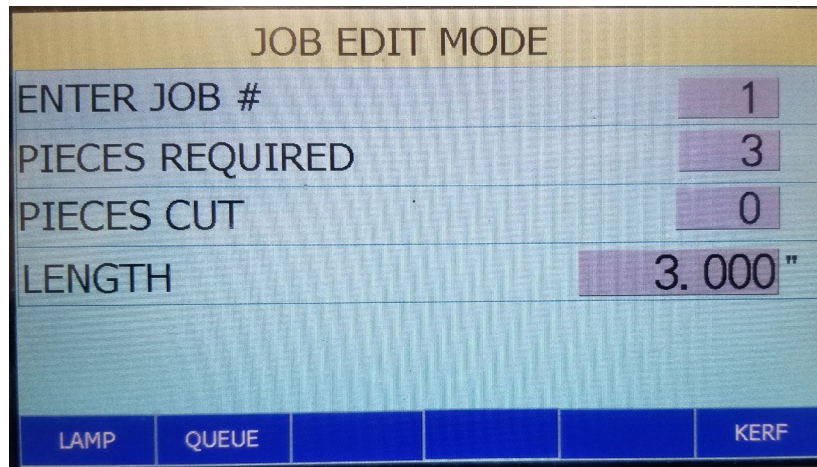
When making cuts, the PLC must account for an amount called the “KERF,” which is the material removed by the blade. This value must be entered into the PLC and must be checked and adjusted as required when the blade has been replaced. This is due to the fact that there is a variance in the kerf value from blade to blade. The original value entered is for the blade installed at the time of manufacture. If the kerf value is to be adjusted, its value can be accessed while in Auto Mode. Press and hold the key below the word “KERF” on the display until the display appears as shown. Enter the desired kerf value and press enter.



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## AUTOMATIC OPERATION

When the FIXED VISE Closed is activated and the AUTO key is pressed, the screen will change to the JOB display window as shown below and be ready for editing or starting a new job. All manual functions will be disabled.



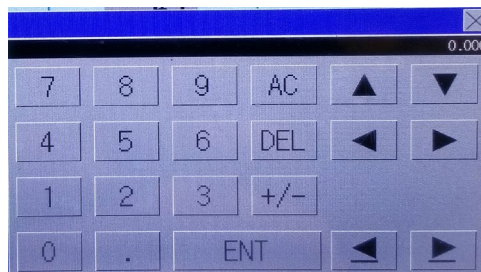
The screenshot shows a screen titled "JOB EDIT MODE" with a light blue background. It contains four rows of input fields with grey boxes for editing values:

Parameter	Value
ENTER JOB #	1
PIECES REQUIRED	3
PIECES CUT	0
LENGTH	3.000"

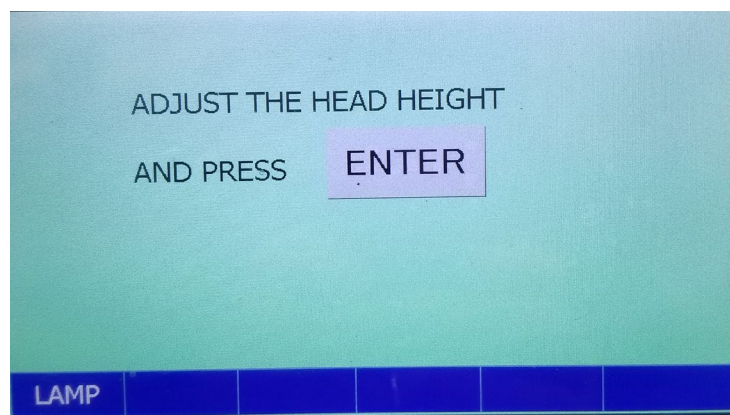
At the bottom of the screen, there is a blue bar with several buttons: "LAMP", "QUEUE", a blank space, another blank space, and "KERF".

### PROCEDURE FOR EDITING OR STARTING A NEW JOB IN AUTO MODE

1. In AUTO mode, key in a job number from 0 to 999 and press enter. The REQUIRED QUANTITY (RQ), LENGTH (LTH) and QUANTITY CUT (CT) will be displayed. The values displayed can be edited by touching the grey box with displayed value. It will prompt the entry key pad to be displayed allowing to key required value.



2. After the values are entered, press the CYCLE START push buttons you will be prompted to set the head height and the to start the blade.



3. Simultaneously press the ENABLE and BLADE START push buttons. After starting the blade, the head will descend for the cut and the machine will complete the required job. The screen will change to AUTO MODE CYCLE displaying the job status.

AUTO MODE CYCLE			
JOB #	1	IS IN PROGRESS	
PIECES REQUIRED			3
PIECES CUT			0
LENGTH			3.000 "
FEED RATE			15.78 "/min
BLADE SPEED	SPEED SET	51	51 SFM
BLADE MOTOR LOAD			57 %
LAMP			

4. At the completion of the job, the machine will shut down if "0" has been entered in the "POWER DWN TIMER" parameter or continue running for the specified time up to a maximum of 180 minutes and will switch to MANUAL MODE

**NOTES:**

The AUTO cycle may be exited and stopped at any time by pressing the MAN key.

Before entering "AUTO MODE" and working with a "QUEUE", follow the same procedures outlined on the previous page for "SINGLE PART CYCLE OPERATION" with regards to setting up for an initial trim cut.

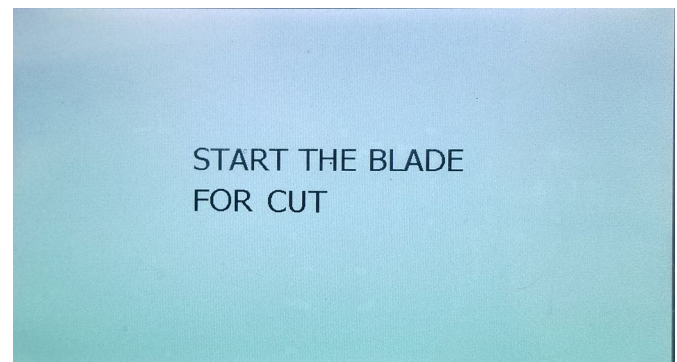
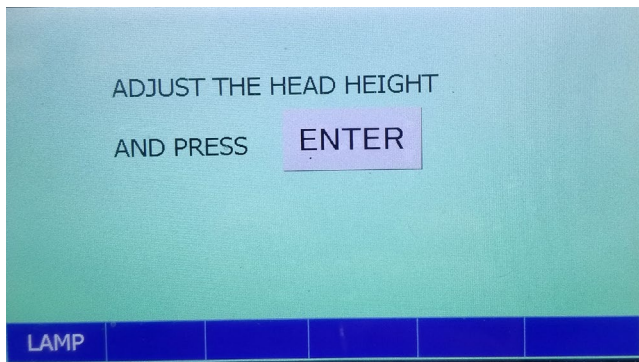
## WORKING WITH A QUEUE

The purpose of a QUEUE is to allow the operator to run several jobs (max of 10) in series if they are of the same material and shape.

In AUTO mode, press the key below the word "QUE" on the display and the display window will appear as shown.

JOBS TO BE EXECUTED IN QUEUE					
JOB IN QUEUE	JOB#	QTY. Req	QTY. CUT	LENGTH Req	JOB
1	1	123 pcs	0 pcs	5.000 "	
2	13	123 pcs	0 pcs	10.000 "	
3	14	123 pcs	0 pcs	15.000 "	CLEAR QUEUE
4	15	123 pcs	0 pcs	20.000 "	
5	16	123 pcs	0 pcs	25.000 "	QUEUE REQ.
6	123	123 pcs	0 pcs	30.000 "	12
7	124	123 pcs	0 pcs	35.000 "	QUEUE CUT
8	125	123 pcs	0 pcs	40.000 "	12
9	126	123 pcs	0 pcs	100.000 "	
10	999	123 pcs	0 pcs	500.000 "	

To run the QUEUE as it is displayed (jobs may be edited in this mode), press the CYCLE START button on the control panel. You will be prompted to set the head height and start the blade.



If you choose to edit the QUEUE, press the key below the words "CLEAR QUE" on the display. This will clear any jobs that are in the QUEUE and the display window will show an empty Queue. Jobs may be entered and edited in this mode.

To fill the QUEUE, follow these two steps.

1. Key in a job number. If that job number has previously been programmed, its values will be displayed. Up to five jobs may be in the QUEUE at any time. The job values can be edited in this mode.
2. When the desired jobs have been entered, you may press CYCLE START key on the control panel to execute the jobs in the QUEUE.  
(Follow the instructions on the screen)

At completion of the "QUEUE," the machine will shut down if "0" has been entered in the "POWER DWN TIMER" parameter or continue running for the specified time up to a maximum of 180 minutes.



## SHUTTLE EMERGENCY STOP

A second emergency stop push button is mounted to the shuttle above the shuttle vise cylinders. 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.



## 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)



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.

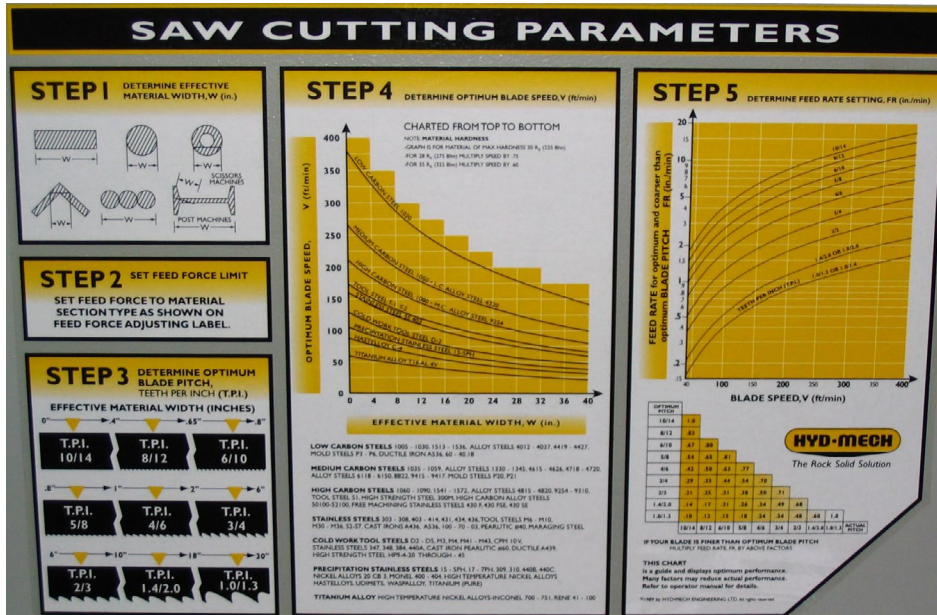
Fine metering valve should be used

- 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.



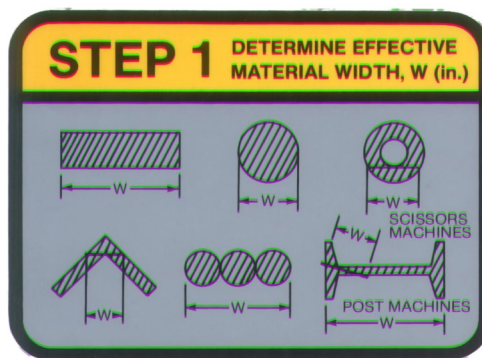
Saw Cutting Parameters Chart

## 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:

- 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).

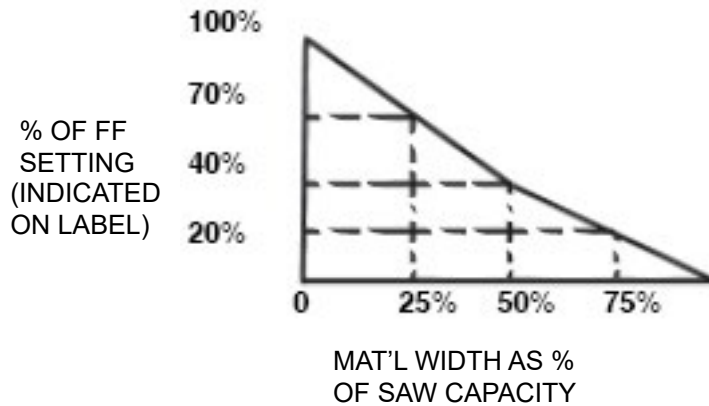
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## STEP 2: SET FEED FORCE LIMIT

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.

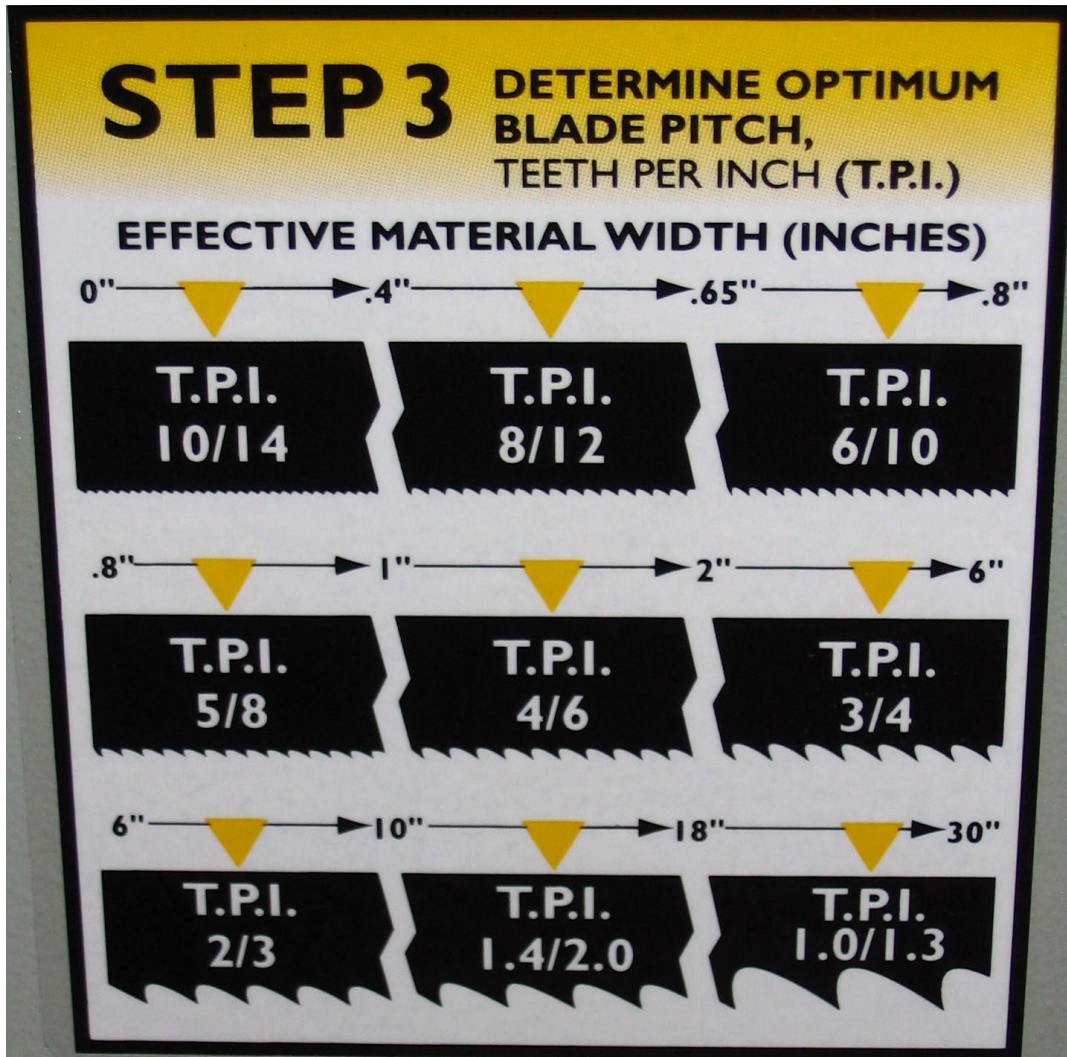
**CUTTING STRUCTURALS:** A reduced Feed Force Setting is used when cutting structurals.

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**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)

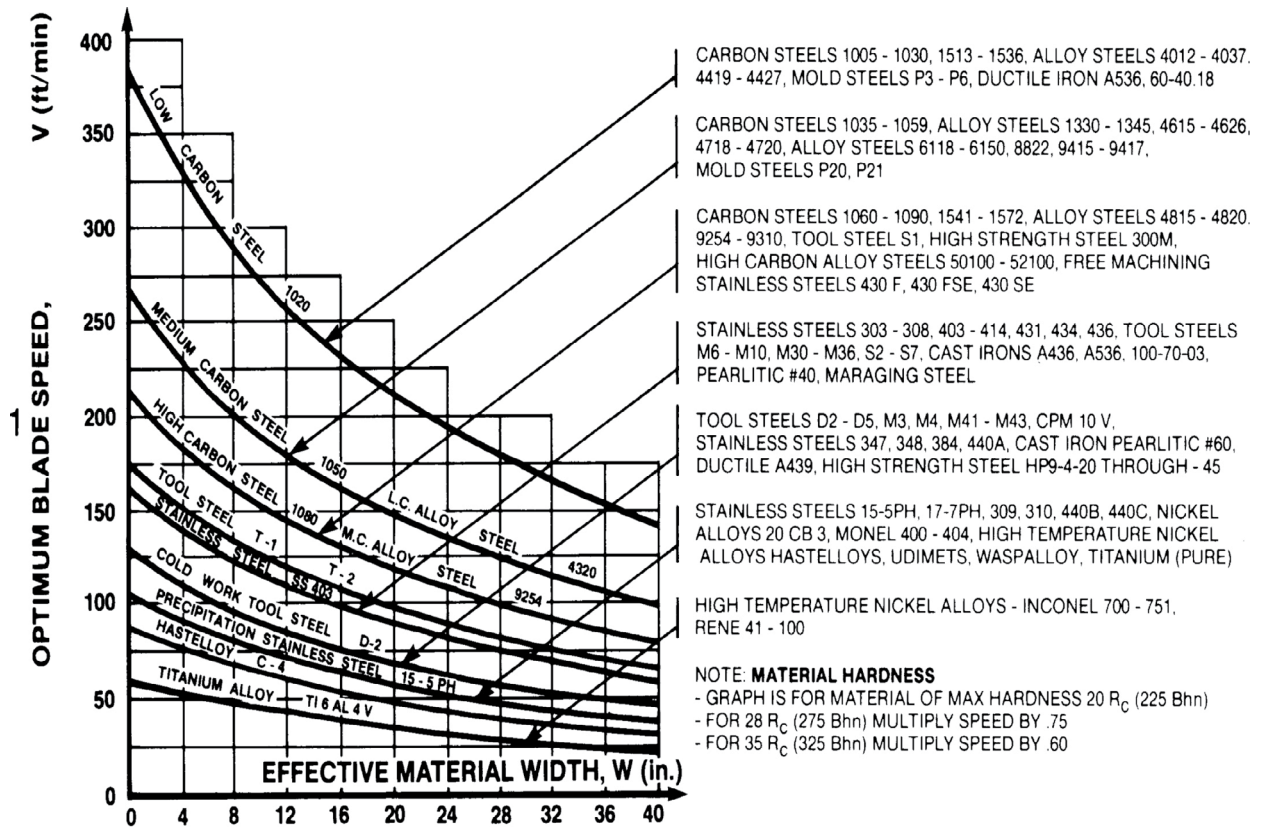
It is impractical to change the blade to the proper pitch every time a different width of material is cut and it is not necessary, but remember that the optimum blade will cut most efficiently. Too fine a blade must be fed slower on wide material because the small gullets between the teeth will get packed 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

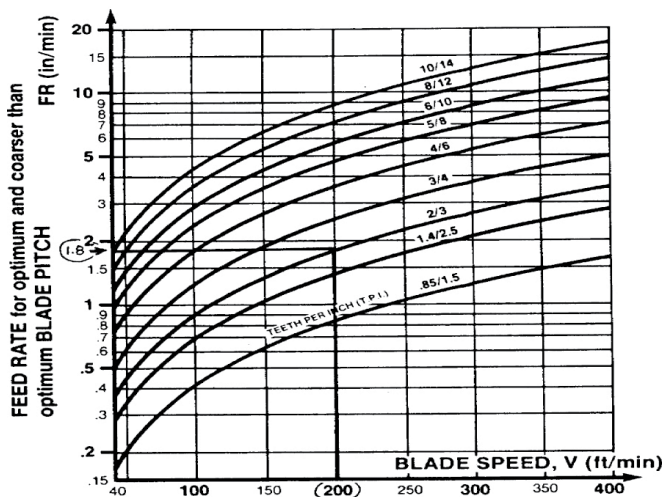
Materials and Blade Speed

**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 PITCH											ACTUAL PITCH	
10/14	1.0											
8/12	.83											
6/10	.67	.80										
5/8	.54	.65	.81									
4/6	.42	.50	.63	.77								
3/4	.29	.35	.44	.54	.70							
2/3	.21	.25	.31	.38	.50	.71						
1.4/2.5	.17	.20	.25	.31	.40	.57	.80					
.85/1.5	.10	.12	.15	.18	.24	.34	.48	.60	1.0			
	10/14	8/12	6/10	5/8	4/6	3/4	2/3	1.4/2.5	.85/1.5			

**IF YOUR BLADE IS FINER THAN OPTIMUM BLADE PITCH  
MULTIPLY FEED RATE, FR, BY ABOVE FACTORS**

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)

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## 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.



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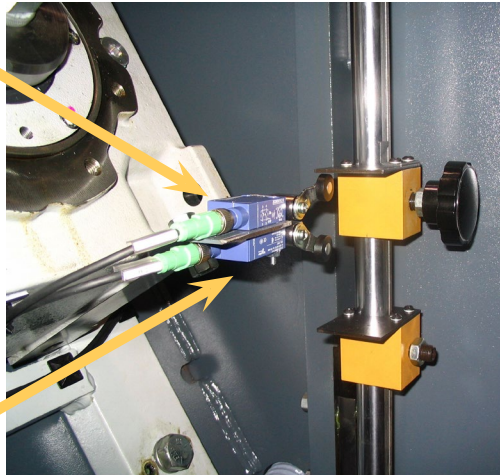
## HEAD UP and DOWN LIMIT SETTING

The head up limit is used to restrict the distance the head travels for each stroke. It can be adjusted at any time by moving the switch trip plate to any position on the vertical bar. The trip plate & switches are found behind the head on the drive end near the gear box.

**Head Up Limit:** In order to maximize production in the automatic, cycle the Head Up Limit should be set to just clear the height of the material.

**Head Down Limit:** This limit is factory set and under ordinary cutting requirements should not be changed. If changed, it may cause the machine to malfunction in the automatic cycle.

HEAD UP  
LIMIT SWITCH



HEAD DOWN  
LIMIT SWITCH

NON CANTED HEAD



6 DEGREE CANTED HEAD  
HEAD DOWN L/S MOUNTED ON  
MOVEABLE GUIDE ARM

## 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.

Variable vise pressure  
read-out gauge

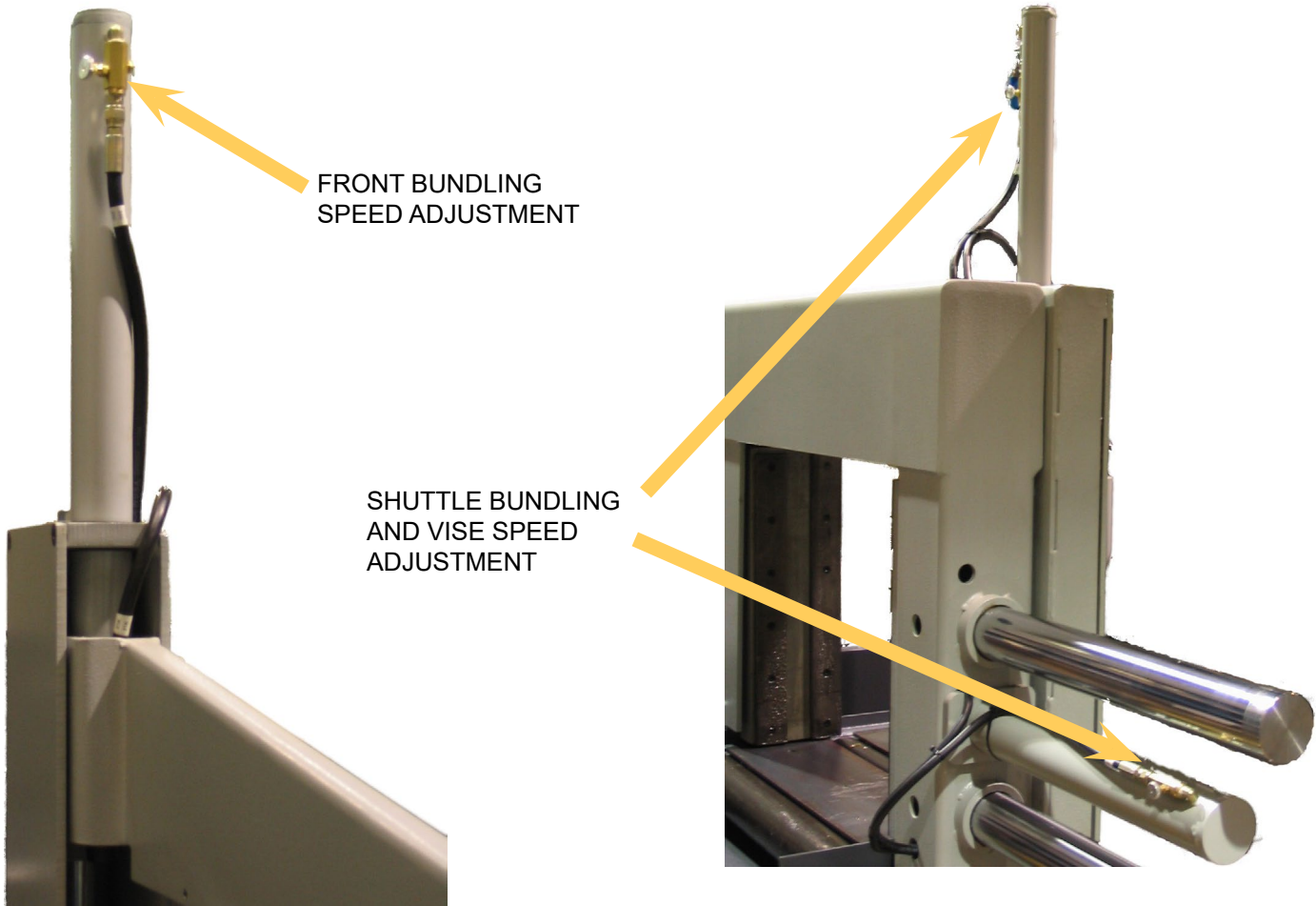


Variable vise pressure controls

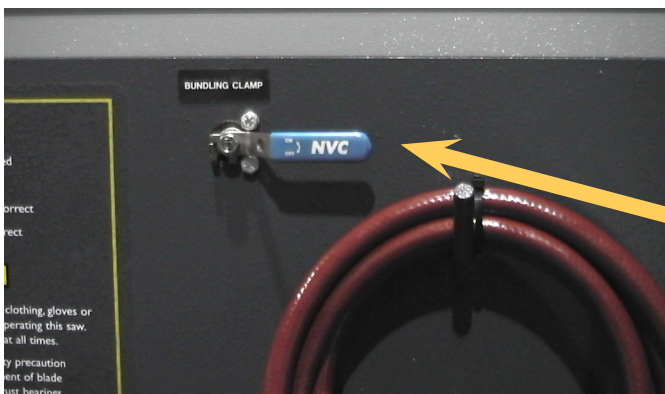


## BUNDLING OPERATION (OPTION)

The bundling vises can be operated in direct conjunction with the front and shuttle vises or at a slower clamping speed. Either bundling can be turned on or off at any time. The on / off valves are shown in the photos. The speed at which the bundling jaws open and close can be adjusted as required by turning the flow control valves (shown in the photos) for each bundling cylinder.



FRONT VISE SPEED ADJUSTMENT (LOCATED ON BACK OF IDLER SIDE)



FRONT BUNDLING ON/OFF VALVE LOCATED ON FRONT OF MACHINE

# 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 FEEDER power which supplies power to the machine and which is connected to the machine via the Power Junction Box (see picture below) 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. 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.
5. 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.
6. Work on the locked-out machine may now proceed.



H18 & H22  
MACHINE DISCONNECT SWITCH USED FOR SAFETY  
LOCKOUT PURPOSES

Machine Power Disconnect located on the lid of the machine control box.

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

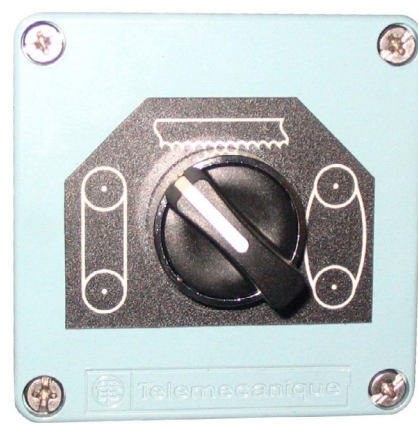
Wear safety glasses, gloves, and a long sleeve shirt for protection when handling band saw blades during blade change. NOTE THAT GLOVES SHOULD NEVER BE WORN NEAR A RUNNING BANDSAW BLADE. When handling new blades, or ones that will be re-used, it is important to keep the teeth out of contact with concrete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

This machine is equipped with a hydraulic blade tension selector switch and a 'Blade Change Mode' key switch, located on the operator control panel. The description of the switch functions will either be in English or portrayed as a pictogram. (See pictures below)

The blade change mode keyswitch has two positions:

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

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





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## 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 ' - '. The blade tension switch also opens and closes the hydraulic blade guides. 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 and the blade guides have fully opened.
  2. Insert the lower strand of the new blade into the blade guides and briefly turn the blade tension switch to the '+/RUN' position. This will close the hydraulic guides and assist in holding the blade in the 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 machine leaves the factory, but it wears out during operation and needs to be readjusted 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 setscrew counterclockwise 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 3" diameter. Replacements can be purchased through your HYDMECH Dealer.

H18 SV  
BLADE BRUSH



H22 SV  
BLADE BRUSH



## BLADE TRACKING ADJUSTMENT

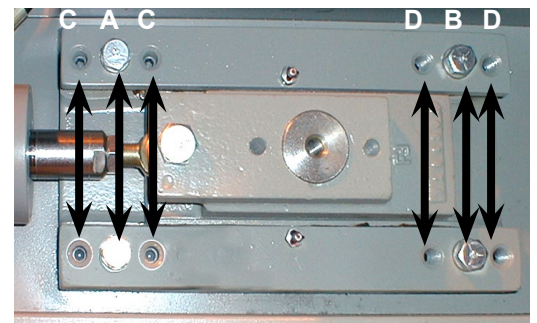
For an H-18, blade tracking is set so the teeth of the blade protrude  $.260 \pm .01$ " ( $6.6 \pm .25$ mm) from the face of the wheels. For an H-22, blade tracking is set so the teeth of the blade protrude  $.310 \pm .01$ " ( $6.6 \pm .25$ mm) from the face of the wheels.

## IDLER WHEEL TRACKING

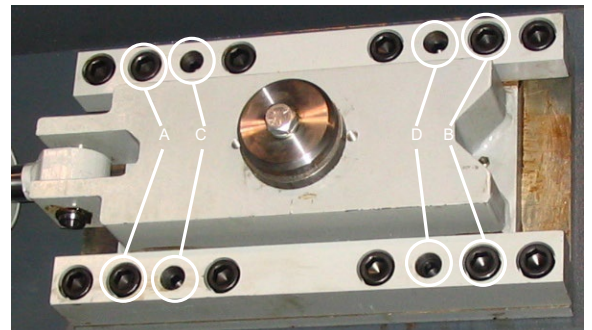
Release blade tension before adjusting. Adjust tracking by regulating "push" set screws and "pull" bolts. Loosening bolts "A" and turning in set screws "C" by equal amounts will move the blade OFF the wheel. Loosening bolts "B" and turning in set screws "D" by equal amounts will move the blade ON to 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.

Note: Check the proximity sensor distance from the wheel target or spokes before starting the blade drive. Failure to do so may result in damage to the sensor.

H18 SV



H22 SV

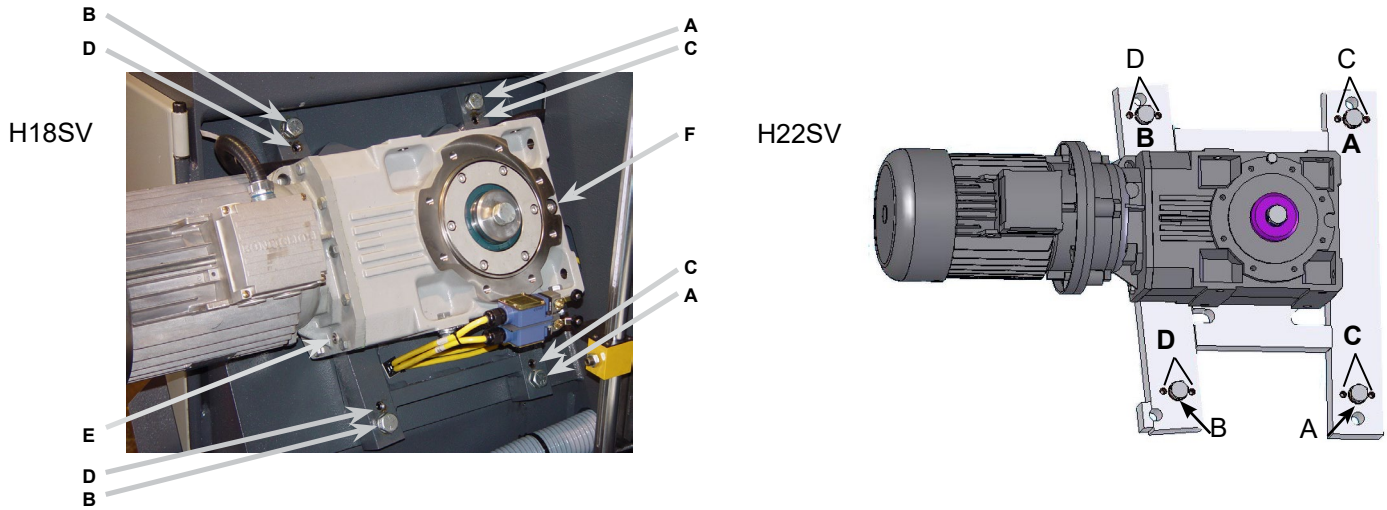


Idler wheel tracking bolts & set screws



## DRIVE WHEEL TRACKING

Release blade tension before adjusting. 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.



## GEARBOX LUBRICATION (H-18ASV WITH A503 GEARBOX, H-22ASV WITH A603 GEARBOX)

The Bonfiglioli A503 gearbox used on the H18 is supplied with 8.4 litres (2.22 US gallons) of Shell Omala S4 WE 320 synthetic oil. This oil has an ISO Viscosity Grade of 320 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 H18 and H22 saws, the correct oil level is about 1 inch below the level plug, F, shown in the illustration.

**Note: The H-22ASV with the A603 gearbox requires 15 litres (3.96 US gallons) of Shell Omala S4 WE 320 synthetic oil.**

The suggested oil change interval is given below:

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

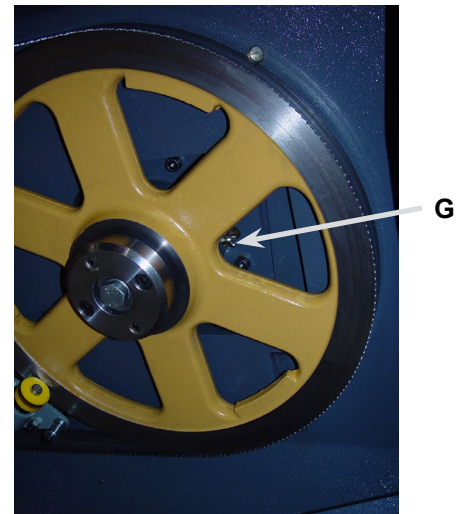
Oil can be changed by draining through plug, E, and filling at plug F. If the type of oil is being changed, it is advisable to flush the old oil by filling the box with the normal quantity of the new oil, running it briefly at moderate speed, and then draining the box again, before re-filling it with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

## OUTPUT SHAFT LUBRICATION

**Always follow Lock-out Procedures before performing this lubrication.**

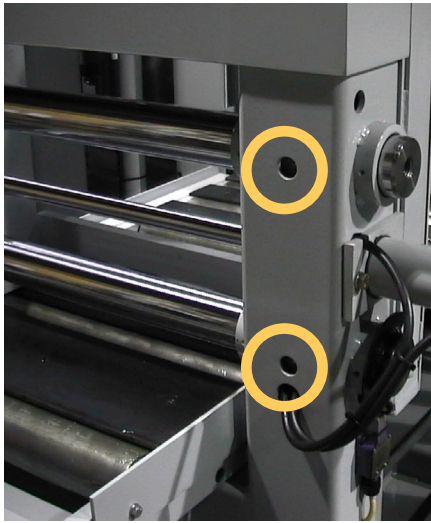
Band tension load is carried by a grease lubricated spherical bearing. A grease fitting is accessible through the spokes of the blade wheel, as shown at point G in the accompanying illustration. Lubricate once per year with 30 ml [1 fluid ounce] of NLGI Class 2 Lithium base mineral oil grease. This quantity represents about 20 to 30 strokes of a typical hand grease gun.

Vise jaw guides, infeed rollers and bundling assemblies also require periodic greasing.

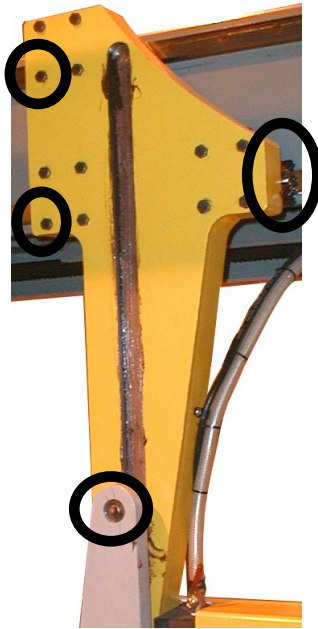


## LUBRICATION

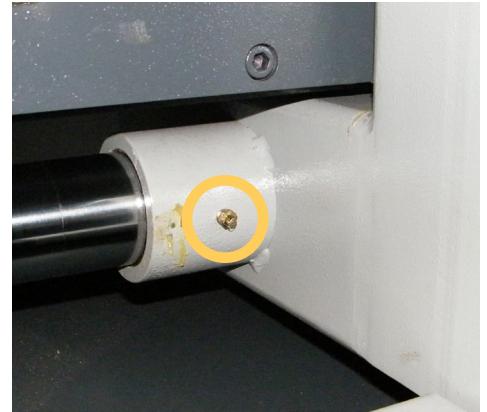
The design of the machine was intended to minimize maintenance, although periodically certain moving parts need lubrication. We recommend that this periodic lubrication be done once a month using any general purpose grease. In addition to the grease points shown, vise jaw guides, in-feed rollers and bundling assemblies require greasing.



2 SHUTTLE VISE GREASE NIPPLES



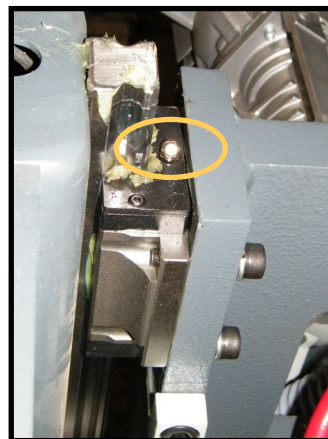
4 GUIDE ARM GREASE POINTS



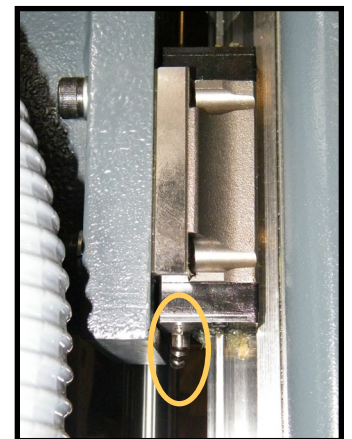
2 SHUTTLE  
SHAFT BEARING HOUSINGS



IDLER WHEEL TENSIONER  
(ONE AT BOTH ENDS)



Head Linear Guide Blocks  
x3



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## HYDRAULIC MAINTENANCE

1. OIL FILTER- Ten micron filtration of the 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. See section 5 for replacement filter element information.

2. HYDRAULIC OIL- Machine hydraulic reservoir is filled with mineral oil AW 46. In case of changing the brand, hydraulic system should be drained and thoroughly flushed. Following is a list of recommended replacement oils:

- TEXACO RANDO HD 46
- CHEVRON ECO Hydraulic oil AW ISO 46
- MOBIL DTE 25
- ESSO NUTO H46
- SHELL TELLUS OIL 46

3. HYDRAULIC OIL LEVEL - 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 if at all.

4. HYDAULIC OIL CHANGE - Oil visual inspection should be conducted with every filter change for following signs of degradation:

- Milky or hazy oil color
- Burnt smell
- Varnish or sludge formation
- Increased viscosity

**If one of the above is observed then oil should be changed. It is recommended to change oil after every 6000 hours of operation or every 2 years.**

5. OIL TEMPERATURE - Oil temperature is indicated by a thermometer contained in the level gauge. Oil temperature during steady operation should stabilize at about 50-55F (28-31 deg C) above room temperature. Thus in a 70F (21 deg C) shop one might expect an oil temperature of about 120F (49 deg C). Oil temperature should never exceed 155F (68 deg C).

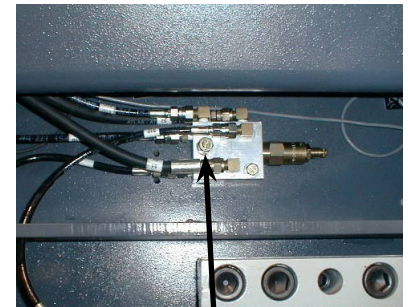
6. HYDRAULIC PRESSURE - Hydraulic pressure is factory set and should not require any further attention. For correct pressure see hydraulic schematic.

7. BLADE TENSION – Blade tension pressure is factory set and should not require any further attention. For correct pressure see hydraulic schematic.

8. CARBIDE PRESSURE - Carbide lock pressure is factory preset:

- H-18SV 300 – 400 PSI
- H-22SV 150 – 200 PSI

The pressure gauge is not provided. There is a separate port to hook up a gauge if setting needs to be verified or corrected.



Gauge Port

## 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.
- Out-feed 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.	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.
		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	Saw starts but will not run after Start button has been released.	10	On machines so equipped, the out-of-stock or blade breakage limit switch has been tripped.	10	Reload with stock or reset the blade. Hold the hydraulic start button and release the blade tension or open vises far enough to deactivate the limit switch.
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.
<b>IN MANUAL MODE</b>					
12	No individual function will respond to its manual control switch.	12a.	Observe pilot light(s) on relevant valve. If pilot light fails to go on, problem is electrical.	12a.	This requires the attention of a qualified service person.
		12b.	If pilot light related to inoperative function does light, problem may still be the coil . If problem remains it may result from dirt in the valve spool.	12b.	Disassembly of hydraulic valves should be under taken only by qualified service personnel or those knowledgeable with hydraulic components.
13	Head will not descend.	13a.	Feed Rate Valve is fully closed - pointer is set on "0" or close to "0" in/ min.	13a.	Turn Feed Rate Knob in a counter clockwise to open valve.
		13b.	Feed Force Limit is set too low.	13b.	Increase Feed Force Limit.
		13c.	Check for physical interference preventing the head from falling.	13c.	Remove obstructions.
<b>IN AUTOMATIC MODE</b>					
14	Auto cycle will not start.	14a.	No job queue programmed to run.	14a.	Enter job numbers(s) and job data as described in Section 2.
		14b.	Pieces required equals pieces cut.	14b.	Clear pieces cut.



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## 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 HYDMECH 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:

- Head down limit switch
- 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).

An encoder is attached the shuttle assembly and travels with the shuttle to provide length information to the PLC. 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.

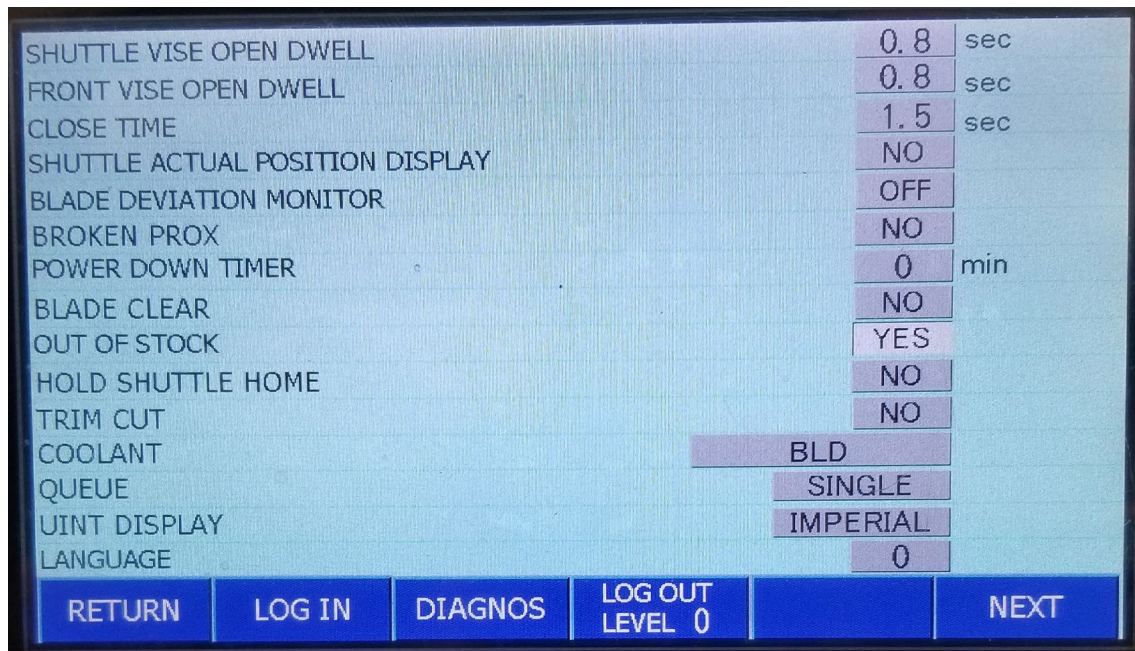
The programmed information includes logic put into the PLC by the manufacturer, as well as information programmed into it, through the keypad during assembly. Information from the plant is referred to as the parameters. The parameters are important for the PLC to provide accurate sawing lengths and blade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

To view the PLC parameters:

In manual mode, press the Service Mode key on the keypad. The PLC will display the parameters on the HMI screen. At this level you can review and edit the following parameters:

- Broken Proxy
- Unit Display

To edit the other parameters you will need to login by pressing LOG IN on the touch screen. The PLC will display the numeric keypad to enter password. The PLC password can be obtained from the HYDMECH Service Dept.



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## PLC PARAMETERS

### BLADE SPEED CONST

Blade speed adjustment number. If the actual blade speed is different than the displayed blade speed, a new speed factor will need to be calculated.  $\text{Actual speed} \div \text{display} \div \text{adjustment factor} \times \text{existing speed factor} = \text{New Speed Factor}$

### BLADE DEVIATION

Enables Blade Deviation function for machines equipped with blade deviation sensor

### BLADE MOTOR FLA

Blade motor FLA value in Amperes

### BLADE MINIMUM SPEED

Blade minimum speed in Surface Feet / Minute

### CANTED HEAD

For canted head machine parameter is set to YES

### SHUTTLE LENGTH CONSTANT

Length constant. Specifies linear distance of shuttle movement in inches per one pulse of shuttle encoder.

### SHUTTLE ACCELERATION DISTANCE

Shuttle acceleration distance. Distance, in inches, the shuttle will travel slowly before reaching fast speed while starting to move in either direction. (i.e. 1.000).

### SHUTTLE DECELERATION DISTANCE

Shuttle deceleration distance. Distance, in inches, the shuttle will travel slowly reaching before home or target position. (i.e. 1.000)

### SHUTTLE MINIMUM FAST DIST

Minimum fast speed distance. If the programmed length is smaller than this parameter, the shuttle will only move in slow speed.

### SHUTTLE TARGET WINDOW

Allowable +/- tolerance from programmed length in inches.

### FRONT VISE OPEN DWELL

Delay time for the opening of the fixed VISE in seconds.

### SHUTTLE VISE OPEN DWELL

Delay time for the opening of the shuttle VISE in seconds.

### CLOSE TIME

Delay time for the closing of the shuttle or fixed VISE in seconds.

### FEED RATE CONSTANT

Blade Speed Display adjustment parameter. If actual blade speed is different than displayed blade speed a New Constant has to be entered.  $\text{New Speed Constant} = \text{Old Speed Constant} \times \text{Actual Speed} / \text{Displayed Speed}$

---

#### SHUTTLE ACTUAL POSITION

If this value is set to "YES," displays shuttle vise actual position.

#### HOLD SHUTTLE HOME

Hold shuttle VISE home and closed during cut.

#### BROKEN PROX

Allows user to override signal from proximity sensor in case it is broken. (When set to "NO" machine will not run with broken proximity sensor. Set to "YES" allows machine to run).

#### MINIMUM BLADE SPEED

Minimum blade speed on which the PLC will detect the that blade is running.

#### SPEED PROXY DELAY

Delay in monitoring of the blade speed proximity sensor during acceleration of the blade from start to desired speed set by the potentiometer.

#### POWER DOWN TIMER

If "0" selected, then the machine will shut down after the job is completed. This will allow the machine to continue running for a specified time after the job (in Manual Mode) or the cycle (in Auto Mode) has been completed. Range is from "0" to "180" minutes.

#### BLADE CLEAR

If set to "YES," when the AUTO cycle reaches the function of head up, the shuttle will retract the material from the blade by 1/8" before the head will move up. When the head reaches the up position the next length of material is shuttled into position.

#### TRIM CUT

If "YES" selected the machine will perform a facing cut of the material at the beginning of an automatic cycle.

#### OUT OF STOCK

Selecting "yes" activates the out of stock option, which prevents the shuttle vise from closing if insufficient length of material is available for the next length advance. Also stops the automatic cycle if there is insufficient length of material.

#### COOLANT

When "BLD" selected, coolant flows when the blade is running. When "BLD+ DWN" selected, coolant flows when the blade is running and head is moving down.

#### QUEUE

The queue allows the operator to run several jobs (max 5) in series. If "REPEAT" is selected the above series will be executed the selected number of times.

#### UNIT DISPLAY

Sets units of Measure: Metric or Imperial.

#### LANGUAGE

Sets display language

---

## PLC TROUBLESHOOTING

Problem #1 (for automatic models with a shuttle)

PLC is not measuring lengths

Possible causes:

1. Encoder
  - a. Pinion gear is loose on the encoder shaft
  - b. A bad encoder
2. Encoder Cable
  - a. Bad connections at the encoder or the PLC
  - b. Open or shorted wire.
3. PLC Unit
  - a. Damaged hardware
4. Display unit
  - a. No power from the PLC unit
  - b. Damaged hardware
5. Wrong Shuttle length Constant

Diagnosis:

1. With the machine in MANUAL mode, bring the shuttle forward to the home position and clear the length display so it reads "0.000". Run the shuttle, in slow speed, to the rear of the machine and back to the home position. Make sure you move in full complete strokes.
  - a. The length should accumulate on the display as a positive number when the shuttle is moving away from the blade and should count back to 0 when coming back. If this is not the case then reverse the green channel wire on the encoder with the white channel wire.
  - b. If the display alters between 0.000 and  $\pm 0.001$ , then the encoder channel is not being recorded correctly.
2. To determine the cause, first, check the encoder cable connections at both ends to be sure all four wires are connected properly.
3. Measure the voltage:
  - a. At the encoder connector. Between 0 Volt pin and 24 Volt pin. This voltage should be a minimum of 22 VDC to 26 VDC.  
If the voltage is incorrect, check the encoder cable continuity. If it is ok, there is possible PLC problem. If the voltage is correct then proceed to the next step.
  - b. At the encoder connector. Between 0 Volt pin and channel A pin, and, between 0 Volt pin and channel B pin. This voltage should be slightly less than the supply voltage at each channel  
If the voltage is incorrect at this point, check for proper continuity of these wires and repair as necessary.

Note:

When checking the encoder cable for continuity, each wire should also be checked for shorting to ground and or to each other. If the voltage to the encoder is correct, proceed to the next step.

4. At the encoder connection of the PLC, between the 0 volt and A&B channels, with the shuttle moving slow, the voltage should be approx. 10 to 13 VDC. Input LED's X0 and X1 should flicker or go dim with the shuttle moving. If these LED's show no change with the shuttle moving, the encoder is likely at fault. Check that the pinion gear is securely fastened to the encoder shaft and that it can rotate along the rack as the shuttle moves.

If all mechanical components are functioning correctly then the encoder is defective. If all test check positive, the problem is in the PLC unit.

---

## Problem #2 (for automatic models with a shuttle)

### Inaccurate Lengths in Auto Mode

#### Possible Causes:

1. Encoder
  - a. Pinion not engaging the rack all the way from front to back.
  - b. Mechanical interference.
  - c. Pinion loose on the encoder shaft.
2. Encoder Cable
  - a. Bad connection at encoder or at the PLC.
  - b. Intermittent open in one or more signal wires.
3. Improper programmed information
  - a. Existing parameter(s) incorrect.
  - b. Incorrect blade kerf.
4. PLC
  - a. Faulty PLC unit (not repairable in the field)

#### GENERAL RULES

Normally, three types of length inaccuracies may occur.

1. Inconsistent
  - a. Lengths cut are not consistent, error changes. It doesn't matter how long the part required is the error is never the same.
  - b. Cause: Most likely a defective electrical, hydraulic or mechanical component.
2. Consistent
  - a. Lengths cut are consistent and the error is also consistent. The error always stays the same regardless of part length.
  - b. Cause: Kerf Value
3. Linear
  - a. Lengths cut are consistent but the error increases as the part length increases. The longer the part the greater the error.
  - b. Cause: an incorrect "SHUTTLE LENGTH CONSTANT" value was entered.

#### Diagnosis:

- Check and record the existing parameters. Also check for proper blade kerf. By making a cut part way into a piece of material and measuring the width of the cut, the operator can check the blade kerf.

#### INCONSISTENT INACCURACY

• With the machine in Manual mode, move the shuttle all the way forward and clear (zero) the length display. Move the shuttle in reverse, in slow speed, all the way to the end of its travel. Return the shuttle forward to the home position, also in slow speed. The display should read  $0.000" \pm 0.005"$ . Do this test several times to be sure the read-out is repeatable.

#### Diagnosis:

Following the same procedure, run the shuttle alternating between fast and slow speed going back and forth. Again the display should be able to read  $0.000" \pm .005"$  when returning to the home position



---

If the display does not read as specified:

- Check the encoder pinion gear to be sure it can run smoothly down the rack and that the gear and rack teeth engage over the entire travel of the shuttle.
- Check that the pinion gear is tight on the encoder shaft.
- Check the encoders cable connections, a loose connection could easily cause this concern.
- Remove the encoder from the machine and check that the shaft can rotate freely. There should be no binding or rough spots felt when spinning the shaft. Plug the encoder cable into the encoder, clear the length display and rotate the shaft as closely as possible to one revolution. The display should read 3.142" (positive or negative depending on the direction you rotated). Repeat this test 3 or 4 times, spinning the shaft several times between tests.

CONSISTENT INACCURACY (make sure the blade kerf value is correct)

Change the "ACTUAL POS" parameter to YES. This will make the PLC show actual shuttle travel in AUTO

With no material in the machine:

1. Program JOB 1 for 2 pieces of 5" in length. JOB 2 for 2 pieces of 10" in length and JOB 3 for 2 pieces of one complete shuttle stroke length.
2. Enter JOBS 1 to 3 into the QUEUE.
3. Record measurements on the display each time the shuttle vise reaches the target length and closes. It should equal the required length plus the programmed kerf. Check that this measurement is  $\pm .002$ " for each length. If the overshoot / undershoot is very inconsistent, it could be related to an incorrect shuttle cushion period. This may be caused by "SHUTTLE DECELERATION CONSTANT" parameter being set to low, defective fast or reverse output relays on the PLC, or the hydraulic cushion valve (located at the hydraulic manifold) may be faulty.

LINEAR INACCURACY (not valid for machines with linear encoder)

Linear inaccuracy may be corrected, by adjusting the SHUTTLE LENGTH CONSTANT as follows: Load the machine with a piece of stock for test cutting.

Program the PLC to cut two pieces of 1", 12" and a length equal to a shuttle and a half of the machine being checked. Make the cuts and measure as accurately as possible.

Using the formula provided, calculate the new parameter SHUTTLE LENGTH CONSTANT

Formula for determining new parameter SHUTTLE LENGTH CONSTANT

Measured length  $\div$  programmed length x existing constant = new SHUTTLE LENGTH CONSTANT

i.e. Programmed length	Measured Length
=1.00"	=.99"      -.001"
=12.00"	=11.988"      -.012"
=60.00"	=59.940"      -.060"

Existing parameter for SHUTTLE LENGTH CONSTANT =  $0.001256 \times 11.988 \div 12.00 \times .001256 = 0.001255$

The new parameter LTH CONST value would then be 0.001255. This value should be entered and the test repeated. Adjust the parameter as necessary.

GENERAL RULE:

Lowering the parameter value = longer shuttle travel = longer parts  
Increasing the value = shorter shuttle travel = shorter parts

---

## Problem #3

### Auto Cycle Not Being Completed

In auto mode, the PLC controls the saw functions through output relays. For a certain function to be actuated, the PLC must first see specific input(s). Like the output relays, the input relays are located on the PLC unit. Directly beside the input and output terminals are red LED's (Light Emitting Diode), which will light up when the corresponding input is being received or output being actuated. Observation of these input/output LED's can help diagnose auto cycle problems. Refer to the PLC inputs and outputs in this section. When a problem occurs in the auto mode, the lights should be checked to see if they are coming on at the proper time or if they are coming on at all.

#### Input LED's

If a specific input light does not come on when expected

- Check for a faulty/misadjusted limit switch, push button, encoder or faulty wiring or connections.
- Wiring for each limit switch should be connected from the VDC terminal connection to the particular limit switch, and from the limit switch to the input connector of the PLC.

Note:

All inputs are denoted by an "X" All outputs are denoted by a "Y"

The following is information on output diagnosis and the sequence of inputs and outputs during the auto cycle.

#### Auto Cycle Sequence:

After the mode push button is in the auto position, the job has been programmed into the PLC, and the cycle start push button pressed:

1. Hydraulics running, the head should move to its up limit if it is not already there. The shuttle vise should open and come forward to the home position. HUP input light must come on for the cycle to continue.
  - a. HUP input on – cycle should continue, if not check outputs per step 2.
  - b. HUP input not on – Check that the head up limit switch is being activated. Check the limit switch/limit switch wiring.
2. Front vise should be closed; the shuttle vise should stay open and move back to the programmed length.
  - a. FVC output should be on and SVO output will light momentarily, REV output and FST output should be on when the shuttle moves back fast.
3. As the shuttle approaches the target length the FST output should shut off and the shuttle should travel slowly for the DEC DIST parameter (cushion distance). When the shuttle reaches the target length the SVC output should light and the shuttle vise should close on the material.
4. FVO output light should momentarily turn on and the front vise should open.
5. FWD output should light as will the FST for the shuttle to move forward in fast speed. FST will turn off when the shuttle home cushion period is reached and the shuttle should slow down into the home position.
6. FVC output should light and the front vise should close. FWD light should go out, HDN output should come on and the head should start to descend for the cut. If the blade is not running at this time, the cycle will hold until minimum SFM is reached. Depending on "HLD SHTL HM" parameter in the PLC, the shuttle may stay home and closed during the cut or may move back to pick up the next length. HUP input should go out as the head descends and HUP L/S deactivates.
7. After the cut is completed HDN input should light, HDN output should go out, the HUP output should light and the head should move up. When the head reaches it's up limit, HUP input should come on, HUP output should turn off, and the cycle repeats with the next length being clamped by the shuttle, the front vise opening and the material being brought forward to the home position.

As mentioned, 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.

---

#### Problem #4

#### 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 #5

#### 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.

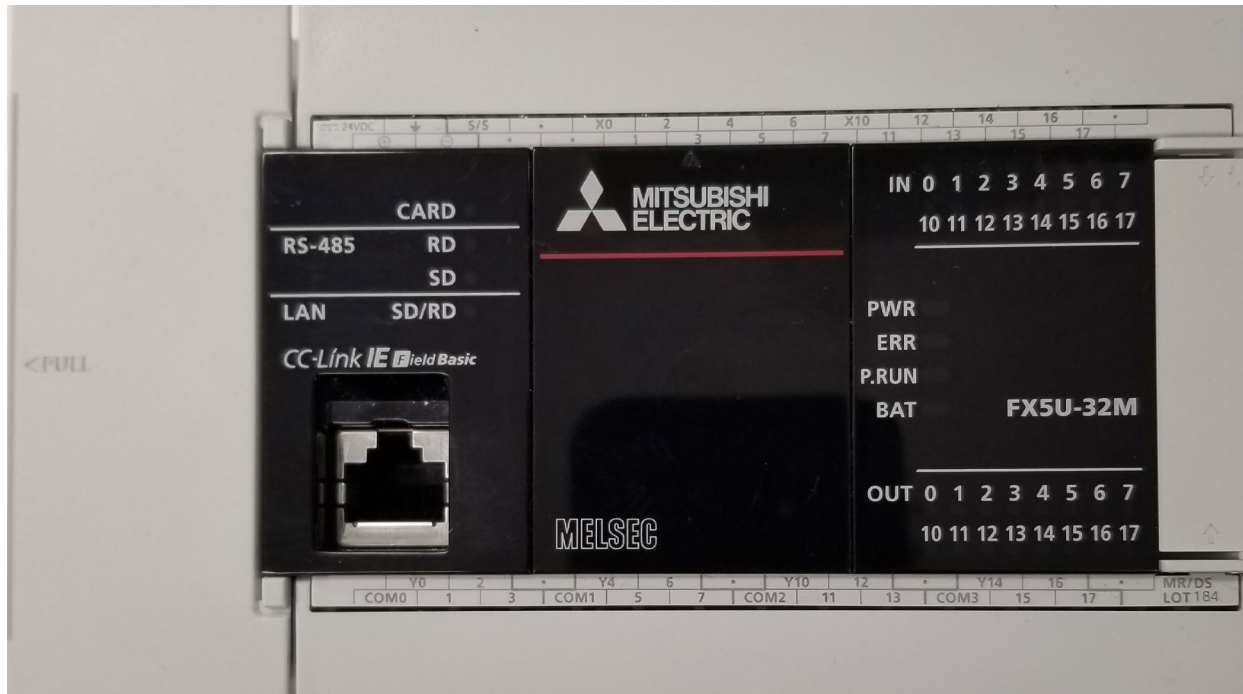
#### Diagnosis:

- 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

## PLC INPUTS AND OUTPUTS

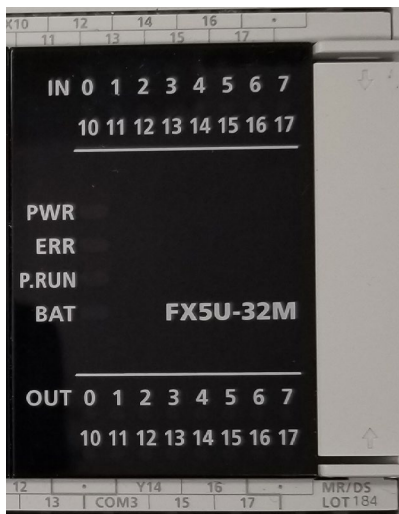
PLC status indicators:

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 V6	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:

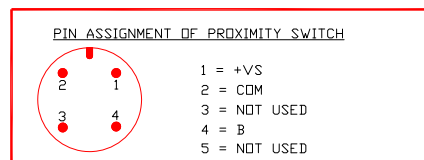
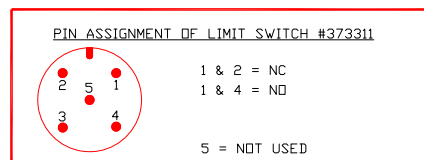
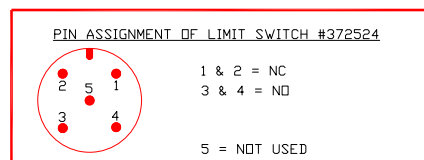
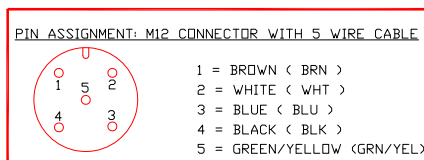
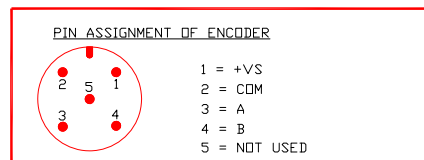
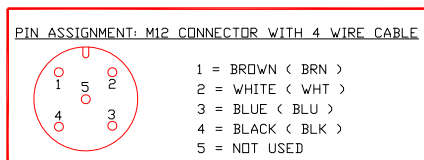
The top row of LED's correspond to the top row of terminals and the bottom row of LED's correspond to the bottom row of terminals.



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

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

INPUTS	X0	Shuttle encoder, channel B	X10	Blade Proxy
	X1	Shuttle encoder, channel A	X11	Enable
	X2	Not Used	X12	Not Used
	X3	Not Used	X13	Not Used
	X4	Feed rate encoder B	X14	Head Down
	X5	Feed rate encoder A	X15	Not Used
	X6	Out of Stock	X16	Alarm Safety Relay
	X7	Head Up	X17	Blade Change Mode
			X20	Not Used
			X21	Not Used
		X22	Not Used	
OUTPUTS	Y0	Machine latch	Y10	Front vise open (FVO)
	Y1	Blade Motor	Y11	Front vise close (FVC)
	Y2	Laser (Option)	Y12	Shuttle fast (FST)
	Y3	Coolant	Y13	Blade Motor
	Y4	Shuttle Vise Open	Y14	Shuttle reverse (REV)
	Y5	Shuttle Vise Close	Y15	Shuttle forward (FWD)
	Y6	Head Lock Valve Idler	Y16	Head Up (HUP)
	Y7	Head Lock Valve Drive	Y17	Head Down (HDN)
			Y20	Outboard vise close (OVC)
			Y21	Blade Brush (H22 Only)
			Y22	Blade Deviation (Option)
			Y23	Blade Deviation (Option)
			Y24	Work Light
			Y25	Mist
			Y26	Not Used
			Y27	Not Used





## PLC DIAGNOSTIC MODE

The Plc is Equipped with a Diagnostic Tool allowing to:

- Test the integrity of Keypad
- Test Shuttle, Feed rate encoder inputs.
- Test Digital input and outputs

Diagnostic Tools are accessed in Manual Mode by Pressing the Service Mode Key on Keypad and then selecting Diagnos Button on Touch Screen. The proper diagnostic tool can be selected from the displayed touch Screen Window

CANTED HEAD	YES
BLADE MINIMUM SPEED	50 SMF
SHUTTLE FULL STROKE	34.224 "
SHUTTLE LENGTH CONSTANT	0.0003140
SHUTTLE ACCELERATION DISTANCE	0.250 "
SHUTTLE DECELERATION DISTANCE	1.000 "
SHUTTLE MINIMUM FAST DISTANCE	1.000 "
SHUTTLE TARGET WINDOW	0.006
SPEED PROX DELAY	0 sec
FEED RATE CONSTANT CONSTANT	0.00600
BLADE SPEED CONSTANT	4.00000
BLADE MOTOR FLA	12.70 A

RETURN LOG IN DIAGNOS LOG OUT LEVEL 0

DIGITAL INPUTS	BACKUP RESTORE	KEYPAD TEST
DIGITAL OUTPUTS	BRIGHTNESS ADJUSTMENT	OTHER 2
COUNTERS	UTILITY	
	LADDER MONITOR	

RETURN

INPUT	CABLE WIR # / WIRE COLOR	INPUT DESCRIPTION	INPUT	CABLE WIR # / WIRE COLOR	INPUT DESCRIPTION
X 0	SDT-CE1 BLACK	LENGTH ENCODER CH. B	X 20		Not AVAILABLE
X 1	SDT-CE1 BLUE	LENGTH ENCODER CH. A	X 21		Not AVAILABLE
X 2		Not used	X 22		Not AVAILABLE
X 3		Not used	X 23		Not AVAILABLE
X 4	SDT-CE4 BLACK	FEED RATE ENCODER CH.B	X 24		Not AVAILABLE
X 5	SDT-CE4 BLUE	FEED RATE ENCODER CH.A	X 25		Not AVAILABLE
X 6	SHT-C23 BROWN	OUT OF STOCK LS4	X 26		Not AVAILABLE
X 7	SAW-C43 BLACK	HEAD UP LS1	X 27		Not AVAILABLE
X 10	SDT-CP1 BLACK	BROKEN BLADE PROXI SENSOR	X 30		Not AVAILABLE
X 11	SC D-BL	ENABLE BP	X 31		Not AVAILABLE
X 12		Not used	X 32		Not AVAILABLE
X 13		Not used	X 33		Not AVAILABLE
X 14	SAW-C44 BLACK	HEAD DOWN LS2	X 34		Not AVAILABLE
X 15		Not used	X 35		Not AVAILABLE
X 16	X16 D-BL	ALARM SAFETY RELAY	X 36		Not AVAILABLE
X 17	X17 D-BL	BLADE CHANGE	X 37		Not AVAILABLE

RETURN

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## **SECTION 4 - ELECTRICAL**

**ELECTRICAL SCHEMATICS: SEE PDF ON ATTACHED USB**

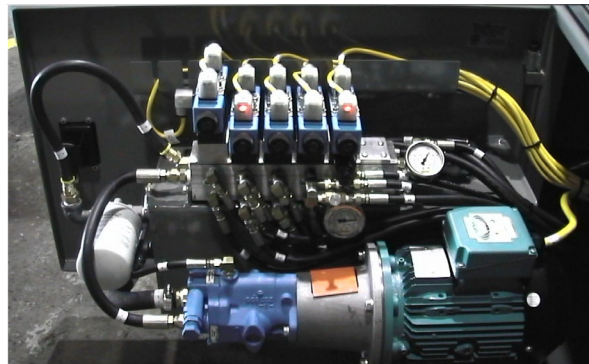
# SECTION 5 - HYDRAULIC SYSTEM

FOR HYDRAULIC SCHEMATICS AND PLUMBING DIAGRAMS  
SEE PDF ON ATTACHED USB.

The H-18/22 SV hydraulic system does not require any special work on a new machine before its start-up. The hydraulic tank is filled with an AW 46 hydraulic oil and all machine functions have been tested at the factory to ensure proper operation upon initial start-up.

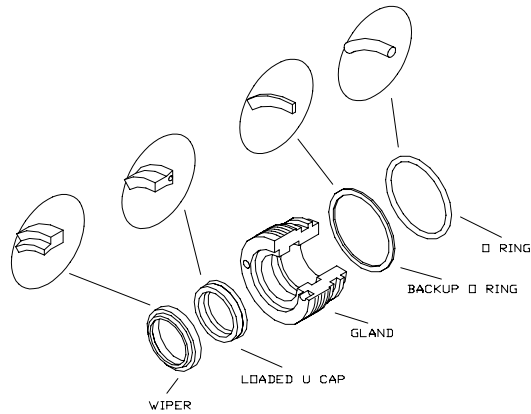
## HYDRAULIC COMPONENT LIST

H18ASV & H22ASV HYDRAULIC LIST		
QTY (H18A) QTY (H22A)	PART NUMBER	DESCRIPTION
1	H22-C41-00A	MAIN HEAD CYLINDER
1	H22-C42-00A	AUX HEAD CYLINDER
1	H14-C1-00A	SHUTTLE CYLINDER
1	H14-C22-00	DATUM CYLINDER
2	H22SV-C31-00C	WISE CYLINDER
(1, 2 or 3)	H22SV-C23A-00 H22CSV-C23A-00A	BUNDLING CYLINDER BUNDLING CYLINDER (CANTED HEAD)
1	S25-C5-00 (H18)	BLADE TENSION CYLINDER
1	H22-C5-00A (H22)	
1	MB6PA	MANIFOLD BLOCK
1	DDF6-0-00FP	DDF VALVE
2	363300	DOUBLE PILOT CHECK VALVE (DPCH-1)
4	363295	DIRECTIONAL VALVE (DCV3P-AB-T)
1	363290	DIRECTIONAL VALVE (DCV3P-AB-C)
1	363160	POPET VALVE (PV2P-A-C)
2		
1	CHB-25C	CUSHION BLOCK
1	362690	CHIP AUGER MOTOR (HM-01)
1	363155 (H22 Only)	PRESSURE REDUCING VALVE (PRV-2)
1	362745	HYDRAULIC PUMP (HYP-1)
1	363105	RETURN FILTER ELEMENT (SF 6520)
1	363235	PRESSURE REDUCING VALVE (PBDB OBN E21)
1	363150	PRESSURE REDUCING VALVE VVP OPTION (PRV1-10-K-6T-12 )
1	JB-02A	DOUBLE JUNCTION BLOCK VVP OPTION
1	363140	HYDRAULIC CARBIDE LOCK CARTRIDGE (PRV1-10-S-0-6)
2	SPCH-1	SINGLE PILOT CHECK VALVE
1	362700 (H22 Only)	BLADE BRUSH MOTOR
2	363160	Valve Cartridge SV2-10-C-6T-115AG (MX) - Head Lock Valve



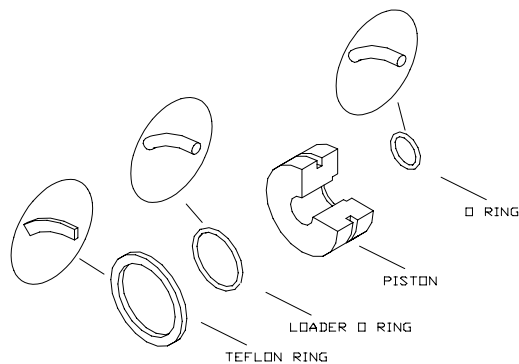
## CYLINDER ASSEMBLIES

### GLAND ASSEMBLIES



CYLINDER DIAMETER	E O RING	F BACKUP O RING	G GLAND	H LOADED U CAP	I WIPER
2.0"	362960	362785	CS20-GL-01A	362830	363330
2.5"	362970	362790	CS25-GL-01B	362815	363335
3.0"	362985	362795	CS30-GL-01A	362815	363335
3.5"	362995	362800	CS35-GL-01A	362835	363340
4.0"	363005	362805	CS40-GL-01A	362840	363345
5.0"	363015	362810	CS50-GL-01A	362840	363345

### PISTON ASSEMBLIES



CYLINDER DIAMETER	A TEFLON RING	B LOADER RING	C PISTON	D O-RING
2.0"	363035	362950	CS20-PS-01B	362905
2.5"	363040	362965	CS25-PS-01	362910
3.0"	363045	362980	CS30-PS-01	362910
3.5"	363050	362990	CS35-PS-01	362925
4.0"	363055	363000	CS40-PS-01	362940
5.0"	363060	363010	CS50-PS-01	362940

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## **SECTION 6 - MECHANICAL ASSEMBLIES**

**MECHANICAL ASSEMBLY DRAWINGS & PARTS LIST: SEE PDF  
ON ATTACHED USB**



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## SECTION 7 - OPTIONS

**OPTIONAL ASSEMBLY DRAWINGS: SEE PDF ON ATTACHED USB**

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## BLADE DEVIATION MONITOR

### General description of the blade deviation monitoring system.

This system monitors lateral blade deviation during cutting. If blade deflection increases beyond the pre-set warning limit, then the monitoring device sends a warning signal by means of flashing beacon mounted on the top of machine head. If no steps are taken to correct this condition, the machine will continue to cut until the pre-set shut-down limit is reached. At this point the machine will behave in one of two ways, selectable by parameter setting:

1. Stop cutting, raise the head and shut down
- or
2. Finish the cut with present degree of deviation and then shut down.

### Operation of the system

The proximity transducer is enclosed in a housing mounted on the idler side guide arm. The sensor converts the blade lateral deflection to an analog signal, which is sent to PLC and after a series of calculations is displayed on the operator interface in a form of a bar graph.

The bar graph appears in both Manual Mode and Automatic Mode Screens. It is only active when the blade is running and head is descending. The length of the bar graph is proportional to the blade deflection. The bar graph extends from the screen centre towards the right if blade is deviating toward the front of the saw (cutting into the part), and extends from the screen centre towards the left if blade is deviating toward the rear of the saw (cutting into the stock).

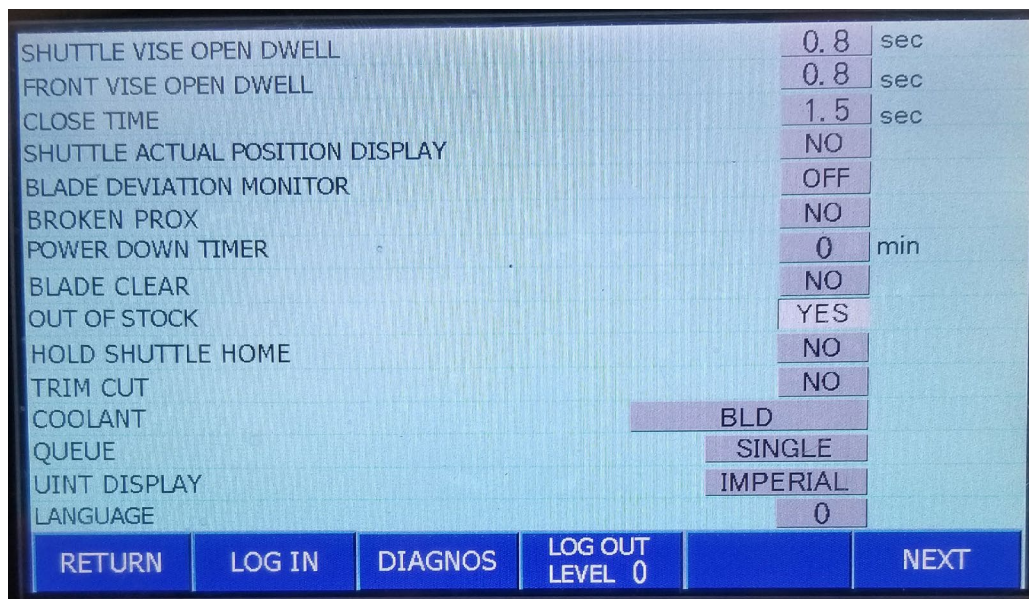
If a warning limit is reached and maintained longer than the preset response time, then the beacon light mounted on the top of the head will start flashing.

If a shutdown limit is reached and maintained longer than the preset response time, then the machine will behave in one of two ways: stop cutting, raise the head and shut down or finish the cut with present degree of deviation and then shut down.

### Enable procedure

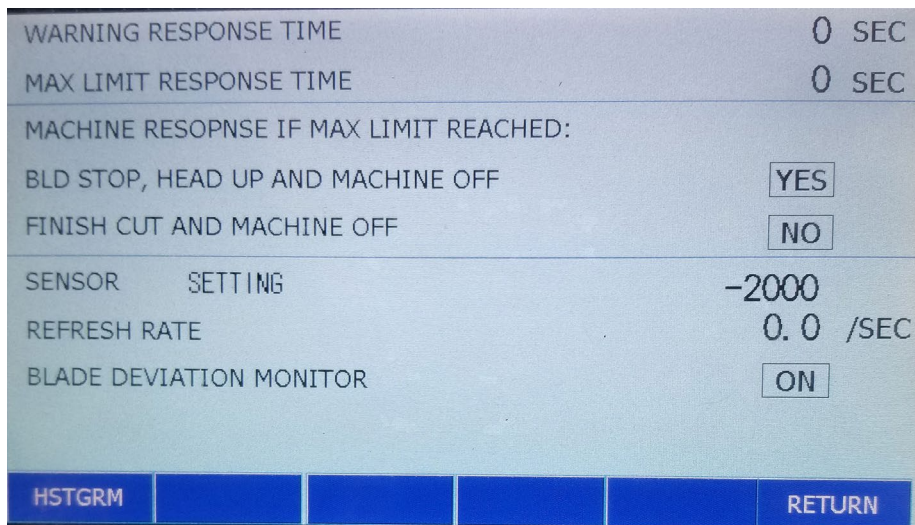
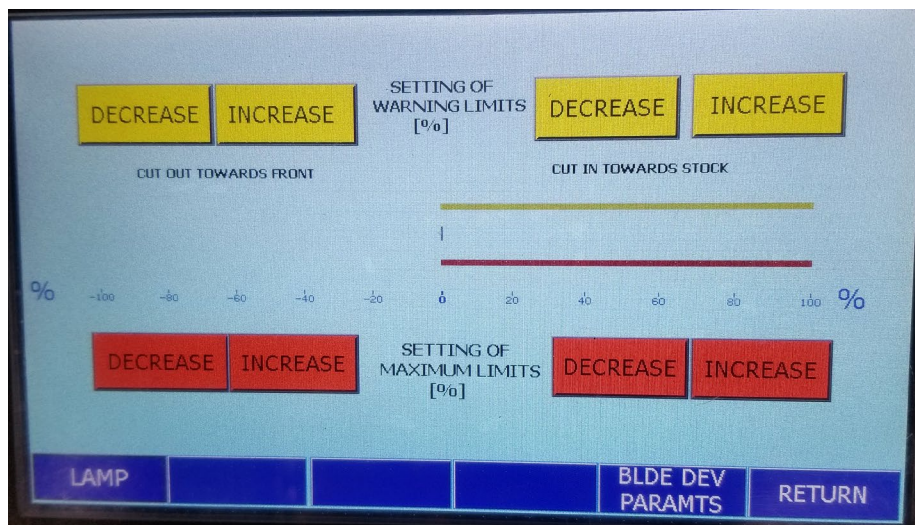
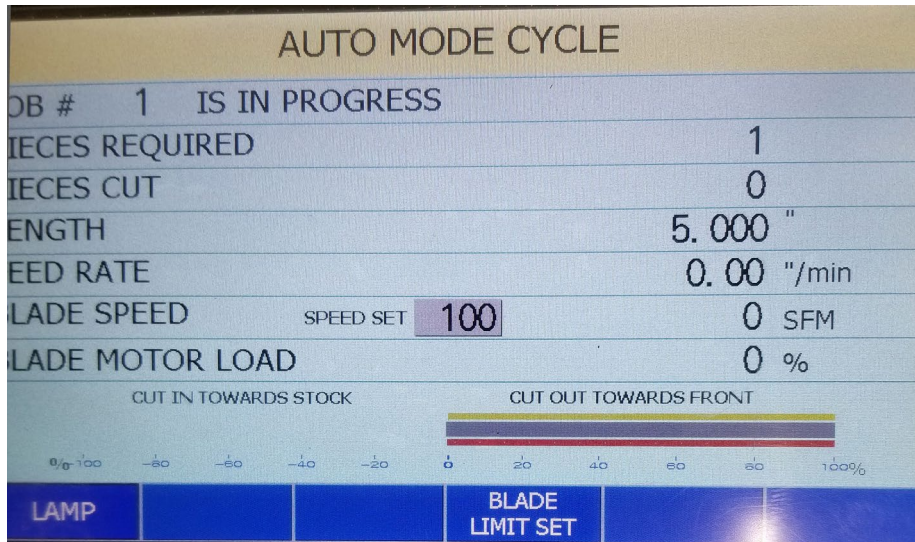
The blade monitor option can be enabled from PLC parameters screen:

- In Manual Mode, press Service Mode on Keypad
- Press log In on Touch screen and Enter password
- Set BLADE DEVIATION parameter to ON



## BLADE DEVIATION SETUP PROCEDURE

In Manual or Auto Mode press the BLADE LIMIT SET button on touch screen . Using DECREASE/ INCREASE touch screen buttons set the required settings for WARNING and MAXIMUM LIMITS. Pressing BLADE DEV PARAMTS button will enable the Parameter setup screen.





**Cut out maximum limit** – (out - cutting towards outfeed, range 0 ~100). This parameter will adjust shutdown limit if blade is cutting towards the part. Increasing this value decreases sensitivity, which will result in a larger deviation from nominal straight, before shutdown sequence is initialized.

**Cut in maximum limit** – (in - cutting towards infeed, range -100 ~ 0) This parameter will adjust shutdown limit if blade is cutting towards the stock. Decreasing this value decreases sensitivity, which will result in a larger deviation from nominal straight, before shutdown sequence is initialized.

**Cut out warning limit** – (out - cutting towards outfeed, range 0 ~100) This parameter will adjust warning limit if blade is cutting towards the part. Increasing this value decreases sensitivity, which will result in a warning further from nominal straight.

**Cut in warning limit** – (in - cutting towards infeed, range -100 ~ 0) This parameter will adjust warning limit if blade is cutting towards the stock. Decreasing this value decreases sensitivity, which will result in a warning further from nominal straight.

WARNING RESPONSE TIME	Warning response time (range 2 – 99 seconds) If the blade deviation exceeds the preset warning limit for longer than warning response time, then the beacon light mounted on the top of the head will start flashing.
MAX LIMIT RESPONSE TIME	Maximum limit response time – (range 2 – 99 seconds) If the blade deviation exceeds the preset shutdown limit for longer than shutdown response time, then the machine will execute shutdown sequence.
MACHINE RESPONSE IF MAX LIMIT REACHED	If the shutdown sequence has been executed then the machine will behave in one of two ways
STOP, HEAD UP THEN MACHINE OFF YES	Stop cutting, raise the head and shut down
FINISH CUT, THEN MACHINE OFF: <b>NO</b>	Finish the cut with present degree of deviation and then shut down
SENSOR	(range –2000 – +2000) The number displayed here represents the position of the blade within the measuring range of the proximity transducer. At 0, the blade is exactly centered within the sensing range. The display assists adjustment with the prompts 'SETTING, or 'SET'. The prompt 'SET' appears when the adjustment is within the acceptable range of – 100 +100. [See sensor adjustment procedure section]
BLADE DEVIATION MONITOR <b>ON/OFF</b>	This parameter will activate or deactivate response of the blade deviation monitoring system.
DISPLAY REFRESH RATE	(range 0.1 sec – 10 sec) The refresh time is time between bar graph updates. If it is set to low value then the display will flicker do to vibration of the blade, weld passing by the sensor or other irregularities in the blade.

## Relationship between Blade Deflection Display and Actual Cut Deviation

The digital display indicates the blade lateral deflection at the point where it passes the blade deflection sensor, which is 1" past the idler side guide arm. The display range of 0 +/-100 is proportional to the amount of blade deviation. This depends on the type of material, shape of the work-piece and amount of blade tension. The maximum deviation of the cut surface will occur at or near the center of the cut, and will be several times larger than that measured at the sensor.

**The actual amount is difficult to predict, experience with different work-pieces will provide the best guide.**

# SECTION 8 - SPECIFICATIONS

## H-18 ASV BANDSAW SPECIFICATIONS

H-18A SV BANDSAW SPECIFICATIONS		
Capacity	Round	18" (457mm)
	Rectangular	18"x 18"(457mm x 457mm)
Length Control	Programmable up to 99 jobs, 5 in Queue	
Blade	Length	19'-2" (5842mm)
	Width	1 1/2", (41mm) , or optional 1 1/4" ( 32mm)
	Thickness	.050" (1.3mm) or optional (.042", 1.1mm)
Blade Tension	Hydraulic	
Blade Speed	VFD	50 - 350 sf/min (15.5 - 109 m/min)
Blade Guides	Carbide inserts (water soluble coolant lubricated)	
Blade Wheel Dia.	22" (559mm)	
Motors	Blade drive	10 HP (7.5 KW)
	Hydraulic pump drive	3 HP (2.2 KW)
Pumps	Hydraulic	6 1/2 U.S. Gal. / min (25 Liters/min)
	Coolant	3 1/2 U.S. Gal. / min (13.5 Liters/min)
Hydraulic Tank	9.5 U.S. Gallons (36 Liters)	
System Pressure	1000 PSI (6890 kPa)	
Vise Control	Hydraulic	
Shuttle Stroke	0-34" (0-863mm) single stroke, multi-index capability	
Table Height	31" (787mm)	
Control Panel	Waist Height	
Machine Weight	8500 lbs (3856 Kg)	
Maximum Workload	10000 lbs (4535 Kg)	
Overall Dimensions	127" (3225mm) Wide, 88" (2235mm) Long, 92.5" (2362mm) High	

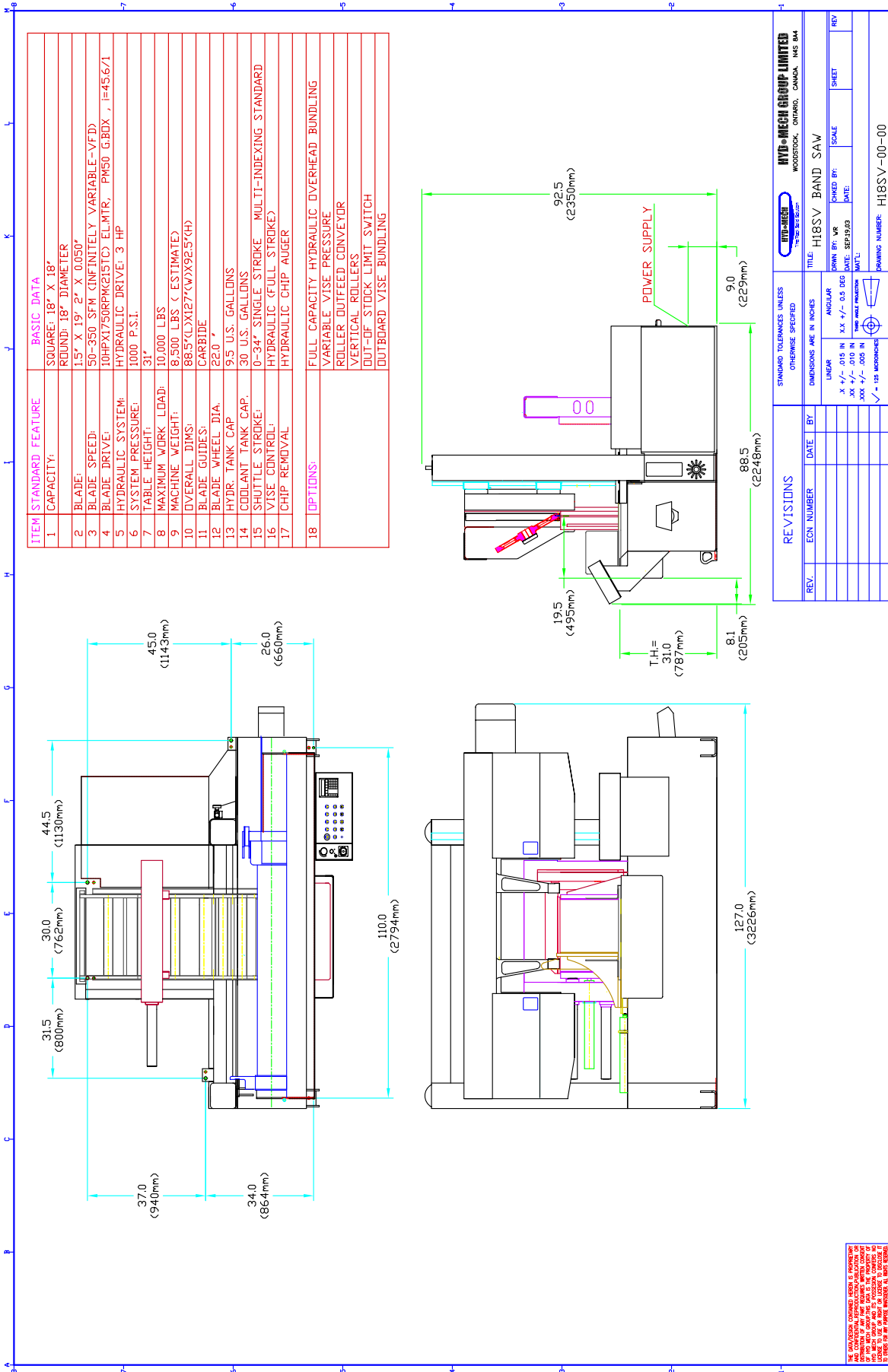


## H-22 ASV BANDSAW SPECIFICATIONS

<b>H-22A SV BANDSAW SPECIFICATIONS</b>		
Capacity	Round	22" (558mm)
	Rectangular	22"x 22"(558mm x 558mm)
Length Control	Programmable up to 99 jobs, 5 in Queue	
Blade	Length	22'-6" (6858mm)
	Width	2"
	Thickness	.063" (1.6mm)
Blade Tension	Hydraulic	
Blade Speed	VFD	40 - 300 sf/min (12 - 91 m/min)
Blade Guides	Carbide inserts (water soluble coolant lubricated)	
Blade Wheel Dia.	27" (685mm)	
Motors	Blade drive	10 HP (7.5 KW)
	Hydraulic pump drive	3 HP (2.2 KW)
Pumps	Hydraulic	6 1/2 U.S. Gal. / min (25 Liters/min)
	Coolant	3 1/2 U.S.Gal. / min (13.5 Liters/min)
Hydraulic Tank	9.5 U.S. Gallons (36 Liters)	
System Pressure	1000 PSI (6890 kPa).	
Vise Control	Hydraulic	
Shuttle Stroke	0-34" (0-863mm) single stroke, multi-index capability	
Table Height	31" (787mm)	
Control Panel	Waist Height	
Machine Weight	12500 lbs (5670 Kg)	
Maximum Workload	15000 lbs (6804 Kg)	
Overall Dimensions	141" (3581mm) Wide, 88.5" (2235mm) Long, 92.5" (2362mm) High	



# H18SV LAYOUT



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# SECTION 9 - WARRANTY

## WARRANTY

HYDMECH warrants parts/components on each new H-18/22 SV bandsaw to be free from failure resulting from defective material and workmanship under proper use and service for a period of two years following the date of shipment to the user. HYDMECH's sole obligation under this warranty is limited to the repair or replacement without charge, at HYDMECH's factory, warehouse, or approved repair shop any part or parts which HYDMECH's inspection shall disclose to be defective. Return freight must be prepaid 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-18/22 SV, but not originally manufactured by HYDMECH are subject to the original manufacturer's warranty. HYDMECH 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 HYDMECH for damages, whether general, special or for negligence and expressly including any incidental and consequential damages is hereby disclaimed. HYDMECH'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.

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**HYDMECH CANADA Corp.**  
**1079 Parkinson Road**  
**P.O. BOX 1659**  
**Woodstock, Ontario**  
**Canada**  
**N4S 0A9**  
**Phone: (519) 539-6341**  
**Fax: (519) 539-5126**  
**Toll Free (877) 276-SAWS (7297)**  
**E-mail, [info@hydmech.com](mailto:info@hydmech.com)**

