

**KNOWLEDGE BASE**

Article Type: Instructions

1224 Splitter Quick Reference Guide, Standard & Encoder, with QBC-Quick Blade Change

Description:

Instructions on “How to” 1224 Splitter Quick Reference Guide #388.2.1B for Standard and Encoder style splitters using “AB” Allen Bradley PLC’s. Blade alignment and removal, switch layout, hydraulic pump and valve layout information, panel information, overall view, and flow chart. Also, using Quick Blade Change.

WARNING

Never work on, clean or service this unit, control panel or any machine or open or remove any protective cover, guard, grate, door, or maintenance panel until the power or energy sources has been turned off, locked out / tagged out, and all moving parts have come to a complete stop and or blocked to prevent movement. Machinery is dangerous – avoid personal injury and or death by following manufacture, Local, and OHSA safety procedures. Contact Columbia Machine for safety decals, guards, horns and beacons.

QUICK REFERENCE GUIDE

MODEL 1224 BLOCK SPLITTERS STANDARD AND WITH ENCODER

Columbia Machine, Inc., a manufacturer of selected concrete products marking equipment, have incorporated built-in factors to be in accordance with acceptable standards indicated by the Occupational Safety and Health Act (OSHA). Columbia complies in general to these standards, however, Columbia declines responsibility in every instance due to the fact that OSHA applies to location; use and operation conditions are interpreted by individual OSHA affiliated state agencies.

This document is intended to be a quick reference guide only. It is to be regarded as a supplement to, not a replacement for, the information contained in the specific instruction manual for your Columbia equipment, please contact Columbia immediately. In addition, all affected operators and authorized maintenance personnel are required to totally familiarize themselves with the many cautions, warnings, guarding devices and other instructional decals, labels and located on the machine as well as related lockout-tagout procedures.

Columbia Machine, Inc.

107 Grand Blvd.

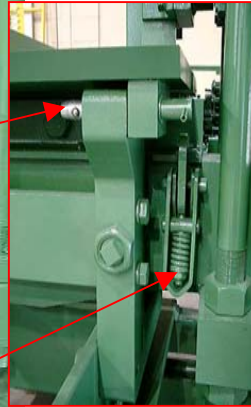
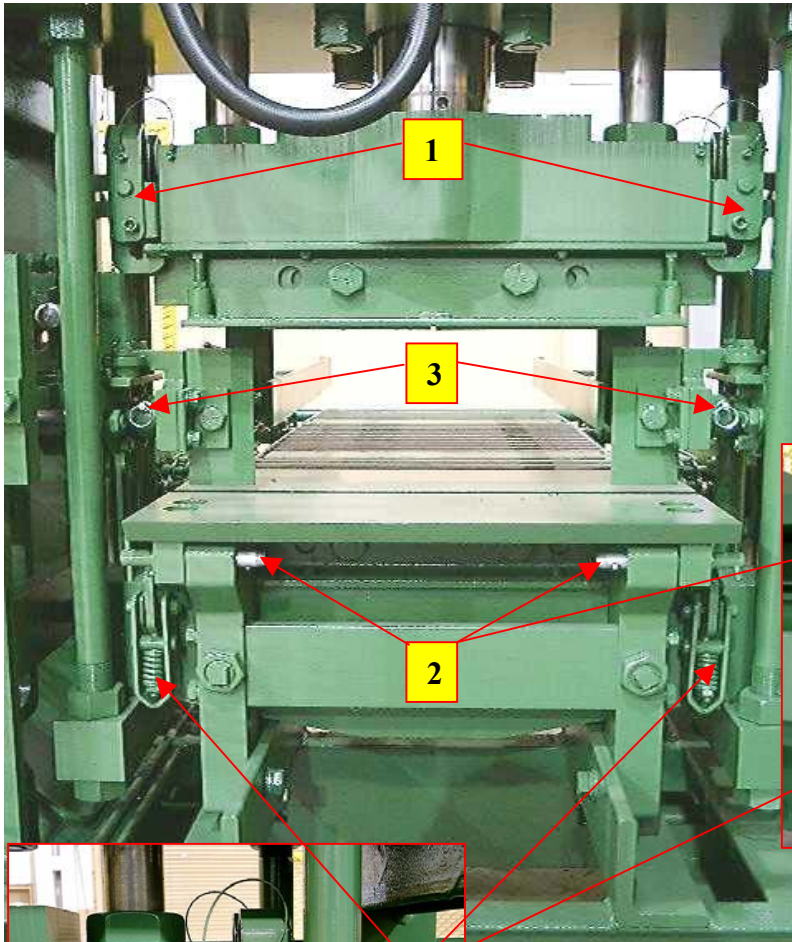
Vancouver, WA 98661

(360) 694-1501

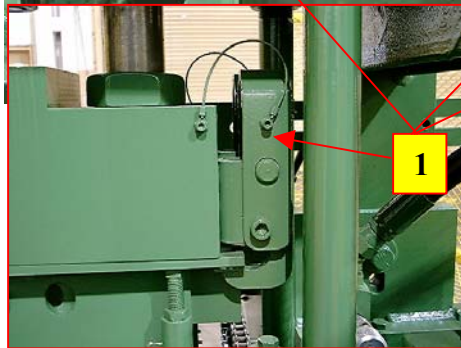
388.2.1B

Columbia

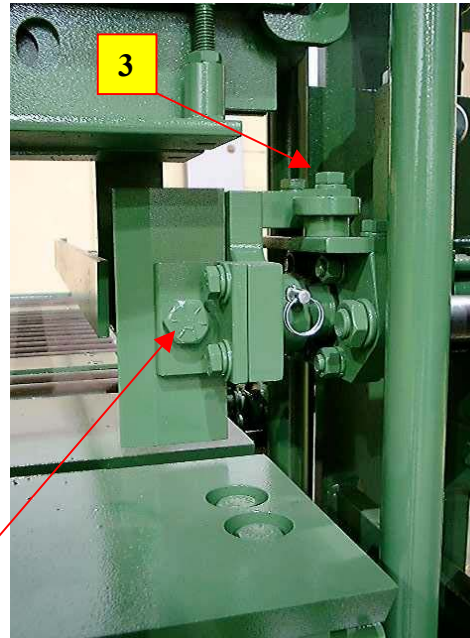
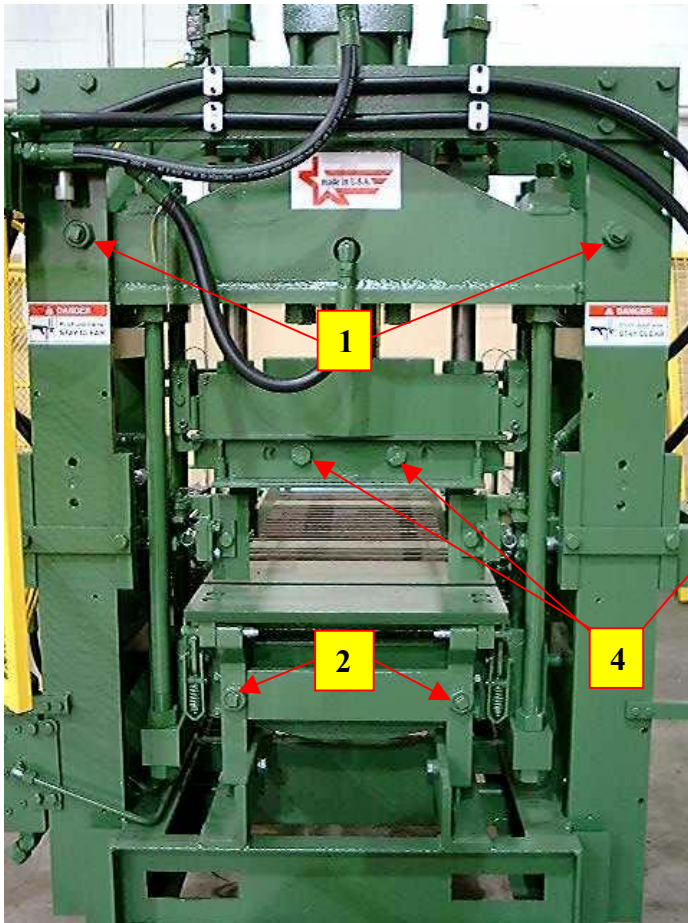
SPLITTER BLADE REMOVAL AND REPLACEMENT



**RELEASE AND
CRANK TOOLS**

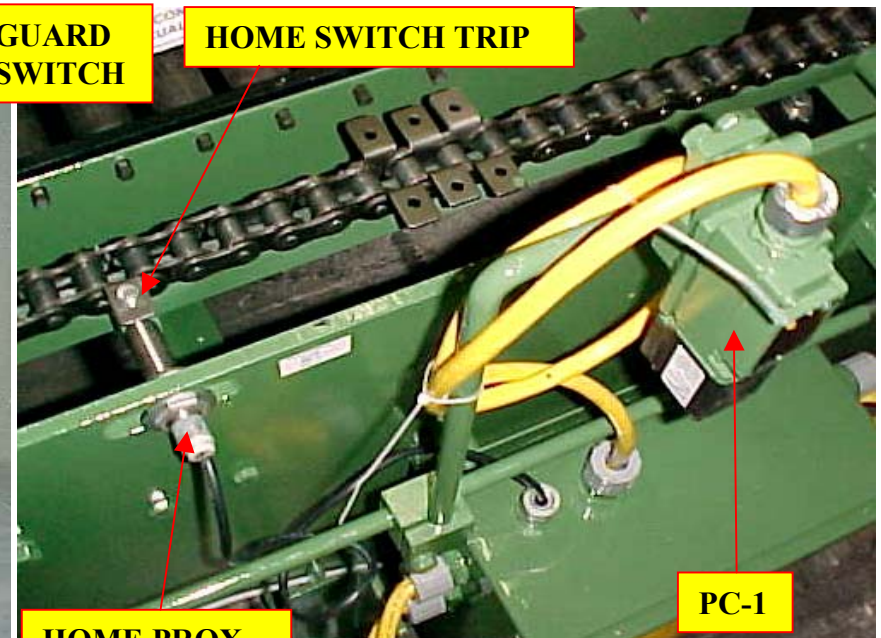
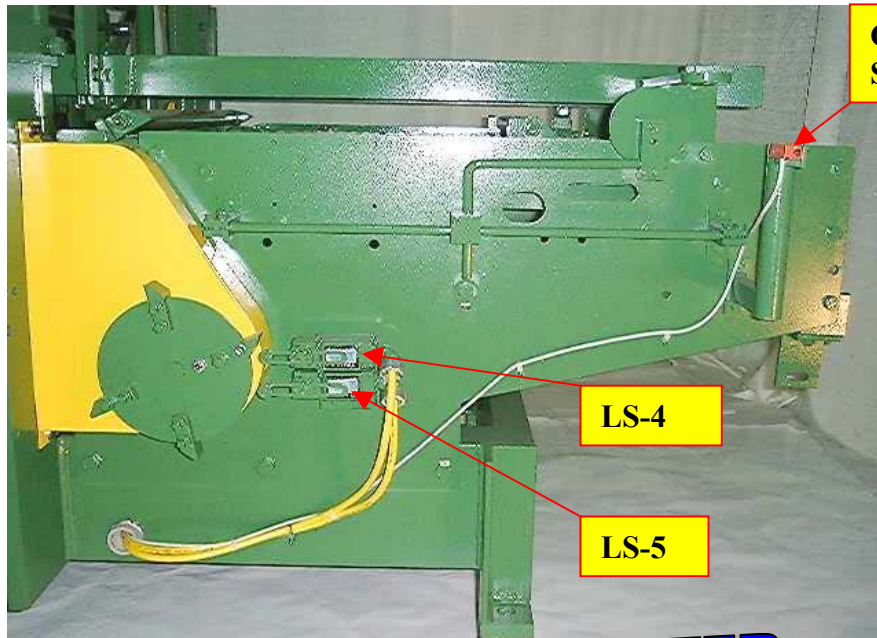


1. These spring loaded blade retainer clamps hold top and bottom blades in place. Always use a block of wood to support top blade when removing it.
2. Removing these pins will allow removal of table top, exposing bottom blade.
3. Remove these pins to detach the side knife blade assemblies.



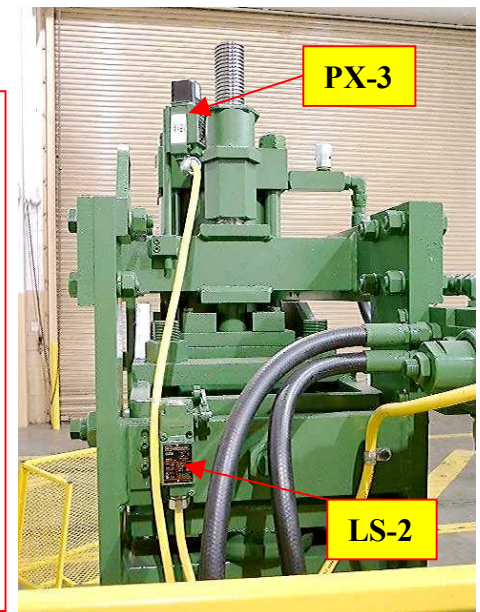
BLADE ALIGNMENT

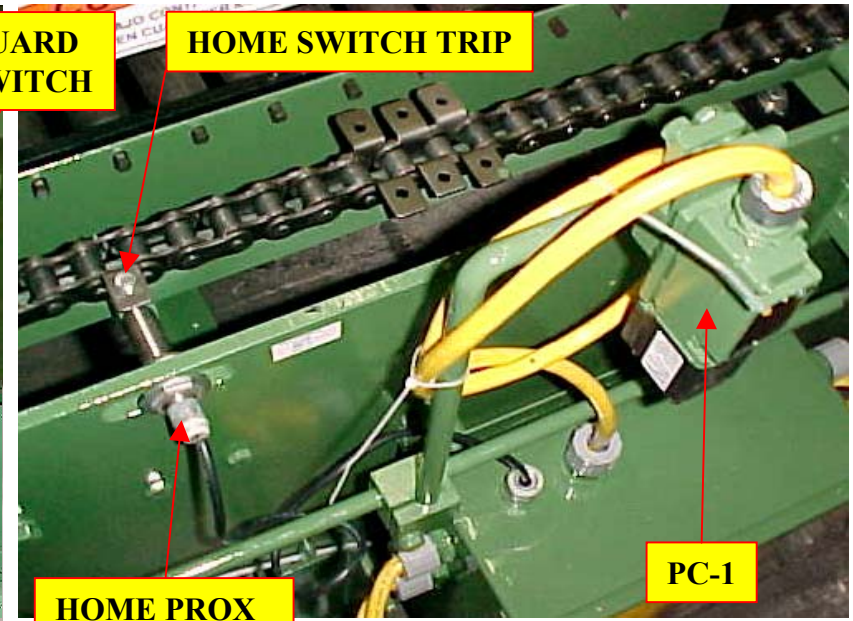
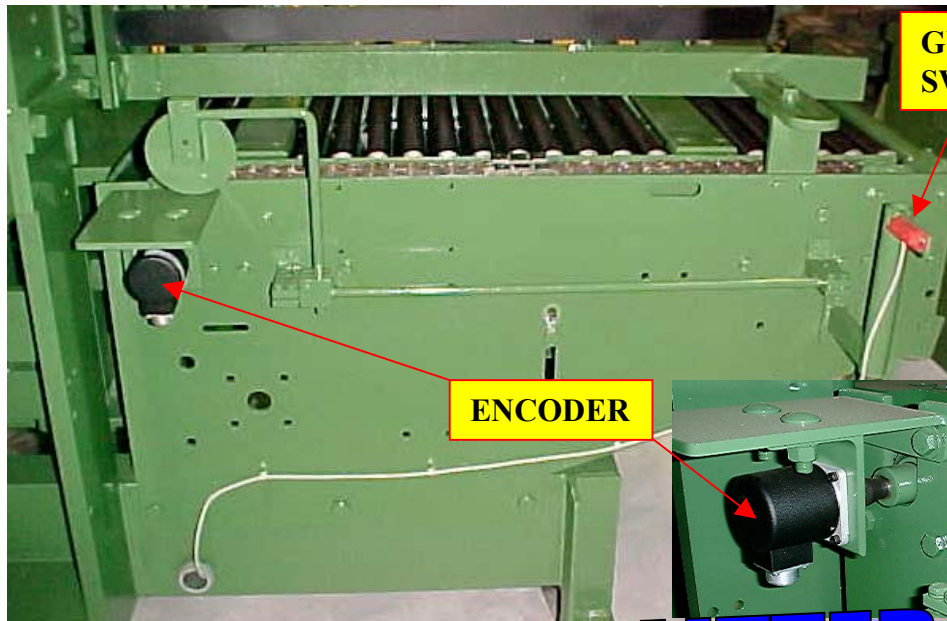
1. The adjustment bolts for top blade alignment are located on the front, both sides, and the rear of top beam.
2. The adjustment bolts for the bottom blade alignment are also located on front, both sides, and the rear of the beam.
3. Adjustment bolt for side blade alignment.
4. When tightening the large blade bolts, don't over tighten the self locking nut. The blade must be able to move when uneven product passes through.



STANDARD SPLITTER

- PC-1** As the product is fed to the splitter by the meter belt, the leading edge of the product will block the light source (PC-1). This stops the meter belt and reverses the belt for a timed duration. The flight bar then starts forward and, after a time delay, the meter belt will start forward again.
- LS-5** The flight bar travels forward at fast speed until the switch is tripped by the timing cam activating LS-5, which causes the flight bar to move at slow speed.
- LS-4** When LS-4 is activated, the flight bar stops and reverses for a timed duration and the splitter cylinders are activated.
- LS-2** LS-2 is activated as the bottom beam rises to split the product.
- PX-3** PX-3 is activated as the top beam moves up. This signals the flight bar to start moving fast again until it repeats LS-5 and LS-4.
- PX-1** PX-1 is activated when the flight bar is in the home position and waiting for a signal that PC-1 is blocked and the meter belt has reversed.





ENCODER SPLITTER

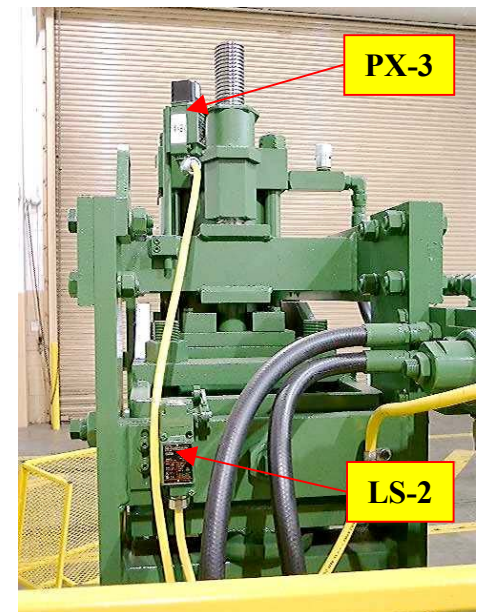
PC-1 As the product is fed to the splitter by the meter belt, the leading edge of the product will block the light source (PC-1). This stops the meter belt and reverses the belt for a timed duration. The flight bar then starts forward and, after a time delay, the meter belt will start forward again.

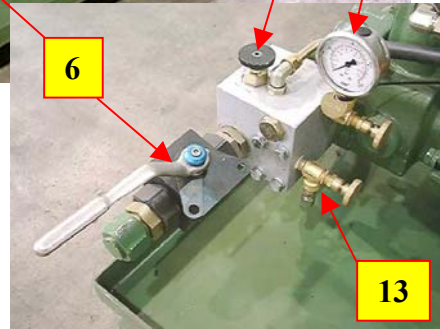
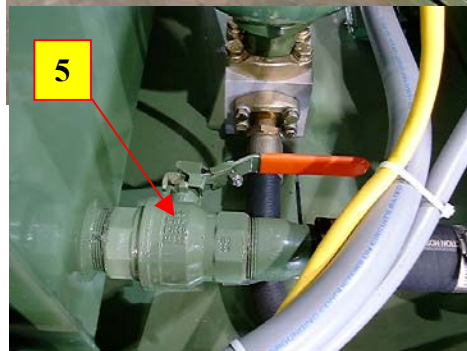
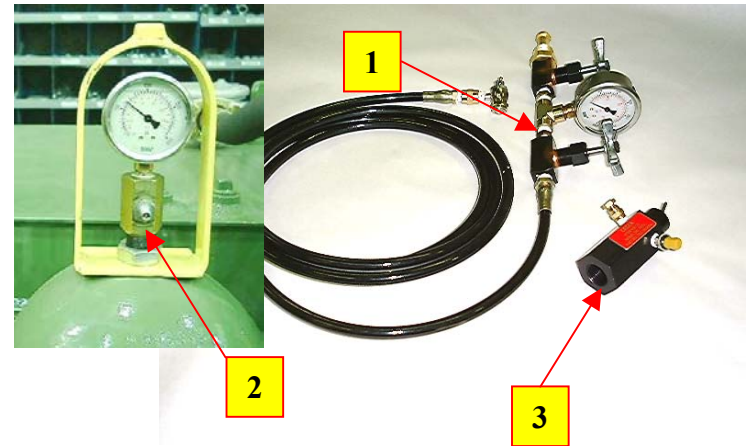
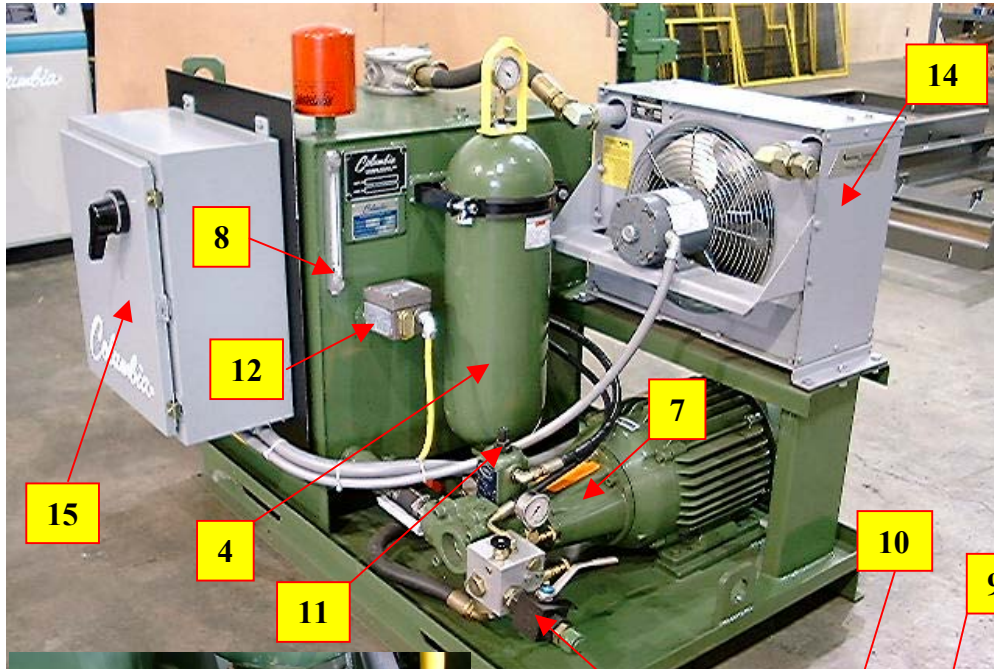
ENCODER The flight bar travels forward at slow speed until the flight bar has met the block, then it will switch to fast speed until the encoder has reached slow down counts, then it will travel slow until the flight bar reaches the final number of counts at which time the flight bar stops and reverses for a timed duration and the splitter cylinders are activated.

LS-2 LS-2 is activated as the bottom beam rises to split the product.

PX-3 PX-3 is activated as the top beam moves up. This signals the flight bar to start moving fast again until it repeats the counts.

PX-1 PX-1 is activated when the flight bar is in the home position and waiting for a signal that PC-1 is blocked and the meter belt has reversed.



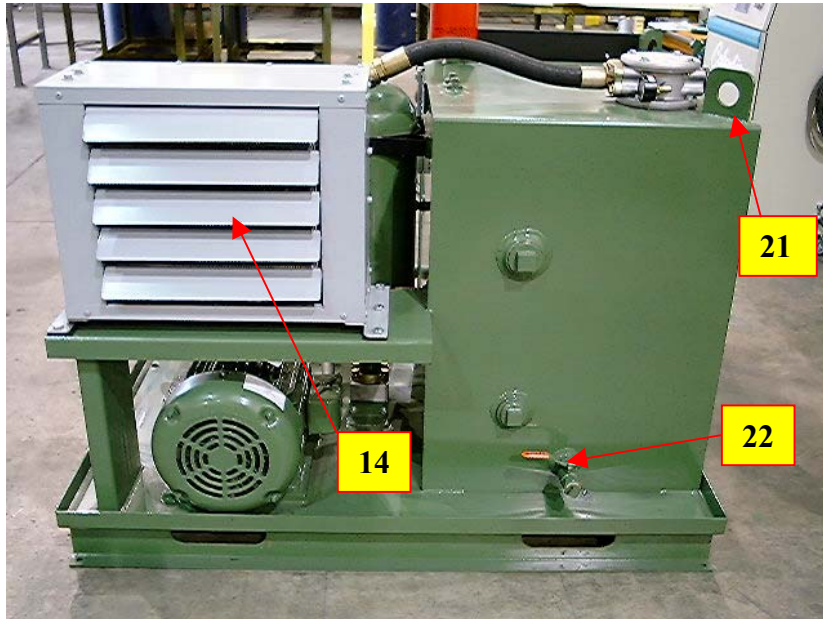


1. Accumulator charging hose.
2. Accumulator charging point and pressure gauge.
3. Schrader valve adapter chuck used on top repair accumulators only.
4. Accumulator should be set no less then 1/3 system pressure and no higher then 2/3 the system pressure with pump off.
5. Suction line shut off valve.
6. Pressure line shut off valve.
7. Coupling inspection cover plate (orange).
8. Oil sight gauge and oil temperature gauge.

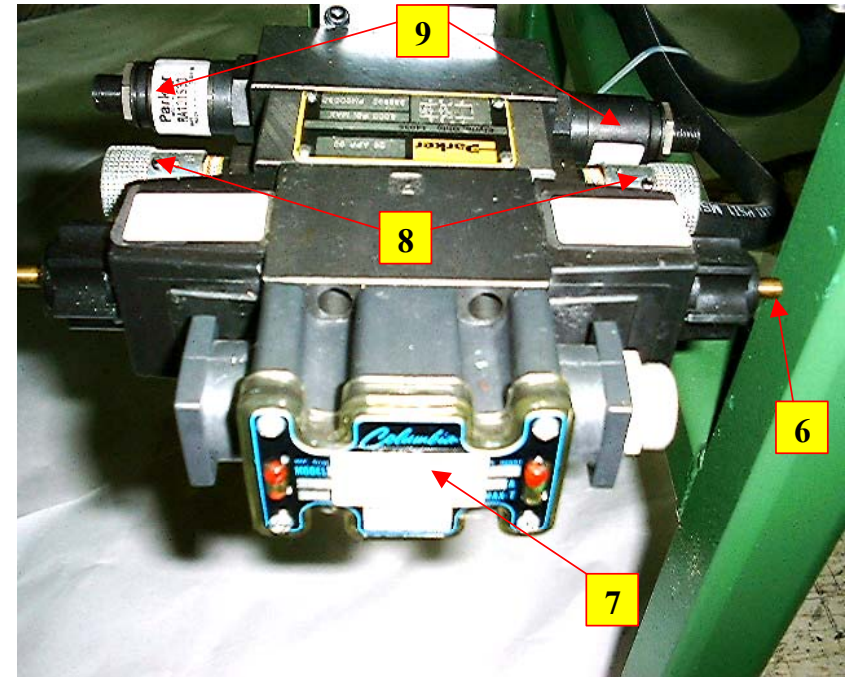
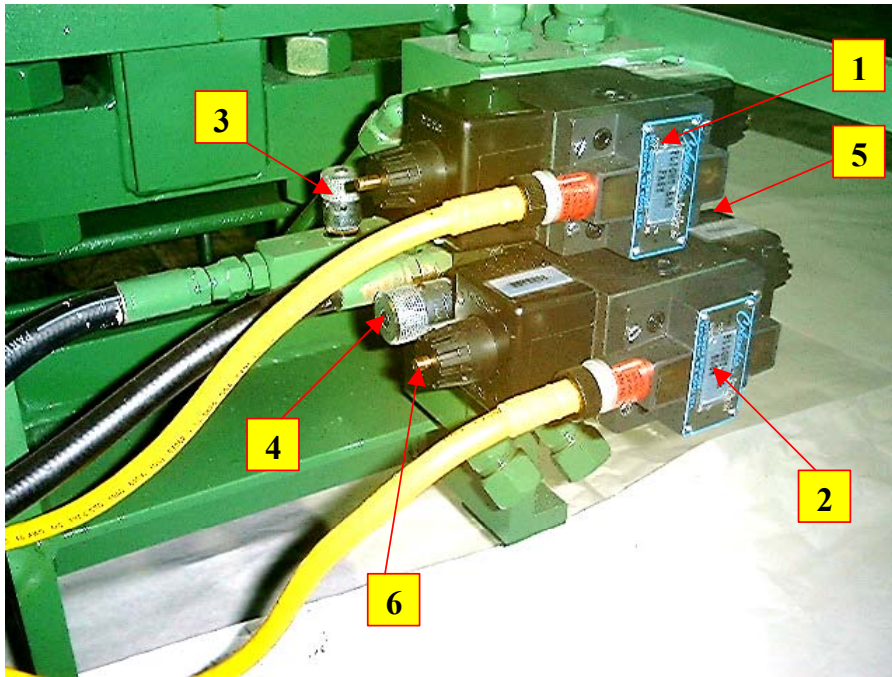
9. **Pressure gauge:** A pressure of 900 PSI is set at the factory but it can be adjusted up to 1500 PSI if needed, accumulator should also be changed to a higher setting.
10. **Manual oil heater valve:** Use when oil is cold, open valve and start pump. When the oil reaches 90-100 Fahrenheit, turn heater valve off. Never run splitter in automatic or manual with heater valve open, as this will damage the pump.
11. **Pump pressure adjustment:** Loosen jam nut. Use Allen wrench to turn adjusting bolt clockwise to increase pressure and counterclockwise to decrease pressure.

Continued on next page

12. **Thermostat:** The thermostat is used to turn on and off the heat exchanger, plus it has over temp shut down settings. You can adjust these settings by removing the gold colored cover on the side and setting for desired temperature.
13. **Oil sample valve:** This valve is used only for taking oil samples. First, open valve one or two seconds, then place oil sample container under valve for collection of oil sample.
14. **Heat exchanger:** The louvers should be opened at all times. Clean this unit with compressed air every three months.
15. **Starter control panel:** This panel houses the starters, 120V transformer, three phase lock-out on door.



16. **Oil tank filling point:** This allows the oil to pass through the filter before entering the tank.
17. **Return oil filter:** oil is filtered as it is returned from the system. Filter element # 362317 Two needed. Changer every 1500 hrs of operating time.
18. **Filter element sight gauge:** Monitor daily during operation. **Green indicates filter is OK. Yellow indicates filter is clogging and should be replaced. Red indicates the filter has gone into bypass and the oil is not being filtered.**
19. **Tank breather filter:** Replacement breather filter part # 301128
20. **Columbia Machine pump I D tags:** These numbers are used for ordering replacement parts for your pump.
21. Lifting eye for moving pump unit.
22. Ball valve used for draining the oil from tank.



1. Flight bar fast valve.
2. Flight bar slow valve.
3. Flight bar fast forward speed flow control valve.
4. Flight bar slow reverse flow control valve.
5. Flight bar forward flow control valve.
6. Detent pin used for manually shifting valve.
7. Meter belt control valve.
8. Flow control valve, used for speed of forward and reversing meter belt.
9. Cross over relief used to take the shock out of the forward and reversing of the meter belt.

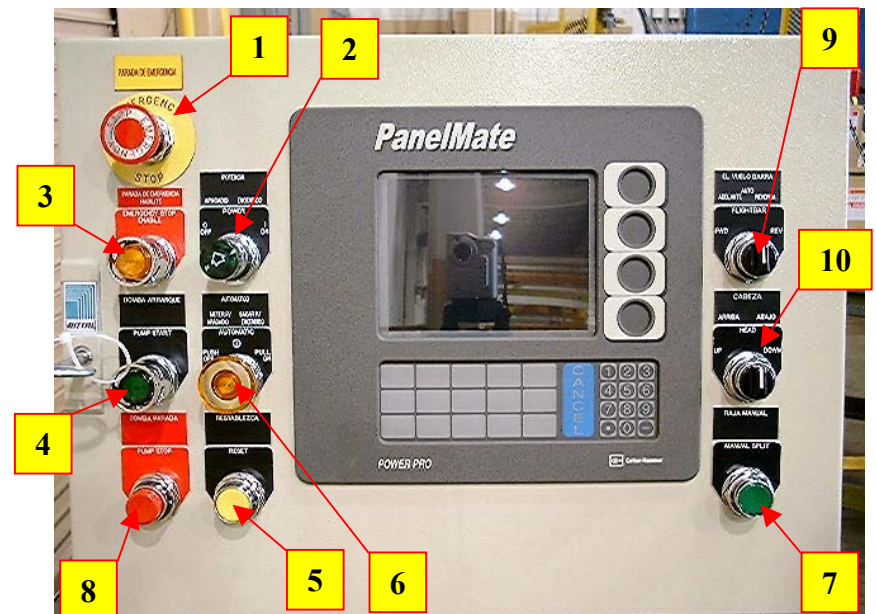
Standard panel



Automatic splitter operation

1. Pull emergency stop out.
2. Turn power switch on.
3. Pull emergency enable button.
3. Switch number 9,10 need to be in auto position.
4. Put meter belt to automatic on D-Tam or Panelmate.
5. Start pump.
6. Clear relays.
7. Pull automatic to "on" position.
8. For manual split, push # 6 to off position.
Manually position product between splitter blades by using the valve de-tent pins.
9. Push manual split button.
10. Turn off power before working on splitter.

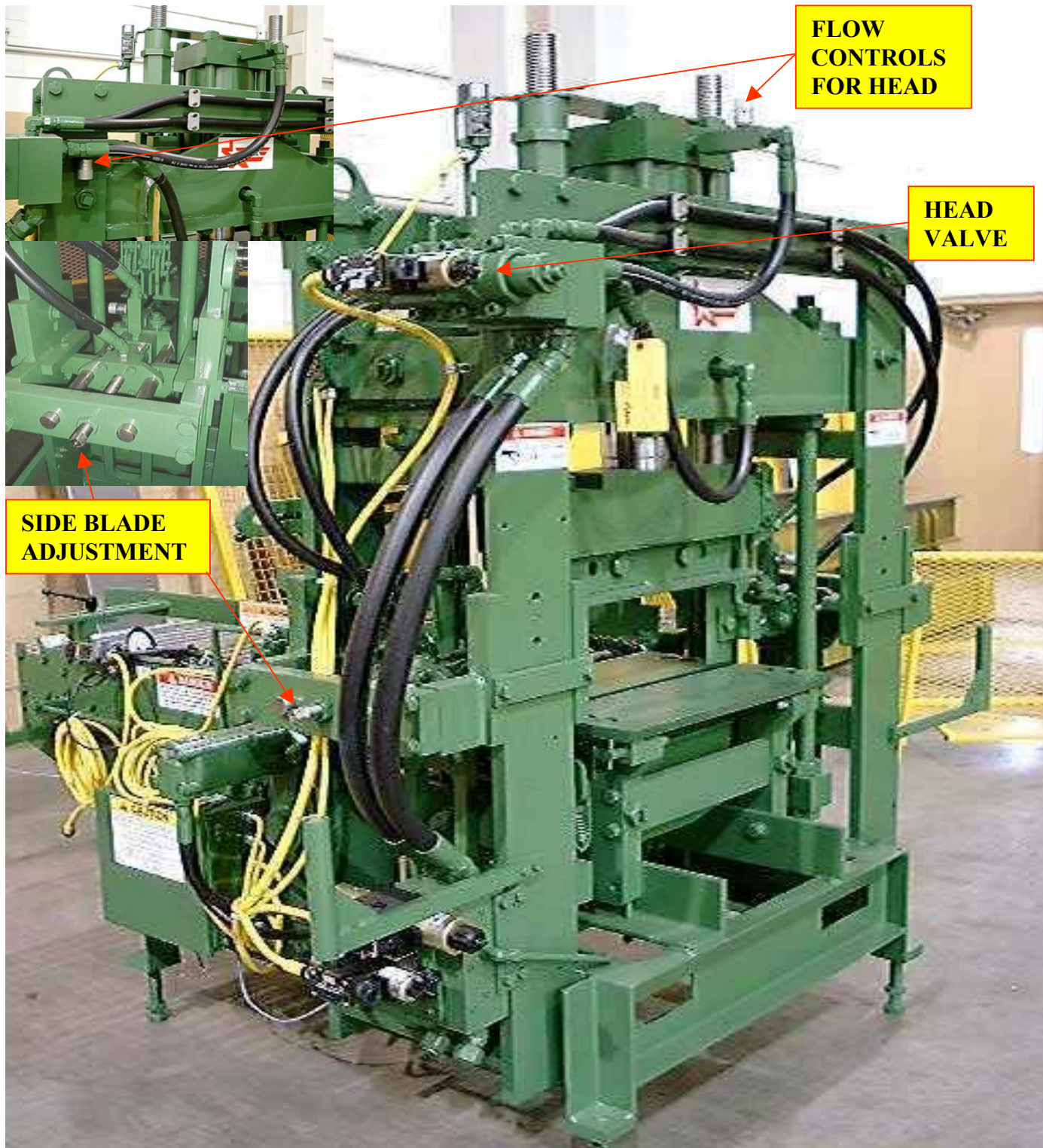
Encoder panel



Switch location

1. Emergency stop.
2. Power switch.
3. Emergency stop enable.
4. Pump start.
5. Clear relays.
6. Automatic.
7. Manual split.
8. Pump stop.
9. Flight bar forward, auto reverse.
10. Head up, auto, down.
11. Panelmate interface.
12. D-Tam interface.

SIDE VIEW



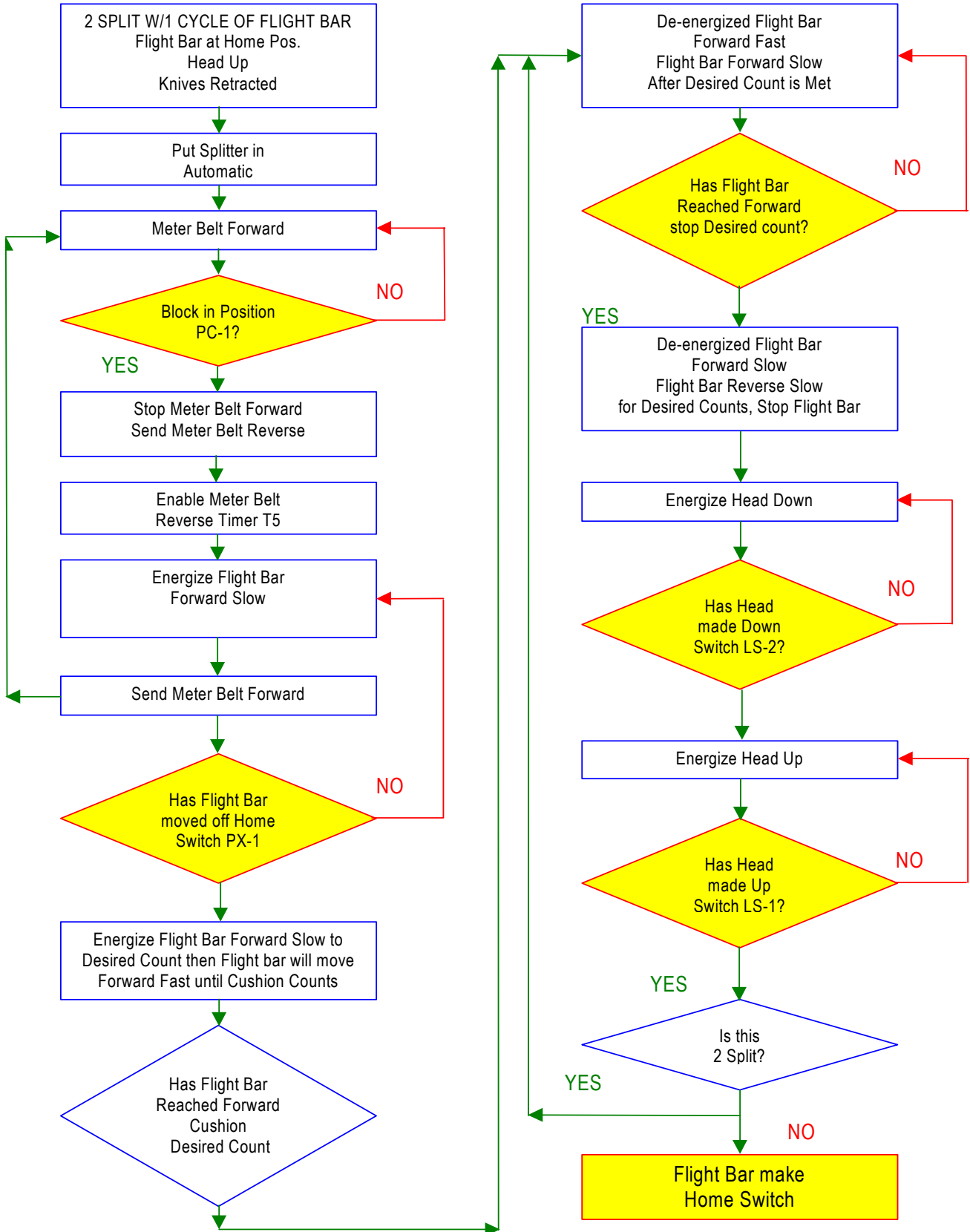


**SPLITTER GUARDS ARE
LOCATED ON BOTH SIDES OF
SPLITTER AND INTERLOCKED
BY MAGNETIC SWITCH ON
EACH SIDE.**

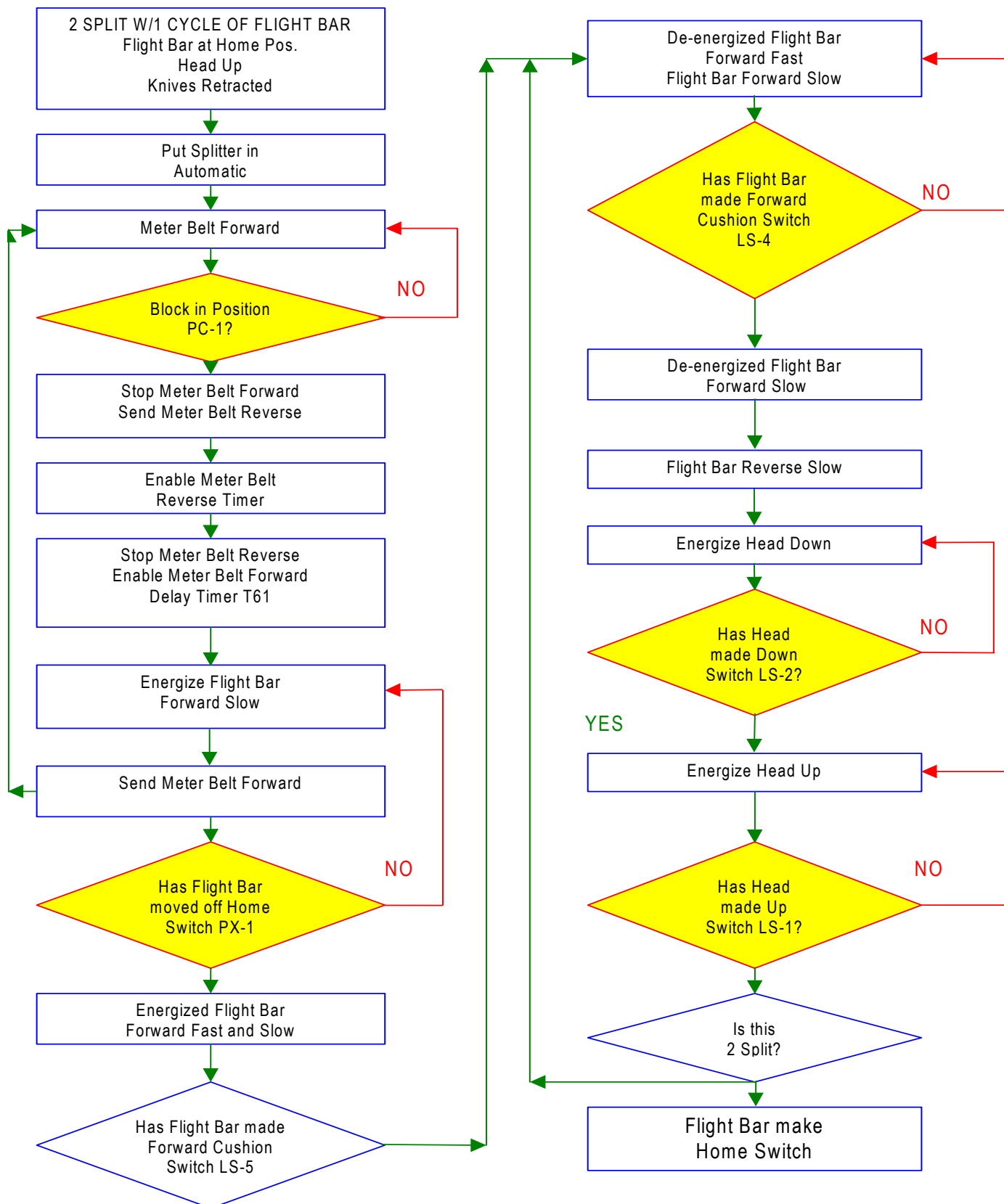


FORK LIFT HOLES

ENCODER SPLITTER



STANDARD SPLITTER



SPLITTER OPERATOR INTERFACE SCREENS

PAGE 0 FLIGHT BAR STATUS

12:34:56
CANCEL

Silence Alarm Horn

Coolant Pump Failed 12:34:56 P00
Oil Pressure Low 12:34:56 P00
Reduction Furnace Overtemp Clrd 12:34:56 P00
Inbound Hopper Overweight Clrd 12:34:56 P00

<div>ACTUAL FB POSITION</div> <div>123456</div> <div>COUNTS</div>	<div>FB AT FAST POSITION</div> <div>123456</div> <div>COUNTS</div>	<div>FB CLEAR OF INFEED</div> <div>123456</div> <div>COUNTS</div>	<div>FB SPLIT CUSHION</div> <div>123456</div> <div>COUNTS</div>	<div>FB SPLIT REVERSE</div> <div>123456</div> <div>COUNTS</div>	<div>View or Acknowledge Alarms</div> <div>Get Page</div>
<div>NUMBER OF SPLITS</div> <div>123456</div> <div>COUNTS</div>	<div>SPLIT # 1 POSITION</div> <div>123456</div> <div>COUNTS</div>	<div>SPLIT # 2 POSITION</div> <div>123456</div> <div>COUNTS</div>	<div>SPLIT # 3 POSITION</div> <div>123456</div> <div>COUNTS</div>	<div>SPLIT # 4 POSITION</div> <div>123456</div> <div>COUNTS</div>	
<div>SPLIT # 5 POSITION</div> <div>123456</div> <div>COUNTS</div>	<div>SPLIT # 6 POSITION</div> <div>123456</div> <div>COUNTS</div>	<div>SPLIT # 7 POSITION</div> <div>123456</div> <div>COUNTS</div>	<div>SPLIT # 8 POSITION</div> <div>123456</div> <div>COUNTS</div>	<div>FB HOME CUSHION</div> <div>123456</div> <div>COUNTS</div>	

SCREEN 0

ACTUAL FB POSITION: Shows the actual position of the flight bar in encoder counts.

FB AT FAST POSITION: Shows the preprogrammed position, in encoder counts, where the flight bar will run at the fast position.

FB CLEAR OF INFEED: Shows the preprogrammed position, in encoder counts, where addition product can be moved onto the splitter infeed rollers.

FB SPLIT CUSHION: Shows the preprogrammed number of encoder counts the splitter will decel before each split.

FB SPLIT REVERSE: Shows the preprogrammed number of encoder counts the flight bar will reverse before each split.

NUMBER OF SPLITS: Shows the number of preprogrammed splits.

SPLIT #1-8 POSITION: Shows the preprogrammed position for each split in encoder counts.

FB HOME CUSHION: Shows the preprogrammed position the flight bar will decel before reaching the home position.



SCREEN 1

BYPASS SPLIT KNIVES: Allows the splitter knives to be turned off. The splitter will operate normally just not split anything.

INFEED DEVICE: Indicator to show whether the splitter is configured for a meterbelt infeed, or a pallet handling pushoff device. This is a software configuration and cannot be changed by the operator.

METERBELT: Allows the operator to select auto or bypass for the meterbelt. In bypass the meterbelt will run continuously. In auto the meterbelt will run as determined by the programmed recipe.

PUSHOFF IS CLEAR OF FB: An adjustable timer to determine when the pushoff has retracted enough for the flight bar to operate. *(Used only when a pushoff is the infeed device)*

METERBELT REV. TIME: An adjustable timer to determine how long the meterbelt will reverse when the flight bar is full. *(Used only when a meterbelt is the infeed device)*

DISCHARGE IS FULL: An adjustable timer used to shut down the splitter when product has backed up to the discharge photocell.

INFEED I/L DISABLE: An adjustable timer, to shut down the conveyor-feeding product to the meterbelt. *(Used only when a meterbelt is the infeed device)*

PAGE 2 SETUP ENTRIES

12:34:56

CANCEL

Coolant Pump Failed

12:34:56 P00

Oil Pressure Low

12:34:56 P00

Reduction Furnace Overtemp

CIRD 12:34:56 P00

Inbound Hopper Overweight

CIRD 12:34:56 P00

	NEW	CURRENT
SPLITTER RECIPE #		
123456		
SAVE RECIPE DATA		
NUMBER OF SPLITS:	12345	12345
FLIGHTBAR AT FAST POSITION:	12345	12345
FLIGHTBAR CLEAR OF INFEED:	12345	12345
FLIGHTBAR SPLIT CUSHION:	12345	12345
FLIGHTBAR SPLIT REVERSE:	12345	12345
SPLIT #1 POSITION:	12345	12345
SPLIT #2 POSITION:	12345	12345
SPLIT #3 POSITION:	12345	12345
SPLIT #4 POSITION:	12345	12345
SPLIT #5 POSITION:	12345	12345
SPLIT #6 POSITION:	12345	12345
SPLIT #7 POSITION:	12345	12345
SPLIT #8 POSITION:	12345	12345
FLIGHTBAR HOME CUSHION:	12345	12345
SPARE LOCATION:	12345	12345
ACTUAL FLIGHTBAR POSITION:		12345

Change Value

SCREEN 2

SPLITTER RECIPE #: Used to select the recipe to be edited. The recipe data will appear in the CURRENT column.

SAVE RECIPE DATA: Used to save the data in the NEW column to the selected recipe number.

NUMBER OF SPLITS: The number of splits desired for the selected recipe.

FLIGHTBAR AT FAST POSITION: The position where the flightbar will start traveling at the fast speed.

FLIGHTBAR CLEAR OF INFEED: The position where the flightbar has traveled far enough to allow another group of product to be moved onto the splitter. *(Primarily used with a pushoff infeed)*

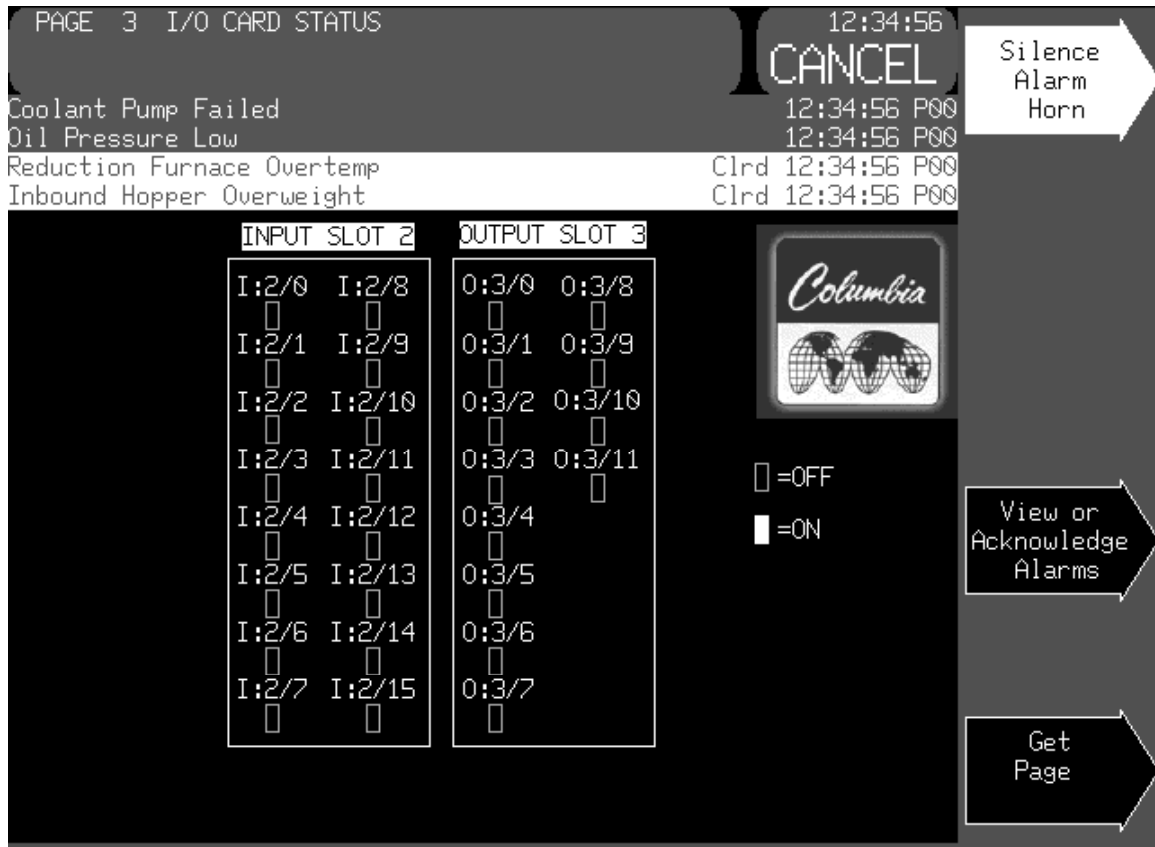
FLIGHTBAR SPLIT CUSHION: The distance for the flightbar to decel, before the product is positioned to split.

FLIGHTBAR SPLIT REVERSE: The distance the flightbar will back-up before the product is split.

SPLIT #1-8 POSITION: The position for each split.

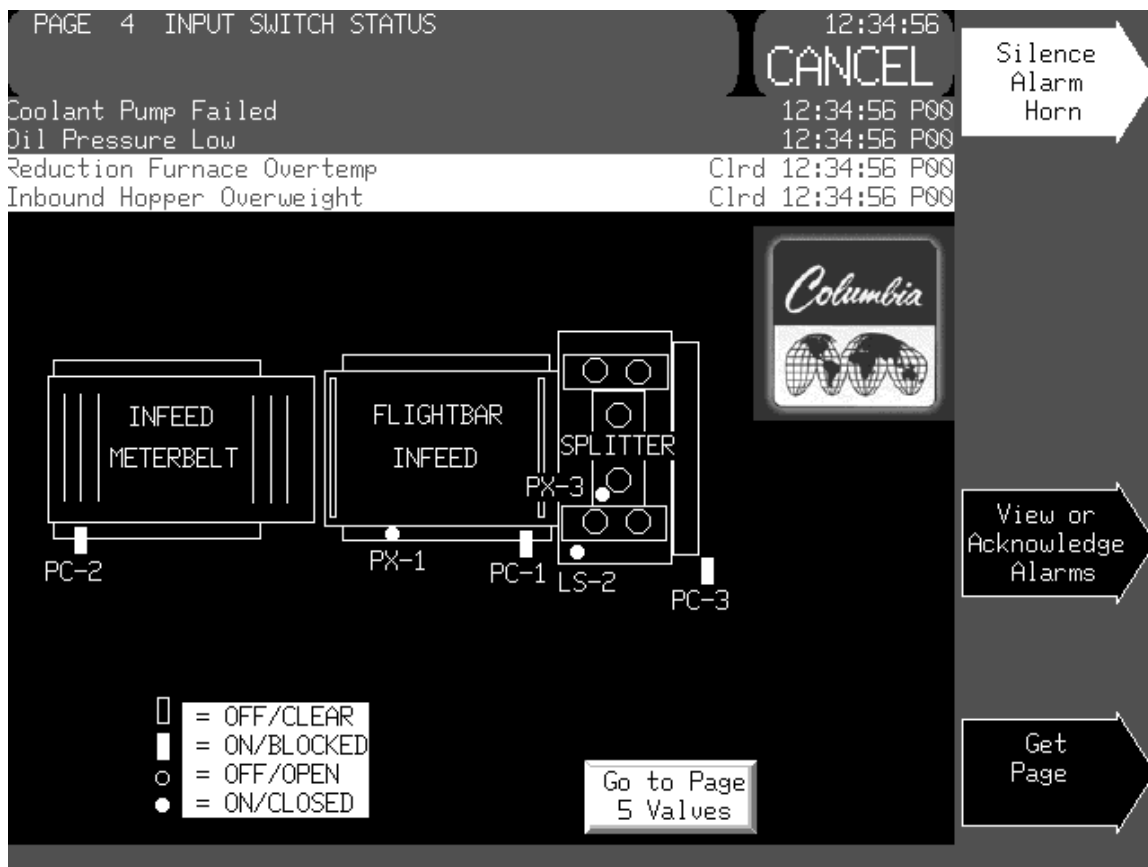
FLIGHTBAR HOME CUSHION: The distance before the home position that the flightbar will slow down.

ACTUAL FLIGHTBAR POSITION: The position in encoder counts of the flightbar.



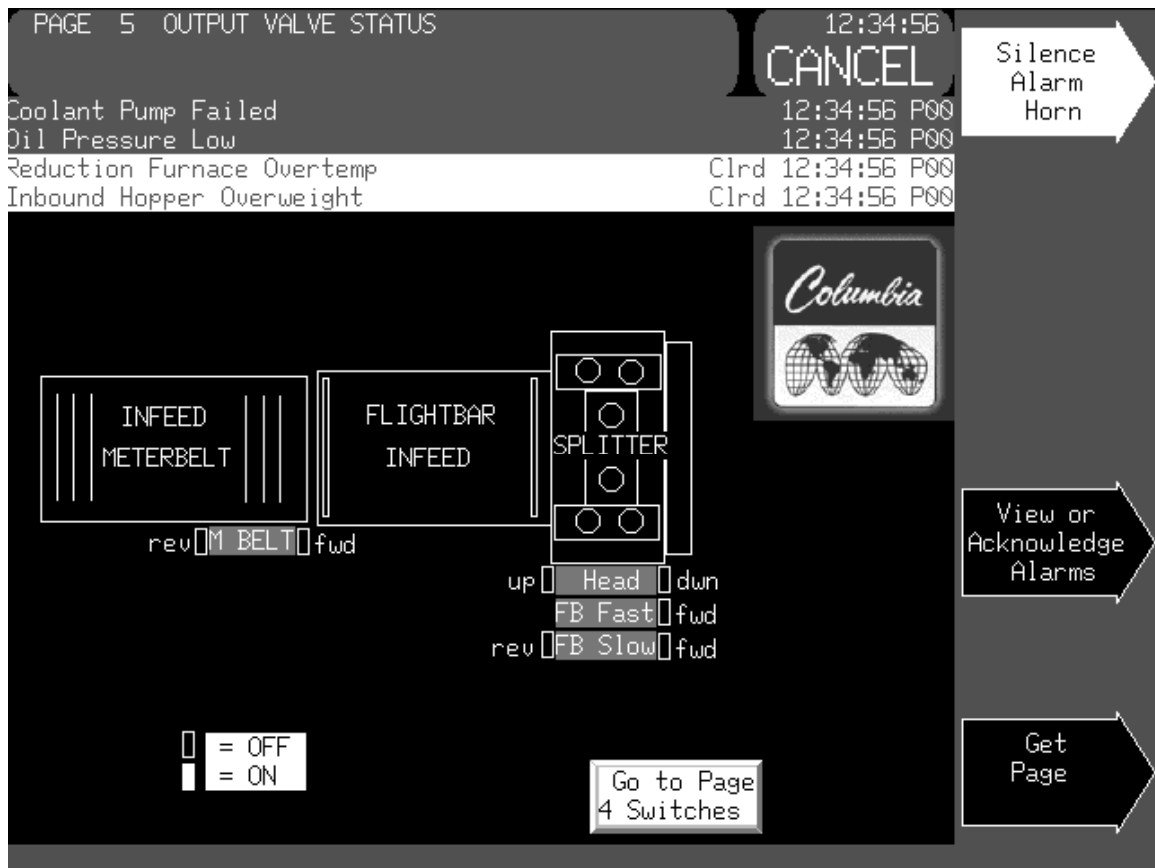
SCREEN 3

I/O CARD STATUS: This screen is used for a troubleshooting guide. The display shows the status of all inputs and outputs at the same time.



SCREEN 4

INPUT SWITCH STATUS: This screen is used for a troubleshooting guide. It shows the status and approximate location of the input switches.



SCREEN 5

OUTPUT VALVE STATUS: This screen is used for a troubleshooting guide. It shows the status and approximate location of the output valves.



SCREEN 6

DAILY/SHIFT COUNT: A counter to show the total number of splits done, regardless of which recipe or the number of recipes used. This counter can be reset at any time at the panelmate screen.

TOTAL ACCUMULATIVE COUNT/RECIPE: A counter to show how many splits that a selected recipe has done. Getting on-line to the PLC can only reset this counter. This counter is intended to track the life of splitter blades.

SPLITTER WITH ENCODER PRODUCT SETUP ENTRY PROCEDURE FOR PANELMATE 1700.

The 1224 splitter is designed to Split concrete blocks up to eight times. The 1224 splitter can store 50 product setups for the operator to choose from. The operator must enter each setup pattern. To enter a setup pattern the 1224 splitter **must be in the Manual mode of operation**. A pencil and paper is needed to record the information to be entered.

TO ENTER SETUP DATA

1. Turn the Power Switch ON.
2. Push in the Auto Switch to turn the system into Manual Mode.
3. Start the hydraulic pump. Hydraulic pressure is needed to manually move the flight bar. Manually move the Flight Bar from Home Position forward until it touches the product placed on the Roller Deck by the Meter Belt (or pusher). Then read the count from ACTUAL FLIGHTBAR POSITION. This is located on the Panelmate screen "page2", see figure 1. This is the FLIGHTBAR AT FAST POSITION. Record the count on a sheet paper.

PAGE 2 SETUP ENTRIES

12:34:56
CANCEL

Coolant Pump Failed 12:34:56 P00
Oil Pressure Low 12:34:56 P00
Reduction Furnace Overtemp Clrd 12:34:56 P00
Inbound Hopper Overweight Clrd 12:34:56 P00

Silence Alarm Horn

	NEW	CURRENT
SPLITTER RECIPE #		
123456		
SAVE RECIPE DATA		
NUMBER OF SPLITS:	12345	12345
FLIGHTBAR AT FAST POSITION:	12345	12345
FLIGHTBAR CLEAR OF INFEED:	12345	12345
FLIGHTBAR SPLIT CUSHION:	12345	12345
FLIGHTBAR SPLIT REVERSE:	12345	12345
SPLIT #1 POSITION:	12345	12345
SPLIT #2 POSITION:	12345	12345
SPLIT #3 POSITION:	12345	12345
SPLIT #4 POSITION:	12345	12345
SPLIT #5 POSITION:	12345	12345
SPLIT #6 POSITION:	12345	12345
SPLIT #7 POSITION:	12345	12345
SPLIT #8 POSITION:	12345	12345
FLIGHTBAR HOME CUSHION:	12345	12345
SPARE LOCATION:	12345	12345
ACTUAL FLIGHTBAR POSITION:		12345

View or Acknowledge Alarms

Get Page

Figure 1

4. After recording the count for Flight Bar Fast position, continue to move the Flight Bar to a position which will be clear for the Meter Belt (or Pushoff) to push the next product onto the rollers. Then read the count from ACTUAL FLIGHTBAR POSITION. On page 2 of the Panelmate. Record this count as FLIGHTBAR CLEAR OF INFEED on paper.

CAUTION: The operator must ensure that the flight bar is forward enough such that any product that is pushed or conveyed onto the roller deck of the splitter will not come into contact with the flight bar. Failure to do this can result in damage to the splitter flight bar and/or product.

5. Move the Flight Bar to a position about 2 or 3 inches before the product reaches the First Splitting Position. Then, from ACTUAL FLIGHTBAR POSITION on page 2 of the Panelmate, record this count as Cushion Count.
6. Move Flight Bar so that the product reaches the First Splitting Position. Then from ACTUAL FLIGHTBAR POSITION, record this count as SPLIT #1 POSITION.
7. Subtract Cushion Count from SPLIT #1 POSITION. This is the FLIGHTBAR SPLIT CUSHION.
8. Repeat step 6 for split positions 2-8 as required.
9. Move the Flightbar until it is about three inches before the home Position. From ACTUAL FLIGHTBAR POSITION, record this count as FLIGHTBAR HOME CUSHION.

NOTE: The data being entered will appear in the “NEW” column.

NOTE: once the operator starts to enter the data into the system the operator must not change Panelmate screens until the setup is saved. If the operator changes screens before the data is saved then all data entered will be lost.

PAGE 2 SETUP ENTRIES

12:34:56

CANCEL

Coolant Pump Failed

Oil Pressure Low

Reduction Furnace Overtemp

Inbound Hopper Overweight

12:34:56 P00

12:34:56 P00

Clrd 12:34:56 P00

Clrd 12:34:56 P00

	NEW	CURRENT
SPLITTER RECIPE #		
123456		
SAVE RECIPE DATA		
NUMBER OF SPLITS:	12345	12345
FLIGHTBAR AT FAST POSITION:	12345	12345
FLIGHTBAR CLEAR OF INFEED:	12345	12345
FLIGHTBAR SPLIT CUSHION:	12345	12345
FLIGHTBAR SPLIT REVERSE:	12345	12345
SPLIT #1 POSITION:	12345	12345
SPLIT #2 POSITION:	12345	12345
SPLIT #3 POSITION:	12345	12345
SPLIT #4 POSITION:	12345	12345
SPLIT #5 POSITION:	12345	12345
SPLIT #6 POSITION:	12345	12345
SPLIT #7 POSITION:	12345	12345
SPLIT #8 POSITION:	12345	12345
FLIGHTBAR HOME CUSHION:	12345	12345
SPARE LOCATION:	12345	12345
ACTUAL FLIGHTBAR POSITION:		12345

Change Value

Figure 2

10. Scroll down to the NUMBER OF SPLIT. Press the Change Value button and enter the number of splits required. Press the Enter Button.
11. Scroll down to FLIGHTBAR AT FAST POSITION. Press the Change Value button and enter the fast position recorded in step 3. Press the Enter Button.
12. Scroll down to FLIGHTBAR CLEAR OF INFEED. Press the Change Value button and enter the recorded value from step 4. Press the Enter Button.
13. Scroll down to FLIGHTBAR SPLIT CUSHION. Press the Change Value button and enter the *calculated* cushion position from step 7. Press the Enter Button.

Warning: The operator must ensure that the “FLIGHTBAR SPLT CUSHION” position is not too close to the splitter head to ensure that the flight bar can stop in position. Failure to do this can result in damage to the product.

14. Scroll down to SPLIT #1 POSITION. Enter the recorded flight bar position for split 1 and press the Change Value button and enter the counts from step 6. Press the Enter Button. Repeat for splitting positions 2 through 8. If these splitting positions are not being used then enter zeros.
15. Scroll down to FLIGHTBAR HOME CUSHION. Press the Change Value button and enter the recorded value from step 9. Press the Enter Button.

16. Press the SAVE RECIPE DATA button and then press SAVE RECIPE CHANGES.

17. Repeat this process for all other Setup.

TIPS TO DECREASE THE SPLITTER CYCLE TIME

1. Set the flight bar fast position such that the flight bar has just touched the brick. The longer the flight bar is in slow speed the slower the cycle time. But make sure that the flight bar is still in contact with the brick before going fast.
2. Shorten the cushion before split such that the flight bar has slowed down just before the split position. **DO NOT SPEED UP THE SLOW VALVE!** By speeding up the slow valve the flight bar will coast before stopping. This will move the split position.
3. Set the cushion before home position as short as possible. This is not a critical value. Just make sure that the flight bar stops before interfering with the next set of blocks coming onto the roller deck.