



Vacu-Torq
Cutting System
OPERATING INSTRUCTIONS
ENGLISH VERSION

OPERATING INSTRUCTIONS
HIGH PERFORMANCE ROTARY CUTTERS

Model No:

WARNING

Ensure that all personnel involved in the installation, operation and maintenance of this machine as well as those persons who will act as supervisory personnel for this listed above, have read and understood fully these instructions and those contained in the accompanying suppliers' instruction manuals and instruction sheets before attempting to install, operate or perform maintenance on this machine.

Should any questions arise regarding the safe and proper installation, operation or maintenance of this machine, contact the manufacturer at the address listed below before proceeding. No modifications or alternations are to be made to this product without the prior express written consent of Peter Gillard & Co Ltd.

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Operating Instructions

Rotary Cutter

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1 INTRODUCTION

Your Rotary Cutter cutter was carefully inspected, both mechanically and electrically, prior to shipment.

It should be free from scratches and in perfect mechanical and electrical order upon receipt. Check the machine for any physical damage which may have occurred in transit.

If there is any indication of damage, file a claim with the carrier prior to using the machine. Inform us, so that we can take prompt action to remedy the problem.

If the cutter appears to be in good condition proceed with the following instructions, making sure to familiarize yourself with the power, safety and control requirements of the Rotary Cutter.

SAFETY CONSIDERATIONS

Cutting machines are potentially extremely dangerous. The knives used in the cutter are of the highest sharpness. They can easily cut through fingers, thumbs and cause severe cuts.

Although the cutter is fully safety protected, it is strongly recommended that the following additional safety guidelines be followed:

- a) NEVER attempt to change cutter blades when the electrical supply is connected to the machine.

ALWAYS turn the isolator switch OFF before changing blades.

- b) NEVER open the clam-shell safety guard or remove cutter bushes without first turning OFF the cutter motor and placing the cutter in 'stand-by' mode.

For absolute safety it is recommended that the isolator switch be turned off to disconnect electrical supply.

- c) NEVER use cutter bushes whose inner bore is considerably larger than the extrudate size being cut.

ALWAYS match extrudate size to cutter bush bore.

- d) NEVER attempt to use fingers to remove cut pieces from the cutter bush bore.

The cutting action of the cutter could be engaged, causing the blade to rotate, slicing through whatever was in the bush bore.

ALWAYS use another object to clear the bore. Better a bent blade than a lost finger.

- e) NEVER leave knife blades lying around where they could be used for purposes for which they were not intended.

ALWAYS keep your spare blades in a safe place and allow only trained personnel to change blades.

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- f) NEVER allow unskilled operators to change blades, bushes or generally handle the cutter.

ALWAYS brief your staff, including part-timers, of the potential danger of the equipment.

BE CAREFUL - KEEP YOUR FINGERS!

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Safety Protection

The cutter is fitted with a number of features designed to minimize the possibility of damage to either operators or the machine.

a) **Guide Bush Safety Sensors**

The machine will not operate unless steel guide bushes are located within the guide bush holders.

b) **Clam Shell Safety Sensors**

The machine will not operate unless the clam-shell guard covering the knife blade is in its 'down' position.

c) **Clutch/Brake Overload Protection**

Automatically cuts-out the clutch/brake should the knife blade get caught or jammed during its rotation.

This will protect the clutch/brake from serious damage and excessive wear

d) **Top Cabinet**

Please ensure the top cabinet is always locked. The key must not be left in the lock. The key should be held by a person of suitable authority - it must not be kept by the operator.

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2 OUTLINE

The cutter is a high accuracy extrusion cutter. It utilizes a 'flying knife' action for precision cutting. By rotating an ultra-thin knife blade in an arc at high speed, the cutter can slice through extrudate with minimal product interruption.

A patented vacuum clutch/brake is used to control the operation of the blade. It ensures that the torque generated by the cutter motor is separated from the blade until a signal-to-cut is given. In this way the cutter operates 'on-demand'.

All machines are tested and calibrated to give a repeat accuracy from signal to cut to knife penetrating the extrudate of 0.1 milliseconds (0.0001 seconds). This figure should be maintained throughout the operating life of the cutter's vacuum clutch/brake.

This type of accuracy represents a tolerance of 0.15mm or better. However, the accuracy achieved by your machine will depend upon a number of factors:

- Linespeed
- Material type
- Feeding method
- Length measuring system
- Blade/guide bush configuration.

Your particular application will have been discussed prior to placing an order. If you feel that your machine is not achieving the performance specified please contact us.

When cut accuracy problems do occur, they are rarely due to the cutter itself. We have paid particular attention in these operating instructions to explaining the influence of non-cutter factors on cut length accuracy.

If you have any problems telephone us on Tewkesbury 01684 290243 We can usually solve a problem over the 'phone, avoiding hours of frustration.

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3 INSTALLATION

- 3.1 Carefully check that all crating, packing and transportation strapping has been removed from the machine.
- 3.2 Check that all loose items have been removed from within the top cabinet of the cutter.
- 3.3 Unpack these items - what is supplied is dependent upon individual customer's requirements. As a minimum, 1 off set of knife blades and 1 off pack of spare filler pads will be supplied.
- 3.4 To identify additional items, please refer to the specification sheet provided with these instructions. The appropriate boxes will be ticked to signify which option is fitted to your machine. Please refer to the section mentioned for installation and operating advice.
- 3.5 There are two possible configurations for your cutter system. Please refer to the specification sheet provided with these instructions for information concerning your machine. Then read the appropriate section below.
- 3.6 **Cutter Supplied Without Caterpillar**

If your cutter has been supplied free-standing, without a caterpillar encoder/haul-off, you will need to attach the shaft encoder/measuring wheel provided to your existing caterpillar.

A support bracket is supplied for the encoder. See sketch 1 for further details on the correct installation of the encoder/measuring wheel system.

Infeeder type, method and measuring wheel positioning are of vital importance in obtaining cut length accuracy.

See section 16.2 for more information.

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3.7 Cutter Supplied With Caterpillar

If your cutter has been supplied with a caterpillar infeed/haul-off then the encoder will probably have been installed for you. In the majority of cases the encoder will be positioned within the base of the caterpillar, directly linked to the caterpillar drive worm gearbox.

Our experience is that this is the optimum location for the encoder. It gives the most accurate length reading to the cutter. The encoder is also protected from 'knocks' and requires no adjustment due to worn belts, etc.

Where cutter and caterpillar are supplied on separate free-standing bases, a cable is provided to link the cutter to the encoder in the caterpillar. A suitable plug is located at one end of the caterpillar.

If in any doubt as to which method of encoder location you have, please refer to the specification sheet concerning your machine, or consult the factory.

3.8 Cutter Location

The optimum location of the cutter in the extrusion line will depend to a large extent as to which type of extrudate is being produced.

For soft and flexible products, the inlet bush (3K) should be as close as possible to the discharge point of the infeed.

For rigid materials, the cutter may need to be located some distance from the infeed to allow the extrudate to flex as each cut occurs.

Some degree of trial and error may be required to obtain the ideal cutter location for your particular extrudate.

3.9 Electrical Supply

A 3 phase 380volt or 415volt 50Hz supply with neutral and earth line is normally required.

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If requested, your machine will have been supplied with a different electrical specification.

Connect electrical supply to main isolator (1) as indicated within the isolator.

A suitably qualified electrician should undertake all electrical installations.

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4 INITIAL START-UP

- 4.1 Referring to sketch 2, please familiarize yourself with all controls located on the main cutter fascia.

Some of the controls fitted to your cutter may not be identified on sketch 2. This is because these controls concern optional extras or special functions. Separate instructions will explain their operation.

For initial start-up, only the controls illustrated in sketch 2 will be required.

- 4.2 Ensure that the electrical supply is OFF at the isolator switch (1) and that the clutch switch (11) is at '0'.

- 4.3 Open the knife guard cover (2) and check that a blade has not been fitted.

If there is a blade fitted it is recommended that this be removed during initial start-up. This is achieved by removing the blade clamp bolt (see sketch 5).

To assist in releasing the clamp bolt there is a tommy bar hole in the hub.

Check that the cutter guide bushes are fitted. Without these items in place, the cutter will not operate due to its safety protection.

- 4.4 Close the knife guard cover (2). The cutter will not run with this guard open.
- 4.5 Open the main control cabinet by releasing the lock.
- 4.6 Switch on isolator (1). The 'Mains On' light (5) and the 'Guard' light should illuminate.

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- 4.7 Press main motor start button (7). The motor will start and the 'Motor On' lamp (8) should illuminate.

- 4.8 Check that the timing belt rotation is in the correct direction (see sketch no 3).

Never start the vacuum pump before the main cutter motor. Always check that the timing belt rotation is correct before the vacuum pump is started.

Severe damage can result if the vacuum pump is operated in the incorrect direction, even for a very short period of time.

- 4.9 If it is, then close lid and lock cabinet.
- 4.10 If it is not, then press main motor stop button to turn off the motor. Turn off the machine from the mains isolator. Remove the isolator cover and switch any two of the phases. Replace isolator cover. Refer to step 4.5 and check motor rotation again.
- 4.11 Remove panel at rear of machine. Press vacuum pump start (9) button on control fascia. The 'Vacuum' indicator lamp will illuminate.
- Check gauge on vacuum pump. This should be set to 0.7 bar. This setting is extremely important. If vacuum gauge does not show this reading, adjust control value as necessary. Replace rear panel.
- 4.12 Rotate the rotary switch (11) to position II and release. It will return to position I automatically.
- 4.13 To test the operation of the set length counter (12) it is necessary to enter a cut length. Any figure will do, but a convenient figure is 2000 (200mm - the counter counts in 0.1mm increments).

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Press buttons 'K' and 'V' simultaneously. This will insert the length you have set into the counters memory.

Press buttons 'K' and 'N' simultaneously. This will zero the counter and cause a signal revolution of the cutter head.

- 4.14 Turn to caterpillar infeed on. If the shaft encoder is attached to the caterpillar you will now note that the LED display on the counter 'counts' from '0' to the preset number '2000' as the caterpillar belts rotate. At coincidence, a signal is sent to the cutter causing the knife head to rotate once.

The counter will immediately reset to '0' and the sequence will repeat.

- 4.15 The above procedure ensures that all the functions of the cutter are operating satisfactorily and that it is now ready to be set up in its operating mode.

- 4.16 To stop the machine - return the rotary switch (11) to '0', press main motor stop (16) and turn-off main isolator.

If this sequence is followed the machine will not be damaged.

- 4.17 For the machine to be ready to run, ALL lamps (5), (6), (8) and (1) must be illuminated.
- 4.18 If you have been unable to reach this stage, please refer to the Trouble Shooting Guide in section 7 of these instructions, or consult the factory.

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5 SETTING UP PROCEDURE

- 5.1 Check that the machine is switched off at mains isolator (1).

- 5.2 Fit a knife blade. Refer to sketch 5.

Remove the blade cap clamp bolt. To assist in releasing the bolt there is a tommy bar hole in the hub.

Remove the cap. Rotate the knife shaft until the score line on the edge of the blade holder is visible. This score line should be uppermost when you attach the blade.

Fit the clamp bolt through the cap and then through the hole in the knife blade. Attach to the blade holder.

It is essential that the blade is correctly located as shown in sketch 5.

- 5.3 Select the correct cutter bushes (3A and 3B) to suit section or tube to be cut.

- 5.4 Insert into the cutter bush holder (13).

- 5.5 Rotate the blade by hand (take care) until it lies across the centre line of the bushes.

- 5.6 Slide bushes in towards blade until they just contact it (see sketches 4 and 6).

It is recommended that the blade is allowed to just 'brush' the faces of the bushes (3A & 3B).

It is vital that the clearance between the blade and the bushes is kept to an absolute minimum to prevent the extrudate - particularly flexibles - from being pushed down between the bushes by the blade. In addition, the bushes act as guides for the blade during the cutting sequence.

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- 5.7 Tighten bush clamping bolts (4A and 4B) and check that bushes have not moved.
- 5.8 Rotate blade by hand two or three times to ensure that it moves freely.
- 5.9 Close guard.
- 5.10 Switch on main isolator (1).
- 5.11 Press vacuum pump start button.
- 5.12 Press main motor start button.
- 5.13 Set desired length on length setting counter.

The counter counts in 0.1mm increments. Therefore, to achieve a length of 200.0mm it will be necessary to enter 2000 into the counter.

Press button 'K', 'V' and 'N' simultaneously, to zero the counter, and enter the new length into the counter memory.
- 5.14 Check that totaliser ON-OFF switch (14) is in OFF position and zero totaliser by pressing red button.
- 5.15 Pass extrudate through infeeders and cutter bushes.
- 5.16 Once extrudate is passing smoothly rotate clutch brake rotary switch from 'O' through (II) to (I) and release; this will cause the knife blade to operate once and then carry on in automatic mode on signal from length counter.

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- 5.17 Check cut length and adjust length setting accordingly.

It is important to remember to press buttons 'K', 'V' and 'N' on the counter in order to zero the counter and insert new figure, otherwise the counter will continue to operate on the previously set figure.

- 5.18 Once desired length is achieved switch on totaliser.

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6 ROUTINE MAINTENANCE

6.1 Blade Changing

In order to maintain the efficiency of the cutter it is essential that a sharp cutting edge be maintained on the blade. This ensures that

- (a) a clean cut edge is maintained on the extrudate and
- (b) undue stress is not placed on the clutch.

For safety it is ESSENTIAL that the main isolator (1) be turned off during the blade changing operation.

Refer to sketch 7. Remove blade cap clamp bolt. To assist in releasing the bolt there is a tommy bar hole on the hub. Remove cap and lift out blade. The new or re-sharpened blade may then be fitted. It is essential that the blade and cap be correctly located and seated as detailed on sketch 7.

After fitting check correct bush location, etc, as detailed on sketches 4 and 6.

- 6.2 Cutter shaft bearings - these are sealed bearings and require no lubrication.
- 6.3 Vacuum pump - see supplier's maintenance and operating instructions.
- 6.4 Replacing bulbs in indicator lamps - unscrew coloured head of lamp, remove white diffuser plate, remove bulb.

They are bayonet fixings.

Mains on - guard and vacuum pump lamps are 24 volt. Clutch indicator lamp bulb is 30 volt.

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Only replace with correct bulb.

- 6.5 The position of the brake sensor which is mounted on the left hand end of the cutter shaft is critical. This has been factory set relative to the blade and under no circumstances should it be moved, as incorrect setting can cause premature brake/clutch failure.

6.6 **Cutting Machine Caterpillar 306 Range
(Enclosed Gearbox)**

Daily/Weekly

- 6.6.1 Wipe clean and lubricate infeed vertical drive shaft and adjusting screws.
- 6.6.2 Check operation of safety sensors. (Remove blade first.)
- 6.6.3 Check for any untoward noises. (Locate and rectify.)

Monthly

All of the three points above plus:

- 6.6.4 Check and tighten any loose bolts
- 6.6.5 Check for loose and chaffed wires. (Repair and replace.)
- 6.6.6 Check and adjust if necessary the caterpillar cushion belt.
- 6.6.7 Check caterpillar belt for wear, replace if necessary.
- 6.6.8 Check and adjust caterpillar and cutter drive belts for wear and slack.
- 6.6.9 Check vacuum pipe for leaks, adjust if necessary to 0.7 bar.

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- 6.6.10 Check for oil leaks from gearboxes.
- 6.6.11 Check operation and locking of top cabinet and cutter guard.
- 6.6.12 Check and replace front panel indicator bulbs.

When Required

All of the above points plus:

- 6.6.13 Replace clutch if accuracy is lost.
- 6.6.14 Replace carbon vanes when correct vacuum is no longer obtainable.

6.7 Reset Overload Protection Board

- 6.7.1 Remove cover from SRB 3110 control board.
- 6.7.2 Move selection switch MK1 to join 1 and 2 (in normal use, joined between 2 and 3).
- 6.7.3 While operating machine manually, turn setting potentiometer clockwise until LED just comes on, then back off potentiometer anti-clockwise two complete turns.
- 6.7.4 Move selection switch MK1 to join 2 and 3 for normal operation.
- 6.7.5 Replace cover.

6.8 Fitting and Setting Up Brake Sensor

- 6.8.1 Remove old sensor
- 6.8.2 Loosen blade sensor disc but do not remove from shaft.
- 6.8.3 Fit replacement sensor with disc running through slot.

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- 6.8.4 Set up blade holder so that pins are in a horizontal position with the reference mark at the rear. Hold shaft still and lock blade sensor with rear edge in vertical position as sketch 14 (see Diagrams), ensure blade sensor runs through centre line of sensor block.
- 6.8.5 Run the machine without a blade. Operate switch to make the machine cut. Open the guard and check pins on the blade holder are in the horizontal position. If they are not, slacken the locking screw and move blade sensor in a radial position and relock. Retest and check pins are in the horizontal position.

Note: Always turn off before resetting sensor.

6.9 Pump Maintenance

On the back of the pump is a data plate giving the name and model, size and output of the pump. Record this information and keep it to hand as it will be required when ordering spare parts. Check to see if the pump is Dry (carbon vaned), Wet (oil-lubricated) or a Side Channel Blower. To keep the pump working to maximum efficiency regular maintenance is essential.

6.9.1 For Dry and Oil Lubricated Pumps

When connecting, provide pipes so that the minimum diameter of them corresponds to the threads of the connections. When pipes exceed 2m in length, increase the diameter. Narrow pipes cause loss of pressure and poor efficiency. Check the direction of rotation (arrow on casing) in case of wrong direction change two supply leads.

- a) **Filter Cartridges** - Blow through from inside outwards. If found to be clogged with dust, grease or oil, filters should be replaced. Use additional filters if dust collection is extremely high.
- b) **Cooling Ducts** - Clean with compressed air. Clogged ducts cause overheating and the breakdown of the pump.

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- c) **Coupling Instructions** - when the motor has to be replaced, it is essential that the correct coupling instructions are followed.
- d) **Spare Parts** - Specify serial number, type of pumps and request the parts list.
- e) **Valves** - Do not close the pressure and vacuum valve more than is necessary. In this way you will economise your current consumption.
- f) **Installation** - The pump should be located in such a way that the operating parts - filter and valves are easily accessible at all times.

6.9.2 Maintenance Schedule by Pump Type

Dry Pumps

- a) **Carbon Separator** - replace every 1000 - 2000 hours.
- b) **Vanes** - Inspect the width of the vanes after 2000 hours for the first time and thereafter every 1000 hours. Clean the cylinder with dry compressed air. Install new vanes when the minimum width is reached.
- c) **Bearings** - Lubricate at given intervals with 4 to 5 shots of the grease gun using Kluber Amblygon TA 15/2 whilst the pump is running. Do not over grease the bearings. The pump operates without oil and therefore must not be allowed to suck in water, oil or other liquids. Do not install besides apparatus which blows out oil contaminating air - for example.

6.9.3 Oil Lubricated Pumps

- a) **Oil Level** - When the oil level has sunk half way down the glass, add fresh oil.

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- b) **Oil Change** -First oil change after 100 operating hours, then thereafter every 500 - 1000 depending on the dust content of the intake air. Drain the oil whilst the pump is still warm by uncrewing the drain screw and fill up to the lip of the filling hole.
- c) **Oil Separator Mesh** - Clean the filter of the oil separator in petroleum, then blow through with compressed air. Clogged packs cause poor oil separation.
- d) **Exhaust Air Filter Element** - Check and replace as required. Consult with manufacturer.

6.9.4 Side Channel Blower

- a) **Suction Filter** - Clean suction filter every day or every week depending on the dust content of the intake air. Clogged filters impair performance and result in overloading of the motor.
- b) **Safety Valve** - If safety valve is existing, check weekly and clean if necessary.
- c) **Cleaning** - Clean compressor every month or more depending on the dust content of the ambient air, to avoid over heating.

6.9.5 Prolong the Life of your Pump -

- a) Adequate and suitable filtration must be fitted to this pump to ensure long and trouble free life.
- b) Please ensure that no foreign bodies, ie metal swarf dust etc are allowed to enter the intake and outlet ports of the pump.
- c) If the pump is Oil Lubricated please ensure that the correct grade of oil is in the pump before use.

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- d) Any electrical connections must be made by a qualified electrician and the motor must be protected with a suitable manual overload.
- e) Please check direction of rotation as failure to run the pump in the correct direction may cause internal damage.

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7 TROUBLE SHOOTING GUIDE

- 7.1 No lamps on - check mains isolator is on.
- 7.2 Guard lamp (6) off - check that knife guard cover is closed and both guide bushes (3A and 3B) are correctly inserted.
- 7.3 Motor lamp (8) off - press start button.
- 7.4 Clutch indicator lamp off - rotate rotary switch (11) to position II. Then release - it will return to position I.

For the clutch to engage, the vacuum pump and the cutter motor must be on.

- 7.5 Clutch indicator lamp on but clutch/brake will not run - rotate switch to position 'O', then II, and release.
- 7.6 Clutch lamp remains off despite taking action in 7.4 above.

Clutch in 'stall'. Check blade is free to isolate. Reset clutch by rotating switch to II and releasing.
- 7.7 Mains motor fails to start - check motor contactor has engaged. If not, press reset button on contactor (refer to attached wiring diagrams for identification of components).

If contactor still does not engage, check line fuses.
- 7.8 Vacuum motor fails to start - follow sequence in section 7.7.

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8 **BLADE LUBRICATION OPTION - A-1**

When extruding cured and uncured rubber, medical grade polymers and rigid plastics, it has been found that cutting quality can be vastly improved by lubricating the blade as it passes through the extrudate.

This has led to the development of our blade lubrication system for use with the cutter.

The system consists of the following:

- 8.1 A cast aluminium cutter block is supplied with a matching lid.
- 8.2 The bottom half of the cutter block forms a chamber, into which a suitable lubricant should be poured. A drain is provided to allow easy removal of liquid after use.
- 8.3 The knife blade passes through the lubricant on every rotation. The speed of the knife is such that all excess lubricant is thrown off as it accelerates to cut the extrudate.

It has been found that the minimal amount of lubricant adhering to the surface of the blade is sufficient to allow clean cutting.

- 8.4 Type of lubricant used varies depending upon extrudate type:

Cured and Uncured Rubber

Either plain water or sterate solution. A drop of washing up liquid may be added to plain water to act as a surface agent.

Medical Extrusions

Due to the possibility of contamination, it is not recommended that normal mains water be used.

In its place one of the following is suggested:

- Spirit/alcohol (eg white spirit)
- Distilled water
- Silicone based lubricant, eg Pentaerythritol Mono Oleate

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A lubricant which quickly evaporates from the cut face is often the best choice.

Rigid Plastics

To the list mentioned under medical extrusions can be added:

- Liquid paraffin
- Anti-static solutions

In some cases a degree of trial-and-error may be required to determine the optimum lubricant.

Please ask if you are uncertain of which lubricant type is best for your product.

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9 **BLADE AND/OR HEATED INLET CUTTER BUSH OPTIONS B-1/2, C-1/2**

These options are principally for those who are cutting smaller rigid plastic sections.

The heated blade attachment is for obtaining a swarf-free cut with a 'polished', stress-mark free cut edge.

The heated inlet cutter bush is intended to act as a 'pre-heater', warming larger rigid sections prior to the actual cut.

Serious burns could result from attempting to handle either heater blades or heated bushes without adequate protective gloves.

Always switch temperature controllers to zero when not using these options.

Always allow an ample cooling down period before attempting to remove blade or bush.

Remember during an operating shift it is likely that the entire cutter block will heat up - be careful!

Take the same care as you would in handling an extruder die head.

9.1 **Operation**

9.1.1 **Heated Blade**

Two brackets are located within the knife blade 'clam-shell' guard - one on either side of the knife blade travelling path. A metal disk is fixed to each bracket, around which is located a small header band. When in its 'park' position the knife blade sits inbetween the two metal disks and is thus heated.

9.1.2 **Heated Bush**

A heated band is wrapped around the inlet cutter bush in a similar way to a band around an extruder barrel.

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9.2 Control

Both the blade and the bush have their own individual temperature controller. This is graduated in ten divisions and is provided with a thermostat so that set temperatures can be maintained.

The exact temperature required for your product will have to be determined by trial and error.

The optimum situation is where the heat available is sufficient to warm the plastic, but not hot that the plastic melts and attaches itself to the metal.

It is important to keep all surfaces, especially the blade, free from burnt-on plastic. This could seriously effect cut quality if allowed to accumulate.

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10 PHOTO-EYE CUT LENGTH CONTROL SYSTEM - D-1

The photo-eye cut length control system is designed for cutting rigid or semi-rigid extrudates where -

- a) Very precise cut length accuracies are required.
- b) There are difficulties in getting an adequate length reading from the infeed/take-off due to constant line feed fluctuations.
- c) The infeed is fitted with blocked belts which make the use of a measuring wheel length input system impossible.

This method is usually unsuitable for flexible extrudates, except over very short lengths. This is due to the difficulty in being able to guarantee uniform movement of the extrudate as it leaves the cutter bush.

The system consists of a photo-electric proximity switch (photo-eye), located beneath the cutter block assembly, and a fibre optic cable, adjustable along a rail running parallel to the front of the cutter cabinet.

The general method of operation is as follows -

- i) The fibre optic cable is moved along the rail until the distance from the knife blade to the cable end equals the required cut length.
- ii) A cut will only take place when the end of the extrudate appears before the end of the cable.
- iii) Once a cut has taken place, the cut length will fall away allowing the on-coming end of the extrusion to move towards the photo-eye cable without hinderance.

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10.1 Adjustment

10.1.1 Switch

Before placing the cutter in an operating extrusion line it is advisable to check that the sensitivity of the switch is correctly set for your product.

The sensitivity is adjusted by turning the small screw located on the main switch body beneath the cutter block assembly. Move a piece of your extrudate in front of the end of the cable. Turn the screw clockwise (left-to-right) to make the switch less sensitive, anti-clockwise (right-to-left) to make it more sensitive. It is recommended that the switch be set to a setting as in-sensitive as possible. However, care must be taken to ensure that the actual extrudate is sensed and not the front of the cutter cabinet. When the switch has been activated the small red LED, adjacent to the screw, will flash.

It is probable that the very dark or very clear extrudate will require less sensitive adjustment whilst white or very light extrudates will require more.

Extrudates with letterings or markings on them, especially white or light coloured markings, will probably require quite careful sensitivity setting to ensure that the mark is not mistaken for a gap in the extrudate. A less sensitive setting is recommended.

10.1.2 Fibre-Optic Cable

As explained earlier, the distance from the knife blade to the cable end must be as near as possible to the required cut length.

Before starting the extrusion line locate the cable in approximately the right place. This is achieved by moving the two linked blocks which make up the cable support assembly up or down the rail.

Once the cable is on the approximate position lock the left-hand block in place.

Operating Instructions

Rotary Cutter

Start extrusion line, bring section up to correct size and start cutter.

Check cut length against required length, Final, fine adjustment of the cable location is achieved by turning the screw positioned to the far left of the cable assembly. This will move the right hand cable block either towards the knife blade or away. Approximately 20mm of total movement is available.

Once the correct cut length has been achieved lock the right hand block in place.

Adjustment is also available to move the cable end towards the extrudate or away. The operating range of the cable is from 0.5mm to 20mm. If the cable is nearer to, or further away from the extrudate the switch may not operate.

To adjust the cable loosen the two bolts on the top surface of the cable support assembly and move the cable as necessary. Re-tighten before proceeding.

10.1.3 Rail

When seeing longer lengths, especially longer semi-rigid lengths, it may be found that the end of the extrudate actually falls below the rail height.

To overcome this the rail can be adjusted from its usual position parallel to the floor to a position angled towards the floor, thus lowering the sensing position.

This is achieved by loosening the two bolts which locate the rail to the cutter block assembly and adjusting as necessary.

Operating Instructions

Rotary Cutter

10.2 Trouble Shooting

10.2.1 Switch Fails to Sense Extrudate

- a) Check that the sensitivity adjusting switch has been correctly set.
- b) Check that the end of the cable is within the sensing range of 0.5mm to 20mm from the extrudate.
- c) Check that the cable has not been bent beyond the minimum bend radius (equal and greater than 20mm). This will disrupt the fibre optic bundles and prevent the cable from transmitting and receiving light. See Maintenance section for details of how to replace cable.
- d) Check with the Factory that your product is suitable for use with a Photo-electric Proximity Detector. If your material is very dark or very clear you may require a Photo-electric Reflex Switch instead.
- e) Check that the end of the cable is free from dust or other material which may be preventing light being transmitted or received.

10.2.2 Cutter does 'Double' or Unwanted Cut

This is probably caused by the back-end of the cut piece re-breaking the light beam as it is ejected from the cutter bush.

Operating Instructions

Rotary Cutter

To overcome this problem either -

- a) Modify exit end of outlet cutter bush. Cut away bottom of cutter bush so that cut piece can fall sooner so that any movement as it falls does not interfere with the photo-electric switch.
- b) Change bevel on knife blade cut edge. A double bevelled blade or a blade with a single bevel on the exit side of the blade will cause the cut piece to be ejected from the cut bush at a considerable speed. This may mean that its trajectory as it falls causes it to re-break the light beam.

By changing the bevel this speed may be reduced, thus eliminating the problem.

Experimentation will be required to arrive at the best compromise between cut quality and speed of ejection.

- c) If neither a) or b) are successful it may be necessary to re-locate the photo-electric switch rail support. Please consult the Factory for advice.

10.2.3 Accuracy

Please refer to the "Obtaining Best Results" section of these operating instructions.

Operating Instructions

Rotary Cutter

11 SPEEDCUT CONTINUOUS ROTATION CUTTING - E-1

This feature is designed for cutting at very high rates. The knife blade is continuously rotated at speed between 400 and 1200 cuts/minute. A variable speed DC motor with tachogenerator replaces the standard cutter AC motor.

Control is provided by a ten-turn potentiometer and a digital LED cuts/minute indicator. A change over switch allows either on-demand or continuous operation to be selected.

Cut length is determined by the relationship between blade rotation speed and linespeed, eg

30 m/min linespeed / 1500 cuts/min

$$\frac{30}{1500} = \frac{0.02 \text{ metre (20mm)}}{\text{cut length}}$$

Since extrusion linespeed is normally fixed, the operator must adjust cut rate to achieve final trimming of length required. The cuts/minute indicator is provided to assist this function.

It is recommended that the operator estimates the blade speed required using the above calculation. He then will need to check the actual cut length produced and trim the rate up or down accordingly.

Operating Instructions

Rotary Cutter

12 BATCH COUNTER OPTION - F-1

The batch counter is designed as a fully automatic 'reminder' system to warn operators that a pre-determined batch of cut pieces have been cut.

The system consists of the following:

- 12.1 A 5-digit counter (ref 2.325) allows operator entry of the number of cut pieces required in the batch. This quantity can be anything from 1 to 99,999 pieces. If no batch quantity is required, then 'zero' can be entered into the counter.
- 12.2 To enter the cut quantity into the counter:

Using the thumbwheel buttons enter the required batch quantity.

Once this is set, it is necessary to enter this figure into the counter memory. To do this, press buttons 'S' and 'V' simultaneously. This action will also set the counter to zero, allowing the batch to start counting correctly.
- 12.3 With the counter set, every time the cutter cuts, one piece will be added to the total displayed on the batch counter.
- 12.4 When the counter reaches the pre-set number the counter will reset to zero and the sequence will be repeated.

On coincidence of the pre-set number and count number, a signal is sent to either a buzzer or flashing light.

This warns the operator that the batch is complete and appropriate action must be taken.

Operating Instructions

Rotary Cutter

13 **INFRA-RED PRE-WARMING TUNNEL - H-1**

This infra-red tunnel is designed to warm smaller rigid plastic extrusions immediately before they enter the cutter.

This heating considerably improves the quality of cut achievable when cutting rigid extrusions.

The system consists of the following:

- 13.1 Twin heater channels mounted on a cabinet base. Each channel holds 2 off 750W infra-red panels.

The channels are mounted so as to allow the extrudate to drop between them during any line stoppage etc.

- 13.2 Controls consist of a temperature dial graduated in 50 increments. A pilot shift light indicates power ON/OFF. A large toggle switch is provided to turn off the inlet end pair of IR panels (ie the pair furthest away from the cutter bush). Turning the toggle switch DOWN turns off these two panels. Turning it UP will cause all four panels to be on.

- 13.3 When all four panels are on, the total heat output should be approximately 3.0KW.

Operation

The IR tunnel is designed only to warm the plastic, not to heat it to such an extent that it deforms.

When operating in the line, the IR tunnel should be positioned between the caterpillar and the cutter.

When first installing the tunnel, it is recommended that the heat control be set to its minimum setting. The extrudate should then be passed through it and into the inlet cutter bush.

The temperature should now be slowly raised until the quality of cut achieved by the cutter is adequate.

Operating Instructions

Rotary Cutter

It is not possible to give any precise recommendations of temperature setting, since it is dependant upon extrudate size and linespeed.

If it is found that the extrudate distorts during heating, try turning off the two inlet heater panels and adding more heat with the remaining panels.

Be careful when handling the infra-red heater tunnel.

During an operating shift, the panels, and the metalwork surrounding them, can become extremely hot.

Therefore, you must wear protective gloves when handling the tunnel.

Operating Instructions

Rotary Cutter

14 **INFRA-RED PRE-WARMING TUNNEL - H-2**

This infra-red tunnel is designed to warm larger rigid plastic extrusions immediately before they enter the cutter.

Please read section 10 of these instructions before proceeding. Many of the comments which apply to the H-1 tunnel, also apply to H-2.

The main differences are:

- 14.1 The twin heater channels each hold 4 off 750W infra-red panels, positioned in a rough semi-circle.
- 14.2 A fully enclosing wire mesh guard is provided to protect operators.
- 14.3 A slide-away arrangement is provided to allow the tunnel to be moved away from the cutter during initial line threading-up.
- 14.4 A handwheel allows adjustment of the tunnel 'in' and 'out', towards and away from the extrudate passage. This adjustment is useful in providing a crude temperature control.
- 14.5 Twin temperature controls are provided. One controls the front four panels. The other, the rear panels.

Operating Instructions

Rotary Cutter

15 MICROPROCESSOR COUNTER - I-1

This counter is designed to replace our standard length counter.

It has the facility to store up to 16 different cut length and cut quantity combinations within its memory.

Cut lengths are entered in 0.1mm increments. Maximum value is 999999.9 (999.999 9 metres).

Quantities of up to 9999 pieces can be entered with each of the 16 cut lengths.

Each cut length is called a 'preset'. These are numbered 1 to 16.

The preset length/batch quantity combination can be processed automatically in sequence to create a 'cascade' effect, ie

1.	300.0mm	200 lengths
2.	60.0mm	500 lengths
3.	1010.0mm	45 lengths
4.	827.0mm	10 lengths
16.	452.0mm	876 lengths

To operate the counter:

- 15.1 Switch on the Vac-U-Torq cutter.
- 15.2 Press 'STOP' button on counter.
- 15.3 Press button '1' on counter. This will bring up preset 1 onto the display screen.
- 15.4 Press 'CE' button to clear existing screen.
- 15.5 Insert new length by utilizing keyboard. DO NOT use the dot button as a decimal point - it has a different function.

Operating Instructions

Rotary Cutter

- 15.6 Press UP arrow once to display the cut quantity for preset
- 15.7 Press 'CE' button to clear existing quantity entry.
- 15.8 Insert new quantity by utilizing keyboard.
- 15.9 Press 'UP' arrow once to bring up preset 2.
- 15.10 Follow same sequence as for preset 1, ie steps 15.4 through 15.8 as above.
- 15.11 Once all required presets have been entered, then press button marked with 'DOT' (immediately above button 'E') followed by 'E'. The last preset number on the display will now start to flash indicating that this is the last preset and that the new programme has been entered into the counter.
- 15.12 To start the machine and the counter, actuate the clutch brake switch by rotating it clock-wise.
- 15.13 This resets the clutch/brake and causes it to actuate once - on releasing the switch it returns to the 'ON' position (ie upright) and zeros the counter which causes another cut to take place and the counter to start to operate.
- 15.14 You may stop the machine at any point in the programme and the counter will remain ready for restarting. The current batch will be resumed at the remaining quantity automatically, even if the counter's 'STOP' button is pressed or power is turned off/on.

If it is required to go to a different preset and restart, press the 'STOP' button on the counter, use the ARROWS to find the new preset length and restart the machine. Note - the batch quantity which was halted will now be reset to its full value.

Operating Instructions

Rotary Cutter

If it is required to restart on the same batch but with the full quantity, you must programme the quantity again. Press 'E' to enter, return to the preset length display and restart machine.

- 15.15 Under normal circumstances it should never be necessary to adjust any of the operating parameters within the counter. However, there are some features which may require alteration from time-to-time.
- 15.16 Scaling Factor, ie the figure by which each length measuring output is multiplied by to give an actual cut length which is equal to counter displayed length.
- 15.17 To change the Factor - open the cutter top cabinet. Unscrew and remove the two retaining clips located to either side of the counter. Pull the counter forward through the control fascia. On the top surface there is a cover, underneath which there are 5 rotary and 3 tumbler switches. These switches adjust the operating modes.
- 15.18 With a small screwdriver adjust the third rotary switch from the right to position 6. With the switch in this position use the 'DOWN' arrow to step the counter display through to preset 16. After preset 16, instead of going to preset 1 as normal, it will display the counter set-up parameters. Step through the parameters until FACTOR is displayed. Clear the existing factor by pressing the 'CE' button. (NOTE: It is a good idea to keep a note of the previous factor number until you are satisfied with the new factor). The new factor number can be entered using the numerical keys. When finished press the 'DOT' button followed by 'E'. Use the 'DOWN' arrow to step the counter back to preset 1.
- 15.19 Move the rotary switch from position 6 to position 1. Refit the cover and return the counter to it's normal operating position. Turn the main power supply OFF and then ON again. This will ensure that the new factor is loaded into the counter. Proceed as normal.

Operating Instructions

Rotary Cutter

- 15.20 Calculation of a new factor number can be a complicated procedure. We suggest you contact the factory before attempting to make adjustments using this feature.
- 15.21 Loop Mode, ie when the counter automatically jumps from the last preset to preset 1 in a continuous closed loop. The alternative is when the counter gets to the end of the last preset and then stops until restarted again.
- 15.22 Follow the instructions in 15.17. With a small screwdriver adjust the second rotary switch from the right to position 6 for continuous 'loop' mode. Position 5 stops the program after the last preset.
- 15.23 Language. There are 5 languages to choose from. Follow the instructions in 15.17. With a small screwdriver adjust the fourth rotary switch from the right to the following positions:

Position 0	:	German
Position 1	:	English
Position 2	:	French
Position 3	:	Italian
Position 4	:	Spanish

Operating Instructions

Rotary Cutter

16 OBTAINING THE BEST RESULTS FROM YOUR CUTTER

This section is intended to help you to get the optimum performance from your rotary cutter. It runs through the main causes of poor cut quality and accuracy and suggests correct procedures to overcome these problems. A check-list is provided at the end of this section to help you quickly pin-point possible causes of poor performance.

Advice is always readily available from experienced personnel at Boston should you require it.

Cut quality and accuracy are principally affected by the following:

- a) Cutter positioning
- b) Method of infeeding
- c) Cutter bushes and positioning
- d) Knife blades
- e) Type of cutting action

16.1 Cutter Positioning

16.1.1 For Flexibles -

The upstream (inlet) side of the cutter bush holder should be as close as practicable to the discharge point of the caterpillar infeeder/take-off which precedes cutter.

This reduces the tendency for flexible extrudates to snag or droop as they leave the infeeder/take-off and enter the cutter bush.

For optimum results the inlet end of the inlet cutter bush should be coned so that it can fit inbetween the upper and lower conveyor booms of the infeeder device. This ensures that it reaches right into the exit of the caterpillar nip giving the product no possible opportunity to snag or jam.

Site cutter as close as possible to infeeder/take-off when cutting flexibles.

Operating Instructions

Rotary Cutter

16.1.2 For Rigids

The upstream (inlet) cutter bush should be approximately 0.2m to 1.8m (0.25ft to 6ft) away from the discharge point of the caterpillar infeder/take-off which precedes the cutter.

The exact distance will depend on cross-section of profile being extruded and line speed.

This gap allows the extrudate to flex every time a cut takes place.

An indication of whether the cutter is too close to the infeder will be if you get swarf or 'rags' of material across the cut face of the extrudate. If you do it is probable that this is caused by the extrudate pressing against the knife blade too strongly as the blade attempts to pass through the plastic. Move the cutter away from the infeder until the cut face becomes clean.

As a rule you should be able to place your hand on the extrudate as it leaves the infeder/take-off and not feel any jerk or bump caused by the cutter cutting.

Move the cutter away from the infeder/take-off when cutting rigids.

16.1.3 For Semi-Rigids

The relationship between the cutter and infeder/take-off will depend to a great extent on how rigid or flexible your semi-rigid product is.

Generally the more flexible the extrudate the nearer the cutter to the infeder, the more rigid, the further away.

Operating Instructions

Rotary Cutter

16.2 Infeeder Method

Infeeder type and method are of vital importance in obtaining cutting accuracy.

The rotary cutter is an extremely accurate piece of machinery. It is important that the type of infeeder used and the method of infeeding reflect this.

16.2.1 Speed Stability

Check the speed stability of your infeeder. Speed variation should be avoided as far as possible.

The more stable the infeeder speed the better the accuracy on cut length.

16.2.2 Caterpillar Belts

Check that your caterpillar belts are in good condition. Very worn belts, or belts where the surface joint has come apart, should not be used. This is especially the case if you have a shaft encoder/measuring wheel type length input system.

Even dirty belts can effect cut length accuracy. Ensure that the part of the belt over which the measuring wheel will pass is clean and free from grease or any other matter. Blocked belts should not be used with a measuring wheel system.

Keep your caterpillar belts in good condition, particularly if you are using a shaft encoder/measuring wheel.

Operating Instructions

Rotary Cutter

16.2.3 Shaft Encoder Positioning

Check that the shaft encoder (where supplied) is properly attached to the infeder and that the measuring wheel is in constant contact with the belt surface. This will require some adjustment from time to time as the wheel wears into the belt.

Also check that the position of the shaft encoder is correct. The optimum position is where the wheel is reading from the belt directly above the top driven roller of the caterpillar. This will give a reading which most accurately reflects actual extrudate movement. If this is impossible, place it above a top-boom idler roller. Under no circumstances place it above an unsupported area of belt.

Position your shaft encoder/measuring wheel unit where it will most accurately read actual extrudate movement.

Operating Instructions

Rotary Cutter

16.2.4 Nip Pressure

Check that the nip pressure used with the infeeders/take-off is adequate to avoid extrudate slippage and snaking within the belts. This is especially important if the infeeder is pulling material from a drum or coil, particularly if the extrudate has a curved 'memory' which encourages it to attempt to turn within the belts.

However, do not use excessive nip pressure as this may damage the extrudate and place the caterpillar infeeders/take-off under unnecessary load.

Set nip pressure sufficiently to avoid extrudate slippage or snaking.

16.2.5 Extrudate Presentation

Check that the extrudate is being presented to the infeeder at a constant speed and pulling power requirement. Avoid any sudden hold-ups which place the infeeder under extra load or cause stretching to the extrudate. A motorized drum or pay-off stand is recommended if using the cutter to cut material from a coil as a secondary process.

Avoid hold-ups when presenting extrudate to infeeder.

16.3 Cutter Bushes and Positioning

16.3.1 Product Support

Cutting the plastic, rubber or other material with a flying knife type cutter, such as the cutter, requires a device to support the material while the cut is in progress.

Operating Instructions

Rotary Cutter

The cutter dies or bushes are cylindrical metal devices which have been bored or otherwise machined to match the cross-sectional profile of the material to be cut.

They serve the following functions:

- a) Guide the product to the cut point.
- b) Provide support for the material as it is cut.
- c) Guide and support the knife.

Although frequently overlooked, cutter bushes are extremely important in obtaining a clean cut on extruded tubes, pipes and profiles.

16.3.2 Boring the Bushes

Have the cutter bushes machined or bored to suit the product cross-sectional profile. Clearance must be provided to permit the material to freely slide through the opening. However, the clearance must not be great enough to permit excessive movement of the product material. This may cause irregular or angular cuts.

Excessive clearance will allow the material to move laterally and may cause irregular or angular cuts.

The opening in the pair of bushes should be continuous. Any misalignment will cause feeding problems.

Do not enlarge the entrance of the down-stream bush unless the product is being held-up on the edge at each cut. The more square the entrance, the better the cut quality.

Operating Instructions

Rotary Cutter

16.3.3 Positioning the Bushes

It is vital that the clearance between the blade and the cutter bushes is kept to an absolute minimum. This prevents the extrudate - particularly flexibles - from being pushed down between the bushes by the blade and helps keep the cut in as square as possible.

The optimum position is where the blade is just in contact with the front face of each bush.

Cut quality will be improved the closer the knife blade is to the cutter bush faces.

16.4 Knife Blades

The most significant factor to successful cuts in a sharp knife.

Different products will require different knife blade thicknesses.

As a general rule -

The thinnest knife blade possible should be selected when cutting flexible extrudates.

The more rigid the product, the greater the thickness of the blade required.

Despite the first statement in this section, it is sometimes found that when cutting rigid materials a better cut quality is achieved with a blade which has had its edge taken off.

Operating Instructions

Rotary Cutter

The following thickness blades are available from the Factory -

0.25mm	(0.010")
0.38mm	(0.015")
0.46mm	(0.018")
0.60mm	(0.024")
0.80mm	(0.031")

16.5 Type of Cutting Action

Possibly the most difficult selection concerning knife blades is whether the cutting action should be chopping or slicing.

Chopping directly through a product with a straight edged blade causes the least amount of engagement time and, therefore, the least interruption to the extrudate as it is continuously pushed forward by the caterpillar infeeders.

Slicing through the product with a curved blade tends to give a better cut quality, but can considerably increase extrudate interruption time.

Using a static cutter, such as the cutter, with a continuously moving product demands a compromise between slicing angle and engagement time.

The type of blade you should use will obviously depend upon your application. However, in our experience, approximately 90% of products can be cut adequately with a straight edged 'chopping' blade.

The remaining 10% are best served with a curved 'slicing' blade. Typical products would be thin-wall tubes or profiles, or profiles with an intricate shape where a chopping action might cause material distortion or collapse.

We can offer you a selection of straight or curved blades, or produce a custom blade design especially for your product.

Operating Instructions

Rotary Cutter

Additional advice is always available from the factory. Experienced staff would be pleased to share their knowledge to help you achieve the best possible results from your cutter.

16.6 Problem Identification

16.6.1 Problems

- a) Poor accuracy - 1, 5, 6, 7, 9, 10, 13, 15, 16, 19, 23, 24
- b) Stalling in product during cut - 1, 2, 3, 4, 10, 11, 12, 17, 18, 21
- c) Excessive product interruption - 10, 11, 20
- d) Breakage or shattering of product at cut - 8, 10, 11, 12, 13, 14, 16, 25
- e) Excessive burrs on cut end - 8, 10, 11, 12, 13, 14, 15, 16
- f) Angular cut - 9, 10, 11, 12, 13, 14, 16, 22, 25

16.6.2 Possible Causes

- 1) Vacuum level below 0.35 bar (10")
- 2) Faulty vacuum pipe
- 3) Defective vacuum gauge
- 4) Defective relief valve
- 5) Defective encoder: bearing end play
- 6) Defective encoder wheel
- 7) Bad encoder mount
- 8) Cutter bush gap too large over blade width

Operating Instructions

Rotary Cutter

- 9) Variation in product o.d. size
- 10) Dull blade
- 11) Incorrect blade angle
- 12) Heat in product
- 13) Loose cutter bush bore over section
- 14) Not sharp enough sheer edge on cutter bush
- 15) Rough cutter bush bore
- 16) Lack of product support
- 17) Defective vacuum pump
- 18) Defective motor
- 19) Loose drive belts
- 20) Broken blade
- 21) Clogged vacuum filter
- 22) Double bevel on blade uneven
- 23) Uneven product feed
- 24) Worn infeeder belts
- 25) Infeeder too close to cutter for rigid extrudates.

Operating Instructions

Rotary Cutter

17 CUTTER CLUTCH/BRAKE MAINTENANCE

- 17.1 The cutter clutch/brake and associated electrical circuitry have been designed to give millions of cycles of use with the minimum amount of maintenance.

Due to the complexity of construction, as well as the necessity of special tools, we highly recommend that when the clutch/brake does wear out, or become damaged, that you send it back to us for repair.

17.2 Trouble-Shooting

If you have used the cutter clutch/brake for some time, and you are seeing a decay in accuracy, it may have nothing to do with the clutch/brake.

- a) Have you changed the material you are cutting?
- b) Have you altered your method of feeding?

Refer to Section 16 of these Operating Instructions.

Things to check -

- a) Tension of drive belts from motor to clutch/brake and from clutch/brake to knife shaft.
- b) Are the pulleys too loose?

However, if all the above appears to be adequate and you are still have accuracy problems, then it is most likely that the friction material is worn so much that the clutch and/or brake will no longer engage.

When the clutch/brake tries to switch from brake to clutch, or vice versa, the vacuum gauge (located in the bottom half of the cutter cabinet - access via panel at back of machine) will drop below 0.35 bar (10") and the clutch/brake will hiss.

Operating Instructions

Rotary Cutter

This hiss is a vacuum leak caused by the inability of the disc to make contact with the friction material. This occurs when the gap between the disc and friction material becomes too large.

A quick test to prove this -

Using the palm and finger of both hands grasp the disc and flange of the motor input side and squeeze. The hissing should stop and the vacuum should go back to its standard setting of 0.7 bar (20").

Do not try this with input motor running as injury could result.

Take the clutch/brake off and send it back to us.

17.3 Minimum Downtime Repair Plan

Having established that you have a friction material wear problem it is obviously vital to get it repaired as soon as possible.

Our unique service repair plan enables you to have a clutch to replace your worn unit at low cost. It works this way -

- a) When it looks as though your clutch/brake unit has worn below acceptable level give us an order for a new unit.
- b) We will then send you a replacement unit and invoice you in the normal way.
- c) When the replacement unit arrives replace your old unit with it. You then send your old unit back to us.
- d) We will then send you a Credit Note for a value equivalent to 50% of the cost of a new clutch. You can balance this Credit Note against our original invoice for the replacement unit.
- e) In other words, you only pay half the normal cost of the replacement unit (provided, of course, that you return your old worn clutch to us).

Operating Instructions

Rotary Cutter

- f) Your replacement clutch will perform in exactly the same manner as your original clutch and is provided with similar guarantees and warranties.

Please ensure that your worn unit is promptly returned to us after receipt of a new unit. Any delay in sending it back will cause a delay in issuing a Credit Note.

The feature is unique to cutter's vacuum clutch/ brake and guarantees economical operating with minimal production downtime.

SPARE PARTS LIST

	500	750	HD	No. m/c
Length Counter	<----- 426.1 WE1 ----->		1	
Total Cuts Counter	<----- Cub II ----->		1	
Batch Counter	<----- 2.325.1 WE1 ----->		1	
Shaft Encoder	<----- 3020 ----->		1	
Safety Sensor	<----- RS633-470 ----->		3	
Main Control Board	<----- SRB 3110 ----->		1	
Interface Board	<----- SRB 3211 ----->		1	
External Photocell	<----- SRC 1501 ----->		1	
Photo-Eye	<----- WLL10-310 ----->		1	
Fibre-Optic Cable	<----- LMI-750 ----->		1	
Vacuum Pump	<----- 3.16 ----->	3.25-1	1	
Clutch/Brake	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <----- Ref No on clutch -----> </div>		1	

Whenever possible, please quote machine model number and serial number when ordering spare parts.

May 1990

WARRANTY

Standard products manufactured by Peter Gillard & Co Ltd. hereinafter referred to as the "Company", are warranted to be free from defect in workmanship and material for a period of one year from the date of shipment, and products which are defective in workmanship or material will be repaired or replaced at the option of the Company at no charge to the Buyer. Final determination as to whether a product is actually defective rests with the Company.

The obligation of the Company hereunder shall be limited solely to repair or replacement of products that fall within the foregoing limitations, and shall be conditioned upon receipt by the Company of written notice of any alleged defects or deficiency promptly after discovery within the warranty period and, in the case of components or units purchased by the Company, the obligation of the Company shall not exceed the settlement that the Company is able to obtain from the supplier thereof.

No products shall be returned to the Company without its prior consent. Products which the Company consents to have returned shall be shipped CIF the Company's factory. The Company cannot assume responsibility or accept invoices for unauthorised repairs to its components, even though defective.

The life of the products of the Company depends, to a large extent, upon type of usage thereof.

THE COMPANY MAKES NO WARRANTY AS TO FITNESS OF ITS PRODUCTS FOR SPECIFIC APPLICATIONS BY THE BUYER NOR AS TO PERIOD OF SERVICE UNLESS THE COMPANY SPECIFICALLY AGREES OTHERWISE IN WRITING AFTER THE PROPOSED USAGE HAS BEEN MADE KNOWN TO IT.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED, TO ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

This Warranty does not apply to experimental or developmental products.

**Peter Gillard & Co Limited,
Alexandra Way,
Ashchurch Business Centre,
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Vac-U-Torq HD 500/50B Maintenance

Danfoss SRB 3110 Controller

Selector switch settings

MK 1	1-2 NPN
MK 2	1-2 (OUT) NPN
MK 3	2-3 Stop pos edge
MK 4	1-2 Start neg edge
MK 5	1-2 Option box

LED

B1 lights in brake mode
C1 lights in clutch mode
C2 not use
SC short circuit on valves

Danfoss SRB 3211 overload

Selector switch settings

MK 1	1-2
MK 2	2-3
MK 3	1-2
MK 4	1-2
MK 5	2-3
MK 7	LINK

To set overload

- a) Remove cover.
- b) Move MK 1 to 2-3.
- c) Operate manual cut and turn pot c/w until led just on.
- d) Back off 2 turns
- e) Move MK1 back to 1-2
- f) Replace cover.

To test, stop cutter motor and operate clutch orange light on front panel will illuminate and **Danfoss SRC 1501** led will light in SRB 3110.

This unit has an NPN output and is wired to the SRB 3110 using the following terminals:

Pin No 9	=	0V
Pin No 10	=	24V
Pin No 11	=	Signal

Signal Voltage = 24V covered
0V uncovered

Electronic internals can be replaced if mounting box is in good condition.

SRA 23 Clutch

Non serviceable unit. If cut length accuracy begins to deteriorate replace with exchange unit.

Connections 0V (common) Pin 19
24V brake Pin 16
0V clutch Pin 17

Main Motor

1.5 k/watt, 415V 3ph, 950 RPM
A/C motor
output shaft Dia 38mm
full load current 7.3 amps

Vacuum Pump

.55 Kw pump motor 415V 3ph
VT 3.16 pump

If vacuum is unobtainable by adjusting the setting control replace carbon vanes 8 filter set.

Pump should be set to .7 bar this valve should not be increased or decreased.

426.1 WE1 Length Counter

Unit is powered by 240V single phase live and neutral connected to pins B1 and B2. 0V (Chasis) is provided on pin B3. This is connected to the encoder on pin 1 and attached to the screen.

The 24V power to the encoder is provided by pin B5 and is connected to encoder pin 2. The signal (NPN) is pin 3 on the encoder and is connected to pin A15 signal input on the counter. The output at presigned is pin A1 on the counter. This is connected to pin 12 of SRB 3110. It is also looped to pin A5 to produce an automatic reset of the LED display.

This unit can be serviced with a lead time of about 4 weeks.

If normally open/normally closed potential free contacts are required at presignal, these are provided at pins B10, B11, B12.

Current rating 20 milli amps min
1 amp max

Total Cuts Counter Cub II

This unit is powered by two N size batteries which should be replaced approx. every 2 years.

The unit is driven by an NPN output 24V from pin 1 on the SRB 3110 board.

Series 3020 Shaft Encoder

This unit is a single channel encoder, with 501 pulses per rev.

Wiring connections

Pin	1	Blue	OV
Pin	E	Green	Join with screen
Pin	3	Yellow	signal 24V NPN
Pin	2	Red	24V D/C

1 pulse of the encoder is equal to .1mm of product movement.

Safety Sensors

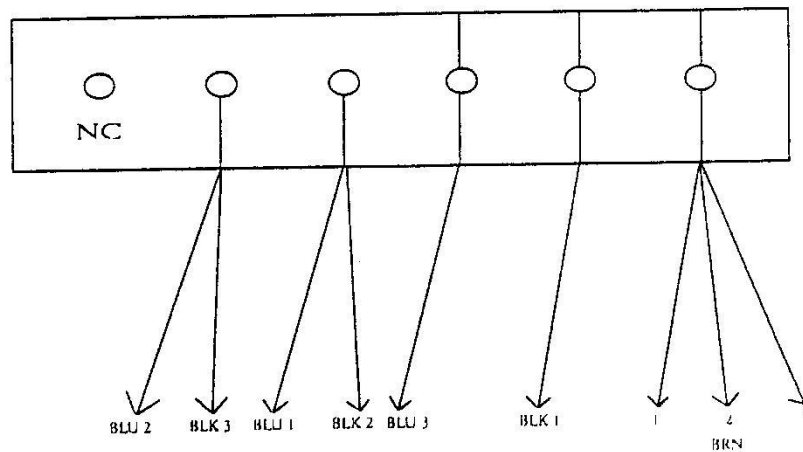
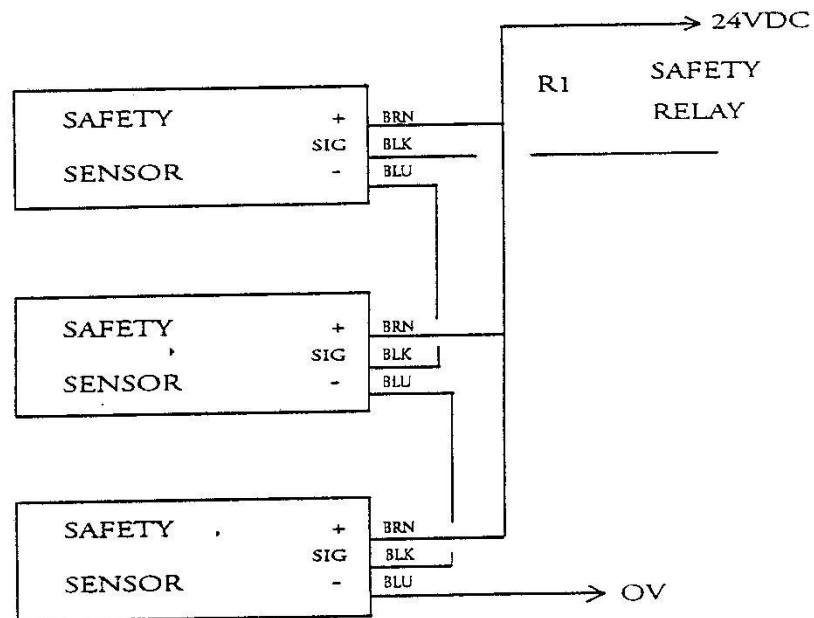
These units are M8 proximity sensor with an NPN signal.

They are powered 24V DC \pm 6V

Wiring connections

Brown = 24V
Blue = 0V
Black = Signal

These units are wired in series between the 0V and the signal and the 24V is common.



Motor/Clutch Drive Pulley

The pulleys are unlikely to even need replacement and the belts should be checked for wear every 6 months of operation.

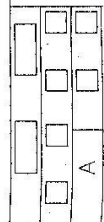
The Clutch/Cutter shaft belt is prone to stripping teeth because of the load at impact with product to be cut.

SNP 30 Cutter shaft bearings

Check the main cutter shaft bearings for wear and slackness every 12 months. If wear is found replace and reset shaft alignment as described in manuals.

Hydraulic Bush

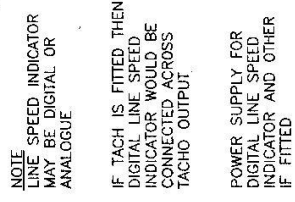
This unit mounts the aluminium alloy pulley to the smooth shaft of the clutch. The clamping bolts should be tightened to a torq of 8 Nm.



Gillard

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Gillard Cutting Technology

Gillard

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A. RICKARD	16/07/02
1	CAT505_OLD_E