

Gillard Advanced Cutting Systems

Operating Instructions

**BENCH-CUT ROTARY
CUTTING SYSTEM**

Issue 01/97/BC
Bench-Cut Cutting System

Date March 1997

English

Operating Instructions

B e n c h - C u t **M o d e l 3 5 0 / 3 0 - 1 2 0 0**

Construction date

Serial 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 supplier's 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 alterations are to be made to this product without the prior express written consent of Peter Gillard & Co Ltd.

Gillard Cutting Technology
Alexandra Way
Ashchurch Business Centre
Tewkesbury
Gloucestershire
England
GL20 8NB
Tel: 01684 290243
Fax: 01684 290330
E-mail: sales@gillard.co.uk
www.gillard.co.uk

Issue 01/97 BC
Bench-Cut Cutting System

Warning!

CONTENTS

	SECTION
A. General information	6-12
1. Introduction	6
2. General purpose and use of the machine	6
3. Products to be cut or handled	7
4. Local service and after-sales support	7-10
5. Standards to which this machine complies	11
6. CE Declaration of conformity/incorporation	12
B. Safety considerations	13-16
1. Hazards in case of non-compliance with safety guarding	13
2. Safety conscious work practices	13-15
3. Safety protection	15
4. Noise emissions	16
5. Prohibition of non-authorised modifications	16
C. Installation	18-19
1. Weight and dimensions of machine	18
2. Lifting and handling instructions	18
3. Unpacking instructions	18
4. Electrical Supply	18-19
5. Air Supply	19
D. Machine controls and their functions	20
1. Control panel details	20
E. Operation	23-27
1. Cutter start-up	23
2. How to operate the cut length counter	25
3. Stopping the machine	26
F. Setting up procedure	27-33

Issue 01/97/BC
Bench-Cut Cutting System

Contents

SECTION	PAGE NUMBER
G Bench-Cut optional items	34-39
1. Blade lubrication A-1	34
2. Speed cut continuous rotation E-1	35
3. Cut length counter	36
4. Batch counter with beacon F-2	37
5. Automatic stop at end of batch F-3	38
6. Linespeed indicator R-1	38
7. Length measuring counter R-2	38
8. Boom position indicator R-5	39
9. Angled top boom facility U-2	39
H Obtaining the best results	40-47
1. Introduction	40
2. Cutter positioning	40
3. Infeeder control	40
4. Cutter bushes	41
5. Knife blades	42
6. Type of cutting action	43
7. Problem identification chart	43-47
I Maintenance and inspection	48-53
1. Monitoring during operation - Consumables	48
2. Monitoring during operation - non-Consumables	50
3. Preventative measures	52
4. Planned maintenance schedule	53
5. Functional checking of safety devices	53
J. Parts list	55-58
1. Front control panel	55
2. Rear electrical cabinet	56
3. Mechanical items	56
4. Spare parts	58
K Trouble shooting guide	60
L Warranty	61

Issue 01/97/BC
Bench-Cut Cutting System

Contents

DIAGRAMS

DIAGRAM NO.	DESCRIPTION	PAGE NUMBER
001	Danger areas	14
002	Installation	17
003	Control panel	21
004	Straight blade mounting	22
005	Curved blade mounting	28
006	Razor blade mounting	29
007	Chip blade mounting	30
008	Blade clearance	31
009	Mechanical part identification	32
010	Mechanical part identification (Caterpillar)	49
011	Brake sensor set-up	51

Issue 1/97/BC
Bench-Cut Cutting System

Contents

A GENERAL INFORMATION

1 Introduction

Your machine 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, inform us, so that we can take prompt action to remedy the problem.

If the machine appears to be in good condition proceed with the following instructions. Make sure to familiarise yourself with the power, safety and control requirements of the Bench-Cut before starting the machine.

2 General purpose and use of the machine

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

A compressed air 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 Bench-Cut operates 'on-demand'.

All machines are tested and calibrated to give a repeat accuracy from signal-to-cut to knife penetrating the extrudate of 3 milliseconds (0.003 seconds). This figure should be maintained throughout the operating life of the Econo-Cut compressed air clutch/ brake.

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.

Issue 01/97/BC
Bench-Cut Cutting System

Introduction

When cut accuracy problems do occur, they are rarely due to the Bench-Cut 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 please telephone us or fax us. We can usually solve a problem quickly, avoiding hours of frustration.

3 Products to be cut or handled

The Bench-Cut is designed to be used in an extrusion line, cutting flexible and rigid plastic and rubber extrusions. The maximum capacity of the machine is 30mm. However, actual cutting capacity will depend upon product type and wall thickness.

4 . Local service and after-sales support

The following companies in the countries listed support this machine. For all other countries, please contact the manufacturer directly at the address shown on page 2 of this manual.

5. Standards to which this machine complies

The machine is supplied in accordance with the Supply of Machinery (Safety) Regulations 1992 (EU Machinery Directive 89/392).

A CE mark will have been affixed to the machine to signify compliance with the above mentioned Directive. Either a Declaration of Conformity or a Declaration of Incorporation will have been completed and filed after this page.

The following European Standards have been applied to the machine design.

EN 292-1:1991	Safety of Machinery, - Basic Concepts - General Principles for Design, Part 1 Basic Terminology, Methodology.
EN 292-2:1991	Safety of Machinery - Basic Concepts - General Principles for Design, Part 2 Technical Principles and Specifications.
EN 294:1992	Safety of Machinery - Safety Distances to prevent danger zones being reached by the upper limbs.
EN 418:1992	Safety of Machinery - Emergency Stop equipment functional aspects, Principles for design.
EN 60 204-1: 199	Electrical Equipment of Machines Part 1 - Specification for General Requirements.

Issue 01/97/BC
Bench-Cut Cutting System

Introduction

Deceleration of conformity

93/44/EU

Manufacturer's name: Peter Gillard & Co Ltd

Product description: Bench-Cut rotary cutter and infeeder

Declaration: I declare, as the authorised representative, the above machinery is in conformity with the provisions of 93/44/EU Directives.

Name of authorised representative: Mr C.N. Gillard

Position of authorised representative: Director

Signature of authorised representative:

Place: Tewkesbury
England

Date:

B SAFETY CONSIDERATIONS

Please refer to drawing No. 001 page 14. This shows the location of danger areas, guarding and emergency stop push button.

1. Hazards in case of non-compliance with safety guarding

UNDER NO CIRCUMSTANCES SHOULD GUARDING BE MODIFIED OR REMOVED. MODIFICATION OR REMOVAL OF GUARDING CAN RESULT IN THE FOLLOWING HAZARDS:

- 1.1 Loss of fingers, thumbs and severe cuts to hands, caused by rotation of knife blade.
- 1.2 Fatal electrical shock - Contact with 220 Volts MAY KILL OR INJURE

2 Safety conscious work practices

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

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

- 2.1 **Never** attempt to change cutter blades when the electrical supply is connected to the machine.

Always turn the isolator switch **off** before changing blades.

- 2.2 **Never** open the clam-shell safety guard or remove cutter bushes without first turning off the cutter motor.

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

- 2.3 **Never** use cutter bushes whose inner bore is considerably larger than the extrudate size being cut. **Always** match extrudate size to cutter bush bore.

Issue 01/97/BC
Bench-Cut Cutting System

Safety Considerations

POSITION GUIDE ONLY!

DIAGRAM OF BENCH-CUT DANGER AREAS

DRAWING NUMBER 001

- 2.4 **Never** attempt to use fingers to remove cut pieces from the cutter bush bore.

The cutting action of the Bench-Cut 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 damaged blade than a lost finger.

- 2.5 **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.

- 2.6 **Never** allow an unskilled personnel to change blades, bushes or generally handle the Bench-Cut.

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

Be Careful - Keep Your Fingers!

3 Safety protection

The Bench-Cut is fitted with a number of features designed to minimise the possibility of damage to either operators or the machine. Please refer to drawing number 001 to illustrate the danger areas of the Bench-Cut. Please ensure that all staff have seen this and are aware of potential danger points.

3.1 Cutter Clam-shell guard (1)

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

3.2 Inlet and Outlet Guide Bushes (2 & 3)

Under no circumstances attempt to operate the machine without the inlet and outlet guide bushes in place.

Issue 01/97/BC
Bench-Cut Cutting System

Safety Considerations

4. Noise emissions

This machine conforms to the following regulations:

The Supply of Machinery (Safety) Regulations 1992 (SI 1992/3073).

Equivalent continuous A weighted sound pressure level at workstations	70dB
---	------

Peak C weighted instantaneous sound pressure level at workstations	94dB
--	------

Sound power level emissions	less than 85dB
-----------------------------	----------------

5. Prohibition of non-authorised modifications.

No modification or alterations are to be made to this product without the prior express written consent of Peter Gillard & Co Limited. Failure to do this will void all legal obligations from Peter Gillard & Co Limited regarding this product.

Issue 01/97/BC
Bench-Cut Cutting Systems

Safety Considerations

POSITION GUIDE ONLY!

DIAGRAM OF BENCH-CUT INSTALLATION

DRAWING NUMBER 002

C INSTALLATION

1. Weight and dimensions of machine

Weight	-	100Kgs unpacked
Dimensions	-	1180mm Long
	-	820mm wide
	-	1340mm high

2. Lifting and handling instructions

The Bench Cut should be lifted using the handles located at each end of the machine. Ensure safe lifting practices are employed. The machine should be lifted by 2 people ensuring that their back remain straight.

THE BENCH-CUT WEIGHS 100 KGS. IF DROPPED IT MAY CAUSE SEVERE INJURY. TAKE CARE!

3 Unpacking instructions

- 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 electrical cabinet of the Bench-Cut.
- 3.3 Unpack these items - what is supplied is dependant upon individual customer's requirements. As a minimum, a knife blade, Manual, Blank cutter bushes will have been supplied.

4 Electrical supply

A standard 220 Volt, single phase, 50Hz supply plus a neutral and earth connection are required.

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

The electrical specification for your machine will be noted on the serial number plate. Please check this before connecting an electrical supply.

WE CANNOT BE HELD RESPONSIBLE FOR ANY DAMAGE CAUSED TO THE MACHINE BY BEING CONNECTED TO AN INCORRECT ELECTRICAL SUPPLY.

CHECK THE SUPPLY REQUIRED BEFORE MAKING A CONNECTION.

Issue 01/97/BC
Bench-Cut Cutting System

Installation

A suitably qualified electrician should undertake all electrical installations. See drawing 002 for location of electrical cabinet (6)

5 Air supply

Factory compressed air supply 10 bar maximum. The machine has its own regulator. This should be set to 3.0 bar maximum. See drawing 002 for the location of the connections (7).

The 3.0 bar setting of the machine regulator should not under any circumstances be exceeded. This will not improve machine performance and will only tend to seize the clutch due to excessive air pressure.

Issue 01/97/BC
Bench-Cut Cutting System

Installation

D MACHINE CONTROL AND THEIR FUNCTIONS

1 Control panel details

See control panel drawing 003 page

- 1.1 **Power on lamp (1).** (White) This illuminates when the electrical isolation switch located on the side of the machine has been turned on.
- 1.2 **Guard lamp (2).** (Blue) To enable the machine to run, this lamp must be illuminated. If it is not, check that the emergency stop button has been reset and that all guards are closed.
- 1.3 **Safety circuit reset button (4).** This resets the fail-safe guard circuit to enable the machine to operate. A blue lamp within the button illuminates when the button is pressed. If the lamp does not illuminate when pressed re-check from section 1.2.
- 1.4 **Emergency stop button (3).** When pressed the whole machine will stop immediately. The switch must be reset before operations can recommence.

This switch is only to be used in emergencies.
- 1.5 **Cutter start buttons (6)** The green button starts the cutter motor and illuminates when pressed. The red button stops the cutter motor.
- 1.6 **Cut cycle selector switch (8).** The selector switch has 2 positions 0 = Stop I = Run. When the switch is moved to the run position the test cut button will illuminate green. Pressing the test cut button will make the machine complete on cut cycle. One test cut must be completed before the machine will operate in automatic from the set length counter.
- 1.5 **Cut length counter (5).** Determines the cut length of product.
- 1.8 **Total Cuts counter (9).** This unit keeps a record of the total cuts produced.
- 1.9 **Total cuts on/off switch (10).** This starts/stops the total cuts counter

Issue 01/97/BC
Bench-Cut Cutting System

Control Panel

POSITION GUIDE ONLY!

**BENCH-CUT CONTROL PANEL STANDARD
CONFIGURATION**

DRAWING NUMBER 003

POSITION GUIDE ONLY!

BENCH-CUT Straight blade mounting

DRAWING NUMBER 004

E	OPERATION
----------	------------------

1 **Cutter start-up**

- 1.1 Please familiarise yourself with all controls located on the main control panel (see section D and drawing no. 003 page 20). Some of the controls fitted to your cutter may not be identified. This is because these controls concern optional extras or special functions. Separate instructions will explain their operation. See section G for details of these options.
- 1.2 Ensure that a factory compressed air supply has been connected to the inlet point located on the base of the machine. A maximum pressure of 10 bar should be connected.
- 1.3 A regulator is provided to control the pressure into the cutter. This should be set to 0.3 bar maximum.

The Bench-Cut can be operated from .5 bar to 3 bar. However, it is recommended that the pressure should be set to as near as possible to 3 bar. This will improve clutch/brake performance.

- 1.4 Ensure that the electrical supply is **off** at the isolator switch and that the clutch switch (8) is at '0'.
- 1.5 Open the knife guards cover 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.

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

Check that the cutter guide bushes are fitted.

- 1.6 Close the knife guards cover. The cutter will not run with this guard open.
- 1.7 Close the bush inlet and exit guards.
- 1.8 Turn the electrical supply on at the isolator switch. The 'Power on' lamp (1) will illuminate.
- 1.9 Ensure all guards are closed and the blue guard lamp is illuminated. Press the 'Safety circuit reset' Push button which will illuminate

The machine will not work until all guards are closed and the 'safety circuit reset' button has been pressed. If the lamp will not illuminate recheck that the guard is closed. See section B.2 for assistance.

Issue 01/97/BC
Bench-Cut Cutting System

Operation

- 1.10 Press the 'cutter start' push button (6). The cutter motor will start and the green lamp will illuminate.

- 1.11 Turn the 'cut cycle' selector switch (8) to position 'I'. Then press manual cut button to complete one cut cycle.

When the caterpillar is running, the cutter will cut automatically, producing cut lengths, which are commanded by the length counter (5). To stop cutting, turn the 'cut cycle' selector switch (8) to position '0'.

To test the operation of the set length counter (5) it is necessary to enter a cut length. Any figure will do, but a convenient figure is 200mm. See section 2 for details how to operate this counter.

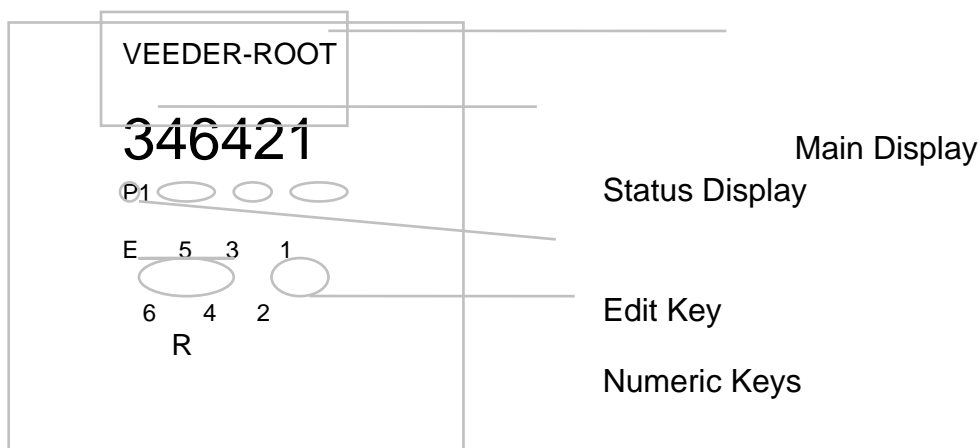
Issue 01/97/BC
Bench-Cut Cutting System

Operation

2 How to operate the cut length counter Type Veeder Root C346

If the machine is fitted with a batch counter option refer to counter/batch operating instructions on page 37

- 2.1 The display has a 6-digit LCD display. The resolution of the counter represents one pulse per mm of product travel.
- 2.2 **To set the counter cut length pre-set.**
- 2.3 Front panel.



- 1. Main display indicates the default value as it counts up to the pre-set value
- 2. Status displays indicates pre-set 1 (F1) pre-set 2 (F2 not used) prescale (Psc) program (Prg)
- 3. Edit key is used with numeric keys 1,2,3 to display pre-set 1, pre-set 2 (not used) and prescale value respectively
- 4. Numeric keys each increment their respective digit of the pre-set. When simultaneously pressed keys "6" and "4" act as a reset to zero of the default value.

2.4 To change the pre-set value

- 2.5 The cut length pre-set is stored in pre-set 1. To select and display setting press "E" and "1" simultaneously
- 2.6 The display will now show the pre-set value along with status displays "F2" and "PRG". If a button is not pressed within 15 seconds the display will not reset to the default screen.
- 2.7 The numeric keys can now be used to individually scroll each digit to the required value.

Issue 01/97/EC
Bench-Cut Cutting System

Counter

- 2.8 Press button "E" to confirm entry and counter will change back to default display.

2.9 To reset counter default screen to zero press button “6” and “4” simultaneously.

3. Stopping the machine

3.1 To stop the machine when the cutter is running, turn the 'clutch stop/run selector' switch to '0' and press the LED cutter motor stop button (10).

3.2 To remove power from the machine, turn off the main isolator switch.

Once you have completed sections 1 to 3 move onto section F 'Setting up procedure'.

If you go past the number or digit you require, you must scroll through the remaining numbers or digits until you get back to the one you want.

Issue 01/97/BC
Bench-Cut Cutting System

Operation

F SETTING UP PROCEDURE

- 1 Check that the machine is switched off at the mains isolator.
- 2 Fit a knife blade. Refer to diagrams 0005, 0006, and 0007 attached. These diagrams show the 3 main types of blades that will have been supplied with your machine (please note: the razor and chip blade holders are options). Follow the instructions below for information on fitting the blades and holders.

TAKE CARE! BEFORE CONTINUING MAKE SURE YOU HAVE READ SECTION B, SAFETY CONSIDERATIONS, IN THIS MANUAL.

BLADES ARE DANGEROUS - KEEP YOUR FINGERS!

- 2.1 Remove the blade cap clamp bolt. To assist in releasing the bolt there is a Tommy bar hole in the hub.
- 2.2 Remove the blade cap. Rotate the knife shaft until the score line on the edge of the blade head is visible. This score line should be uppermost when you attach the blade.
- 2.3 For standard blades (not razor or chip blades) fit the clamp bolt through the cap and then through the hole in the knife blade. Then attach both blade and cap to the blade head.
- 2.4 For the razor and the chip blades, the blades must be fitted to the holder provided before the holder itself is attached to the blade head.

With the blade in the holder, fit the clamp bolt through the hole in the holder and attach to the blade head. The blade cap is not required for these types of blades.

It is essential that the blade is correctly located as shown in the diagrams

- 3 Select the correct cutter bushes to suit section or tube to be cut.
- 4 Insert the cutter bushes into the cutter bush holder.
- 5 Rotate the blade by hand (take care) until it lies across the centre line of the bushes.
- 6 Slide the bushes in towards the blade until they are just in contact with it (see diagram 008).

It is recommended that the blade is allowed to just 'brush' the faces of the bushes.

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.

Issue 01/97/BC
Bench-Cut Cutting System

Setting Up

POSITION GUIDE ONLY!

DIAGRAM OF BENCH-CUT CURVED BLADE MOUNTING

DIAGRAM NUMBER 005

POSITION GUIDE ONLY!

**DIAGRAM OF BENCH-CUT RAZOR BLADE
MOUNTING**

DIAGRAM NUMBER 006

POSITION GUIDE ONLY!

**DIAGRAM OF BENCH-CUT CHIP
BLADE INSTALLATION
DIAGRAM NUMBER 007**

POSITION GUIDE ONLY!

**DIAGRAM OF BENCH-CUT BLADE CLEARANCE
DIAGRAM NUMBER 008**

POSITION GUIDE ONLY!

DIAGRAM OF BENCH-CUT MECHANICAL PARTS LIST

DIAGRAM NUMBER 009

- 7 Tighten bush clamping bolts and check that the bushes have not moved.
- 8 Rotate blade by hand two or three times to ensure that it moves freely.
- 9 Switch on mains isolator.
- 10 Close all guards. The machine will not operate until all guards are closed. Guard light will illuminate

Press the safety circuit reset button (4). Until this button is pressed and illuminated, the machine will not function.
- 11 Press main cutter motor start button (9).
- 12 Set the desired length into the cut length counter (5). See section E.2 details of how to enter a length.
- 13 Check that total cuts counter on-off switch (14) is in the off position. Zero the total cuts counter (13) by pressing reset button.
- 14 Pass the extrudate through the caterpillar infeeders and the cutter bushes.
- 15 Pull the extrudate so that it is straight as it passes through the caterpillar belts and guide bushes. Rotate the caterpillar boom adjustment handle to clamp the caterpillar belts on to the extrudate.
- 16 Check that the caterpillar speed control potentiometer (7) is set to zero. If not, adjust it to zero. Press the caterpillar start button (6) to start the caterpillar motor.
- 17 Adjust the caterpillar speed by rotating the potentiometer (7) until the required Linespeed has been reached. The potentiometer is equipped with a lock. Use this to secure the potentiometer if only one speed is required.
- 18 Once extrudate is passing smoothly rotate clutch brake rotary switch (11) from '0' to '1'. Press the clutch initiate button (12); this will cause the knife blade to operate once and then carry on in automatic mode on signal from the length counter.
- 19 Check cut length and adjust length setting accordingly (see section E.2 for details on how to adjust the counter).
- 20 Once the desired length is achieved switch on the total cuts indicator (14).

G BENCH-CUT OPTIONAL ITEMS

This section describes the optional items, which may be fitted to your Bench-Cut machine.

Cutter options

1. A-1 Blade lubrication
2. E-1 Speed cut continuous rotation cutting
3. F-1 Batch counter with buzzer
4. F-2 Batch counter with beacon
5. F-3 Automatic stop of infeeders at end of batch

Caterpillar options

6. R-1 Linespeed indicator
7. R-2 Length measuring counter
8. R-5 Boom position indicator
9. U-2 Angled - top boom facility

1 Blade lubrication option A-1

- 1.1 When cutting cured or uncured rubber, silicone or latex rubber, or medical grade plastics, it has been found that cut 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 Bench Cut.

- 1.2 The system consists of the following:

- 1.2.1 A cast aluminium cutter block

- 1.2.2 The bottom half of the cutter block forms a chamber, into which a suitable lubricant should be poured. A drain is provided at the rear of the machine to allow easy removal of liquid after use.

- 1.2.3 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.

- 1.3 The type of lubrication recommended depends upon extrudate type:

Issue 01/97/BC
Bench-Cut Cutting System

Options

1.3.1 Cured and uncured rubber

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

1.3.2 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, e.g. white spirit
- Distilled water
- Silicone based lubricant, e.g. Pentaerythritol Mono Oleate

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

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

2. Continuous Rotation E-1

- 2.1 This option is designed for cutting very high rates. The knife blade is continuously rotated at a speed between 400 and 1200 cuts/minute. A variable speed D/C motor with tachogenerator replaces the standard Bench-Cut A/C motor.

- 2.2 A ten-turn potentiometer and a digital LED cuts/minute indicator provide control. A change over switch allows either on-demand (clutch/brake) or continuous rotation operation to be selected.

- 2.3 Cut length is determined by the relationship between blade rotation speed and Linespeed, e.g.

13.5 m/min linespeed divided by 900 cuts minute

$13.5/900 = 0.015 \text{ metre (15mm) cut length}$

- 2.4 Since linespeed is normally fixed, the operator must adjust the blade speed to achieve the cut length required. The cuts/minute indicator is provided to assist this function.

- 2.5 It is recommended that the operator estimate the blade speed required using the above calculation. They will need to check the actual cut length produced and trim the blade speed up or down.

- 2.6 When the selector switch is used to select on-demand operation, the cutter motor speed is automatically set to a fixed speed, which gives optimum performance in on-demand mode. When switching the continuous rotation mode, the motor will set itself to whatever speed has been set on the ten-turn potentiometer.

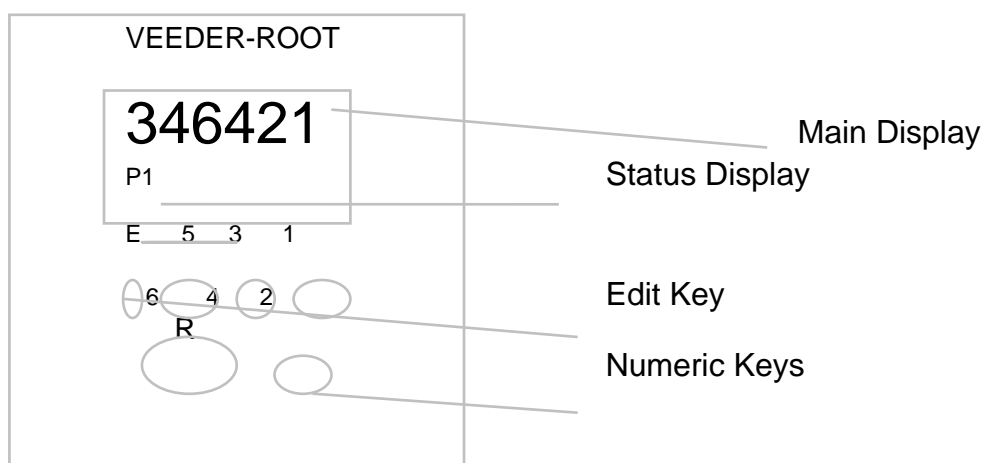
Issue 01/97/BC
Bench-Cut Cutting System

Options

- 7 Because of this, it is strongly recommended that the potentiometer always be set to the estimated cut rate (see section G.2.5 above).

3 How to operate the cut length counter Type Veeder Root C346

- 3.1 The display has a 6 digit LED display. The resolution of the counter represents one pulse per mm of product travel.
- 3.2 **To set the counter cut length pre-set.**
- 3.3 Front panel.



1. Main display indicates the present count as it counts up to the pre-set value
2. Status displays indicates pre-set 1 (F1) pre-set 2 (F2) prescale (Psc) program (Prg)
3. Edit key is used with numeric keys 1,2,3 to display pre-set 1, pre-set 2 and prescale value respectively
4. Numeric keys each increment their respective digit of the pre-set. When simultaneously pressed keys "6" and "4" act as a reset to zero

3.4 To change the cut length and batch pre set value

- 3.5 The batch pre-set is stored in pre-set 1. To select and display setting press "E" and "1" simultaneously
- 3.6 The display will now show the pre-set value along with status displays "F2" and "PRG". If a button is not pressed within 15 seconds the display will not reset to the default screen.
- 3.7 The numeric keys can now be used to individually scroll each digit to the required value.

Issue 01/97/EC
Bench-Cut Cutting System

Options

- 3.8 Press button "E" to confirm entry and counter will change back to default display.

- 3.81 To display batch actual total press “E” & “4” simultaneously
- 3.82 The cut length pre-set is stored In pre-set 2, to select and display setting press E & 2 simultaneously.
- 3.83 The display will now show the pre-set value along with the status displays “F2” and “PRG”. If a button is not pressed within 15 seconds the display reset to the default screen.
- 3.84 The numeric keys can now be used to individually scroll each digit to the required value.
- 3.85 Press button “E” to confirm early and counter will change back to default display.
- 3.9 To reset counter default screen to zero press button “6” and “4” simultaneously.
- 3.10 A switch is provided beside the batch counter to enable the counter to be switched on or off. When the switch is on, every cut will result in one count being added to the batch counter display when the counter reaches the pre-set number, the counter will zero and the sequence will be repeated.
- 3.11 On coincidence of the pre-set number and the count number, a signal will be sent to a buzzer located on top of the electrical cabinet. This buzzer will emit a sound to warn the operator that the batch is complete. The sound will cease automatically after a short period of time.
- 3.12 The buzzer tone and duration can be controlled by adjusting the dipswitches inside the buzzer itself. To access the dipswitches twist the top part of the buzzer until it becomes loose from the base.
- 3.13 The dipswitches can be set as follows:

Tone	Code	Sound output
	12345	dBA at 1m
Fast sweep	11110	105
Medium sweep	11101	105
Fast sweep	11011	114
Slow whoop	11001	103

A small potentiometer is provided to adjust the volume of the buzzer.

4. Batch counter with beacon option - F-2

- 4.1 The batch counter is designed as a fully automatic 'reminder' to warn operators that a pre-determined batch of cut pieces have been cut.
- 4.2 The operation of the batch counter is identical to that described in section G.3.1 to G.3.2.12. Please refer to these instructions for information on how to use the counter.

Issue 01/97/BC
Bench-Cut Cutting System

Options

- 4.3 On coincidence of the pre-set number and the count number, a signal will be sent to a beacon located on top of the electrical cabinet.

- 4.4 The beacon will illuminate to warn the operator that the batch is complete. The light will go out automatically after a short period of time.

5. Automatic stop at the end of batch – option - F-3

- 5.1 This option is fitted in association with either option F-1 batch counter with buzzer or option F-2 batch counter with beacon. Please refer to section G.3 or G.4 for more details.
- 5.2 With this option it is possible to automatically stop the caterpillar infeeders at the completion of the batch quantity. This is useful if the machine is to be left to run un-attended and only a certain number of cut pieces are required.
- 5.3 A switch is provided to select the following operating modes:
- 5.3.1 **Continuous running at completion of the batch quantity.**

The buzzer or beacon will be activated on batch completion. The batch counter will reset itself to zero and start counting-up to another batch. The infeeders will run continuously. The machine will carry-on running in this manner until it is manually stopped.

5.3.2 **Automatic stop at completion of batch quantity**

The buzzer or beacon will be activated on batch completion. The batch counter will reset itself to zero. The infeeders will stop. The machine will remain stopped until manually restarted.

6. Linespeed indicator - R-1

- 6.1 An LCD display is provided of linespeed. This display is in 0.1 metre/minute increments. This display operates when the caterpillar infeeders are running.
- 6.2 This indicator is NOT a calibrated instrument. It should be used for indication purposes only.

7. Length measuring counter - R-2

- 7.1 An LCD display is provided of measured length. The display is in 0.1 metre increments. The maximum length, which can be measured, is 9,999,999.9m.
- 7.2 The counter measures material passing through the caterpillar infeeders. If the belts are running, but no material is being fed forward, the counter will still function as though material was being measured.

Issue 01/97/BC
Bench-Cut Cutting System

Options

- 7.3 A reset button is provided to set the counter to zero. The counter counts up from zero to 9,999,999.9m. It will automatically return to zero and start counting-up again, once it has reached 9,999,999.9m.
- 7.4 This indicator is not a calibrated instrument. It should be used for indication purposes only.

- 7.5 The display remains on the counter until it is reset or reaches 99,999.9m. Provided the main memory for up to 200 hours (subject to internal battery life) is retained. This length will be re-displayed when power is reconnected.

8. Boom position indicator - R-5

- 8.1 This indicator is positioned below the caterpillar belt height adjustment hand wheel. It displays nip distance.
- 8.2 As the hand wheel is rotated, the counter display will change to indicate the changing distances between the upper and lower caterpillar belts.
- 8.3 The main purpose of the counter is to allow a constant nip pressure to be set from run-to-run. This is important if consistent length accuracy is to be maintained. (see section H.3.3. for more details).
- 8.4 This indicator is not a calibrated instrument. It should be used for indication purposes only.

9. Angled top boom facility - U-2

- 9.1 The top boom can be adjusted to produce a nip point relative to the bottom belt surface.
- 9.2 To adjust the top boom, loosen the locking nut fitted to the right-hand front face of the top-boom. Push the top boom upwards and lock into position.
- 9.3 To return the belt to its normal horizontal format, loosen the locking nut and push the boom down. Lock into position.

Issue 01/97/BC
Bench Cut Cutting System

Options

H OBTAINING THE BEST RESULTS FROM YOUR BENCH-CUT

1 Introduction

- 1.0 This section is intended to help you to get the optimum performance from your Bench-Cut rotary cutter. It runs through the main causes of poor cut quality and accuracy and suggests correct procedures to overcome these problems. A checklist is provided at the end of this section to help you quickly pinpoint possible causes of poor performance.
- 1.1 Advice is always readily available from experienced personnel at GILLARD should you require it.
- 1.2 Cut quality and accuracy are principally affected by the following:
- a. Cutter positioning
 - b. Infeeder control
 - c. Cutter bushes
 - d. Knife blades
 - e. Type of cutting action

2 Cutter positioning

The Bench-Cut should be located on a bench or table at a convenient working height

The material to be cut should be fed into the cutter from a similar operating height. It is not recommended that the material be pulled off the floor.

For very flexible extrudates, which are easily stretched, it is strongly recommended that a relaxing loop of material be allowed to form before the infeeder. This will ensure that the extrudate is not stretched as it enters the infeeder.

It is also important to ensure that any pre-coiled material is allowed to un-twist before it goes into the cutter. An un-wind table or stand should be used to remove any twist.

3. Infeeder Control

3.1 Speed stability

Infeeder speed variation should be avoided as far as possible. Do not adjust the speed unnecessarily during a production run. Allow time for the caterpillar to accelerate from rest to production speed before checking cut length accuracy.

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

Issue 01/97/BC
Bench-Cut Cutting System

Optimum Results

3.2 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.

Even dirty belts can effect cut length accuracy. Ensure that the belt is clean and free from grease or any other matter.

Keep your caterpillar belts in good condition.

3.3 Nip Pressure

Check that the nip pressure used with the infeeder/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 infeeder under unnecessary load.

Avoid changing the nip pressure during a production run. This may effect the cut length being produced, causing apparent cut length inaccuracy. If possible, set the nip-pressure to the same setting for each product size from run-to-run.

Set nip pressure sufficiently to avoid extrudate slippage or snaking.

4. Cutter bushes

4.1 Product support

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

The cutter dies or bushes are cylindrical metal devices which have been bored or otherwise machined to match the cross-sections 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 profile.

Issue 01/97/BC
Bench-Cut Cutting System

Optimum Results

4.2 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.

4.3 Positioning the bushes

The upstream (inlet) side of the cutter guide bush should be as close as practicable to the discharge point of the caterpillar infeed, which precedes cutter.

This reduces the tendency for flexible extrudates to snag or droop as they leave the infeed and enter the cutter bush.

For the optimum results the inlet end of the inlet cutter bush should be coned so that it can fit in between the upper and lower belts of the infeed. This ensures that it reaches right into the exit of the caterpillar nip giving the product no opportunity to snag or jam.

Generally, the more flexible the extrudate the nearer the cutter guide bush has to be to the caterpillar belt.

5. Knife Blades

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

Different products will require different knife blade thickness.

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 Blade required.

Issue 01/97/BC
Bench-Cut Cutting System

Optimum Results

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.

The following thickness blades are available from the Factory -

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

Please see the parts list section J.4 for details on ordering blades.

6. 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 Bench-Cut, 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

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 Bench-Cut.

Issue 01/97/BC
Bench-Cut Cutting System

Optimum Results

7. PROBLEM IDENTIFICATION CHART - BENCH-CUT SYSTEM

PROBLEM

a Poor length accuracy

POSSIBLE CAUSE

RECOMMENDED ACTION

- | | |
|----------------------------------|--|
| 1. Extrudate Slippage in belts . | The extrudate must be firmly clamped between the upper and lower caterpillar belts. When setting up the machine, check that it is not possible to pull the extrudate out from between the belts. It is, increase the nip pressure. In addition, check that the extrudate is not wet or slippery. Finally, make sure that the caterpillar belts are in good condition. Worn belts should be replaced. See the spares parts list within this manual for the appropriate part number. |
| 2. Extrudate tension varying. | The extrudate must be under constant tension as it enters the caterpillar belts. This is particularly critical for materials, which easily stretch, e.g. foam rubber, silicone and very small diameter flexible plastics. Ideally, the tension on the material should be as low as possible. |
| 3. Cutter bush set-up incorrect. | The machine must be operated at a constant linespeed to achieve best results. Do not adjust the caterpillar speed unnecessarily. Leave it locked onto a constant speed. Similarly, do not adjust the nip pressure during a run. Any changes in infeed speed or nip pressure will immediately influence cut length accuracy. |
| 4. Cutter bush set-up incorrect | The guide bush bore should be a reasonable tight fit to the product diameter. If too tight, it may cause a product hold-up as the extrudate is pushed through by the infeed. If too loose, it may allow the product to move from side-to-side. For very flexible extrudates the distance between the end of the caterpillar belt lead-in is kept to a minimum. It is also important that the knife blade brushes the bush faces during cutting. |
| 5. Material not exiting bush. | Any material hold-up in the exit bush may cause compression of the on-coming extrudate end. This will effect the accuracy of the oncoming length. Make sure cut lengths are free to exit the bush. Do this by either reducing the length of the exit bush, by putting an internal cone into the bush or using air to blow the cut pieces out of the bush. |

Issue 01/97/BC
Bench-Cut Cutting System

Optimum Results

a. Poor length accuracy

POSSIBLE CAUSE

- | | |
|---------------------------------|---|
| 6. Encoder shaft coupling loose | The shaft encoder is connected to the top of the vertical drive shaft, driving down through the caterpillar. Locate encoder on top of the caterpillar guarding if locking screw has come loose tighten using suitable allen key. |
| 7. Infeeder drive defective. | An accurate infeed speed is vital to accurate cut lengths. If, despite checking the above points, not achievable, check the DC motor drive (see the appropriate third party instructions in this manual), the tachnogenerator linkage to the motor (if the tachnogenerator option has been ordered), and the caterpillar motor/gearbox arrangement. Any loose items should be tightened. Also check the bevel gears on the caterpillar for wear and backlash. If worn, replace. |
| 8. Worn clutch/brake. | Although the clutch/brake fitted to this cutter is rated for many millions of cuts, it will eventually wear out. If you have been using the cutter for a considerable length of time or you have been using it for high cut rates over a long period, this might be the cause of the inaccuracy. If you think you have a worn clutch, a friction ring is available as a spare part (see recommended spare parts list attached to these instructions). |

b. Poor cut quality

- | | |
|-------------------------|--|
| 1. Blade gap too large. | It is critical that the knife blade actually brushes each cutter guide bush face during the cut. The bushes should be as tight as possible to the blade, whilst still able to pass through the gap when the blade head is turned by hand. |
| 2. Bush edge not sharp. | The bush faces, which are in contact with the blade, should be straight and clean. The 90° angle between the bush face and the product bore should be as sharp as possible. Under no circumstances should there be a bevel or radius on this edge. check for wear on this edge from time-to-time |

Issue 01/97/BC
Bench Cut Cutting System

Optimum Results

- | | |
|----------------------|---|
| 4. Blade not sharp | Check the cutting edge. Check the double bevel is even. Replace the blade if appropriate. |
| 5. Worn clutch/brake | If the clutch/brake is badly worn, the friction rings will not engage, causing the clutch to slip and the blade to stall in the product. This problem will only occur after done many millions of cuts. Try cutting products that you know the machine can cut. If the stalling problem continues, replace the friction rings inside the clutch. A friction rings replacement kit is available as a spare part (see recommended spare parts list attached to these instructions). |

d. Feed difficulties

- | | |
|---------------------------|---|
| 1. Inlet bush too short. | For very flexible extrudates, make sure that the distance between the end of the caterpillar belt nip & the bush lead-in is kept to a minimum. It may be necessary to turn the end of the inlet bush into a cone, so that it can fit in between the caterpillar rollers. in extreme cases, use a small tube to fit right into the nip point & guide the material into the inlet bush. |
| 2. Exit bush too long. | When cut short lengths or very flexible materials, make sure that the exit bush is not over long. If too long, material will have to be pushed an excessive distance through the bush, causing drag and product hold-up. |
| 3. Bush bores not smooth. | Make sure that the internal bush bore is smooth and free from machining rings and other potential drag points. |

d. Feed difficulties

- | | |
|----------------------------------|--|
| | If possible, polish the bore or use a very low friction material (e.g. Teflon) as an insert in the bush. Alternatively, use low-pressure air, blown down the bush, to create an air cushion around the extrudate to minimised drag. |
| 4. Infeed guide-in not straight. | Check that the extrudate is straight as it enters the caterpillar. If the material has been coiled before it is cut, it may have a tendency to try to twist as it passes through the inlet guide rollers. If this is a problem, add additional guide in rollers to hold the infeed. In very bad cases, use a tube guide to direct the extrudate right to the caterpillar inlet belt nip. |

Issue 01/97/BC
Bench-Cut Cutting System

Optimum Results

5. Incorrect blade shape.

Because the material is trying to move forward continuously during the cutting during the cutting action, a wide blade may cause excessive product hold-up, resulting in a jam. Check that you are using the narrowest blade possible. If necessary grind away the back of the blade to reduce hold-up.

Issue 01/97/BC
Bench-Cut Cutting System

Optimum Results

I MAINTENANCE AND INSPECTION

Please refer to diagram 010 page 51 for location of items mentioned in these Instructions.

1. Monitoring during operation - Consumables

Consumables items such as knife blades and caterpillar infeeders belts should be visually checked on a regular basis for wear. If these items are not kept in a reasonably condition, the machine performance will almost certainly deteriorate over time.

1.1 Knife blades

It is difficult to define when a blade requires replacing. However for the efficiency of the cutter it is essential that a sharp cutting edge be maintained on the blade. This ensures that:

1.1.1 A clean, swarf-free, cut edge is maintained on the extrudate.

1.1.2 Undue stress is not placed on the clutch.

If in doubt as to the sharpness of the blade, fit a new blade by following the instructions in section F.1.

FOR SAFETY, IT IS ESSENTIAL THAT THE MAINS ISOLATOR SHOULD BE TURNED OFF DURING THE BLADE CHANGING OPERATION.

1.2 Caterpillar infeeders belts

The belts should be replaced if the belt surface is torn, split or otherwise excessively worn, Belt damage may cause variations in length measuring accuracy.

To change the caterpillar belts:

1.2.1 Fully slacken off the two tension screws location at the right-end of each caterpillar boom. By slackening these screws, the idler roller will move into the machine, thus reducing the tension on the caterpillar belt. When loose enough slide the belt off the front of the boom plate.

Note: For the lower caterpillar belt, it may be necessary to remove the guide-in roller bracket (when fitted)

1.2.2 Once the old belt has been removed, fit the new belt by sliding it over the Poly-vee rollers. Ensure that the Poly-vee ribbing on the back of the belt matches the Poly-vee grooves in the rollers.

Issue 01/97/BC
Bench-Cut Cutting System

Maintenance

POSITION GUIDE ONLY!

BENCH-CUT MECHANICAL PARTS IDENTIFICATION (CATERPILLAR) DIAGRAM NUMBER 010

Issue 01/97/BC
Bench-Cut Cutting System

Maintenance

- 1.2.3 To tension the new belt, re-tighten the two tension screws located at the right-hand end of Each caterpillar boom. By turning each screw clockwise, the idler roller will move towards the end of the boom, increasing the tension on the belt the further the roller moves.
- 1.2.4 It is important that equal tension is maintained across the entire belt width. To do this, adjust the screw on both the front and back boom plate by the same number of turns.
- 1.2.5 Do not over tension the belts. The belts should be taut, but loose enough to be able to lift the belt over the middle idler roller by approximately 5mm.

2. Monitoring during operation - Non-Consumables

2.1 Lamp bulbs LED

Although these bulbs have a rated life of many hundreds of hours operation, they will eventually fail. When they have failed, they should be replaced immediately.

DO NOT USE THE MACHINE WHEN LAMPS WILL NOT ILLUMINATE. REPLACE BULBS IMMEDIATELY TO AVOID CONFUSION AS TO WHETHER THE MACHINE IS OPERATING CORRECTLY.

2.2.1 To replace a lamp (LED)

Lever off the lens using a small screwdriver, and remove from the indicator housing. Unclip the LED from the rear of the lens unit.

Insert the new LED into the lens unit and refit the indicator housing. Ensure that the lens unit has properly located into the housing.

This machine uses 24vdc LEDs in the indicator units.

2.2 Brake Sensor Position

The SRC 1501 brake sensor determines the position the blade stops at after each cut. The sensor is located in an enclosure positioned adjacent to the knife shaft, at the opposite end from the knife blade. A slotted disc is fitted to the end of the knife shaft and runs through a slot in the face of the brake sensor. (See diagram 011 page 53).

The position of this slotted disc relative to the knife blade has been factory set and should not be adjusted under normal circumstances.

If, for some reason, the relative blade or disc positioning requires adjustment, follow the steps below.

Issue 01/97/BC
Bench-Cut Cutting System

Maintenance

POSITION GUIDE ONLY!

BENCH-CUT BRAKE SENSOR

DIAGRAM NUMBER 011

Issue 01/97/BC
Bench-Cut Cutting System

Maintenance

- 2.2.1 Loosen the screw which clamps the slotted disc onto the knife shaft so that the disc rotated by hand without moving the can be shaft.

With a blade fitted, rotate the knife shaft so that the blade is positioned at approximately 2 o'clock when looking from the end (see diagram 011 page 52).

IMPORTANT: TURN-OFF THE MAINS ISOLATOR BEFORE FITTING A BLADE OR ROTATING THE SHAFT WITH THE BLADE FITTED.

- 2.2.3 Once the blade is in the 2 o'clock position, move the slotted disc so that the back face of the slot is vertical. Take care not to rotate the knife when this adjustment is being made.
- 2.2.4 Check that the disc runs through the central slot of the SRC1501 photocell without brushing against either face. If it does hit the photocell, damage might occur to the photocell.
- 2.2.5 Tighten the screw holding the disc onto the knife shaft. Check once again that the disc does not hit the photocell. If it does, readjust.

2.3 Clutch/brake maintenance

The Econo-Cut's clutch/brake has been designed to give a long operating life with minimum maintenance. As the clutch/brake self-adjusts, there is no regular maintenance requirement.

However, the clutch will eventually wear. This wear will probably become apparent due to a decline in clutch/brake accuracy. However, before you take any steps regarding the clutch/brake, check that you have not changed any other factor which might effect cut length accuracy:

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

Check through the problem list in section H.7 to check for non-clutch causes of length accuracy problems.

If you feel that the clutch is worn, please replace the friction disc set using the service kit listed in the spare parts list (section 3.4.4).

3. Preventative measures

Regular maintenance inspection is vital if unscheduled breakdowns are to be avoided. Please follow the maintenance schedule listed in section 4 below. It is designed to identify problems before they cause production downtime.

Issue 01/97/BC
Bench-Cut Cutting System

Maintenance

4. Planned maintenance schedule

Once per day	-	<ol style="list-style-type: none">1. Check knife blade condition2. Check caterpillar belt condition3. Check safety guard operation4. Check emergency stop operation
Once per week	-	<ol style="list-style-type: none">1. Clean wet block if being used2. Lubricate infeed vertical drive shaft and adjusting screw
Once per month	-	<ol style="list-style-type: none">1. Check Caterpillar belt tension2. Replace fan filter pad3. Check fan operation
Once per six months	-	<ol style="list-style-type: none">1. Visually check for loose wires2. Visually check for loose bolts3. Check hinges and lids for damage4. Check that the infeed is stationary when speed control potentiometer set to zero.5. Check boom height adjustment screw for ease of movement. Brush with light machine oil or grease if dry.6. Run infeed at full speed and check for excessive noise.7. Check that the blade head is square to cutter bush holder block.8. Check that brake sensor disc is not rubbing against brake sensor enclosure.
Once per year		<ol style="list-style-type: none">1. Check caterpillar bevel gears for wear. To do this, rock caterpillar belts back and forth by hand. If excessive movement is possible, it is probable that the gears are worn.
As necessary		<ol style="list-style-type: none">1. Replace any blown lamp bulbs.

5. Functional checking of safety devices

The functional checking of all safety devices occurs each time that the machine is started. This is done automatically.

When all guards are closed and the emergency stop push-button is reset, the guard lamp should illuminate (see diagram 003 page 20). As all switches are 'fail to safe' type switches, the guard lamp will not illuminate until all circuits have been checked as being safe.

Issue 01/97/BC
Bench-Cut Cutting System

Maintenance

When the safety circuit reset button is pressed the following actions take place:

- 5.1 Safety relay energised. This re-checks that all guards are closed.
- 5.2 The main motor contactor and relays are checked to ensure that they have returned to a de-energised (safe) condition since the machine was last used. As contactors are of a 'positive guided' type, you cannot start a motor if there is a fault in a contactor.

The safety circuit reset button will not illuminate if there is a fault in any motor contactor, guard switch or emergency stop switch.

Issue 01/97/BC
Bench-Cut Cutting System

Maintenance

J PARTS LIST

1. Control Panel

Please refer to diagram no. 003 (page 21) for the location of the item numbers identified below:

Item	Description	Qty	Code
1	Power on - White	1	5000
2	Guards on - Green	1	5001
3	Emergency stop button	1	5002
4	Safety circuit reset - White	1	5003
5	Cut length counter	15004	6 Main
motor stop - Red	1	5005	
7	Infeeder speed control	1	5006
8	Cut cycle selector	1	5007
9	Total cuts counter	1	5008
10	Total cuts selector	1	5007
11	Clutch activated - Green	1	5009
12	Infeeder stop- red	1	5005
13	Main motor start - Green	1	5009
14	Infeeder start - Green	1	5009
Optional Items		Qty	Code
	Batch counter	1	5010
	Buzzer	1	5011
	Beacon	1	5012
	Total length counter	1	5013

Issue 01/97/EC
Bench-Cut Cutting System

Parts List

2. Rear electrical cabinet

Please refer to wiring diagrams for schematic drawing of rear electrical cabinet

Description	Qty	Code
Clutch/brake controller	1	
Infeed motor DC drive	1	
Transformer 230/24V 50Hz 100VA	1	
Pil PN025 safety relay	1	
24VDC contactor 4Kw	2	
Auxiliary contact block	2	
Overload 2.6-3.7	1	
DPCO relay 24VDC 5A	2	
Relay base	2	

3. Mechanical items

Please refer to diagram no. 009 (pages 32) for the location of the item numbers identified below:

3.1 Cutter

Item	Description	Qty	Code
1	Motor (0.37kw)	1	1000
2	Clutch/Brake unit	1	1001
3	Sensor	1	1002
4	Timing pulley	1	1003
5	Timing pulley	1	1004
6	Pulley	1	Gillard
7	Timing pulley	1	1005
8	Timing belt	1	1006
9	Timing belt	1	1007
10	Bearing Block	2	1008
11	Air Filter/ Regulator	1	1009
12	Latch Assy	1	1010
13	Locking lever	2	1011
14	Magnetic safety switch	3	1012
15	Blade holder	1	Gillard
16	Cap	1	Gillard
17	Brake Sensor Disc	1	Gillard

Issue 01/97/EC
Bench-Cut Cutting System

Parts List

Item	Description	Qty	Code
18	Guide Bushes	1 pair	To suit
19	Fan Assy	1	1013
20	Handle	4	1014
21	Guide Roller Assy	1	Gillard

3.2 Infeeder

Item	Description	Qty	Code
22	Motor (0.2KW)	1	1015
23	Gearbox	1	1016
24	Tachogenerator (optional)	1	1017
25	Encoder	1	1018
26	Bearing	6	1019
27	Bearing	2	1020
28	Caterpillar Belt	2	1021
29	Handwheel	1	1022
30	Vertical Drive shaft	1	Gillard
31	Drive shaft	2	Gillard
32	Tension shaft	2	Gillard
33	Idler Roller	7	Gillard
34	Idler Shaft	12	Gillard
35	Cover Plates	2 Pairs	Gillard
36	Bevel Gears	4	Gillard
37	Adjusting Screw	1	Gillard
38	Gear Support Tube	8	Gillard
39	Oilite Bush (Plain)	8	1023
40	Oilite Bush (Plain)	1	1024
41	Oilite Bush (Flanged)	4	1025
42	Locking Collar	2	1026
43	Circlip (External)	8	1027
44	Digital Position Indicator	1	1028

Issue 01/97/BC
Bench-Cut Cutting System

Parts List

4. Spare parts list - Consumables

The parts identified below are normal consumable parts. Wear rates will depend upon machine usage and application.

4.1 Knife blades and holders

Standard blade designs are identified below. Custom blade shapes can be designed for particular products. Please consult the factory for details of these.

Description	Thickness	Part No.	Order Qty
Razor blade	0.25mm	BLD.RZ	50
Razor blade holder		D800080	1
Chip blade (mild steel)	0.38mm	BLD.CHP.MS	5
Chip blade (stainless steel)	0.38mm	BLD.CHP.SS	5
Chip blade holder		D8000070	1
Standard blade	0.46mm	BLD.34N	1
Standard blade	0.6mm	BLD.36N	1
Standard blade	0.8mm	BLD.38N	1
Curved blade	0.46mm	BLD.36C1	1

4.2 Cutter bushes

When ordering cutter bushes please supply details of the bore diameter size required. Please also state which material i.e. Mild or stainless steel. Profiled cutter bushes can be supplied. However, before a quotation can be prepared, details must be supplied showing profile shape.

4.3 Infeeder belts

Various different styles of belt covering can be supplied to suit particular applications. Please consult the table below:

Description	Wear resistance	Part No.
Heavy-duty neoprene	2/5	320J12-HDB
FDA approved neoprene	2/5	320J12-FDA
Polyurethane	3/5	320J12-BTH

Other specialised covering may be available. Please consult the factory for more information.

Issue 01/97/BC
Bench-Cut Cutting System

Parts List

4.4 Clutch/brake unit

The clutch/brake unit used by the Bench-Cut has a rated life of many millions of cuts.
 When it does wear a kit is available to replace the worn friction rings.

Description	Part No.
Friction disc replacement kit	1029

Issue 01/97/BC
 Bench-Cut Cutting System

Parts List

K Trouble shooting guide

Problem

Solution

Cannot start caterpillar or cutter motor	Check that all guards are closed, the guard lamp is on, and the safety circuit reset button is illuminated.
Guard lamp will not illuminate	Check that all guards are closed. Check that the emergency stop button has been reset.
Safety circuit reset button will not illuminate	Check that the guard lamp is illuminated.
Clutch initiate lamp will not illuminate	Check the clutch stop/run selector switch is set to position '1'. Check that the cutter motor is on.
Main motor will not start	Check that the motor contactors are engaged. If not, press the reset button on the contactor (refer to the attached wiring diagram for identification of components). If contactor still does not engage, check line fuses.
Counter will not accept new cut length	Check that the length requested does not exceed the maximum cut rate of the Bench-Cut (350 cuts/minute) at the linespeed selected.

Issue 01/97/BC
Bench-Cut Cutting System

Trouble Shooting

WARRANTY

Standard products manufactured by **Peter Gillard & Co. Limited**, 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 to 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 development products.

Peter Gillard & Co Ltd
Alexandra Way
Ashchurch Business Centre
Tewkesbury
Gloucestershire
England
GL50 8NB
Tel: +44 01684 290243
Fax: +44 01684 290330
E-mail: sales@gillard.co.uk

Issue 01/97/BC
Bench-Cut Cutting System

Warranty