



OPERATOR'S MANUAL

Model: End Load Cartonner KCM1



ELECTRICAL REQUIREMENTS

Volts:	240V
Phase:	1
Hertz:	50 / 60
Control Voltage:	24VDC

AIR REQUIREMENTS

Pressure:	80 PSI / 6 bar
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Contents

Section 1	Safety	Describes the safety features, rules, precautions and employer responsibilities.
Section 2	Introduction	Provides a general overview of the machine
Section 3	Installation	Should be reviewed before you move and position the machine. This section provides you with information on how to handle and set up the machine.
Section 4	Maintenance	Provides maintenance procedures, cleaning methods and lubrication information, and schedules.
Section 5	Operation	Describes the function of the controls. Has start-up and emergency stop / start procedure.
Section 6	Control Panel HMI	Explains the function of each menu page Optional section
Section 7	Changeover & Adjustments	Explains the sequence of operation
Section 8	Trouble Shooting	Gives a logical course of action and diagnosis for use in the event of fault occurring
Section 9	Parts Ordering	Details of ordering replacing worn/damaged parts and recommended spare parts list
Section 10	Mechanical Drawings	Set of mechanical drawings
Section 11	Electrical Documents	Wiring diagrams of all electrical components.
Section 12	Parts list	List of machine parts

If you require additional information about your machine that is not found in this manual please contact the service department at:

Keymac USA LLC
8702 Red Oak Blvd, Suite E
Charlotte, NC 28210
USA

Tel: +1 704 877 5137
E-mail: sales@keymac.co.uk



Section 1
SAFETY

Section 1 - Safety

EC DECLARATION OF CONFORMITY

We declare that the following machinery complies with the essential health and safety requirements of the Machinery Directive 98/37/EC, & Electromagnetic Compatibility Directive 89/336/EEC, 91/263/EEC & 92/31/EEC.

Machine Description: End Load Cartonner
Make: Keymac
Type: KCM3
Manufactured by: KEYMAC Manufacturing Ltd

The following transposed harmonised European Standards have been used:

EN292 Parts 1 and 2:1996, Safety of Machinery- General Principles of Design.

EN294: 1992, Safety of Machinery – safety distances to prevent danger zones being reached by upper limbs.

EN349: 1993, Safety of Machinery- minimum gaps to avoid crushing parts of the human body.

EN418: 1992, Safety of Machinery – Emergency stop equipment; functional aspects; principles of design.

BC5304: 1988 EN6204 Part 1:1993, Safety of Machinery, Electrical; equipment of machines – specifications for general requirements.

Annex 1 of 72/23/EEC and Articles 13 & 14 from (93/68EEC) and EN60204-1

EN50081-1 Generic Emissions standards; light industrial environments.

EN50082-1 Generic Immunity standards; light industrial environments.

A technical construction file for this machinery is retained at the following address:

Keymac Packaging Systems Ltd
15 Ashmead Business Centre
Ashmead Road
Keynsham
Bristol
BS31 1SX
England

Telephone Number: 01179865417 Fax Number: 01179865400

Signed..... Date.....

Name..... Position.....

Signing on behalf of the manufacturer

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The employer is responsible to provide adequate supervision to determine that safe work methods are used.

The employer is also responsible to establish and follow a program of periodic and regular inspection of this machine to ensure that all parts, auxiliary equipment, and safeguards are in a safe operating condition and adjustment.

Section 1 - Safety

Safety First



Ensure you understand and obey all safety warnings in this manual.

Failure to do so may result in serious bodily injury.

This machine should only be used for the purpose described in section 2 of this manual. Misuse or use for another purpose may result in bodily injury or damage to the machine.

PUT SAFETY FIRST

The machinery described in this manual has been designed for the sole purpose of packaging the specified product. Any other products must be approved beforehand by Keymac Packaging Systems Ltd. Packaging of unsuitable products could result in damage to the machinery and injury to the operator.

Suitable doors, guards and electrical safety devices are fitted to all Keymac Packaging Systems Ltd machines. These protective features are designed for the safety of the operator and are tested in our works before the machine is dispatched.

The design of the guards and safety devices all follow the recommendations of the United Kingdom H.M Factory Inspectorate and satisfy the requirements of the Machinery Directive. The functions of the components must not be altered in any way and they must not be replaced by alternative items.

By the following the safety precautions, accidents can be prevented.

SAFETY ASPECTS OF LOCAL OPERATING INSTRUCTIONS:

Before use of your machine, prepare general operating instructions. The operating instructions must meet any requirements for:

- Compliance with local safety regulations and codes
- Protection of employees against bodily injury, e.g. hard hats, gloves, safety glasses, hearing protection etc. as required for local conditions.
- Protection of employees against hazards such as hot surface etc.
- Maintaining clear visibility of **DANGER, WARNING** and **CAUTION** notices and labels.
- Advisory indicating systems to alert employees near the machine that it is ready to be started.
- Piping all vents on pressure equipment to a safe location.
- Instructing operators how to deal with any foreseeable mishandling of the machine

Section 1 - Safety



Although Keymac Packaging Systems Ltd try to guard against every possible misuse of the machine, there are some circumstances where additional warning labels may be needed. Finger Trap warning labels are positioned on the machine to warn operators / engineers of areas of concern where fingers may get caught if misused. These are warning labels and therefore must be kept visible at all times and **MUST NOT BE REMOVED.**

ESSENTIAL DO'S AND DON'TS FOR SAFETY:

- **DO NOT** operate the machine unless all guards are securely and correctly fitted
- **DO NOT** touch the glue pots / guns as they operate at high temperatures. If maintenance needs to be done always wear a pair of protective gloves
- **DO NOT** inhale the adhesive fumes from the glue unit
- **DO NOT** put your hands or fingers into the machine when it is running. If debris needs removing ALWAYS stop the machine and open a guard door before removing any obstructions
- **DO NOT** obstruct or remove any DANGER, WARNING or CAUTION notices / labels that may be on the machine
- **DO NOT** use the machine if you have not received the necessary training
- **DO** check the security of all nuts and bolts, screws etc after the machine has been operating for a while
- **DO** keep the area around the machine clean and tidy
- **DO** disconnect any power supply when needing to work on the electrical system or when cleaning the machine

MAKE SURE YOU ARE AWARE OF WARNING SIGNS AND THEIR PURPOSE

Section 1 - Safety

Glue Safety

The following safety precautions must be adhered to when dealing with any aspect of the Glue System.

Ensure you read and understand all safety warnings dealt with in relevant sections of the Manual.



Be aware that Glue is extremely hot and under pressure, do not attempt to adjust any component of the glue system without correct safety equipment or before consulting relevant sections of this manual.



CAUTION: High Temperature Glue will adhere to and seriously burn skin. Avoid ALL contact with Glue and wear protective gloves and safety goggles whenever dealing with any component of the Glue System.

Section 1 - Safety

General Safety Information

This machine has been guarded for the safety of all personnel that are involved with the products processed through the machine. When operating this equipment, all guards must be in place. Guards, safety switches, and interlocks should not be bypassed for any reason. Any change or modification to the safety equipment of this machine may produce a hazardous condition that could cause injury to persons working with the machine.

WARNING

Disconnecting or bypassing this machine's safety equipment will void the manufacturer's warranty.

Section 1 - Safety

Safety Rules

1. No one should operate this equipment unless they have read the service manual and have been instructed on the safety and operation of the machine.
2. All guards must be in their proper place before starting the machine.
3. The operator should look to insure that the machine is clear before start-up, and call a warning, "CLEAR", to alert other personnel that the machine is being started.
4. Do not reach into the machine until it has come to a complete stop.
5. Activate an **emergency stop** prior to clearing jams or reaching into the machine.
6. Turn the main power disconnect OFF and attach a padlock to assure that the power to the machine remains OFF when performing maintenance on the machine.
7. Wear safety glasses and gloves when working on or around pressurised hot glue systems.
8. Do not wear loose clothing or jewellery when operating this machine.
9. Personnel should stay clear of machines with auto-restart to avoid possible injury.
10. Personnel should be familiar with the location of the emergency stop switches on the machine.
11. Electrical cabinets and boxes should not be open unless power has been disconnected.
12. Do not leave tools in the machine when running or when starting up the machine.
13. Do not use this machine or equipment for any other purposes except for that which it was designed.
14. Do not exceed the speed for which the machine was designed to operate.
15. Only qualified personnel should adjust, repair, and maintain this equipment.

Section 1 - Safety

SAFETY PRECAUTIONS

1. Do not reach into the machine through the discharge or infeed openings.
2. Do not reach into or under the equipment while it is running.
3. Use caution around infeed conveyor lugs tracks and sprockets.
4. On "hand load" machines, keep clear of the downstream end of the load table when the machine is in operation.
5. Ensure that the air supply is disconnected before releasing the hose.



Section 2
INTRODUCTION

Section 2 – Introduction

Introduction

The **Keymac KCM1 2 Flap Sealer** machine handles food and non food products at up to 40 cartons per minute. It is designed to accept pre filled cartons in to moving flight chains. Carton flaps are then glued or tuck closed using carton guide rails and compression plates

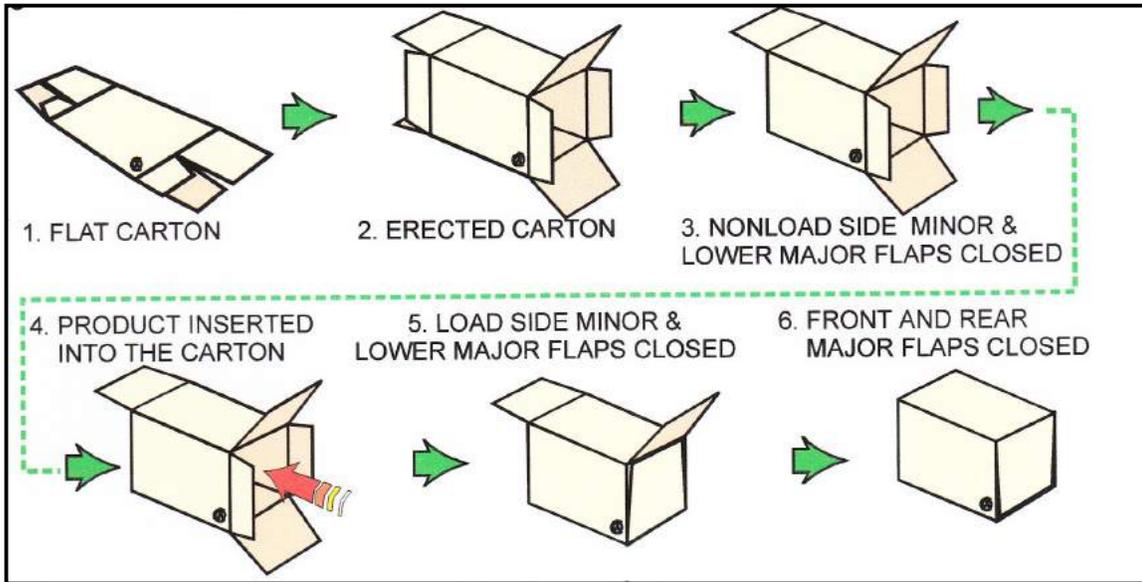
Standard features of the **KCM1 Cartonner** are:

- Continuous motion.
- Small foot print of only 2.5 metre machine length.
- Standard 1.5 metre pocketed infeed conveyor
- Energy saving design using multi-axis AC inverters
- Capable of speeds of up to 40 cartons per minute.
- Powered outfeed side belts (optional)
- Single point adjustment for machine width and overhead guide height
- Stainless steel and aluminium construction with plastic product contact guides.
- Fast size change achieved in less than 5 minutes requiring no tools or change parts.
- Low maintenance 'sealed for life' design concept to reduce costs of spares and service.
- **Maximum carton size: A=250, B=90, C=300**
- **Minimum carton size: A=25, B=25, C=100**

Note: This introduction section is designed for general information only.
Refer to Safety, Installation, Maintenance, Operation and Changeover and Adjustments sections for more detailed information about these areas.

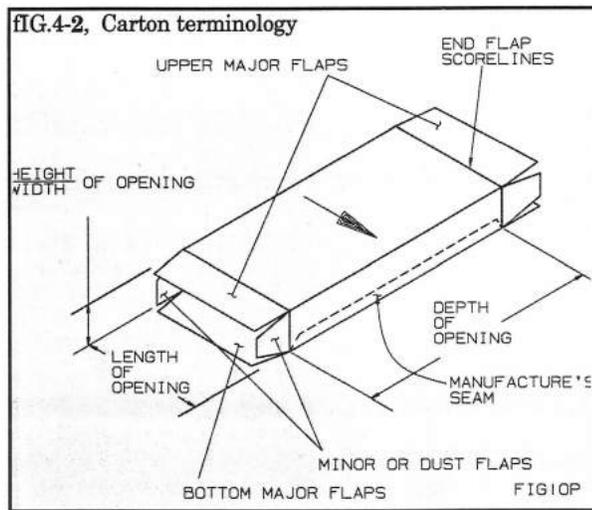
Sequence of Operation

[Fig 2-1]



Carton Terminology

[Fig 2-2]



Section 2 – Introduction

General

Cartons are erected by hand, filled manually and then placed into flight lugs while the machine continues to operate.

The carton is transported between two sets of chain flights. One set locates on the leading edge of the carton and the second set pushes the trailing edge. The minor flaps and lower major flaps of the carton are tucked in during placement.

The upper major flap then passes the hot melt glue applicators and receives a line of adhesive. The flaps are then ploughed down and compressed against the lower major flap.

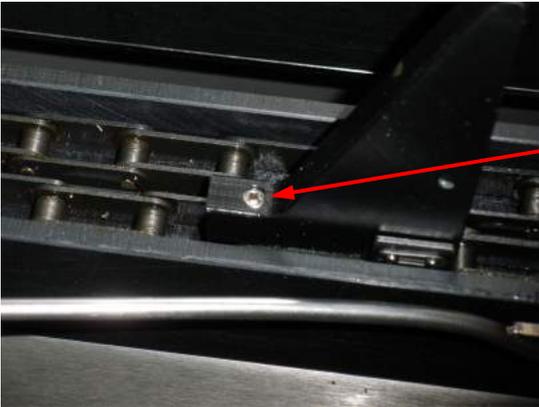
Section 2 – Introduction

Flight Chains

These assemblies comprise the main body of the machine on which empty cartons are erected for filling, closing, coding and sealing. The carton is conveyed in flighted pockets comprising of two outer chains and one inner chain.

The loading side of the machine is the fixed datum and the non-load side (depth of insertion) is adjustable via a handle at the end of the machine.

Guides hold the upper and lower major flaps. Immediately after the product is loaded, these flaps are closed by fixed ploughs.



[Fig 2-9]

Jacking screw in the back of the flight lug allows for lug angle adjustment to improve carton squareness during sealing.

Section 2 – Introduction

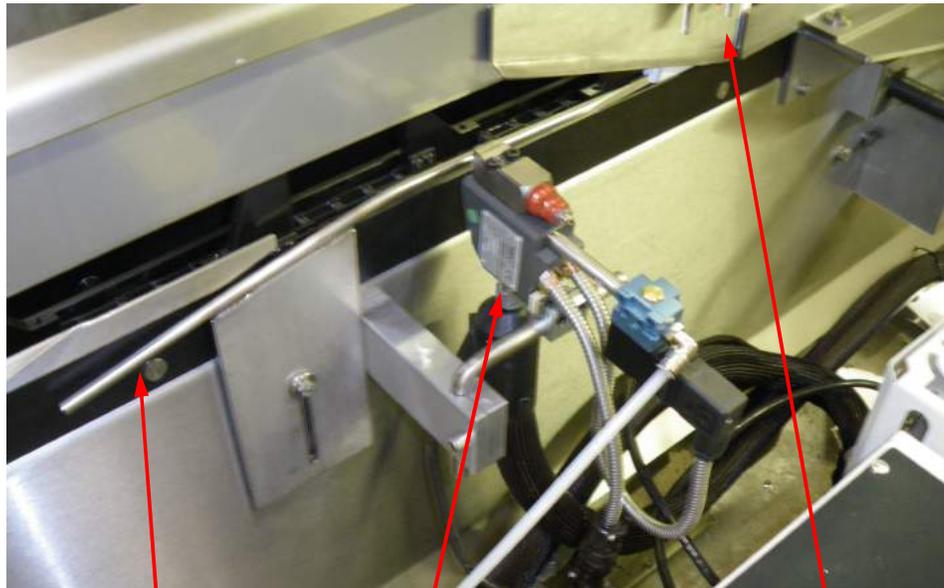
Ploughs and Guides

The KCM1 is equipped with left hand (load side) and right hand (non-load side), ploughs and guides, to hold the minor flaps at each side of the carton and close the major flap.

The final part of the closing section is fitted with left and right handed guides that plough down both upper major flaps before the carton enters the compression section (Fig.2-11).

The compression section consists of flat polished plate that applies the degree of pressure necessary to ensure that each of the upper major flaps remain in controlled contact with the glued lower major flaps until the adhesive has cooled and set.

All ploughs and static guides are adjustable by means of the mounting bars and clamp handles.



[Fig 2-11]

Lower Major flap
plough up guide

Hot melt glue jetting
gun (Typical)

Upper Major flap
plough down guide.
(Right hand shown)

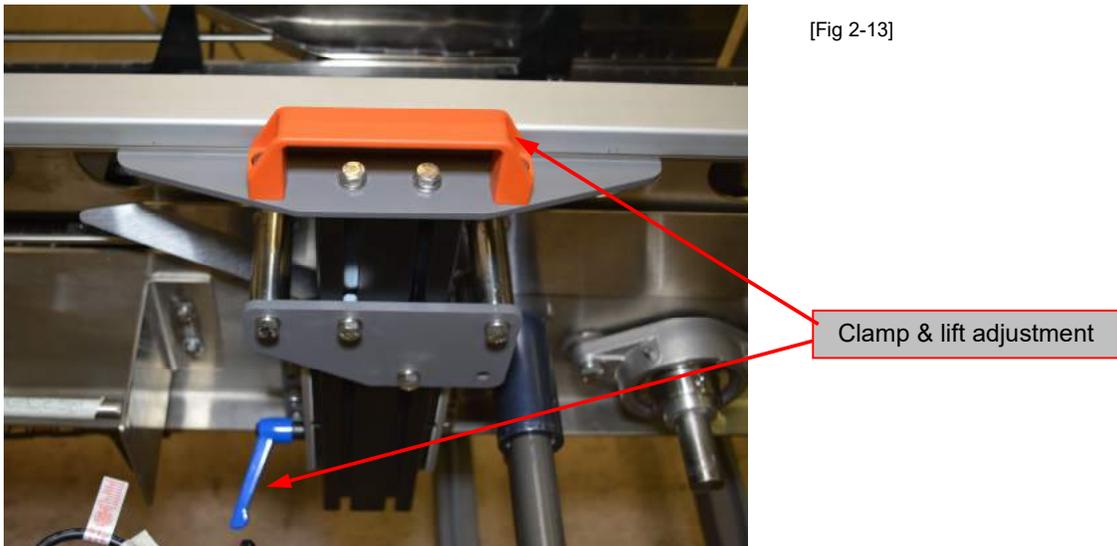
Compression Section

The compression section comprises of two polished side plates. These assemblies apply pressure to the cartons after they leave the gluing area to assist with the sealing of the carton flaps.



Overhead guides

The KCM1 is also equipped with an adjustable overhead hold down guide system. This can be set accurately to hold the carton down onto the flight chain squarely and maintain control during the feeding, loading and flap closing sequences. The single point adjustment is achieved with clamp and lift handles.



Section 2 – Introduction

Glue Application System

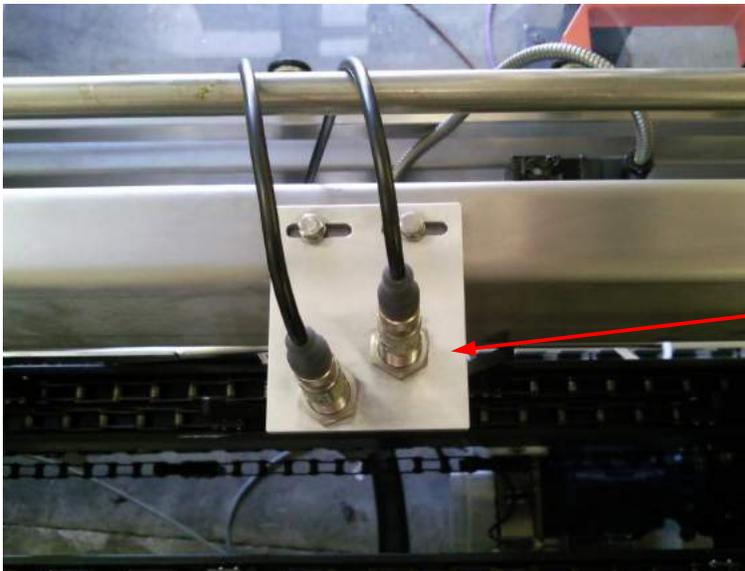
The carton flaps are glue using a pressurised hot melt glue application system (Fig.2-14). The main melting tank feeds hot melt glue through flexible hoses to pneumatic spray gun that release glue onto the side of the carton in a thin line. The length of this line is controlled by two photoelectric sensors (Fig.2-15) that automatically sense the length of the carton and leave the correct gap at the start and at the end.

The glue line is then compressed and glue between the compression guides



[Fig 2-14]

Main melting tank with lift up lid for refilling (Tank type may differ)



[Fig 2-15]

Dual photo eye glue line system.



Recommended Glue Specification

ational Starch and Chemical Company
ADHESIVES DIVISION

10 Finderne Avenue
P.O. Box 6500
Bridgewater, New Jersey 08807-3300
908-685-5000

PACKAGING & CONVERTING

ULTRA MELT™ 34-2100

Product Type:

Hot Melt Adhesive

Physical Properties:

Appearance: Light colored solid
Solids: 100%
Viscosity: 800 cps @ 350°F
1250 cps @ 325°F
1875 cps @ 300°F
Density: 8.0 pounds/gallon
Form: Mini-slats

Suggested Use:

Case Sealing/Carton Sealing/Trayforming

Including:

- DPM Carton Forming
- Bag-in-Box
- Sealing
- Bliss Box Manufacture
- Wrap Around Case Sealing and All Standard Methods

Product Features:

- Excellent adhesion to difficult board stock including recycled and high performance liners
- Superior heat stability to prevent char formation, reduce equipment maintenance costs, and prolong equipment life
- Low density and low viscosity to minimize usage
- Outstanding resistance to high temperature failures
- Excellent adhesion in cold temperature conditions
- Low odor for improved working environment
- FDA approved for indirect food contact regulation 21 CFR 175.105 "Adhesives".

Operating Conditions:

Suitable for all gear and piston pumps
Suitable for all standard electronic and pneumatic nozzles including zero cavity and reduced cavity.
Suitable for wheel applicators and foamed hot melt systems.
Operating Temperature: 325°F to 350°F.

Package:

50 lb. cartons. GMA pallets. 24 cartons/pallet

Precautions:

Material is applied hot - appropriate clothing and eye protection should be used.

Use with adequate ventilation to remove any hot melt fumes or vapors that are generated.

Keep containers and premelters covered to avoid contamination.

Do not mix with other adhesives.

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The information given and the recommendations made herein are based on our research and are believed to be accurate but no guaranty of their accuracy is made. In every case we urge and recommend that purchasers before using any product in full scale production make their own tests to determine to their own satisfaction whether the product is of acceptable quality and is suitable for their particular purposes under their own operating conditions. THE PRODUCTS DISCUSSED HEREIN ARE SOLD WITHOUT ANY WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED. No representative of ours has any authority to waive or change the foregoing provisions but, subject to such provisions, our engineers are available to assist purchasers in adapting our products to their needs and to the circumstances prevailing in their business. Nothing contained herein shall be construed to imply the nonexistence of any relevant patents or to constitute a permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of this patent.

Section 2 – Introduction

Main Guarding

The KCM is fitted with a comprehensive set of guarding integrated with our safety features.

The machine is enclosed with a choice of either polycarbonate panels or an option of laser cut stainless steel mesh.

The polycarbonate panels are retained within stainless steel framed doors. Opening one of these doors while the machine is running will cause it to stop.

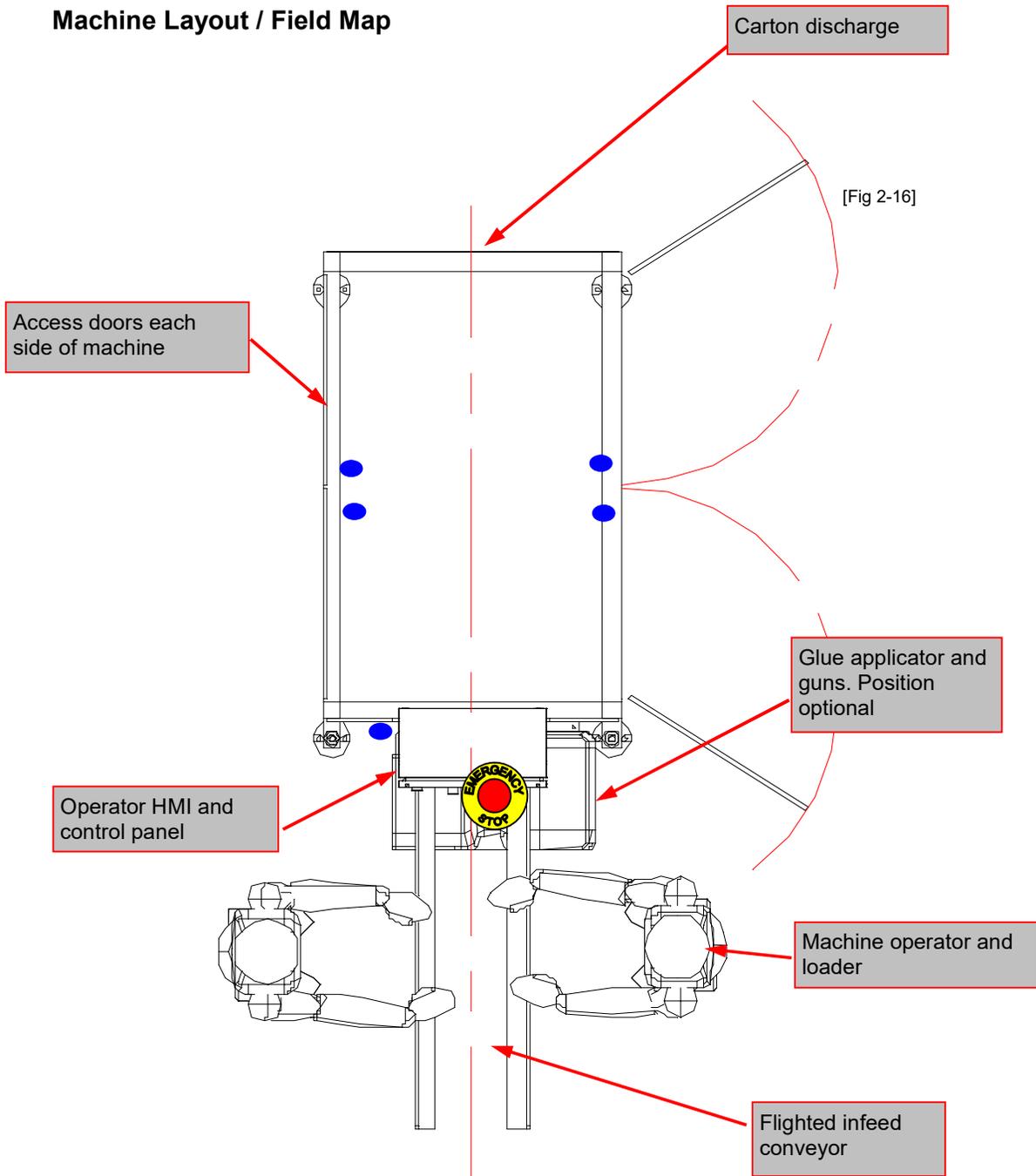
The hinged guard at the point where product enters the machine is known as the 'cat flap'. This hinged guard is designed to stop operators becoming entrapped in the machinery and actuates a safety cut off switch when opened.

The outfeed end of the machine is protected with fixed transparent panels.

Each opening guard is link to a dual circuit electric interlock that will stop the machine immediately if disabled or opened.

The positions for these interlocks are shown on the machine layout with a ● on Fig.2-16.

Machine Layout / Field Map



SUMMARY OF ARTICLE ON CARTON AGEING

RE: WHAT DOES AGEING DO TO FOLDING CARTON PERFORMANCE?

Flat carton blanks and pre-glued sleeve cartons, that are run over vertical or horizontal cartonning machinery, carton forming and/or closing machines, new or old, from the cheapest to the "ROLLS ROYCE" of the line, at one time or another will have problems in setting up, erecting, forming, or closing on a consistent basis.

Normally, the first few runs will go well....then all of a sudden there are problems. IS IT THE MACHINERY OR THE CARTONS???? "The age old question ...? It's the same machinery that ran well when it was first installed, the adhesive hasn't been changed, and you are still purchasing your cartons from the same company. WHY ARE YOU HAVING PROBLEMS????

Recently there have been various studies conducted by Paper Industry Instruments, an independent group in Ohio on CARTON OPENING FORCE. This is the force required to open (erect), fold or close and glue a flap. It has been found that cartons that are aged (stored for a period of time) require considerably more OPENING FORCE than those more recently manufactured. As much as THREE (3) TIMES THE OPENING FORCE is required to open cartons after sitting for 90 days. Naturally, various outside influences may also affect this data such as; temperature, humidity, board weight, density, coatings etc....

The age of "recycled" carton board stock is also upon us, this IS NOT going to help the situation at all... It is becoming more important that you attempt to cycle your inventory as fast as possible. If possible you should minimize your inventory as fast as possible. If possible you should minimize your inventory and cycle it more often utilizing the "FIRST-IN FIRST-OUT" concept.

Increased line and cartonning speeds may only add to your problems. Naturally, increased speeds mean "shorter" opening and/or folding times, which are more effected by the OPENING FORCE....

It is sometimes difficult to recognize the "real" cause of your machinery problems, DO NOT BE TOO QUICK to identify the problem, be objective and consider ALL possibilities....

It could be very important, considering the cost of downtime, to plan ahead and attempt to schedule a quicker turn around in your carton supply... it could make a difference!!!!

Section 2 – Introduction

Guidelines for the Pre-production & Storage of Skillet Cartons

Introduction

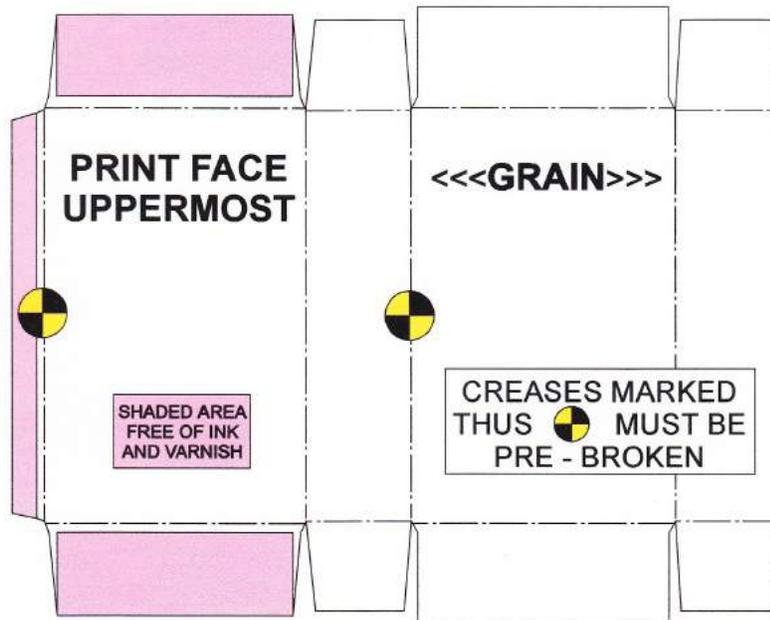
The efficiency of any packaging, or carton forming machine depends on the condition and quality of the cartons being used. Incorrectly manufactured cartons or badly stored cases of cartons will affect the efficiency and performance of a c packing line.

Proper care and attention must therefore be given to the storage and handling of cartons.

Manufacture of End-load Cartons

Grain direction in cartons is extremely important, as it is the grain that assists in the breaking of the creases in the carton. If the grain direction is the wrong way through the cartons this will restrict the carton from opening, thus causing a product-loading problem.

When lying the template of the carton onto the board material make sure that the grain direction is correct (Fig.2-17).



[Fig 2-17]

When folding and gluing the carton blank, to form a skillet carton, make sure the adhesive is applied correctly. Two common problems in this area are 'Tapering' and 'Seeping Out'. If the carton has not been folded parallel, after the adhesive has been applied the carton will not be square when in the cartoning machine and will therefore cause problems. This is known as 'Tapering'.

The other manufacturing problem, 'Seeping Out' is when the glue seeps out from its position when applied and glues the inside of the carton together, therefore the cartoning machine is unable to erect the carton.

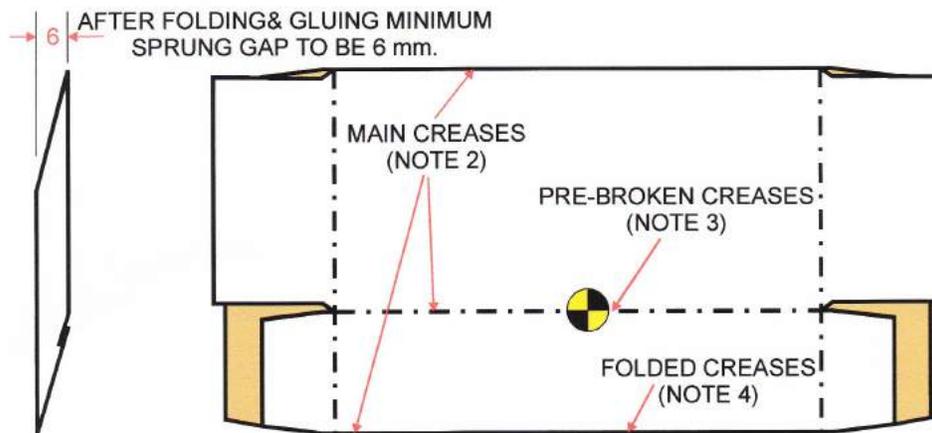
During printing and varnishing the carton, the areas where the hot melt adhesive is to be applied needs to be keyed out, free from any print or varnish so the adhesive can produce a secure bond.

Section 2 – Introduction

Cartons presented to the cartoning machine must be flat. No twist or bowing of the cartons is permissible. Pre-breaking of the indicated crease lines in the below diagram must be carried out during folder/and gluing operation. This process assists the erection of the carton within the cartoning machine.

1. These cartons are to be machine erected, creases must be well defined
2. Maximum pre-fold must be obtained on all 4 main creases
3. The creases marked  **MUST** be pre-broken, maximum pre-fold to be obtained (minimum 160°)
4. The folded main creases of the made up carton are to be ironed to a minimum to obtain maximum spring when opening the carton. Over ironing of these creases can counteract any advantages gained by pre-breaking the other main creases and can seriously affect the efficiency of machine erection of these cartons

All the above notes are intended as guidelines only and are designed to ensure manufactured cartons are suitable for machine erection.
Cartons must also be packed and stored correctly to ensure good performance from your packaging machine



[Fig 2-18]

Handling and Storage of Carton

A carton storage area must be situated in a waterproof, well-ventilated building away from direct sunlight and with an optimum storage temperature or approximately 16°C (60°F) and a relative humidity in the region of 40-50%. The layout of the store should be arranged so that carton blanks are not placed near local sources of heat e.g. radiators, steam pipes and electric lamps. Carton blanks should not be stored directly on the floor, especially when the floor is of concrete or brick, as a cold damp floor will seriously damage the cartons.

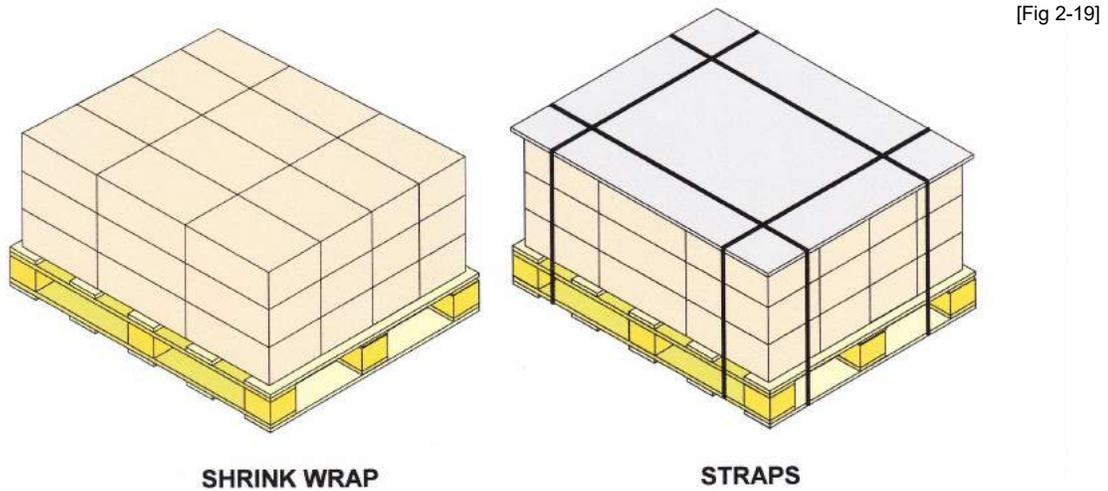
Avoid leaving cartons in the machine carton magazine during long breaks in production, especially overnight when air conditioning or temperature changes occur. Dampness in the atmosphere during wash down can also have a detrimental effect on exposed cartons. Cartons presented to the cartoning machine must be flat. No twist or bowing of the cartons is permissible.

Section 2 – Introduction

Packing Carton Blanks for Transit:

Pallets or cartons must be stored in a dry controlled atmosphere as cartons pick up moisture that together with extremes of temperature will affect the carton characteristics.

Stacking pallets on top of each other is only permissible provided sufficient stacking strength is present to avoid outer case deformation. Stacked outers must not overlap the pallet base. If strapping is used, a top board must be used to avoid straps deforming the outer cases and thus damaging the carton. Another method of pallet stacking is to shrink wrap the carton boxes so the stacked load is stable and secure.



Following and understanding the guidelines for the pre-production and storage of the skillet cartons will make the carton user aware of the importance of manufacturing, handling and storage REQUIRED for packaging machines to operate efficiently.



Section 3
INSTALLATION

Section 3 – Installation

Arrival

Upon arrival of the machine, carry out the following:

1. Inspect the machine thoroughly for damage.
2. Ensure that all parts for the machine (which may be contained within separate boxes) have been removed from the shipping vehicle.
3. Check the packing list to ensure that all accessories are present.

Note: This machine has been thoroughly tested at the KEYMAC factory prior to shipment. After the installation procedure has been carried out, the machine will be ready for operation.

Positioning

WARNING: Only qualified personnel who have read and understood the service manual, and who are familiar with the safety and operation of this machine should be allowed to work on this equipment.

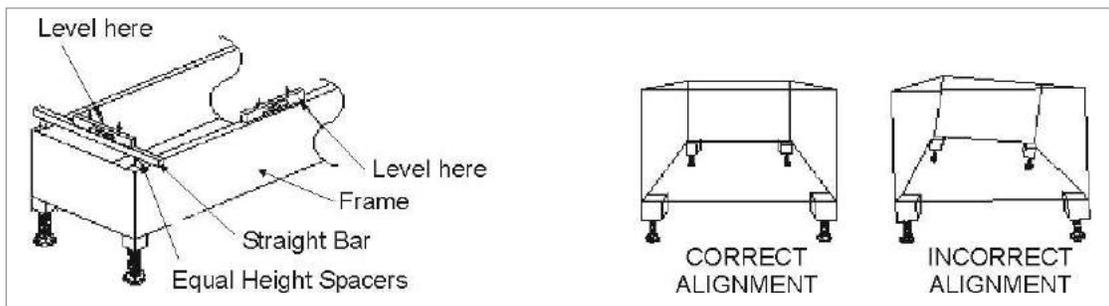
Position the machine as follows:

1. When moving the machine with a fork lift or power lift device ensure that they are ONLY positioned in structurally sound areas.
2. Be careful not to pinch loose hoses, electrical wires or conduit that may be under the machine.
3. When rolling the machine, ensure all feet are retracted sufficiently to clear any high spots on the floor.
4. Move the machine to its final destination.
5. Level the machine using its feet.

Note: Do not use the machine casters for permanent set-up. If they are causing an obstruction when levelling the machine - remove them.

- a) When levelling the machine place the level on the horizontal part of the frame in line with the feet of the machine.

Note: If any part of the inner workings of the machine interferes with the level, use two equal height spacers to elevate the level above the obstruction (Fig. 3-1).



[Fig 3-1]

Figure 3-1
Correct Frame Levelling

Section 3 – Installation

- b) Adjust the feet until the machine is level between each set of feet. (This may take several attempts as each adjustment may affect the previous one).

Warning 1: Incorrect levelling alignment may cause damage to the machine when it runs.

Warning 2: Do not place the level on the guards to obtain the level reading.

- c) Once the machine is level, tighten the jam nut on each foot to lock the position and prevent the feet from turning.
6. Connect any additional equipment to the machine. A list of connecting sequences may have been shipped with the machine. If there is no list, connect the component(s) as they match up.
7. When connecting belts ensure all timing marks are matched.
8. Mount guard accessories to the machine.
9. Carry out a loose article check of the machine.

Electrical Power Connection

Warning: Only qualified personnel should carry out the electrical connection procedures to this machine. All local and state regulations for electrical connections should be followed.

1. Check the serial number, nameplate and electrical schematic drawing of the machine to ensure that the correct voltage is to be connected. The schematic for this machine can be found in wiring section of this manual and in the main electrical enclosure of the machine.

Warning: If the voltage is different from that specified contact 'KEYMAC' immediately.

2. Other equipment may be required to overcome the voltage difference, in which case only a qualified electrician should make the wire connections to the extra equipment.
3. An electrician should inspect all electrical enclosures and related components for damage.
4. If the machine has been shipped in two sections, reconnect the wires using the wiring schematics from this manual for reference.
5. The machine nameplates supply the amperage rating of the machine, the breaker and/or the fuse sizes. Wire size and type must conform to local and state codes.
6. A ground wire must be supplied from the plants grounding system.

Warning: Ensure that the ground wire supplied is able to carry the full amperage load of the machine.

Section 3 – Installation

7. After connecting incoming power to the machine, check for proper rotation of AC motors. Motor rotation must be checked by turning the vacuum pump on and off. Comparing the rotation with the arrow on the motor housing. If the machine is not equipped with a vacuum pump, check for proper rotation by inching the machine (see Start Up Sequence below) and observing which direction the machine is moving. If the motors turn in the wrong direction, reconnect the incoming power to the machine mains at the electrical cabinet (DO NOT reconnect the wires at the motors). Do not run the machine until correct rotation is established.

Warning: Running the machine backwards may result in damage to the machinery.

8. An electrician should ensure that the guard interlock system is in proper working order.

Air Connection

Most 'KEYMAC' machines require a supply of compressed air. A supply line must be connected to the dump valve that is attached to the air filter/regulator assembly. Normally this assembly is located on the outside of the machine, in a readily accessible place.

Note: The incoming air supply should exceed 80 PSI / 6 bar.

The air regulator on the machine has been preset, and therefore no adjustment should be necessary.

Warning: Ensure that all personnel are clear of the machinery when the air supply is switched on.



Section 4
MAINTENANCE

Section 4 - Maintenance

General Routine Maintenance

To ensure a properly operating machine, it is recommended that a routine preventative maintenance schedule be established. This should include cleaning of the machine at regular intervals. This section serves as a supplement to industry standards, and should help in establishing a schedule that is right for this equipment.

Cleaning

Warning: Before washing the machine, ensure that all power has been turned off.

It is important that the machine is kept clean. Machines operating in harsh environments such as dairies or meat packing plants must be washed down daily. Machines operating in other environments should be visually inspected and cleaned as necessary by wiping with a cloth and a solution of mild detergent.

Pressurised Washing

1. Turn off power to the machine.
2. Avoid spraying the water directly at the electrical enclosures.
3. Do not spray the water directly onto the control panel, emergency stop buttons, micro-switches and solenoids, electrical clutches and other electrical components.
4. Where possible, cover the electrical components with plastic.
5. Avoid spraying water directly onto the motors.
6. Do not allow the water to sit on the machine. Remove the water by either blowing it off with air, or wiping it away with a dry cloth.
7. Clean the outside of the electrical enclosures with a damp cloth.

In the event of part failure leading to machine breakdown, it may be necessary to strip assemblies on the machine to replace worn parts. This section serves as a technical guide on recommended part replacements procedures.

Warning 1: Only a qualified maintenance engineer must only carry out Work on this machine.

Warning 2: Before working on the machine, ensure all power has been turned off.

Bearings

The following schedules assume operating for 10 hours per day, 5 days a week in a normal environment. If the machine is subject to extended operating hours or harsh environments i.e. wet, hot or dusty conditions, the lubrication schedule should be adjusted accordingly to a more frequent schedule.

Sealed Bearings (if applicable)

Machine Speed	Lube Schedule
30-60 cartons per minute	after 6 months
60-100 cartons per minute	after 3 months

Section 4 - Maintenance

Open Bearings (if applicable)

Machine Speed	Lube Schedule
0-30 cartons per minute	Monthly
0-60 cartons per minute	Weekly

Bushings

Plastic Linear (if applicable)

The KEYMAC linear motion type Derlin bushings are low friction which dampen noise and vibration. These bearings do not normally require lubrication, but the shafts they run on do. An application of a light oil (10-W) will be sufficient to keep the shaft clean and rust free.

Ball bushing type (if applicable)

The low friction ball bushing bearings require much less lubrication than the conventional sleeve type bushings. An application of a light oil or grease on the shaft is all that is required for normal operating conditions. For unusual operating conditions, contact your lubricant supplier for their recommendations.

Brass or Bronze type (if applicable)

Brass or bronze bushings require daily lubrication. If bushings run dry, lubricate immediately.

Chains

WARNING: Do not run machine with dry chains

Drive Chains (optional)

Keep oiled – do not allow to run dry. Check weekly. Lubricate with a light grade oil (10-W) or a spray on type.

Product Infeed Conveyor Chains (optional)

Keep oiled – do not allow to run dry. Check weekly. Lubricate with a medium grade oil. Avoid getting oil on product carrying surfaces. In food packaging use only approved food grade lubricants.

Flight Chains (Product Carrier Chain)

Keep oiled – do not allow to run dry. Check weekly. Lubricate with a medium grade oil. Avoid getting oil on product carrying surfaces. In food packaging use only approved food grade lubricants.

Sprockets

Keep all open sprockets well lubricated. DO NOT RUN DRY. On high speed machines check sprockets daily. See RECOMMENDED LUBRICANTS for the correct lubricant.

Section 4 - Maintenance

Gearboxes

The gearboxes fitted to this machine have been sealed for life and do not require any further lubrication. It is not recommended that these gearboxes are opened during standard machine maintenance schedules.

If gearbox becomes noisy, seized or runs hot then the gearmotor unit should be replaced.

IMPORTANT

TO PREVENT DAMAGE TO CHAINS AND GEARS PLEASE CARRY OUT MONTHLY LUBRICATION CHECKS AS INDICATED BELOW:

Machine part	Lubricant
CHAINS / SPROCKETS	10-W
GEARS (OPEN)	10-W
GEARBOX	SHC MOBIL 636 or similar
VACUUM PUMP	N/A
SUPPORT SHAFTS	10-W



Section 5
OPERATION

Section 5 - Operation

Start-up Sequence

- 1) Before starting the machine, carry out the following:
 - a) Carry out a loose article check of the machine.
 - b) Ensure all personnel are standing clear of the machine.
 - c) Ensure the machine is free from obstructions and suitably clean for use.
 - d) Ensure the guard doors are closed.
 - e) Check the electrical supply is connected to the mains and the isolating switch is set to 'ON'
- 2) Pull all Emergency stops buttons to the open / out position
- 3) Turn the air supply on ensuring it is set to the correct pressure for operation.
- 4) Press the Reset button.
- 5) Press Start button.
- 6) If the machine does not cycle, check for jams or obstructions and try inching the machine again until a complete cycle has been achieved.

Note: Refer to TROUBLE SHOOTING GUIDE for diagnosing and solving common problems.

Testing the Machine Prior to Full Operation

Before running the machine in full production, it is recommended to test the machine, in order to determine all adjustments are correct for the carton size required, and then ensure the machine is operating correctly and safely. (Refer to changeover and Adjustment section of this manual).

Allow at least 2 cartons to feed into the machine to confirm that settings and speed are correct. If jamming should occur, alter the settings as required and refer to Removing Jams section of this manual. The trouble-shooting guide of this manual should be referred to for diagnosing problems occurring during machine testing.

Once it is established that all adjustments have been made correctly and the operator is happy with the operation of the machine, then the machine is now ready for full operation mode.

Section 5 - Operation

General Operation

All safety rules should be strictly followed when operating the machine.

Removing Jams from Machine

Jams may occasionally occur. To remove a Jam, carry out the following:

- 1) Press the Emergency Stop Button, to cease operation of the machine.
- 2) Lift up the safety guards.
- 3) Remove all product from the machine
- 4) Close the safety guards and reset the emergency stop buttons.
- 5) Restart the machine.

Section 5 - Operation

Description of controls

[Fig 5-1]



Emergency stop button



When depressed this causes an immediate halt to the main motor of the machine. When the stop button is fully depressed. It is automatically locked to prevent an accidental start up.

Opening any of the guard doors will also stop the machine.

Reset button



When pressed this button will reset the machine and bring all motor axis to their home positions.

Start button



Enables starting of the machine. The machine will not start unless all guards are closed, the Emergency stop buttons are lifted and the reset button has been pressed.

Stop



When pressed this button will slowly stop the machine. Once the machine has stopped by this button, press the START button to resume production.

Jog button



When pressed the machine will move and then stop when released. The machine will not start unless all guards are closed.

Section 5 - Operation

Machine speed control



This can be turned up or down to control the speed of the main machine. Note this will not change the speed of the outfeed belts.

Outfeed belt speed control



This can be turned up or down to control the speed of the outfeed belts.



Section 6
CONTROL PANNEL HMI
(optional)

HMI (Human Machine Interface) Screen

The HMI allows the operator to see and designate several operating aspects of the machine. It is a simple touch screen application which consists of five pages, these can be cycled through using the 'Next Page' button or you can navigate back to the main screen via the 'Back' button (see images below).

Each page in turn allows the user to change or view the current settings. Below is each screen display and the function of each one:

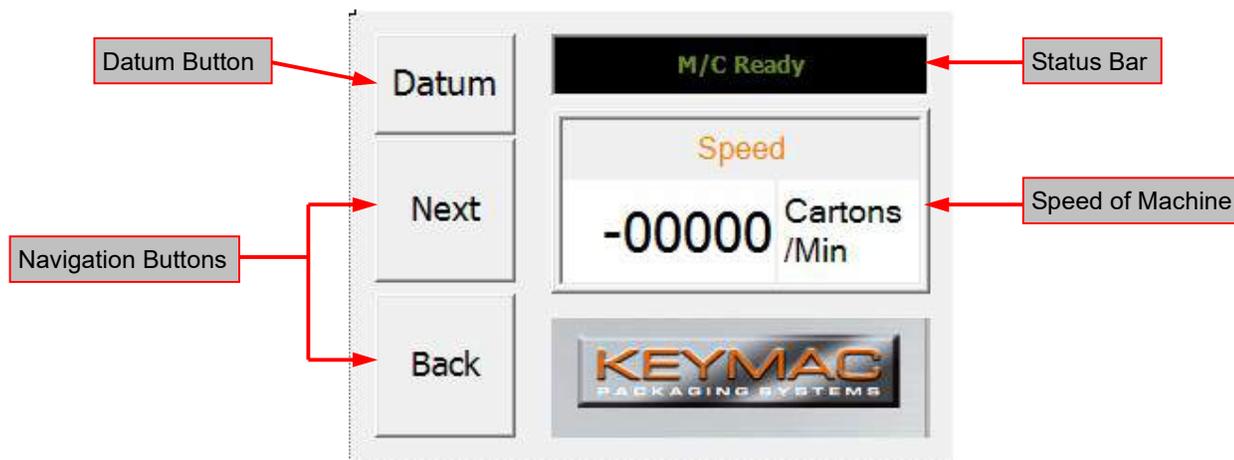
First Page - Main Screen

This page is the default screen (Fig 6-1). It shows the set speed of the machine in cartons per minute and the machine condition status. To change the speed tap on the displayed figure, a number pad will appear, type in how many cartons per minute you wish the machine to run at and press enter. This the standard method used to change any parameter.

NOTE: Maximum speed of the KCM2 is 100 Cartons per minute BUT WILL DEPEND ON THE OPERATORS DEXTERITY

The 'Status Bar' shows whether the machine (M/C) has been stopped/emergency stopped, reset, in a homing sequence, is ready to run or is running.

[Fig 6-1]



The 'Datum' button allows the operator to carry out a homing sequence to ensure the Rotary Feeder and Conveyor are in the correct position relative to one another. The machine will carry out a homing sequence automatically before the machine can run once it has been emergency stopped.

Section 6 – Control Panel

Second Page – Conveyor Status

Consists of two functions – the 'Motor Overload' and the 'Home Offset'

The 'Motor Overload' function restricts the amount of current allowed before the motor will stall i.e. it acts as an electronic clutch. There is a in-built factory setting for the minimum allowance, this is for the safety of personnel, product and the machine itself.

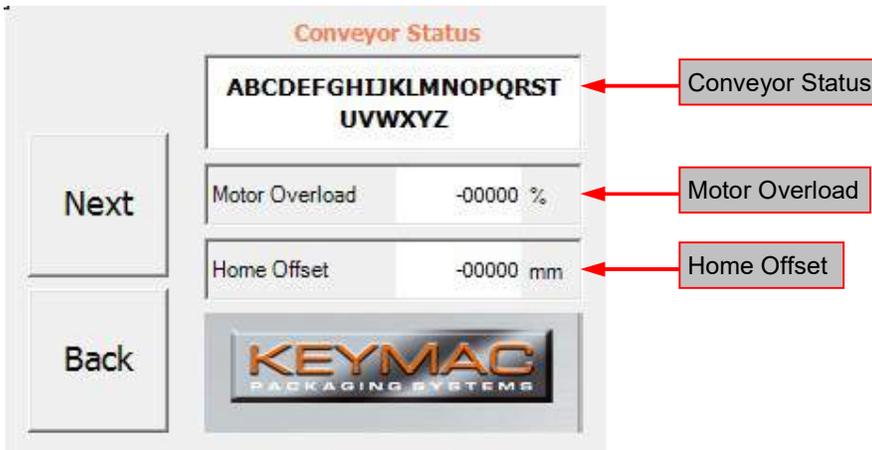
The operator is allowed to increase this figure should there be a need for it e.g. bigger/heavier product.

NOTE: INCREASING THIS SETTING WILL ALSO INCREASE THE CHANCE OF DAMAGING THE KCM2 END-OADER MACHINE

The 'Home Offset' is the distance from the face of the Conveyor Pusher Lug to the centre line of the Vacuum Cups on the Rotary Feeder. This valve when set at 0.0mm is 40mm on the machine (explained further in Section 7) - this is a standard datum for the machine to run with no confliction. The displayed value will need to be modified depending on each carton size.

This figure can be changed whilst the machine is running but will not physically change until a 'Homing Sequence' is carried out via the 'Datum' Button.

[Fig 6-2]



Third Page – Tucker Status

This screen simply displays the status of the Non-Load side Tucker, should any fault occur it will state here (Fig.6-3).

[Fig 6-3]



Section 6 – Control Panel

Fourth Page – Feeder Status

This screen simply displays the status of the Feeder assembly, should any fault occur it will state here (Fig.6-4)..

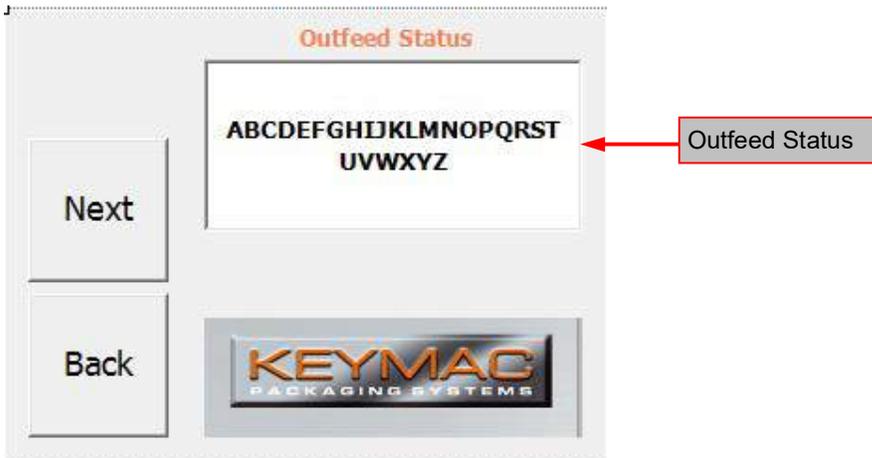
[Fig 6-4]



Fifth Page – Outfeed Status

This screen simply displays the status of the Non-Load side Tucker, should any fault occur it will state here (Fig.6-5).

[Fig 6-5]





Section 7
CHANGEOVER AND ADJUSTMENTS

Section 7 – Changeover and Adjustments

Change Over Sequence

Following list is to help you with changing your machine over to a new size carton in an orderly sequence. It is set up to help you go through changeovers quickly. This sequence does not necessarily have to be followed in order. Such as, the carton width may not change but only the height, or the depth may change where only a strong back and hopper adjustment is necessary.

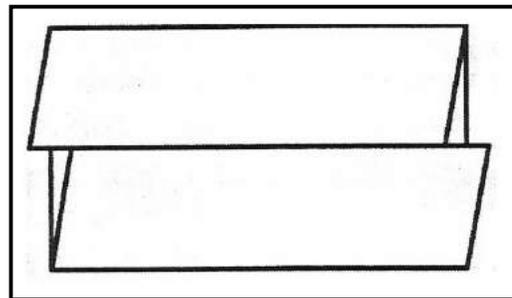
Order of change over:

1. Flight chains
2. Strongback width
3. Overhead rail adjustment
4. Compression
5. Infeed conveyor

Squaring the Flight Lugs

An important factor in making good square cartons is proper lug alignment across the Strongbacks. Fig 7-1 shows an example of a distorted carton with the end flaps overlapping the edges of the carton. Out of square pusher lugs can cause this problem by allowing the cartons to travel through the machine at a slight angle. In large cartons the distortion problem is more evident than in small cartons.

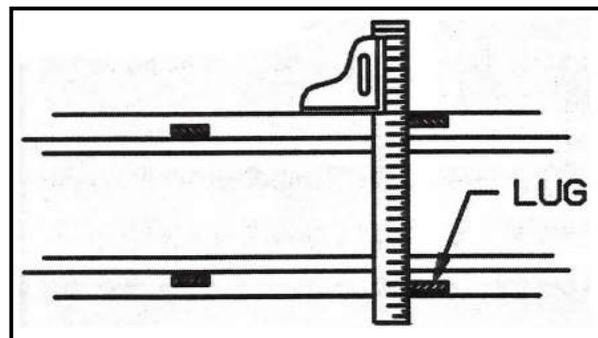
[Fig 7-1]



Most machines have two sets of chains that must be aligned. The first is the chain with “Pusher Lugs”, which push the cartons through the machine. The second is the chain with the ‘Leading Lug’. These lugs lead the carton and hold the front edge up.

Check to see if the ‘Pusher Lugs’ are out of square by placing a combination square across the Strongbacks as shown in Fig 7-2. If a gap exists between one of the lugs then adjustment is necessary.

[Fig 7-2]



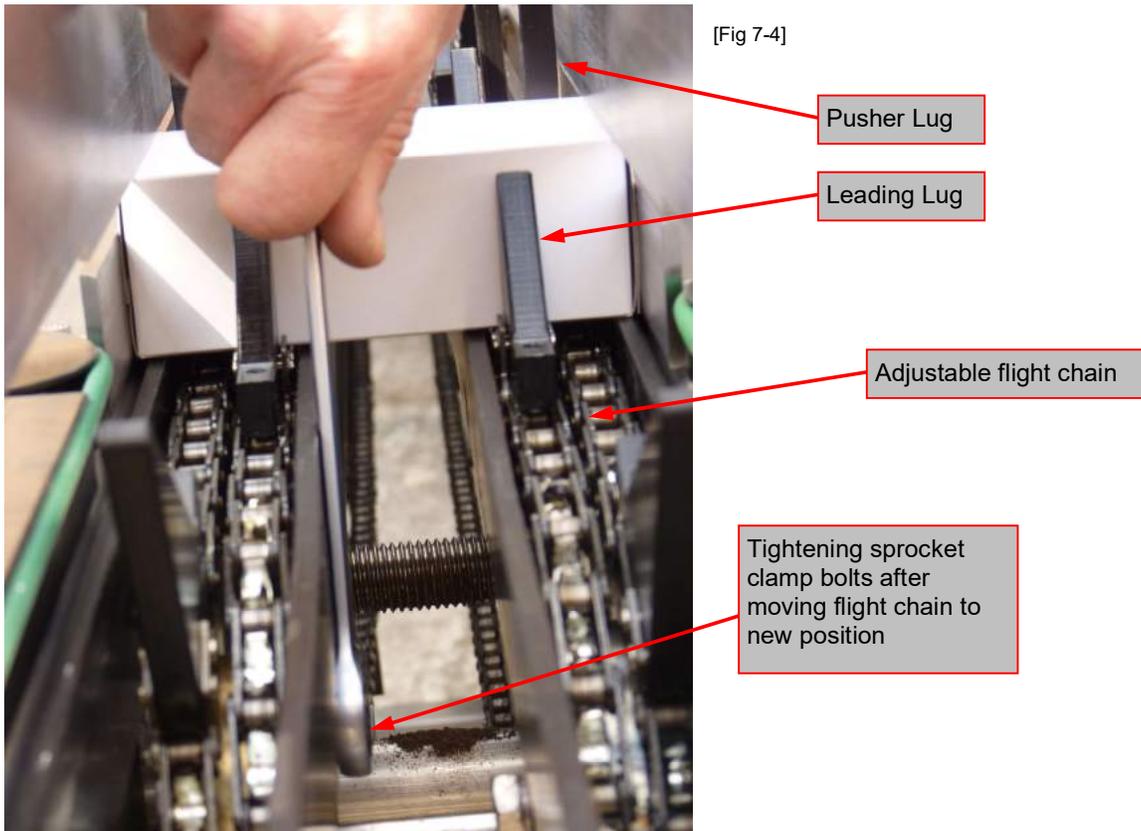
Adjustment of the ‘Leading Lugs’ is done when adjusting the length of opening of the lugs.

Section 8 – Trouble Shooting

Pusher Lug Alignment

The outer sprocket on the down-stream end of the machine (Fig 7-3) adjusts alignment. Only one side is adjustable – the non load side. The adjustable Strongback and must be adjusted to align with the non-adjustable sprocket. The adjustable sprocket is bolted to a hub that has two set screws which lock it down. To adjust the sprocket loosen the setscrews located between the sprockets (shown Fig 7-4). If only one can be reached, loosen it and then jog the machine until the other is accessible. When jogging the machine for this purpose make sure at least one set screw is tight.

Re-tighten the set screws, run the machine, then check the adjustment again. Move the lugs by pushing or pulling the lugs around the sprockets.



Setting Flight Lug Opening Length

When adjusting the flight lugs for a new carton, only the front lugs are adjusted (the 'Pusher Lugs' are not adjusted for carton change-over). The opening between the lugs should be set about 1mm (1/32") more than the outside dimension of the carton.

Move the lugs by pushing or pulling the lugs around the sprockets.

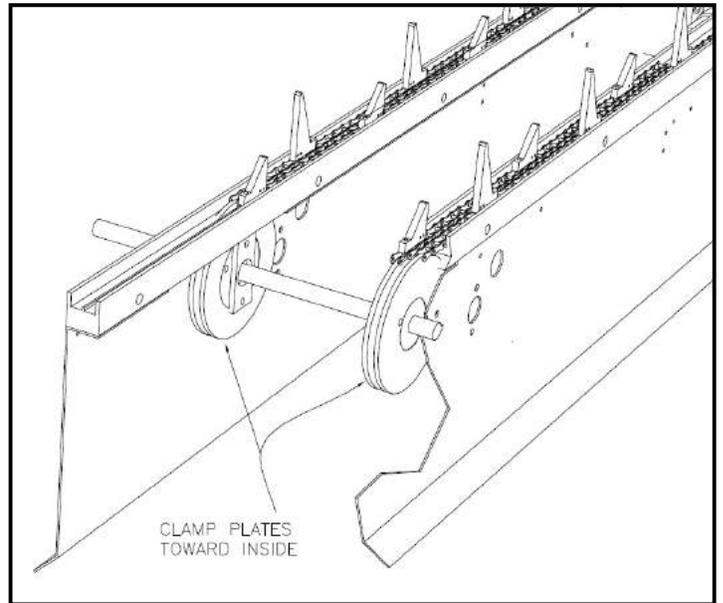
Section 7 – Changeover and Adjustments

To Adjust

Loosen the two bolts on the clamp plate (Fig 7-5).
Once loose, the 'Leading Lug' can be slid to its new position. Slide it past the desired opening length and then rotate it back to the proper setting.

Re-tighten the bolts on the clamp plate. Place a carton in the lugs. The lugs should just barely touch the carton.

[Fig 7-5]



Setting Strongback width to suit Carton Depth

There are two Strongbacks on the machine. One is fixed, the other adjustable.
When changing to a different carton depth, the hand-crank is rotated and the adjustable Strongback moves to the required position.
The Hand-crank is located on the right hand side of the machine looking downstream (Fig. 7-6).

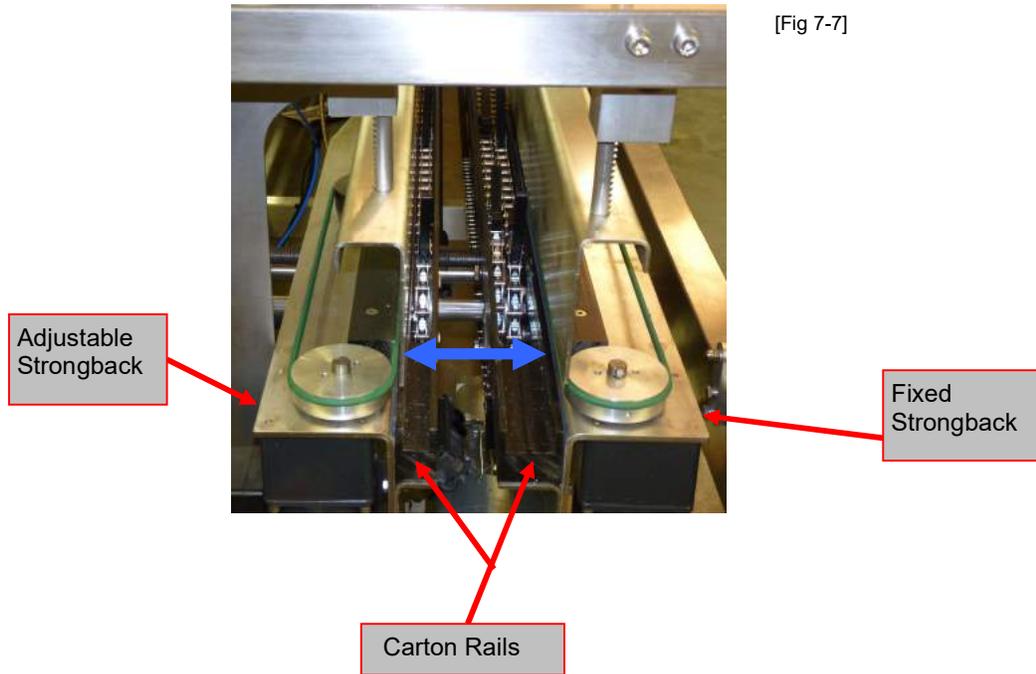
[Fig 7-6]



Adjustment shaft for Strongback adjustment

Turn hand-crank clockwise for deeper carton and counter clockwise for narrower carton.

Setting Strongback width to suit Carton Depth (cont'd)



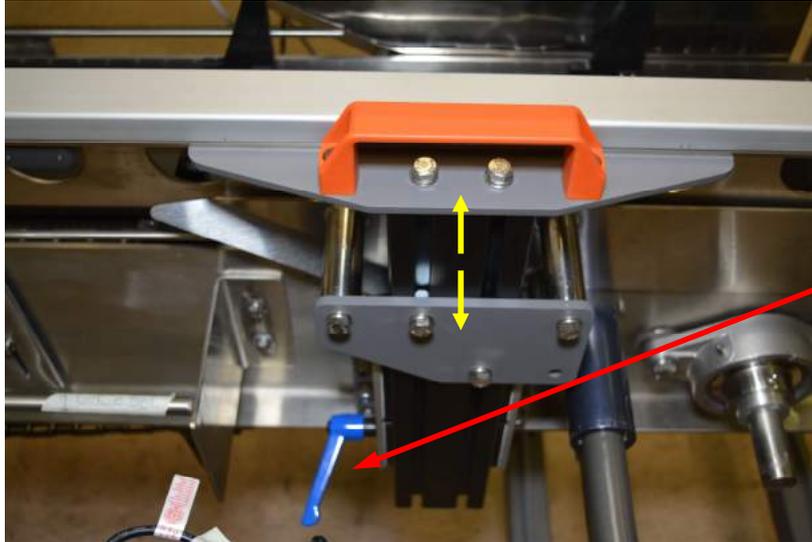
IMPORTANT: DO NOT continue to adjust the Strongback if resistance is felt! If they appear tight, they may be at the maximum distance, or there may be an obstruction. Conversely, they may be at the minimum setting and will not adjust further.

The carton should be set so that the lower major creaselines are lined up with the outside edge of the carton runners. See arrow  on Fig. 7-7.

Section 7 – Changeover and Adjustments

Overhead Guides and Rails

The overhead guides maintain control of the carton as it is conveyed through the machine. They should not be set too tightly as the carton will be marked or damaged.



[Fig 7-8]

Adjusting handle for overhead rail adjustment (Typical)

To Adjust

Undo the blue handle (shown) and hold the orange handle to take the weight of the overhead assembly. The overhead rail will now slide up or down to the correct adjustment position.

The clearance between the carton and the rail should be 1mm – 2mm Approx.

Compression Rail

The compression rails apply pressure to the closed carton flap which aids transfer of the adhesive to the carton surface. They also cool the adhesive, which speeds up the setting time.

The compression rails are normally factory set and do not need continual adjustment.

If adjustment is necessary, it can be achieved by adjusting the strong back as shown in (Fig. 7-6).

DO NOT set the compression rails too tightly as this will have an adverse affect on the squareness of the glued carton!



Section 9
PARTS ORDERING

Section 12 – Parts

Have the KEYMAC machine Model Number and Serial Number available.

When ordering manufactured components always specify:

- a) Brand name
- b) Part number

If this information is not available please specify where on the machine it is located i.e. left/right side looking downstream, or which sub-assembly the part is used in, i.e. feeder, hopper, loader etc.

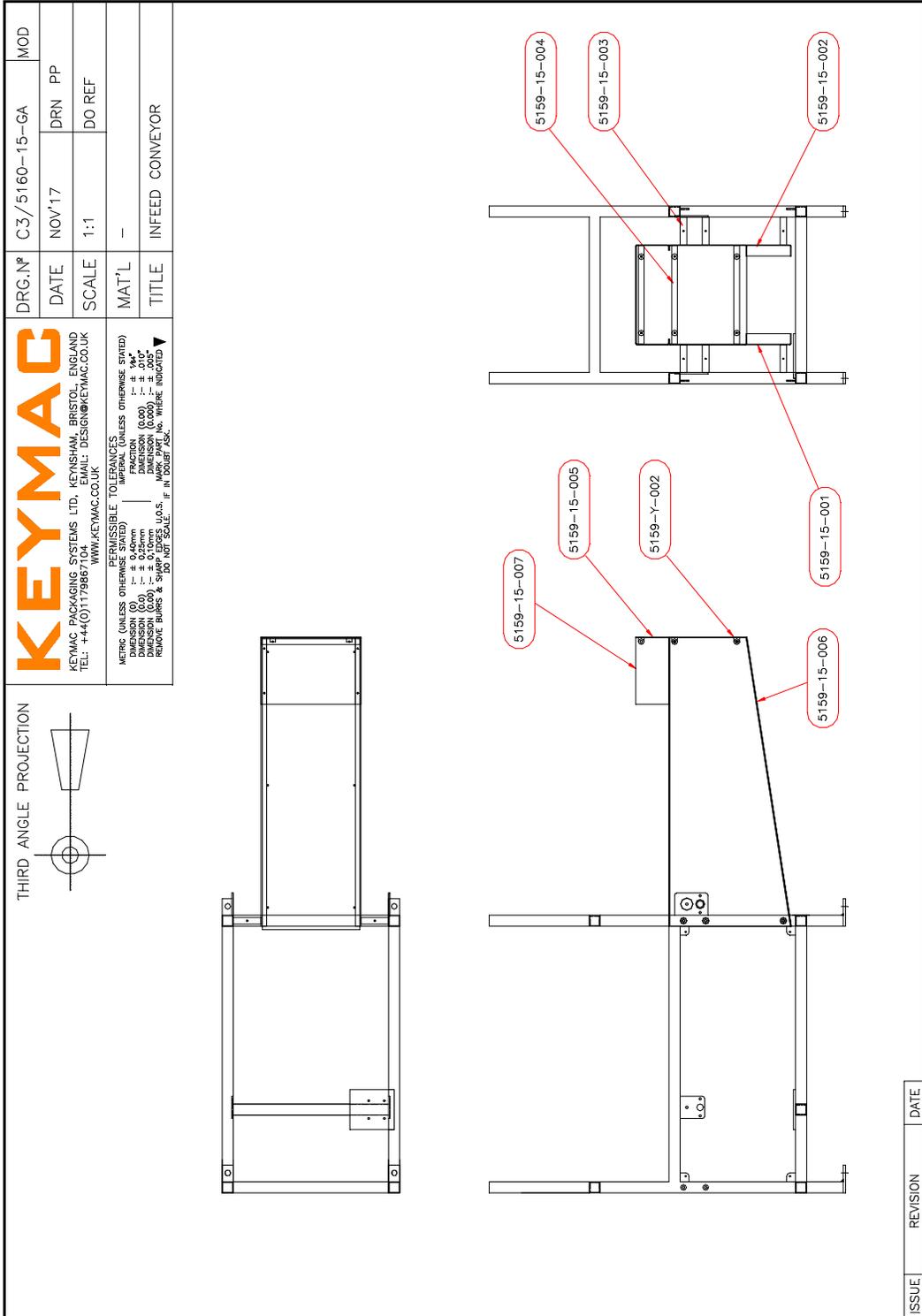
When ordering all other parts specify:

a. KEYMAC Part Number

- A part number maybe obtained by checking the actual part to be replaced for an inscribed number (older parts may not have a part number inscription)
- A part number maybe obtained by referring to the KEYMAC parts drawings sent with the machine.
- If drawings are not available and inscription of the number can not be read please specify where on the machine it is located i.e. left/right side looking downstream, or which sub-assembly the part is used in, i.e. feeder, hopper, loader etc
- When ordering shafts, please specify location, diameter and length required.
- When ordering sprockets/gears, please specify pitch between tooth centres, number of teeth and bore diameter.

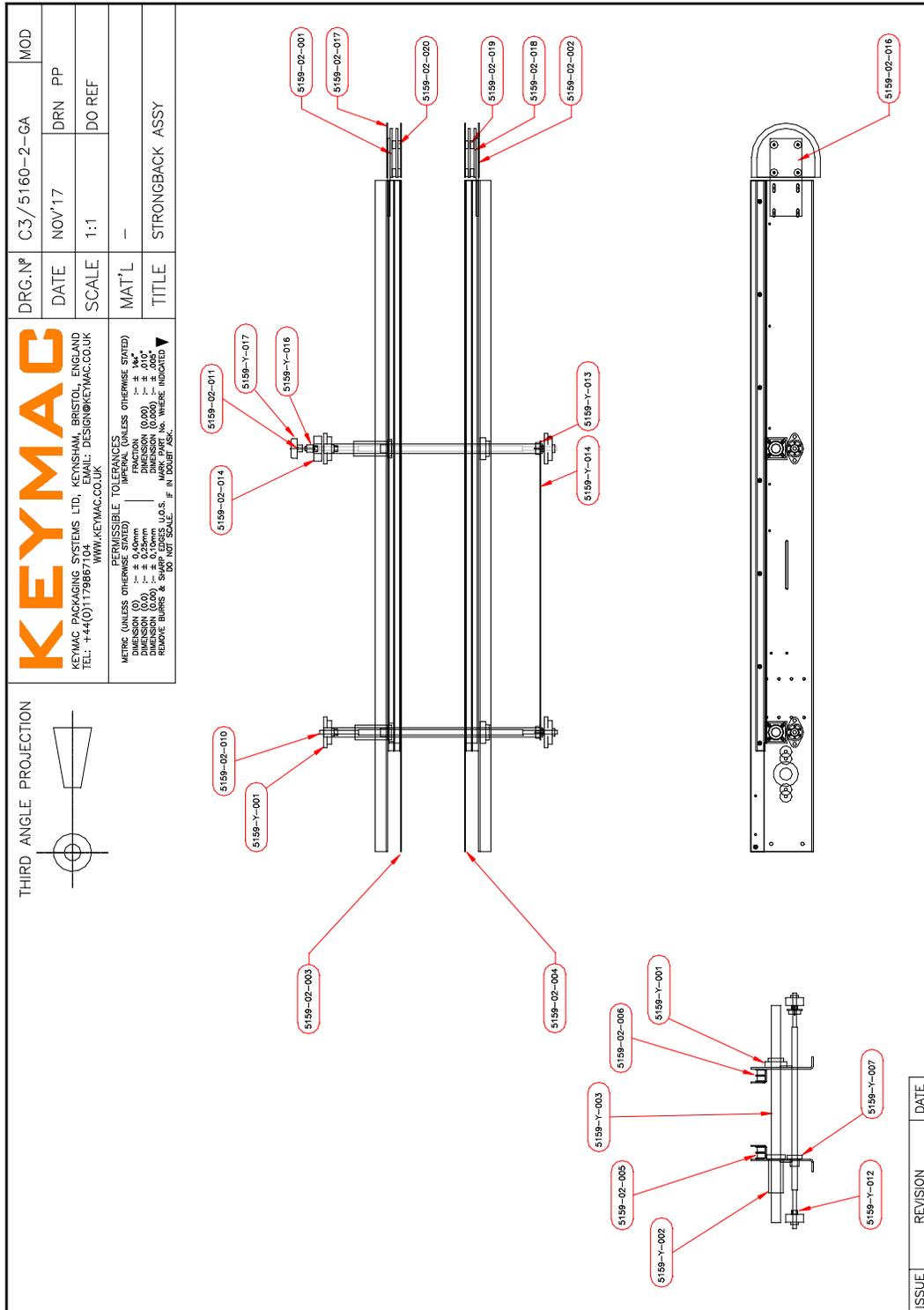


Section 10
Mechanical Drawings

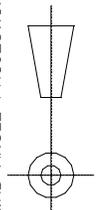


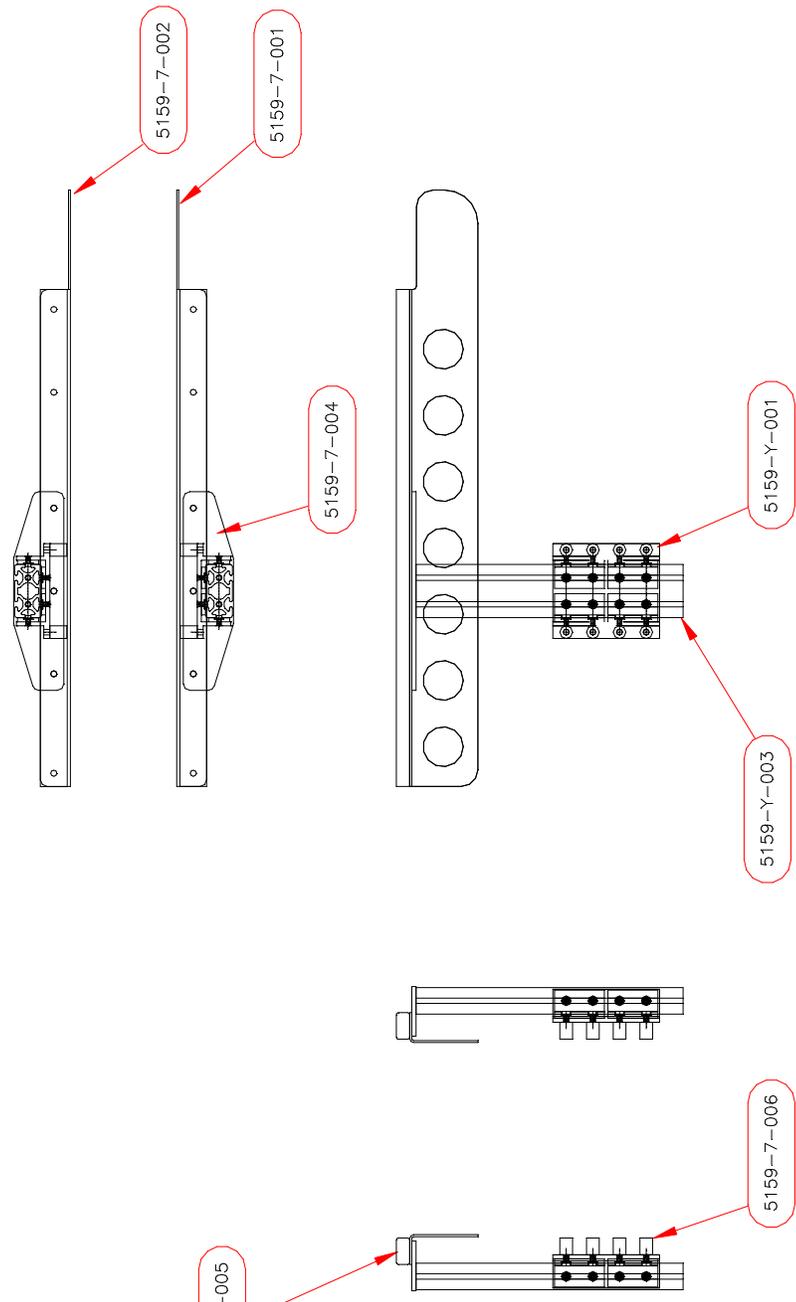
ISSUE	DATE

Section 10 – Mechanical Drawings



Section 10 – Mechanical Drawings

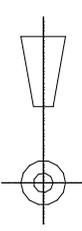
<p>THIRD ANGLE PROJECTION</p> 	 <p>KEYMAC KEYMAC PACKAGING SYSTEMS LTD, KEYNSHAM, BRISTOL, ENGLAND TEL: +44(0)1179867104 EMAIL: DES.GN@KEYMAC.CO.UK WWW.KEYMAC.CO.UK</p>		DRG.N ^o	C3/5160-7-GA	MOD
	DATE	NOV'17	DRN	PP	
	SCALE	1:1	DO REF		
	MAT'L	-			
<p>METRIC (UNLESS OTHERWISE STATED) DIMENSION (0.1) ... ± 0.40mm DIMENSION (0.01) ... ± 0.10mm DIMENSION (0.001) ... ± 0.025" REMOVE BURRS & SHARP EDGES U.O.S. IF IN QUOTE SIGN.</p>		<p>PERMISSIBLE TOLERANCES IMPERIAL (UNLESS OTHERWISE STATED) DIMENSION (0.001) ... ± 0.005" DIMENSION (0.0001) ... ± 0.001" DIMENSION (0.00001) ... ± 0.0025" REMOVE BURRS & SHARP EDGES U.O.S. IF IN QUOTE SIGN.</p>			
		TITLE OVERHEAD GUIDES			

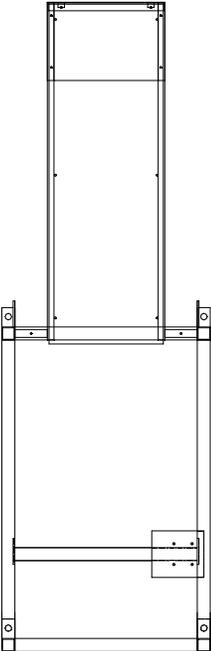


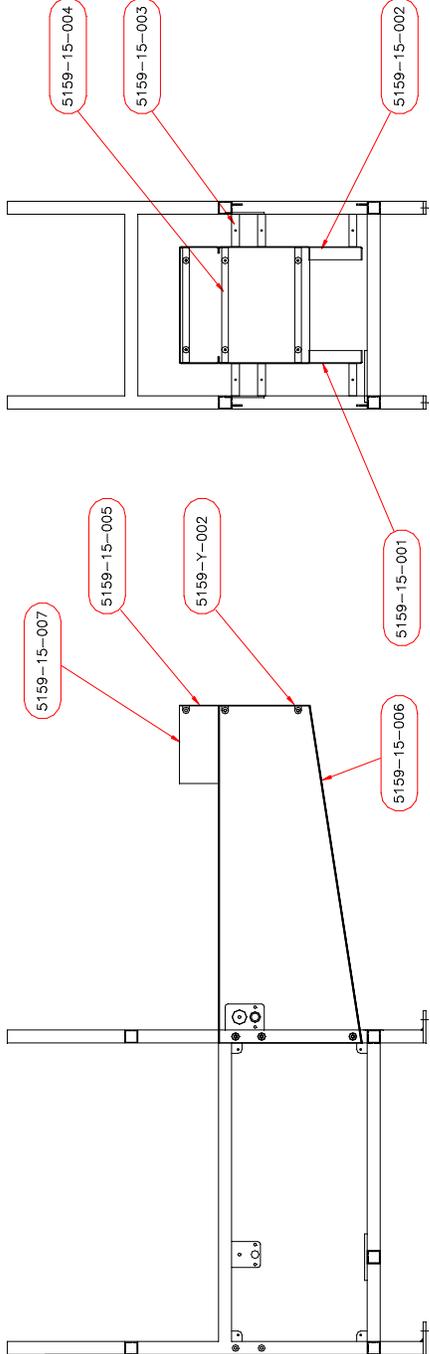
<p>THIRD ANGLE PROJECTION</p>			DRG.Nº	C3/5160-9-GA	MOD
	<p>KEYMAC PACKAGING SYSTEMS LTD, KEYNSHAM, BRISTOL, ENGLAND TEL: +44(0)1179867104, EMAIL: DESIGN@KEYMAC.CO.UK WWW.KEYMAC.CO.UK</p>		DATE	NOV'17	DRN PP
	<p>PERMISSIBLE TOLERANCES METRIC (UNLESS OTHERWISE STATED) DIMENSION (0) ± 0.40mm DIMENSION (0.00) ± 0.15mm REMOVE BURRS & SHARP EDGES U.C.S. IF NOT SPEC. IF IN PART ASSY.</p>		SCALE	1:1	DO REF
	<p>MATERIAL</p>		TITLE	—	OUTFEED ASSY

ISSUE	REVISION	DATE
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Section 10 – Mechanical Drawings

<p>THIRD ANGLE PROJECTION</p> 	 <p>KEYMAC PACKAGING SYSTEMS LTD, KEYNSHAM, BRISTOL, ENGLAND TEL: +44(0)1798671111 FAX: +44(0)1798671112 WWW.KEYMAC.CO.UK EMAIL: DESIGN@KEYMAC.CO.UK</p>	DRG.Nº	C3/5160-15-GA	MOD
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		MAT'L	-	
		TITLE	INFEED CONVEYOR	



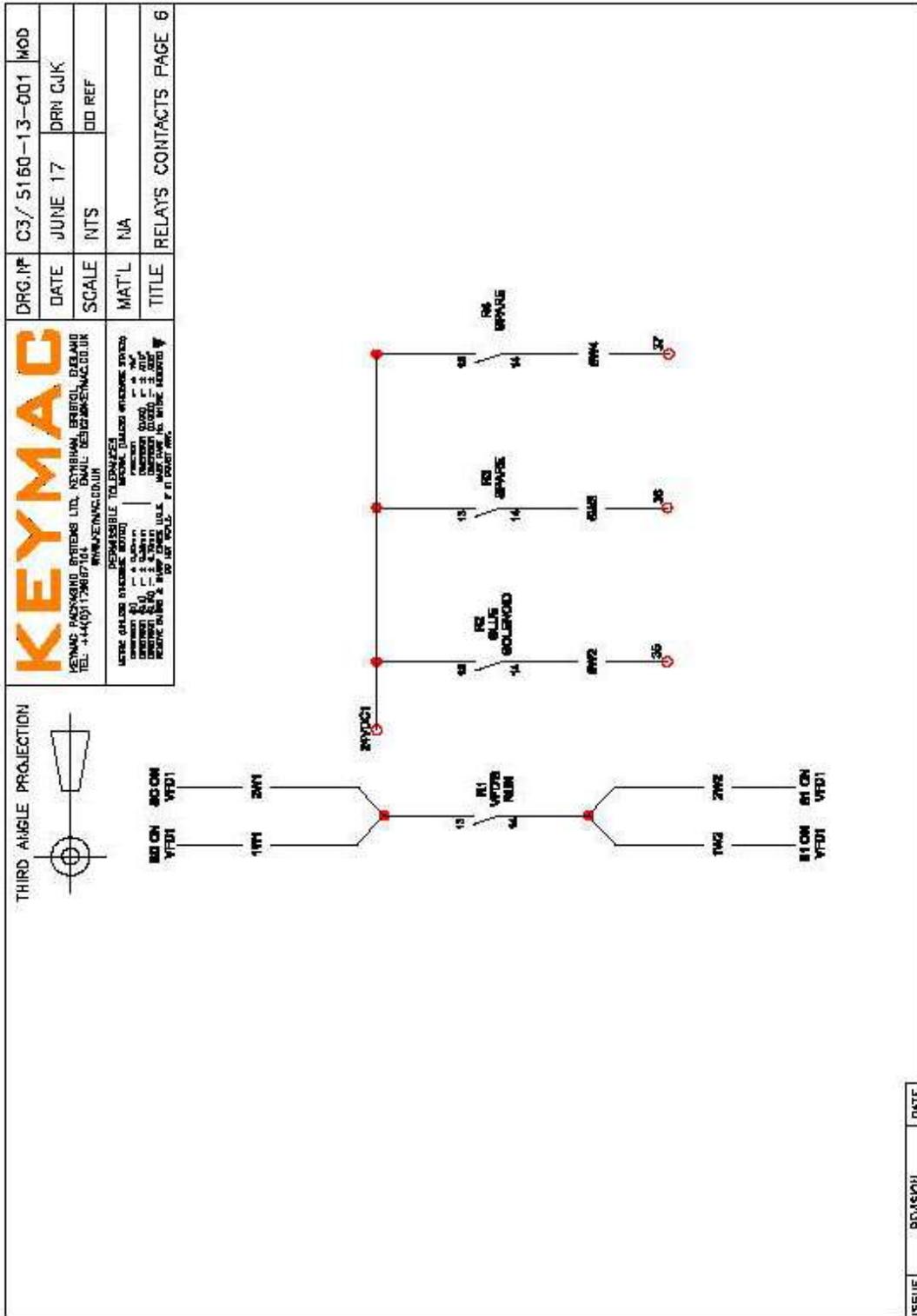


ISSUE	REVISION	DATE



Section 11

Electrical Schematics





Section 12

Parts List

Section 12 –Parts List

M/C TYPE: KCM1				ASSY TITLE CHASSIS FRAME																														
DRAWING SERIES		ASSEMBLY		MOD		DESCRIPTION OF PART		No PER ASSY		TOT ISS		REMARKS		MATERIAL		IN STOCK		QTY ORDER		UNIF PRICE		ORDER No.		QTY REC		TOTAL COST								
DRAWING SHEET No.	5159	1	2	PROJ. No.	01	DRAWING No.	MOD	DESCRIPTION OF PART	No PER ASSY	TOT ISS	REMARKS	MATERIAL	IN STOCK	QTY ORDER	UNIF PRICE	ORDER No.	QTY REC	TOTAL COST																
1	3	5159-01-001		MAIN FRAME		1	1				Cardinal-C2H-GR07 Qmnt.	MILD STEEL																						
2																																		
3		5160-01-003		FRAME RISER		4	4					UHMW																						
4																																		
5																																		
6																																		
7																																		
8																																		
9																																		
10																																		
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18																																		
19																																		
20																																		

Section 12 – Parts



M/C TYPE: KCM1				ASSY TITLE		KEYMAC PACKAGING SYSTEMS						
DRAWING SERIES SHEET		ASSEMBLY		CHASSIS FRAME								
5159		01										
2		2										
No.		No.										
ITEM No.	PART NUMBER	DESCRIPTION	No. OF Pcs	IN STOCK	QTY ORDER	UNIT PRICE	ORDER No.	QTY REC	TOTAL COST			
.001												
.002	MD100-24150	ARTICULATED FOOT WITH M24 ST. ST. SPINDLE	4									
.003		M24 PREC. HEX FULL NUT	8									
.004		M24 PLAIN WASHER	8									
.005												
.006												
.007												
.008												
.009												
.010												
.011												
.012												
.013												
.014												
.015												
.016												
.017												
.018												
.019												
.020												

Section 12 –Parts List

M/C TYPE: KCM1			ASSY TITLE		KEYMAC PACKAGING SYSTEMS									
DRAWING SERIES		ASSEMBLY		STRONGBACK ASSY										
SHEET	1	2	PROJ.	02										
No.	1	2	No.											
ITEM No.	DWG SIZE	DRAWING No.	M/D	DESCRIPTION OF PART	No PER ASSY	TOT ASS	REMARKS	MATERIAL	IN STOCK	QTY ORDER	UNIT PRICE	ORDER No.	QTY REC	TOTAL COST
1	3	5159-02-001/1		FIXED STRONGBACK	1	1		ST. ST.						
2	3	5159-02-002/1		ADJ STRONGBACK	1	1		ST. ST.						
3	3	5159-02-003		CARTON GUIDE	1	1		ST. ST.						
4	3	5159-02-004		CARTON GUIDE	1	1		ST. ST.						
5	3	5159-02-005		CHAIN GUIDE THICK	4	4		UHMW						
6	3	5159-02-006		CHAIN GUIDE THIN	6	6		UHMW						
7	3	5159-02-007		END SPACER	1	1		UHMW						
8	3													
9	3													
10	3	5159-02-010	A	LEADSCREW 560	1	1		BO						
11	3	5159-02-011	A	LEADSCREW 625	1	1		BO						
12	3	5159-02-012		SPACER	4	4		UHMW						
13	3													
14	3	5159-02-014		INDICATOR MOUNT	1	1		ALUM						
15	3													
16	3	5159-02-016		IDLER MOUNT	2	2		ALUM						
17	3	5159-02-017		OUTSIDE GUIDE	4	4		UHMW						
18	3	5159-02-018		INSIDE GUIDE	4	4		UHMW						
19	3	5159-02-019		MIDDLE SPACER	8	8		UHMW						
20	3	5159-02020		SIDE SPACER	8	8		UHMW						

Section 12 – Parts



M/C TYPE: KCM1				ASSY TITLE											
DRAWING SERIES		5159		ASSEMBLY		02		STRONGBACK ASSY						KEYMAC PACKAGING SYSTEMS	
SHEET No.		2 of 2		PROJ. No.											
ITEM No.	PART NUMBER	DESCRIPTION	No. REPR	TOF SS	IN STOCK	QTY ORDER	UNIT PRICE	ORDER No.	QTY REC	TOTAL COST					
.001	WAF-30	FLANGED SHAFT END BLOCK	2												
.002	FJUMT-02-30	SQUARE FLANGE, TWIN PILLOW BLOCK – IGLIDE J LINER	2												
.003	AWMPV-30	30mm DIA PRECISION SHAFT – SOLID 700mm LONG	2												
.004															
.005															
.006	EFSM-12	FLANGE BEARING 4 HOLE	4												
.007	JFRM2835TR18x4	LEAD SCREW DRIVE NUT	2												
.008	PTGGG18x401RES	TRAPEZOIDAL LEAD SCREW 560mm LONG	1												
.009	PTGGG18x401RES	TRAPEZOIDAL LEAD SCREW 625mm LONG	1												
.010															
.011															
.012	5748K69	SET SCREW COLLAR 12mm BORE	6												
.013	ASA 25 24 B	24 TOOTH ANSI 25 SPROCKET BORE 12mm WITH 4mm KEY	2												
.014	ASA 25	ANSI 25 CHAIN 10 FT (.78" FOR MACHINE)	1												
.015															
.016	DD5G-AN-04 0-D-C2	DIGITAL INDICATOR 10 mm BORE (C.E.80233)	2												
.017	VCT-63 B M10 C2	LOBE KNOB	2												
.018															
.019															
.020															

Section 12 –Parts List

M/C TYPE: KCM1			ASSY TITLE		KEYMAC PACKAGING SYSTEMS									
DRAWING SERIES SHEET No.	5159	ASSEMBLY	FLIGHT DRIVE 4 CHAIN											
1 OF 2	2	PROJ. No.												
03														
ITEM No.	DRG SIZE	DRAWING No	M/OD	DESCRIPTION OF PART	No PER ASSY	TOT ES	REMARKS	MATERIAL	IN STOCK	QTY ORDER	UNIT PRICE	ORDER No.	QTY REC.	TOTAL COST
1	3	5117-03-001		DRIVE SHAFT	1	1		ST-ST.						
2	3	7225-03-002	C	FIXED HUB	1	1		ALUM						
3	3	5159-03-003		ADJUSTABLE HUB	1	1		ALUM						
4	3	5117-03-004		HUB CLAMP	2	2		CRS / BMS						
5	3													
6	3	7225-03-006		DRIVE SPROCKET	2	2		BO						
7	3	7225-03-007		LUG PIN	120	120		ST-ST.						
8	3													
9	3													
10	3	7225-03-010	B	PUSHER FLIGHT	30	30		PE BLK						
11	3	7225-03-011	B	LEADING FLIGHT	30	30		PE BLK						
12	3													
13	3													
14	3													
15	3	5040-03-015		PLATEWHEEL	2	2		BO						
16	3													
17	3													
18	3													
19	3													
20	3													

Section 12 – Parts

M/C TYPE: KCM1			ASSY TITLE		KEYMAC PACKAGING SYSTEMS				
DRAWING SERIES SHEET	5159	ASSEMBLY	FLIGHT DRIVE 4 CHAIN						
No.	2	2	PROJ.	0.3					
	OF	PROJ.	No.						
ITEM No.	PART NUMBER	DESCRIPTION	No. OF PERS.	IN STOCK	QTY ORDER	UNIT PRICE	ORDER No.	QTY REC	TOTAL COST
.001		CHAIN LENGTH 180" W/ 15 M2 ATTACHMENTS (BOTH SIDES) W/ 3/8" PINS + RETAINING CLIP (A2040-SK2-9-32) outer pin link reqd for sk2	4						
.002	PLW-A2040-48T	1/2" P x 48T ASA PLATEWHEEL (MAKES 7225-03-006)	1						
.003		1/2" P x 48T ASA PLATEWHEEL, BORE 110mm (PLW-A2040-48T)	2						
.004									
.005									
.006		2 BOLT 99 CTR FLANGE BEARING 25 BORE (UCFL 205 C) ST. ST.	1						
.007		2 BOLT 144 CTR FLANGE BEARING 40 BORE (UCFL 208 C) ST. ST.	1						
.008									
.009	OH SPUR	SPANN BOX TENSIONER (SIZE 0) ANSI #40 CHAIN	4						
.010									
.011		25mm DIA GROUND ST. ST. SHAFT 500mm LG w/ 8 mm KEYWAY, FULL LG	1						
.012									
.013									
.014									
.015									
.016									
.017									
.018									
.019									
.020									

Section 12 –Parts List

M/C TYPE: KCM1		ASSEMBLY		PROJECT		NO.		MOD		ASSY TITLE									
DRAWING SERIES		5159		07						OVERHEAD GUIDES									
SHEET		1		2		PROJ.		No.											
No.		1		2		No.													
ITEM No.	DRG SIZE	DRAWING No.	MOD	DESCRIPTION OF PART	No. PBR ASSY	TOT ESS	REMARKS	MATERIAL	IN STOCK	QTY ORDER	UNIT PRICE	ORDER No.	QTY REC	TOTAL COST					
1	3	5159-7-001		OVERHEAD GUIDE	1	1		ST ST.											
2	3	5159-7-002		OVERHEAD GUIDE	1	1		ST ST.											
3	3																		
4	3	5159-7-004		MOUNT PLATE	2	2		BMS / CRS											
5	3																		
6	3	5159-7-006		CARRIAGE SPACER	16	16		ACETAL											
7	3																		
8	3																		
9	3																		
10	3																		
11	3																		
12	3																		
13	3																		
14	3																		
15	3																		
16	3																		
17	3																		
18	3																		
19	3																		
20	3																		

Section 12 – Parts



M/C TYPE: KCM1			ASSY TITLE		KEYMAC PACKAGING SYSTEMS									
DRAWING SERIES		ASSEMBLY		OVERHEAD GUIDES										
5149		07												
SHEET		PROJ.												
2		2												
OF		NO												
No		No												
ITEM No	PART NUMBER	DESCRIPTION			NO OF PERS	IN STOCK	QTY ORDER	UNIT PRICE	ORDER No.	QTY REC	TOTAL COST			
001	40-6534-BLACK	DOUBLE FLANGE LINEAR BEARING			2									
002	40-6805	LOCK HANDLE BLUE			2									
003	40-4080 BLACK FB	T SLOTTED PROFILE 400mm LONG			2									
004														
005	40-4020-BLACK FB	T SLOTTED PROFILE 750mm LONG			2									
006	13065	M6 T NUTS			10									
007	13066	M8 T NUTS			10									
008														
009														
010														
011														
012														
013														
014														
015														
016														
017														
018														
019														
020														

Section 12 –Parts List

MIC TYPE: KCC CLOSER				ASSY TITLE OUTFEED																									
DRAWING SERIES		ASSEMBLY		DRAWING No.		MCD		DESCRIPTION OF PART		No. PBR ASSY		REMARKS		MATERIAL		IN STOCK		QTY. ORDER		UNIT PRICE		ORDER No.		QTY REC.		TOTAL COST			
ITEM No.	DRG SIZE	1 OF 2	PROJ. No.	5160	9	5160-09-001/1		OUTFEED BODY	2	2	1 PCE/A HAND	STST																	
1	3			5160-09-001/1		OUTFEED BODY			2	2	1 PCE/A HAND	STST																	
2	3			5160-09-002		MOUNT SPACER			6	6		STST																	
3	3			5160-09-003		DRIVE PULLEY			2	2		ALUM																	
4	3			5160-09-004		IDLER PULLEY			2	2		UHMW																	
5	3			5160-09-005		IDLER PULLEY PIN			2	2		ST. ST.																	
6				5160-09-006		IDLER PULLER SPACER			2	2		UHMW																	
7				5160-09-007		CARTON GUIDES			2	2		ST. ST.																	
8				5160-09-008		CARTON GUIDE SPACER			6	6		ALUM																	
9				5160-09-009		BELT GUIDE			2	2		UHMW																	
10																													
11																													
12																													
13																													
14																													
15																													
16																													
17																													
18																													
19																													
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Section 12 – Parts



M/C TYPE: KCM1			ASSY TITLE		KEYMAC PACKAGING SYSTEMS									
DRAWING SERIES		ASSEMBLY		CHASSIS FRAME										
SHEET		PRQJ												
No.		No.												
2		5160												
OF		No.												
2		5160												
ITEM No	PART NUMBER	DESCRIPTION			NO. OF ISS	IN STOCK	QTY ORDER	UNIT PRICE	ORDER No.	QTY REC	TOTAL COST			
001														
002	5IK100VEST 3-30	100 W (1/8 HP) Induction Gear Motor (30:1 Gear Ratio, Three-Phase 220/230 VAC)			2									
003														
004														
005														
006														
007														
008														
009														
010														
011														
012														
013														
014														
015														
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Section 12 –Parts List

M/C TYPE: KCM1			ASSY TITLE				KEYMAC PACKAGING SYSTEMS								
DRAWING SERIES SHEET No.	5160	ASSEMBLY	10	DRAWING No.	DESCRIPTION OF PART	No. PER ASSY	TOT ESS	REMARKS	MATERIAL	IN STOCK	QTY ORDER	UNIT PRICE	ORDER No.	QTY REC	TOTAL COST
1	2	PROJ. No.													
ITEM No.	DWG SIZE	DRAWING No.	MOD												
1	3	5160-10-001			GUARD DOORS 560 x 800 x 100hk	4	4		POLY CARB						
2	3	5160-10-002			TUNNEL GUARDS	1	1		POLY CARB						
3	3	5160-10-003			TUNNEL GUARD MOUNT	2	2		BMS / CRS						
4	3														
5	3														
6	3														
7	3														
8	3														
9	3														
10	3														
11	3														
12	3														
13	3														
14	3														
15	3														
16	3														
17	3														
18	3														
19	3														
20	3														

Section 12 – Parts



M/C TYPE: KCM1			ASSY TITLE		KEYMAC PACKAGING SYSTEMS									
DRAWING SERIES	ASSEMBLY	10	GUARDS											
SHEET No.	2	2	PROJ. No.											
ITEM No.	PART NUMBER	DESCRIPTION	No. PER ASSY	TOT. ESS	IN STOCK	QTY ORDER	UNIT PRICE	ORDER No.	QTY REC	TOTAL COST				
001														
002														
003	37152	HANDLE M.443/150-CH	4											
004	257 8662	DOOR STOP BUFFER	4											
005	N3218	HINGES ALUM BLACK	8											
006														
007														
008														
009														
010	1130 mm X 500 mm	BLACK EXTRUDED ABS SHEET 1/4" THICK	2											
011														
012														
013														
014														
015														
016														
017														
018														
019														
020														

Section 12 –Parts List

MIC TYPE: KCM1				KEYMAC PACKAGING SYSTEMS									
DRAWING SERIES		ASSEMBLY		ASSY TITLE									
5160		11		MAIN DRIVE									
SHEET No.		PROJ. No.											
2		5160											
ITEM No.	PART NUMBER	DESCRIPTION			QTY. IN STOCK	QTY. ORDER	UNIT PRICE	ORDER No.	QTY. REC.	TOTAL COST			
001	MTR-P50-3BD18	standard performance AC induction motor, general purpose, 1/2hp, 3-phase, 208-230/460 VAC, 1800 rpm, TEFC, 56C frame, roled steel, rigid base/C-face mount.			1								
002	WGA-50M-040-H1	medium-duty worm gearbox, 40:1 ratio, 56C-Face input, hollow, 1in diameter output shaft, nominal 0.75hp at 1.0 SF, 684lb/in mechanical output torque, 50mm center distance, cast aluminum housing, top and bottom mount.			1								
003	WGA-50M-ACC3	single output shaft, for use with aluminum WGA-50M series gearboxes. (3) keys, (1) spacer and (1) retaining ring included			1								
004	40824	24 TOOTH SPROCKET ANSI 40 CHAIN			2								
005													
006													
007													
008													
009													
010													
011													
012													
013													
014													
015													
016													
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Section 12 – Parts

MIC TYPE: KCM1			ASSY TITLE		KEYMAC PACKAGING SYSTEMS						
DRAWING SERIES	5160	ASSEMBLY	13		ELECTRICS						
SHEET No.	2	OF	2	PROJ. No.	5160						
ITEM No.	PART NUMBER	DESCRIPTION	QTY REC	IN STOCK	UNIT PRICE	ORDER No.	TOT LSS	QTY ORDER	TOTAL COST		
001	FAZ-D7-1-NA-SP	7A D CURVE 1 POLE CIRCUIT BREAKER	1								
002	LG5925-48-61-24	Dod safety relay, emergency stop and safety gates, 2-channel, 24 VAC/VDC, (3) N.O. safety contacts, (1) N.C. monitoring	1								
003	GCX1131	Pushbutton, 22mm, twist-to-release, emergency stop, 1 N.C. contact(s), metal base, metal bezel, Operator: red, mushroom, 40mm, round, plastic	1								
004	RS4N-DE	Card relay, in-socket mount, 24 VDC, 200mW coil voltage, SPST, 5A contact rating, (4) relays, TY3 relay remover and (2) jumpers included.	1								
005	FAL-S-BP-1E	Photoelectric laser sensor, diffuse with background suppression, 18mm diameter, Class 1 laser/light emission, 30-100mm sensing distance, 10-30 VDC operating voltage, PNP, 4-pin M12 quick-disconnect.	2								
006	DN-Q12-A	DINector single-level screwless terminal block, accepts wire size 24-12 AWG, gray, 20A, 600V rated (UL), 35mm DIN rail mount. Package of 50.	1								
007	GCX1204-24L	Pushbutton, 22mm, momentary, LED illuminated, 1 N.O. contact(s), metal base, metal bezel, plastic ring, Operator: blue, flush, 30mm, round, plastic, 24V.	1								
008	FAZ-D2-3-NA	Eaton miniature circuit breaker, current-limiting, 2A, 480Y/277 VAC/96 VDC, 3-pole, D curve, thermal magnetic, 10kA SOCR, 35mm DIN rail mount.	1								
009	FAZ-D1-3-NA	Eaton miniature circuit breaker, current-limiting, 1A, 480Y/277 VAC/96 VDC, 3-pole, D curve, thermal magnetic, 10kA SOCR, 35mm DIN rail mount.	1								
010	FAZ-D3-2-NA	Eaton miniature circuit breaker, current-limiting, 3A, 480Y/277 VAC/96 VDC, 2-pole, D curve, thermal magnetic, 10kA SOCR, 35mm DIN rail mount.	1								
011	FAZ-D6-2-NA	Eaton miniature circuit breaker, current-limiting, 6A, 480Y/277 VAC/96 VDC, 2-pole, D curve, thermal magnetic, 10kA SOCR, 35mm DIN rail mount.	1								
012	PSB24-120S-3	RHINO switching power supply, 24 VDC (adjustable) output, 5A, 120W, 480 VAC nominal input, 3-phase, aluminum housing, IP20, 35mm DIN rail mount.	1								
013	GCX1101	Pushbutton, 22mm, momentary, 1 N.C. contact(s), metal base, metal bezel, Operator: red, flush, 30mm, round, plastic.	1								
014	GCX1103	Pushbutton, 22mm, momentary, 1 N.O. contact(s), metal base, metal bezel, Operator: yellow, flush, 30mm, round, plastic.	1								
015	GCX1122	Pushbutton, 22mm, momentary, 1 N.O. contact(s), metal base, metal bezel, Operator: green, flush, 40mm, round, plastic.	1								
016	ECX2300-10K	Potentiometer, 10k ohm, 22mm, black. Legend plate ECX26-40 purchased separately.	2								
017	BMS3RHB-001	Fuji Electric manual motor starter relay actuator, thermal, adjustable FLA range 0.63 to 1A, 13A instantaneous trip rating, 45mm frame.	2								
018											
019											

Section 12 –Parts List

MIC TYPE: KCM1				KEYMAC PACKAGING SYSTEMS				ASSY TITLE			
DRAWING SERIES		ASSEMBLY		ELECTRICS							
5160		13									
SHEET		PROJ.									
3		No. 5160									
No.		No.									
ITEM No.	PART NUMBER	DESCRIPTION	NO. REORDER	TOT ISS	IN STOCK	QTY ORDER	UNIT PRICE	ORDER No.	QTY REC	TOTAL COST	
001	BMSRHB-010	Fuji Electric manual motor starter, rotary actuator, thermal, adjustable FLA range 6.3 to 10A, 130A instantaneous trip rating, .45mm frame.	1								
002	BZ0VYRL	Fuji Electric handle, rotary, red/yellow, external front mount, de-feratible, lockable. For use with BM30H series MMS.	1								
003	2080-LC30-240BB	Micro830 Controller, 14-24V DC/V AC input, 10-24V DC Source Output Controller	1								
004	CIMR-VU4A001FAA	1/2 HP V1000 480V 3 PHASE INPUT VFD	1								
005	CIMR-VUBA002FAA	1/4 HP V1000 240V SINGLE PHASE VFD	1								
006											
007											
008											
009											
010											
011											
012											
013											
014											
015											
016											
017											
018											
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020											

Section 12 – Parts



M/C TYPE: KCM1				ASSY TITLE										
DRAWING SERIES		ASSEMBLY		INFEED CONVEYOR										
5159		15												
SHEET No.		PROJ. No.												
1		2												
OF		No.												
ITEM SIZE	DRG SIZE	DRAWING No.	M.O.	DESCRIPTION OF PART	No. PER ASSY	TOT SS	REMARKS	MATERIAL	IN STOCK	QTY ORDER	UNIT PRICE	ORDER No.	QTY REC	TOTAL COST
1	3	5159-15-001		SIDE CHANNEL	1	1	Central - Coat - on 07 Orange- and	MILD STEEL						
2	3	5159-15-002		SIDE CHANNEL	1	1	Central - Coat - on 07 Orange- and	MILD STEEL						
3	3	5159-15-003		FRAME MOUNT BAR	6	6	Central - Coat - on 07 Orange- and	MILD STEEL						
4	3	5159-15-004		END MOUNT BAR	3	3		ALUM						
5	3													
6	3													
7	3													
8	3													
9	3													
10	3													
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														

Section 12 –Parts List

M/C TYPE: KCM1			ASSY TITLE				KEYMAC PACKAGING SYSTEMS							
DRAWING SERIES	5160	ASSEMBLY	17											
SHEET No.	1	2	PROJ. No.											
ITEM SIZE	DRG SIZE	DRAWING No.	MOO	DESCRIPTION OF PART	No. PER ASSY	TOT ISS	REMARKS	MATERIAL	IN STOCK	QTY ORDER	UNIT PRICE	ORDER No.	QTY REC	TOTAL COST
1	3	5160-17-001		GLUE MOUNTS	2			BMS						
2	3													
3	3													
4	3	5159-17-001		GLUE GUN MOUNT LH	1			ST.ST.						
5	3	5159-17-002		GLUE GUN MOUNT RH	1			ST.ST.						
6	3	5159-17-003		GLUE TANK MOUNT BRACKET	2			BMS/CRS						
7	3													
8	3													
9	3													
10	3													
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														