DinaSaw®

CUTTING EDGE SHARPENING EQUIPMENT

T-REX

Automatic Chain Sharpener

INSTRUCTION MANUAL

VERSION 8.0

Cutting Edge Sharpening Equipment.

Table of Contents

	Page
Check List	03
Installation	04
Wall/Bench Mounting	05
Assembling the Tri-Pod stand (Optional)	07
Bench mounting	09
Operational Overview	10
The Control Panel	12
Removing Shipping & Allignment Brace	14
Assembling the Machine	16
Adjustments	20
Fitting the Grinding Wheel	21
Dressing the Grinding Wheel	22
Fitting the Chain	25
Adjusting the Clamp Opening	26
Feed Stroke & Pawl Height Adjustments	29
Operating Modes	31
Auto Cutter Sensor Setup	32
Magnet Mode Setup	35
Magnet Positioning for Sensing	36
Adjusting the length of the Cutters	37
Adjusting how much to grind	40
Changing the Top Plate Angle	41
'0' Degree Top Plate Angle	42
How to Grind the Depth Gauges	44
Chains with Double Tie Links	45
Safety Chain	46
3/4" Harvester Chain	47

Table of Contents

How to check the Cam Timing	49
Leaving the machine for extended periods	50

Warning!

Grinding is dangerous.

You should become thoroughly familiar with the information supplied in this manual before operating this machine.

Check List

Standard T-Rex accessory bag:

1 x Instruction USB
1 x 10/13mm Spanner
1 x 2.5mm Hex Key
1 x 3mm Hex Key
1 x 4mm Hex Key
1 x 6mm Hex Key
1 x CMAGSEN - Magnet
1 x Instruction Manual
2 x 5mm Spring Washers
2 x M5 x 10 Pan Head Screws
1 x Dressing Stone
1 x 3mm Grinding Wheel
1 x 5mm Grinding Wheel
1 x Clear Shield

Wall / Bench mounting Bracket:

1 x Wall Bracket
1 x Gusset
1 x Mounting Plate
1 x 10mm Flat Washer
1 x 8mm Spring Washer
2 x M6 x 12 bolts
2 x 6mm flat washers
1 x M10 Nyloc Nut
1 x M8 x 12 Bolt

Power Supply:

1 x Power Supply with AC power cord.

Optional Extras

Tri-Pod Stand:

1 x Support Stand
9 x M5 x 8 Pan Head Screws
2 x M6 x 12 Hex Head Bolts
3 x Sets of Legs
9 x M5 Locknuts
2 x 6mm Flat Washers

Power Supply Stand Bracket:

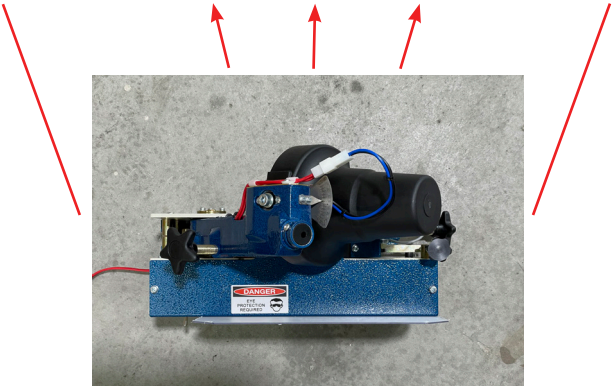
1 x M6 x 40 Pan Head Screws
1 x Bracket
1 x M6 Nut
1 x 6mm Spring Washer

Installation

Caution!

GRINDING SPARKS WILL BE EMMITTED IN THIS AREA!

Do not stand, or allow others to stand behind the machine while it is operating.



When positioning the machine it is recommended to have a wall or shield immediately behind the machine to prevent people from standing behind the machine.

Power Requirements:

The Dinasaw Chainsaw Sharpener can operate from a well charged automotive battery as well as a suitable regulated switch mode power supply.

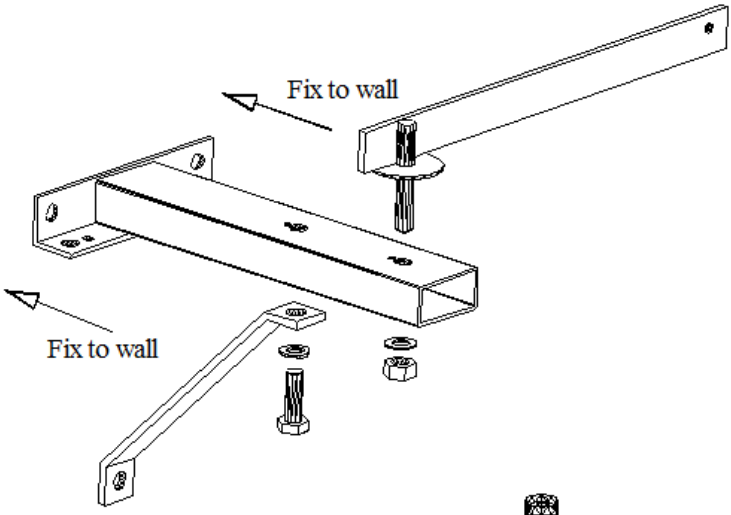
It is important however that the lead from the battery / power supply to the machine is no longer than 2 meters (6 feet).

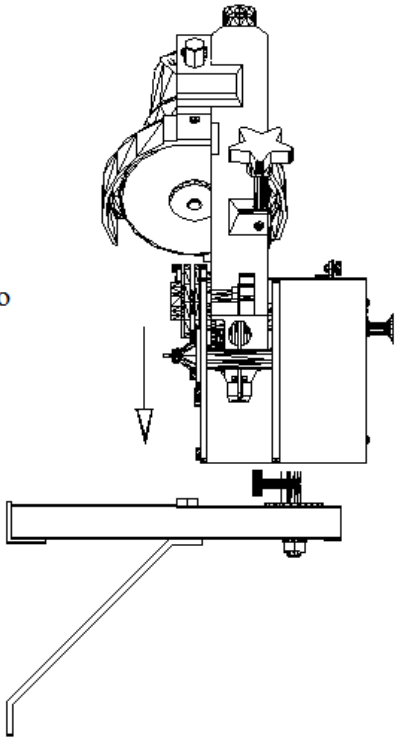
CAUTION!

DO NOT USE AN UNREGULATED POWER SUPPLY AS DAMAGE TO THE ELECTRONIC COMPONENTS MAY OCCUR.

USE OF AN UNREGULATED POWER SUPPLY WILL VOID THE WARRANTY ON THE CONTROL MODULE.

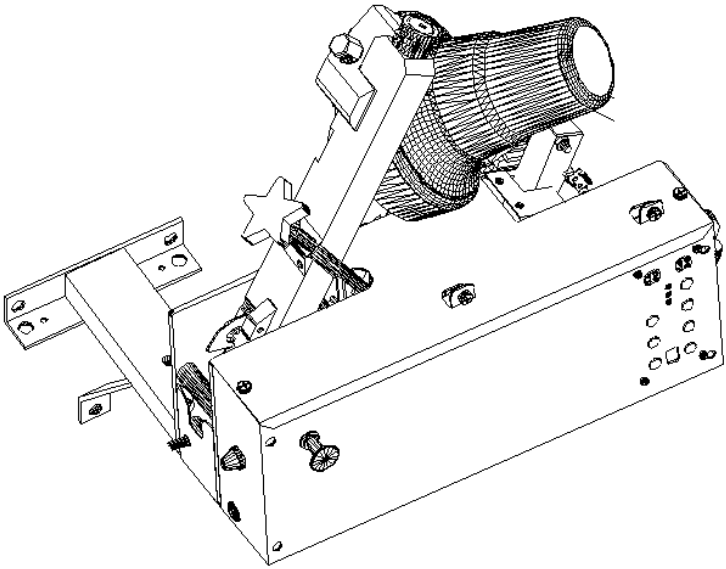
Wall / Bench Mounting



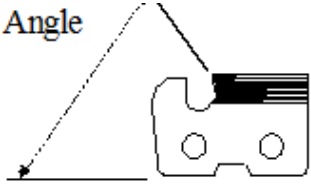


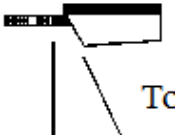
Attach Machine onto
Bracket as shown.

Machine attached to wall bracket.

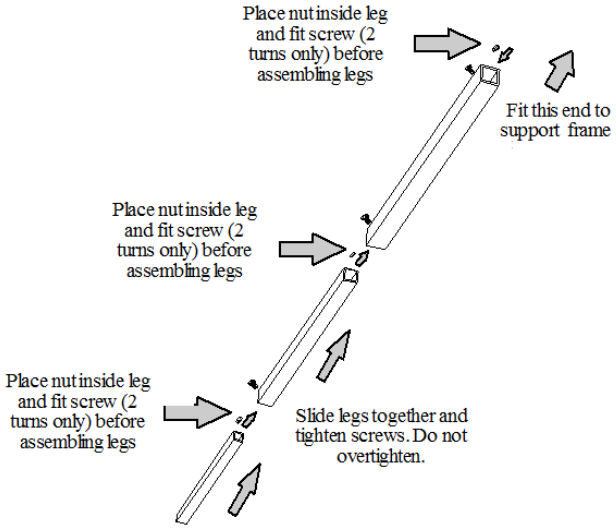


Cutter Terminilogy:



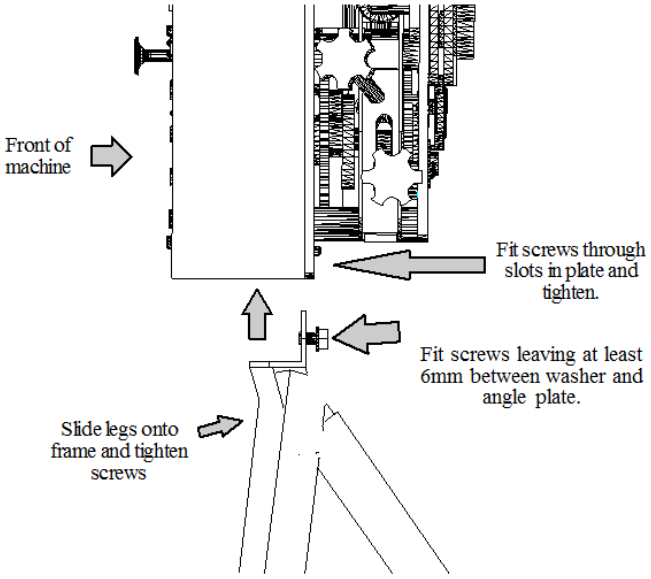


Assembling the Tri-Pod Stand (optional)



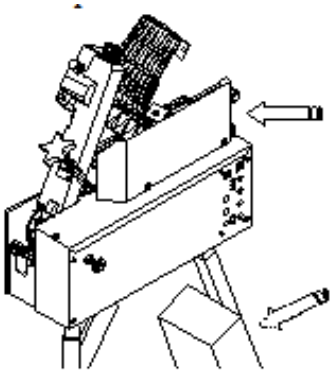
Do not over tighten the screws in the legs as damage to the screws may occur.

Fit the legs to the support frame as shown in fig 2.
Fit the 2 m6 x 12 hex head screws into the support frame as shown in fig 2.



Fit the machine onto the support frame and tighten securely. See fig 2. Adjust the legs so that the machine sits level on the support frame.

Large harvester chains may require the machine to be tilted back slightly to prevent the chain from catching on the rear plate of the machine. To do this, shorten the centre leg by approximately 25mm (1 inch).

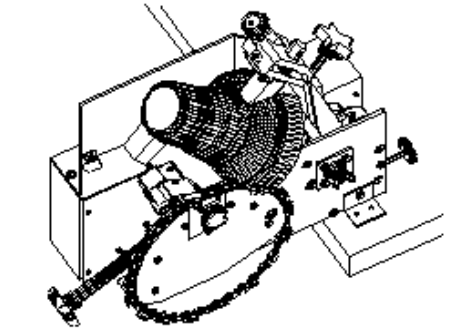


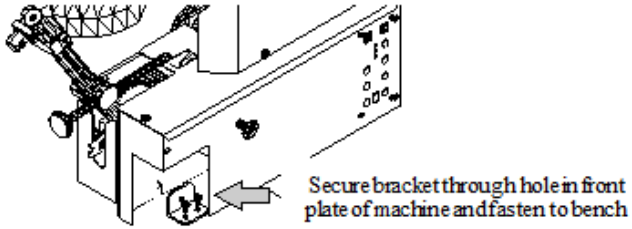
Protection shield

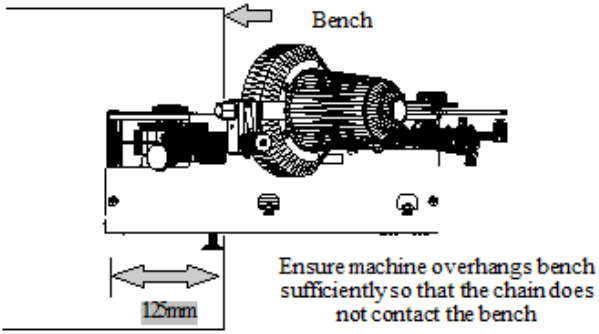
Attach power supply onto leg as shown.

Ensure power leads are not near moving parts and covers are fitted to prevent dust from entering the power supply.

Bench Mounting the Machine (Brackets not supplied)







Overview of Operation

The T-Rex uses cams to operate the feed, clamp and grinding head. The “Grind Cam” raises and lowers the grinding head while the “Feed Cam” both indexes and clamps the cutters.

Caution!

Excessive clamping pressure will damage the machine.

The T-REX model has three modes of operation:

“OFF” - Green LED	Sharpens left and right hand cutters without detection.
“AUTO” - Amber LED	Uses cutter sensor to detect and grind two cutters in a row.
“MAGNET” - Red LED	Uses a magnet to detect and grind two cutters in a row.
GREEN+AMBER LED	NOT USED

The machine uses four sensors to operate automatically.

1. The cutter sensor “looks” at each cutter and determines what hand it is.
2. The proximity switch senses a magnet placed on a cutter to correct the grinding sequence for out of sequence cutters. It also serves as a counter to automatically shut off the machine.
3. Two other sensors are located inside the machine. One, located in the feed motor to count motor revolutions and the second, behind the idler gear which checks the bevel angle of the grinding head.

Adjustments

There are four main adjustments which need to be made when changing between different size chains. (see previous page)

1. Limiting the feed stroke.
2. Setting the feed pawl height.
3. Centring the grinding head.
4. Chain Clamp.

Limitations

1. The T-Rex model cannot automatically sharpen chains with three or more cutters in a row on the same side of the chain. Two is the maximum.
2. Chains with three or more tie links in one section of the chain must be stopped at this point with the magnet, as the feed stroke will not cope with more than two tie links.
3. Chains with double tie links cannot be sharpened using “AUTO” mode as the sensor will not ‘see’ the cutter after the double link. Only use “MAGNET” or “OFF” mode on these chains.

The Control Panel

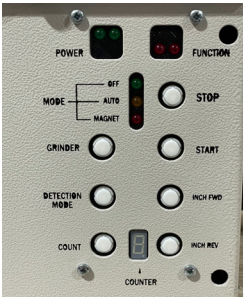
Power indicator

Mode indicator

Grinder on/off

Detection mode

Count



Function indicator

Stop / Reset

Start

Inch forward

Inch reverse

Counter display

Power indicator light:

- Indicates that power is on.

Function indicator light:

- When in “Run Mode” light is on.
- When magnet is detected light will go out momentarily.

Detection mode indicator:

- Indicates which mode machine is in.
- “OFF” - No detection. Machine grinds sequentially.
- “AUTO” - Automatically detects double cutters (left or right).
- “MAGNET” - Corrects only after chain magnet passes proximity switch.

Stop / Reset:

- Stops the machine.

Start:

- Starts the feed mechanism.

Grinder:

- Turns the grinder motor on - press again stops motor.

Inch Fwd:

- “Inches” machine forward when not in run mode.

Inch Rev:

- “Inches” machine in reverse when not in run mode.

Detection Mode:

- Changes between the three detection modes and is shown by the Mode Indicator lights.

Counter:

- Sets number of times chain circuits (maximum of 9).
- Counter is triggered by placing the magnet on chain (Low down on sideplate, on or between the rivets of a cutter).

Counter Display:

- Indicates number of circuits a chain will do, referenced by the chain magnet.

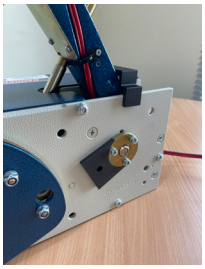
Holding Count and pressing Inch Fwd.

- Positions the machine for adjusting the top plate angle of LEFT hand cutters.
- Display will show a ⊢ symbol.

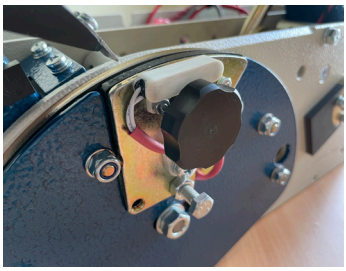
Holding Count and pressing Inch Rev.

- Positions the machine for adjusting the top plate angle of RIGHT hand cutters.
- Display will show a ⊣ symbol.

Removing Shipping & Allignment Brace

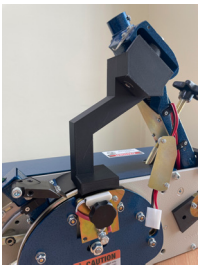


- Pull directly upwards to remove the brace on the top of the body.
- Using a small flat screw driver, gently pry this brace away from the side plate and remove.



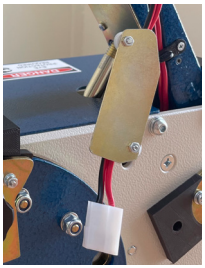
- Turn knob anti-clockwise and undo to release bottom section of support brace.

- Undo the M8 Cap Screw
- **DO NOT REMOVE THIS BOLT**
- Removal of this bolt will allow the gear timing for the grinding motor to disengage.



- Remove the arm support brace.

- Remove the cable tie from the



- Remove both M3 nuts on cover plate.

- Attach the cover plate to the motor arm with screws on reverse side of plate.
- Connect power cords between motor and arm.

Assembling the machine

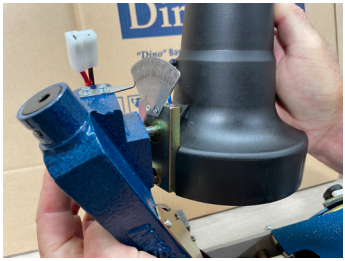
- Connect the AC lead to the power supply.
- Check the voltage selection switch.
- Failure to correctly set this switch will destroy the unit and void the warranty.

- Connect the output of the power supply to the machine.

- Switch the machine on and wait 15 seconds.
- Switch down to turn on.

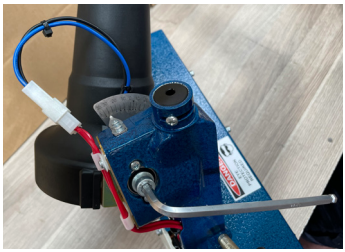
- Carefully tilt the motor arm fully back until the latch engages.

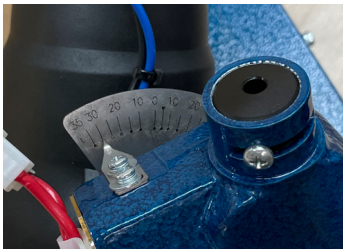
- Press and hold the 'COUNT' button and press the 'Inch Fwd' button, then release both buttons.
- This will force the machine to run to the position for setting the LEFT side angle.



- Attach the motor plate in the position shown.
- Note the orientation of the spacer & the hole position (Top hole)

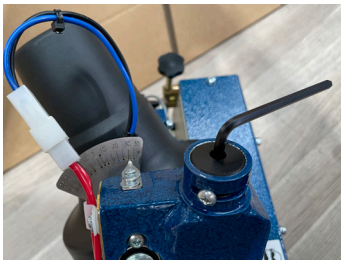
- Lower the arm.

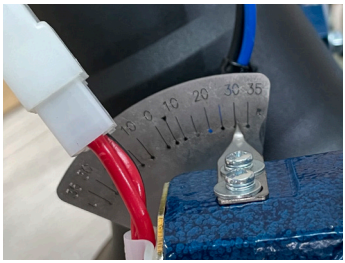




- Rotate the motor to the desired angle on the LEFT side and tighten the bolt with the 6mm hex key.
- Connect the wires.

- Press and hold the 'COUNT' Button and press the "Inch Rev' Button, then release both Buttons.
- This will force the machine to run to the position for setting the RIGHT side angle.





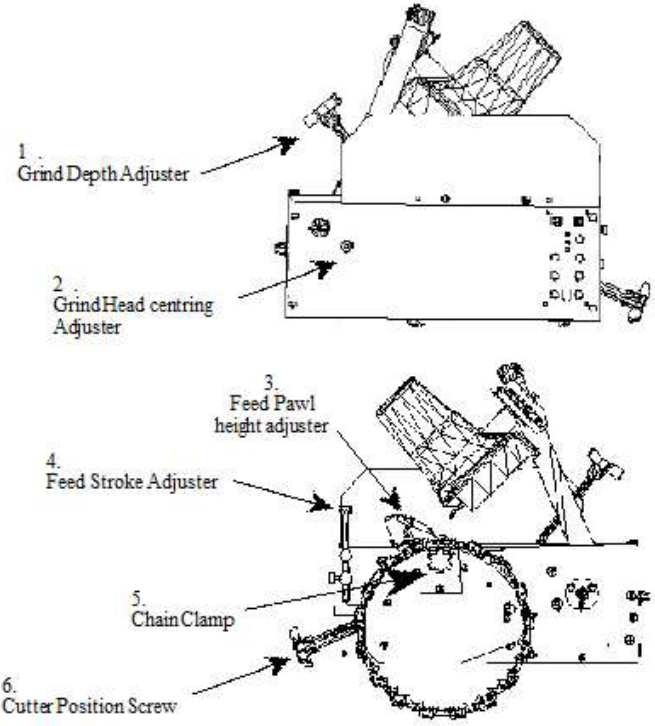
- Insert the 4mm hex key into the end of the motor arm and turn until the indicator shows the exact same angle on the right side.
- Turn Clockwise initially.

- Attach the protection Shield.
- Note: Protection film shown with film still attached, remove before attaching to machine.

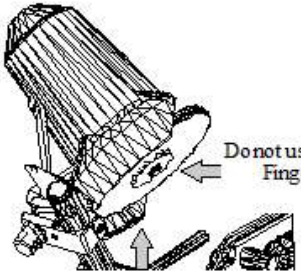
Adjustments

The diagram below shows the main adjustment positions on the machine.

1. Grind Depth Adjuster	Sets the grinding depth.
2. Grind Head Centring Adj	Centres the grind head on the chain.
3. Feed Pawl Height Adjuster	Sets the feed pawl height to suit the chain pitch.
4. Feed Stroke Adjuster	Limits the return stroke of the feed arm.
5. Chain Clamp	Adjusts the clamping pressure.
6. Cutter Position Screw	Sets the amount of material ground from the face of the cutter.



Fitting the Grinding Wheel



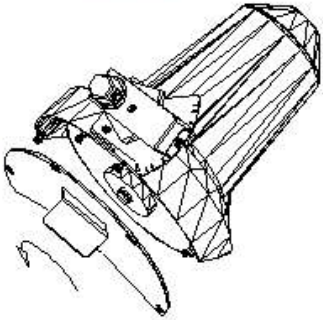
Do not use tools to fit nut.
Finger tight only.

Fit the grinding wheel. Tighten the securing nut **finger tight only**. Fit the grinding wheel cover and protection shield.

Note: Retaining nut has **left hand thread**

Recessed face against grinding wheel

Attach wheel cover by pushing over locating screws and turning anti clockwise.



Dressing and Truing the Grinding wheel

Caution!

Grinding wheels may shatter causing injury.

Grinding dust has been associated with respiratory disease.

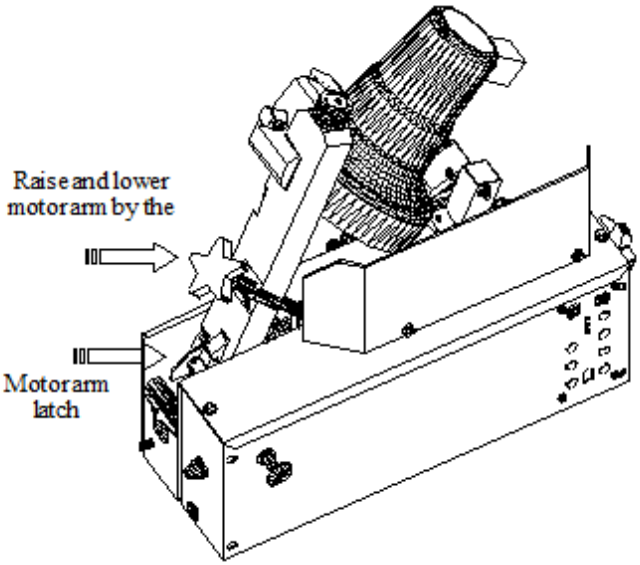
Preferably use ABN / CBN wheels and wear a suitable dust mask.

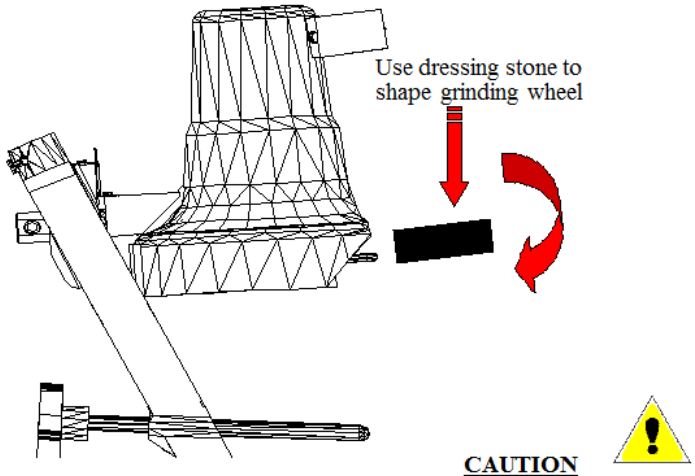
Resin bond Grinding Wheels

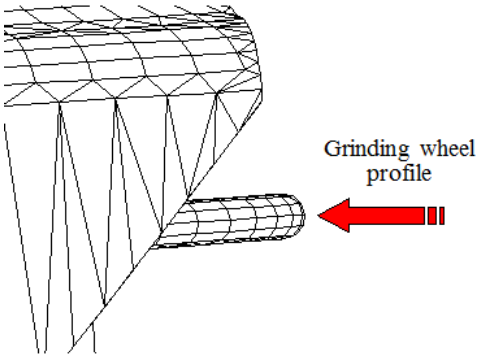
- Fit and secure the appropriate grinding wheel (note left hand thread).
- Before starting the grinding wheel check that it is rated at 6500 RPM or more and is not cracked or damaged.
- Raise the grinding head fully so that the catch holds the head back.
- Do not lift the grinding head by the motor. Always lift the head by the handle on the depth adjusting screw.
- When satisfied the wheel is okay, make sure there are no bystanders near the machine.
- Standing behind the grinding wheel shroud, press the grinder button.

Caution!

It is prudent not to trust the integrity of a newly fitted, bonded grinding wheel - run for at least one minute before dressing the wheel to the required shape.







Warning!

Grinding is dangerous.

Damaged or cracked grinding wheels can shatter causing injury to the operator. Do not operate the machine without guards in place and always wear face and breathing protection. True and dress the grinding wheel using the dressing stone provided as shown above.

Fitting the Chain

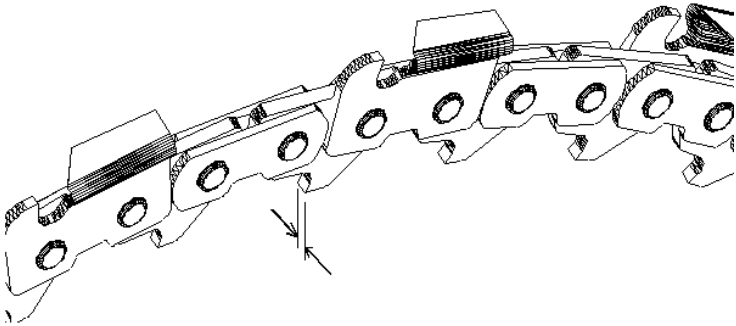
Important:

The chain clamp must be adjusted so that pressure is only applied when the cutter is in the fully forward position.

Before fitting, ensure the clamp is backed off sufficiently when changing from small to large chains.

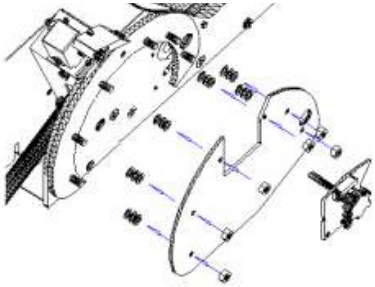
Excessive clamping pressure will damage the machine.

First -- determine the drive link thickness:



Use two spacers for .404" Harvester chain - three spacers for 3/4".

Transfer the outer spacer (washer) below the screw head to the inside to increase the gap for 3/4" harvester chain.



If the machine is to be used for general chain sharpening, (i.e. 0.043"up to 0.067"), the spacers provided can be fitted to the chain guide instead of the washers as shown.

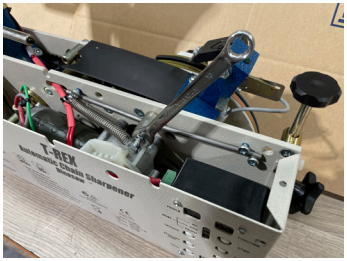
Adjusting the chain clamp opening width

When sharpening .043" chain it may be necessary to reduce the opening of the clamp to prevent the chain from falling into the clamp.

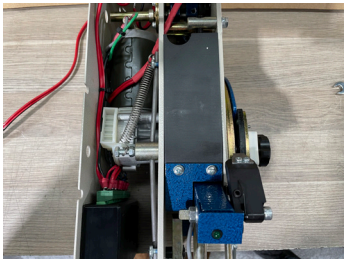
The same opening setting can be used for chain up to .067".

To adjust the clamp opening follow the procedure below.

- Remove the top cover.



- Adjust the clamp opening by turning the NUT.
- Turning the nut clockwise will reduce the opening amount and anticlockwise will increase the opening amount.



- There should be no resistance on the chain when the clamp is in the open position.

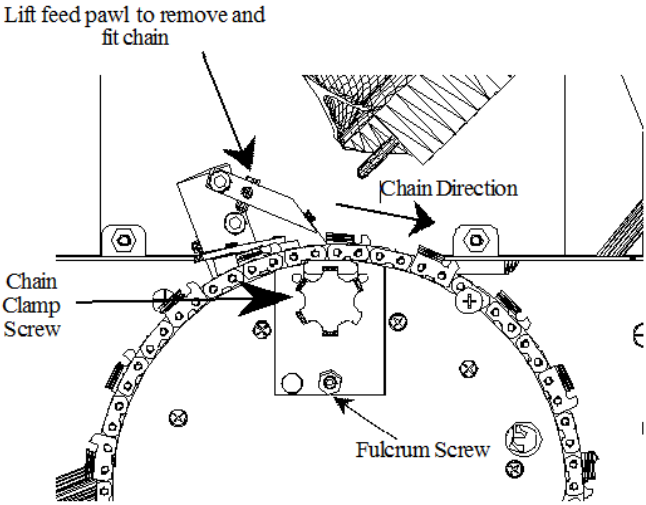
With the motor arm still latched in the upright position, loosen the chain clamp one full turn.

Fit the chain into the chain guide as shown below.

Press the button combination "COUNT"+"INCH FWD". This will run the machine until the feed mechanism is in the fully forward position and the chain clamp is on.

When the machine has stopped, tighten the chain clamp on the chain. Finger tight only. The clamp need only be tight enough to stop movement of the chain.

Excessive clamping pressure will damage the machine.



Chain should be fitted to the machine as shown above (Note the direction of chain).

Tighten the chain clamp knob using finger pressure only.

Do not over-tighten.

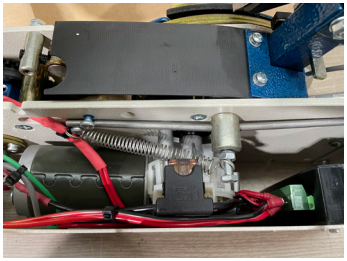
Ensure the clamp knob is only tightened (by finger pressure only) while the feed is in the fully forward position to avoid inadvertent over-tightening.

Changing the Feed Motor Fuse.

The machine is fitted with a fuse to protect the mechanism from damage if excessive pressure is applied to the chain clamp.

If excessive pressure is applied and the machine will no longer feed the chain, follow the procedure below.

- Remove the two screws from the top cover and remove top cover.



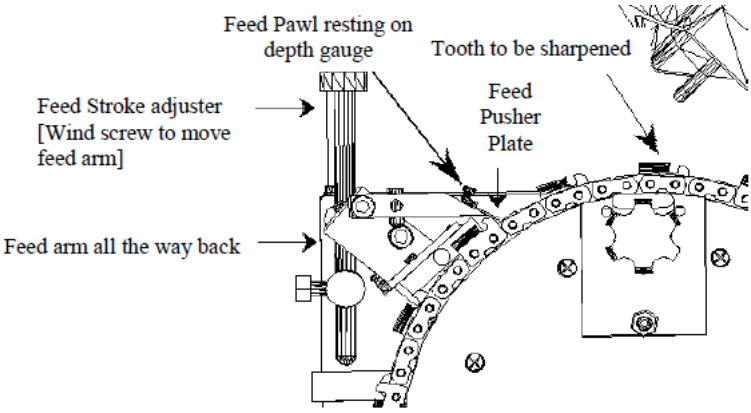
- Replace with 7.5 amp fuse.
- Do not use a higher rated fuse as damage to the machine may occur voiding your warranty.

Adjusting the Feed Stroke and Pawl Height.

Using the Inch Fwd button, Inch machine until feed pawl is all the way back and adjust the feed stroke adjuster until the feed pusher plate is positioned just in front of the depth gauge.

Set the feed pawl height adjuster so that the feed pusher plate is just above the tie links.

See below.



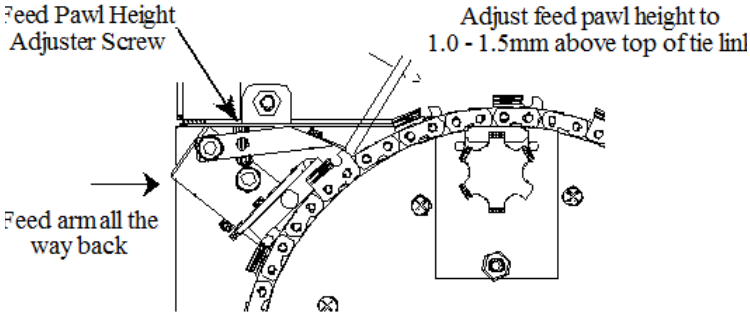
The feed pawl must be adjusted:

1. To provide sufficient stroke length for the chain pitch.
2. At a height to prevent possible catching on the top of the tie links.

Press 'INCH FWD' and take note of the 'Feed Pusher Plate' as it approaches the cutter.

It must not contact the tie links of the chain as it may push from this point instead of the back of the cutter.

Adjust the height of the Feed Pawl as shown below.



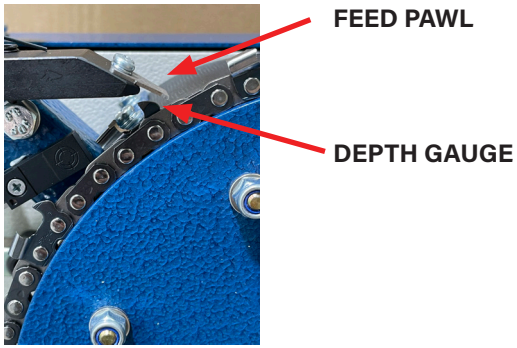
Lower the motor arm and wind the 'Depth Adjusting Screw' on the motor arm so that the grinding wheel is above and not contacting the chain.

Press the button combination "COUNT"+"INCH FWD".

Ensure the cutter being pushed is the same orientation as the grinding head. If not press 'INCH REV' until the Feed Pawl travels back over the following cutter then press 'INCH FWD' to get the correct cutter.

The feed is set to over-stroke the next cutter to provide sufficient stroke length should there be an additional tie link at the join. Set the stroke so the Feed Pawl returns and sits just in front of the following depth gauge.

See below.

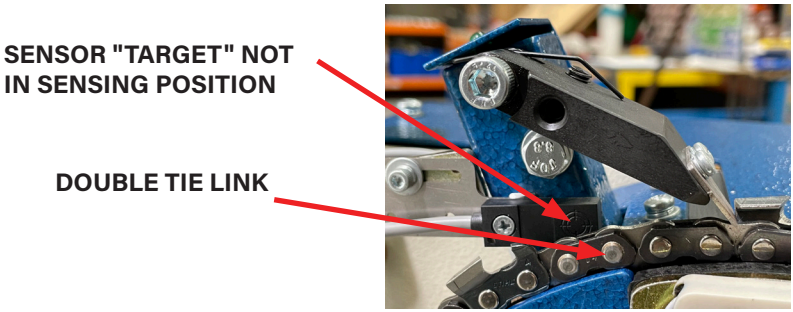


Note:

Sharpening chains with the extra tie link requires the stroke to be set acurately to prevent the feed finger jumping behind and engaging the depth gauge.

The "Auto Detect" cutter sensor will not detect the following cutter if an additional tie link is present.

DO NOT USE AUTO MODE IN THIS CIRCUMSTANCE.



'OFF' Mode Setup

This mode assumes the chain has no double cutters and no extra tie links.

1. Press 'INCH FWD' and ensure the cutter and the grinding head are angled the same way. If not, press 'INCH REV' until the Feed Pawl travels back over the following cutter then press 'INCH FWD' to get the correct cutter.
2. Select 'OFF' mode.
3. Attach magnet to first rivet on any cutter.
4. Select number of chain rotations by pressing 'COUNT.'
5. Press 'START' then 'GRINDER.'

'AUTO' Mode Setup

This mode uses sensors to determine if there are two cutters in a row on the same side of the chain.

This mode uses a sensor to "look" at the cutter and determine what hand it is. If there are two cutters on the same side of the chain, the grinding head will automatically orientate itself and grind both cutters.

** This mode requires careful and accurate adjustment of the "Cutter Sensor".

See following page.

Caution: Check chain for bent or broken cutters before using AUTO mode.

DO NOT USE 'AUTO' MODE ON CHAINS WITH DOUBLE TIE LINKS.

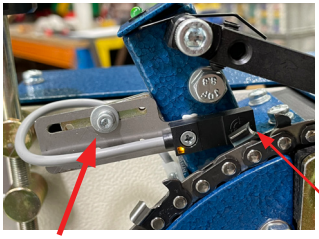
Fit the chain into the chain guide making sure that the hand of the cutter is the same as the grinding head orientation. If it is not, press 'INCH REV' then 'INCH FWD' to synchronise the grinding head and the cutter.

Press and hold the "COUNT" then press "INCH REV" then release both buttons. The display will show a ⊣ symbol and the machine will position itself with the head angled away from the operator (right).

The following series of pictures shows the correct setting of the tooth sensor:

1. Loosen the sensor clamp screw (1) and slide the sensor so that it's "TARGET" is beside the preceding left hand cutter.

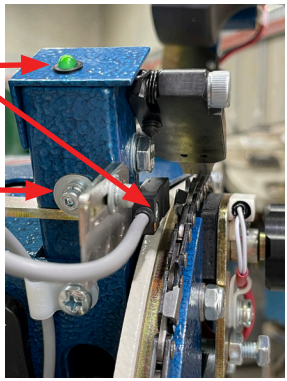
TARGET

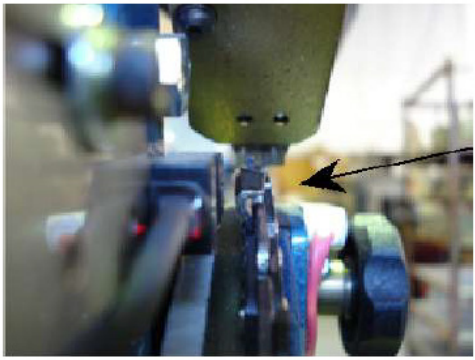


SENSOR CLAMP SCREW

POSITION SENSOR AS SHOWN, TARGET ON SENSOR SHOULD BE IN LINE WITH TOP OF CUTTER

2. Loosen the Sensor Clamp Bracket Screw and slide the sensor toward the cutter. Position the sensor approximately 1-2mm from the cutter. Both LED's (end of sensor & top of feed arm) should be on.

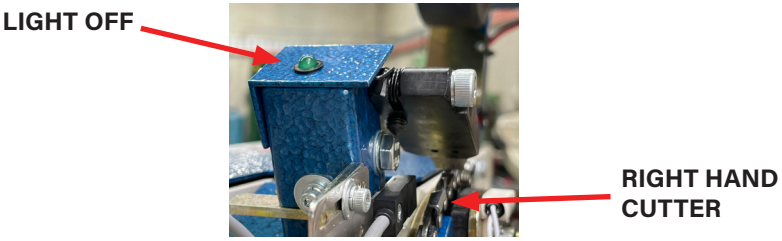




Caution: Positioning sensor too low will cause false sensing. Make sure sensor only senses the cutter and not the body of the chain.

Figure below shows right hand cutter beside sensor.

Note that lights are OFF indicating that the sensor is NOT sensing.



Press and hold the 'COUNT' Button and press the "Inch Fwd' Button, then release both Buttons.

Check that the Grinding head and the cutter are angled the same way.

If they are not, press 'INCH REV' until the feed pawl travels back over the following cutter then press "INCH FWD' to bring the correct cutter into place.

Then repeat step 1.

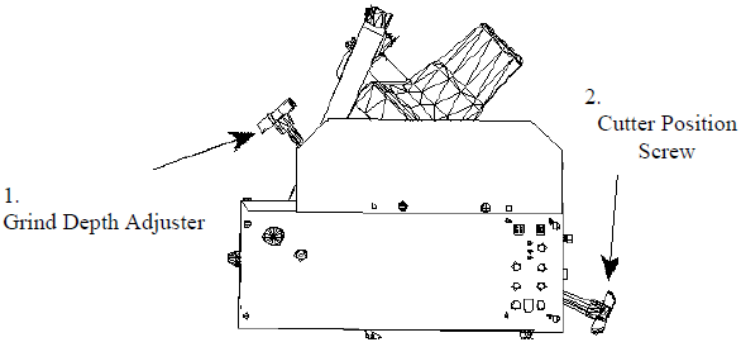
Ensure the grinding wheel is clear of the cutter by winding the 'Depth Adjusting Screw' on the motor arm clockwise.

Press 'START.' Allow to run and verify that grinding wheel is clear of chain.

Press 'GRINDER.' Note that the machine will stop feeding until the grinder motor reaches full speed.

Carefully adjust the 'Grind Depth Adjusting Screw' and 'Cutter Position Screw', while machine is running, to grind the desired amount off the cutters.

Note: Only adjust the 'Cutter Position Screw' when the feed arm is fully to the right.



‘MAGNET’ Mode Setup

Use this mode if the chain is damaged and ‘AUTO’ mode cannot be used.

This mode uses a magnet placed on the first rivet of a cutter on the chain to force the machine to reposition itself for grinding two cutters on the same side of the chain.

The magnet still provides the reference for counting the chain rotations.

1. Press the ‘INCH’ button to index the cutter into the grinding position.

2. Make sure the cutter is in the same orientation as the grinding head.

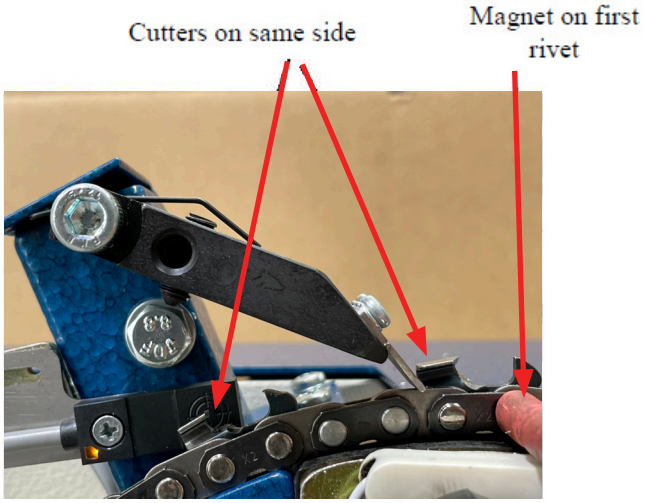
3. Place the magnet on the first rivet on the first of the two cutters which are on the same side.

4. Select ‘MAGNET MODE.’

5. Press the count button so that the display reads at least 2 (if the counter is left at ‘1’ the machine will simply stop when the magnet passes the switch).

6. Press ‘START’, then ‘GRINDER’

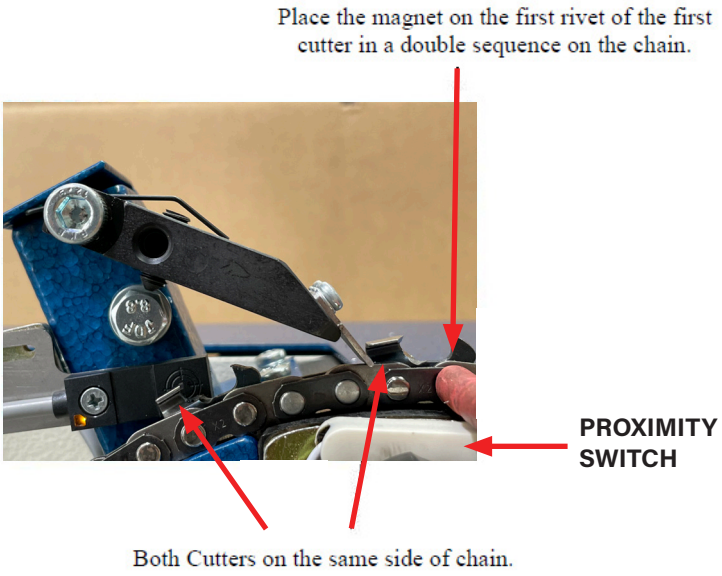
Note: the machine will stop feeding until the grinder motor reaches full speed.



Magnet Positioning for Counting.

Place the magnet supplied onto the chain as shown in fig. below.

Do not place the magnet on a tie link (link between cutters) as the machine will not function correctly.



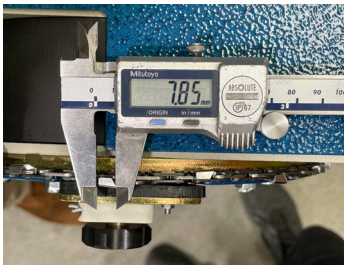
The magnet placed on the side of the chain references the number of chain rotations in *all modes*.

Press the "COUNT" button to indicate how many times the chain will circuit the machine. A maximum of nine (9) times may be entered.

If the count is set to one (1), the machine will stop when the magnet passes the proximity switch.

Grinding the Cutters the same length.

- For a chain to perform at its optimum, it is crucial the cutters are the same length.
- After grinding the cutters, measure the length of one cutter on each side.



- If the cutters are different lengths, adjust the grinding head to compensate.

- Winding the head clockwise will bringthe grinding head towards the operator and winding the adjuster anticlockwise will move the grinding head away from the operator.
- This adjustment can be made while the machineis operating.

Adjusting the amount of material to remove

It is only possible to adjust the cutter while the chain is not clamped.

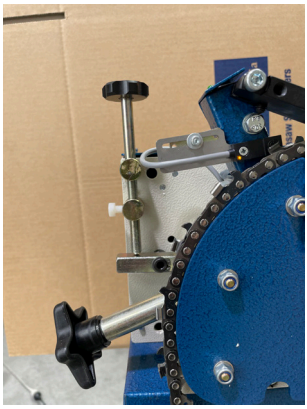
IE: When the feed arm is in the return position. See picture below.

Feed Arm in the return position and
the chain clamp is OFF.

DO NOT ADJUST THE TOOTH POSITION SCREW WHEN THE CHAIN IS CLAMPED.

Damage to the machine may occur if the Tooth Position Screw is adjusted while the chain is clamped.

Feed Arm in the Forward position
and the chain clamp is ON.



The following section deals with altering the settings from standard.

Adjusting the amount of material to remove

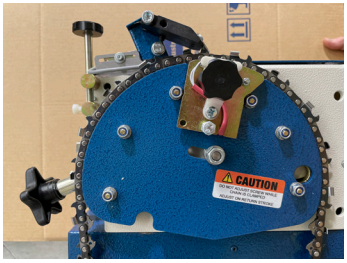
1. Loosen the 8mm retaining nut.

2. Rotate the chain guide to the desired position.

3. Retighten the 8mm retaining nut.

- Remove the two screws from the top cover and remove top cover.

8mm retaining nut



- Minimum side plate angle Approximately 18°.

Note:

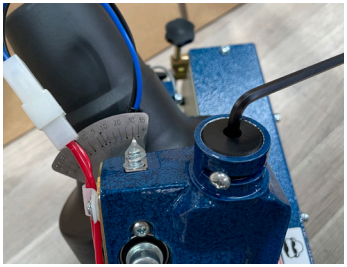
Reset the stroke length and feed pawl height after altering the side plate angle.

Changing the Top Plate Angles

- Press and hold the 'COUNT' Button and press the "Inch Fwd' Button, then release both Buttons.

- Loosen the bolt and set the LEFT angle to the desired angle (30° shown).

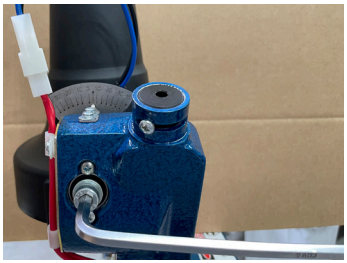
- Press and hold the 'COUNT' Button and press the "Inch Rev' Button, then release both Buttons.



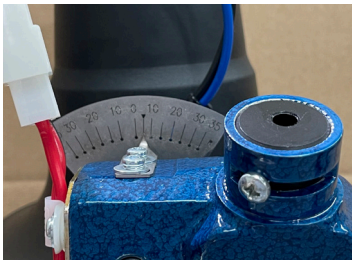
- Insert the 4mm hex key into the end of the motor arm and turn until the indicator shows the exact same angle on the right side.

“0” Degree Top Plate Angle

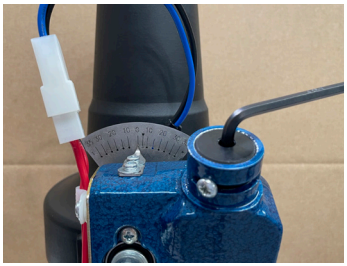
- Press and hold the ‘COUNT’ Button and press the “Inch Fwd’ Button, then release both Buttons.



- Loosen the head clamp bolt and rotate head to the triangular mark as shown.
- Retighten head clamp bolt.



- Press and hold the ‘COUNT’ Button and press the “Inch Rev’ Button, then release both Buttons.

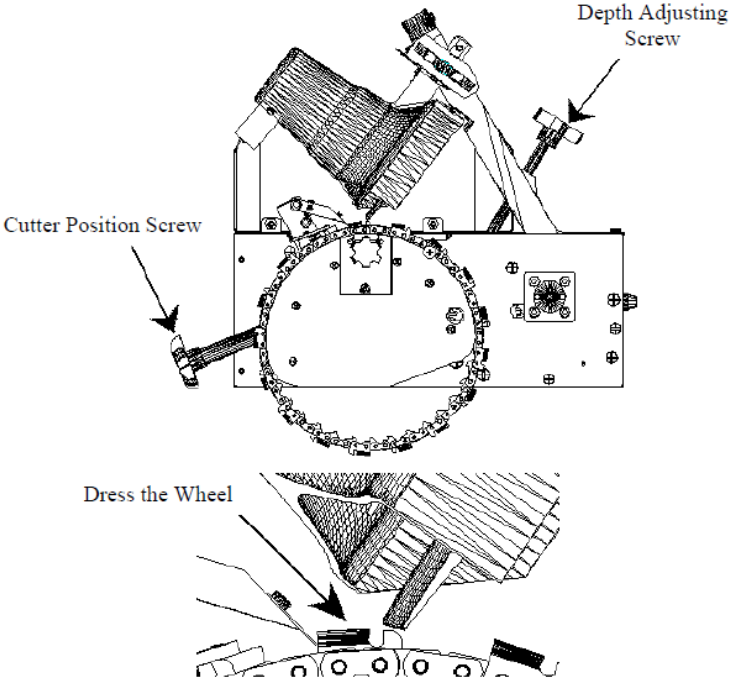


- Insert the 4mm hex key into the end of the motor arm and turn until the indicator points to 0°.

To reset the grinding head angle after it has been set to “0” degrees refer to previous page.

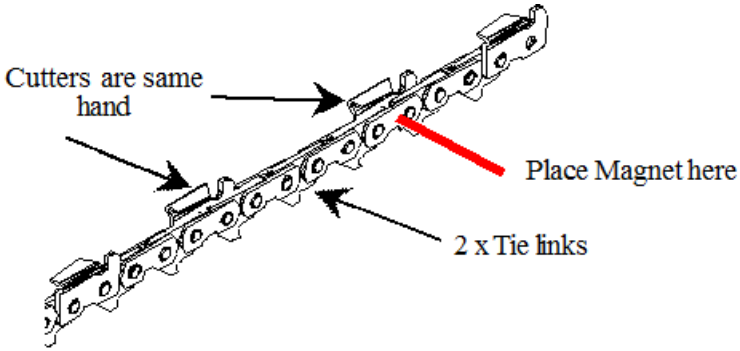
GRINDING the DEPTH GAUGES

1. Set the grinding head angle for "0" degrees as described earlier.
2. Replace or redress the grinding wheel so that the edge of the wheel suits the shape of the depth gauge.
3. Wind the depth adjusting screw in so that the grinding wheel is clear of the chain.
4. "INCH" the machine, adjusting the cutter position screw and the depth adjusting screw until the depth gauge is directly under, but not touching, the grinding wheel.
5. Select "OFF" mode.
6. Press "START" then "GRINDER".
7. Adjust the depth adjusting screw for the amount of material to be removed.



Chains with Double Tie Links

Chains with both two tie links and an out of sequence cutter require the machine to be operated in magnet mode. Adjust the feed limiting screw so that the feed pawl returns far enough to push the cutter after the double join and place the magnet on the chain as described earlier.



Chains with two tie links and the cutters in the correct sequence require the machine to operate in the "OFF" mode as no change is required through the join.

Chain with irregular joins can be easily identified by:

1. Place on a table.
2. Extend them out so the drive links lie immediately beside each other and check the cutters are paired in sequence.

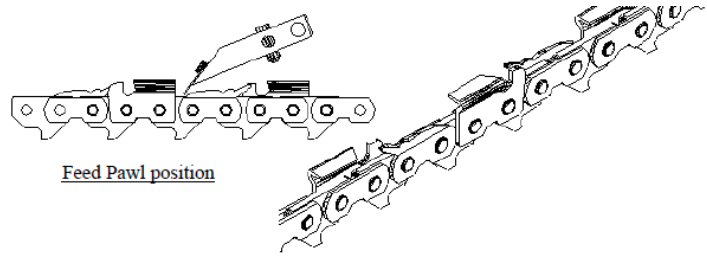
Repaired Chains

Chains which have had a cutter replaced require special attention. Because all of the chain cutters except the replaced cutter are worn or ground shorter than a new cutter, this replaced cutter must first be ground back to the same length as all other cutters.

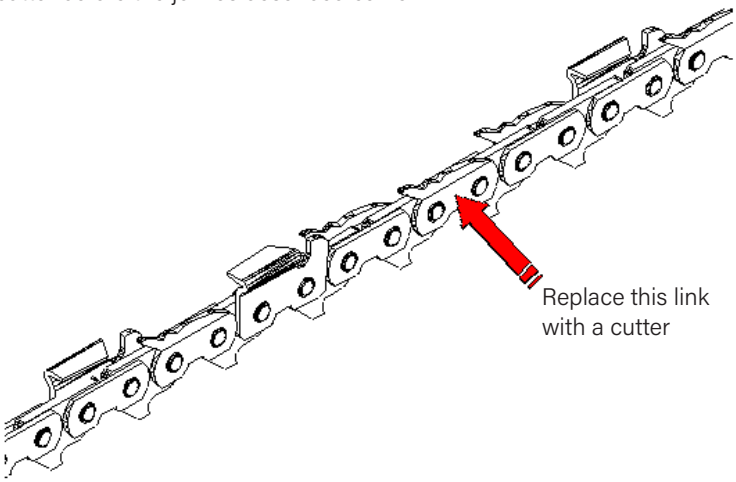
Set up the chain as described earlier. Inch the machine over a section of chain that has worn cutters with the grinding wheel running so that the grinding wheel is just touching the cutters. Inch the machine up to the replaced cutter and very slowly inch the machine into the replaced cutter. This will bring all cutters back to the same length and allow the chain to be sharpened in the normal manner.

Safety Chains

Chains with this type of safety link require the feed pawl stroke to be limited so that it does not push the ridges on top of the safety link.



If the chain has 2 or more tie links, the machine has to be stopped before the join. Set the mode to 'OFF' and place the magnet on the last cutter before the join as described earlier.



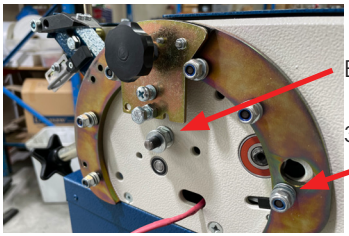
3/4" Harvester Chain

Changing the machine to grind 3/4" harvester chain requires the following adjustments.

1. Remove the chain guide plate and place 3 washers on each stud.
2. Add one washer to the centre stud.
3. Remove the plate from the feed Pawl.
4. Remove the feed Stop Arm.
5. Change the position of the cutter sensor.

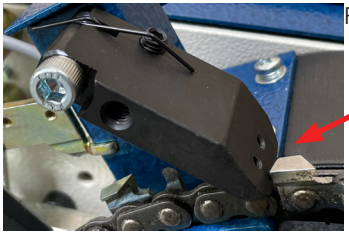
Caution!

Make sure the chain clamp has been loosened before fitting the chain.

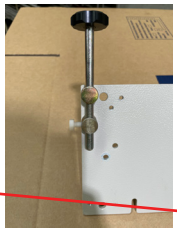


Extra washer on stud.

3 washers on each stud.



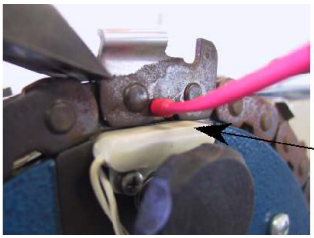
Remove plate from Feed Pawl.



Remove Feed Stop Arm.

Note: Partially assembled machine shown in photo

Attach Cutter Sensor as shown.



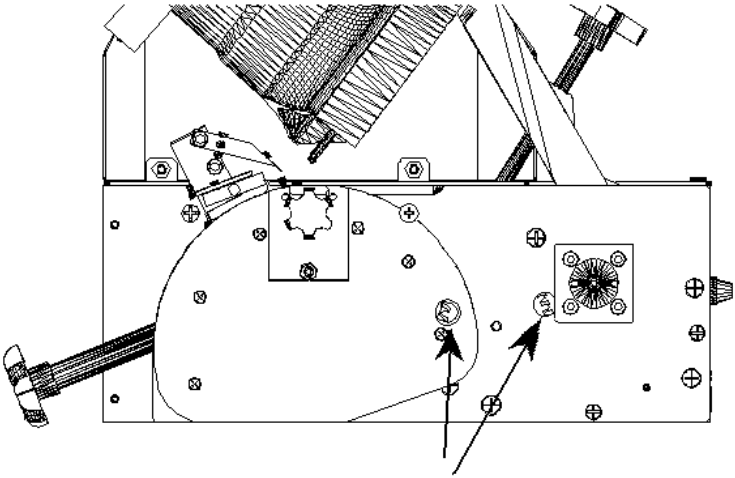
Place magnet below pin on chain.

Magnet must be no more than 5mm (3/16") away from proximity switch.

Checking the Cam Timing

This will only be required after disassembly.

Inch the machine forward until the feed pawl has reached its furthermost forward point. View the timing marks through the cut-outs in the rear plate and ensure all three gears are timed correctly as shown below.



Timing marks visible through sight holes in plate

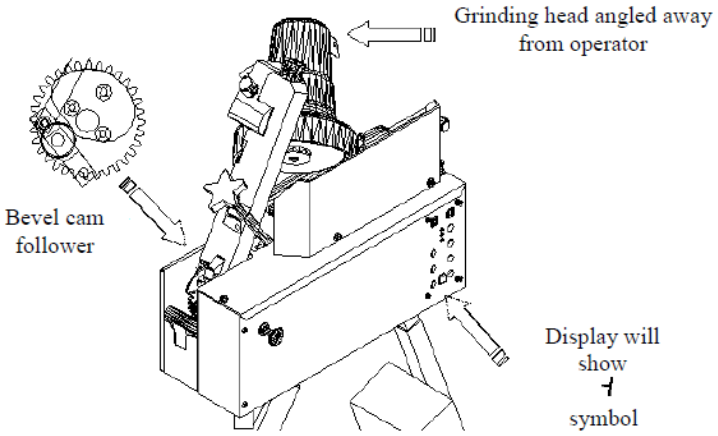
To alter the timing, remove the retaining bolt from the bevel idler gear, rotate the gears so that the timing marks line up and replace the bolt in the bevel idler gear.

Do not force the bevel idler gear into mating gears as coarse operation will result.

Leaving the Machine for Extended Periods

When the machine is not in use (i.e.: overnight, vacations etc.), always leave the machine with the bevel cam follower on the lowest section of the bevel cam.

This ensures that the contact surface of the bevel cam is not damaged. To achieve this press 'COUNT + INCH REV' on the automatic machine, or wind the handle until the machine is orientated as shown below for the manual model.



Failure to follow this procedure may result in damage to the contact surface of the bevel cam.

DinaSaw Pty Ltd
Unit 3/11 Hinkler Ct,
Brendale QLD 4500, Australia

T. +61 (0)7 5491 4999
E. sales@dinasaw.com.au
W. dinasaw.com.au