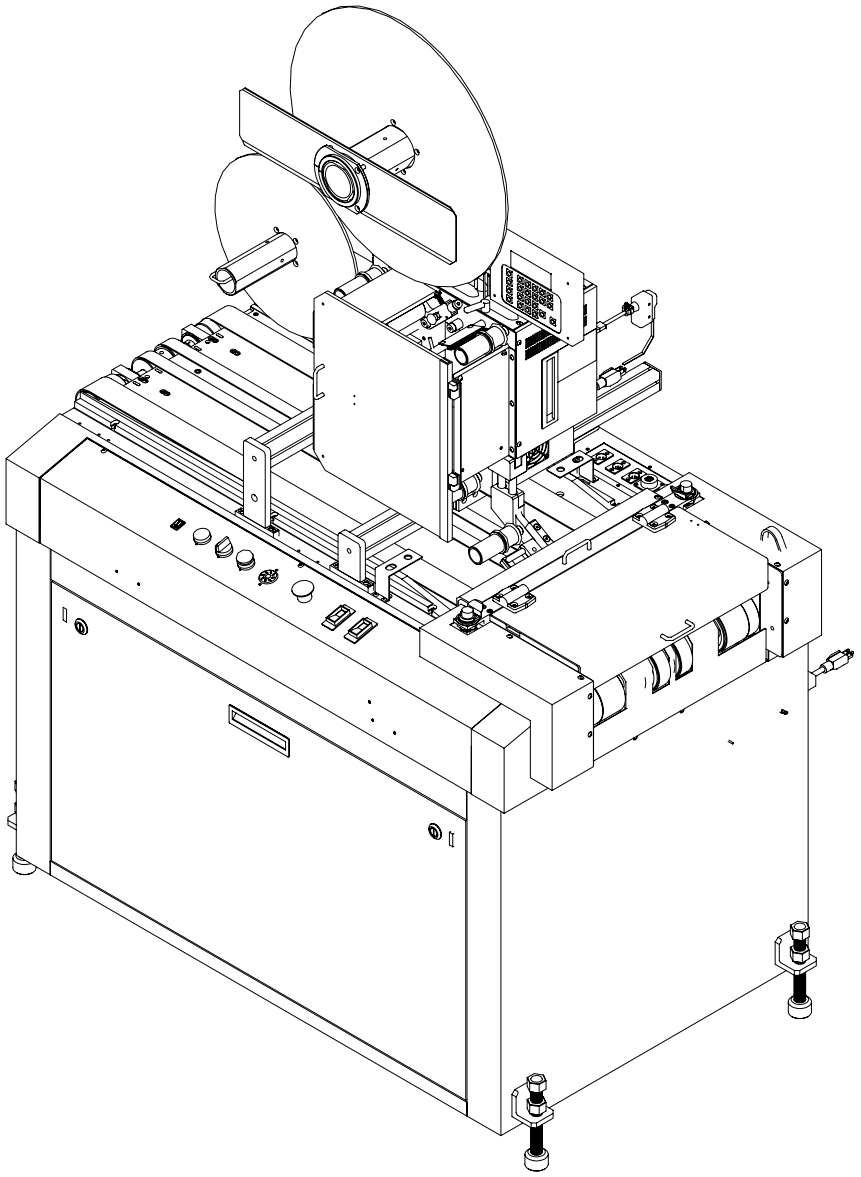
BUSKRO®

BK730-2 Tabber 2



Part No. 9104528

User's Guide V1.1

BK730-2 Tabber User's Guide

Published by:

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First Edition, 2007

Printed in Canada

Manual History

Version	Date	Description	ECO No.
1.0	29-Jun-07	Manual Released.	-
1.1	07-Jul-08	Appendix B-15 updated for Tabber II CPU DIP switch settings.	1090

BK730-2 Tabber

Table Of Contents

General Information

Chapter 1

1.1 Description

The Buskro BK730-2 Tabber/Labeler is designed to apply pressure-sensitive tabs onto mail pieces and can be used as a wrap-around tabbing unit or as a labeling system. The system consists of two major components, the transport base, which conveys the mail piece, and the tabbing head, which applies the individual tabs. The system offers full flexibility in its ability to apply a number of tabs on either edge of the mail piece. Simplified mechanical adjustments and software controlled tab placement functions offer unsurpassed ease of use permitting rapid job setups.

The mail piece, which is conveyed into the system by a feeder or inkjet system, is transported against a registration rail resulting in a tightly controlled tab-wrap. In addition, the presence of but a few mechanical adjustments for thickness and edge selection, gives the operator the tools necessary to accurately and rapidly setup for a variety of mail pieces.

In keeping with Buskro's philosophy of ease of use, the Tabber/Labeler head is designed with many innovative features. The Tabber/Labeler head is controlled through software via an operator keypad that permits rapid selection of the number of tabs dispensed and their placement positions. A unique tab-sensing feature allows the operator to easily adjust the tab pitch at a touch of a button. The Tabber/Labeler head was designed with a few mechanical parts to allow easy tab threading and machine setup resulting in improved productivity. The Tabber/Labeler head is mounted on two aluminum extrusion rails that allow the Tabber/Labeler head to be moved easily from side to side to allow tabbing of either edge of the mail piece and facilitate fine tune adjustments. In addition, the peel point assembly can be adjusted up and down and laterally for different material and tab thickness.

All these features, in addition to the manufacturing quality and innovative product design, add up to an extremely functional Tabbing/Labeling system capable of years of reliable and trouble free operation.

1.2 Features

1.2.1 High Speed Production

The BK730-2 is capable of high production speeds in excess of 30,000 PPH for single tab operations, 25,000 PPH for double tab operations, and 23,000 PPH for triple tab operations. The unit has been solidly constructed with electrical components capable of delivering reliable, full-day production.

1.2.2 Integration with Buskro and 3rd Party Equipment

The BK730-2 can now be easily integrated with Buskro inline inkjet, flipover, feeders, and third party equipments. This is now possible due to the new Base Control Board (p/n 9102380) that comes standard with all next generation Tabbers. The features and technical discussion of the board's operation is presented in section 2.3 of chapter 2. Connections to all inline systems are made through an upstream or downstream connector (located at the in-feed and out-feed of the base) providing all interface functions. The required cable for Buskro machines to connect upstream and downstream equipment is the Universal Interconnect Cable (p/n 9102083A). The Base Control Board passes on a variety of signals including stop, momentary start signal for upstream and downstream machines, run signal for upstream equipment, speed control, encoder, and a Heater ON signal for downstream heaters.

1.2.3 Simplified Mechanical Adjustments

Product size acceptance and compensation is performed on the base through simple mechanical knob controls; one for product thickness and the other for tab edge selection. In addition, some simple adjustments can be made in the tab forming area to fine-tune the tab-wrapping process for improved tab-wrap quality.

The Tabber/Labeler head is designed for ease of use and portability. The operator keypad is easily accessible simply by sliding it in and out of view. The head is mounted on two aluminum extrusion rails that allow easy movement for left and right tabbing and fine

adjustments of tab positioning on the product. The peel point can also be adjusted up and down and laterally for different product thickness. The peel point lateral adjustment allows adjustment for different tab material widths. Tab threading is easy since the system has few rollers and a large tab bin. In addition, the despool roller is not controlled by a motor but a simple adjustment knob thus reducing the cost of repair. The head is fully portable as all the electronics are located on the back of the unit and can be integrated with third party transport bases or web presses as required.

1.2.4 Software Controlled Tabber/Labeler Head Functions

All Tabber/Labeler head functions are controlled through software and use an operator keypad interface for command entry. A unique feature is the automatic tab pitch configuration, which allows the operator to automatically set the distance between each tab on the backing paper at a touch of a button. Other configuration options include the type of tabs (i.e. clear, solid), position of tabs, full Tabber/Labeler head diagnostics, product sensor selection, peel point sensor sensitivity adjustment, metric units, material size error, and production and life counters.

1.2.5 Construction, Safety Features, and Maintenance

All mechanical and electrical system components in the transport base have been designed for long-lasting and extensive use. Included is a full safety package with feedback through the operator display, monitored by a series of interlocking sensors. The system has been designed to facilitate maintenance, should it be required. The transport assembly including conveying belts and the tabletops are all easily removable for complete mechanical component access. The Tabber/Labeler operator interface is easily accessible by a simple slide rail system on the Tabber/Labeler head.

1.2.6 Tabbing Quality Considerations

The Tabber base has been specifically designed for the tabbing process and as such incorporates a number of unique features to optimize tabbing quality. Particular attention was paid to the transport belts for accurate edge positioning, the tab wrap section for the

production of consistently tight tab-wraps, and the addition and optimization of the tabbing head software controls for ease of use and superior production speeds. The conveying belts are biased to ensure that product registers against the material side guides before application of tabs or labels. This ensures that tabs and labels are not applied at an angle onto the product due to skewing of materials during transport.

1.3 Tabber/Labeler Base Specifications

Table 1-1: *Tabber/Labeler Base System Specifications*

Product handling		
Minimum	3.0” x 5.0”	76mm x 127 mm
Maximum	16.0” x 17.0”	405 mm x 432 mm
Thickness	Single Sheet to 5/8”	Up to 38 mm
Physical		
Overall Length	47.5”	1203 mm
Overall Height (w/Head)	72”	1829 mm
Height	34.3” to 36.5”	869 mm to 927 mm
Overall Width	29.5”	747 mm
Weight (Crated)	550 lbs	251 kg
Production Rate		
Belt Speed	0 to 600 ft/min	0 to 3.00 m/s
Cycle Speed	0 to 30,000 pph	
Single tabs (up to 1”)		
Cycle Speed	0 to 25,000 pph	
Double tabs (up to 1”)		
Cycle Speed	0 to 23,000 pph	
Triple tabs (up to 1”)		
Electrical Requirements		
Line Voltage	115 ± 15% VAC	220 ± 15% VAC for Europe
Line Current	6 Amps	5 Amps for Europe
Power	690 W	1.1 KW
Machine Motor	1/3 H.P. DC controller	1/3 H.P. DC controller
Mechanical Controls		
Product Thickness	Rotary adjuster for product thickness	
Edge Selection	Rotary adjuster for lateral table movement	
Skidbar	Pressure control for product conveyance	

1.4 Tabber/Labeler Head Specifications

Table 1-2: *Tabber/Labeler Head system specifications*

Tab Specifications		
Number of Tabs	1, 2 or 3	
Tab Roll Size	Up to 50,000 – 3/4” (paper)	
Tab Core Diameter	3.00”	76.2 mm
Tab Spool Size	19.75”	502 mm
Tab Length	1/2” to 5.0”	12.7 to 178 mm
Tab Width	Up to 3” (5” with the Wide Label Head)	76mm
Tab Style	Circle, square, rectangle, stamps	
Tab Type	Clear (c/w engineered backer), Paper, Translucent	
Tab Placement	Front, back or flat tab (gate fold)	
Physical		
Length *c/w Unwind & rewind spools*	32.2”	818 mm
Height *c/w Unwind & rewind spools*	37.3”	947 mm
Overall Width	14.1”	330 mm
Weight (Head)	72 lbs	32.6 kg
Software Controls		
Product Sensor Selection	Selection of Front or Back Product Sensor	
Tab Sensor Positioning	Set distance between product and peel point sensor	
Product Counter Resetting	Reset product counter	
Software Version	Display software version	
Factory Reset	Reset all setting to factory default	
Life Count Display	Display the total production to date (can not be reset)	
System Test	Test all system components for malfunction	
Tab Spacing	Selection of automatic or manual tab spacing	
Number of Tabs	Select amount of tab per product	
Tab Position Entries	Set the distance between tabs on a product	
Tab Pitch setting	Set tab pitch automatically or manually	
Type of Tab setting	Set opaque or clear type tab	
Peel Point Sensor Sensitivity	Adjusts the peel point sensor gain	
Material Size Error	Fault signal when unexpected product length is detected	
Imperial / Metric Unit Display	Displays all units in either imperial or metric units	
Mechanical Controls		
Head Position	Slide head on extrusion rail c/w locking lever	
Peel Point ⇑ ⇓ Adjustment	Adjustable for materials up to 1 ½” thick	
Peel Point Lateral Adjustment	Adjustment for different tab width up to 3”	
Despool Brake Adjust	Adjustable for different production speed	

1.5 Tabber/Labeler Base and Head Dimensions

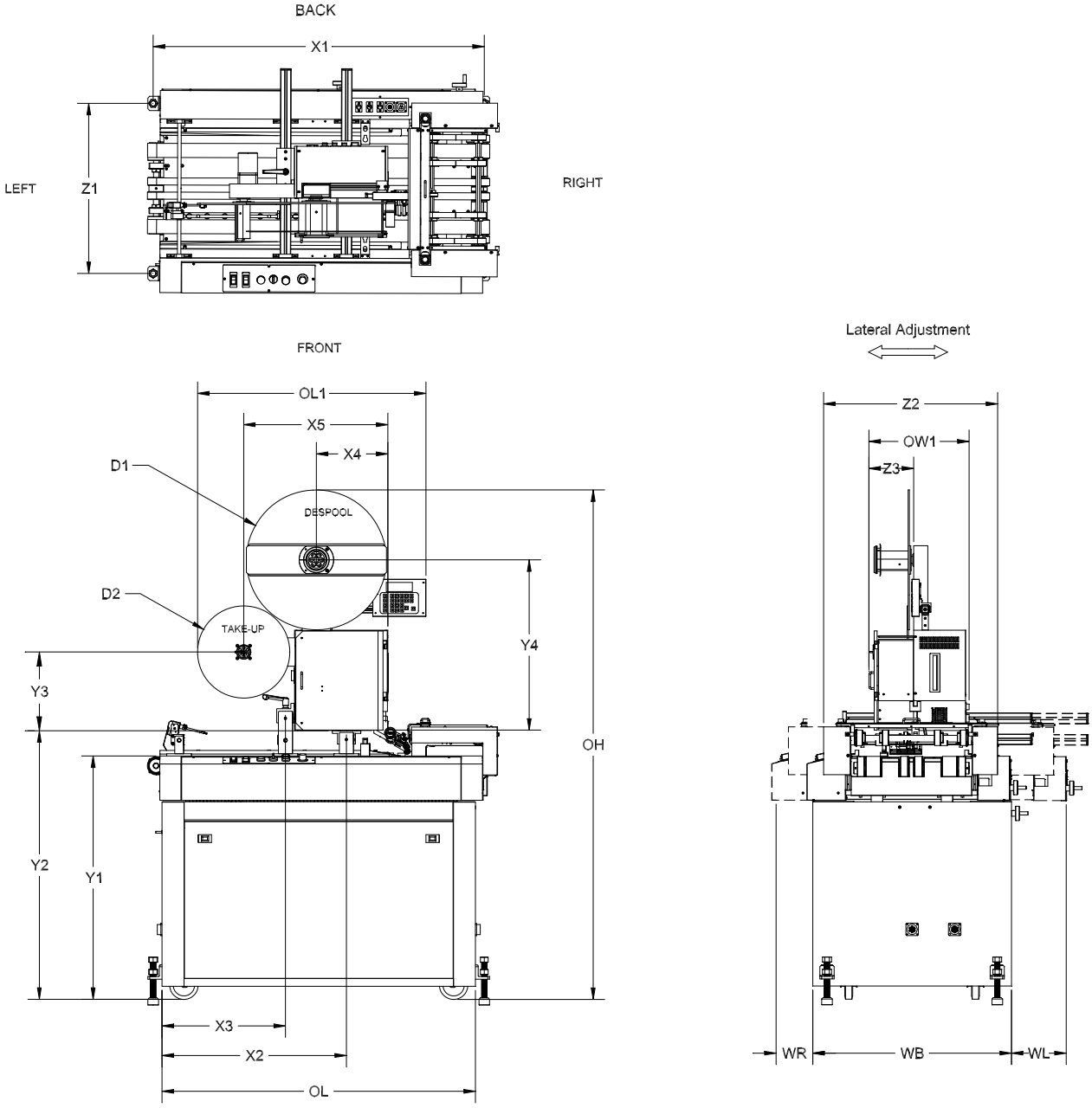


Figure 1-1: *Tabber/Labeler Base and Head dimensions.*

Table 1-3: *Tabber/Labeler Base and Head Dimensions*

Symbol	Description	Dimensions	
WB	Overall Base Width	28.00”	710 mm
WR	Front Lateral Extension	6.00”	152 mm
WL	Back Lateral Extension	6.50”	165 mm
OL	Overall Length	44.18”	1122 mm
OH	Overall Height	71.90”	1826 mm
OW1	Overall Tabber Head Width	14.11”	358 mm
OL1	Overall Tabber Head Length	32.15”	816 mm
X1	Leveling Foot Length	46.69”	1185 mm
X2	Right Head Mount	26.00”	660 mm
X3	Left Head Mount	17.39”	711 mm
X4	Despool Center Distance	9.39”	238 mm
X5	Take-up Spool Center Distance	19.64”	499 mm
Y1	Tabletop Height	34.30” - 36.50”	869 mm - 927mm
Y2	Tabber Head Support Height	37.90”	962 mm
Y3	Take-up Spool Height	11.00”	279 mm
Y4	Despool Height	24.00”	609 mm
Z1	Leveling Foot Width	24.00”	609 mm
Z2	Upper Transport Width	24.53”	623 mm
Z3	Front Face Width	8.31”	211 mm
D1	Despool Diameter	19.75”	502 mm
D2	Take-up Spool Diameter	13.00”	330 mm

BK730-2 Base

Chapter 2

2.1 Instrument Panel Functions

The BK730-2 tabbing base is equipped with a system control panel containing all the necessary controls to operate the base. The front panel is shown in *Figure 2-1* as a reference. The available controls include:

- Feed Disable control
- Start pushbutton, Jog/Run selector knob, and Stop pushbutton)
- Speed Control module connector
- Production Speed potentiometer
- Main and Head power rocker switches

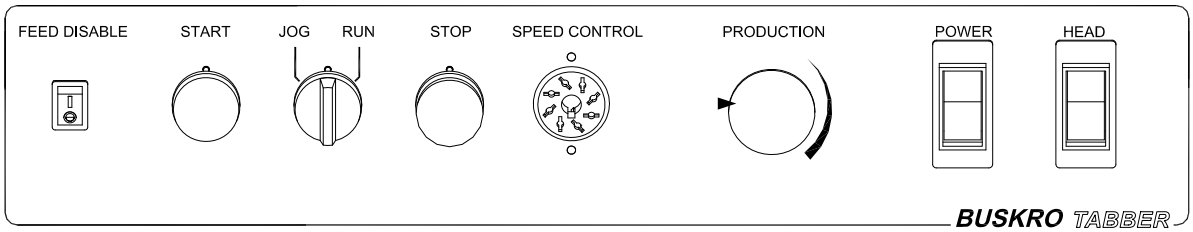


Figure 2-1: *Instrument Control Panel*

2.1.1 Feed Disable Control

The Feed Disable switch brings the control of the RUN signal for upstream equipment from the DIP switch (S1-6) on the new Base Control Board (p/n 9102380) to the operator front panel. There is a relay coil which whenever energized, will open the NC contacts used to pass on the RUN signal at pins 9 and 10 of the upstream connector on the Base Control Board. In order for operator control of this function to work at the front panel, the DIP switch, S1-6, must be enabled (i.e. open) since electrically, it is connected in parallel with the front panel switch. The control of the upstream RUN signal is then left to the FEED DISABLE switch. When it is closed (| position), a coil is energized which opens the NC contacts connecting to the upstream RUN contacts at pins 9 and 10 at J2 on the board preventing the RUN signal from being passed to upstream equipment. This same operation will result if the DIP switch S-6 is closed (DISABLED position) regardless of what condition the front panel switch is in. When the FEED DISABLE switch on the front panel is open (O position) AND the DIP switch S-6 is also open (ENABLED

position) the coil is not energized which allows the RUN signal to be passed due to the NC contacts at pins 9 and 10 at J2. In order for the FEED DISABLE function to work at the front panel, DIP switch S-6 must always be in the enabled position on the Base Control Board.

2.1.2 START Pushbutton

The **START** (green) pushbutton turns on the machine contactor and applies power to the motor controller. When this button is pressed, the machine will cycle providing that the following conditions have been met:

- The machine **STOP** button is not pressed or in the locked position.
- There are no stop inputs being received from the Base Control Board or the Tabber Head.
- All safety covers are in the closed position (Tabber Head door is closed, Upper Transport cover is down and closed, and the jam switch is not in a fault condition).

2.1.3 STOP Pushbutton

The **STOP** pushbutton (red) suspends operation of the system by interrupting power to the machine DC controller. This is used mostly as an emergency stop button since depressing this button will cause the machine to stop instantly regardless of the Tabber/Labeler's operating status.

Note: The STOP pushbutton has a locking feature by pressing the button and turning clockwise into its locking position. When engaged it will prevent the system from cycling. Should this condition occur, twist and release the locking mechanism to allow base operation to continue.

2.1.4 JOG/RUN Selector

This selector button permits a choice between continuous and intermittent machine operation. When the **RUN** mode has been selected and the **START** button is pressed momentarily, the machine will operate continuously at the speed set by the production dial. In the Jog mode, the machine will cycle only as long as the **START** button remains depressed at the speed set by the production dial.

- Run Mode - Machine will operate when the START button is pressed.
- Jog Mode - Machine will operate only while the START button is pressed and held.

2.1.5 Speed Control Module Connector

The Speed Control Module connector is used for production systems that have the universal Speed Control option installed. A Master Speed Control module, shown in *Figure 2-2*, plugs into this connector and is used to set the speed of the entire production line. At any given time, only one of the master control modules can be plugged into any given unit in the production line.

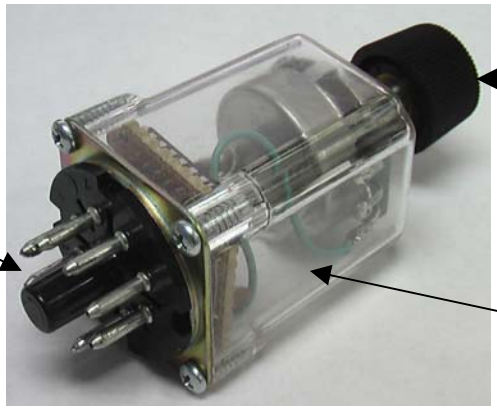


Figure 2-2: *Master Speed Control Module*

2.1.6 POWER Rocker Switch (Main Power)

Located on the far right of the instrument panel and labeled **POWER**, this switch turns on main power for the entire system (including the head when the **HEAD** switch is ON). When this switch is turned ON, it will illuminate. The switch is also equipped with a circuit breaker to protect against overload conditions. It is rated at 15 A (120 VAC). In order to operate the Tabber simply as a transport base with no tabbing or labeling operation, the POWER rocker switch must be in the ON position and the HEAD rocker switch must be in the OFF position. A normally closed relay bypasses the stop signal from the HEAD when the HEAD switch is off enabling the base to simply be used as a transport base. When the HEAD switch is ON, the NC relay becomes energized, opens,

and will pass on the stop signal from the Tabber Head whenever a stop or OFFLINE condition exists.

2.1.7 HEAD Rocker Switch (Head Power)

Located to the right of the **POWER** switch, the **HEAD** switch supplies power to the tabbing head. When this switch is turned ON, it will illuminate. The switch is also equipped with a circuit breaker to protect against overload conditions. It is rated at 15 A (120 VAC).

2.1.8 Production Speed Regulation Dial

The production speed regulation dial is the knob located to the right of the machine pushbuttons. This dial permits machine speed adjustment. A clockwise rotation of the speed dial corresponds to a speed increase. Conversely, a counter-clockwise rotation results in a speed decrease. The speed range is from 0 ft/min (0) to 600 ft/min (10) for the transport base.

2.1.9 Tabber Connection Receptacle Panel

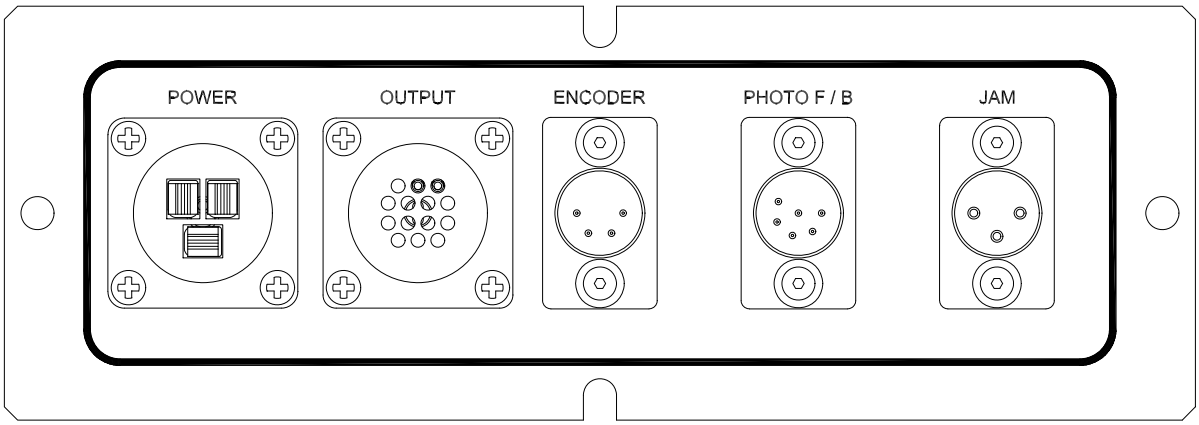


Figure 2-3: *Receptacle Panel*

The receptacle panel shown in Figure 2-3 provides electrical connections to the Tabber/Labeler head from the transport base. This section describes the function of each connection.

2.1.9.1 Power Receptacle

The **POWER** receptacle provides power to the Tabber/Labeler head. It is connected to the head power receptacle using cable P/N 9101657A.

2.1.9.2 Output Receptacle

The output receptacle is connected to a stop relay on the transport base that stops the base and head when a safety sensor is triggered. It is connected to the head **I/O** receptacle using cable P/N 9101656A.

2.1.9.3 Encoder Receptacle

This receptacle provides communication from the encoder ENC+ and ENC- signals. It is connected to the head **Encoder** receptacle using cable P/N 9101658A.

2.1.9.4 Photo F/B receptacle

This receptacle is connected to the front and back photo sensors on the transport base. It is connected to the head **Photo F/B** receptacle using cable P/N 9101659A.

2.1.9.5 Jam Receptacle

This receptacle is connected to the base jam switch and the upper transport sensor. ***It must be connected*** for the Tabber/Labeler to function. It is connected to the head jam receptacle using cable P/N 9101660A.

2.2 Upstream and Downstream Installation Instructions

The upstream and downstream installation instructions comprise all the information necessary to properly integrate the Tabber/Labeler system with upstream and downstream equipment such as inkjet systems, feeders, flipover units, and conveyors. Essentially there are two steps to a successful integration. They are proper alignment of the base with the upstream and downstream equipment for proper material handling and integration of the electrical system via the Base Control Board (p/n 9102380) to coordinate the control of all equipment in the system. Note that the proper interconnect cable, listed in *Table 2-1*, must be used depending on the system's configuration.

Table 2-1: *BK730-2 Upstream/Downstream Integration*

Upstream	Downstream	Cable Required (Buskro P/N)
BK425 (Shuttle Feeder) BK460 (Inline Base – Series 4) BK660 (Inkjet Base) BK76IB BK7IB (Inline Base – Series 7)	BK730-2	9102083A
BK730-2 (Tabber/Labeler)	BK460 BK730-2 BK76IB BK7IB	9102083A
BK720 (Friction Feeder)	BK730-2	9101814A

2.2.1 Physical Alignment of Upstream/Downstream equipment

These instructions describe the physical alignment of the tabbing system with upstream or downstream equipment:

1. Place the BK730-2 next to the upstream/downstream equipment. Position the systems so that their centers are inline with one another. Also, move the systems as close as possible to each other (approximately ¼" or 5 mm from the infeed or outfeed rollers).

2. Adjust the height the height of the Tabber base by individually turning each of the four mounting legs in a clockwise manner using a 1-1/8" wrench. Ensure that the system is level and that the tabletop of the BK730-2 is equal to or slightly below the tabletop of the upstream equipment and equal to or slightly higher than the tabletop of the downstream equipment. Tighten the locking nuts on the legs when the system is correctly aligned.

2.2.2 Electrical Connection to Upstream/Downstream equipment

In order to connect upstream and downstream equipment electrically to the BK730-2, the proper interconnect cable is required. This information is listed in Table 2-1. Once the proper interconnect cable has been identified, it must be plugged into the proper receptacles on the BK730-2 and the upstream/downstream equipment. Once this step has been completed, the DIP switches on the Base Control Board must be configured (**Section 2.2.3**) based on how the integrated system should operate.

In the case where additional systems are connected upstream to the Tabber, the interconnect cable must be connected to the upstream receptacle on the left side of the BK730-2 base (**Section 1.5**). The opposite end of the cable must then be connected to the downstream connector of the upstream system.

In the case where additional systems are connected downstream to the Tabber, the interconnect cable must be connected to the downstream receptacle on the right side of the BK730-2 base (**Section 1.5**). The opposite end of the cable must then be connected to the upstream connector of the downstream system.

2.2.3 The Base Control Board (p/n 9102380A)

The Base Control Board was designed as a universal control board for all Buskro machines enabling control signals to be communicated with multiple modules in a production system. It can also be easily integrated with third party equipment. The board is illustrated in *Figure 2-4* highlighting the DIP switches. A more detailed view is available in appendix B.

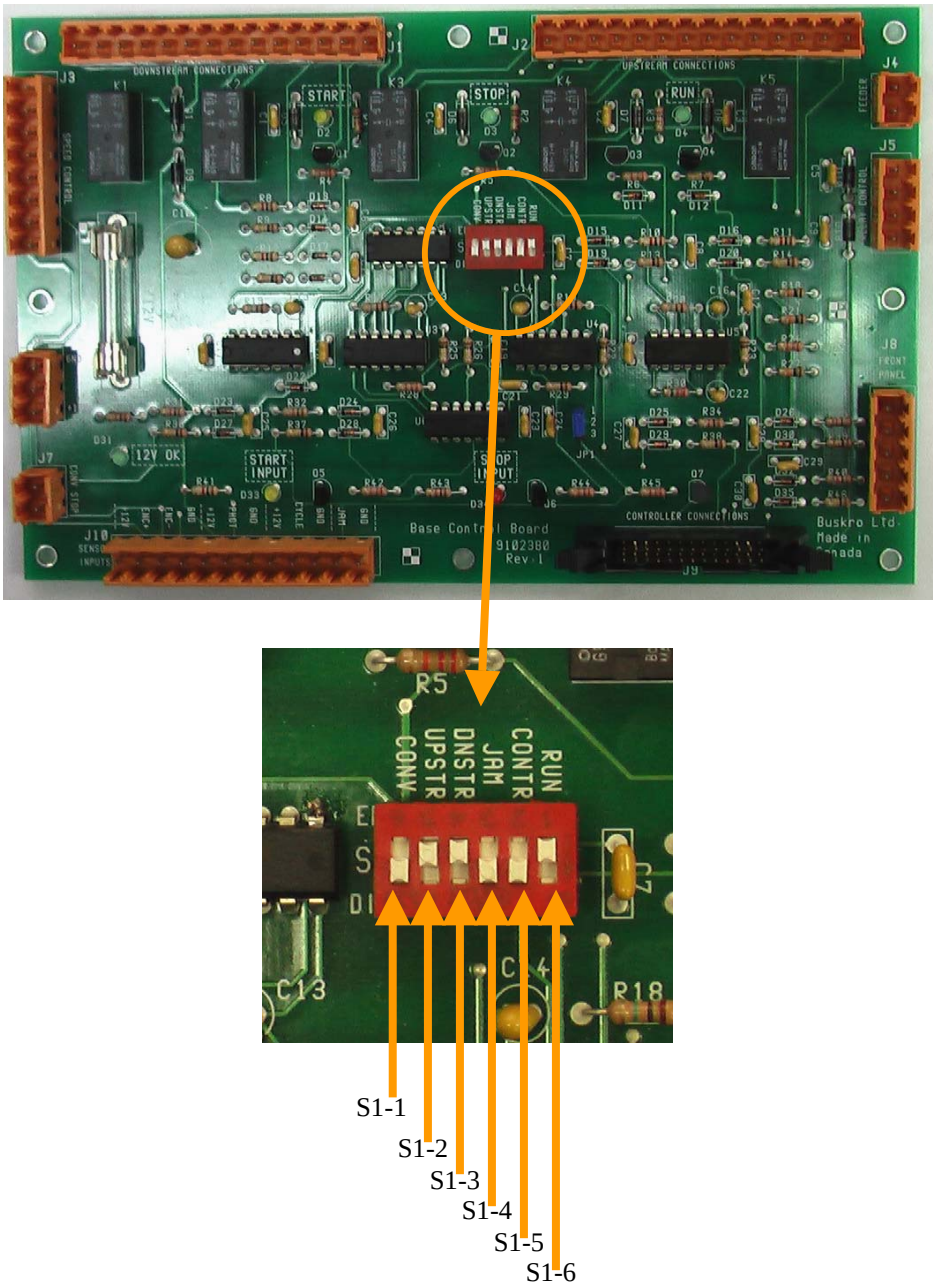


Figure 2-4: The Base Control Board (p/n 9102380A)

The Base Control Board can be configured via the 6 DIP switches on DIP S1. These switches are used to enable or disable communication of a CONVEYOR stop input signal (switch S1-1), UPSTREAM stop input signal (S1-2), DOWNSTREAM stop input signal (S1-3), JAM stop input signal (S1-4), CONTROLLER stop input signal (S1-5), and a RUN signal which is passed on to upstream equipment (S1-6). These features can be turned on or off at the customer's discretion depending on how they want their system to function. The DIP configuration switches allow the unit to eliminate the need for Stop inputs in those machines and/or configurations where they may not be used. It is important to note that any external STOP input can be disabled, the only one which cannot be disabled is the front panel STOP switch.

A red "STOP INPUT" light on the board means that it is receiving a STOP input (i.e. the input sees an open contact!). The machine cannot start and it will not send a START signal to other equipment as long as it receives a STOP input. If there is a constant STOP light, disable the 5 STOP inputs (S1-1 to S1-5) on the control board one by one until the red light goes off; then you have found the input which is causing the stop condition.

The "Rule of Thumb" for the board is if a STOP input closure is not supplied (i.e. there is no equipment to supply it), then the input must be disabled, otherwise it should be enabled. Note that the five STOP Enable/Disable sections of the DIP switch will only disable the STOP inputs and **NOT** the START inputs. The board is looking for a contact closure for a START input and a contact opening for a STOP input. This is in keeping with "fail-safe" philosophy which dictates that a disconnect or a power failure in any part of the system results in the entire system stopping operation.

All START inputs need an open contact to close to activate a Start, while all STOP inputs need a closed contact to open to trigger a stop condition. Thus, a lack of input for a start means no start action, while the lack of a closed contact for a STOP input means that there is a problem and the system should stop. Therefore non-existent STOP inputs must be disabled for proper operation.

Note that all input signals used in the unit are at a 12 VDC level (1kOhm pull-up to the +12 VDC supply), looking for a dry contact (STOP and START **from** other machines), while the unit provides dry contacts for those signals coming from other machines (STOP and START **to** other machines). The only exception is the drive output to the heater control which supplies a switched +12 VDC and Ground to activate the relay in the Heater Units.

Table 2-2 shows the options and explains the implications:

Table 2-2: *Base Control Board DIP Switch Settings*

Configuration	**Explanation**
S1-1 (CONV)	Enables or disables a STOP signal from the conveyor. If no conveyor is used in the system, the switch should be set to “disabled”.
S1-2 (UPSTR)	Enables or disables a STOP signal from an upstream machine. If no upstream equipment is used in the system, the switch should be set to “disabled”.
S1-3 (DNSTR)	Enables or disables a STOP signal from a downstream machine. If no downstream equipment is used in the system, the switch should be set to “disabled”.
S1-4 (JAM)	Enables or disables a STOP signal from the JAM sensor. If no JAM sensor is used in the machine, the switch should be set to “disabled”.
S1-5 (CONTR)	Enables or disables a STOP signal from the control computer. If no computer is used with the machine, the switch should be set to “disabled”.

S1-6 (RUN)	This switch is connected in parallel to the RUN Enable/Disable switch on the front panel. This switch enables or suppresses the upstream START signal. The function would be used for testing, when the operator wishes to start the machine, without starting the upstream section of the system. For machines which have a front panel switch, S1-6 should be open (=enabled) to enable the operation of the front panel switch, otherwise it should be closed (=disabled).
JP1	Determines how the board handles a JAM input and the effect of S1-4. For some applications it is desirable to suppress the STOP signal from the JAM sensor, but to still report the condition to the control computer. In this case, selection 1-2 should be used at jumper location JP1. If no control computer is connected, either position may be used, with 1-2 preferred. 1 – 2: Jam signal is ignored by the board, but still passed on to the control computer. 2 – 3: Jam signal is ignored by the board, and not passed on to the control computer.

2.2.4 The Speed Control Board (p/n 9102421)

The Speed Control Board (p/n 9102421) is a new option for Buskro systems enabling the speed of an entire production line to be controlled from a single location regardless of the number of subsystems involved. It is intended for the integration of systems with two or more separate pieces of equipment. In order for this feature to work, each individual subsystem, whether it is a Buskro unit or third party equipment, will require:

- the Speed Control Board (p/n 9102421) as shown in *Figure 2-5*
- A Buskro approved encoder (6000 PPR)
- Production speed potentiometer

- Purchase, installation, and calibration of these components must be completed by qualified Buskro Ltd. Technicians
- On a third party unit, some rewiring or modifications may be required to derive and communicate the required signals

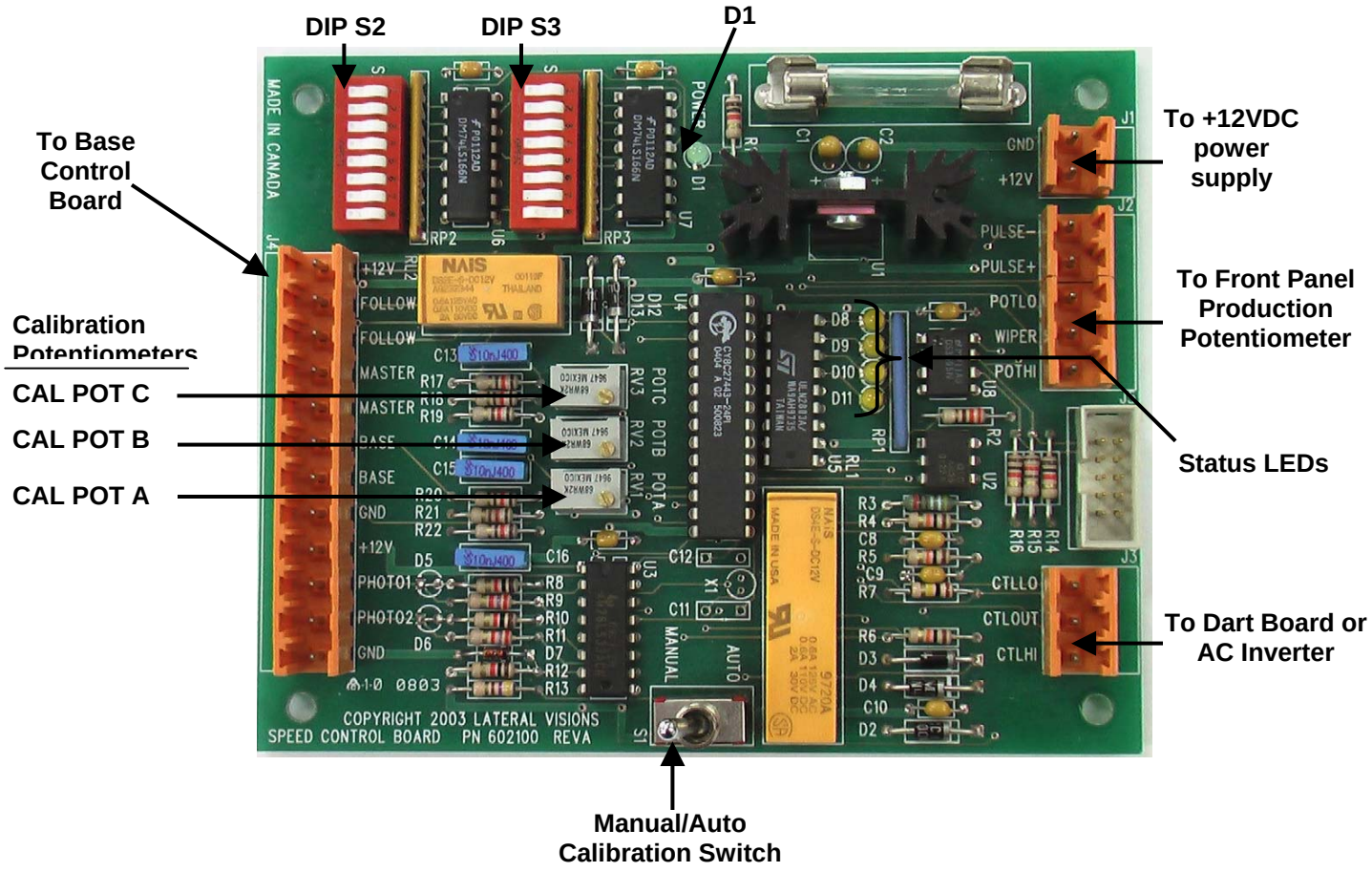


Figure 2-5: *The Speed Control Board (p/n 9102421)*

The universal speed control feature is beneficial because it allows operators to control the production throughput for their application, regardless of the number of modules, from a single location. This reduces job setup time and allows for operational changes to be

made “on the fly”. This type of control enables end users to modify the system’s speed without having to worry about incorrectly setting the speed of upstream or downstream equipment due to the intelligence built into the solution.

Historically, operators were required to adjust the speeds of each individual unit in the production line separately to achieve a desired throughput. Depending on the complexity of the system, this can be a challenge due to material handling and material transport requirements.

Since this is an option, every Buskro Tabber base will come pre-wired from the factory for use with a Speed Control Board by using a pass-thru Dummy Speed Control Board (p/n 9103875). This “dummy” board allows for all of the required electrical connections to be installed without affecting system operation.

Such a design methodology is consistent with Buskro’s vision for versatility as customer requirements change and grow. At any point, a Speed Control Board can be purchased from Buskro Ltd. and installed to replace the Dummy Speed Control board to enable the features. The dummy board is illustrated in *Figure 2-6* as a reference.

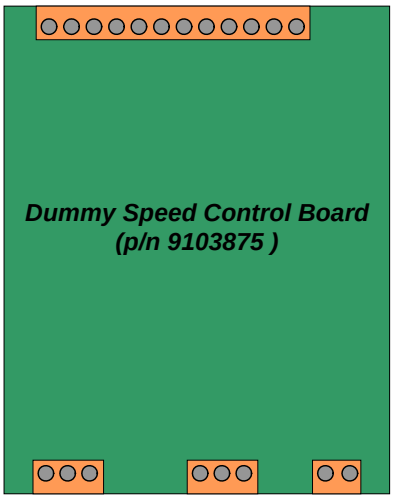


Figure 2-6: *Dummy Speed Control Board*

2.2.4.1 Dip Switch Settings

The Speed Control Board has two 8 position DIP switches used to configure its operating mode based on the system's setup requirements and position in the Production line. *Table 2-3* and *Table 2-4* list the switch assignments for DIP S2 and S3 respectively.

Table 2-3: *DIP switch setting definitions for DIP S2.*

Switch Position(s)	Description	
Position 1	On if Photo 1 is Normally Closed	
Position 2	On if Photo 2 is Normally Closed	
Position 5, 6	Feedback Encoder Resolution as follows	
	5:6 = Off:Off	660 DPI
	5:6 = On:Off	600 DPI
	5:6 = Off:On	Not Used
	5:6 = On:On	Not Used
Position 7, 8	Follower Encoder Resolution as follows	
	7:8 = Off:Off	660 DPI (Or for last Transport)
	7:8 = On:Off	600 DPI
	7:8 = Off:On	Not Used
	7:8 = On:On	Not Used

Table 2-4: *DIP switch setting definitions for DIP S3.*

Switch Position(s)	Description
Position 1	On to calibrate for 0 m/s
Position 2	On to calibrate for 1 m/s
Position 3	On to calibrate for 17 inch pitch
Position 4	On for "Follower" operating mode
Position 5	On for "Gap Control" operating mode
Position 6	Not Used
Position 7	Not Used
Position 8	On for "Master Follower" operating mode
Note: Only 1 switch can be enabled at any given time for DIP S3.	

2.2.4.2 Auto/Manual Switch

The Auto/Manual switch enables the operator to bypass the speed control board and to operate the machine as if the board were not installed. This enables a supervisor or operator to quickly swap a Tabber between systems which have speed control and others which do not. The Auto configuration will enable the speed control option whereas the manual setting disables it. The switch is a toggle switch near the edge of the board.

2.2.4.3 LED Assignments

The Speed Control Board has four yellow status LEDs and *Table 2-5* defines what each LED represents depending on whether they are ON or OFF. There is also one green status LED, D1, used to indicate that power is being supplied to the board.

Table 2-5: *Status LED indicator definitions.*

LED	Description
D1	Indicates 12 VDC is being supplied to the board when on
D8	Off if the speed reported by the encoder is less than 0.05 m/s
	On if the speed reported by the encoder is greater than 0.05 m/s
D9	Off if the speed reported by the encoder is less than 1 m/s
	On if the speed reported by the encoder is equal to 1 m/s
	Blinks if the speed reported by the encoder is greater than 1 m/s
D10	On if Photo 1 is blocked
D11	On if Photo 2 is blocked

2.2.4.4 Speed Control Board Calibration

Before it can be used, the Speed Control Board must be calibrated to the base whose speed it will be controlling. The following is a mandatory step-by-step calibration procedure to be performed on every system requiring the speed control option. It is important to note that only one of the DIP switches on S3 can be enabled during normal operation.

1. Switch the Speed Control Board **Auto/Manual** switch to **Manual**. Set the **Production Pot** on the transport base to its minimum setting and start the transport

base. Rotate the **MIN** pot on the DART Controller so that the transport moves at about 0.05 m/s. LED D8 will turn off when the speed drops below 0.05 m/s.

2. Switch the Speed Control Board **Auto/Manual** switch to **Auto**. Set the **S3 DIP Switch** on the Speed Control Board to ***Calibrate 0.0 m/s Mode (Position 1 On).*** Start the base and rotate the **POTA** pot on the Speed Control Board so that the transport moves at about 0.05 m/s. LED D8 will turn off when the speed is below 0.05 m/s.

    - **Note:** If the Base is a Feeder that is not equipped with an encoder, **POTA** should be adjusted so that the Feeder operates at a ***'crawl'***.

3. If the base is equipped with an encoder…

    - Set the S3 DIP Switch on the Speed Control Board to *Calibrate 1.0 m/s Mode (Position 2 On).*

    - Start the Base and rotate the POTB pot on the Speed Control Board so that the transport moves at 1.0 m/s. LED D9 will turn on solid when the speed is at 1.0 m/s, and it will blink if the speed is greater than 1.0 m/s.

4. If the Base is a Feeder, and Gap Control will be used …

    - Set the S3 DIP Switch on the Speed Control Board to *Calibrate Pitch Mode (Position 3 On).*

    - Start the Base and rotate the **POTC** pot on the Speed Control Board so that the Feeder feeds at 2 cycles per second. This corresponds to a 20 inch pitch when feeding onto a transport moving at 1.0 m/s.

5. Set the **S3 DIP Switch** on the Speed Control Board to the desired operating mode as follows:

- If the Base is a Feeder, and Gap Control is the desired operating mode, turn **S3 Position 5** on with all others off.
- If the base is the last transport in the system turn **S3 Position 8** on with *all others off.*
- If the base is other than the last transport in the system turn **S3 Position 4** on with *all others off.*

2.3 Product Setup Instructions

The product setup instructions must be followed in order to ensure smooth product flow and tab-wrap quality. Included is information pertaining to the lateral positioning of the BK730-2 table for edge selection, adjustments for various product thickness, setting of the skidbar for smooth product conveyance, and upper transport height adjustment for excellent tab wrapping results. In addition, the instructions will cover the setting of the relative transport speed to ensure smooth product transfer between the BK730-2 and the upstream system.

All tabbing head mechanical adjustments and control settings will be covered in **Chapter 3.0**. These instructions will cover the mechanical positioning of the tabbing head, tab spool threading, leveling the tabbing head, and tab application.

2.3.1 To adjust the base speed for smooth product transfer

In order to prevent product buckling at the entry of the BK730-2 transport, it is important that the BK730-2 speed be slightly faster than the upstream delivery equipment. As a result, set the BK730-2 transport base so that it is slightly faster than the transport speed of the upstream equipment. In addition, ensure that the gap between the product pieces on the transport base is between 1 to 2 inches (25 to 50 mm). If the gap is too small, it may result in inconsistent tabbing and may result in unnecessary product jams.

2.3.2 Skidbar and Material Side Guide Adjustments

Proper adjustment of the skidbar assembly and material side guides will permit dependable and accurate feeding of the conveyed products. These parts work together to ensure that the mail pieces are correctly registered against the material guide as they are conveyed on the BK730-2 tabletop. The function of the base's transport section is to re-align and register any product that may be delivered in a skewed fashion from the upstream equipment so that when the tabbing head places a tab on the product, it will be correctly and accurately placed. If a product is not registered and aligned properly, the tab and label positioning becomes inconsistent and unacceptable.

The function of the skidbar is to ensure positive product conveyance by forcing the product against the table transport belts. In order to correct product skew from upstream equipment, the BK730-2 uses biased transport belts as well as material guides which act as registration bars. The position of the material guides can be adjusted using the edge selection handwheel (Figure 2-7).

In order to adjust the skidbar to accommodate different product thickness, the following should be completed (reference Figure 2-8):

1. Loosen both skidbar handles and raise the skidbar away from the transport belts.
2. Place a product completely under the skidbar.
3. Lower the skidbar onto the product until the skidbar's ball bearings contact the upper surface of the mailpiece and pressure is applied.
4. Hold the skidbar down on the product and retighten both skidbar handles
5. Verify that the mail piece can be easily transported by the belts and does not get stuck at any point on the tabletop. If the product does get lodged, readjust the skidbar assembly. Also ensure that the skidbar assembly is level.

For certain types of products, some of the ball bearings may have to be removed to prevent product buckling at the entry of the base. In order to do this:

1. Place a product under the skidbar until its ***trailing edge*** is fully engaged by the skidbar.

2. Loosen and remove the thumbscrews holding the ball retention plate.
3. Remove all the ball bearings contacting the surface of the product. If a ball bearing just makes contact with the piece at its ***leading edge***, it may be left in place.
4. Replace and tighten the ball retention plate against the ball bearings by turning the thumbscrews in a clockwise fashion.

Note: An improper skidbar adjustment may cause inconsistent transportation of the product. If the skidbar slows the product significantly, the tab positioning will be inconsistent and/or the piece will become trapped in the transport section.

If sufficient ball bearings are not removed when required, buckling of the mailpiece may occur. Ensuring the BK730-2 transport speed is faster than the speed of the upstream equipment will also help to minimize this problem.

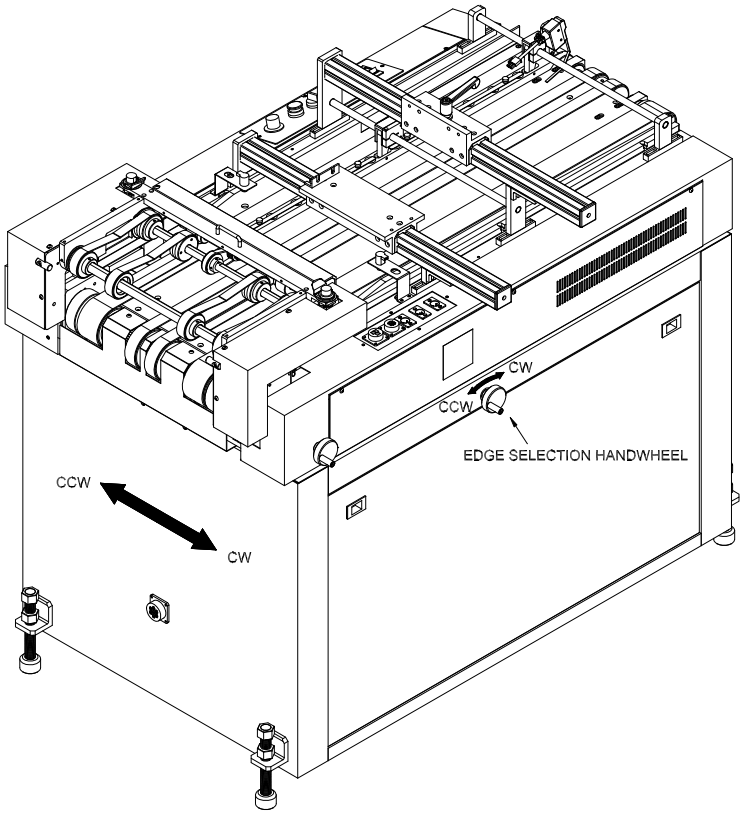


Figure 2-7: *Rear of BK730-2 showing the edge selection handwheel*

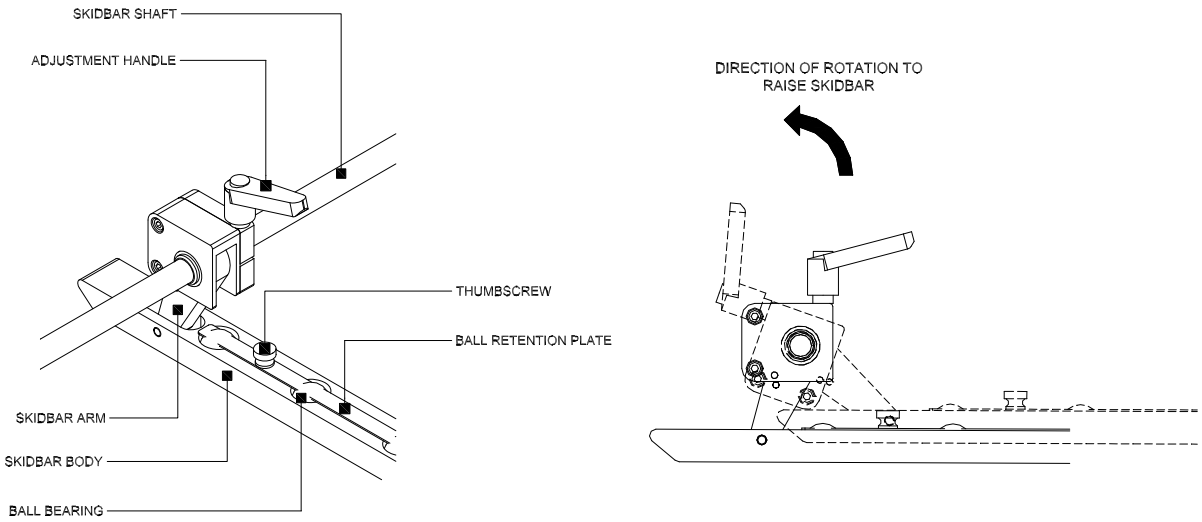


Figure 2-8: *Skidbar adjustment for height adjustment*

To select tabbed edge using the edge selection handwheel (Figure 2-9):

1. Determine the side that the product needs to be tabbed or labeled.
2. For a back side tab placement, rotate the edge selection handwheel counter-clockwise (CCW) until the product is delivered within 1/8 to 1/4" (3 to 6 mm) from the back registration rail at the entry point. Ensure that the product makes contact with the back registration rail prior to passage past the tabbing head peel point.

- OR -

3. For a front side tab placement, rotate the edge selection handwheel clockwise (CW) until the product is delivered within 1/8 to 1/4" (3 to 6 mm) from the front registration rail at the entry point. Ensure that the product makes contact with the front registration rail prior to passage past the tabbing head peel point.

Note: Tight registration at the entry point may cause the occasional skewed product to jam against the registration rails.

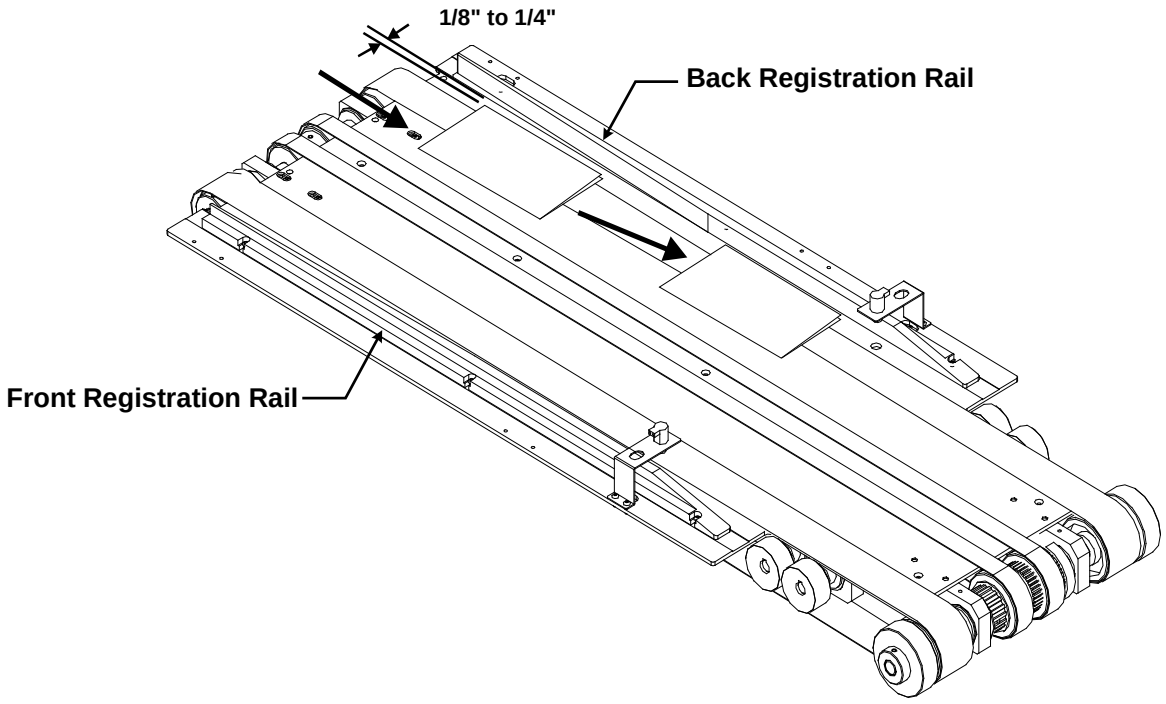


Figure 2-9: *Product flow showing desired infeed gap at entry of the registration rails*

2.3.3 Product Thickness Adjustment (Upper Transport)

When feeding a new product, it may be necessary to adjust the upper transport assembly and the Tabber/Labeler head peel point assembly to accommodate the product's thickness. Adjustment to the upper transport is made by rotating the product thickness handwheel (Figure 2-10). The tabbing head peel point assembly also needs to be moved up or down to accept different product thickness. Proper thickness adjustment will ensure that the product is tabbed and conveyed in the tab-wrap section without skewing.

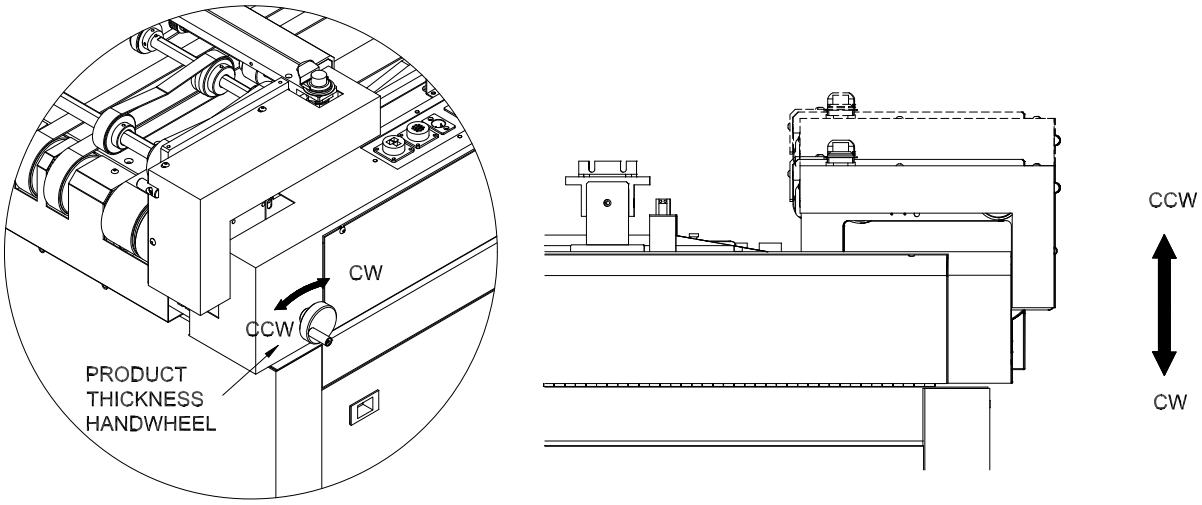


Figure 2-10: *Product Thickness adjustment*

In order to adjust the height of the upper transport:

1. Close the upper transport (it should be latched in place).
2. Raise the upper transport assembly sufficiently to allow free passage of the product by rotating the product thickness handwheel counter-clockwise (CCW).
3. Place the product between the upper transport assembly's outfeed rollers and the table belt outfeed rollers.
4. Lower the upper transport assembly such that the product is snuggly held between the rollers in step 3. Do this by rotating the product thickness handwheel in a clockwise (CW) fashion. Perform a test by pulling the mailpiece to see if it is snuggly held. Be careful not to put too much pressure on the mailpiece because it can cause the upper transport belts to fall off the rollers or product skew.

Note: Lowering of the upper transport assembly is accomplished by rotating the product thickness handwheel clockwise (CW). Conversely, a counter-clockwise (CCW) rotation of the handwheel will raise the upper transport assembly.

2.4 Advanced Setup Instructions

These instructions comprise all the adjustments necessary to optimize the operation of the tab-wrap section for trouble-free operation and superior tab-wrap quality. Careful attention and diligence should be used when performing these adjustments since even the slightest movement will result in dramatically different results. If you are unsure of the instructions in this section, please contact your service representative to ensure your system is optimized.

The following instructions discuss how to setup the lower pinch rollers and the tab crease rollers. The Tabber/Labeler is equipped with an identical set of rollers and form plate on both sides of the base for both left and right tabbing capabilities, hence the instructions must be repeated for both sides to ensure consistent operation regardless of which side is used during normal operation.

2.4.1 Crease and Pinch Roller Adjustment

The purpose of the crease and pinch roller combination (Figure 2-11) is to initiate the tab wrap-forming process. The crease roller folds the protruding portion of the tab along the edge of the product with the pinch roller acting as an anvil. It is vitally important that the outer forming side of the pinch roller be closely aligned to the product edge registration line in order to produce a crisp fold line close to the product's edge. When adjusting these rollers, the pinch roller setting should be done first, followed by the crease roller setting.

The gap setting between the crease and pinch rollers is critically important as it determines the crispness and tab fold location with respect to the edge of the product. This ultimately determines the quality of the tab-wrap. If the crease roller is too far away from the pinch roller and the gap is too large, the tabs will skew since the pressure

between the two rollers is uneven. Conversely, a tight gap setting will cause the crease roller to act as a knife shearing the tab into two pieces.

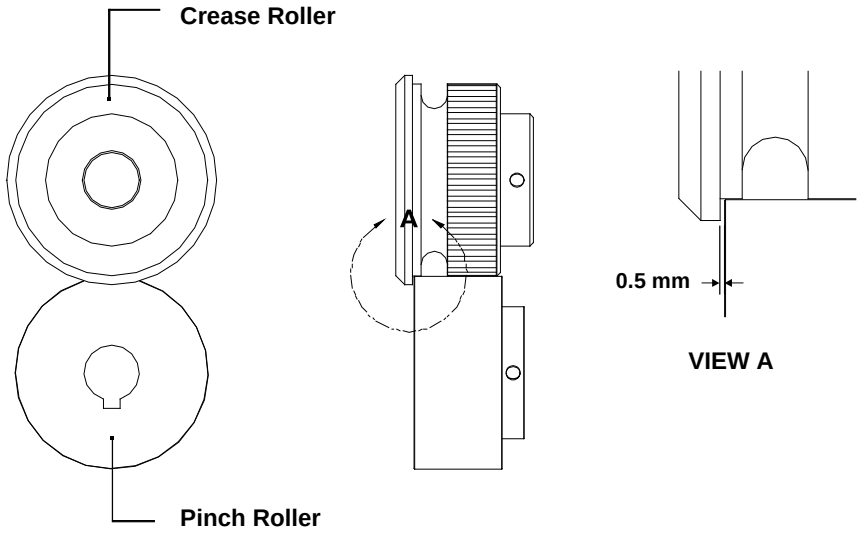


Figure 2-11: *Crease/Pinch Roller Combination*

To set the pinch rollers:

The objective of this adjustment is to align the outer edge of the pinch rollers with the material side guides to ensure that the tab fold produced by the crease roller is as close to the product's edge as possible.

1. Move the tabbing head peel point away from the front side's pinch rollers.
2. Obtain a clear, unobstructed access to the pinch rollers by pivoting the upper transport assembly upwards.
3. Place a ruler or a straight edge against the front material guide's inner edge as per Figure 2-12.
4. Loosen the 10-32 UNF set screw of both of the front side's pinch rollers using a 3/32" hex key ensuring that they are free to move laterally on the shaft. This setscrew is located on the roller's shoulder.
5. Grip the first pinch roller and move it until its outer edge aligns with the ruler. Secure it on the shaft by re-tightening its setscrew. Repeat for the second pinch roller.
6. Repeat steps 3 to 5 for the pinch rollers situated on the rear of the Tabber/Labeler.

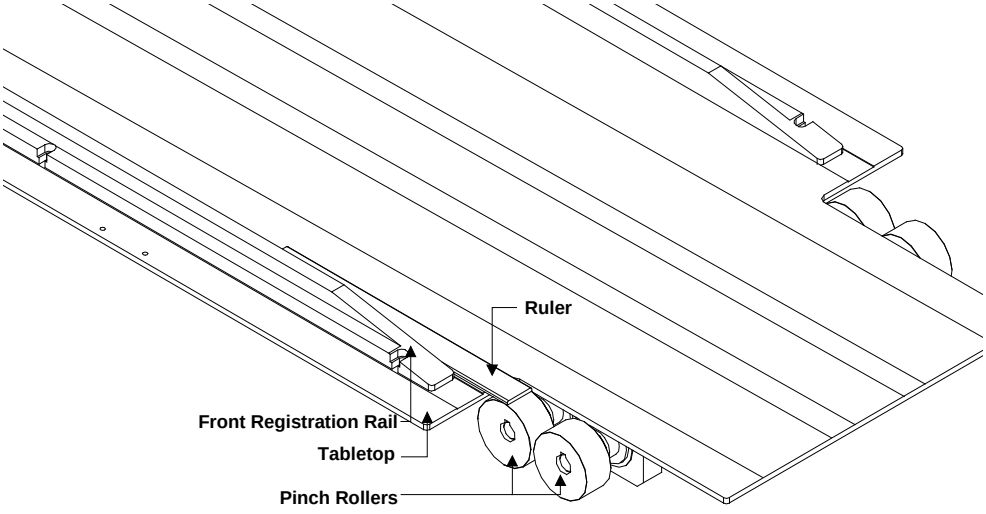


Figure 2-12: *Pinch Roller Alignment Method*

To set the crease roller:

1. Access the crease roller by lifting the plastic safety cover located on the Upper Transport Assembly (p/n 212735A).
2. Loosen the front crease roller's 10-32 UNF setscrew using a 3/32" hex key ensuring that it is free to move laterally on the shaft. This setscrew is located on the roller's shoulder.
3. Slide the crease roller towards the pinch roller until it can no longer advance due to interference with the pinch roller. Back the crease roller off slightly by gently nudging it. The best tabbing results are attained when the crease roller is set 0.02" away (0.50mm) from the pinch roller's edge (Figure 2-11). The gap can be set by placing a folded 20 bond piece of paper between the crease and pinch roller.
4. Secure the crease roller on the shaft by re-tightening its setscrew.
5. Repeat steps 2 to 4 for the rear crease roller.
6. Close the plastic safety cover.

2.5 Maintenance Schedule

The maintenance schedule table below applies to equipment operated daily on an 8-hour basis. If the equipment is to be used more frequently, the maintenance schedule must be adjusted accordingly.

Table 2-6: *Maintenance Schedule Table*

Period	Maintenance Function
Daily	Wipe table surface clean of paper, dust and other accumulated debris. Remove the front door and clean any debris that may have fallen into the machine. Remove any tabs that may have settled on the rollers, belts and form plates in the tab-wrap section. Use of Varsol will facilitate removal of any adhesive glue that has cured. Examine the table belts and rollers for wear. Replace if necessary.
Monthly	Grease gears accessible through the Outfeed Roller Cover (P/N 700537). See *Appendix A, drawing BKT730-2.* Special gear grease oil such as **Shell Capac Lube** is recommended.
Semi Annually	Remove the tabletop and examine all mechanical drive components including belts, shafts, bearings, and rollers for wear. Replace if necessary.

Note: Acquiring a small air compressor is recommended as compressed air is useful in removing debris.

Mechanical Adjustments

Chapter 3

3.1 Mechanical Adjustments

3.1.1 Tabber/Labeler Head Lateral Positioning

The Labeling head may be moved laterally in order to place labels on different locations of the product. The head rests on two aluminum extrusion rails, which permits easy lateral adjustment to achieve the desired labeling location.

During labeling operations, lateral positioning of the peel point must compensate for the label's width to ensure even label placement on the upper and lower side of the product. Lateral positioning of the head is accomplished by first loosening the head position lock handle (Figure 3-1) and then pushing or pulling the head in the desired direction. Once this is done, the lock handle is retightened to secure the head in place.

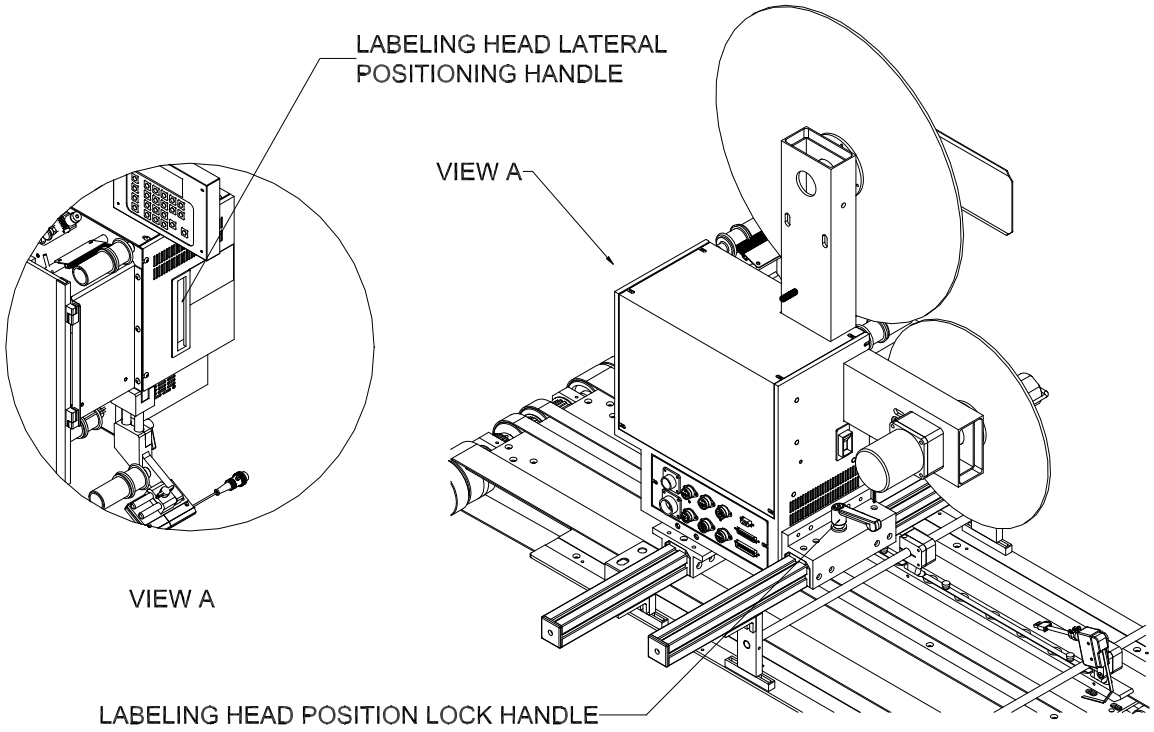


Figure 3-1: *Illustration of the Labeling head lateral adjustment*

Note: The product must trigger either one of the two product sensors at the front or rear of the base to enable tab dispensation.

Ensure that the correct product sensor (front or back) has been selected in the head controller to permit correct operation of the Tabber/Labeler (Section 4.2.1).

3.1.2 Peel Point Setup for Different Product Thickness

The peel point assembly needs to be adjusted whenever the product's thickness changes between jobs. The Labeler can handle material up to 1½" thick material.

In order to make adjustments for different product thicknesses:

1. Loosen the Peel Point Up/Down Position Lock Handle.
2. Pull the peel point and the suspension roller up approximately 4 mm from the top of the mail piece as shown in Figure 3-2 below.
3. Pull the mail piece in the direction shown to make sure that the mail piece is snuggly held between the suspension roller and the tabletop belt.
4. Lock the Peel Point Handle into position once the adjustment is made.

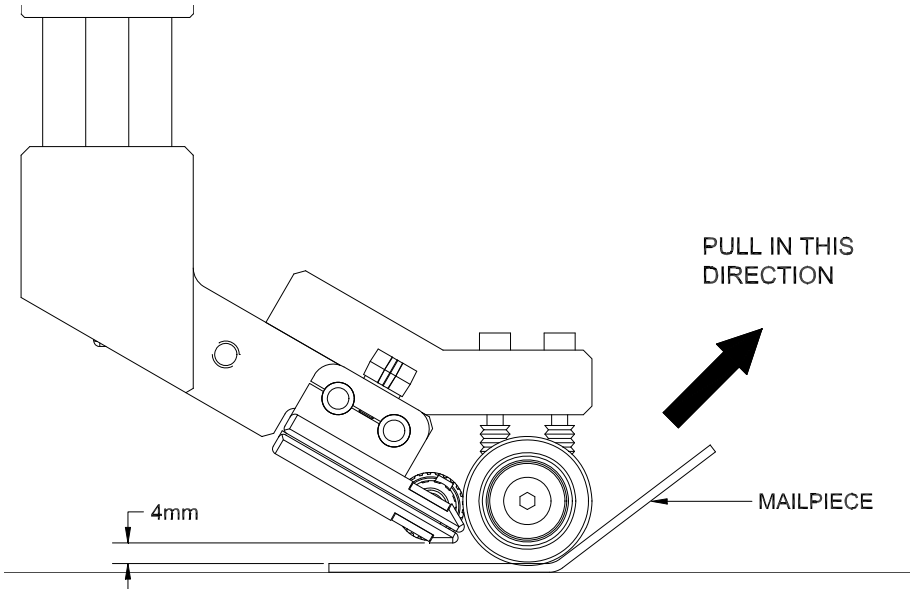


Figure 3-2: *Illustration of peel point adjustment for different product thickness*

3.1.3 Peel Point Lateral Adjustment

In order to accommodate a different range of label widths, the peel point lateral position will need to be setup appropriately. It is important to account for the label/tab width during setup for each job such that the center of the label/tab is always in line with the notch on the Peel Point Sensor. The notch indicates the location of the sensor electronics used to detect tabs/labels in the Peel Point Assembly. Lateral positions can be adjusted by loosening the lock knob as shown in Figure 3-3.

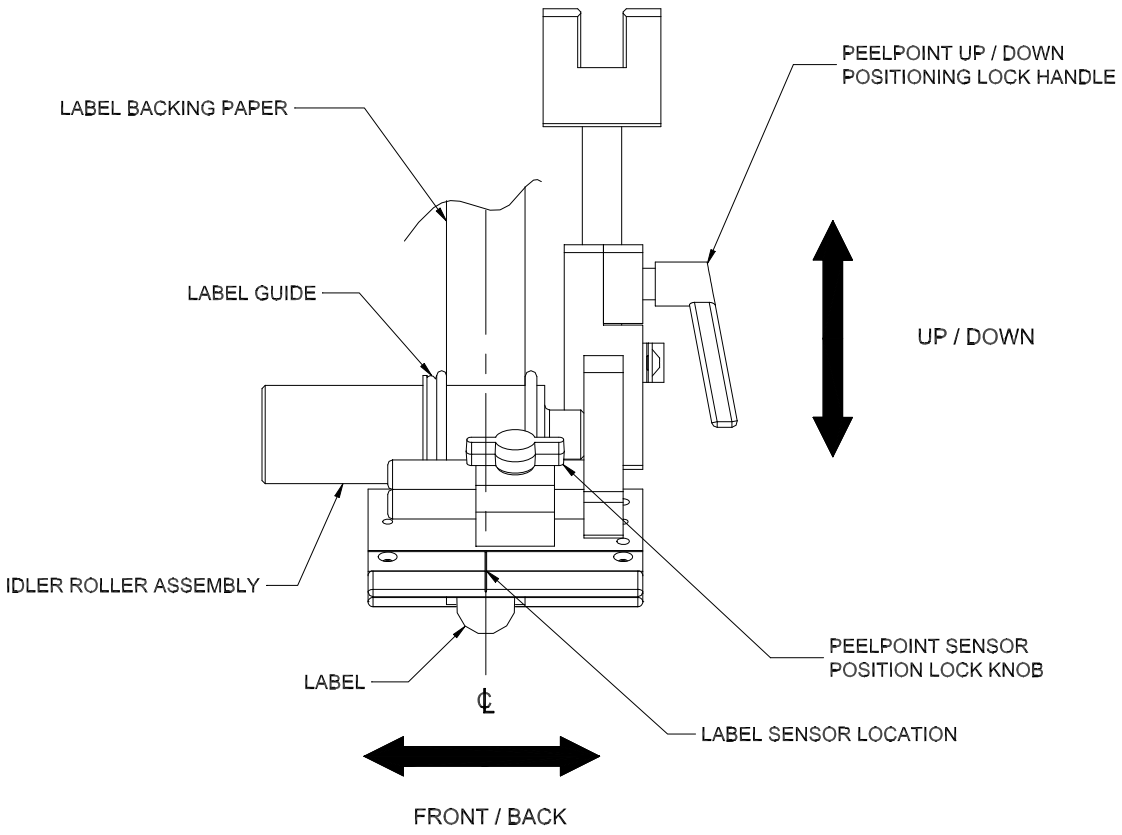


Figure 3-3: *Peel Point Assembly*

3.1.4 Label Spool Threading and Lateral Positioning

When initially loading on a new roll of labels, it is very important that the centerline of the labels are aligned to the sensor location on the peel point as shown in Figure 3-3. A groove line on the peel point indicates the label sensor location. This line must be placed at the center of the label. Labels that are sensed off-center will result in incorrect label placement on the product.

In order to properly thread the labels, the following instructions as well as Figure 3-4 should be referenced:

1. Load the roll of labels onto the despool roll. Despooling is done in a clockwise direction. Assemble the hub guide to the core to lock the roll of labels in place.

2. Pull back Pressure Roller 1 situated at the Despool Drive. The pressure roller should lock in an open position. Repeat for Pressure Roller 2.

3. Rotate the Brush Pivot Arm off Idler 2.

4. Create a leader in the label backing paper by removing the labels from the first 18 to 24 inches of the label roll on the despool roll. This is to avoid having to clean labels that are dispensed at the peel point during initial setup. Thread the leader into the head as shown in Figure 3-4.

5. Position each individual label guide on the idler rollers so that they can guide the label backing paper (see Figure 3-3). Ensure that they are not set too tightly.

6. Thread the label backing paper around the lock pin at the Take-Up roller. Rotate the Take-Up roller a few revolutions in a clockwise manner to lock the backing paper into place.

7. Ensure that the label backing paper is taut from the Despool Drive as shown in Figure 3-4 and then pull the release knob on Pressure Roller 1.

8. Ensure that the label backing paper is resting straight on the Label Drive Roller and then pull the release knob on Pressure Roller 2.

9. Rotate the Brush Pivot Arm clockwise in order to apply pressure against the label backing paper.

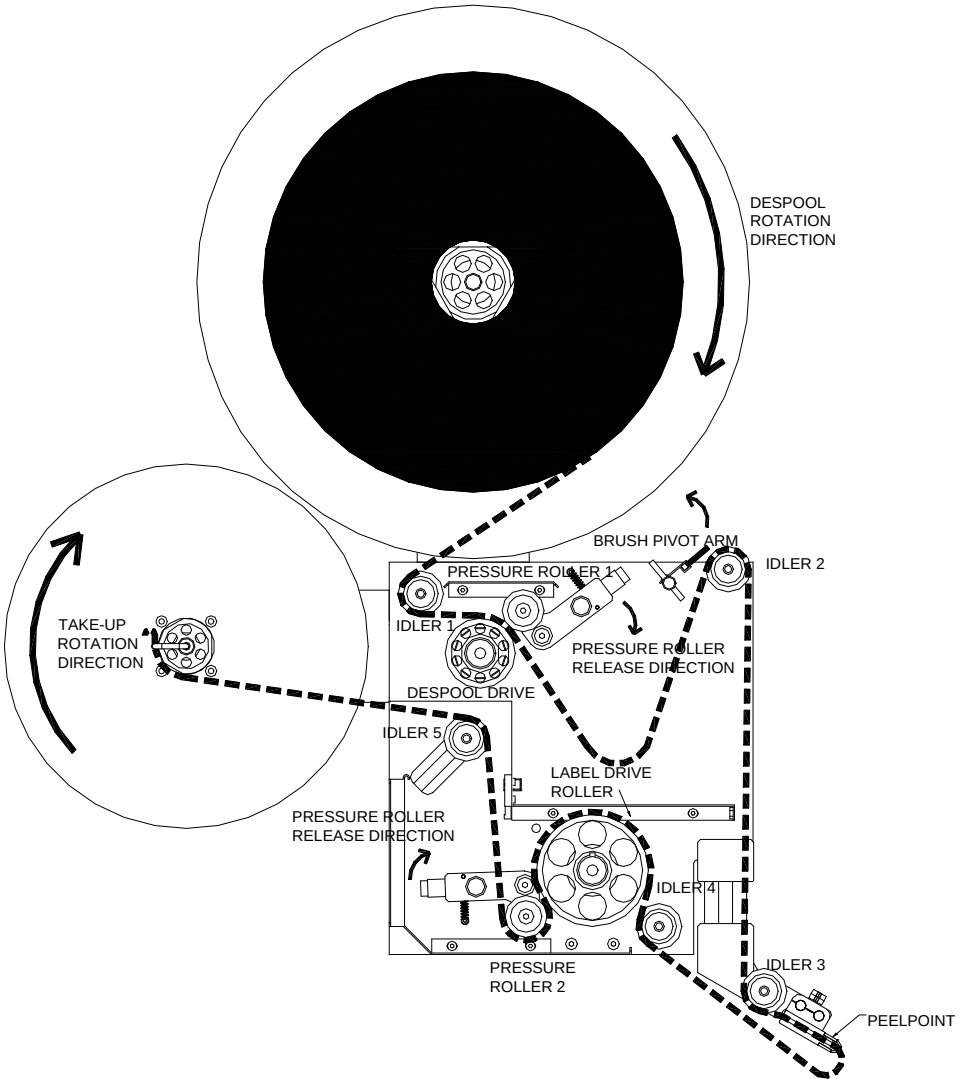


Figure 3-4: *Threading Path for the BK731-2*

3.1.5 Despool Brake Adjustment

The despool speed is controlled at the Despool Drive. At faster production speeds, the despool speed needs to be decreased to avoid tangling of the backer material. If there is too much tension which can occur if the despool drive is rotating too slowly, the backer material will tear. If there is not enough tension which can occur when the despool drive is allowed to run freely, the backer material can become tangled. The despool speed can be adjusted by turning the Brake Adjustment Knob as shown in *Figure 3-5*. A clockwise rotation of the knob will decrease its speed while a counter-clockwise rotation will increase speed.

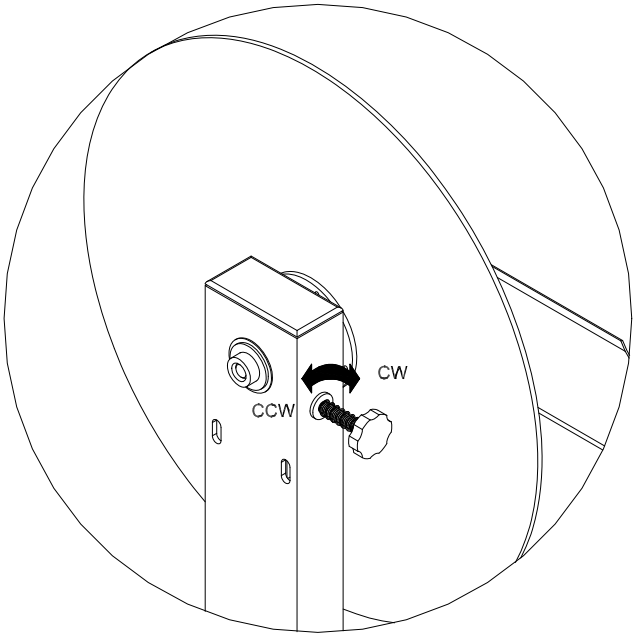


Figure 3-5: *Illustration of Despool Brake Adjustment Knob*

3.2 Labeler Connector Panel

The Labeler Connector Panel on the BK731-2 is the electrical interface for power, operator keypad interface, output signals, and sensor inputs that enable the head to operate.

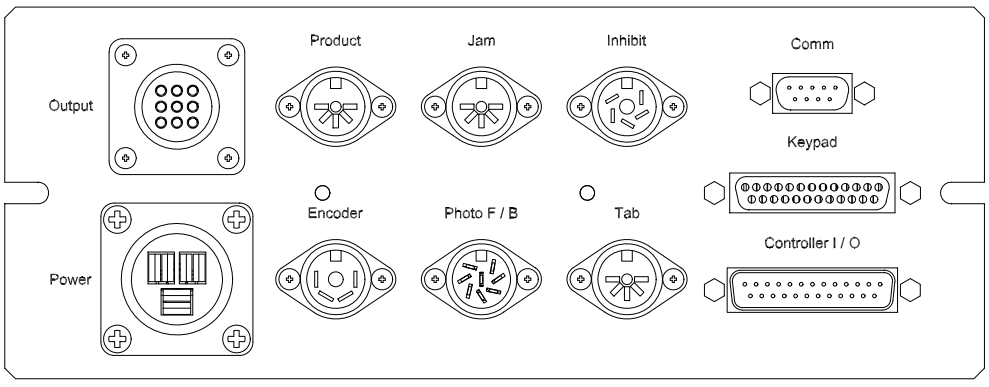


Figure 3-6: *Illustration of the labeler connector plate*

The various functions are listed in Table 3-1.

Table 3-1: *Labeler Connector Panel Functions*

Connector	Function
Output	Provides output signals (stop relay uses pins 1 and 2). Requires Connector (614125), contacts (614108), and cable clamp (614126).
Product	Connection for Photocue sensor (Reflective, Through-Beam, or Diffuse).
Jam	Connection for Jam switch
Inhibit	Used for future designs
Comm	Used for future designs
Power	Incoming Power (115 VAC)
Encoder	Connection for Encoder sensor
Photo F/B	Used on the BK730 base (for front *and* back Through-Beam sensors)
Tab	Connection for Tab Sensor in the Peel Point
Keypad	Connection for the Labeler Keypad
Controller I/O	Connection for Labelers mounted on a BK7IB

Note: The Product and Photo F/B cables cannot be connected simultaneously. One of these inputs is used in order to trigger the presence of materials on the transport base whether it is a BK730A-2 or third party equipment.

3.3 Wide Labeler Guidelines (BK731-2WL & UBK-731-WL)

This section provides guidelines for applying labels with backer materials up to 5” (127 mm) onto mail substrates such as envelopes and magazines. These tips apply for all Wide Label Systems including normal BK731-2 labeling heads that have been upgraded in the field via the UBK-731-WL field upgrade kit.

3.3.1 Importance of the Right & Left Side Guides

One of the critical requirements for Wide Label Tabber applications is to ensure that the mail piece or magazine being labeled does not skew in any direction before the label is applied. If the substrate does approach the Wide Label Peel Point Assembly (p/n 9103815A) at an angle, the applied label will also have a skew angle and its edges will not be parallel to that of the substrate. Furthermore, if each piece is transported with slightly different angles, there will be a significant piece-to-piece drift for the applied label position. This is due to the fact that the signal that determines when the label application process should begin is based on lead edge detection of mail pieces. Different angles with respect to the Right and Left Side Guides (p/n 212430 and 212431) for transported mail pieces can delay or accelerate detection of the physical mail piece resulting in inconsistent label positioning.

To ensure that the mail being labeled registers properly against the side guide, ensure that the feeding system transfers material onto the Tabber tabletop or third party equipment's tabletop such that its entire edge makes contact with the material side guide being used to register material with no resulting skew. The concept is illustrated in figure Figure 3-7.

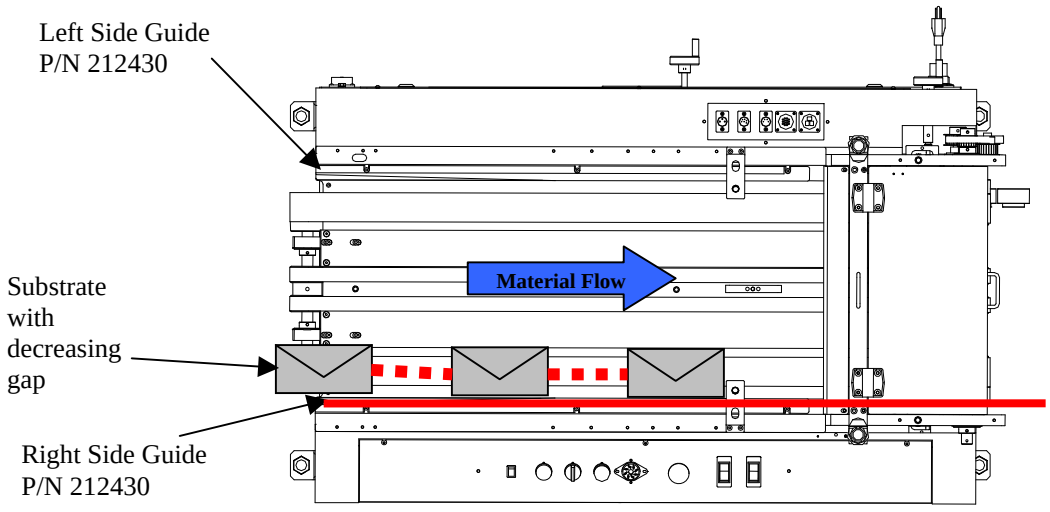


Figure 3-7: *Registration of mail/magazine pieces using the Right/Left Side Guide.*

3.3.2 The Tabber Skidbar Assembly

The Skidbar Assembly (p/n 330740A) is used to apply sufficient pressure onto conveyed mail and magazine substrates. It helps to register substrates against the Left and Right Side Guides by forcing the material to make proper contact with the directionally biased transport belts. This means that the belts will move material from the center of the tabletop towards one of the two side guides depending on whether operator side or non-operator side labeling is desired. If there is insufficient pressure along the entire length of the Skidbar Assembly, it is possible that the substrate can skew in an undesirable direction resulting in poor label positioning accuracy. A side view of the Tabber Skidbar Assembly is illustrated in Figure 3-8 as a reference. During setup of a job, it is important that the spacing between the tabletop and the ball bearings installed in the Tabber Skidbar Assembly is consistent along its entire length. If the ball bearings are closer to the tabletop at one end of the transport (say the upstream side) and higher at the other end, the material being conveyed will not be properly transferred to the label application and

sealing zone. If there is insufficient pressure, the material may also simply stop moving and get stuck on the tabletop. Alternatively, with a lack of consistent pressure along the entire length of the Skidbar Assembly, the substrate can slip and skew which will result in inaccurate label placement.

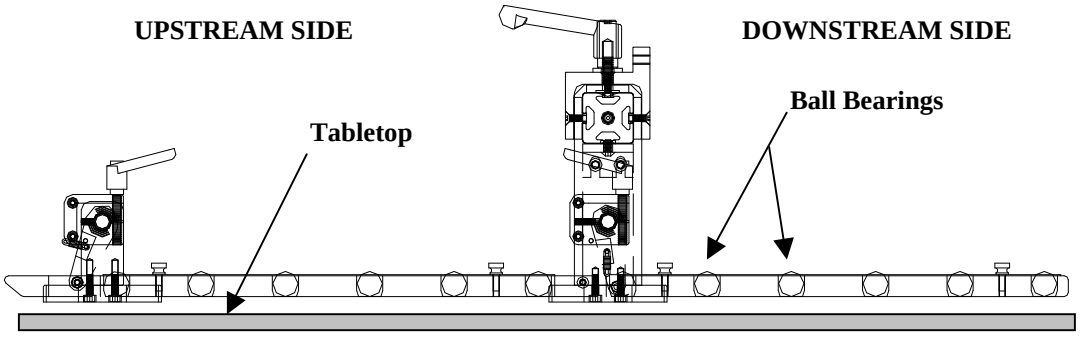


Figure 3-8: Tabber Skidbar Assembly side view.

If the spacing between the tabletop surface and the ball bearings is not equal along the entire length of the skidbar, the Skidbar Assembly must be adjusted. There are four support blocks (p/n 9101059) with machined oblong cutouts that allow for adjustments to be made to the position of the Skidbar. By loosening the mounting screws shown in *Figure 3-9* and pushing on one of the Skidbar Brackets (p/n 330302), the level of the Skidbar Assembly can be set to have an equal gap between the tabletop and the bottom surface of the Skidbar Assembly. The mounting screws for the brackets should be tightened once the correct setup is achieved. Double-check for a consistent gap between the Skidbar Assembly and the tabletop once all the screws have been tightened.

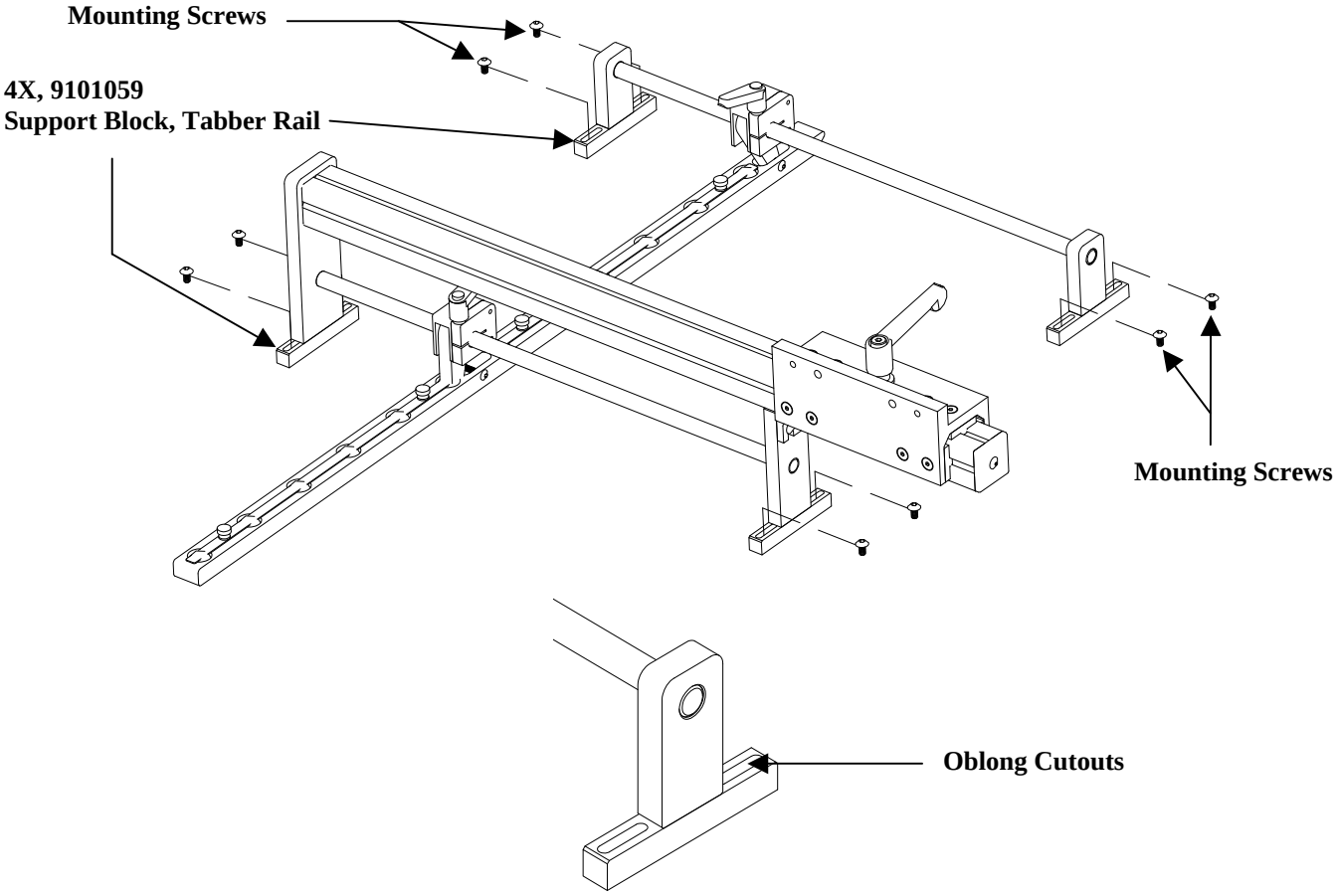


Figure 3-9: Tabber Skidbar Assembly setup.

3.3.3 Wide Label Pressure Roller

The Wide Label Pressure Roller (p/n 9102020), which is part of the Lower Pivot Arm Assembly, WL (p/n 9102020A), is used to provide equal pressure across the entire width of the label backing material as labels are applied onto mail and magazines. This enables the stepping action of the Abrasive Grit Wheel (p/n 9101056) to accurately place labels and tabs when required. The Wide Label Pressure Roller was designed to be 5" wide in order to accommodate labels and post-it notes attached to 5" wide backer materials. Over time, the rubber pressure roller will wear. As part of a monthly preventative maintenance routine, it is important that the operator regularly inspect the pressure roller for excessive wear so that a replacement can be ordered through Buskro's Service department.

Excessive wear is defined as significant changes in the diameter of the pressure roller resulting in unacceptable labeling/tabbing performance.

3.3.4 Label Backer Tension

The tension of the label backer material in the section between the Wide Label Tabber Storage Bin (p/n 9103807) and the Wide Label Peel Point Assembly (p/n 9103815A) must be taut. This is accomplished by adjusting the pressure on the label backer material using the Brush Pivot Assembly (p/n 9103816A). Illustrations of proper and poor setup of the label backer material tension are shown in *Figure 3-10*.

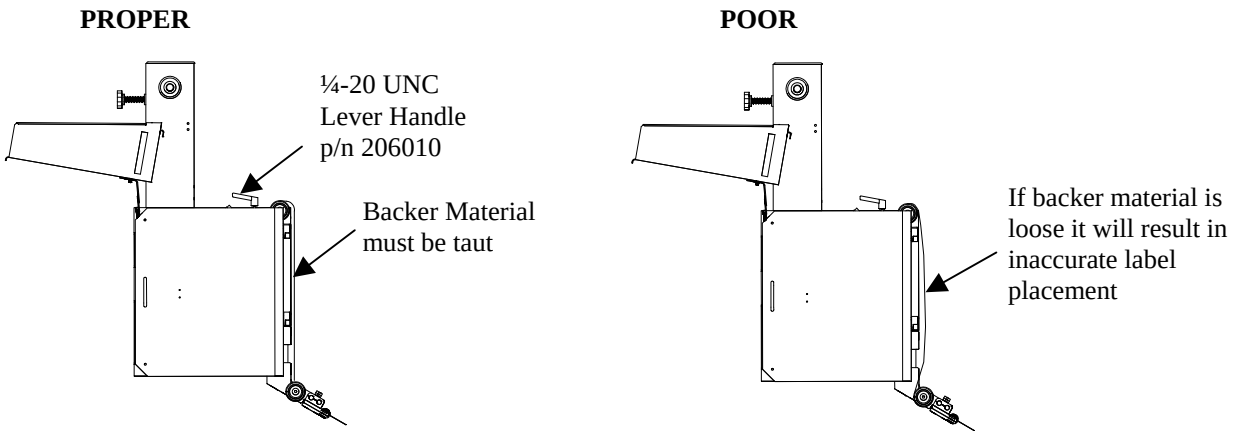


Figure 3-10: Label Backer Material tensioning setup.

If it is determined that insufficient tension is present, the following steps should be performed to readjust the backer material:

1. Loosen the ¼-20 UNC Lever Handle (p/n 206010) and back off the Brush Pivot Assembly, WL (p/n 9103816A).

2. Adjust the label backer material so that it is taut as shown in *Figure 3-10*.

3. Reposition the Brush Pivot Assembly and tighten so that it is applying pressure onto the label backer material.

3.3.5 Idler Roller Setup

The idler rollers (p/n 9102017A) are used to route and support the label backing material throughout the required components on the BK731A-2 / BK731-2WLA head. For labels on backer materials that are up to 5" wide, wider idler rollers were designed to ensure that the labels are properly conveyed through the Peel Point Assembly and onto mail pieces.

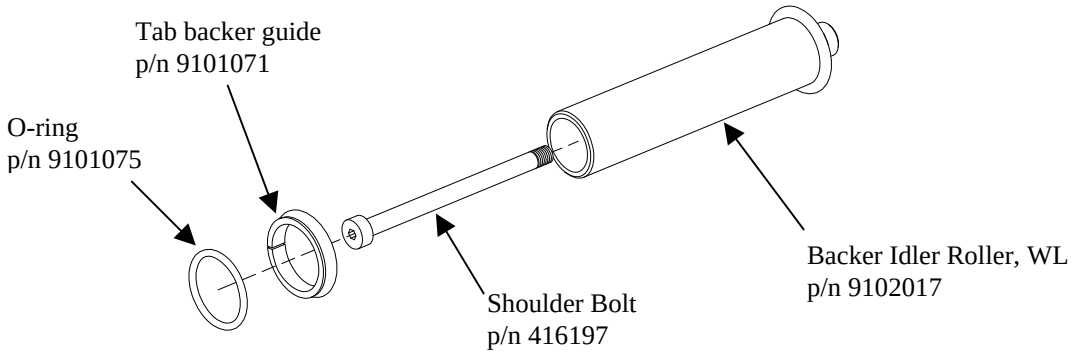


Figure 3-11: Idler roller assemblies (p/n 9102017A).

To ensure that labels are dispensed as square as possible from the Peel Point Assembly, it is important to ensure that the backer material is routed in an aligned manner. Adjustments can be made to the alignment by using the Tab backer guide based on the width of the labels being used for a particular application. Regardless, it is important to setup the label backer material such that the "aligned edge" as indicated in *Figure 3-12* is making full contact with the circular extension on the Backer Idler Roller and there is roughly a 1/32" gap between the other edge of the backer material and the Tab Backer Guide. If the gap is too small, it is possible that the backer material will tear if there is insufficient clearance for the label backer to move during normal operation.

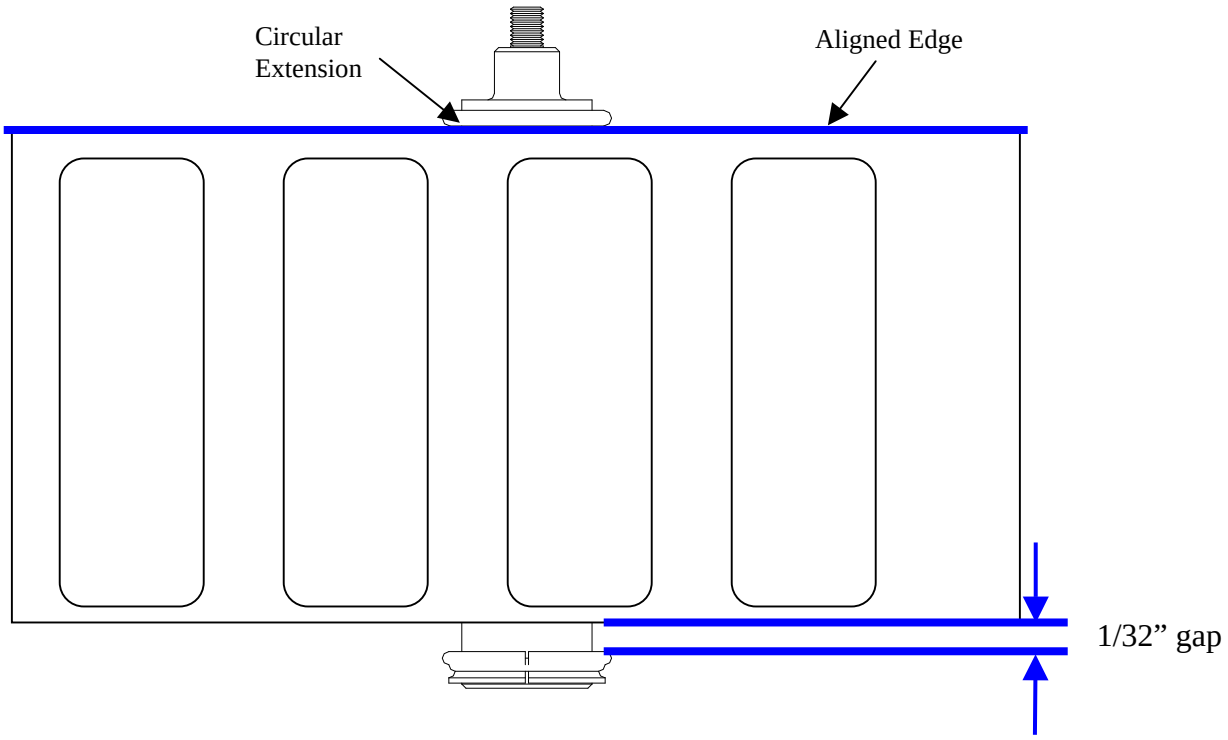


Figure 3-12: Gap between backer material and Tab Backer Guide.

3.3.6 Fanfold Supply Tray Assembly (p/n 9102031A)

The Fanfold Supply Tray is used to allow for feeding of fanfold label materials rather than roll-fed label materials. Simply drop in a fanfold supply of up to 5,000 labels and 5” wide into the tray and begin routing the backer material through the Labeling system. A nylon brush assembly is available to ensure that there is sufficient pressure on the backer material so that it is accurately transported through to the Peel Point Assembly. The entire assembly is illustrated in Figure 3-13 as a reference.

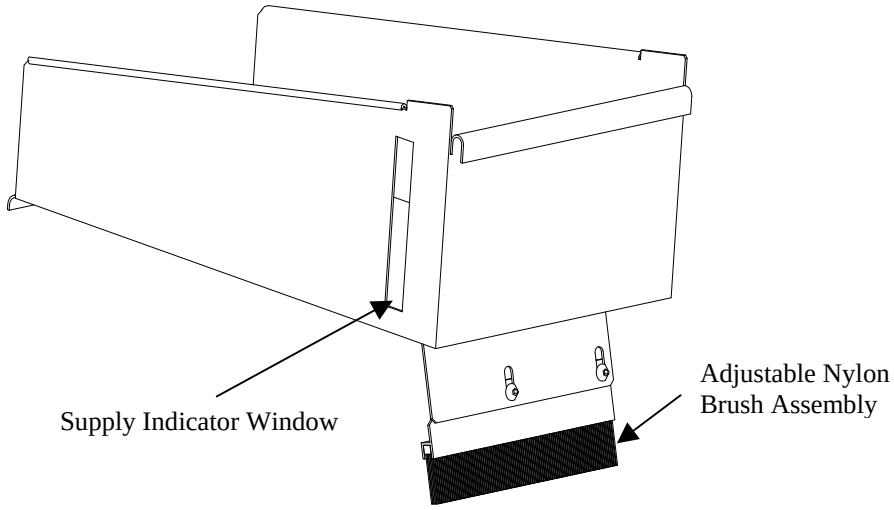


Figure 3-13: *Fanfold Supply Tray Assembly.*

3.3.7 Independent Nip Roller Height Adjustment

Another important part of material handling setup is to adjust the nip roller height on the Upper Transport Assembly (p/n 212735A). The new Upper Transport Assembly enables end users to independently adjust the height of the nip roller from the height of the entire assembly. This is beneficial because the height of the nip roller differs from that of the upper transport belts causing inconsistent pressure to be applied onto conveyed mail pieces and magazines. Historically, the only method of raising and lowering the nip roller was achieved by means of raising and lowering the entire Upper Transport Assembly. This was a conflict because for thinner substrates, there will be little to no contact between the nip roller and the surface of the piece to allow for sealing of tabs or application of labels. To resolve this issue, the height of the nip rollers can now be independently adjusted via two ¼-28 UNF x 2 ½" socket head cap screws as identified in *Figure 3-14*.

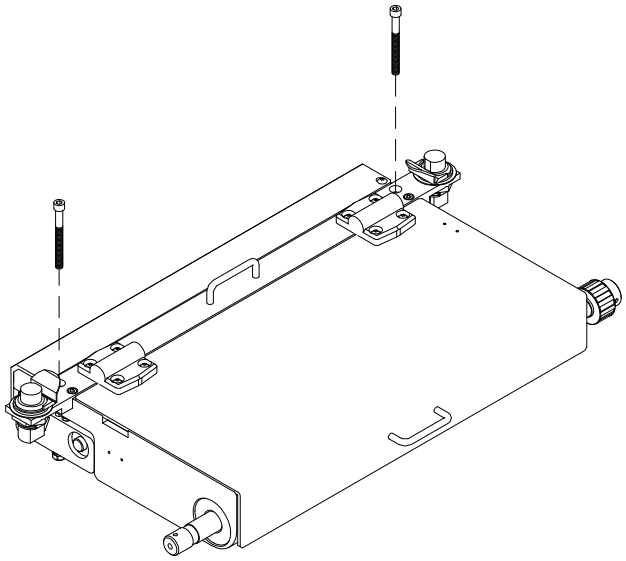


Figure 3-14: Nip roller block adjustment screws.

User Interface

Chapter 4

4.1 Tabber/Labeler Keypad Interface

The BK731-2 keypad shown in Figure 4-1 provides the user interface for all setup and diagnostic functions. The white buttons are for inputting setup changes (number pad, enter, + and -), the yellow buttons (scroll up and down) are to cycle through menus, the blue buttons (setup, test, position, and labels) are sub-menus for job setup and diagnostics, and the green button (online) sets the head operation mode.

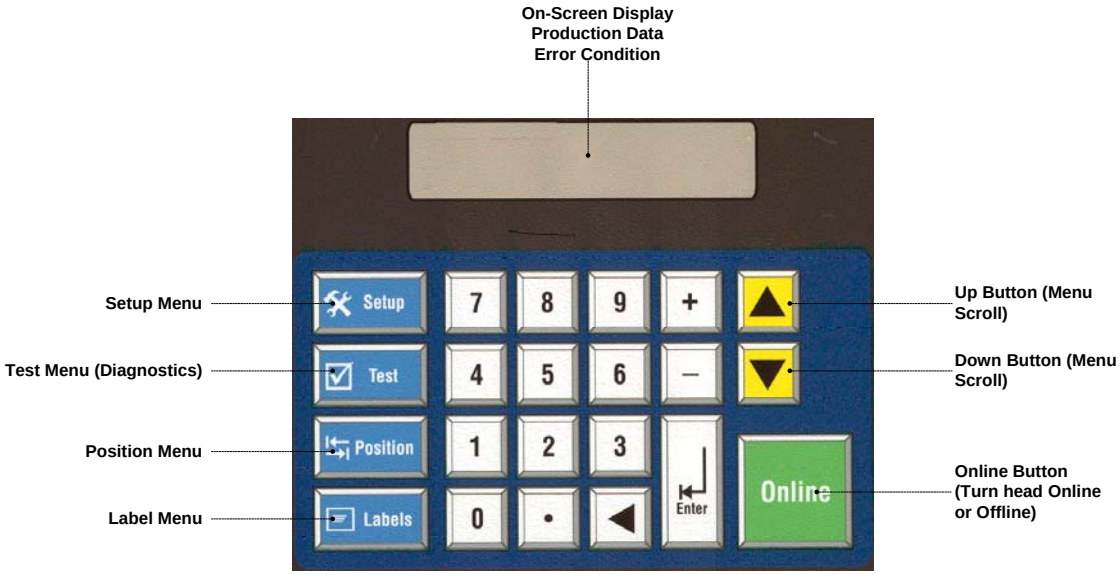


Figure 4-1: *BK731-2 Keypad Controls*

4.2 Keypad Setup Menu

The **"Setup"** button on the keypad permits the configuration of the head. The sub-commands under **Setup** are as follows:

- Front or Back Product Sensor Selection
- Product Sensor Position Setting
- Reset production count
- Display software version
- Reset to default factory settings
- Life count
- Form Size Error selection
- Display metric or imperial values

4.2.1 Front or Back Product Sensor Selection

The Product sensor detects the presence of a product to be labeled. This setting is mainly used on the BK730-2 which includes both a front and back through-beam sensor and requires the ability to switch between them. For a standalone Labeler, only the FWD setting is used. In order to switch between sensors, follow the below instructions:

1. Put the head into "OFFLINE" mode by pressing the <**Online**> key. The keypad will display an "OFFLINE" message.
2. Press the <**Setup**> button. The display should read "**PRODUCT SENSOR: FWD**" or "**PRODUCT SENSOR: BAK**". If not, scroll through the menu by pressing the Up or Down arrow until the Product Sensor option is displayed.
3. Press <-> or <+> in order to select FWD or BAK. When your selection is made, press <**Online**>.

Note: If an incorrect product sensor has been chosen, then the system will not detect the conveyed products and labels will not be dispensed from the Labeling head.

4.2.2 Adjustment of the Product Sensor Position

The Product Sensor Position (PS POS) indicates the distance from the photo sensor to the tip of the peel point. This setting affects the position of the label being placed onto the product. An incorrect setting will result in inaccurate placement of the label on the product. This value must be changed to match the location of the photo sensor. This can be accomplished by completing the following:

1. If the keypad does not say "OFFLINE", press the <**Online**> key.
2. Press the <**Setup**> button. Press the Down button until the display reads **"PS POS: ##. ###"** (where ##.### indicates the current position).
3. Using the keypad, enter in the distance (in inches) the center of the product sensor is from the tip of the peel point (where the label is released) and then press <**Enter**>. It is also possible to press <+> or <-> to increment this value by ±1/8".
4. Press <**Online**> to exit the Setup menu.

Note: The factory setting for the product sensor location is 6.25". The BK731-2 head allows for values between 1 to 40 inches. However, it is recommended that the sensor be as close to the peel point as possible to avoid the possibility of the product moving out of position or slipping after passing the photo sensor.

4.2.3 Production Counter Resetting

The production counter indicates the number of pieces labeled in a given job. In order to reset this value after a job is complete, the following steps must be completed:

1. If the keypad does not say "OFFLINE", press the <**Online**> key.
2. Press the <**Setup**> button. Press the Down button until the display reads **"RESET COUNT <+++>"**.
3. Press <+> button three times. The head should beep and reset the counter.
4. Press <**Online**> to exit the Setup menu.

4.2.4 Software Version

In order to display the BK731-2 head software version, perform the below instructions:

1. If the keypad does not say “OFFLINE”, press the **<Online>** key.
2. Press the **<Setup>** button. Press the Down button until the display reads **“VERSION #.#”** (where #.# represents the version number).
3. Press **<Online>** to exit the Setup menu.

4.2.5 Factory Reset

The factory reset allows the operator to reset all operation variables except the life count back to their factory default settings. This operation might be necessary in the event the Labeler is unable to operate under normal conditions or an upgrade has been performed. The most common requirement for a factory reset is when labels are misplaced on the product, or no labels are being placed at all, without any explanation. In order to execute a factory reset perform the following steps:

1. If the keypad does not say “OFFLINE”, press the **<Online>** key.
2. Press the **<Setup>** button. Press the Down button until the display reads **“FACTORY RESET <+++>”**.
3. Press <+> three times. The head should beep indicating a complete reset.
4. Press **<Online>** to exit the Setup menu.

4.2.6 Life Count Display

The Labeler is equipped with a non-resetable counter, which records and displays the total number of labels applied over the course of the system’s life. This counter is intended as a service counter and cannot be reset by the operator. To view the life count:

1. If the keypad does not say “OFFLINE”, press the **<Online>** key.
2. Press the **<Setup>** button. Press the Down button until the display reads **“LIFE COUNT: #########”**. This is the total number of labels applied with the system.
3. Press **<Online>** to exit the Setup menu.

4.2.7 Form Size Error

The Form Size Error feature is used to verify the length of the product being conveyed for any given job. If the Labeler has been setup to run a 30,000 piece job running 9.5" long envelopes, when enabled, the Form Size Error will monitor the length to ensure that each piece is in fact 9.5" long. This is accomplished by monitoring the speed of the transport base and the amount of time that the product sensor is triggered. When an unexpected length is calculated from these parameters with respect to the setup length, a stop signal is generated. This feature is helpful for detecting skew of materials during transport or a change in material length. With this feature disabled, product skew and variation in lengths are ignored during normal tabbing/labeling and may cause a problem for label/tab placement especially if the lead edge of the product is skewing. The following instructions detail how to setup the head for Form Size Error detection:

1. If the keypad does not say "OFFLINE", press the **<Online>** key.
2. Press the **<Setup>** button. Press the Down button until the display reads **"SIZE ERROR: ######"**.
3. Press the **<+>** button to switch between the "**ENABLED**" or "**DISABLED**" options depending on how you would like to operate the Labeler.
4. Press the <**Enter**> key to save your selection.
5. Press **<Online>** to exit the Setup menu.

4.2.8 Displaying Metric Units on the Operator Keypad

There now exists the option to display the product sensor position, label spacing positions, product length, and label pitch in metric [cm] or imperial [in] units. Perform these instructions to configure your Labeler as desired:

1. If the keypad does not say "OFFLINE", press the **<Online>** key.
2. Press the **<Setup>** button. Press the Down button until the display reads **"UNITS: ######"**.
3. Press the <+> button to switch between "METRIC" or "IMPERIAL".

4.3 Keypad Test Menu

The Labeler is equipped with diagnostic tools that allow for the testing of various functions of the head. This is an important troubleshooting tool that can be used to isolate a given problem. If any one of these tests fails, it can compromise the performance or even functionality of the system. In order to access the diagnostic tools, reference the following instructions:

1. If the keypad does not say “OFFLINE”, press the **<Online>** key.
2. Press the **<Test>** button.
3. Press the Up or Down arrow keys to scroll through the different tests.
4. Press **<Online>** to exit the Test menu.

There are a total of 12 different tests under the Test menu. They are described in Table 4-1. Also reference **Section** Error! Reference source not found. for the sensor locations.

Table 4-1: Head Diagnostic Tools

Test	Display	Description
Encoder Test	ENCODER COUNT:	This display value should increase when the transport base is running.
Peel Point Label Sensor Test	LABEL:	Insert labeling material between the peel point top plate and bottom plate. The display should read “BLOCKED” when a label is blocking the sensor and “UNBLOCKED” when there is no label on the backing material.
Front Product Sensor Test	FWD PROD:	Physically block the product sensor with your hand (do not touch the sensor). The display should read, “BLOCKED” when your hand covers the sensor and “UNBLOCKED” when your hand is clear.
Rear Product Sensor Test	BAK PROD:	Not used on the standalone head. Same procedure as FWD PROD test.
Bin Sensor Test	BIN:	Physically block the bin sensor with your hand (do not touch the sensor). The display should read, “BLOCKED” when your hand covers the sensor and “UNBLOCKED” when your hand is clear.
Take-Up Sensor Test	TAKE-UP:	Rotate the take-up spool one full rotation. The keypad display should say “UNBLOCKED” during part of the rotation and “UNBLOCKED” for the remainder of the rotation.
Jam Test	JAM:	Lifting the Jam lever should display “JAMMED”. Otherwise it should display “NOT JAMMED”.
Front Door Cover Test	COVER:	When the BK731-2 head front door is closed it should display “CLOSED”. Otherwise it should display “OPEN”.
Label Drive Motor Test	LABEL STEP:	The label drive roller should rotate counter-clockwise one step each time the **<ENTER>** key is pressed.
Despool Drive Motor Test	UNWIND STEP <ENTER>	The despool drive motor should rotate clockwise one step each time the **<ENTER>** key is pressed.
Take-Up Test	TAKEUP TEST <ENTER>	When performed WITHOUT a roll of labels installed, the take-up spool should rotate clockwise and stop automatically.
Stop Relay Test	STOP RELAY <ENTER>	While the transport base is running, pressing **<ENTER>** will cause the transport base to stop.

4.4 Keypad Position Menu

The **"Position"** button on the keypad provides the user with the ability to change the number of labels per product and where they are positioned on the product. This includes automatic symmetrical positioning of labels or manual placement.

4.4.1 Label Spacing Option

The Label Spacing function allows the spacing between each label to be set manually or automatically. The automatic spacing allows the labels to be spaced symmetrically along the length of the product. If the manual option is selected, the user can key in the spacing between labels manually. In order to set the label spacing to auto or manual:

1. If the keypad does not say "OFFLINE", press the <**Online**> key.
2. Press the <**Position**> button.
3. The display should read **"SPACING: AUTO"** or **"SPACING: MANUAL"**. If not, press the Down key until it does.
4. Press the <+> or <-> key to change between the Auto and Manual settings.
5. If you wish to manually change the label position, go to **Section 4.4.4**.
6. Press <**Online**> to exit the Position menu.

Note: If automatic label spacing is chosen, label position cannot be keyed in.

4.4.2 Number of Labels

The Buskro labeler has the ability to apply 1 to 3 labels on a piece during a single pass. In order to change the number of labels applied, reference the following steps:

1. If the keypad does not say “OFFLINE”, press the **<Online>** key.
2. Press the **<Position>** button.
3. Press the Down key until the display reads **“LABELS PER PIECE: #”** where # indicates the number of labels. This value can be changed by either pressing <+> or <-> or by entering the number using the keypad corresponding to the number of required labels and pressing the **<Enter>** key.
4. Press **<Online>** to exit the Position menu.

4.4.3 Product Length Entry

Anytime a different length material is used, the product length must be entered into the head. Otherwise, the labels will not be placed in the proper locations. To set the product length:

1. Measure the product length with a ruler or measuring tape.
2. If the keypad does not say “OFFLINE”, press the **<Online>** key.
3. Press the **<Position>** button.
4. Press the Down key until the display reads **“LENGTH: ##.###”** where ##.### indicates the product length.
5. Using the keypad, enter in the length of the product measured from step 1 and press **<Enter**>.
6. Press **<Online>** to exit the Position menu.

4.4.4 Manual Label Position

This section is only relevant if the label spacing is set to the manual setting (**Section 4.4.1**). The label position entry is defined as the distance from the leading edge of the product to the leading edge of the label with label position #1 being closest to the leading edge of the product (*Figure 4-2*).

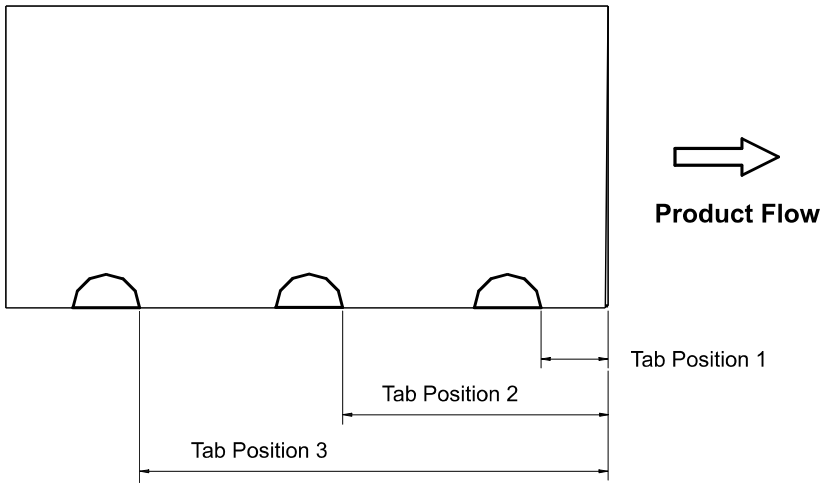


Figure 4-2: *Label position*

In order to set the label position (assuming 3 labels per product):

1. If the keypad does not say “OFFLINE”, press the <**Online**> key.
2. Press the <**Position**> button.
3. Follow the instructions in **Section 4.4.1** and set the spacing to manual.
4. Press the Down key until the display reads **“POS 1: ##.###”** where ##.### indicates the position of the first label.
5. Using the keypad, enter the desired position of the label and press <**Enter**>.
6. Press the Down key until the display reads **“POS 2: ##.###”** and repeat step 5.
7. Press the Down key until the display reads **“POS 3: ##.###”** and repeat step 5.
8. Press <**Online**> to exit the Position menu.

Note: 0.00” is the minimum setting.

A material size error condition could occur if the label positions are set too close together. The result is immediate.

4.4.5 Keypad Labels Menu

The **"Labels"** button on the keypad provides the user with the ability to set up the type, position, and pitch of a label. The sub-commands under **Labels** are as follows:

- Label Pitch Auto Configuration
- Label Pitch Manual Configuration
- Type of Label
- Sensor Sensitivity Setting
- Sensor Nudge Factor

4.4.6 Label Pitch Auto and Manual Setting

The BK731-2 utilizes the Label Pitch value to determine how much of an incremental move the label drive roller has to make between application of each label. This value is extremely important to maintain accurate label placement. The pitch is determined by measuring the distance from the beginning of the first label to that of the second label (

Figure 4-3). This value must be within ± 0.05" to ensure that each successive label is accurately placed on the product. Failure to set this parameter accurately will result in label "drift" with labels being incorrectly placed on successive products. Although it is possible to manually enter the label pitch, the BK731-2 is capable of automatically determining both the appropriate pitch and sensor gain (**Section 4.4.8**).

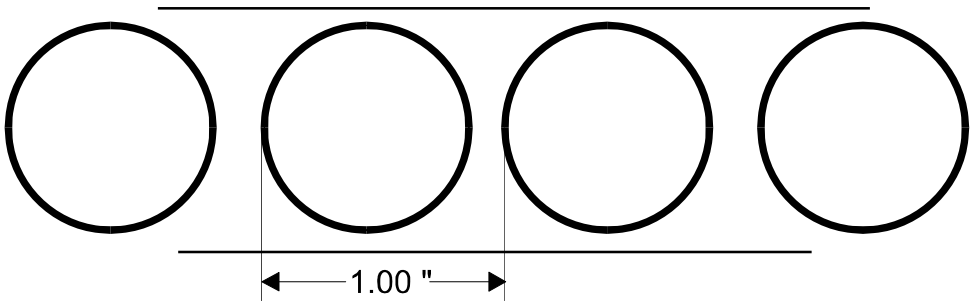


Figure 4-3: *Label Pitch Example (In this case Label Pitch is 1.00")*

In order to set the label pitch automatically perform the following:

1. If the keypad does not say “OFFLINE”, press the **<Online>** key.
2. Press the **<Labels>** button. The display should read **“AUTO CONFIG <ENTER>”**. If not, press the Down arrow key until it does.
3. Place a product underneath the Peel Point Assembly. Now press **<ENTER>**. The BK731-2 should release two labels during its configuration procedure.
4. Repeat step 3.
5. Press **<Online>** to exit the Labels menu.

In order to set the label pitch manually:

1. If the keypad does not say “OFFLINE”, press the **<Online>** key.
2. Press the **<Labels>** button.
3. Press the Down arrow key until the display reads **“PITCH: #.###”**.
4. Using the keypad, enter in the label pitch and press **<Enter>** (
5. Figure 4-3).
6. Press **<Online>** to exit the Labels menu.

Note: It is recommended that the automatic label pitch setting be used.

If the Label Pitch entry is not accurately set, the result will be that each successive label applied will drift incrementally on successive products. That is, the first label may be applied at 1” from the lead edge, with the second applied at 1.05”, the third one at 1.1” and so on.

The label sensor gain will also need adjustment for accurate label placement when the manual label pitch function is used.

4.4.7 Type of Label Setting

The BK731-2 was designed to operate using two main types of labels, clear or solid (transparent or opaque). Clear labels require backing paper that comes with two black lines acting as leading and trailing edges enabling the Peel Point sensor to measure the pitch. In order to set the type of label:

1. If the keypad does not say "OFFLINE", press the **<Online>** key.
2. Press the **<Labels>** button.
3. Press the Down arrow key until the display reads **"LABEL TYPE: CLEAR"** or **"LABEL TYPE: SOLID"**.
4. Press <+> or <-> to change the setting to solid or clear labels.
5. Press **<Online>** to exit the Labels menu.

4.4.8 Peel Point Sensor Adjustment

The label sensor in the Peel Point Assembly is a photo-sensor that detects the presence of the label's leading edge. Label sensor adjustment involves setting the gain such that its beam is strong enough to pass through the label backer yet weak enough to be blocked by the label. This adjustment should be made if there is a noticeable misalignment in the placement of the labels on the product. To set the Peel Point Sensor gain:

1. If the keypad does not say "OFFLINE", press the **<Online>** key.
2. Press the **<Labels>** button.
3. Press the Down arrow key until the display reads **"SENSOR VALUE: ###"**.
4. Press the <+> or <-> key to increase or decrease the sensor gain to an appropriate value.
5. Press **<Online>** to exit the Labels menu.
6. Test the peel point sensor by referencing Table 4-1. If the display indicates the Peel Point is "BLOCKED" when a label is inserted between the peel point sections and "UNBLOCKED" when only the backing paper is inserted, the setting is correct. If not, repeat this section until the system operates properly.

Note: It is recommended that the automatic label pitch function be used. This function will also adjust the sensor gain automatically. If the Peel Point sensor gain is not properly set, the label placement will not be accurate.

This setting should only be used if there is a noticeable degradation in the positioning of the labels on the product and when the manual label pitch function is used to set label pitch.

4.4.9 Peel Point Sensor Nudge Factor

The nudge factor allows the BK731-2 to automatically offset the label relative to the Peel Point. A positive nudge factor will cause the labels to protrude outside of the Peel Point tip more during labeling operation. This setting can help in improving accurate label placement when set properly. In order to set the peel point nudge factor:

1. If the keypad does not say "OFFLINE", press the <**Online**> key.
2. Press the <**Labels**> button.
3. Press the Down arrow key until the display reads **"SENSOR NUDGE: ±"**.
4. Press the <+> or <-> key to increase or decrease the nudge factor
5. Press <**Online**> to exit the Labels menu.

4.5 Operational Controls

This section describes the functions available during normal operation of the Labeler system.

4.5.1 Online/Offline Status

The head must be placed online whenever the labeling operation is required. Conversely, placing the system offline will result in the suspension of the labeling operation. To place the system online or offline, press the green <**ONLINE**> button. The system will be offline during initial startup, whenever an error condition is detected, or when the user manually takes the system offline.

Note: When the system is placed offline, the Labeler system will immediately cease operation.

4.5.2 Product Count, Production Rate, and Belt Speed Display

The Labeler is capable of displaying the job product count (number of products with labels applied), production rate (in Pieces Per Hour or PPH), or line/transport speed (in Feet per Minute or FPM). During normal operation (ONLINE mode), the user can cycle through these displays by pressing the Up or Down arrow keys on the keypad.

4.5.3 Error Conditions

The Labeler is designed to automatically go offline when an error condition is triggered. This will automatically stop the labeling process and display an error message. As a result, the user will need to remedy the problem that caused the error condition in order to put the system back online. The main error conditions are listed in *Table 4-2* below.

Table 4-2: *Error conditions reported by the Labeler head controller*

Error Condition	Cause	Remedy
ONLINE	All systems are operating normally and no errors are detected	None. Normal operation.
PRODUCT JAM	Product jammed or the upper transport was opened during operation.	Remove jammed product from jam switch.
TAKEUP ERROR	The take-up spool rotates freely.	Empty label backing paper from take-up roll and rethread the label backing paper onto the roll.
COVER OPEN	The Labeler head front safety cover is opened during operation.	Close the Labeler head cover.
MATERIAL SIZE ERROR	There is a misfeed or product skew.	Check if the product is fed correctly.

4.6 Maintenance Schedule

The maintenance schedule in Table 4-3 below applies to equipment operated daily on an 8-hour basis. If the equipment is to be used more frequently, the maintenance schedule must be adjusted accordingly.

Table 4-3: Head Maintenance Schedule

Period	Maintenance Function
Daily	Remove the front safety cover and clean any debris, which may have fallen into the machine. Remove any labels, which may have settled on the rollers and sensor bin. Wipe debris off all sensors to prevent malfunction. Inspect and clean the fan filter installed on the enclosure.
Monthly	Grease all moving parts to help reduce wear due to friction. The peel point sensor must be cleaned to prevent material build up. An air compressor is recommended.
Semi Annually	Examine all moving parts for wear. Replace if necessary.

Note: Acquiring a small air compressor is recommended as compressed air is useful in removing debris.

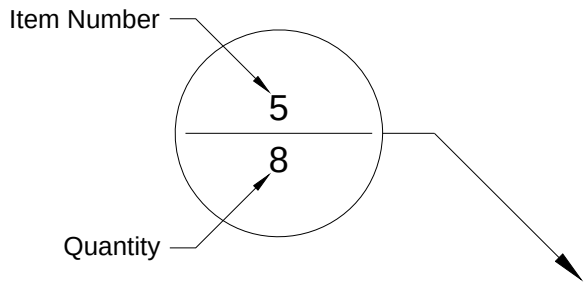
Assembly Drawings

Appendix **A**

List of Figures

List of Tables

Balloon Annotation and Parts Listing



Item	Part Number	Quantity	Description	Reference
1				
2				

The following is a description of how to interpret the information in this section:

Item:

This column indicates the item number used for each unique part in an assembly drawing. It is matched with the top number in the balloon pointing at the associated part.

Part Number:

This column represents the Buskro part number.

Quantity:

This represents the total number of a given part in an assembly. It is matched with the bottom number in the balloon pointing at the associated part.

Description:

This column contains a brief description of the part.

Reference:

This column indicates the page location for sub-assemblies.

Table A-1: *BK730A-2 Tabbing System*

Item	Part Number	Quantity	Description	Reference
1	330116	1	Microswitch Bracket	
2	330740A	1	Tabber Skidbar Assembly, BK730	Page A-2
3	402375	2	Screw, PHMS, 6-32 UNC X 1 1/4 in	
4	403020	2	Screw, FHCS, 8-32 UNC X 3/8 in	
5	404550	12	Screw, BHCS, 10-32 UNF x 3/4"	
6	405250	4	Screw, SHCS, 1/4-20 UNC x 3/4"	
7	405560	2	Screw, BHCS, 1/4-20 UNC x 7/8"	
8	439010	4	Lockwasher, 1/4" I.D.	
9	603520A	1	Sensor, Jam Switch Assembly, NC, 20"	Page A-4
10	614530A	1	Cable, Conveyor Interconnect	Page A-5
11	646002	1	Fuse, 10A, 5 x 20 mm	
12	700574	1	Shipping Bracket	
13	9101077A	1	Front Mounting Rail Assembly	Page A-6
14	9101627	1	Buskro Serial Number Label	
15	9101656A	1	Output Cable Assembly, Tabber	Page A-7
16	9101657A	1	Power Cable Assembly, Tabber	Page A-8
17	9101658A	1	Encoder Cable Assembly, Tabber	Page A-9
18	9101659A	1	Photo F/B Cable Assembly	Page A-10
19	9101660A	1	Jam Cable Assembly, Tabber	Page A-11
20	BK731A-2	1	Tabber Head Assembly, Revision 2	Page A-12
21	BKT730-2	1	BKT730 Tabber Revision 2, Testing	Page A-37

Figure A-1: *BK730A-2 Tabbing System*

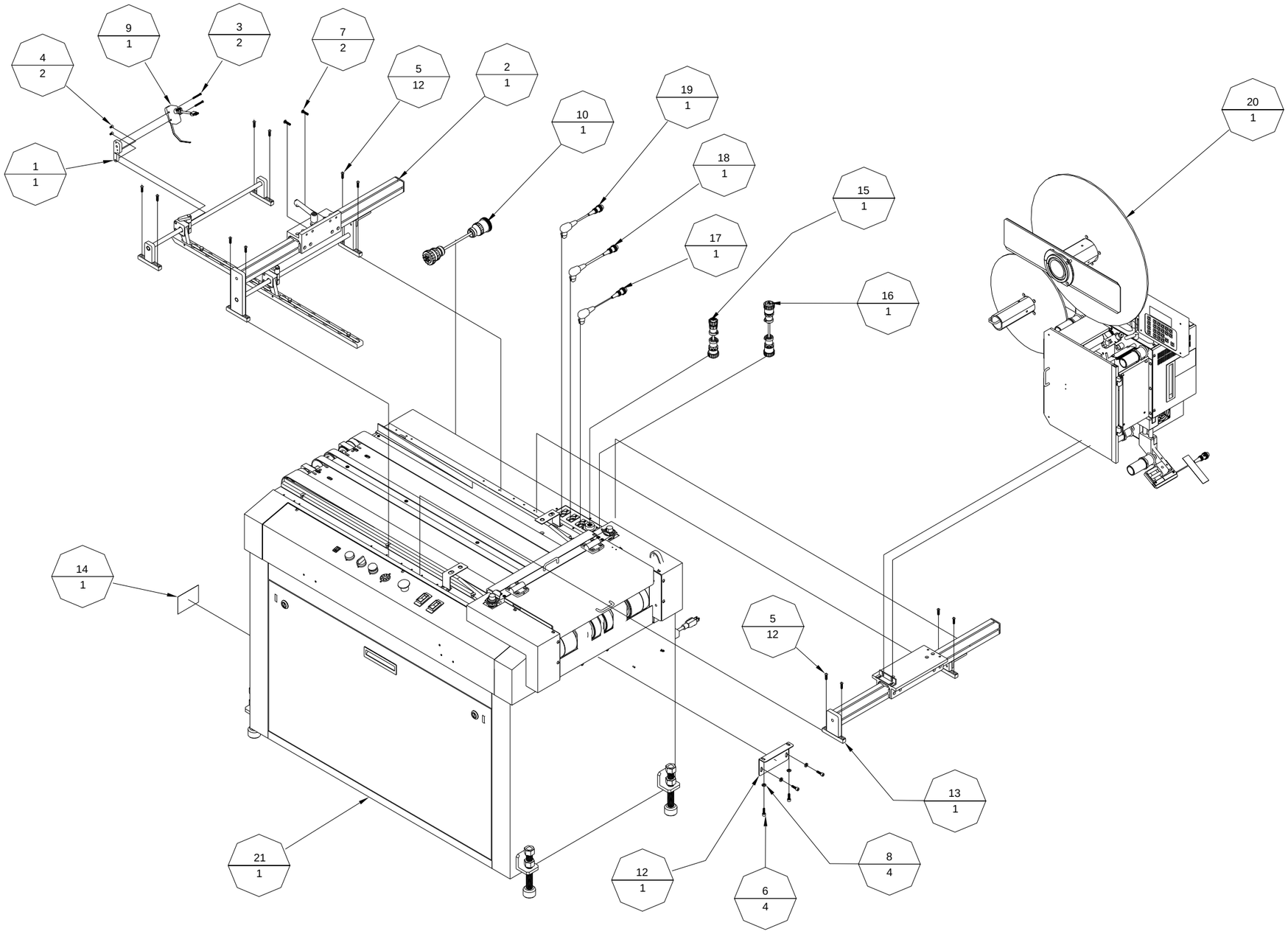


Table A-2: *Tabber Skidbar Assembly (330740A)*

Item	Part Number	Quantity	Description	Reference
1	100021H	2	Front Skidbar Shaft	
2	100026	2	Hollow Skidbar Shaft	
3	203003	2	Skidbar Arm	
4	209003	2	Spring, 1/2", Extension	
5	330018H	2	Skidbar Holder Block	
6	330302	2	Skidbar Bracket	
7	343006	2	Skidbar Holder Clamp	
8	403250	2	Screw, SHCS, 8-32 UNC x 3/4"	
9	403260	2	Screw, SHCS, 8-32 UNC x 7/8"	
10	404030	8	Screw, FHCS, 10-32 UNF x 1/2"	
11	404040	4	Screw, FHCS, 10-32 UNF x 5/8"	
12	404240	8	Screw, SHCS, 10-32 UNF x 5/8"	
13	404570	2	Screw, BHCS, 10-32 UNF x 1"	
14	404820	4	Screw, SHSS, 10-32 UNF x 3/8"	
15	405520	2	Screw, BHCS, 1/4-20 UNC x 3/8"	
16	405530	2	Screw, BHCS, 1/4-20 UNC x 1/2"	
17	406530	2	Screw, BHCS, 5/16-18 UNC x 1/2"	
18	436030	2	Spring Pin, 1/8" Dia. x 1/2"	
19	436050	2	Spring Pin, 1/8" Dia. x 3/4"	
20	438171	4	Thumbscrew, 10-32 UNF x 3/8"	
21	440020	1	Washer, 3/8" I.D.	
22	500211	12	Skidbar Ballbearing, 3/4" O.D.	
23	505003	2	Bushing, 3/16" I.D. X 5/16 O.D. x 1/2 LG.	
24	505004	2	Bushing, 3/4" I.D. X 7/8 O.D. x 1/2 LG.	
25	9100485	2	Lever Handle, 1/4-20 UNC x 1 1/2"	
26	9101059	4	Support Block, Tabber Rail	
27	9101064	1	Tabber Mounting Rail	
28	9101126	1	Double T nut	
29	9101243	1	Skidbar Body	
30	9101246	2	Ball Retention Spring, 13.47"	
31	9101248	6	Bearing Pad, Tabber Head Mount	
32	9101249	1	Rail Mounting Block	
33	9101269	1	Handle, Racheting, 15 Series	
34	9101398	1	Economy T-slot Stud, 5/16-18 UNC x 1"	
35	9101492	1	Mounting Slide, AL	
36	9101622	1	Mounting Bracket, Aligning Rail	
37	9101623	1	Mounting Block, Slide Rail	
38	9101624	1	End Caps (15 Series)	

Figure A-2: Tabber Skidbar Assembly (330740A)

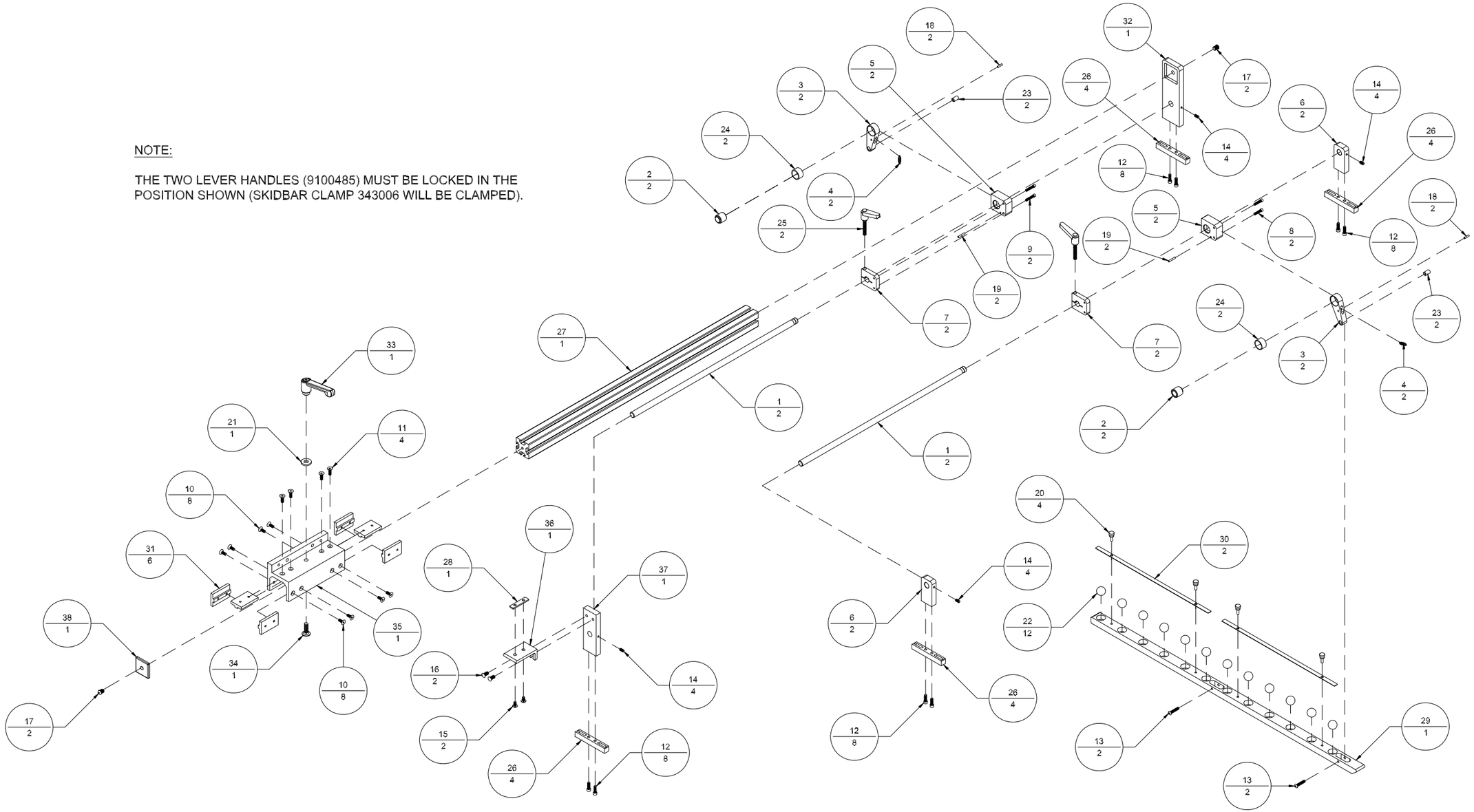
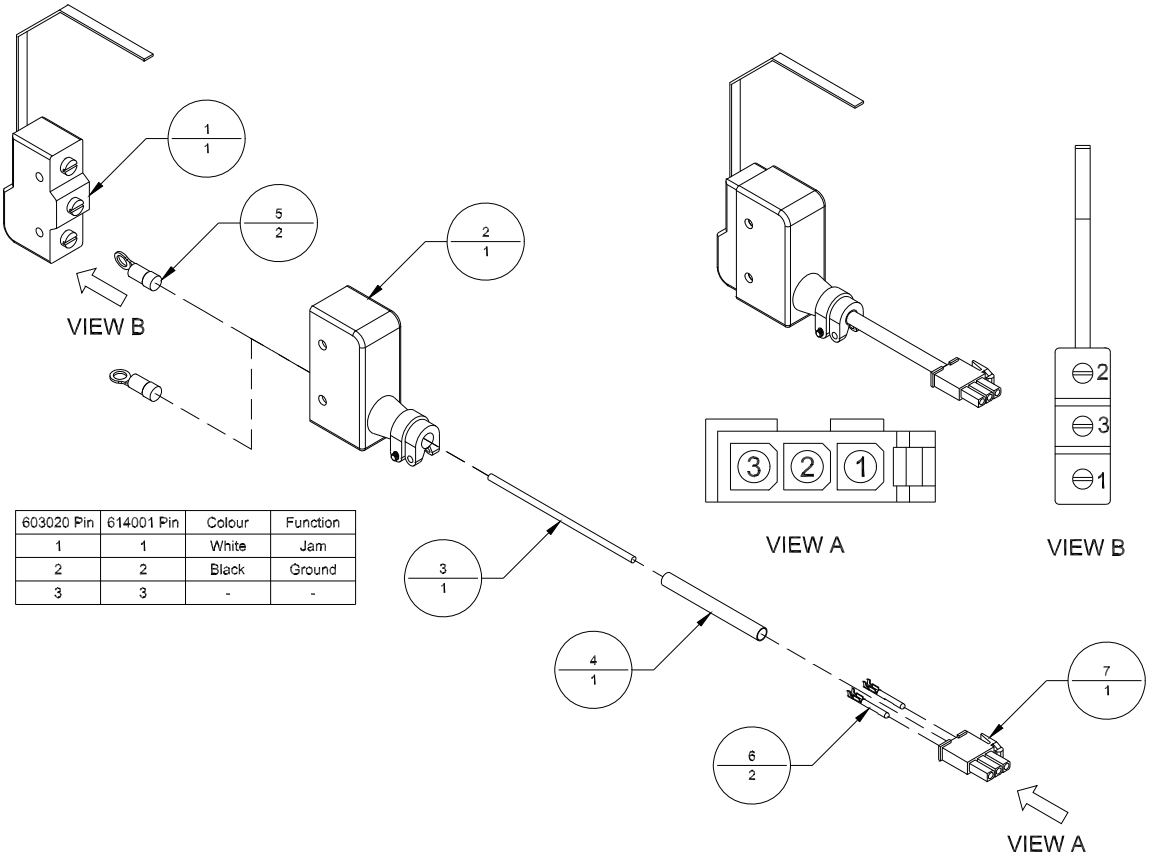


Table A-3: Jam Switch Assembly, Tabber (603520A)

Item	Part Number	Quantity	Description	Reference
1	603020	1	Microswitch	
2	603021	1	Microswitch Cover	
3	606531	20”	Cable, #22-2	
4	609000	1”	Shrink Wrap, 3/16” I.D.	
5	609116	2	Ring Tongue Terminal #10, Red	
6	614000	2	Male Contact Pin	
7	614001	1	Plug, Cap Pin Housing	

Figure A-3: *Jam Switch Assembly, Tabber (603520A)*



603020 Pin	614001 Pin	Colour	Function
1	1	White	Jam
2	2	Black	Ground
3	3	-	-

Table A-4: *Cable, Conveyor Interconnect(614530A)*

Item	Part Number	Quantity	Description	Reference
1	606052	1	Cable, #14-7, Unshielded (72" Long)	
2	614105	1	Receptacle Plug, 23-7	
3	614109	7	Pin, Power Contact	
4	614110	7	Socket, Power Contact	
5	614113	2	Cable Clamp	
6	614128	1	Receptacle, 23-7 Reverse Amp	

Figure A-4: *Cable, Conveyor Interconnect(614530A)*

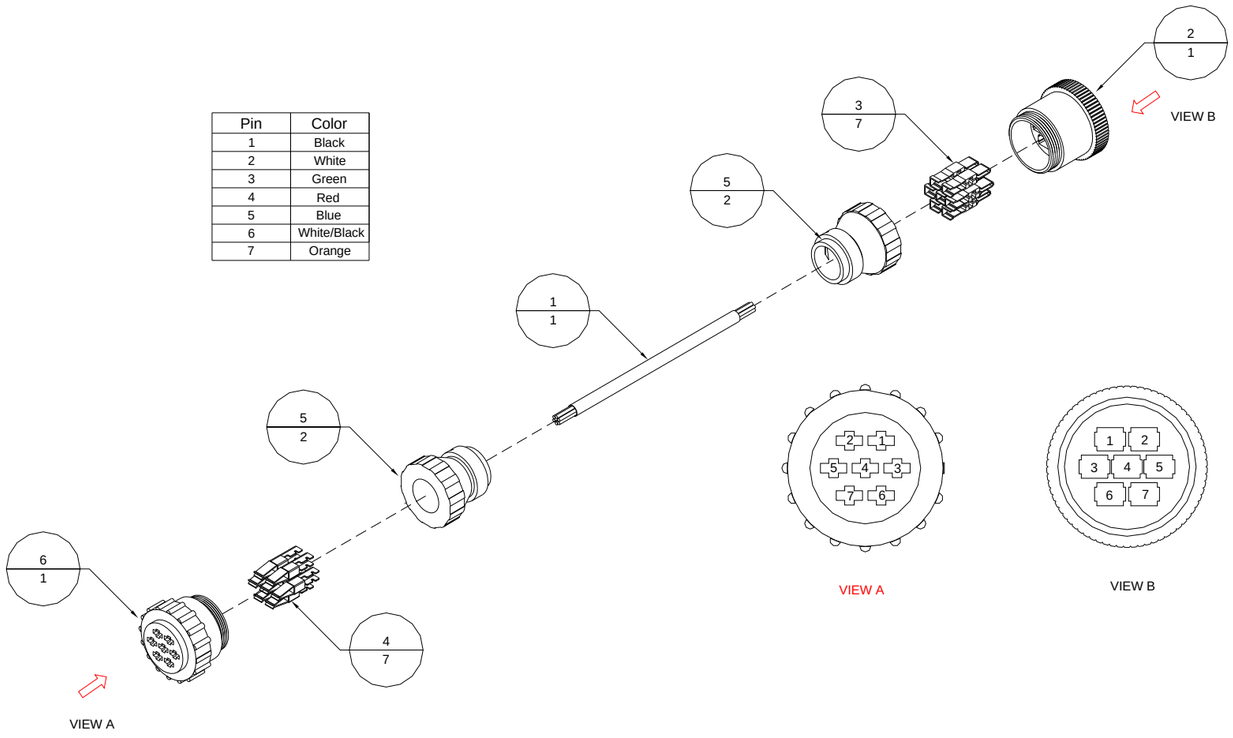


Table A-5: *Front Mounting Rail Assembly (9101077A)*

Item	Part Number	Quantity	Description	Reference
1	404030	12	Screw, FHCS, 10-32 UNF x 1/2"	
2	404230	4	Screw, SHCS, 10-32 UNF x 1/2"	
3	405520	6	Screw, BHCS, 1/4-20 UNC x 3/8"	
4	406530	2	Screw, BHCS, 5/16-18 UNC x 1/2"	
5	9101059	2	Tabber Rail Support Block	
6	9101064	1	Tabber Head Mounting Rail	
7	9101077	1	Front Rail Mounting Block	
8	9101126	1	Double T-nut	
9	9101247	1	Bearing Profile, Double Flange	
10	9101248	6	Bearing Pad, Tabber Head Mount	
11	9101620	1	Mounting Bracket, Slide Rail	
12	9101621	1	Mounting Block, Right Slide Rail	
13	9101622	1	Mounting Bracket, Aligning Rail	
14	9101624	1	End Caps (15 Series)	

Figure A-5: *Front Mounting Rail Assembly (9101077A)*

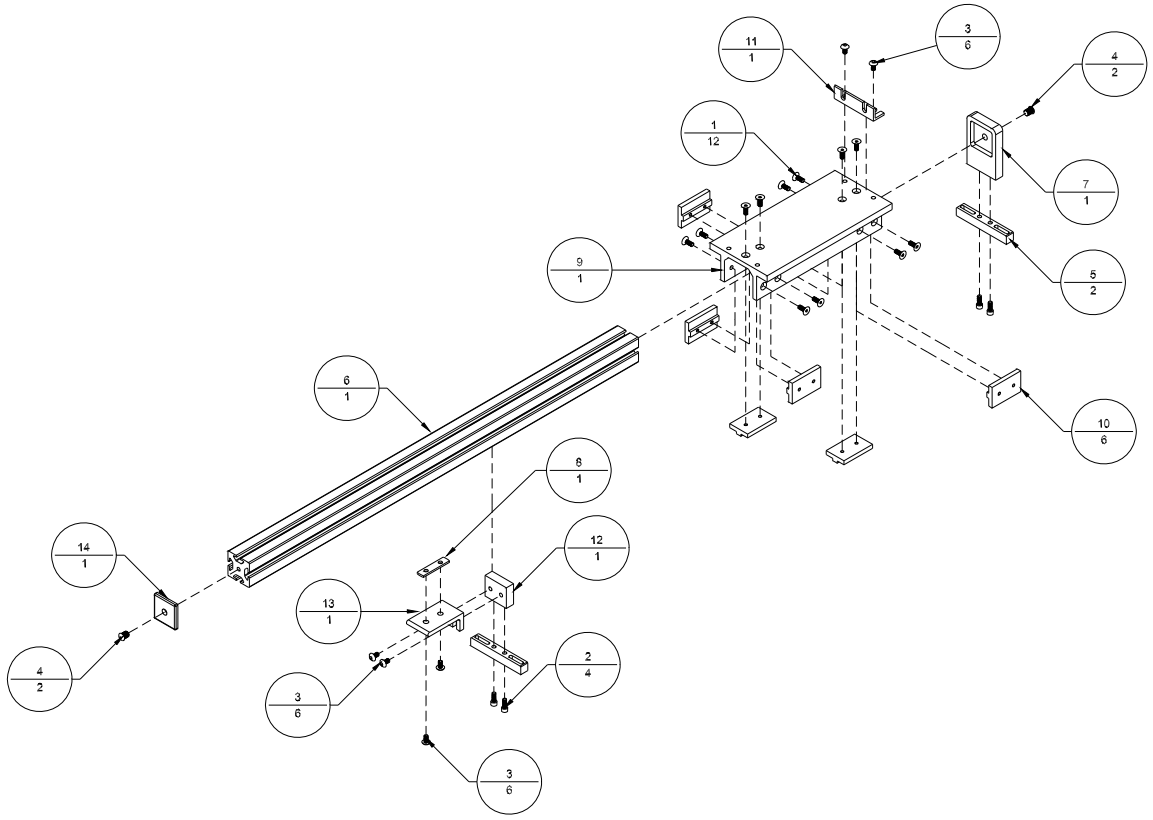


Table A-6: *Output Cable Assembly, BK730-2 (9101656A)*

Item	Part Number	Quantity	Description	Reference
1	606018	22”	Cable, #22-10, Shielded	
2	614107	9	Male Contact, Pin, Yellow	
3	614108	9	Female Contact, Socket, Yellow	
4	614125	1	Plug, CPC, 13-9	
5	614126	1	Cable Clamp, Shell 13	
6	614140	1	Cable Clamp, Shell 17	
7	9101172	1	Plug, Reverse, 17-14	

Figure A-6: *Output Cable Assembly, BK730-2 (9101656A)*

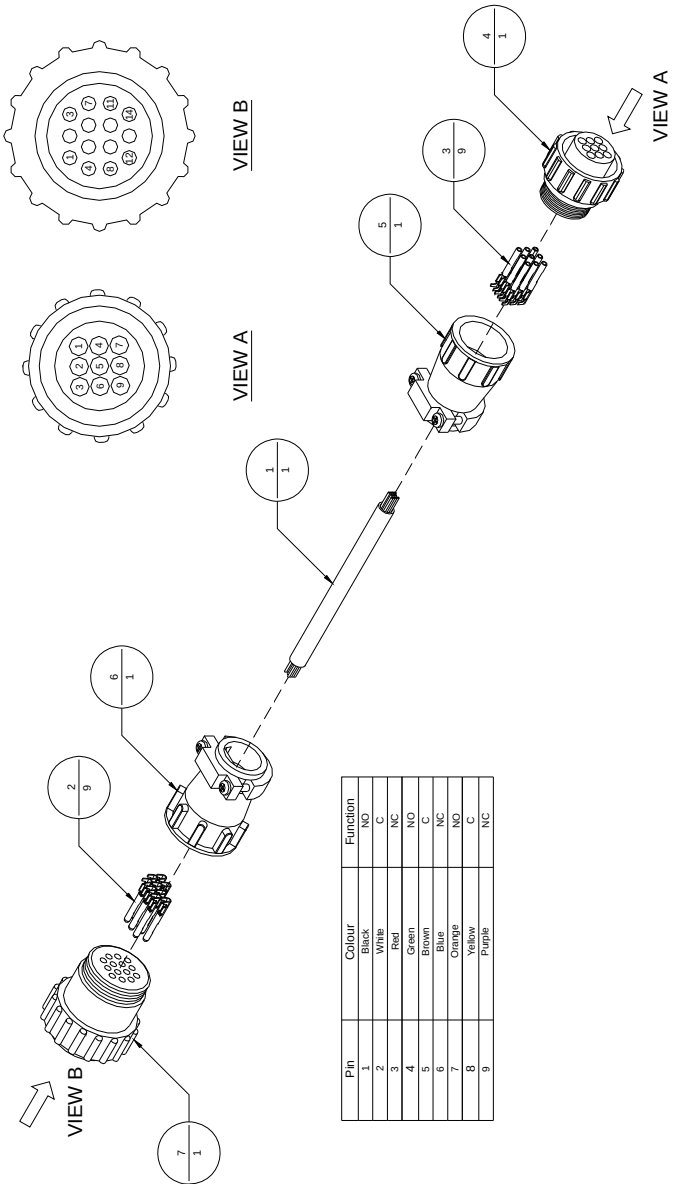


Table A-7: Power Cable Assembly, BK730-2 (9101657A)

Item	Part Number	Quantity	Description	Reference
1	606034	22”	Cable, #16-3, SJOW-A	
2	614104	1	Plug Connector 17-3, Standard	
3	614109	3	Pin, Power Contact	
4	614110	3	Socket, Power Contact	
5	614140	2	Cable Clamp, Shell 17	
6	614207	1	Plug (Reverse Sex), 17-3	

Figure A-7: *Power Cable Assembly, BK730-2 (9101657A)*

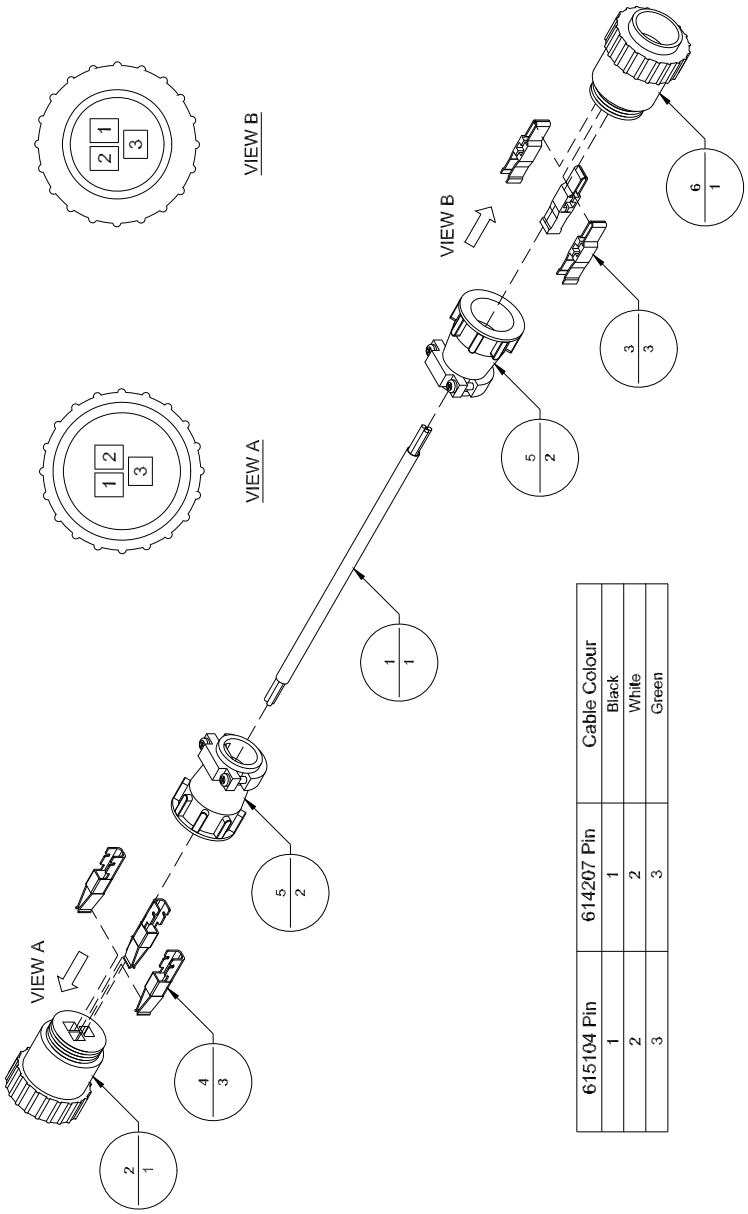
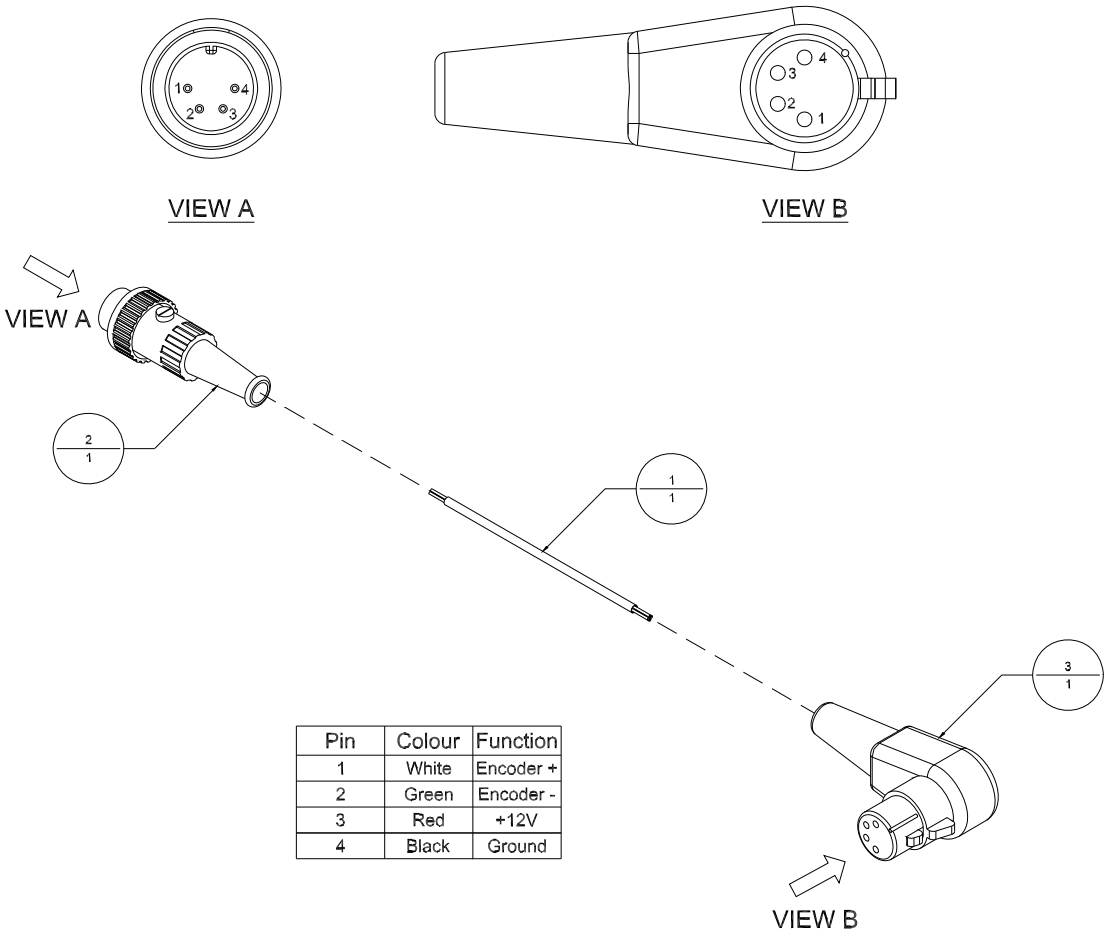


Table A-8: *Encoder Cable Assembly, BK730-2 (9101658A)*

Item	Part Number	Quantity	Description	Reference
1	606014	22”	Cable, #22-4 Shielded	
2	9100725	1	Plug, Preh Locking, 4 Pin	
3	9101280	1	Plug, Neutrik, Female, 4 Pin	

Figure A-8: *Encoder Cable Assembly, BK730-2 (9101658A)*

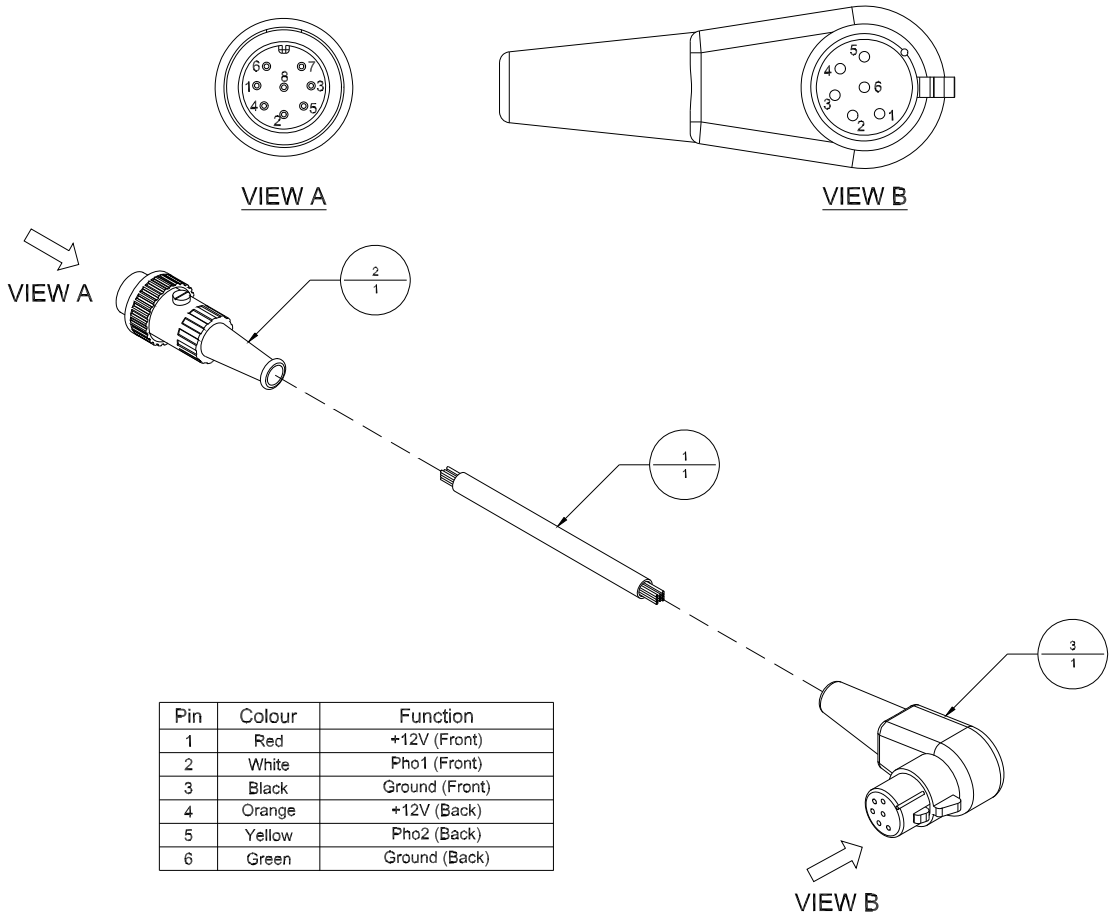


Pin	Colour	Function
1	White	Encoder +
2	Green	Encoder -
3	Red	+12V
4	Black	Ground

Table A-9: *Photo F/B Cable Assembly, BK730-2 (9101659A)*

Item	Part Number	Quantity	Description	Reference
1	606018	22”	Cable, #22-10 Shielded	
2	9101238	1	Plug, Preh, Locking, 8 Pin	
3	9101282	1	Plug, Neutrik, Female, 6 Pin	

Figure A-9: *Photo F/B Cable Assembly, BK730-2 (9101659A)*

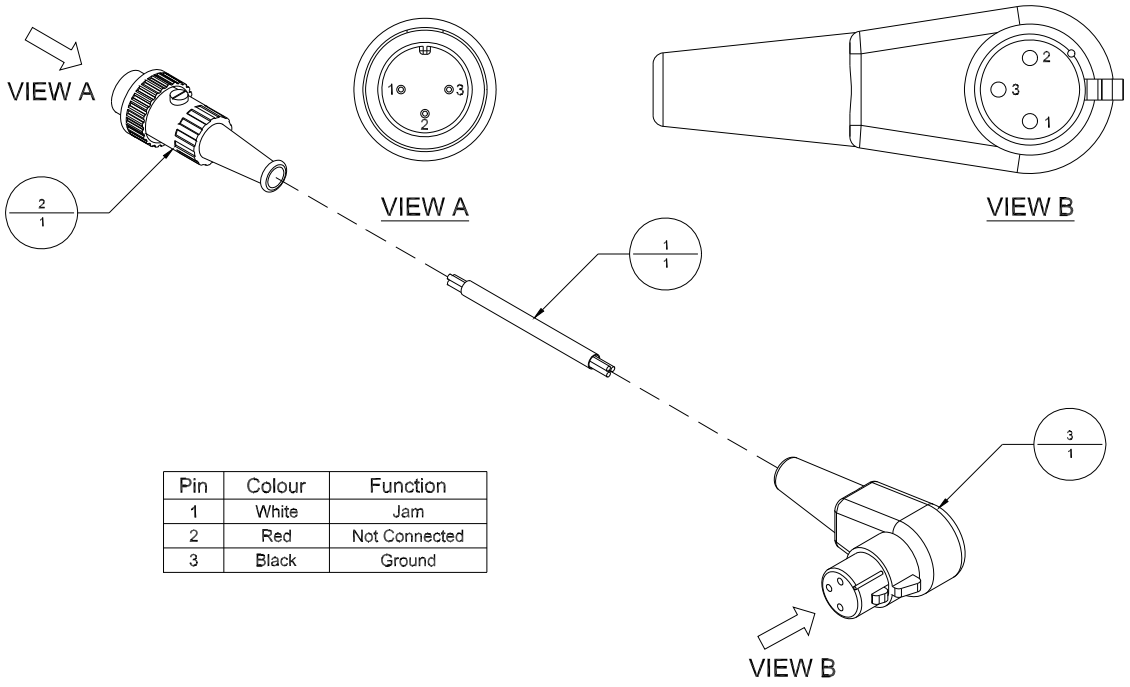


Pin	Colour	Function
1	Red	+12V (Front)
2	White	Pho1 (Front)
3	Black	Ground (Front)
4	Orange	+12V (Back)
5	Yellow	Pho2 (Back)
6	Green	Ground (Back)

Table A-10: *Jam Cable Assembly (9101660A)*

Item	Part Number	Quantity	Description	Reference
1	606013	22”	Cable, #22-3 Shielded	
2	9100724	1	Plug, Preh Locking, 3 Pin	
3	9101549	1	Plug, Neutrik, 3 Pin	

Figure A-10: *Jam Cable Assembly (9101660A)*



Pin	Colour	Function
1	White	Jam
2	Red	Not Connected
3	Black	Ground

Table A-11: *Tabber Head Assembly, Version 2 (BK731A-2)*

Item	Part Number	Quantity	Description	Reference
1	206010	1	Lever Handle, 1/4-20 UNC x 3/4"	
2	401510	5	Screw, BHCS, 4-40 UNC x 1/4"	
3	402250	2	Screw, SHCS, 6-32 UNC x 3/4"	
4	402520	4	Screw, BHCS, 6-32 UNC x 3/8"	
5	403530	4	Screw, BHCS, 8-32 UNC x 1/2"	
6	404070	1	Screw, FHCS, 10-32 UNF x 1"	
7	404250	4	Screw, SHCS, 10-32 UNF x 3/4"	
8	404510	31	Screw, BHCS, 10-32 UNF x 1/4"	
9	404530	2	Screw, BHCS, 10-32 UNF x 1/2"	
10	404805	3	Screw, SHSS, 10-32 UNF x 1/8"	
11	405240	2	Screw, SHCS, 1/4-20 UNC x 5/8"	
12	405270	4	Screw, SHCS, 1/4-20 UNC X 1"	
13	405510	2	Screw, BHCS, 1/4-20 UNC x 1/4"	
14	405530	2	Screw, BHCS, 1/4-20 UNC x 1/2"	
15	405540	6	Screw, BHCS, 1/4-20 UNC x 5/8"	
16	406585	4	Screw, BHCS, 5/16-18 UNC x 2"	
17	416140	2	Shoulder Bolt, 3/8" x 5/8", (5/16-18)	
18	416160	2	Shoulder Bolt, 3/8" x 7/8", (5/16-18)	
19	420008	2	Nut, 10-32 UNF	
20	433000	2	Keystock, 3/16 x 3/16 (3/4" Long)	
21	500055	1	Bearing, UBR-204-12S, 3/4" ID	
22	606020	1	Wire, #18, Black Hookup (15" Long)	
23	606026	1	Wire, #18, Blue Hookup (10" Long)	
24	606029	1	Wire, #18, White Hookup (10" Long)	
25	606029	1	Wire, #18, White Hookup (15" Long)	
26	609110	1	Connector, Push-on, Blue	
27	609113	1	Connector, Push-on, Yellow	
28	609117	3	Connector, Push-on, Red	
29	609118	3	Connector, Tab, Red	
30	615017	2	Terminal, EK2.5/35, Ground	
31	615021	1	T Rail, DIN, 4.75"	
32	615534	1	Sensor, Proximity, Magnetic, NO	
33	803020	1	Electrical Warning Label	
34	9101051A	1	Unwind Assembly	Page A-15
35	9101052A	1	Rewind Base Assembly	Page A-16
36	9101053	1	Tabber Head Base Plate	
37	9101054	1	Tab Storage Bin	
38	9101055	1	Tab Drive Shaft	
39	9101056	1	Abrasive Roller	
40	9101058	1	Stepper Motor, 2 Phase	
41	9101060A	5	Idler Roller Assembly	Page A-18
42	9101061	1	Drive Roller	
43	9101062	1	Shaft, Unwind Motor	
44	9101063	1	Stepper Motor, 5 Phase	
45	9101066	2	Collar, 1/4" Thick	
46	9101069A	2	Pivot Arm Assembly	Page A-19
47	9101081A	1	Peel Point Base Assembly	Page A-20
48	9101085	1	Bin Sensor	
49	9101107	2	Mounting Block, Stepper Motor	
50	9101111A	1	Front Cover Assembly	Page A-21
51	9101112A	1	Brush Pivot Assembly	Page A-22
52	9101121A	1	Keypad Mounting Rail Assembly	Page A-23
53	9101131	1	Support Post	
54	9101134A	1	Tabber Connector Plate Harness	Page A-26
55	9101148	1	Front Cover Guard Plate	
56	9101233A	1	Oscillating Idler Assembly	Page A-29
57	9101235	2	Washer, 25/64" ID, Bow Spring Tension	
58	9101244A	1	Tabber Backcover Assembly	Page A-30
59	9101256	1	Tabber Head Removable Back Cover	
60	9101552	1	Tab Threading Label	
61	9101577	1	Top Guard Plate	
62	9101619	2	Magnetic Latch	
63	9101638	2	Bushing, Nylon, 3/8 "ID X 5/8" OD X 5/8"	
64	9102103	1	Ring Core Ferrite, TT Series	
65	9103465	1	Power Supply, Switching, 12V	
66	9103541A	1	5-Phase Stepper Motor Driver Assembly	Page A-34
67	9103542A	1	2-Phase Stepper Motor Driver Assembly	Page A-36
68	9103670	1	Plug, 0.625" ID x 0.5", Cap, Vinyl	
69	9103881	1	Power Supply, Switching, 24VDC/2.3A	

Figure A-11: *Tabber Head Assembly, Version 2 - Page 1 of 2 (BK731A-2)*

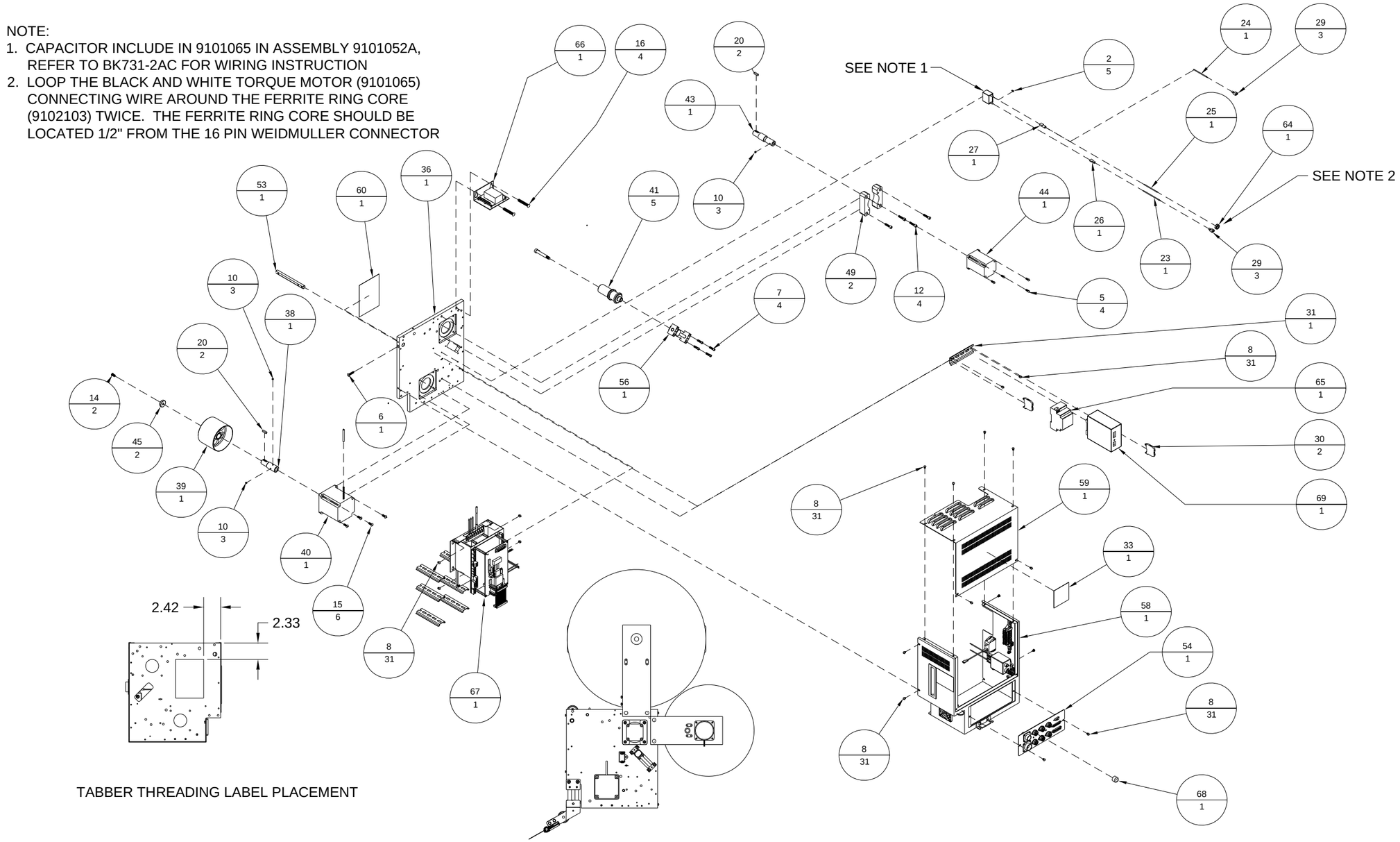


Figure A-12: *Tabber Head Assembly, Version 2 Page 2 of 2 (BK731A-2)*

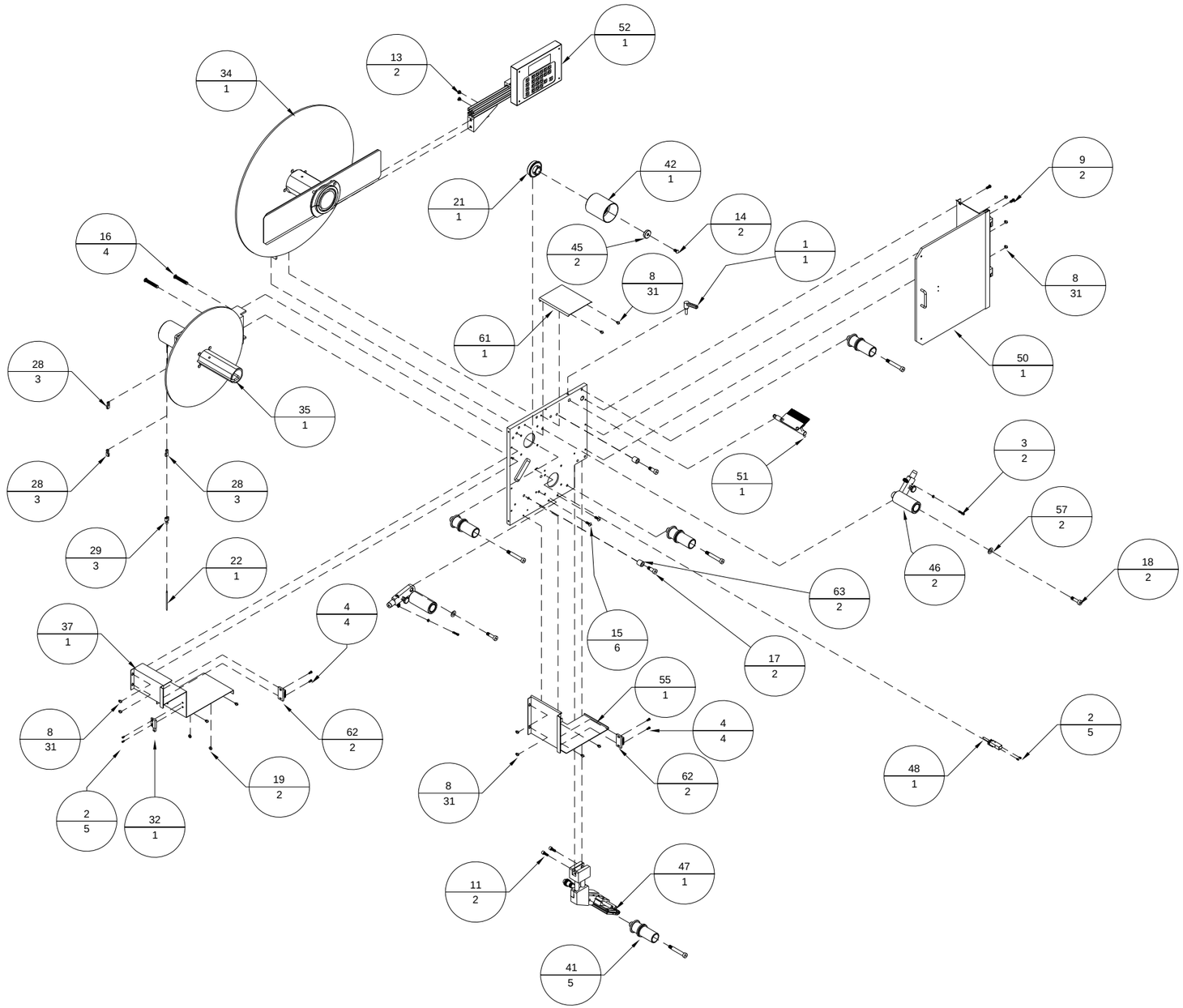


Table A-12: *Unwind Assembly (9101051A)*

Item	Part Number	Quantity	Description	Reference
1	404510	8	Screw, BHCS, 10-32 UNF x 1/4"	
2	405830	2	Screw, SHSS, 1/4-20 UNC x 1/2"	
3	407285	1	Screw, SHCS, 3/8-16 UNC x 2"	
4	438503	1	Rosette Knob, Black Plastic, 3/8" Screw	
5	440008	4	Washer, #10 I.D.	
6	440020	2	Washer, 3/8" I.D.	
7	500045	2	Bearing UBR202-10S, 5/8" I.D.	
8	9101051	1	Unwind Mounting Extrusion	
9	9101088	2	Mounting Bracket, Brake Belt	
10	9101103	1	Extrusion Cap	
11	9101143	1	Shaft, Unwind Motor	
12	9101145A	1	Unwind Disc Assembly	Page A-27
13	9101146	1	Unwind Braking Pad	
14	9101147	1	Unwind Brake Belt	
15	9101258	1	Oscillating Idler Roller Spring	

Figure A-13: *Unwind Assembly (9101051A)*

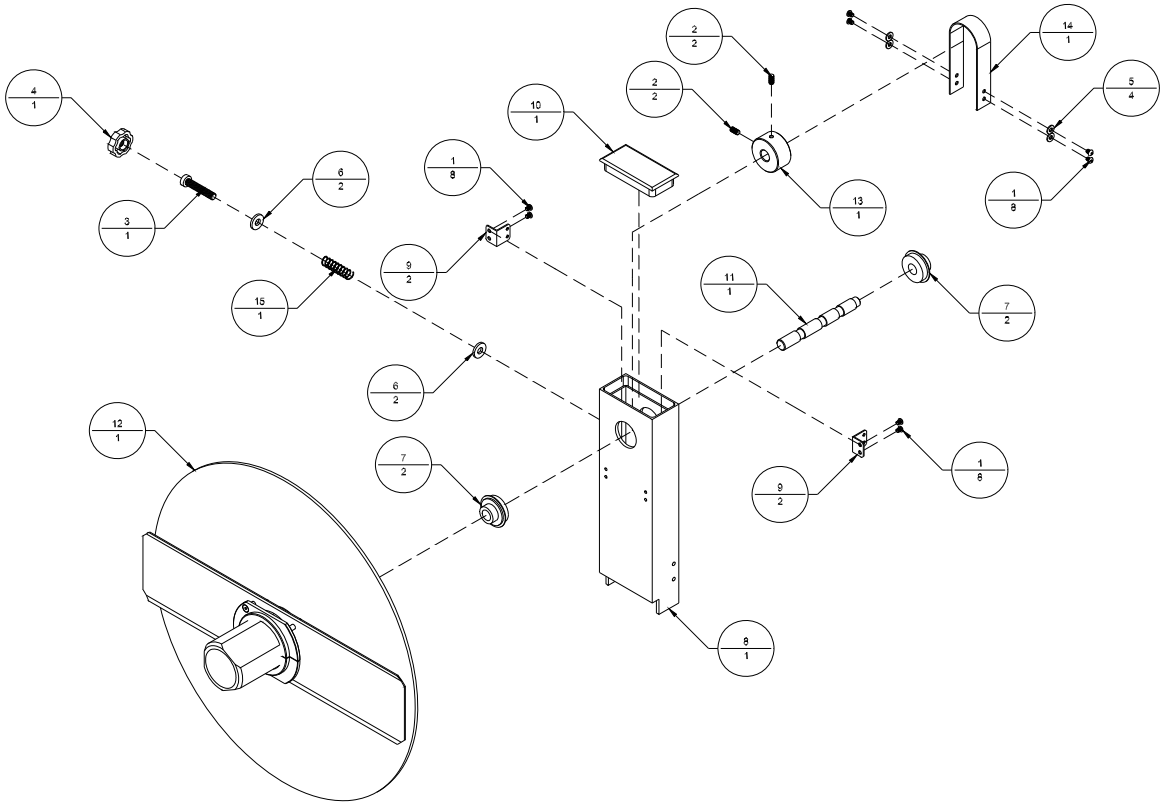


Table A-13: *Rewind Assembly (9101052A)*

Item	Part Number	Quantity	Description	Reference
1	404285	4	Screw, SHCS, 10-32 UNF X 2"	
2	404510	2	Screw, BHCS, 10-32 UNF x 1/4"	
3	404807	2	Screw, SHSS, 10-32 UNF x 3/16"	
4	439009	4	Lockwasher, No. 10	
5	440010	4	Washer, 1/4" I.D.	
6	500045	1	Bearing, UBR202-10S, 5/8"	
7	609000	1	Shrink Wrap, 3/16" I.D. (10" Long)	
8	630004A	1	Cycle Proximity Switch Assembly	Page A-17
9	9101052	1	Rewind Mounting Extrusion	
10	9101065	1	Motor, Torque, 900 RPM	
11	9101078	1	Tab Retaining Rod	
12	9101103	1	Extrusion Cap	
13	9101130A	1	Rewind Disc Assembly	Page A-25
14	9101140	1	Rewind Torque Motor Gear Head	
15	9101141	1	Cam, 90 Degree	
16	9101142	1	Shaft, Winding Motor	
17	9101270	1	Strain Relief Bushing, SR 5M-3	
18	9101569	1	Mounting Bracket, Proximity Sensor	

Figure A-14: *Rewind Assembly (9101052A)*

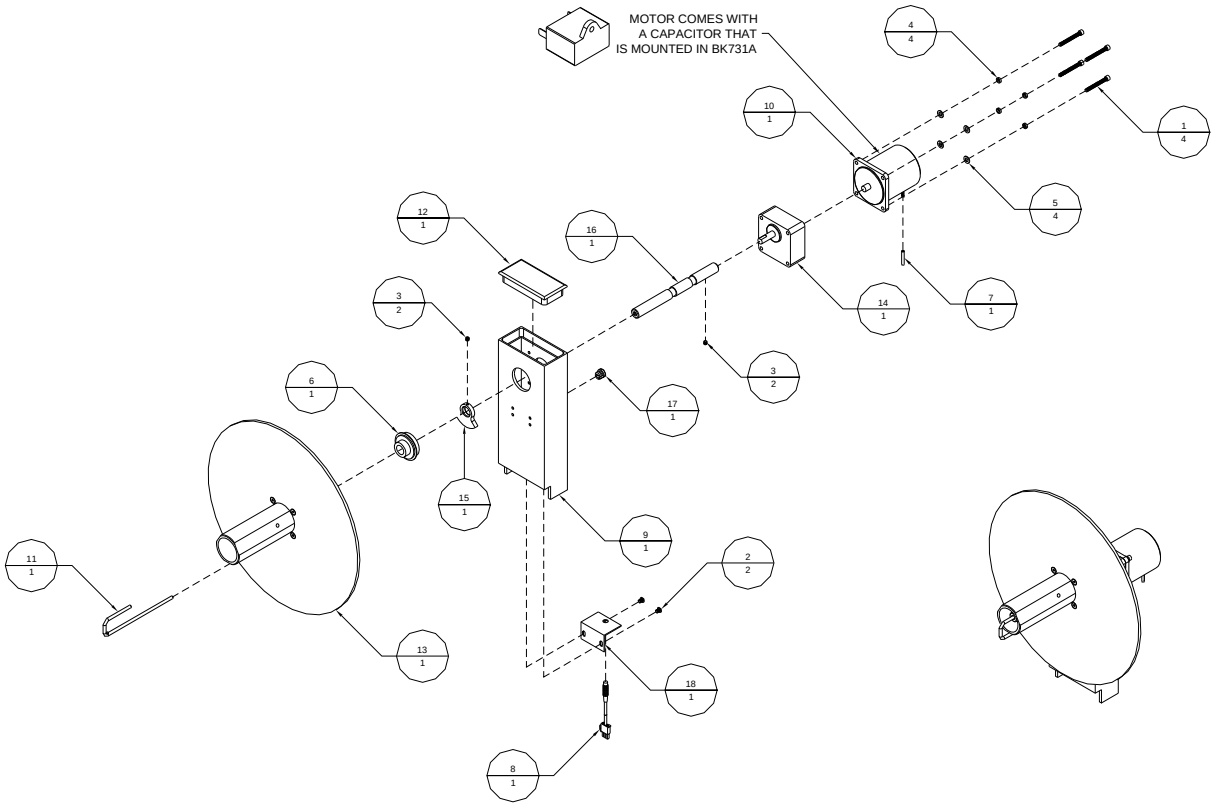
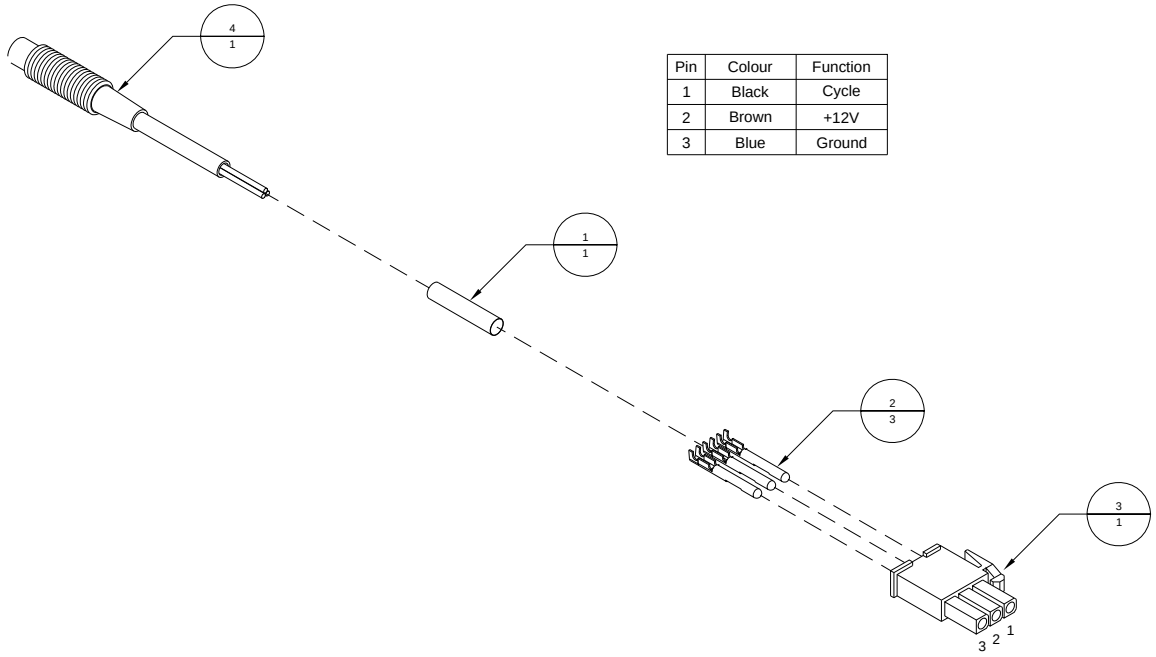


Table A-14: *Cycle Proximity Switch Assembly (630004A)*

Item	Part Number	Quantity	Description	Reference
1	609000	1	Shrink Wrap, 3/16" I.D. (0.75" Long)	
2	614000	3	Contact, Male, 22-18 AWG, Mini Mate-n-lok	
3	614001	1	Plug, Cap Pin Housing	
4	630004	1	Proximity Switch, Cut Cable Length to 7".	

Figure A-15: *Cycle Proximity Switch Assembly (630004A)*



Pin	Colour	Function
1	Black	Cycle
2	Brown	+12V
3	Blue	Ground

Table A-15: Idler Roller Assembly (9101060A)

Item	Part Number	Quantity	Description	Reference
1	9101060	1	Backer Idler Roller	
2	9101071	1	Tab Backer Guide	
3	9101075	1	O-Ring, 1-1/4 I.D. x 1-1/2 x 1/8”	

Figure A-16: *Idler Roller Assembly (9101060A)*

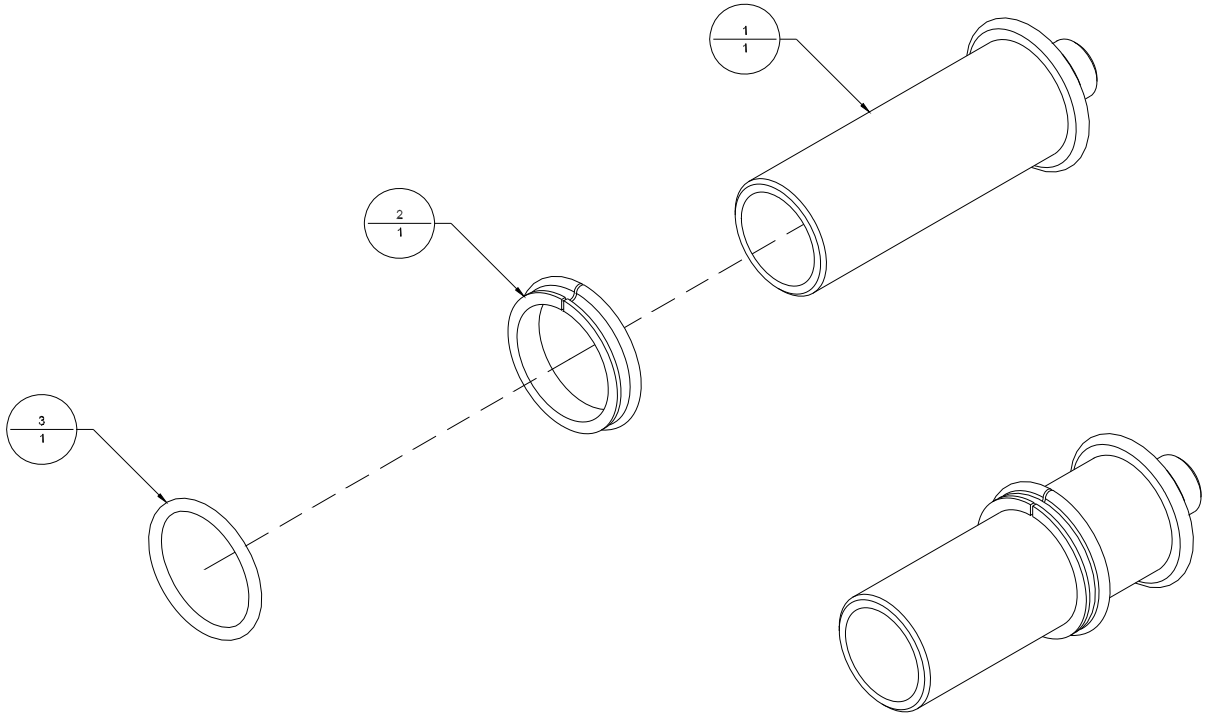


Table A-16: *Lower Pivot Arm Assembly (9101069A)*

Item	Part Number	Quantity	Description	Reference
1	416140	1	Shoulder Bolt, 3/8" X 5/8", 5/16-18 UNC	
2	416185	1	Shoulder Bolt, 3/8" X 2", 5/16-18 UNC	
3	436030	1	Spring Pin, 1/8" Dia X 1/2"	
4	440533	1	Washer, 3/8" I.D. X 0.06"	
5	500020	2	Bearing, R6, 3/8" I.D.	
6	505384	1	Flange Bushing, 3/8 I.D. x 1/2 O.D. x 1/2 LG.	
7	9101069	1	Pressure Roller	
8	9101070	1	Pivot Arm	
9	9101082	1	Quick Release Plunger	
10	9101240	1	Spring, Pivot Arm	
11	9101638	1	Bushing, Nylon, 3/8 "I.D. X 5/8" O.D. X 5/8"	

Figure A-17: *Lower Pivot Arm Assembly (9101069A)*

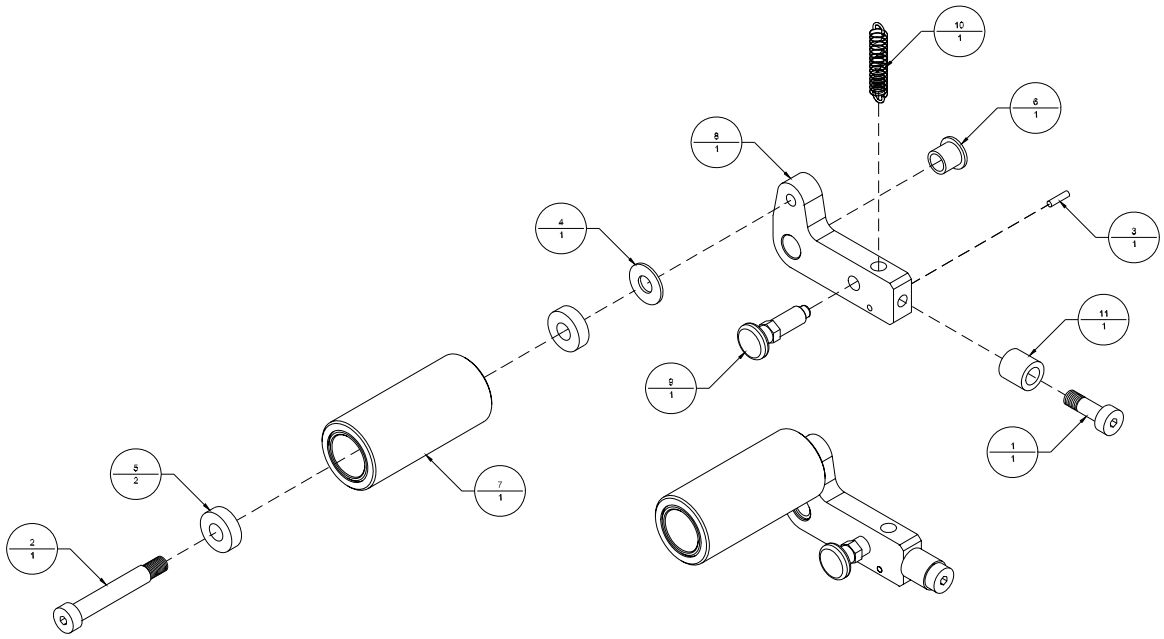


Table A-17: *Peel Point Base Assembly (9101081A)*

Item	Part Number	Quantity	Description	Reference
1	206010	1	Side Guide Locking Lever	
2	404520	1	Screw, BHCS, 10-32 UNF x 3/8"	
3	405230	1	Screw, SHCS, 1/4-20 UNF X 1/2"	
4	405805	2	Screw, SHSS, 1/4-20 UNC X 1/8"	
5	405830	2	Screw, SHSS, 1/4-20 UNC x 1/2"	
6	438505	1	Tee Knob, Black Plastic, 1/4-20 Screw	
7	440010	1	Washer, 1/4" I.D.	
8	9101081	1	Peel Point Base Plate	
9	9101087	1	Mounting Block, Peel Point Shaft	
10	9101115	2	Dowel Pin, 3/8" DIA x 3"	
11	9101128	2	Dowel Pin, 1/2" DIA x 4"	
12	9101264A	1	Peel Point Assembly	Page A-31
13	9101687	1	Peel Point Lock Plate	
14	9101743	1	Cable Clamp, 3/16 Dia.	

Figure A-18: *Peel Point Base Assembly (9101081A)*

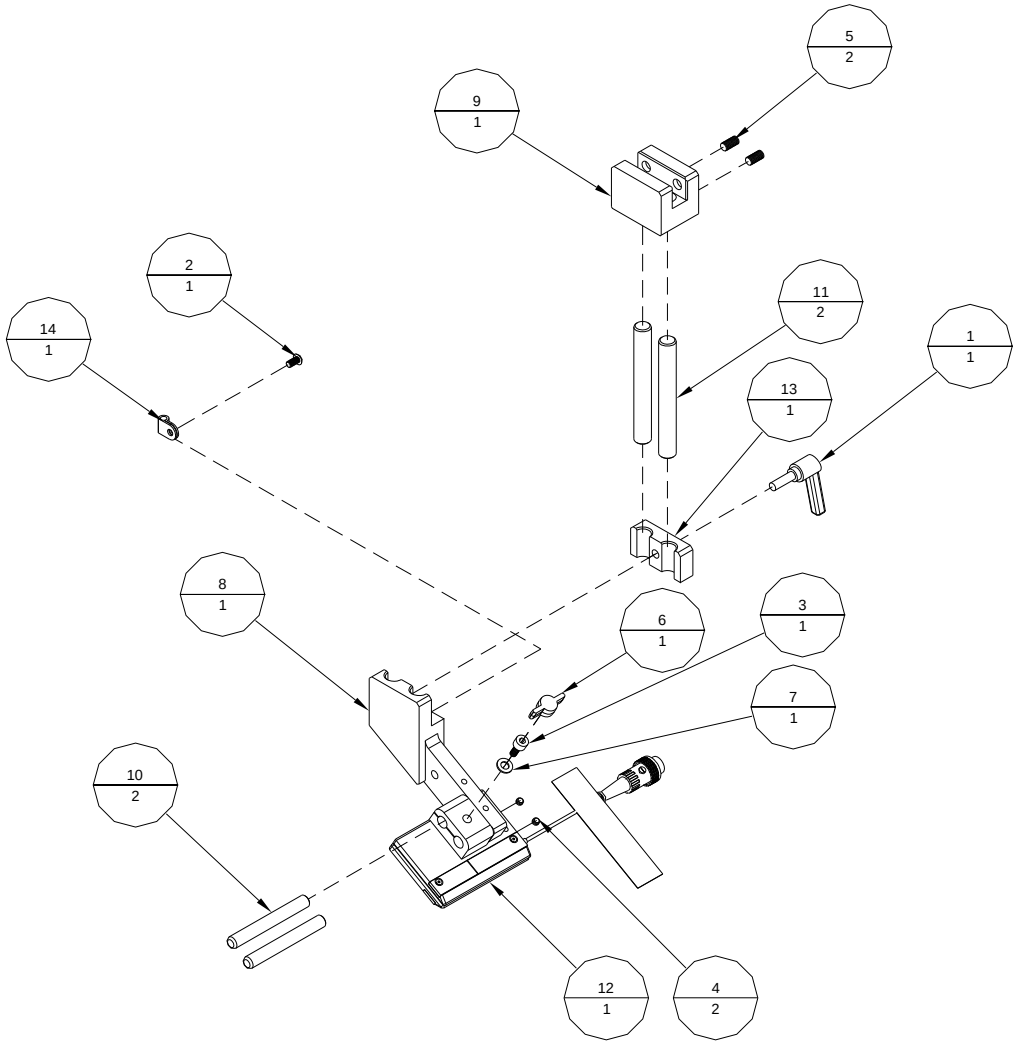


Table A-18: *Front Cover Assembly (9101111A)*

Item	Part Number	Quantity	Description	Reference
1	401510	2	Screw, BHCS, 4-40 UNC x 1/4"	
2	402020	4	Screw, FHCS, 6-32 UNC x 3/8"	
3	402210	2	Screw, SHCS, 6-32 UNC x 1/4"	
4	402510	2	Screw, BHCS, 6-32 UNC x 1/4"	
5	402530	2	Screw, BHCS, 6-32 UNC x 1/2"	
6	404510	4	Screw, BHCS, 10-32 UNF x 1/4"	
7	438314	1	Inkwell Door Handle	
8	615533	1	Actuator, Magnetic	
9	630006	1”	Reflective Tape	
10	9101110	2	Hinge, Mini Lift-off, In-line	
11	9101111	1	Front Safety Cover	
12	9101663	1	Tabber Right Side Cover	
13	9101664	1	Panel Stiffener	
14	9101686	1	Front Cover Magnetic Catch	

Figure A-19: *Front Cover Assembly (9101111A)*

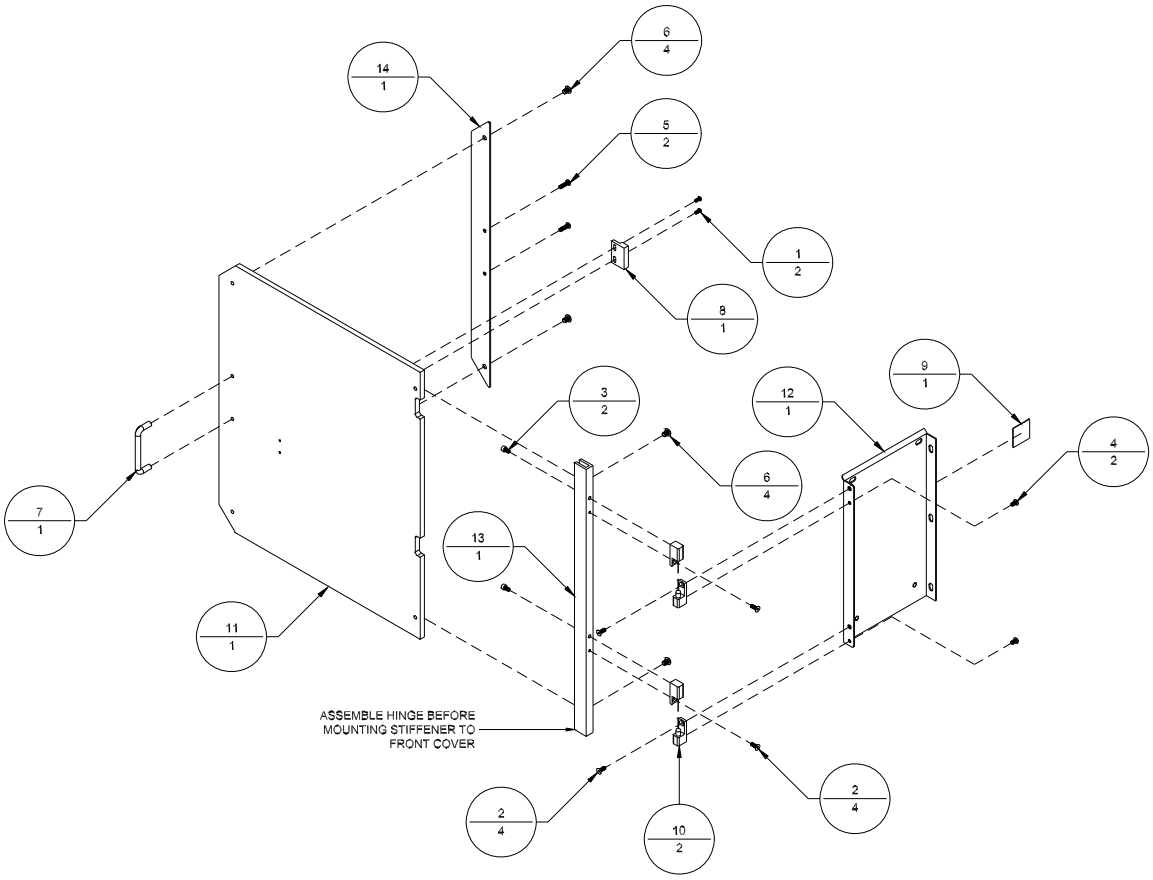


Table A-19: *Brush Pivot Assembly (9101112A)*

Item	Part Number	Quantity	Description	Reference
1	404520	2	Screw, BHCS, 10-32 UNF x 3/8"	
2	436300	1	Spring Pin, 3/16" Dia. X 1 3/4" Long	
3	9101116A	1	Brush Assembly	
4	9101626	1	Brush Pivot Shaft	

Figure A-20: *Brush Pivot Assembly (9101112A)*

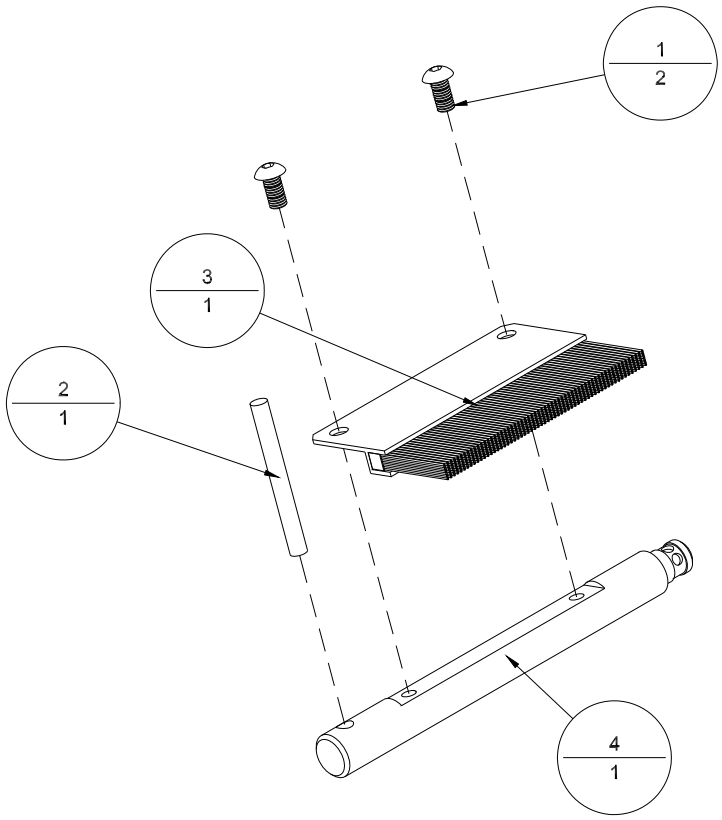


Table A-20: *Keypad Mounting Rail Assembly (9101121A)*

Item	Part Number	Quantity	Description	Reference
1	402020	6	Screw, FHCS, 6-32 UNC x 3/8"	
2	405520	3	Screw, BHCS, 1/4-20 UNC x 3/8"	
3	405530	2	Screw, BHCS, 1/4-20 UNC x 1/2"	
4	606324	1	Serial Extension Cable, 3 Ft, 25 Cond.	
5	9100222	3	Shim Stock	
6	9100360	1	Endcap (10 series)	
7	9101057A	1	Tabber Keyboard Assembly	Page A-24
8	9101121	1	Tabber Keyboard Rail Mounting Bracket	
9	9101122	1	Tabber Sliding Rail	
10	9101124	1	Bearing Profile, Keypad Mount	
11	9101125	3	Bearing Pad, Keypad Mount	
12	9101126	1	Double T-Nut	

Figure A-21: *Keypad Mounting Rail Assembly (9101121A)*

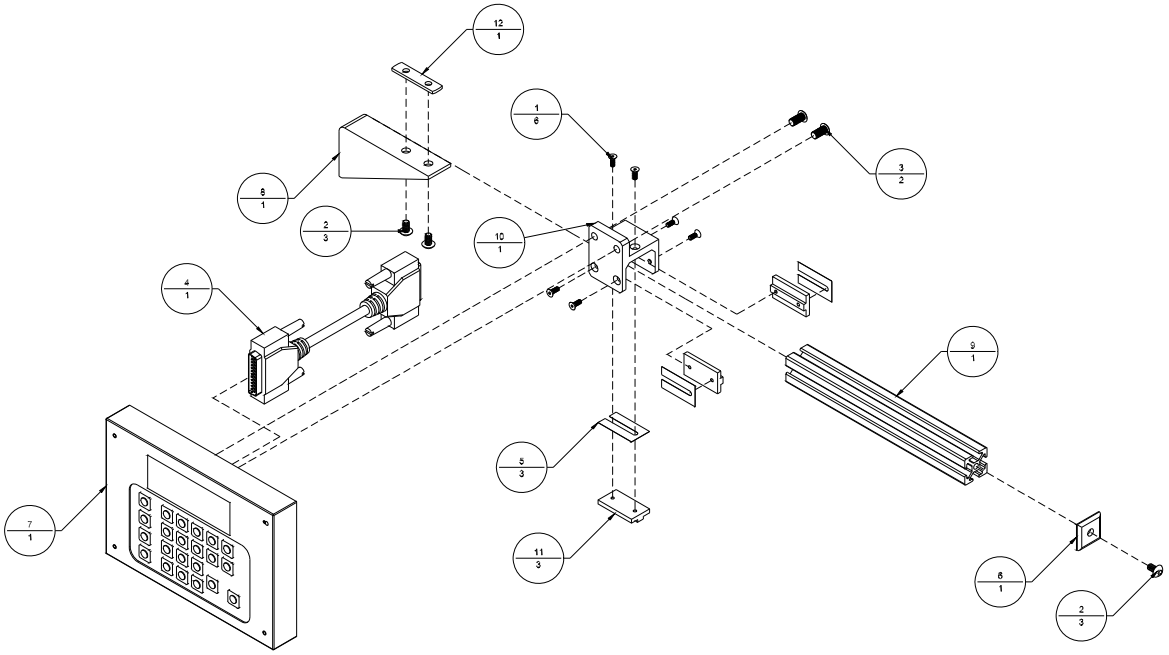


Table A-21: *Tabber Keypad Assembly (9101057A)*

Item	Part Number	Quantity	Description	Reference
1	402310	4	Screw, PHMS, 6-32 UNC x 1/4"	
2	615322	2	Female Screwlock, 4-40 UNC	
3	9101079	1	Tabber Keyboard Box	
4	9101080A	1	Tabber Keypad Board Assembly	
5	9101083	1	Cover, Rear Tabber Keypad	
6	9101083A	1	Tabber Keypad Ribbon Cable Assembly	
7	9101119	4	Hex Spacer, 6-32 UNC x 1/2"	

Figure A-22: *Tabber Keypad Assembly (9101057A)*

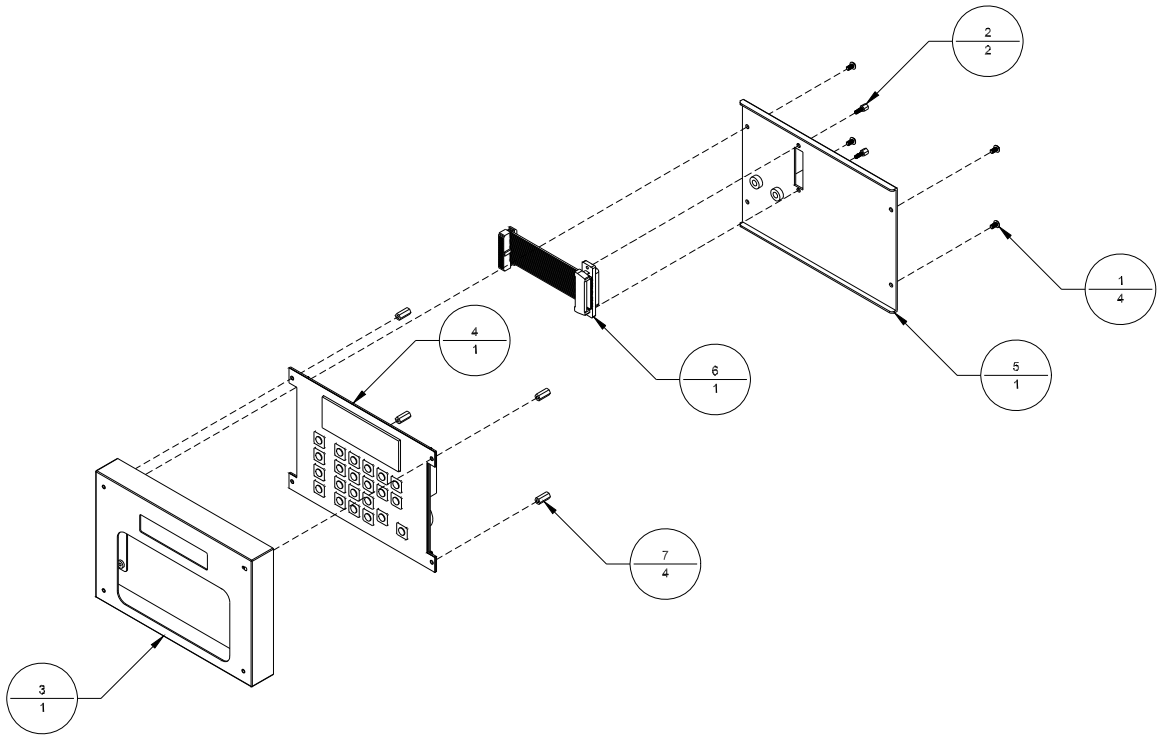


Table A-22: *Rewind Disc Assembly (9101130A)*

Item	Part Number	Quantity	Description	Reference
1	404020	4	Screw, FHCS, 10-32 UNF x 3/8"	
2	405830	2	Screw, SHSS, 1/4-20 UNC x 1/2"	
3	9101129	1	Rewind Hub	
4	9101130	1	Rewind Tab Retaining Plate	

Figure A-23: *Rewind Disc Assembly (9101130A)*

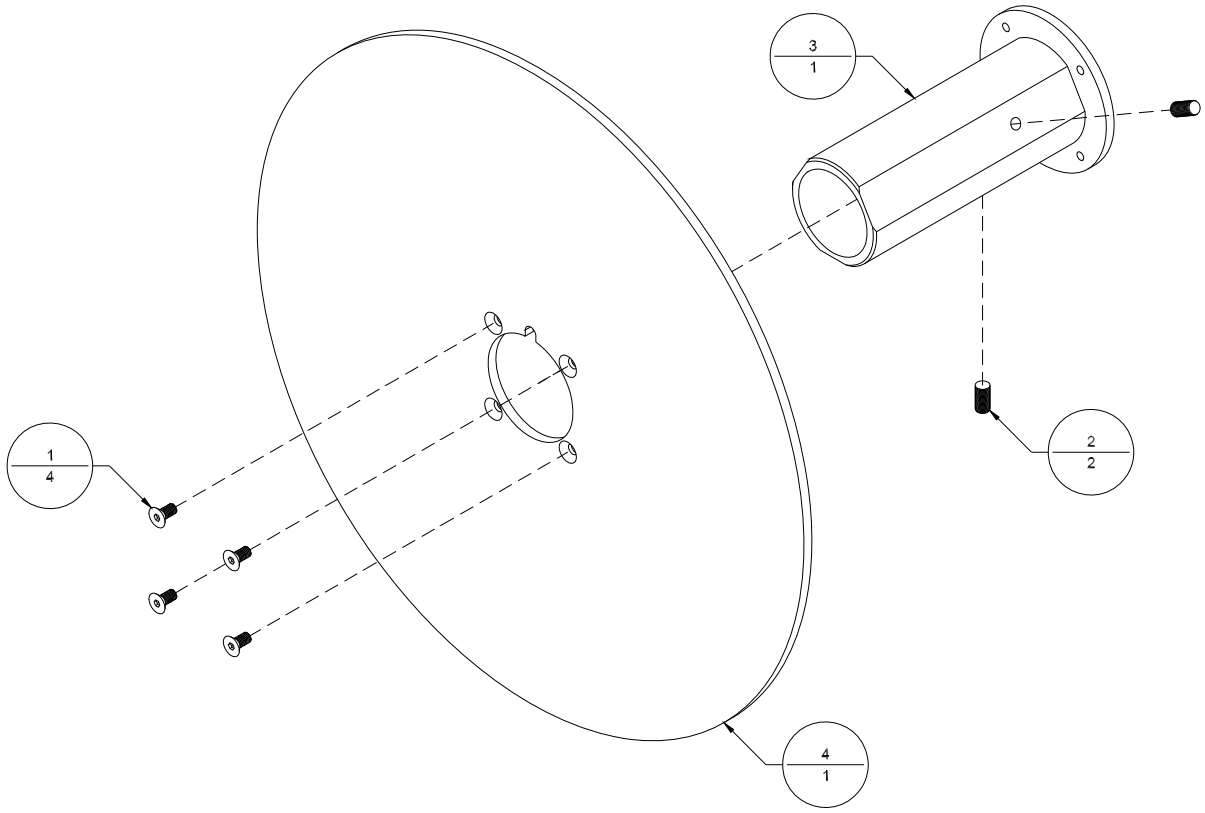


Table A-23: *Tabber Connector Plate Harness (9101134A)*

Item	Part Number	Quantity	Description	Reference
1	401310	16	Screw, PHMS, 4-40 UNC x 1/4"	
2	402310	4	Screw, PHMS, 6-32 UNC x 1/4"	
3	420007	2	Nut, 8-32 UNC	
4	439006	2	Lockwasher, No.6	
5	440005	2	Washer, #6, I.D.	
6	615140	2	Lashing Tie	
7	615322	6	Female Screwlock, 4-40 UNC	
8	9100728	2	Tie Anchor Mount, #8 Screw	
9	9101134	1	Tabber Connector Plate	
10	9101134C1	1	Power Cable, Tabber (Cable #1)	
11	9101134C10	1	Keypad Cable (Cable #10)	
12	9101134C11	1	Controller I/O Cable (Cable #11)	
13	9101134C12	1	Safety Cover Cable (Cable #12)	
14	9101134C13	1	Take-up Cable (Cable #13)	
15	9101134C2	1	Encoder Cable (Cable #2)	
16	9101134C3	1	Photo F/B Cable (Cable #3)	
17	9101134C4	1	Tab Cable (Cable #4)	
18	9101134C5	1	Output Cable (Cable #5)	
19	9101134C6	1	Product Cable (Cable #6)	
20	9101134C7	1	Jam Cable (Cable #7)	
21	9101134C8	1	Inhibit Cable (Cable #8)	
22	9101134C9	1	Communications Cable (Cable #9)	

Figure A-24: *Tabber Connector Plate Harness (9101134A)*

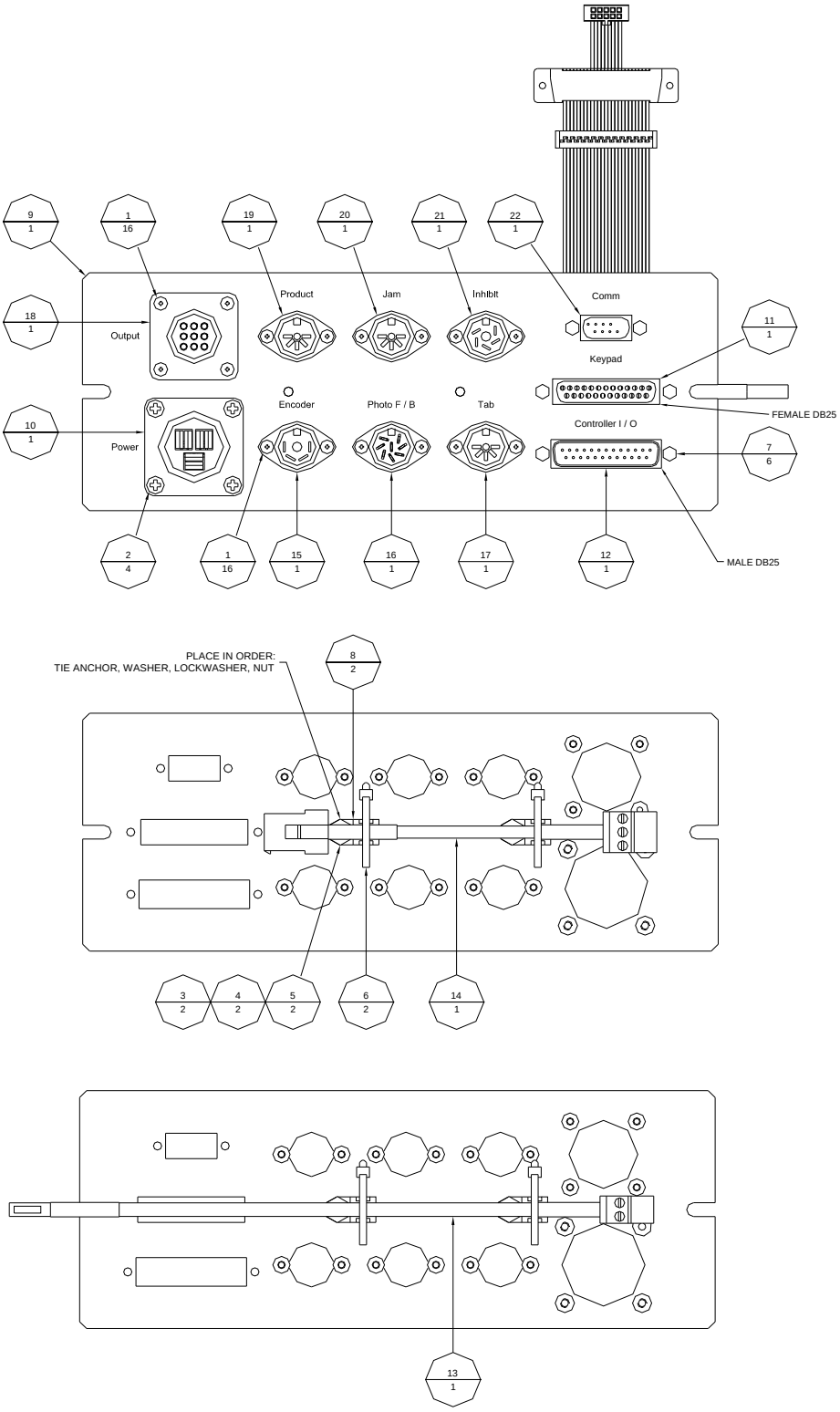


Table A-24: *Unwind Disc Assembly (9101145A)*

Item	Part Number	Quantity	Description	Reference
1	404020	4	Screw, FHCS, 10-32 UNF x 3/8"	
2	404030	2	Screw, FHCS, 10-32 UNF x ½"	
3	405850	2	Screw, SHSS, ¼-20 UNC x ¾"	
4	9101144	1	Unwind Hub	
5	9101145	1	Unwind Tab Retaining Plate	
6	9101149	1	Tab Retaining Plate	
7	9101150	1	Unwind Hub Guide	

Figure A-25: *Unwind Disc Assembly (9101145A)*

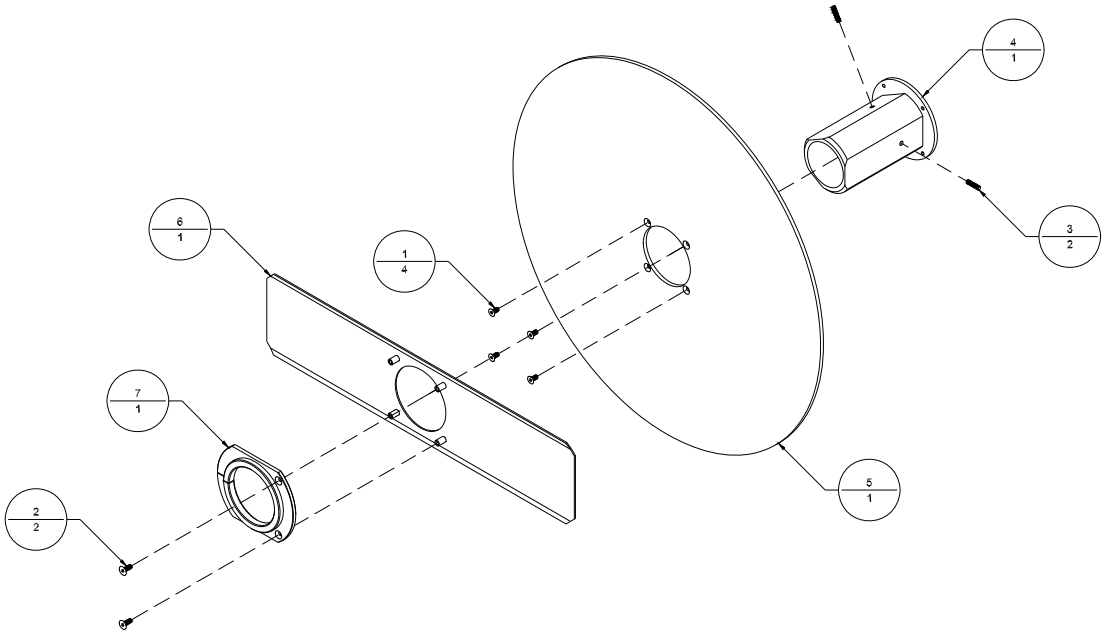


Table A-25: *Oscillating Idler Assembly (9101233A)*

Item	Part Number	Quantity	Description	Reference
1	404810	2	Screw, SHSS, 10-32 UNF X 1/4"	
2	437075	2	Retaining Ring, 3/4" I.D. External	
3	440020	1	Washer, 3/8" I.D.	
4	9100749	2	Rubber Washer, 3/8" I.D. X 1" X 1/8"	
5	9101109	1	Linear Bearing	
6	9101232	1	Oscillating Idler Shaft	
7	9101233	1	Oscillating Idler Slide Block	
8	9101234	2	Oscillating Idler Mount Block	
9	9101258	1	Oscillating Idler Roller Spring	

Figure A-26: *Oscillating Idler Assembly (9101233A)*

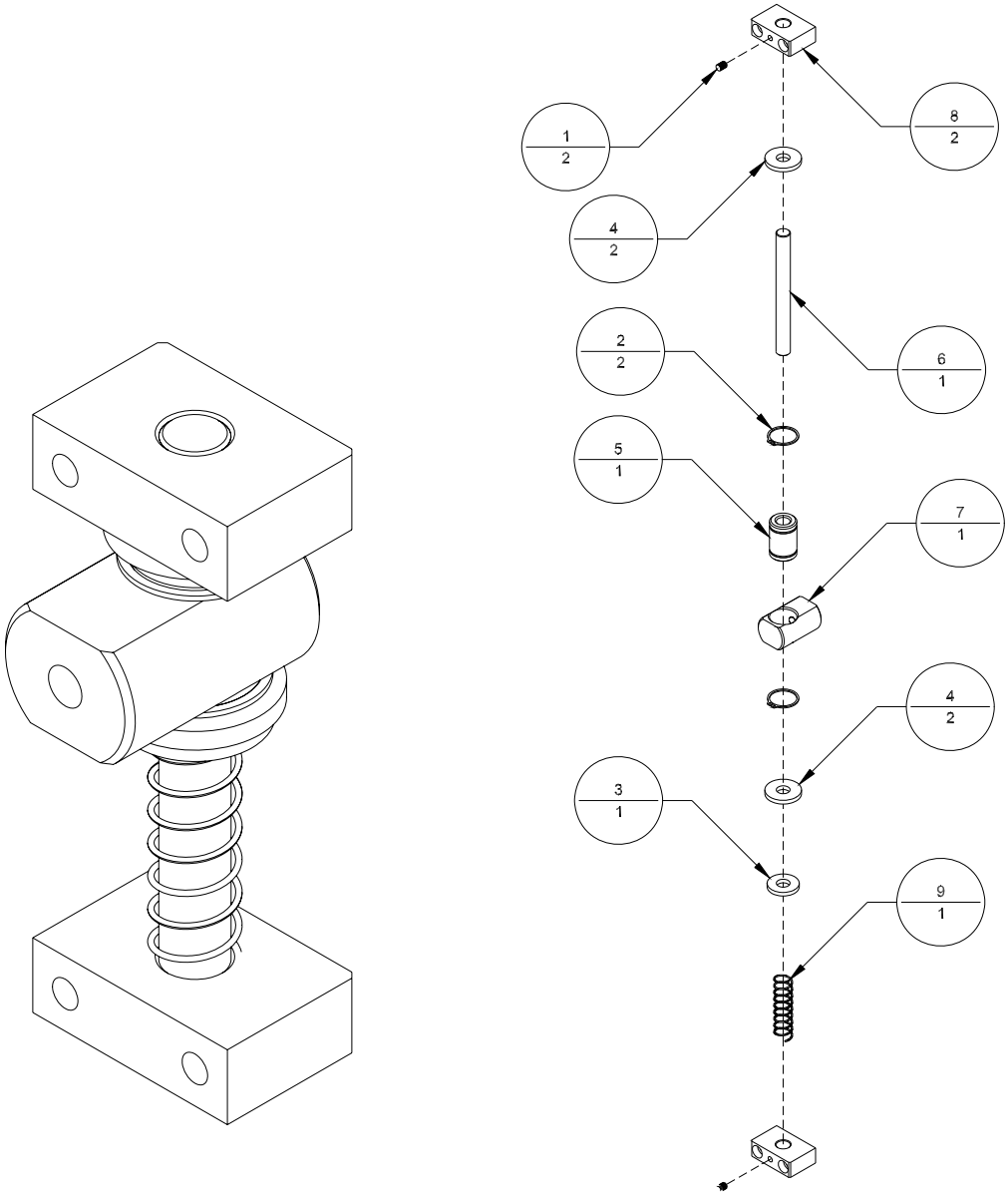


Table A-26: Tabber Back Cover Assembly (9101244A)

Item	Part Number	Quantity	Description	Reference
1	403080	4	Screw, FHCS, 8-32 UNC X 1 1/2 in	
2	403510	4	Screw, BHCS, 8-32 UNC x 1/4"	
3	405520	2	Screw, BHCS, 1/4-20 UNC, 3/8"	
4	420007	5	Nut, 8-32 UNC	
5	420008	2	Nut, 10-32 UNF	
6	439005	4	Lockwasher, No.8	
7	440006	4	Washer, #8, 1/2" O.D. x 0.05" Thick	
8	603300	1	Switch, Breaker, 5A, 1 Pole	
9	606000	2	Wire #16, Black, Hookup (10" Long)	
10	606005-10	1	Wire #16, Green, Hookup (10" Long)	
11	606005-15	1	Wire #16, Green, Hookup (15" Long)	
12	606009	1	Wire #16, White, Hookup (10" Long)	
13	606020	1	Wire, #18, Black, Hookup (10" Long)	
14	606022	1	Wire, #18, Red, Hookup (10" Long)	
15	609102	2	Marrette, Black	
16	609110	5	Connector, Push-on, Blue	
17	609114	2	Ring Tongue Terminal, #10	
18	615140	1	Lashing Tie	
19	9100343	1	Fan, 12VDC	
20	9100674	1	Filter, Corcom, 10 A	
21	9100728	1	Tie Anchor Mount, #8 Screw	
22	9101244	1	Tabber Head Back Cover	
23	9101575A	1	Tabber Terminal Block Assembly	Page A-34
24	9101620	1	Mounting Bracket, Slide Rail	
25	9101627	1	Buskro Serial Number Label	
26	9101640	1	Handle, Panel Snap Style	
27	9101655	1	Filter, 12 VDC Fan	

Figure A-27: *Tabber Back Cover Assembly (9101244A)*

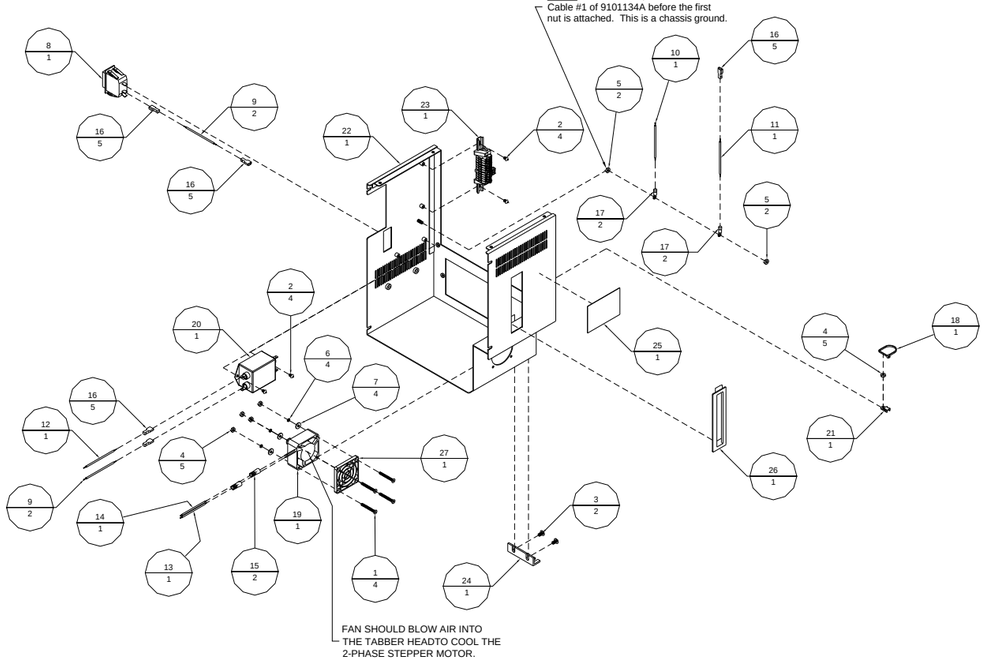
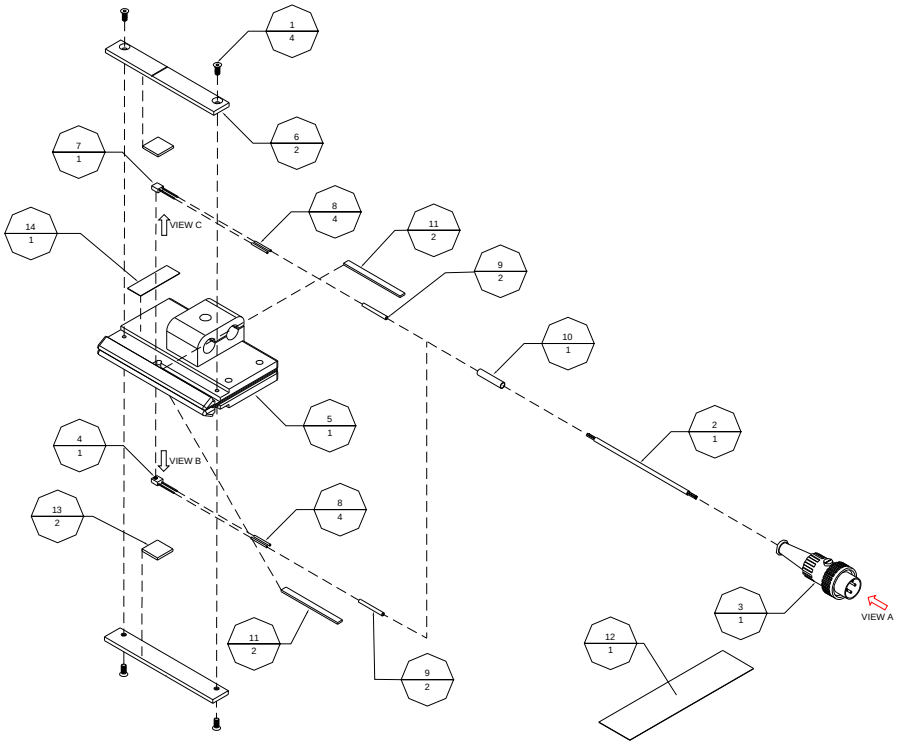
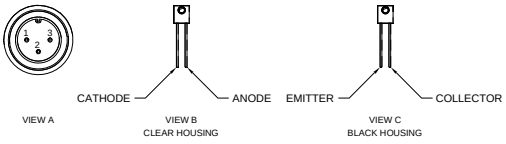


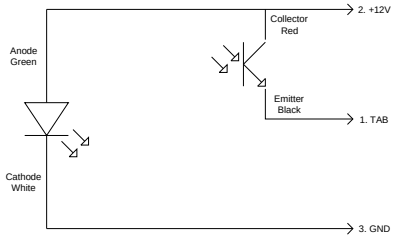
Table A-27: Peel Point Assembly (9101264A)

Item	Part Number	Quantity	Description	Reference
1	401010	4	Screw, FHCS, 4-40 UNC x 1/4"	
2	606014	1	Cable, #22-4, Shielded, (24" Long)	
3	9100724	1	Plug, Preh, Locking, 3 Pin	
4	9101072	1	AlGaAs Infrared Emitting Diode	
5	9101074A	1	Peel Point	
6	9101104	2	Peel Point Top Cover	
7	9101264	1	Sidelooker Phototransistor	
8	9101669	4	Shrink Wrap, 1/16" I.D., 125 C, 500V (1" Long)	
9	9101670	2	Shrink Wrap, 1/4" I.D., 125 C, 500V (3" Long)	
10	9101671	1	Shrink Wrap, 1/2" I.D., 125 C, 500V (3" Long)	
11	9103573	2	Plate, Peel Point Notch	
12	9103578	1	Label, Peel Point Cable Warning	
13	9103598	2	Tape, Double-Sided Foam	
14	9103678	1	Label, Peel Point S/N	

Figure A-28: *Peel Point Assembly (9101264A)*







9101072 Pin	9101264 Pin	606014 Colour	9100724 Pin	Function
	Emitter	Black	1	TAB
	Collector	Red	2	+12V
Cathode		White	3	GND
Anode		Green	2	+12V

Table A-28: *Suspension Base Block Assembly (9101565A)*

Item	Part Number	Quantity	Description	Reference
1	404075	2	Screw, FHCS 10-32 UNF x 1 1/4"	
2	414180	2	Shoulder Bolt, ¼" ID x 1 1/2" (10-24 UNC)	
3	416185	1	Shoulder Bolt, 3/8" ID x 2" (5/16-18 UNC)	
4	440533	1	Washer, 3/8" ID x 0.06" Wide	
5	500020	2	Bearing, R6, 3/8 ID	
6	9101069	1	Pressure Roller	
7	9101564	1	Mounting Block, Pressure Roller	
8	9101565	1	Suspension Base Block	
9	9101813	2	Suspension Compression Spring	

Figure A-29: *Suspension Base Block Assembly (9101565A)*

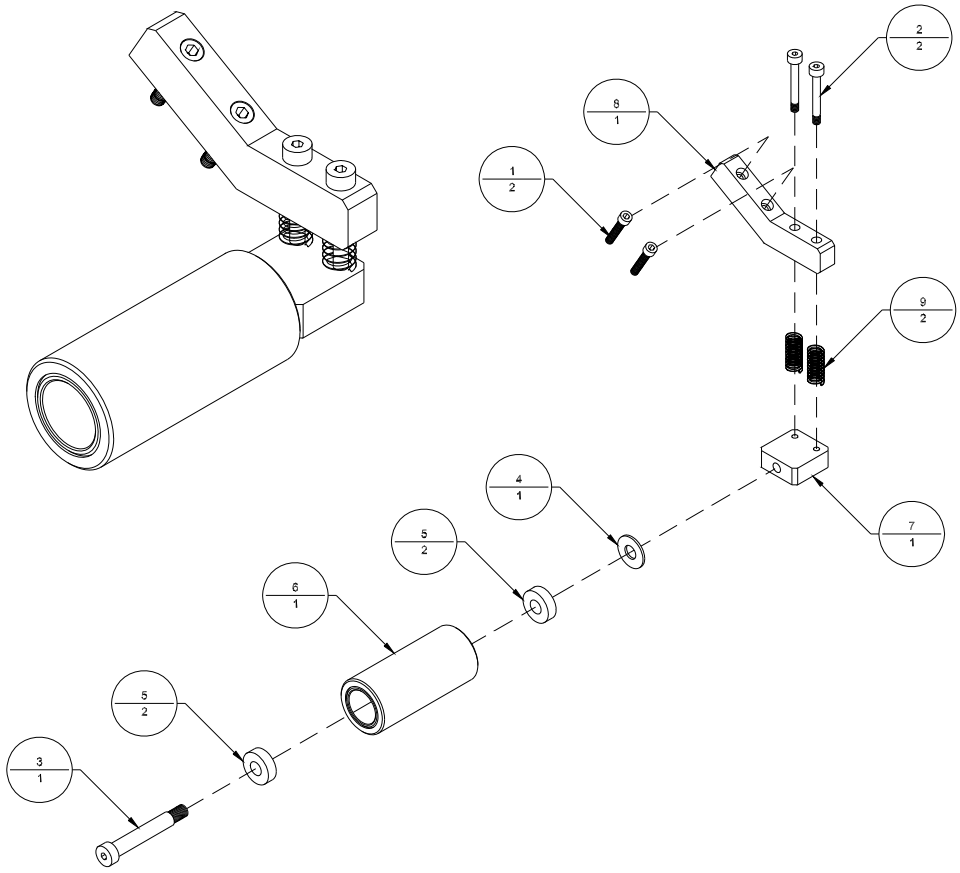


Table A-29: *Terminal Block Assembly, BK731-2 (9101575A)*

Item	Part Number	Quantity	Description	Reference
1	9101570	1	Terminal Block Rail (5" Long)	
2	9101573	2	End Stop, Terminal Block, EW 15	
3	9101574	3	End Plate, Terminal Block, AKZ 2.5	
4	9101575	6	Terminal Block AKZ 2.5	
5	9101576	1	Jumper, AKZ 1.5/AKZ 2.5, Q2	
6	9101580	2	Jumper, AKZ 1.5/AKZ 2.5, Q3	
7	9101662	1	Terminal Block Label, DEK5	
8	9101688	4	Terminal Block, AKZ 2.5, Blue	
9	9101689	1	Ground Block, AKE 2.5	
10	9103724	3	Ferrules, Twin #18 Gauge Wire, White	

Figure A-30: *Terminal Block Assembly, BK731-2 (9101575A)*

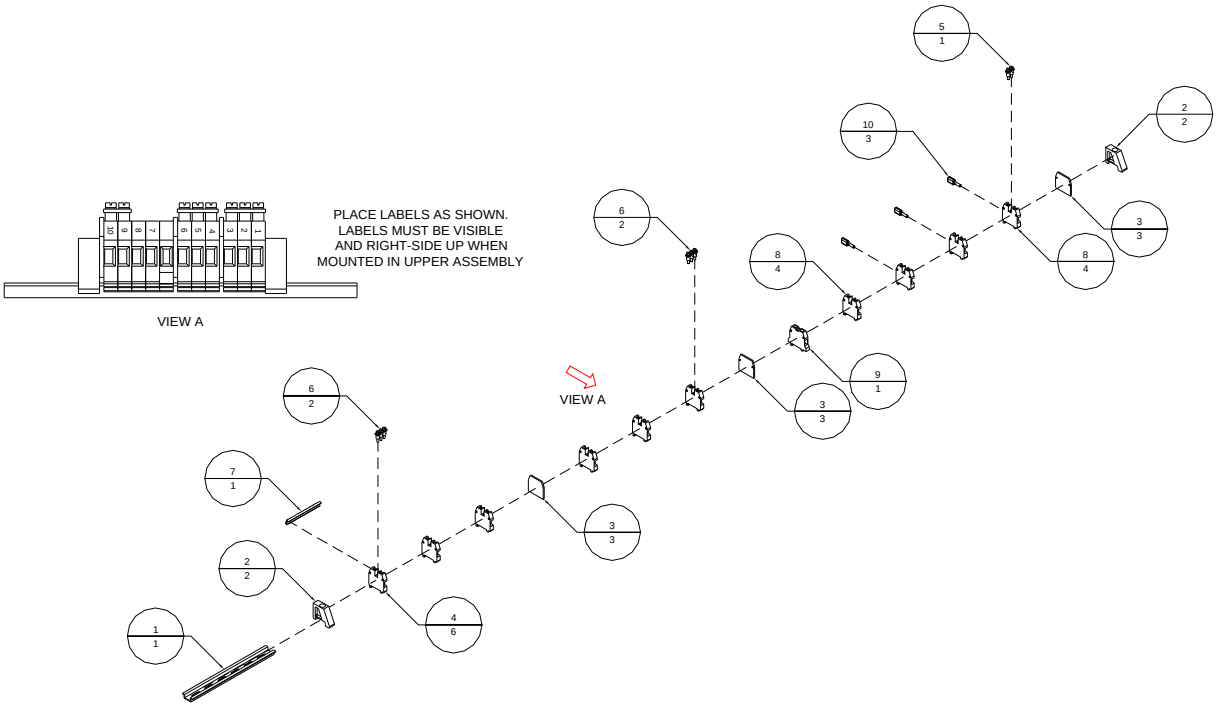


Table A-30: *5-Phase Stepper Motor Driver Assembly (9103541A)*

Item	Part Number	Quantity	Description	Reference
1	401310	4	Screw, PHMS, 4-40 UNC x 1/4"	
2	9101123	1	Stepper Motor Driver, 5 Phase	
3	9103541	1	Bracket, 5 Phase Motor Driver	

Figure A-31: *5-Phase Stepper Motor Driver Assembly (9103541A)*

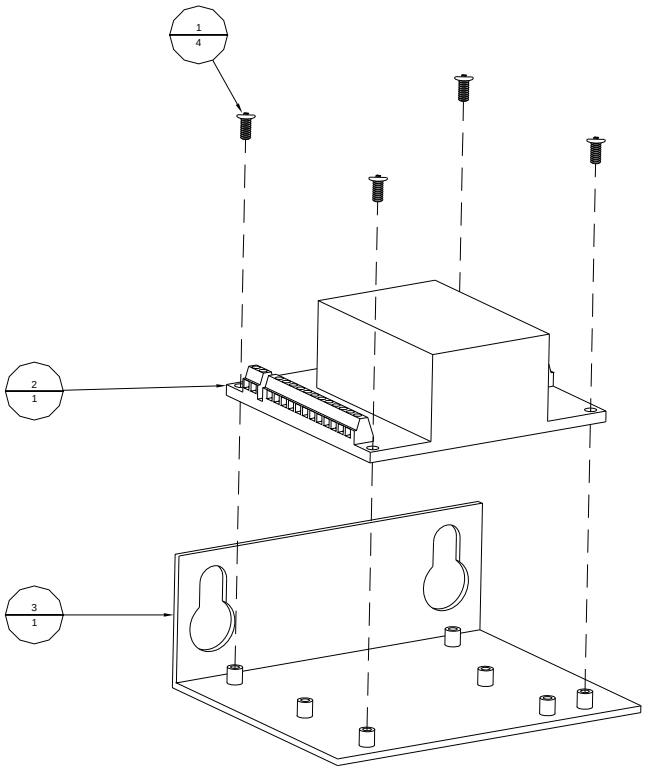
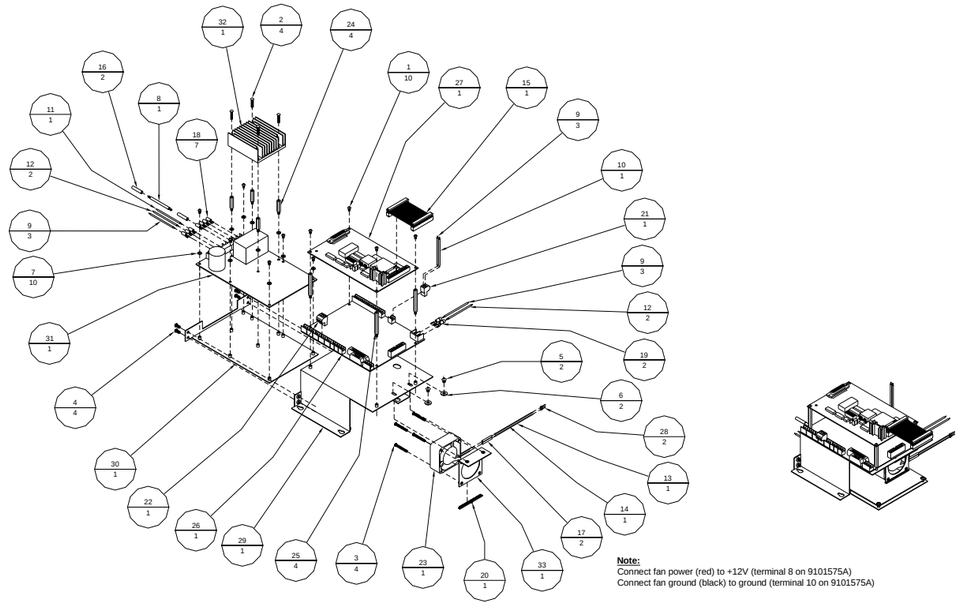


Table A-31: 2-Phase Stepper Motor Driver Assembly (9103542A)

Item	Part Number	Quantity	Description	Reference
1	402310	10	Screw, PHMS, 6-32 UNC x 1/4"	
2	402350	4	Screw, PHMS, 6-32 UNC x 3/4"	
3	402375	4	Screw, PHMS, 6-32 UNC x 1 1/4"	
4	403320	4	Screw, PHMS, 8-32 UNC x 3/8"	
5	404510	2	Screw, BHCS, 10-32 UNF x 1/4"	
6	440008	2	Washer, #10 ID	
7	440530	10	Washer, #6, Nylon	
8	606013-15	1	Cable, #22-3, Shielded (15" Long)	
9	606020	3	Wire, #18, Black, Hookup (18" Long)	
10	606022	1	Wire, #18, Red, Hookup (18" Long)	
11	606023	1	Wire, #18, Green, Hookup (18" Long)	
12	606029	2	Wire, #18, White, Hookup (18" Long)	
13	606037	1	Wire, #22, Black Hook-Up, 12" Long	
14	606044	1	Wire, #22, Red Hook-Up, 12" Long	
15	606311A	1	System Support Interface Cable (Atlas)	
16	609000	2	Shrink Wrap, 3/16" I.D. (1" Long)	
17	609004	2	Shrink Wrap, 1/8", 1" Long	
18	609107	7	Terminal, Fork, 22-16 AWG, #4, Red	
19	609112	2	Terminal, Fork, #10, 16-14 AWG, Blue	
20	615026	1	Flexible Grommet Edging, 2.5"	
21	615062	1	Connector, Female, 2-Pin, BLA2	
22	615063	1	Connector, Female, 3-Pin, BLA3	
23	9100343	1	Fan, 12 VDC	
24	9100383	4	Hex Spacer, 6-32 UNC x 1"	
25	9101114	4	Hex Spacer, 6-32 UNC X 2"	
26	9101133	1	Tabber Interface Board	
27	9101275	1	Tabber CPU Board	
28	9103468	2	Ferrule, #22 AWG, Torquoise	
29	9103542	1	Bracket, Tabber Head Boards	
30	9103544	1	Bracket, 2 Phase Motor Driver	
31	9103548	1	Board, 2 Phase Stepper Motor Driver	
32	9103691	1	Heat Sink, R-Theta Extrusion, 3.25"L	
33	9104068	1	Bracket, Fan, 2-Phase Driver	

Figure A-32: *2-Phase Stepper Motor Driver Assembly (9103542A)*



Note:
Connect fan power (red) to +12V (terminal 8 on 9101575A)
Connect fan ground (black) to ground (terminal 10 on 9101575A)

Table A-32: *BKT730 Tabber Revision 2, Testing (BKT730-2)*

Item	Part Number	Quantity	Description	Reference
1	402020	2	Screw, FHCS, 6-32 UNC x 3/8"	
2	404510	14	Screw, BHCS, 10-32 UNF x 1/4"	
3	405250	2	Screw, SHCS, 1/4-20 UNC x 3/4"	
4	420008	3	Nut, 10-32 UNF	
5	439009	3	Lockwasher, No. 10	
6	440008	3	Washer, #10 ID	
7	700537	1	Outfeed Roller Cover	
8	700538	1	Front Protective Cover	
9	803020	1	Label, High Voltage	
10	9100869	2	Label, Hand Entanglement	
11	9101560	1	Upper Transport Cover, Front	
12	9101561	1	Upper Transport Cover, Rear	
13	9101644	4	Sponge Rubber WeatherStripping,1/4x3/8x18YDS	
14	9101888	1	Label, Downstream	
15	9101889	1	Label, Conveyor In	
16	9101891	1	Label, Upstream	
17	9101892	1	Label, Conveyor Out	
18	9103970A	1	Base, BK730-2 Tabber Version 2, 115 VAC	Page A-39

Figure A-33: *BKT730 Tabber Revision 2, Testing (BKT730-2)*

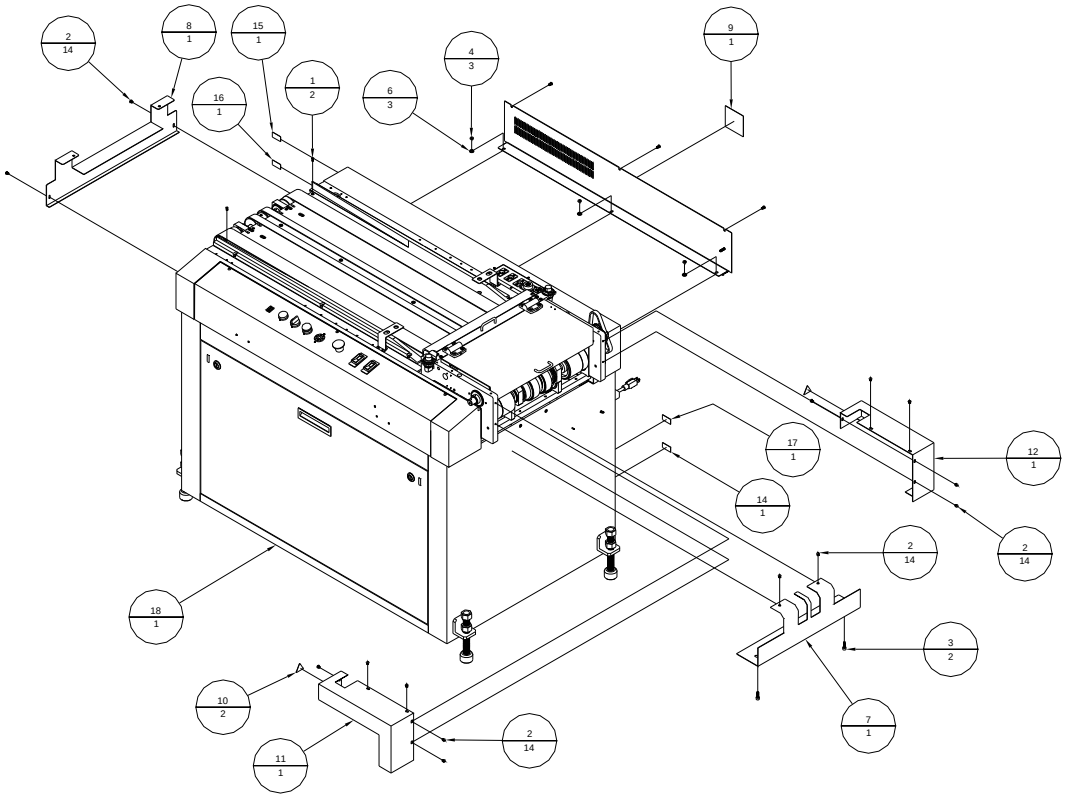


Table A-33: *Base, BK730-2, 115 VAC (9103970A)*

Item	Part Number	Quantity	Description	Reference
1	116533	1	Pulley, 12LF050 X R6	
2	120323	1	Timing Belt, 225L050	
3	212430	1	Right Side Guide	
4	212431	1	Left Side Guide	
5	212735A	1	Upper Transport Assembly (BK730)	Page A-41
6	325530A	1	Tabletop Assembly	Page A-43
7	330730A	1	Tabber Base Mechanical Assembly	Page A-45
8	404030	11	Screw, FHCS, 10-32 UNF x 1/2"	
9	404520	8	Screw, BHCS, 10-32 UNF x 3/8"	
10	407280	10	Screw, SHCS, 3/8-16 UNC x 1 1/2"	
11	407675	3	Screw, HHMS, 3/8-16 UNC x 1 1/4"	
12	416175	1	Shoulder Bolt, 3/8" x 1 1/4", (5/16-18)	
13	420008	11	Nut, 10-32 UNF	
14	439009	11	Lockwasher, No. 10	
15	439020	13	Lockwasher, 3/8" I.D.	
16	440008	11	Washer, #10 ID	
17	440020	13	Washer, 3/8" ID	
18	530707A	1	Tabber Motor Assembly	Page A-50
19	700534	1	Right Upper Cabinet Cover	
20	700535	1	Left Upper Cabinet Cover	
21	700542	1	Rear Panel Access Door	
22	700743A	1	Connector Plate Assembly, BK730	Page A-52
23	9101640	2	Handle, Panel Snap Style	
24	9102380	1	Board, Base Control	
25	9103686	1	Strain Relief, 1/2" NPT, 0.28-0.47" OD, Black Nylon	
26	9103789	4	Latch, Quarter turn, 51 mm	
27	9103792	2	Door, Base Cabinet	
28	9103882A	1	Front Door Assembly, BK730A-2	Page A-53
29	9103883A	1	Front Panel Assembly, Tabber Version 2	Page A-54
30	9103884	1	Panel, Rear, BK730A-2	
31	9104015A	1	Base Cabinet Assembly, BK730A-2	Page A-57
32	9104173A	1	Terminal Block Assembly, Rear Panel, BK730A-2	Page A-61

Figure A-34: *Base, BK730-2, 115 VAC (9103970A) – p.1 of 2*

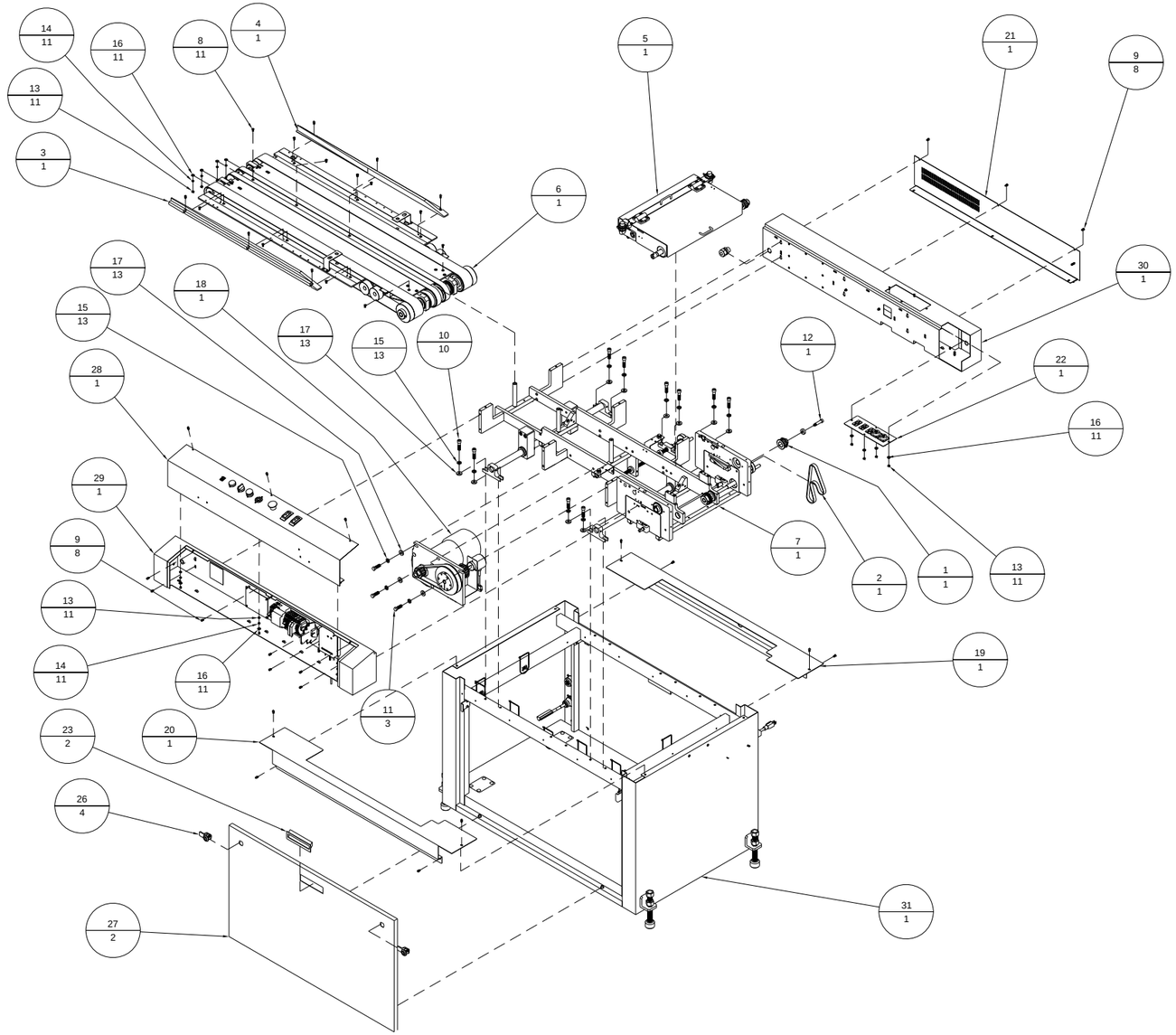


Figure A-35: Base, BK730-2, 115 VAC (9103970A) – p.2 of 2

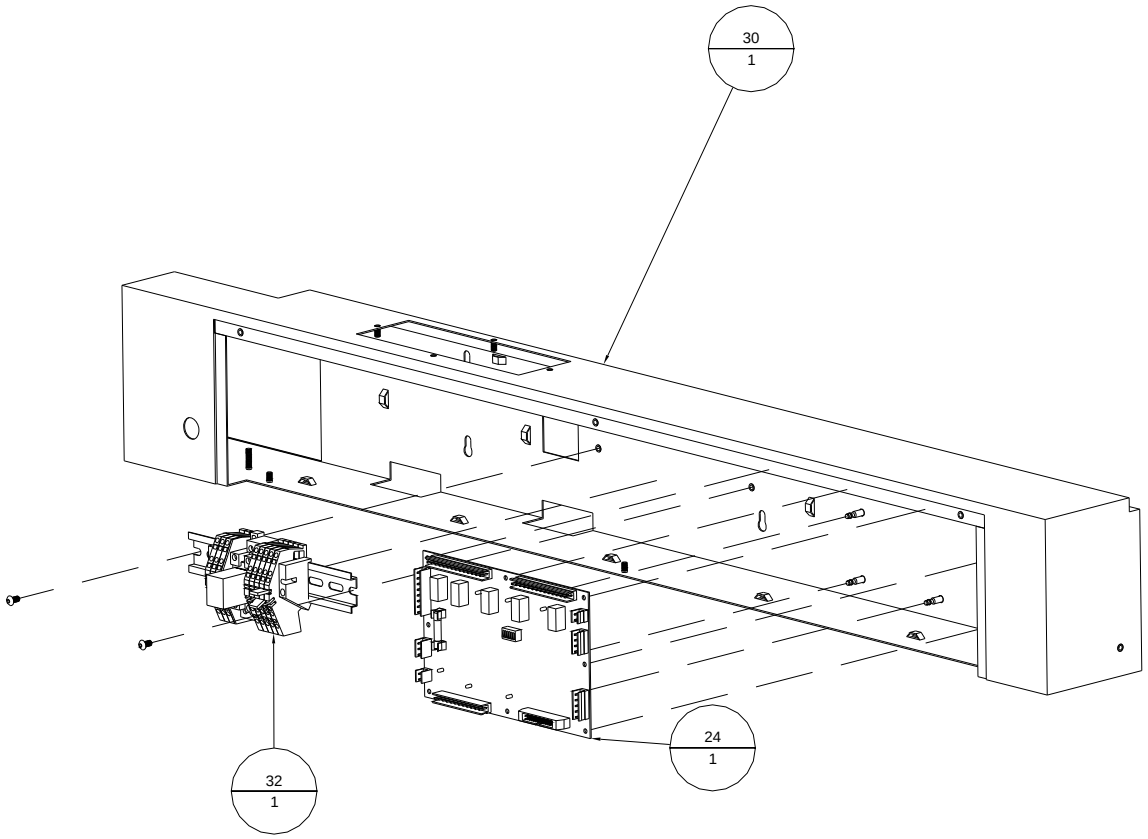


Table A-34: *Upper Transport Assembly (212735A)*

Item	Part Number	Quantity	Description	Reference
1	100534	1	Upper Transport Pivot Shaft	
2	100547	1	Upper Transport Shaft	
3	100548	1	Nip Roller Shaft	
4	106536	2	Tab Nip Roller	
5	106543	4	Upper Drive Belt Roller	
6	106544	2	Cease Roller	
7	106545	4	Upper Belt Drive Roller	
8	116531	1	Pulley, 12LF050 X 5/8"	
9	116535	1	Pulley, 24XLB037 X 5/8"	
10	116536	1	Pulley, 18XLB037 X 5/8"	
11	120209	1	Timing Belt, 90XL037	
12	120532	4	Upper Transport Belt, 18.94"	
13	209531	4	Spring, 11/32 OD X 5/8"	
14	212535	1	BACK HOPPER ROLLER BLOCK	
15	212536	1	FRONT HOPPER ROLLER BLOCK	
16	212537	2	Upper Transport Frame	
17	310530	1	Upper Transport Cover Bar	
18	401310	2	Screw, PHMS, 4-40 UNC x 1/4"	
19	402220	2	Screw, SHCS, 6-32 UNC X 3/8"	
20	402510	2	Screw, BHCS, 6-32 UNC x 1/4"	
21	402805	2	Screw, SHSS, 6-32 UNC X 1/8"	
22	404030	6	Screw, FHCS, 10-32 UNF x 1/2"	
23	404240	2	Screw, SHCS, 10-32 UNF x 5/8"	
24	404520	4	Screw, BHCS, 10-32 UNF x 3/8"	
25	404530	8	Screw, BHCS, 10-32 UNF x 1/2"	
26	404807	11	Screw, SHSS, 10-32 UNF x 3/16"	
27	414180	4	Shoulder Bolt, 1/4" x 1 1/2" (10-24)	
28	420008	4	Nut, 10-32 UNF	
29	420012	2	Nut, 1/4-28 UNF	
30	428287	2	Screw, SHCS, 1/4-28 UNF x 2 1/2"	
31	430150	1	Woodruff Key, #406, 1/8" X 3/4"	
32	430250	1	Woodruff Key, #606, 3/16" X 3/4"	
33	438314	2	Ink Well Door Handle	
34	439009	4	Lockwasher, No. 10	
35	439010	2	Lockwasher, 1/4" I.D.	
36	440010	2	Washer, 1/4" I.D.	
37	446530	2	Upper Transport Latch	
38	449930	2	Space Washer, 1" ID X 0.031" THK	
39	500030	4	Bearing, R8 X 1/2" ID	
40	500055	2	Bearing, UBR-204-12S, 3/4" ID	
41	615533	1	Actuator, Magnetic	
42	700547	1	Nip Roller Cover	
43	700548	1	Upper Transport Cover	
44	9101641	2	Hinge, 115 Deg. Detent	

Figure A-36: *Upper Transport Assembly (212735A)*

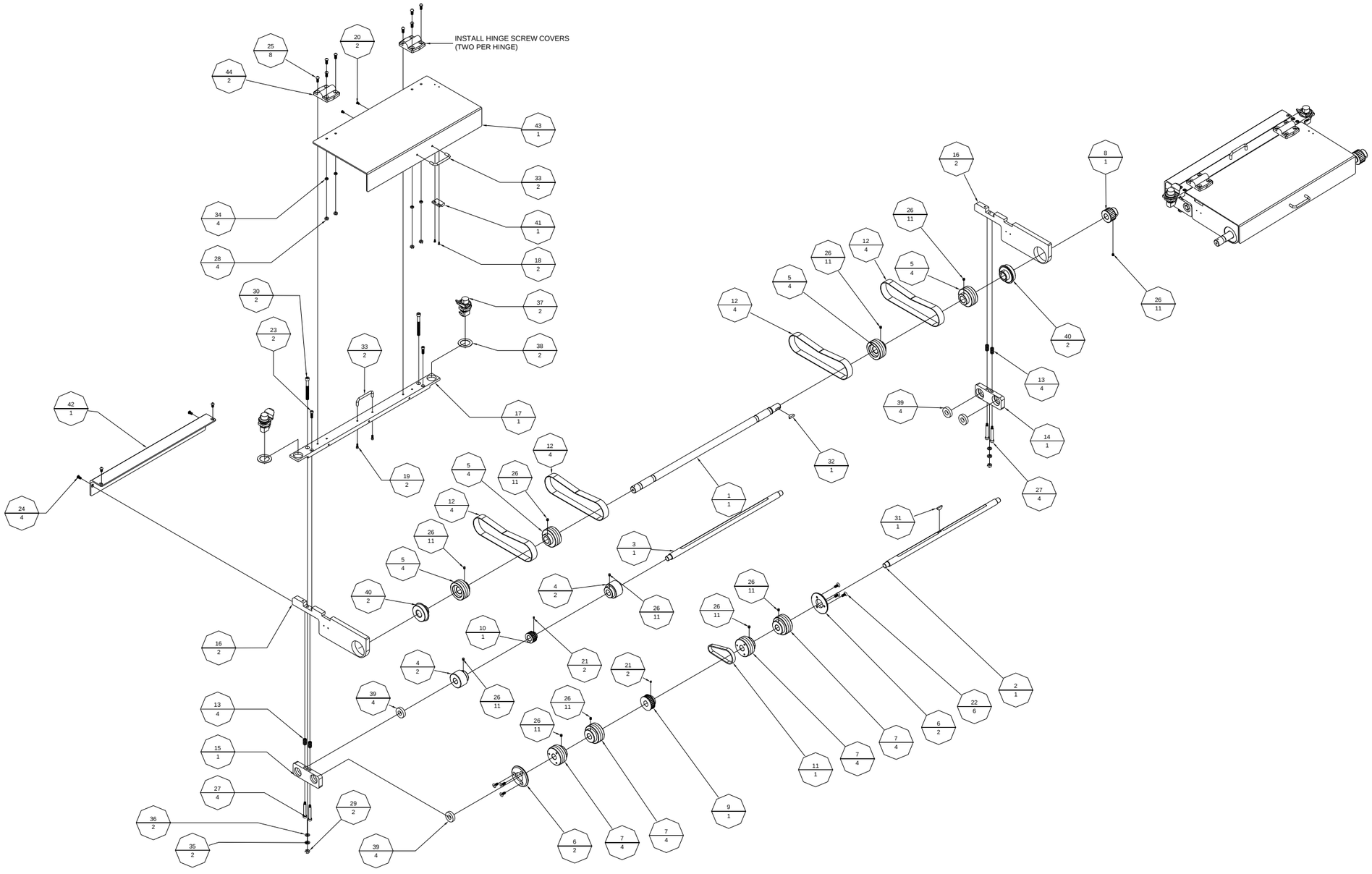


Table A-35: *Tabletop Assembly (325530A)*

Item	Part Number	Quantity	Description	Reference
1	100530	1	Belt Takeup shaft	
2	100531	1	Table Belt Drive Shaft	
3	100532	2	Lower Roller Shaft	
4	106530	2	Outer Takeup Roller	
5	106531	1	Center Belt Takeup Roller	
6	106532	4	Pinch Roller	
7	106533	2	Outfeed Pinch Roller	
8	106534	2	Table Belt Drive Pulley	
9	106535	2	Vacuum Belt Drive Pulley	
10	110207	1	Gear, NSS1636 x 3/4"	
11	116309	1	Pulley, 18LB075 x 3/4" w/o Shoulder	
12	116530	2	Pulley, 22XL037 x 5/8"	
13	116531	1	Pulley, 12LF050 x 5/8"	
14	116532	1	Pulley, 18LB050 x 3/4"	
15	120209	1	Timing Belt, 90XL037	
16	120317	1	Timing Belt, 187L050	
17	120342	1	Timing Belt, 420L075	
18	120530	2	Tabber Table Belt (1" x 99")	
19	120531	2	Tabber Table Belt (2" x 99")	
20	325530	1	Tabber Tabletop	
21	330530	2	Takeup Roller Block	
22	330531	2	Drive Roller Block	
23	330532	2	Lower Roller Block	
24	403310	4	Screw, PHMS, 8-32 UNC X 1/4"	
25	404030	4	Screw, FHCS, 10-32 UNF x 1/2"	
26	404040SS	4	Screw, FHCS, 10-32 UNF x 5/8" SS	
27	404510	4	Screw, BHCS, 10-32 UNF x 1/4"	
28	404540SS	4	Screw, BHCS, 10-32 UNF x 5/8" SS	
29	404807	6	Screw, SHSS, 10-32 UNF x 3/16"	
30	404820	4	Screw, SHSS, 10-32 UNF x 3/8"	
31	404830	1	Screw, SHSS, 10-32 UNF x 1/2"	
32	405820	2	Screw, SHSS, 1/4-20 UNC x 3/8"	
33	405830	5	Screw, SHSS, 1/4-20 UNC x 1/2"	
34	405850	4	Screw, SHSS, 1/4-20 UNC x 3/4"	
35	430250	10	Woodruff Key, #606, 3/16" X 3/4"	
36	436300	1	Spring Pin, %%C3/16 x 1 3/4" Long	
37	440008	4	Washer, #10 ID	
38	500045	4	Bearing, UBR202-10S, 5/8" ID	
39	500055	4	Bearing, UBR-204-12S, 3/4" ID	
40	706533	2	Upper Photosensor Bracket	
41	707532	1	Left Form Plate Guide	
42	707533	1	Right Form Plate Guide	
43	9101271	2	Nut, M12	

Note: Belts 120530 and 120531 are ordered as a belt set (9103545A).

Figure A-37: *Tabletop Assembly (325530A)*

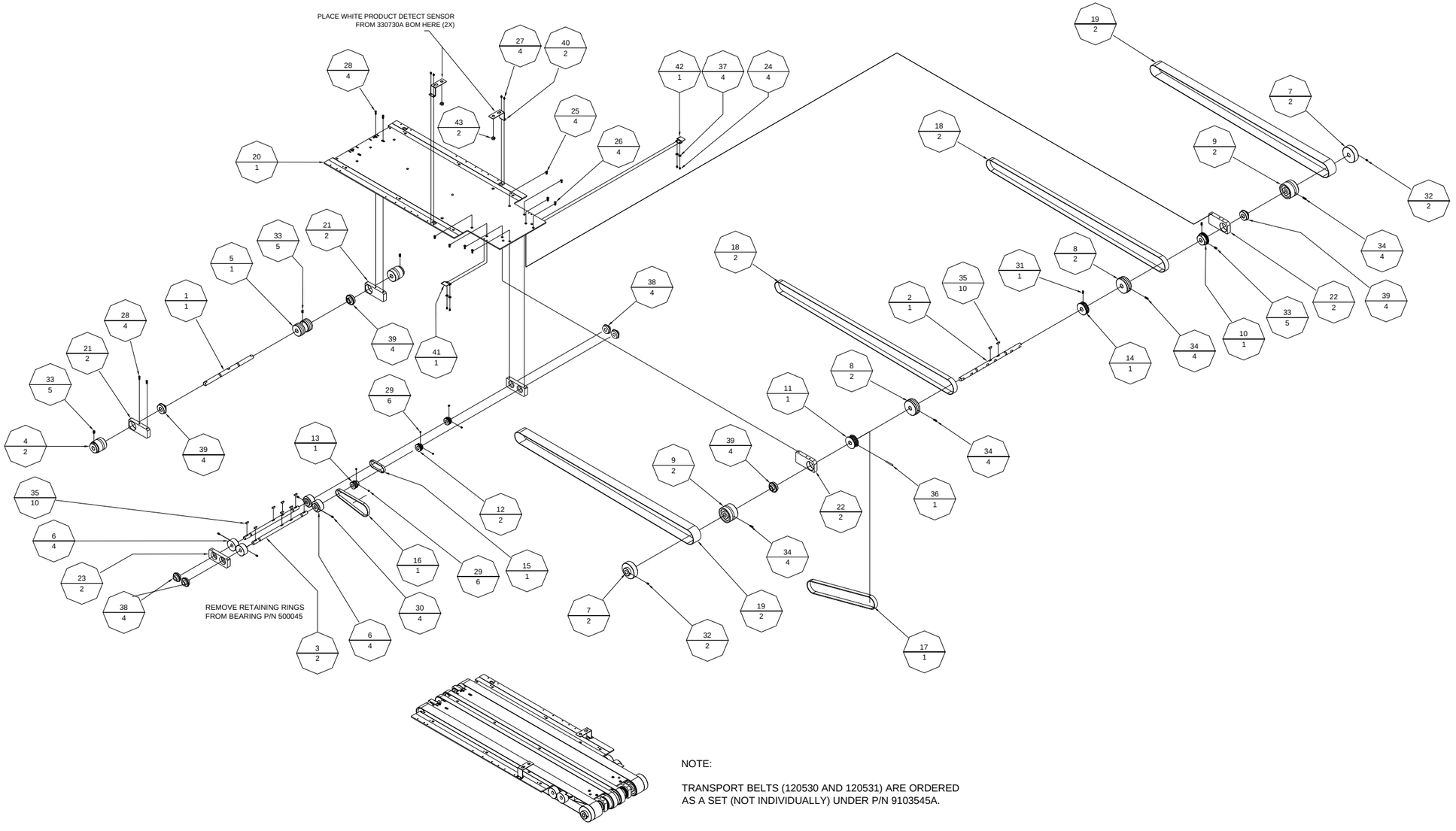


Table A-36: *Tabber Base Mechanical Assembly (330730A)*

Item	Part Number	Quantity	Description	Reference
1	100310	2	Gear Box Shaft	
2	100538	1	Upper Transport Drive Shaft	
3	100540A	2	Height Adjustment Screw Assembly	Page A-47
4	100541	2	Lateral Shaft	
5	100542	1	ACME Screw Shaft	
6	100543	1	Gear Box Coupling Shaft	
7	100544	1	Height Adjustment Extension Shaft	
8	106540	1	Upper Belt Idler Roller	
9	110310	2	Gearbox Worm, Hardened, 1/4" Bore *	
10	110530	1	Gear, NSS1628 x 5/8”	
11	116539	1	Pulley, 14LF050 x 5/8”	
12	122201	2	Gearbox Coupling	
13	131020	3	Collar, 3/8" I.D.	
14	131030	1	Collar, ½" I.D.	
15	212530	2	Upper Transport Slide Frame	
16	212533	4	Linear Bearing, 1" I.D.	
17	300531	1	Right Tabber Frame	
18	300532	1	Left Tabber Frame	
19	300533	1	Right Transport Slide Mount	
20	300534	1	Left Transport Slide Mount	
21	310322	3	Angle Bracket	
22	320531	3	Lower Frame Spacer	
23	320532	3	Tabletop Spacer	
24	320533	2	Frame / Transprort Spacer Bar	
25	325534	1	Right Tab Form Plate	
26	325535	1	Left Tab Form Plate	
27	330315	2	Gearbox Body	
28	330533	6	Tabletop Mounting Bracket	
29	330535	4	Frame Mounting Foot	
30	330536	2	Right Form Plate Block	
31	330537	2	Tabletop Block	
32	330538	1	ACME Screw Bracket	
33	330539	1	ACME Screw Block	
34	330541	4	Lateral Shaft Mount	
35	401310	2	Screw, PHMS, 4-40 UNC x 1/4"	
36	402210	8	Screw, SHCS, 6-32 UNC x 1/4"	
37	404070	3	Screw, FHCS, 10-32 UNF x 1"	
38	404250	4	Screw, SHCS, 10-32 UNF x 3/4"	
39	404270	4	Screw, SHCS, 10-32 UNF x 1"	
40	404520	4	Screw, BHCS, 10-32 UNF x 3/8"	
41	404807	9	Screw, SHSS, 10-32 UNF x 3/16"	
42	404830	1	Screw, SHSS, 10-32 UNF X 1/2"	
43	405240	8	Screw, SHCS, ¼-20 UNC x 5/8"	
44	405270	17	Screw, SHCS, ¼-20 UNC x 1"	
45	405280	4	Screw, SHCS, ¼-20 UNC x 1 1/2"	
46	405530	1	Screw, BHCS, ¼-20 UNC x 1/2"	
47	405570	15	Screw, BHCS, ¼-20 UNC x 1"	
48	405810	8	Screw, SHSS, ¼-20 UNC x 1/4"	
49	407270	2	Screw, SHCS, 3/8-16 UNC x 1"	
50	407282	8	Screw, SHCS, 3/8-16 UNC x 1 3/4"	
51	416180	1	Shoulder Bolt, 3/8 x 1 1/2 (5/16-18 UNC)	
52	420530	1	ACME Bronze Nut	
53	430250	2	Woodruff Key, #606, 3/16 x 3/4	
54	436311	2	Spring Pin, 3/32 Dia x 3/8	
55	436312	2	Spring Pin, 3/32 Dia x 5/8	
56	436530	4	Transport Slide Key	
57	437156	8	Retaining Ring, 1 9/16 I.D., External	
58	438311A	2	Bridge Handwheel Assembly	Page A-48
59	440010	1	Washer, ¼" I.D.	
60	440015	1	Washer, 5/16" I.D.	
61	442530	6	Spacer Washer, ¼" I.D. x 0.032 THK	
62	443830	1	Spacer Washer, 3/8” I.D. x 0.031 THK	
63	500020	2	Bearing, R6, 3/8" I.D.	
64	500045	2	Bearing, UBR202-10S, 5/8"	
65	500055	2	Bearing, UBR204-12S, ¾"	
66	505110	2	Flange Bushing, 3/8 I.D. x 1/2" O.D. X 3/8” LG.	
67	505384	4	Flange Bushing, 3/8 I.D. x 1/2" O.D. X ½” LG.	
68	505463	4	Flange Bushing, 1/4 I.D. x 3/8" O.D. X 3/8” LG.	
69	615537	2	Sensor, Product Detect (Black)	
70	706532	2	Photo Reflector Bracket	
71	9101271	2	Nut, M12	
72	9101557A	1	Sensor, Magnetic, NO/NC Cable	Page A-49

Figure A-38: *Tabber Base Mechanical Assembly (330730A)*

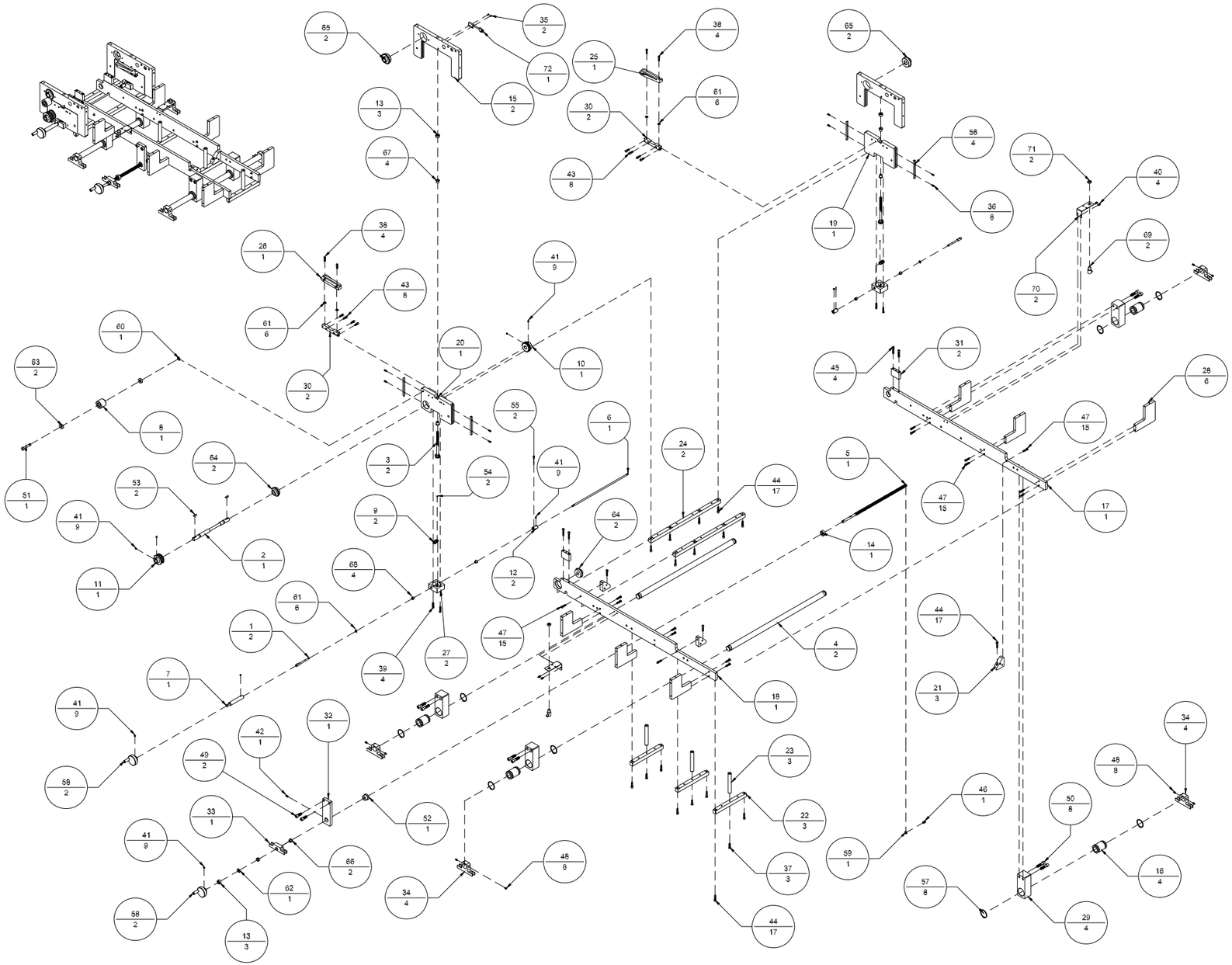


Table A-37: *Height Adjustment Screw Assembly (100540A)*

Item	Part Number	Quantity	Description	Reference
1	100540	1	Height Adjustment Screw	
2	110311	1	Gearbox Worm Gear, 0.374" Bore	
3	436040	1	Spring Pin, 1/8" Dia. x 5/8"	

Figure A-39: *Height Adjustment Screw Assembly (100540A)*

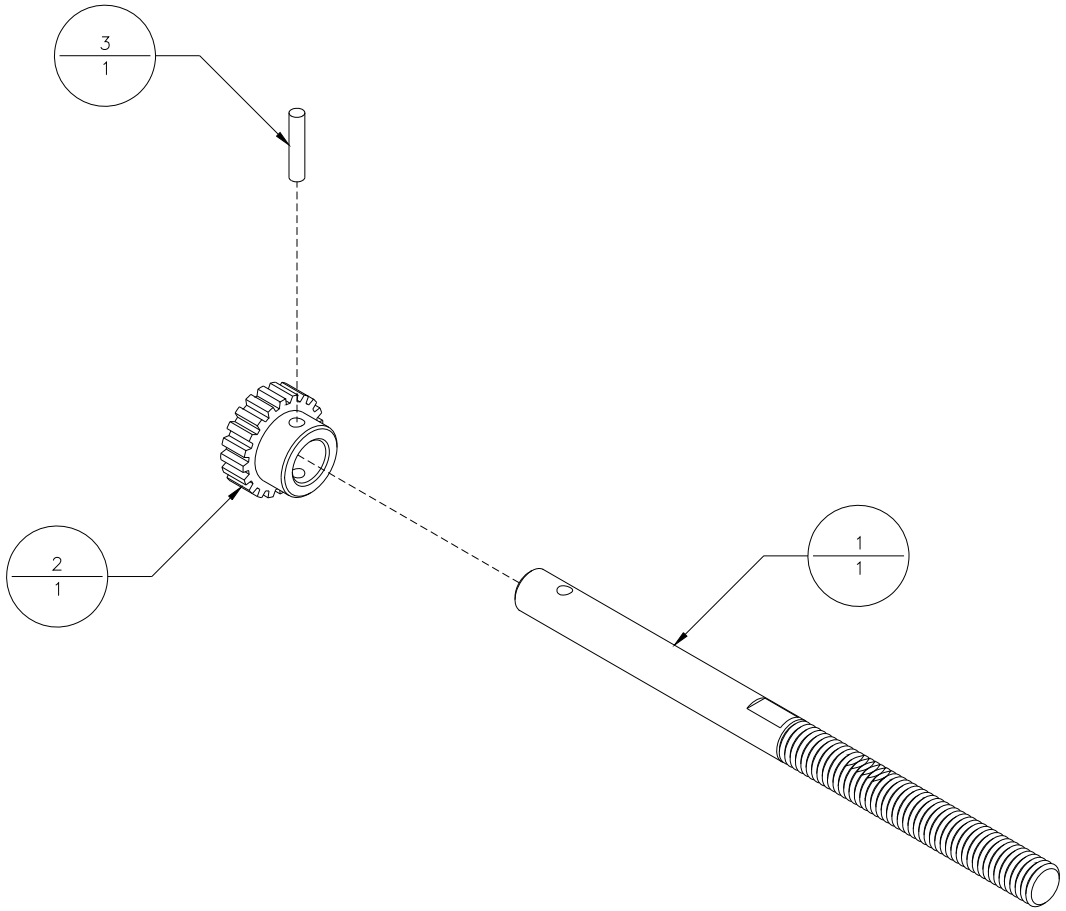


Table A-38: *Bridge Handwheel Assembly (438311A)*

Item	Part Number	Quantity	Description	Reference
1	414170	1	Shoulder Bolt, 1/4" x 1" (10-24)	
2	438309	1	Bridge Handwheel Arm	
3	438311	1	Bridge Handwheel	

Figure A-40: *Bridge Handwheel Assembly (438311A)*

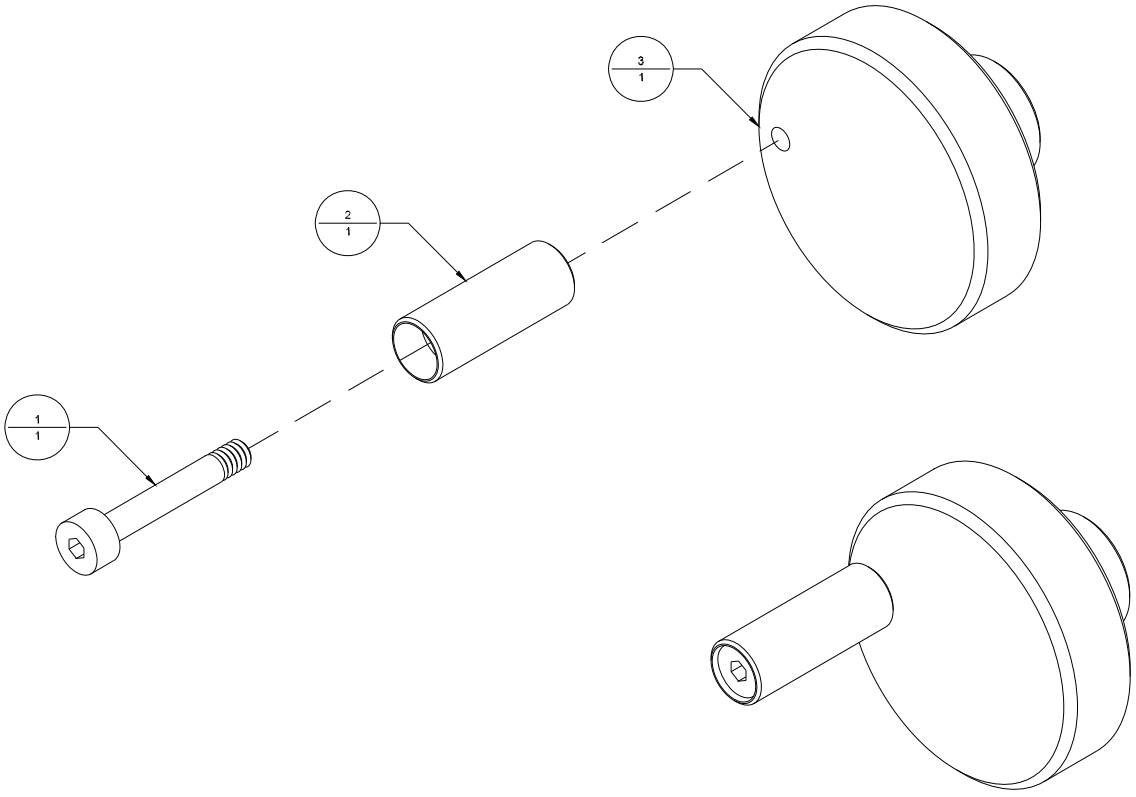


Table A-39: *Sensor, Magnetic, NO/NC Cable (9101557A)*

Item	Part Number	Quantity	Description	Reference
1	609000	10”	Shrink Wrap, 3/16” I.D.	
2	614000	3	Male Contact Pin	
3	614001	1	Plug, Cap Pin Housing	
4	9101557	1	Sensor, Proximity, Magnetic NO/NC	

Figure A-41: *Sensor, Magnetic, NO/NC Cable (9101557A)*

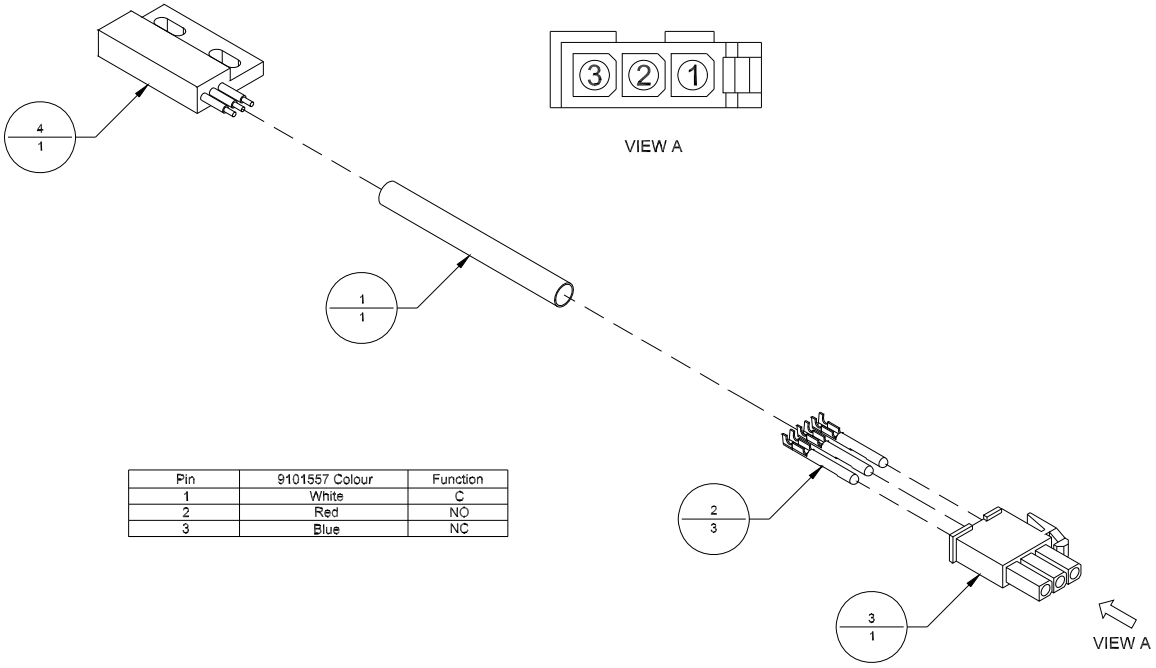
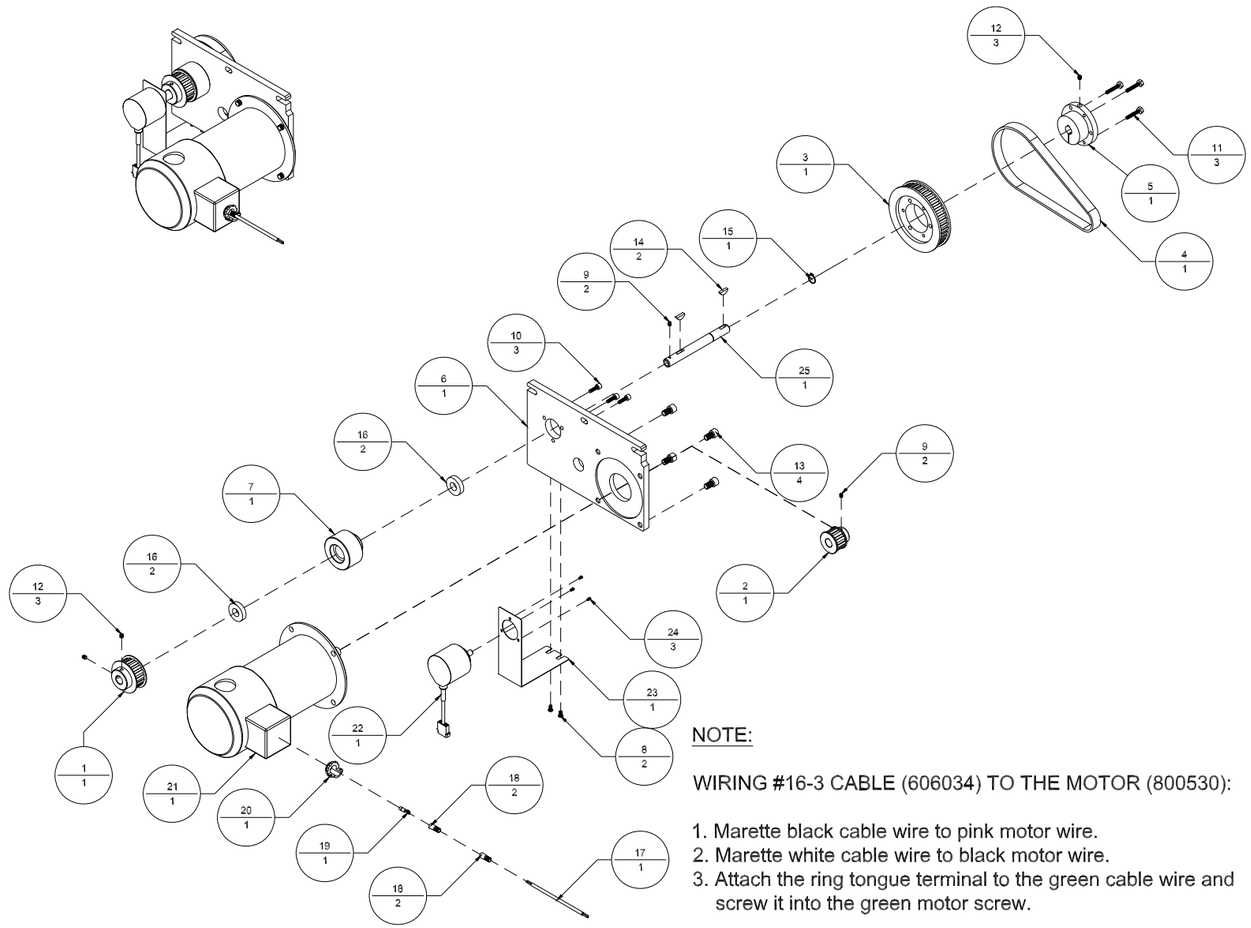


Table A-40: *Tabber Motor Assembly (530707A)*

Item	Part Number	Quantity	Description	Reference
1	116302	1	Pulley, 15LF075 X 3/4"	
2	116537	1	Pulley, 14LF075 X 5/8"	
3	116538	1	Pulley, 14LF075 X STD"	
4	120326	1	Timing Belt, 240L075	
5	127314	1	Pulley Hub	
6	325533	1	Motor Mount Plate	
7	330534	1	Mainshaft Housing	
8	404520	2	Screw, BHCS, 10-32 UNF x 3/8"	
9	404810	2	Screw, SHSS, 10-32 UNF x 1/4"	
10	405250	3	Screw, SHCS, 1/4-20 UNC x 3/4"	
11	405675	3	Screw, HHMS, 1/4-20 UNC x 1 1/4"	
12	405810	3	Screw, SHSS, 1/4-20 UNC x 1/4"	
13	407240	4	Screw, SHCS, 3/8-16 UNC x 5/8"	
14	430250	2	Woodruff Key, #606, 3/16" x 3/4"	
15	437063	1	Retaining Ring, 5/8" I.D., External	
16	500040	2	Bearing, R10, 5/8" I.D.	
17	606034	54”	Cable, #16-3, SJOW-A	
18	609101	2	Marette, Orange, 14-22	
19	609111	1	Ring Tongue Terminal	
20	615131	1	Box Connector, 3/8", Cable	
21	800530	1	Motor, 1/3 HP, 90 VDC	
22	9100188A	1	Shaft Encoder Assembly, 6000 ppr	Page A-51
23	9101563	1	Encoder Mount	
24	9101672	3	Screw, BHCS, M3 x 6	
25	9101812	1	Main Drive Shaft	

Figure A-42: *Tabber Motor Assembly (530707A)*



NOTE:

WIRING #16-3 CABLE (606034) TO THE MOTOR (800530):

1. Marette black cable wire to pink motor wire.
2. Marette white cable wire to black motor wire.
3. Attach the ring tongue terminal to the green cable wire and screw it into the green motor screw.

Table A-41: *Shaft Encoder Assembly (9100188A)*

Item	Part Number	Quantity	Description	Reference
1	609000	0.75”	Shrink Wrap, 3/16” I.D.	
2	614008	4	Male Contact, Pin	
3	614009	1	Plug, Pin Housing	
4	9100188	1	Shaft Encoder	

Figure A-43: *Shaft Encoder Assembly (9100188A)*

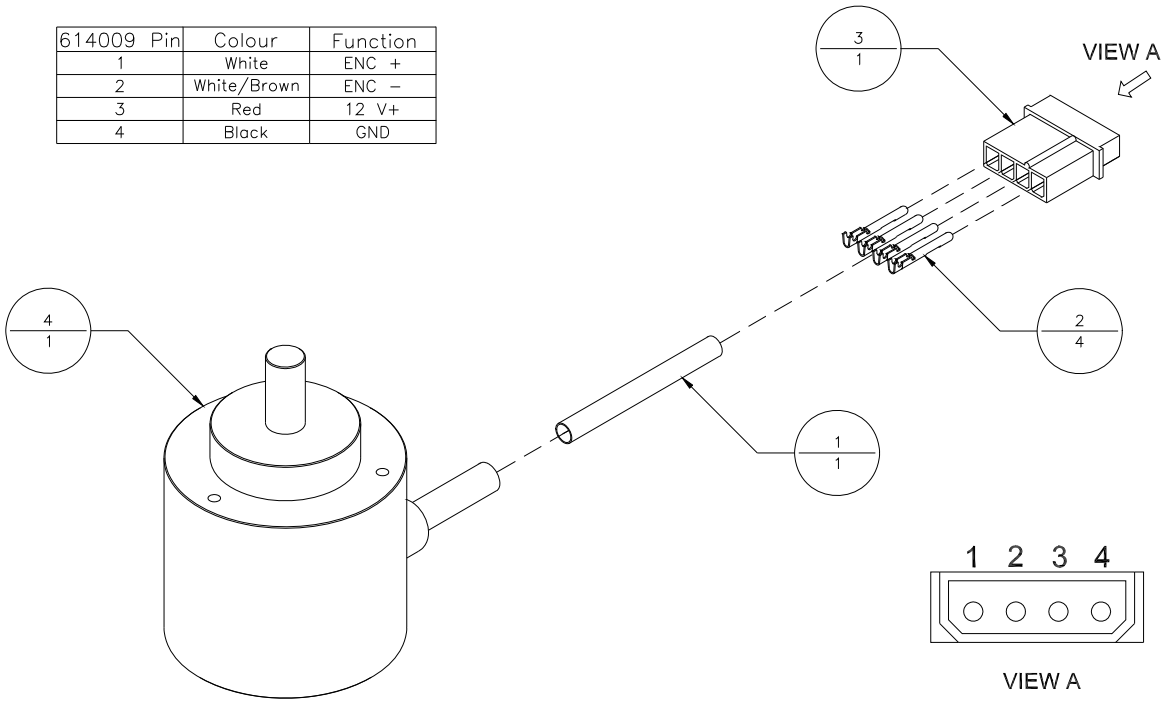


Table A-42: *Connector Plate Harness, BK730 (700743A)*

Item	Part Number	Quantity	Description	Reference
1	402010	6	Screw, FHCS, 6-32 UNC x 1/4"	
2	402310	8	Screw, PHMS, 6-32 UNC x 1/4"	
3	700743	1	Connector Plate, Rear, BK730	
4	700743C1	1	Power Cable, Tabber	
5	700743C2	1	Output Cable	
6	700743C3	1	Encoder Cable	
7	700743C4	1	Photo F/B Cable	
8	700743C5	1	Jam Cable	

Figure A-44: *Connector Plate Harness, BK730 (700743A)*

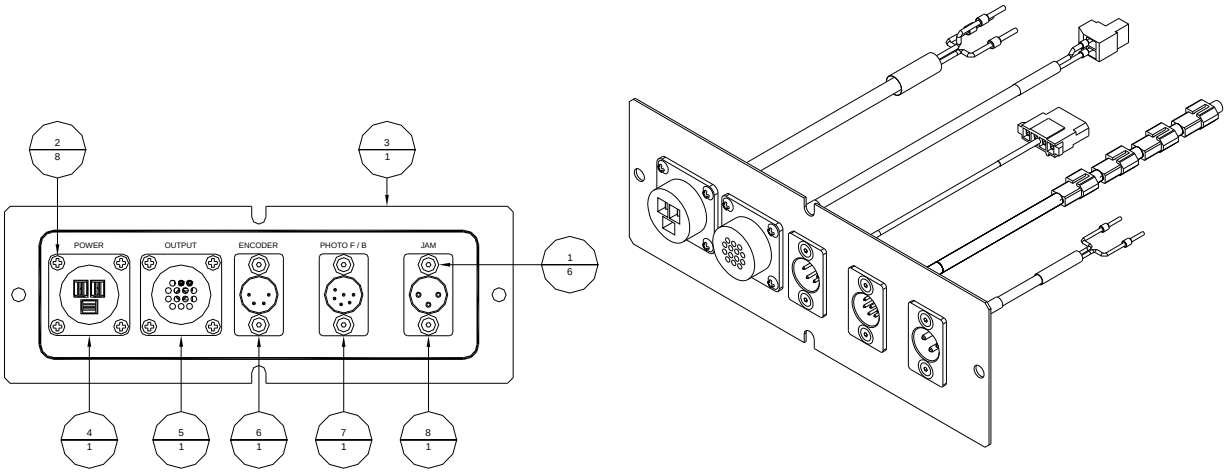


Table A-43: *Panel, Front Door Ass'y, BK730A-2 (9103882A)*

Item	Part Number	Quantity	Description	Reference
1	600011	1	Potentiometer, w/Dart 600005	
2	603120	1	Switch, Green Push Button	
3	603121	1	Switch, Red Mushroom Push Button	
4	603122	1	Switch, 2-Position Rotary Knob	
5	603125	3	Switch, Locking Collar	
6	603126	3	Block, N.O. Contact, Green	
7	603127	3	Block, N.C. Contact, Red	
8	606013	2	Cable, #22-6, Unshielded, 70"	
9	606014	1	Cable, #22-4, Shielded, 75"	
10	606014	1	Cable, #22-4, Shielded, 26"	
11	606052	1	Cable, #14-7, Unshielded, 28"	
12	609004	3	Shrink Wrap, 1/8"	
13	609110	8	Connector, Push-on, 16-14 AWG, Blue	
14	609530	2	Connector, Push-On, 22-18 AWG, Red, 187 Tab	
15	613002	1	Knob, 36mm, Skirted	
16	9102205	2	Switch, Breaker, 15A, 2 Pole, Illuminated Green	
17	9102422	1	Switch, Rocker, 125VAC/4A, 250VAC/2A	
18	9103882	1	Panel, Front Access Door, BK730A-2	
19	9103967	1	Connector, 8-Octal, Standard Socket, Type S	

Figure A-45: *Panel, Front Door Assembly, BK730A-2 (9103882A)*

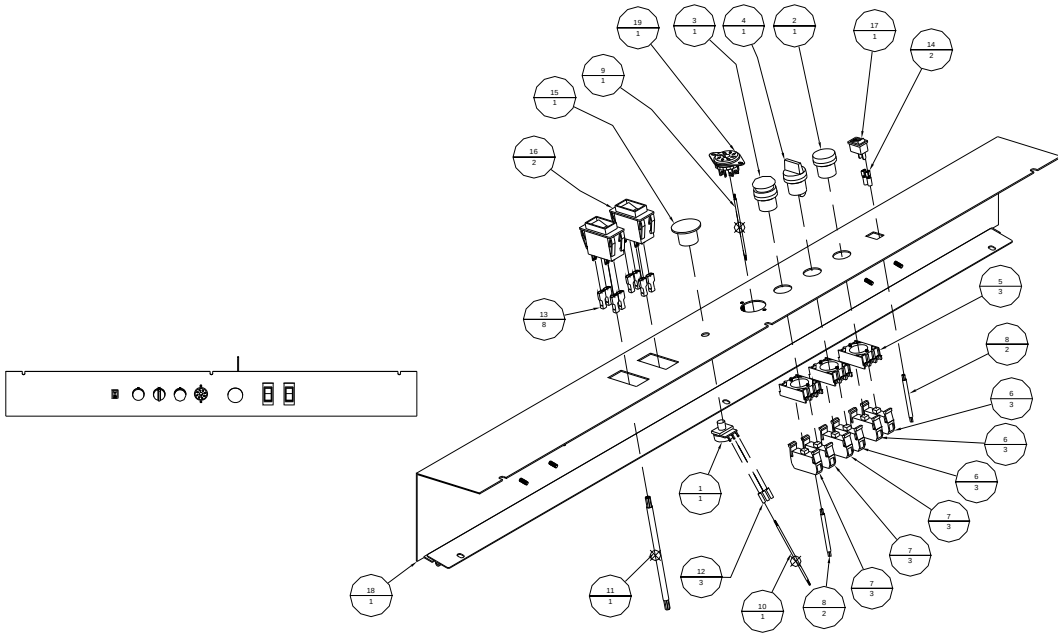


Table A-44: *Front Panel Assembly, Tabber Version 2 (9103883A)*

Item	Part Number	Quantity	Description	Reference
1	402520	2	Screw, BHCS, 6-32 UNC x 3/8"	
2	404510	6	Screw, BHCS, 10-32 UNF x 1/4"	
3	420006	2	Nut, 6-32 UNC	
4	600005	1	DC Controller, 90 VDC	
5	606014	1	Cable, #22-4, Shielded, 18"	
6	606040	1	Cable, #14-2, SJOW, BK/WH, 22"	
7	606531	1	Cable, #22-2, Shielded, 12"	
8	640300	1	Metal Oxide Varistor, 120 VAC	
9	640301	1	Diode	
10	700321	1	Cover, Dart Control	
11	803020	1	Label, High Voltage	
12	9103686	1	Strain Relief, 1/2" NPT, 0.28-0.47" OD, Blk. Nylon	
13	9103875	1	Printed Circuit Board, Dummy for Speed Control Board	
14	9103883	1	Front Panel, BK730A-2	
15	9103890A	1	Terminal Block Assembly, BK730A-2	Page A-55

Figure A-46: *Front Panel Assembly, Tabber Version 2 (9103883A)*

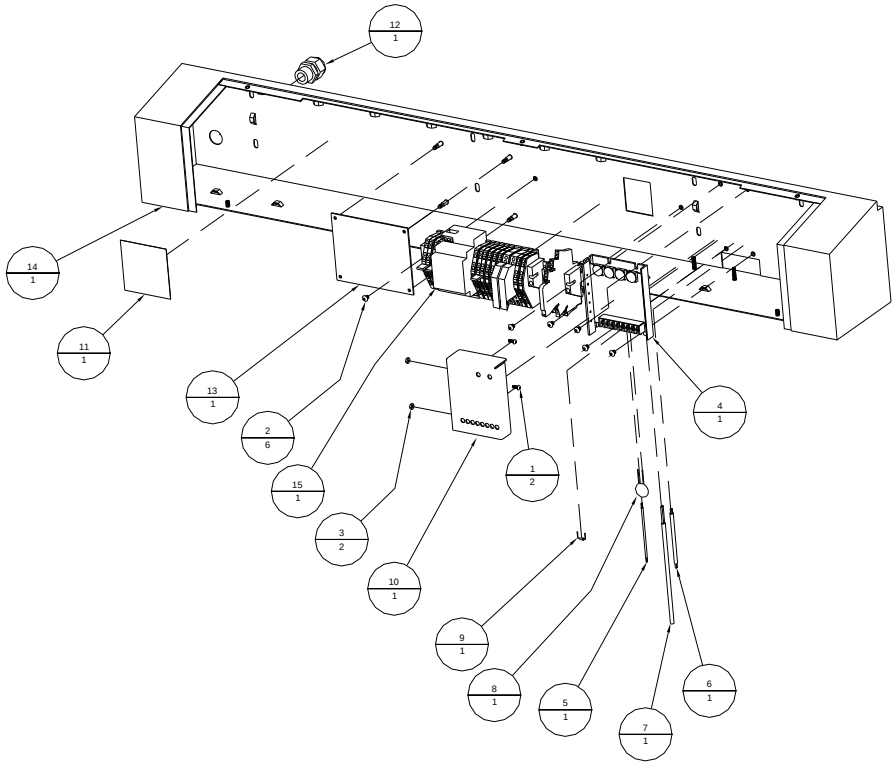


Table A-45: *Terminal Block Assembly, Front Panel, BK730A-2 (9103890A)*

Item	Part Number	Quantity	Description	Reference
1	615021	1	T-Rail, DIN, 10"	
2	9103436	13	Terminal block, Z-roofstyle, ZDU 4-2/4AN	
3	9103437	2	Terminal block, Z-roofstyle, ground, ZPE 4-2/4AN	
4	9103438	10	End plate, ZAP ZDU 4-2/4AN	
5	9103439	3	Cross-connection, ZQV 4/2	
6	9103440	2	Fuse terminal, ZSI 2.5/2, 1/4 X 1 1/4, 10A	
7	9103442	4	End bracket, EW 35	
8	9103465	1	Power Supply, Switching, 12V	
9	9103685	1	Relay, 12 VDC, SPDT, Din Rail Mounting	

Figure A-47: *Terminal Block Assembly, Front Panel, BK730A-2 (9103890A)*

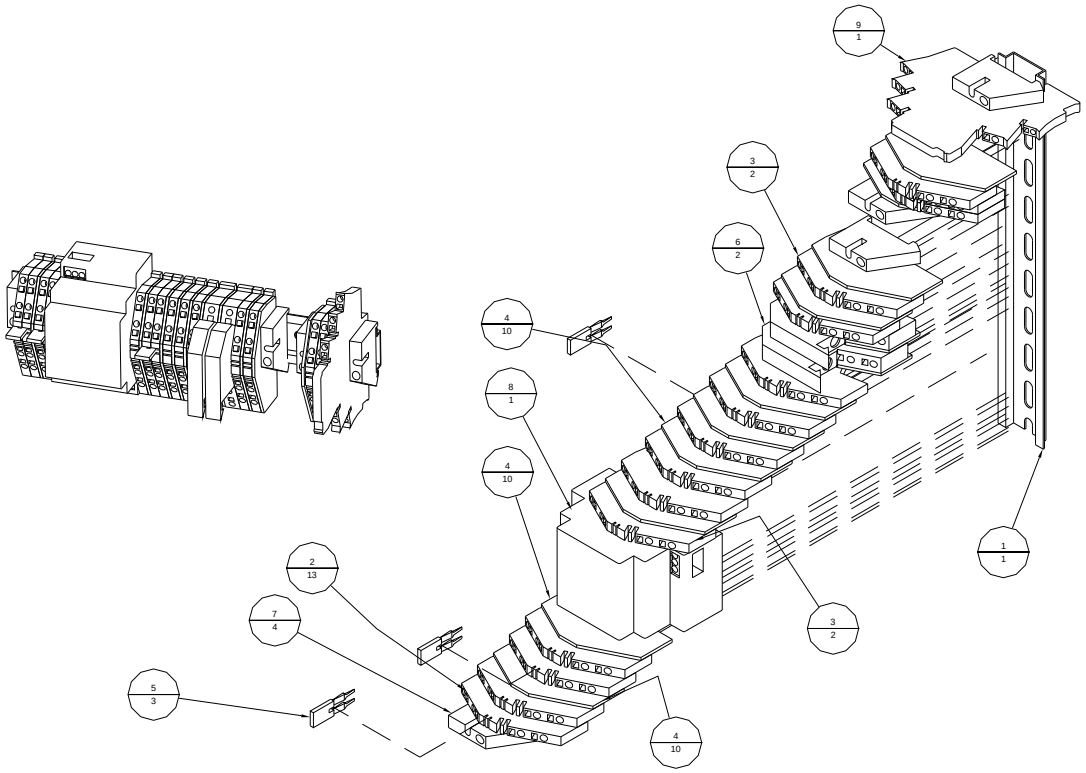


Table A-46: *Base Cabinet Assembly (9104015A)*

Item	Part Number	Quantity	Description	Reference
1	343010	4	Base Mounting Foot	
2	343015	4	Base Mounting Leg	
3	343016	4	Jam Nut, 3/4-10 UNC	
4	402320	16	Screw, PHMS, 6-32 UNC x 3/8"	
5	402510	2	Screw, BHCS, 6-32 UNC x 1/4"	
6	404510	17	Screw, BHCS, 10-32 UNF x 1/4"	
7	405230	4	Screw, SHCS, 1/4-20 UNC x 1/2"	
8	420010	16	Nut, 1/4-20 UNC	
9	420010SS	4	Nut, 1/4-20 UNC SS	
10	439007	3	Lockwasher, 1/4", External Tooth	
11	439010	16	Lockwasher, 1/4" I.D.	
12	440010	16	Washer, 1/4" I.D.	
13	440510	4	Rubber Washer, 1/4" I.D.	
14	606531A	1	Cable, Conveyor Receptacle	
15	614109	7	Pin, Power Contact	
16	614127	1	Receptacle, 23-7 AMP	
17	615102	9	Tie Mount	
18	615141	9	Lashing Tie	
19	717530	4	Door Catch	
20	803530	4	Caster, Swivel, 4 in	
21	9102068	16	Bolt, Carriage, 1/4-20 UNC, 3/4" LG.	
22	9102930	1	Cord, 15A/125VAC, 2.5m, N.A., IEC	
23	9103968A	1	Cabinet, Base Assembly, BK730A-2	
24	9104143A	1	Cable, Rear Panel, Upstream to BCB	Page A-58
25	9104144A	1	Cable, Downstream to BCB	Page A-59
26	9104451A	1	Cable, #21, Power from IEC to Front Panel	Page A-60

Figure A-48: *Base Cabinet Assembly (9104015A)*

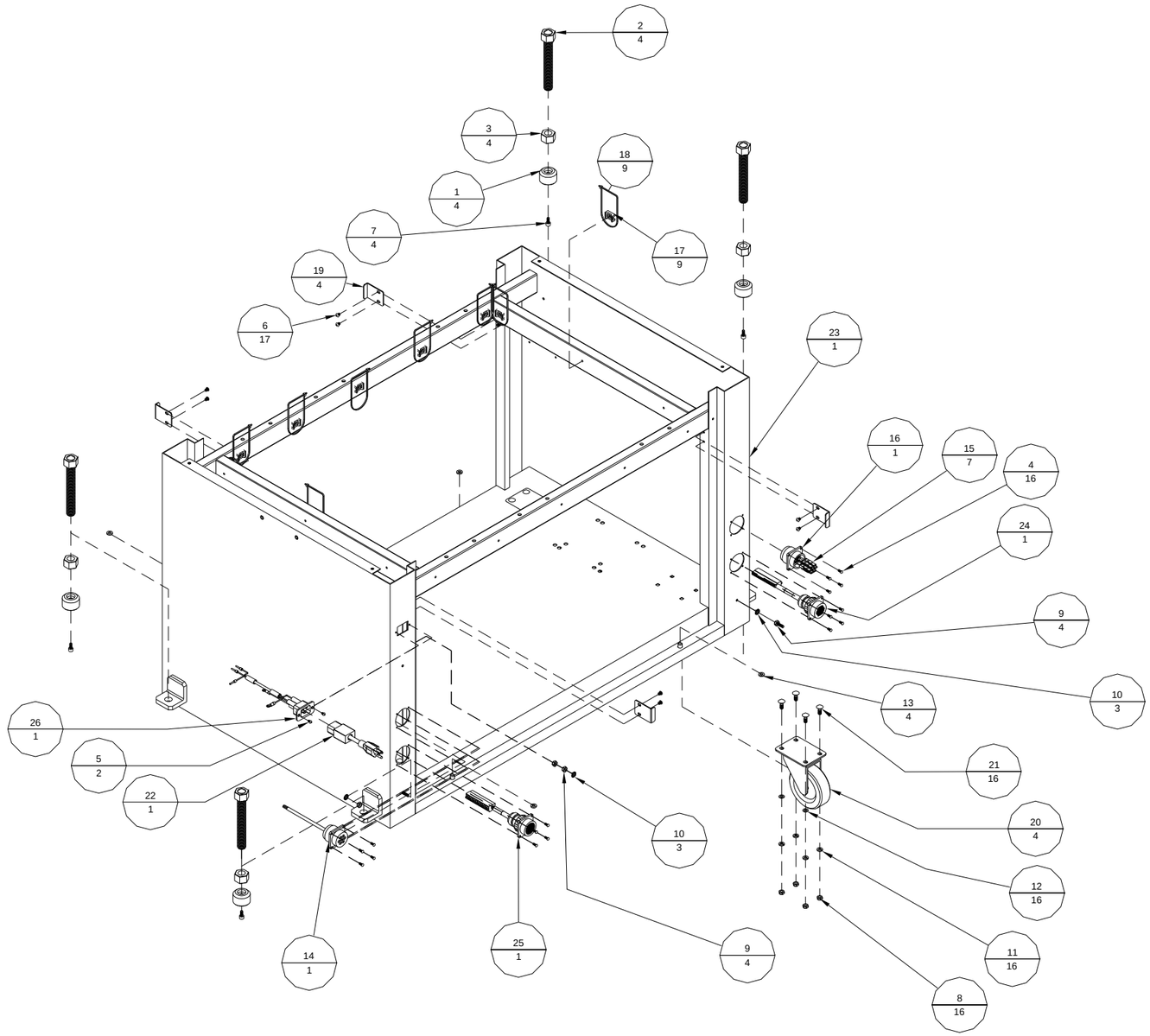
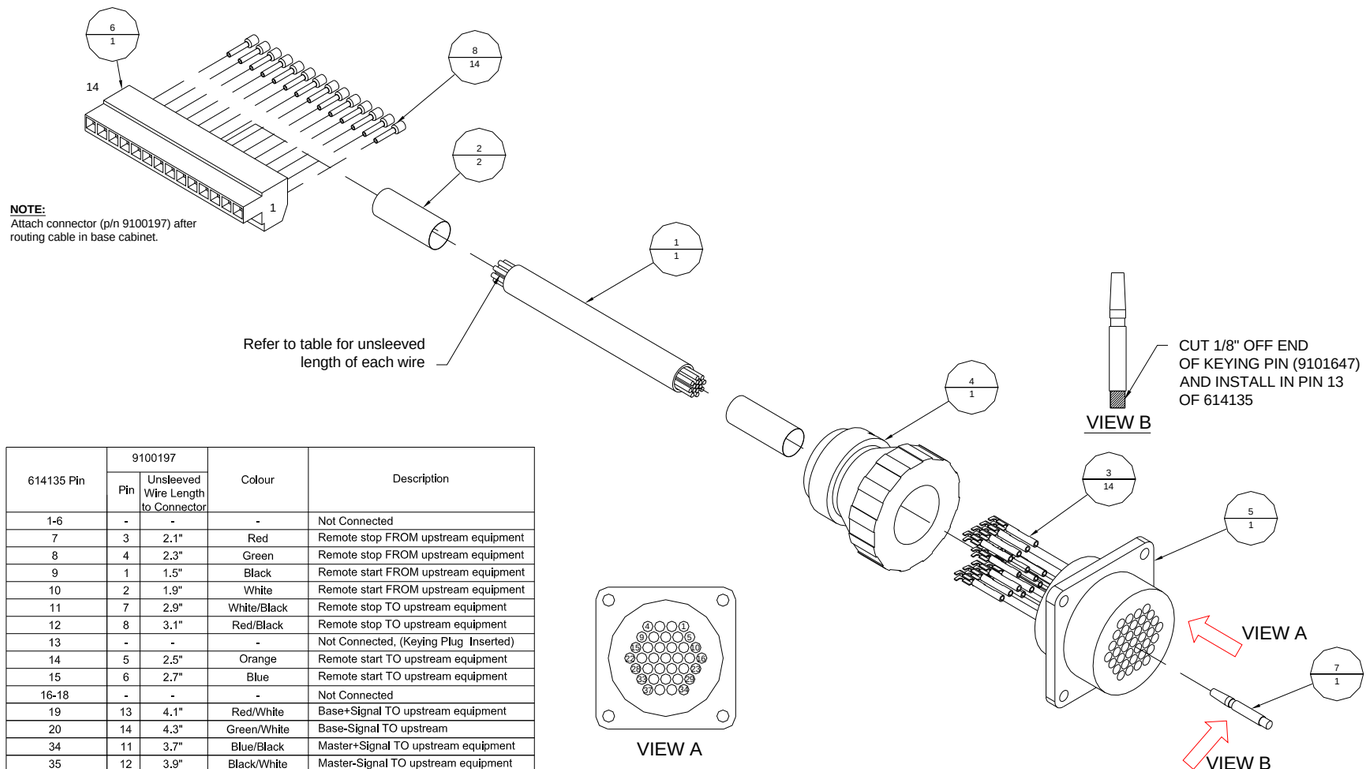


Table A-47: *Cable, Rear Panel, Upstream to BCB (9104143A)*

Item	Part Number	Quantity	Description	Reference
1	606016	1	Cable, #22-15, Shielded, 64" Sleeved Length, 71" Total	
2	609003	2	Shrink Wrap, 3/8" I.D., 1" Long	
3	614108	14	Contact, Female, 24-20 AWG, Yellow	
4	614113	1	Cable Clamp	
5	614135	1	Receptacle, Female, 23-37	
6	9100197	1	Connector, Female, 14-Pin, BLA14	
7	9101647	1	Keying Plug, Series 1	
8	9103468	14	Ferrule, #22 AWG, Torquoise	

Figure A-49: *Cable, Rear Panel, Upstream to BCB (9104143A)*

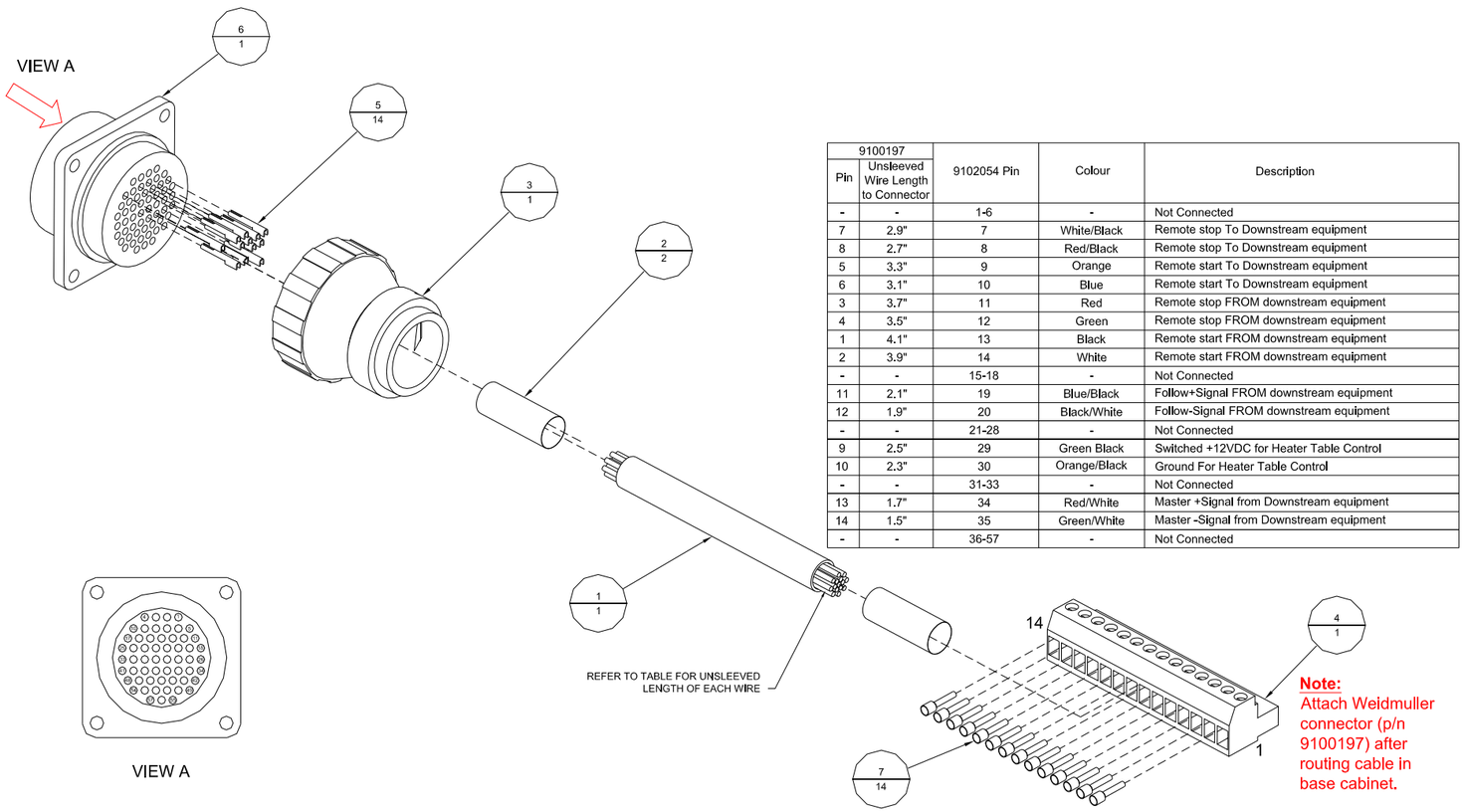


614135 Pin	9100197		Colour	Description
	Pin	Unsleeved Wire Length to Connector		
1-6	-	-	-	Not Connected
7	3	2.1"	Red	Remote stop FROM upstream equipment
8	4	2.3"	Green	Remote stop FROM upstream equipment
9	1	1.5"	Black	Remote start FROM upstream equipment
10	2	1.9"	White	Remote start FROM upstream equipment
11	7	2.9"	White/Black	Remote stop TO upstream equipment
12	8	3.1"	Red/Black	Remote stop TO upstream equipment
13	-	-	-	Not Connected, (Keying Plug Inserted)
14	5	2.5"	Orange	Remote start TO upstream equipment
15	6	2.7"	Blue	Remote start TO upstream equipment
16-18	-	-	-	Not Connected
19	13	4.1"	Red/White	Base+Signal TO upstream equipment
20	14	4.3"	Green/White	Base-Signal TO upstream
34	11	3.7"	Blue/Black	Master+Signal TO upstream equipment
35	12	3.9"	Black/White	Master-Signal TO upstream equipment
36	9	3.3"	Green/Black	To an upstream Frictlon Feeder
37	10	3.5"	Orange/Black	To an upstream Frictlon Feeder

Table A-48: *Cable, Downstream to BCB (9104144A)*

Item	Part Number	Quantity	Description	Reference
1	606016	1	Cable, #22-15 Shielded, 68" Sleeved Length, 75" Total	
2	609003	2	Shrink Wrap, 3/8" I.D., 1"	
3	614113	1	Cable Clamp	
4	9100197	1	14-Pin Weidmuller	
5	9100785	14	Contact, Female, 24-20 AWG, Size 20 DF	
6	9102054	1	Receptacle, Female, 23-57	
7	9103468	14	Ferrule, #22 AWG, Torquoise	

Figure A-50: *Cable, Downstream to BCB (9104144A)*



9100197 Pin	9100197 Unsleeved Wire Length to Connector	9102054 Pin	Colour	Description
-	-	1-6	-	Not Connected
7	2.9"	7	White/Black	Remote stop To Downstream equipment
8	2.7"	8	Red/Black	Remote stop To Downstream equipment
5	3.3"	9	Orange	Remote start To Downstream equipment
6	3.1"	10	Blue	Remote start To Downstream equipment
3	3.7"	11	Red	Remote stop FROM downstream equipment
4	3.5"	12	Green	Remote stop FROM downstream equipment
1	4.1"	13	Black	Remote start FROM downstream equipment
2	3.9"	14	White	Remote start FROM downstream equipment
-	-	15-18	-	Not Connected
11	2.1"	19	Blue/Black	Follow+Signal FROM downstream equipment
12	1.9"	20	Black/White	Follow-Signal FROM downstream equipment
-	-	21-28	-	Not Connected
9	2.5"	29	Green Black	Switched +12VDC for Heater Table Control
10	2.3"	30	Orange/Black	Ground For Heater Table Control
-	-	31-33	-	Not Connected
13	1.7"	34	Red/White	Master +Signal from Downstream equipment
14	1.5"	35	Green/White	Master -Signal from Downstream equipment
-	-	36-57	-	Not Connected

Table A-49: *Power from IEC to Front Panel (9104451A)*

Item	Part Number	Quantity	Description	Reference
1	606016	1	Cable, #22-15 Shielded, 68" Sleeved Length, 75" Total	
2	609003	2	Shrink Wrap, 3/8" I.D., 1"	
3	614113	1	Cable Clamp	
4	9100197	1	14-Pin Weidmuller	
5	9100785	14	Contact, Female, 24-20 AWG, Size 20 DF	
6	9102054	1	Receptacle, Female, 23-57	
7	9103468	14	Ferrule, #22 AWG, Torquoise	

Figure A-51: *Power from IEC to Front Panel (9104451A)*

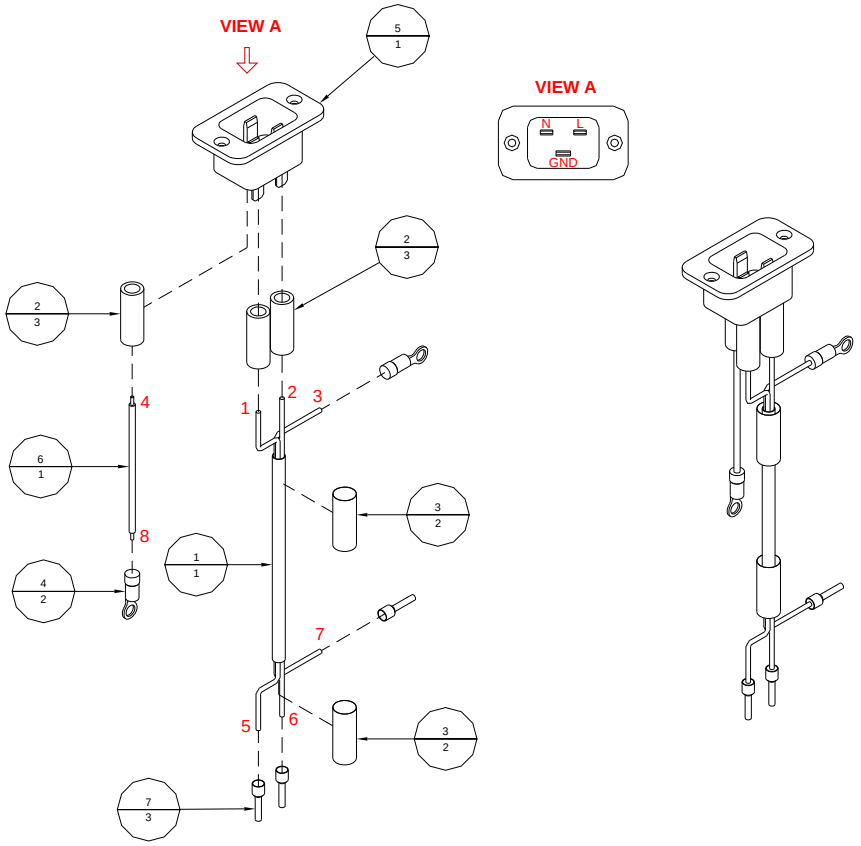
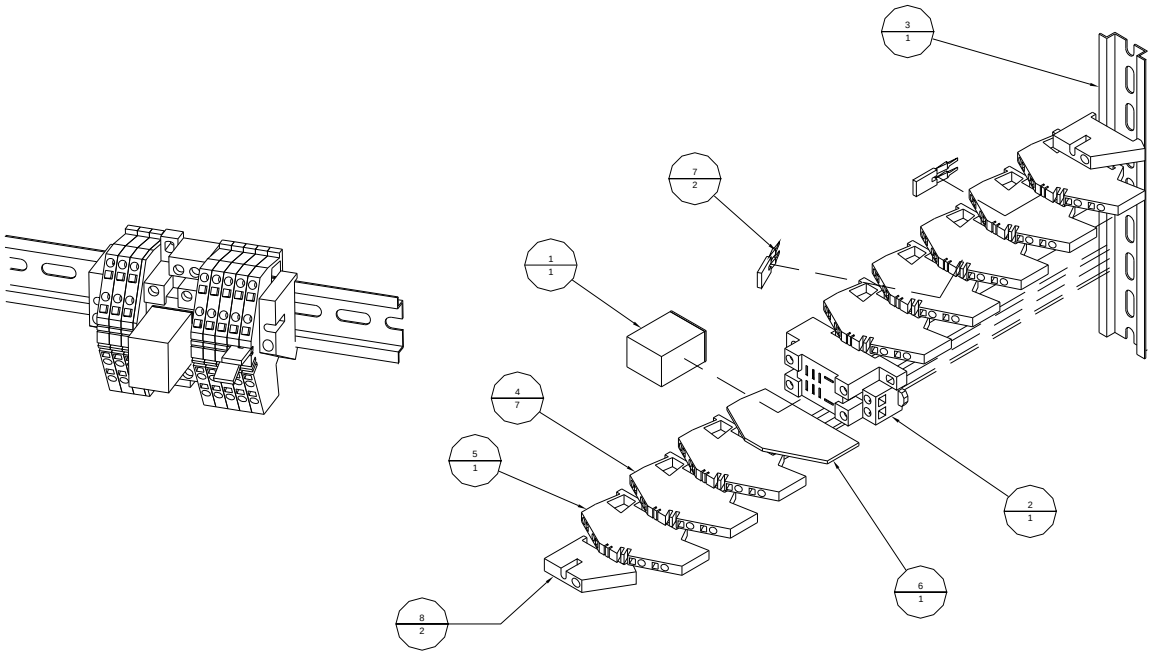


Table A-50: *Terminal Block Assembly, Rear Panel, BK730A-2 (9104173A)*

Item	Part Number	Quantity	Description	Reference
1	610104	1	Relay, 120 VAC, LY3	
2	615004	1	Relay Base	
3	615021	1	T-Rail, DIN, 8"	
4	9103436	7	Terminal block, Z-roofstyle, ZDU 4-2/4AN	
5	9103437	1	Terminal block, Z-roofstyle, ground, ZPE 4-2/4AN	
6	9103438	1	End plate, ZAP ZDU 4-2/4AN	
7	9103439	2	Cross-connection, ZQV 4/2	
8	9103442	2	End bracket, EW 35	

Figure A-52: *Terminal Block Assembly, Rear Panel, BK730A-2 (9104173A)*



Electrical Drawings

Appendix **B**

List of Figures

Figure B-1: *BK730-2 Tabber Base Electrical Schematic (115 VAC Line Input)*

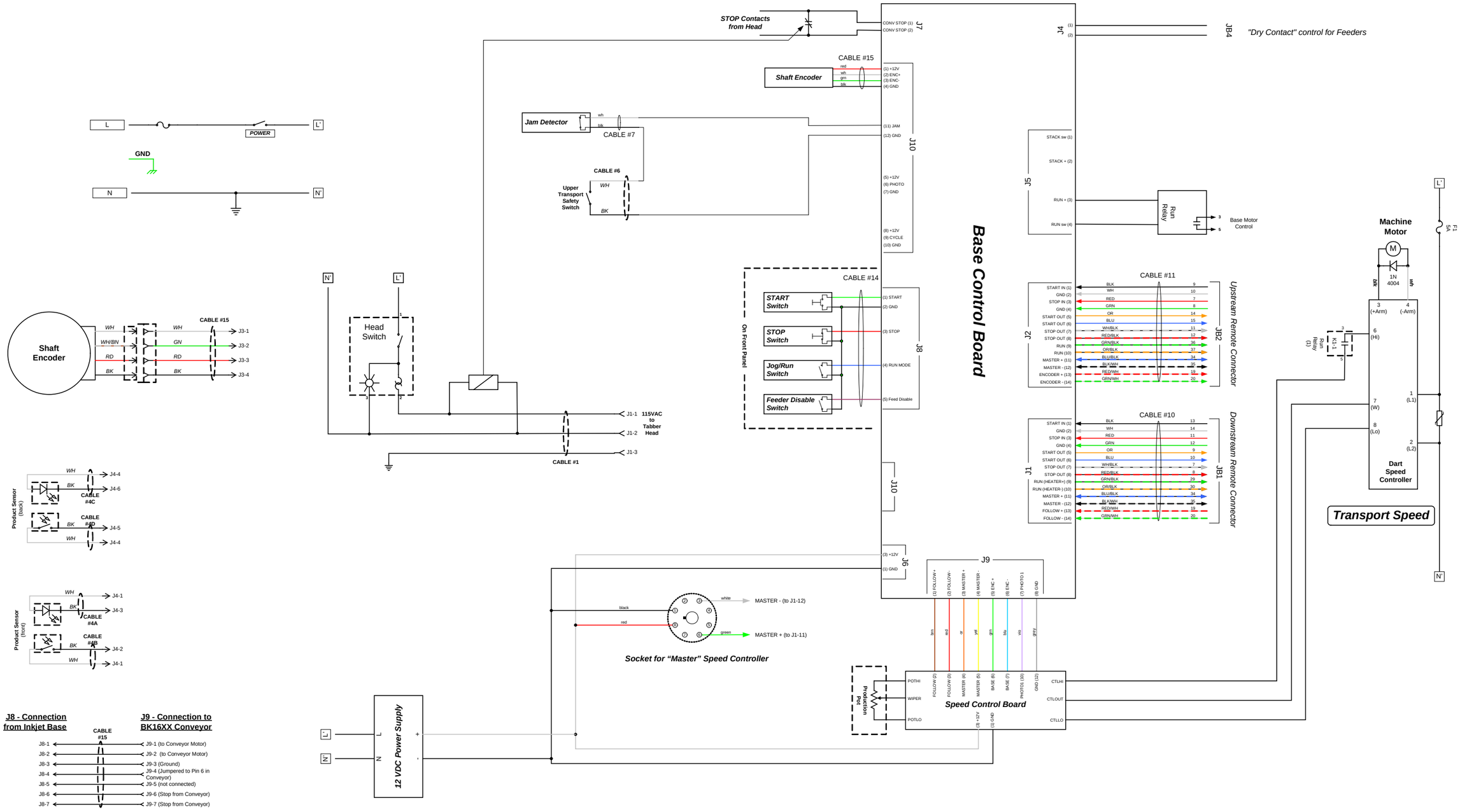


Figure B-2: BK730-2 Tabber Base Electrical Schematic (230 VAC Line Input)

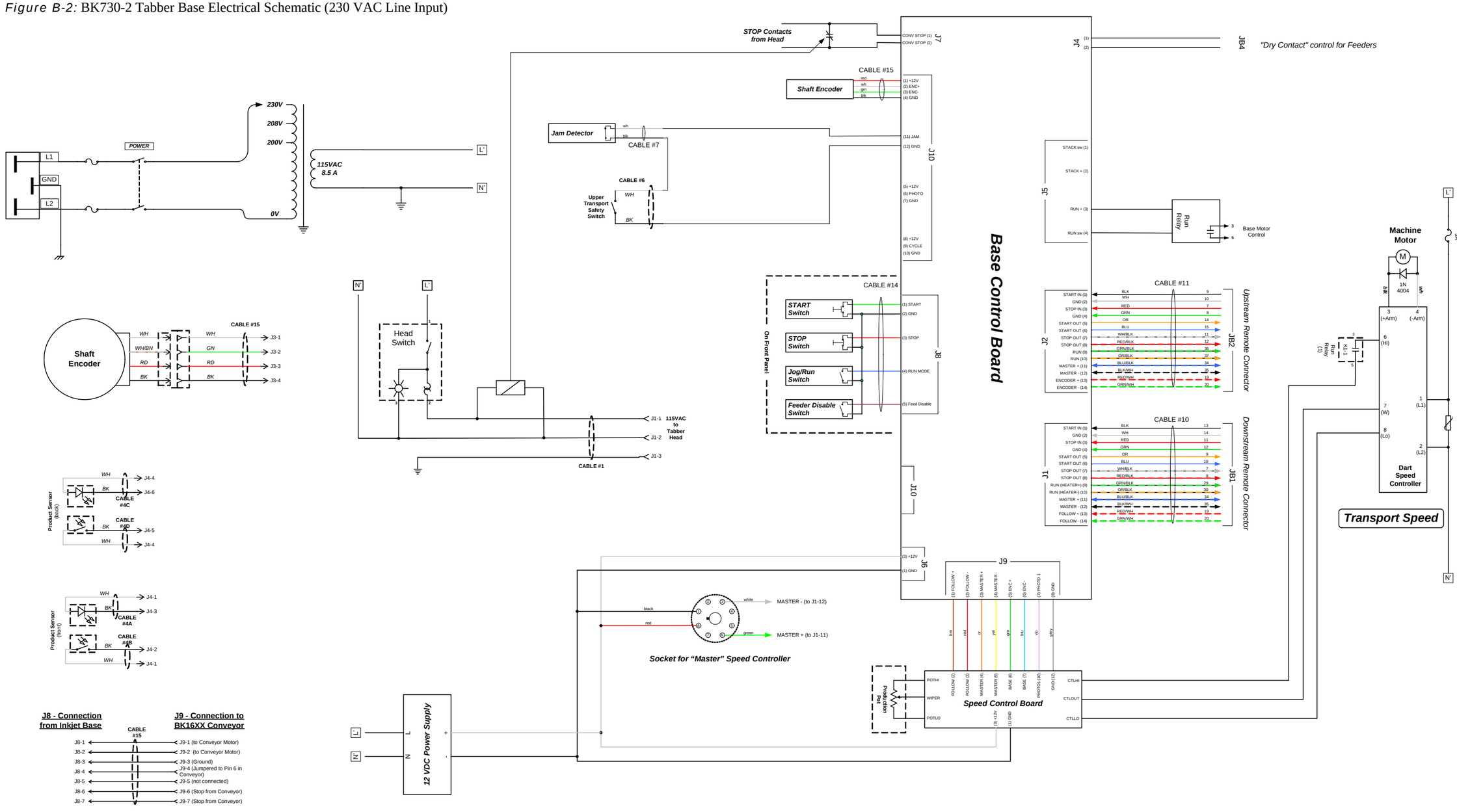
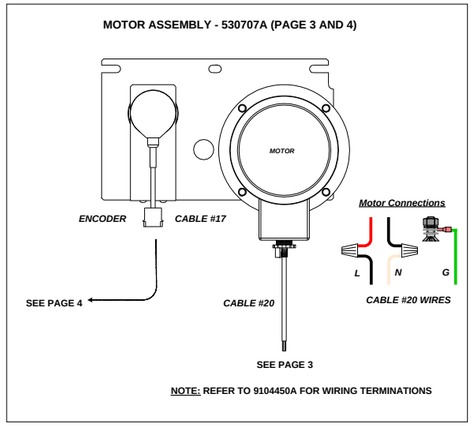


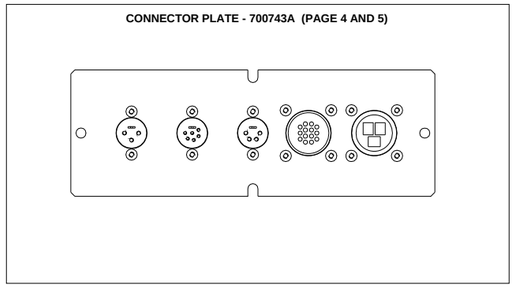
Figure B-3: *BK730-2 Cable Reference Chart – Page 1 of 5*

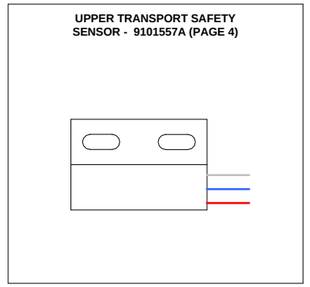
Cable #	Purpose	Buskro P/N	Cable P/N	Wire Gauge	Length [in]	Wire Colours
1	Line, neutral, ground from rear terminal block assembly to power connector on Tabber Connector Plate (p/n 700743A).	700743C1	606033	16 AWG		GN, WH, BK
2	Stop output from Head to conveyor stop input on Base Control Board J7.	700743C2	606531	22 AWG		BK, WH
3	Encoder cable splitting encoder signal to Base Control Board and Tabber Head.	700743C3	606012	22 AWG		WH, GN, RD, BK
4A	Connects front product sensor emitter to Tabber Connector Plate.	700743C4	606531	22 AWG		BK, WH
4B	Connects front product sensor receiver to Tabber Connector Plate.					BK, WH
4C	Connects back product sensor emitter to Tabber Connector Plate.					BK, WH
4D	Connects back product sensor receiver to Tabber Connector Plate.					BK, WH
5	Jam cable from rear terminal block assembly to Tabber Connector Plate.	700743C5	606531	22 AWG		BK, WH
6	Cable from rear terminal block assembly to Upper Transport Safety cover sensor (p/n 9101557A)	9104437A	606531	22 AWG		BK, WH
7	Cable from rear Terminal block assembly to Jam Switch Assembly (p/n 603520A).	9104438A	606531	22 AWG		BK, WH
8	Cable from rear terminal block assembly taking signal from Jam Switch Assembly to Jam input on Base Control Board J10.	9104439A	606531	22 AWG		BK, WH
9	Cable from 115 VAC relay normally closed (N/C) contacts to the Conveyor Stop input on the Base Control Board J7.	9104440A	606531	22 AWG		BK, WH
10	Cable from downstream connection at J1 of Base Control Board to Downstream Connector on the base cabinet.	9104144A		22 AWG		WH/GN, WH/RD, BK/WH, BU/BK, OG/BK, GN/BK, RD/BK, WH/BK, BU, OG, GN, RD, WH, BK
11	Upstream cable from J2 on Base Control Board to upstream connector on the Base Cabinet.	9104143A		22 AWG		WH/GN, WH/RD, BK/WH, BU/BK, OG/BK, GN/BK, RD/BK, WH/BK, BU, OG, GN, RD, WH, BK
12	Cable from Speed Control J3 on Base Control Board and 12 VDC J6 to 12 VDC power supply and speed control in front panel.	9104443A	606018	22 AWG		WH, BK, GY, VIO, BU, GN, YEL, OG, RD, BN
13	Cable from J5 on Base Control Board to RUN relay in front panel.	9104444A	606012	22 AWG		WH, GN, RD, BK
14	Cable from J8 on Base Control Board to Front Panel controls for Start, Stop, Jog/Run, and Feed Enable.	9104445A	9104140	22 AWG		BN, GN, RD, WH, BK
16	Cable to split encoder signal to go to Base Control Board J10 and to Head via cable #3.	9104447A	606012	22 AWG		WH, GN, RD, BK
17	Cable from Encoder Assembly to cable #16.					WH, WH/BN, RD, BK
18	Power connection from Front Panel Assembly to Rear Terminal Block Assembly.	9104449A	606033	16 AWG		GN, WH, BK
19	Jam Switch Assembly cable to cable #7.	603520A	606531	22 AWG		BK, WH
20	Power to Motor	9104450A	606034	16 AWG		GN, WH, BK
21	Cable connecting L, N, G from IEC connector to front panel terminal block assembly.	9104451A	606034	14 AWG		GN, WH, BK
22	Connects +12VDC for master speed control module and master speed signal to the speed control board.	9104452A	606012	22 AWG		WH, GN, RD, BK
23	Connects +12VDC and ground from power supply to Speed Control Board J1.	9104453A	606532	22 AWG		BK, RD
24	Cable connecting front panel speed production potentiometer to J2 on the Speed Control Board.	9104454A	606012	22 AWG		BK, WH, RD
25	Cable from Front Panel Base Power and Head Switch to L, N, G on front terminal block assembly.	9104455A	606530	18 AWG		GN, WH, BK, BN, BU
26	Control cable to Dart Board	9104456A	606012	22 AWG		BK, WH, RD
27	Power to Dart Control Board	9104457A	606035	18 AWG		BK, WH
28	Control cable to Speed Control Board	9104458A	606012	22 AWG		BK, WH, RD
29	Power cable from +12VDC supply to L, N, G	9104459A	606043	18 AWG		BK, WH, RD
30	Conveyor Extension Cable	606531A		14 AWG		BK, WH, GN, RD, BU, WH/BK

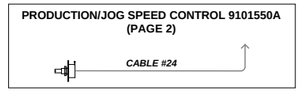
Ferrules: Wire Size vs. Colour		
AWG	**Colour**	**P/N**
14	Blue	9103433 - single wire
		9103434 - dual wire
16	Red	9103435
18	White	9103539 - single wire
		9103724 - dual wire
20	Orange	9103538
22	Turquoise	9103468
24	Light Blue	9103540

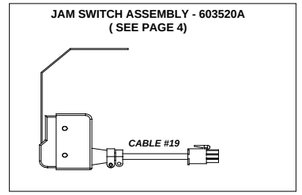
Figure B-4: *BK730-2 Tabber Base Wiring - Page 2 of 5*

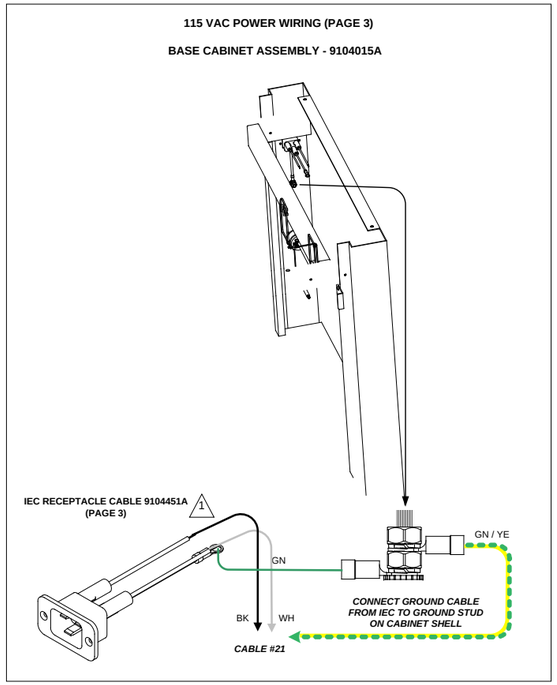


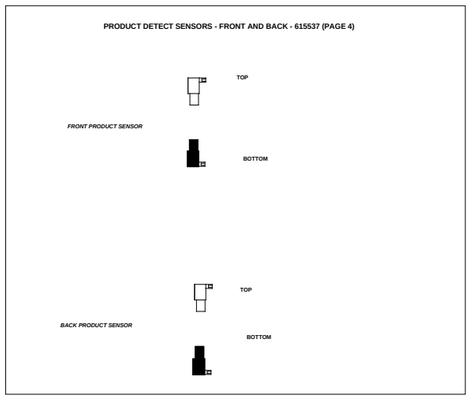












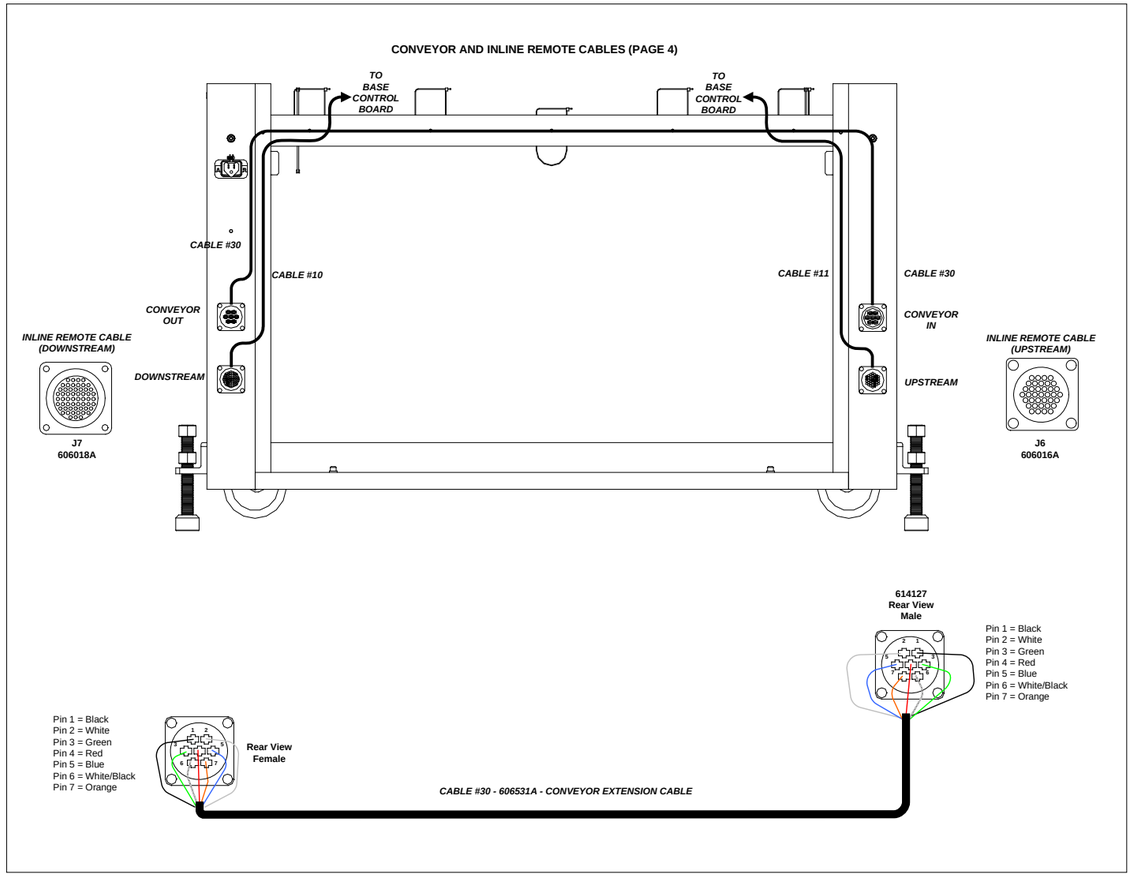
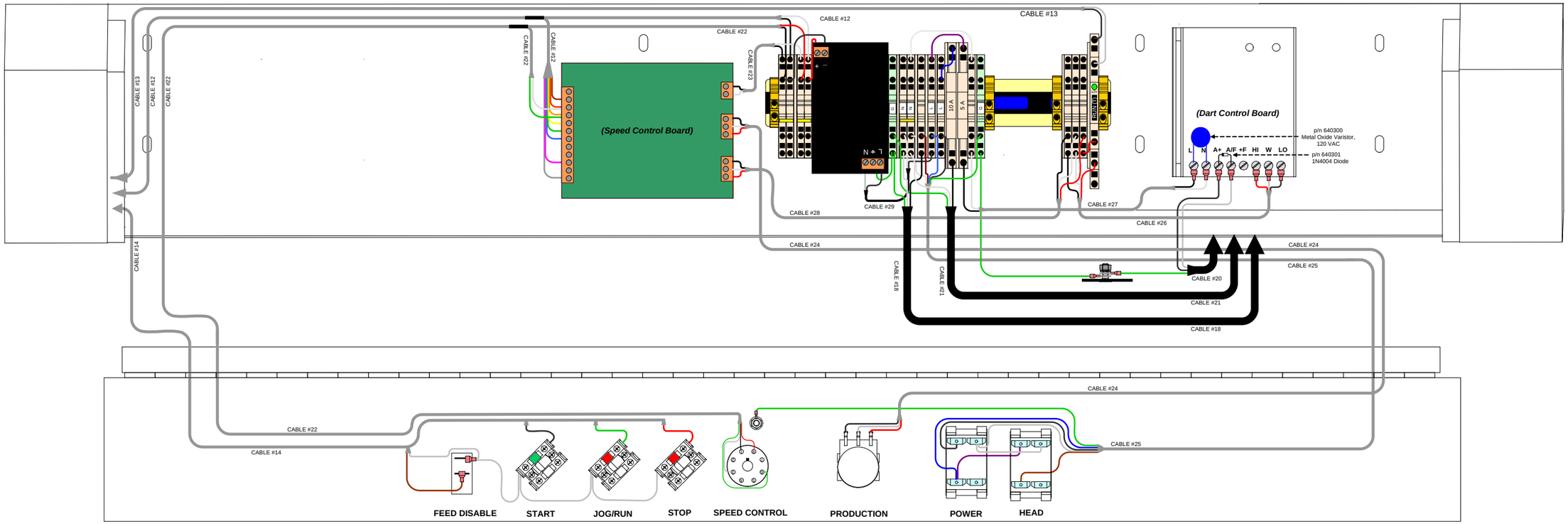


Figure B-5: *BK730-2 Tabber Base Wiring - Page 3 of 5*

Front Compartment View



Notes:
9100096 - Fuse, 10A, 250V, 1/4 x 1-1/4 in, Time Delay

Figure B-6: *BK730-2 Tabber Base Wiring - Page 4 of 5*

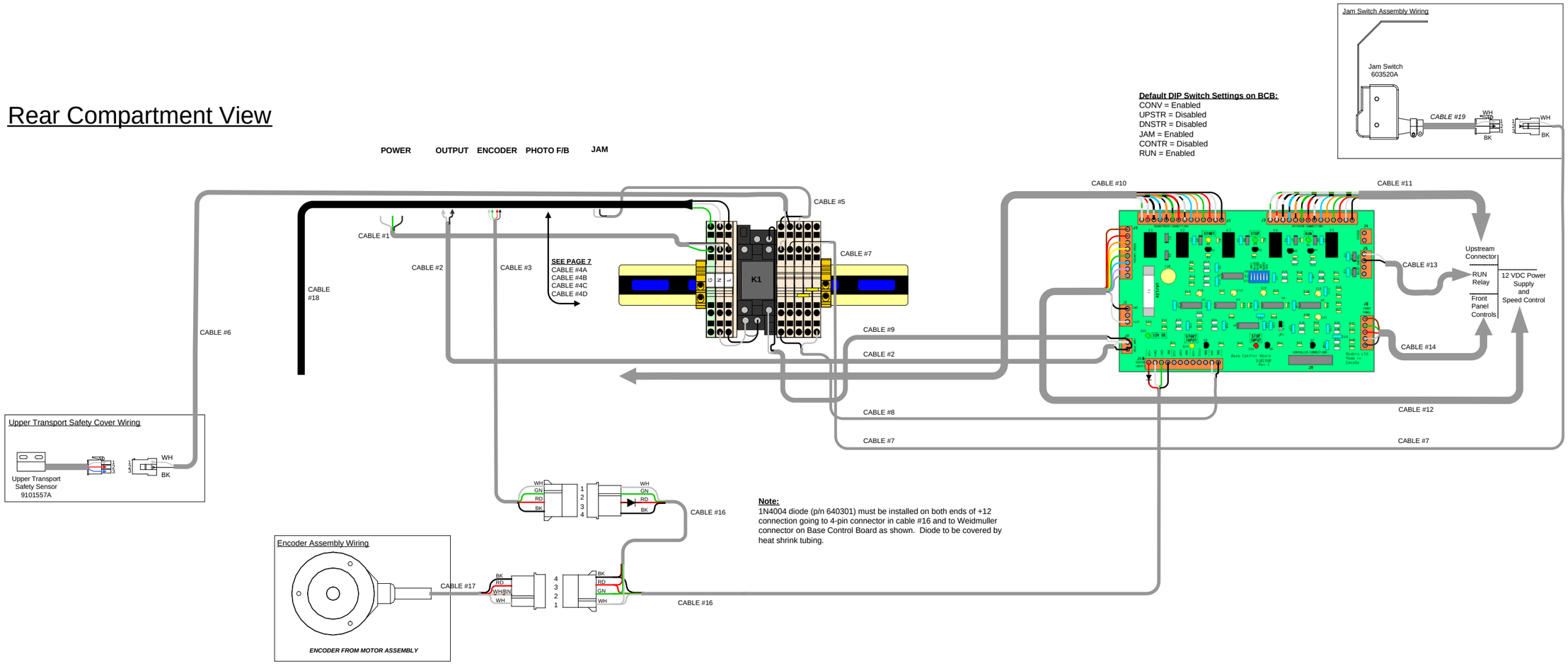


Figure B-7: *BK730-2 Tabber Base Wiring - Page 5 of 5*

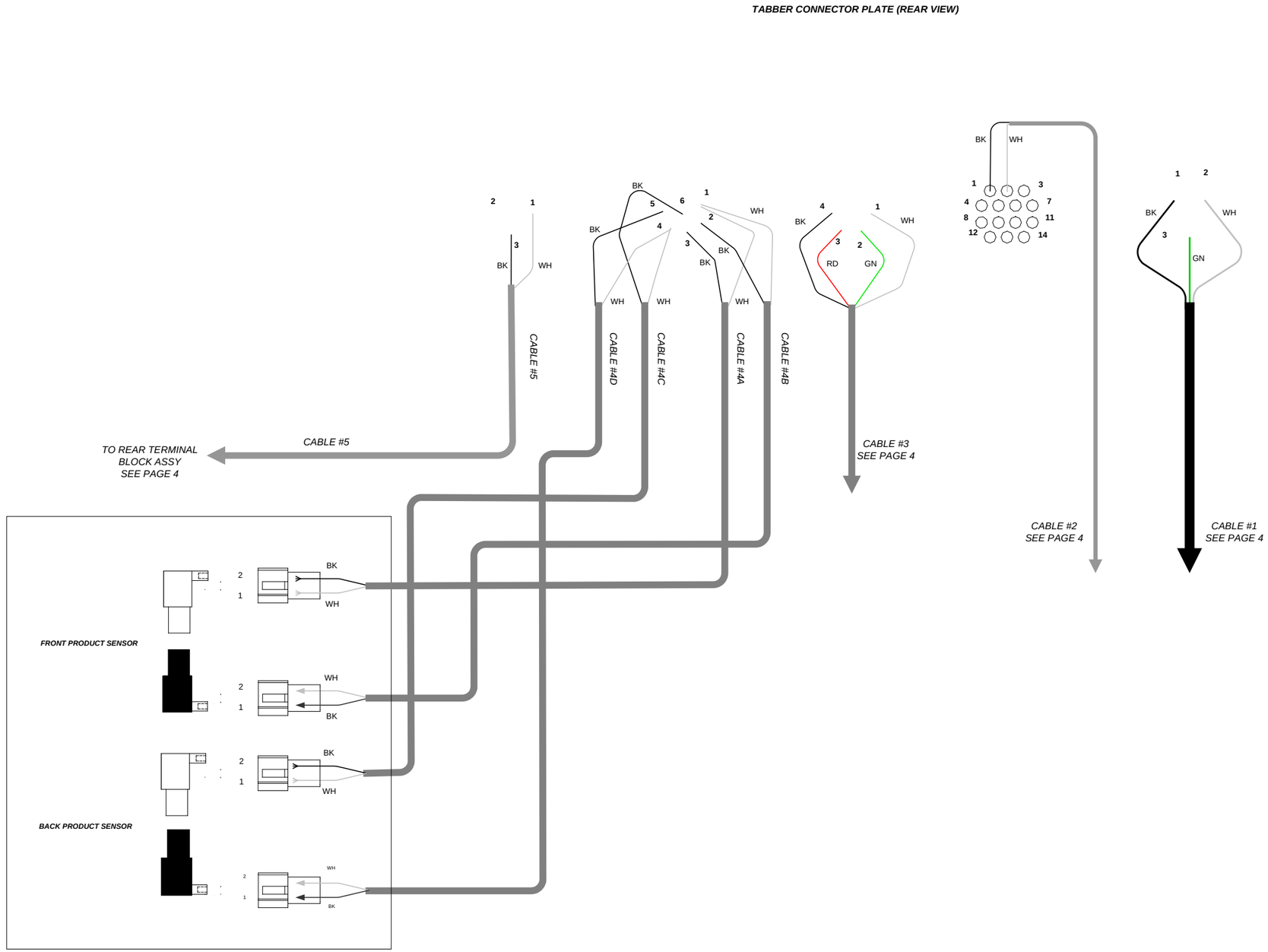
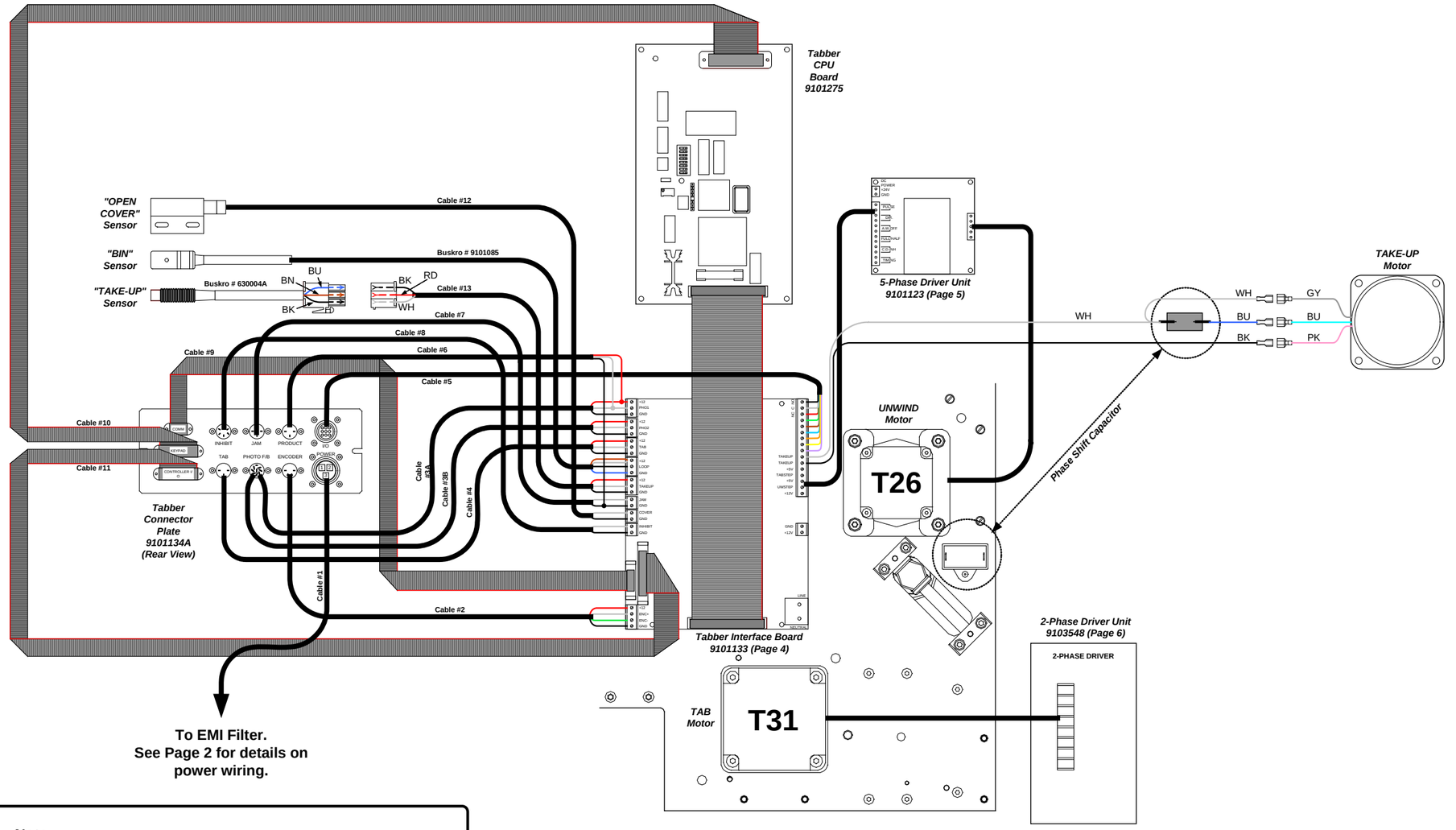


Figure B-8: *BK731-2 Tabber Head Wiring - Page 1 of 6*



Note:

1. For details on power wiring, see Page 2.

2. For details on Tabber Connection Plate wiring, see Page 3.

3, For details on Tabber Interface Board wiring, see Page 4.

4. For details on 5-Phase Driver Unit wiring, see Page 5.

5. For details on 2-Phase Driver Unit wiring, see Page 6.

Figure B-9: *BK731-2 Tabber Head Wiring - Page 2 of 6*

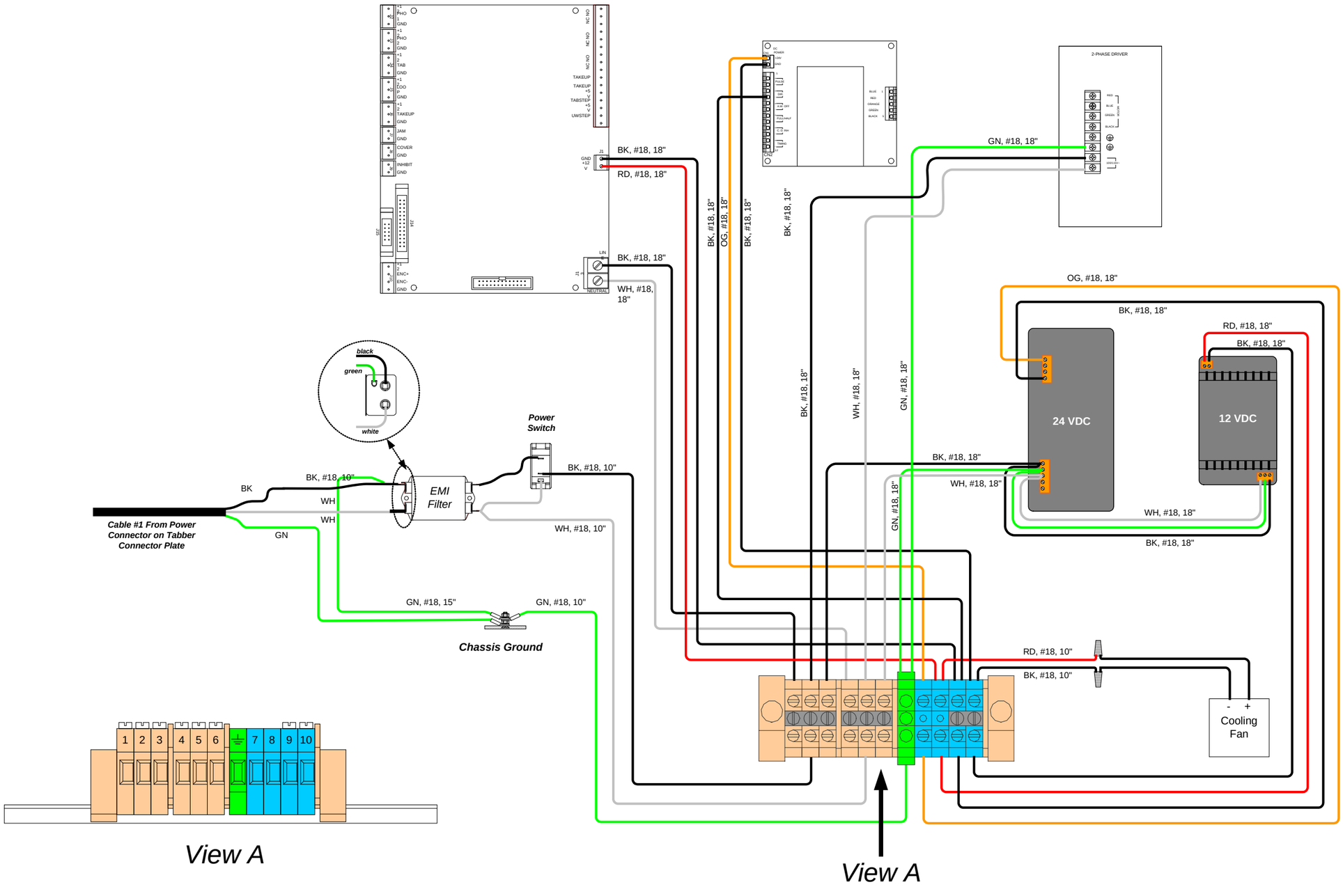
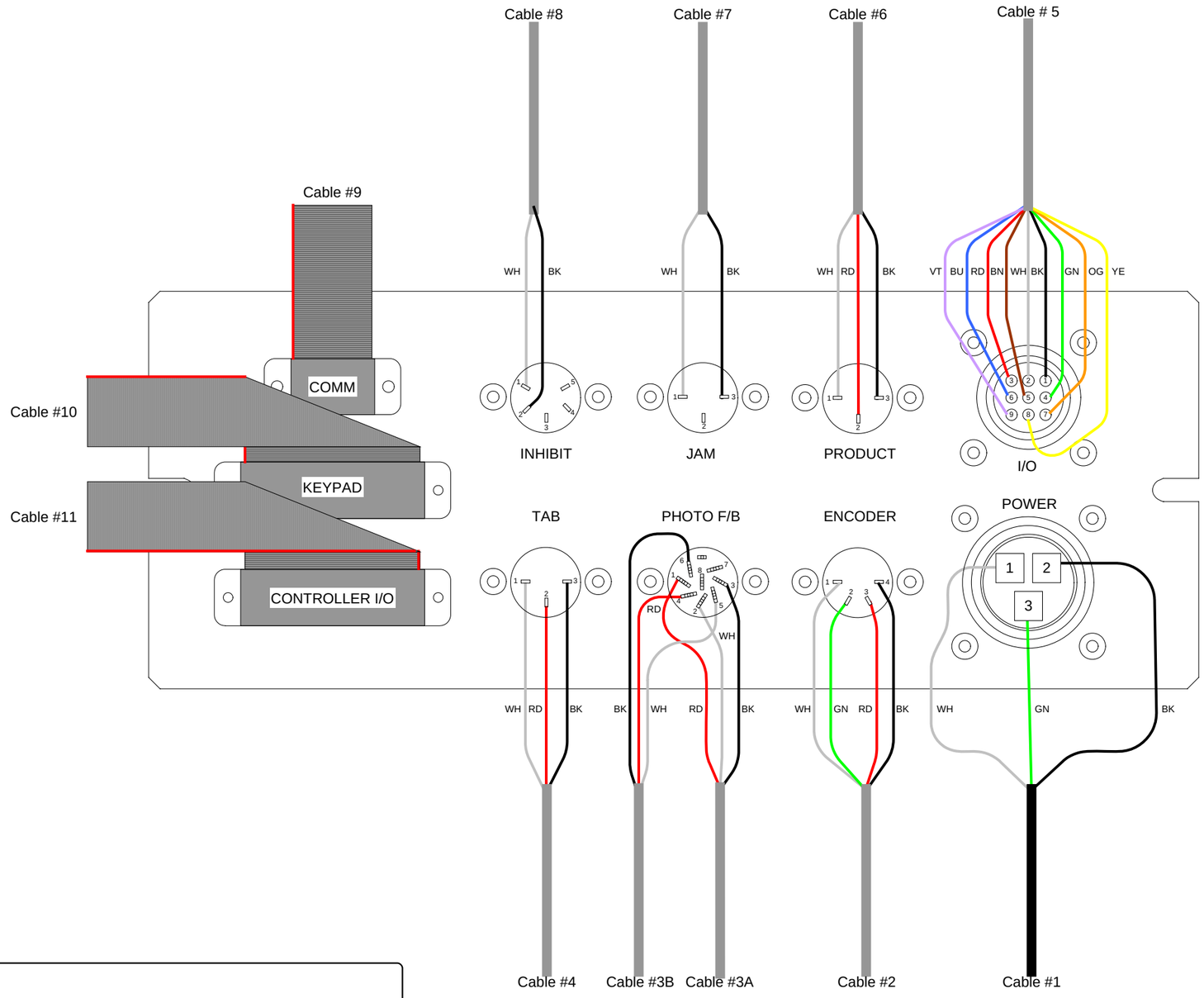


Figure B-10: *BK731-2 Tabber Head Wiring - Page 3 of 6*



Note:
This is part of Cable Harness 9101134A.

Figure B-11: *BK731-2 Tabber Head Wiring - Page 4 of 6*

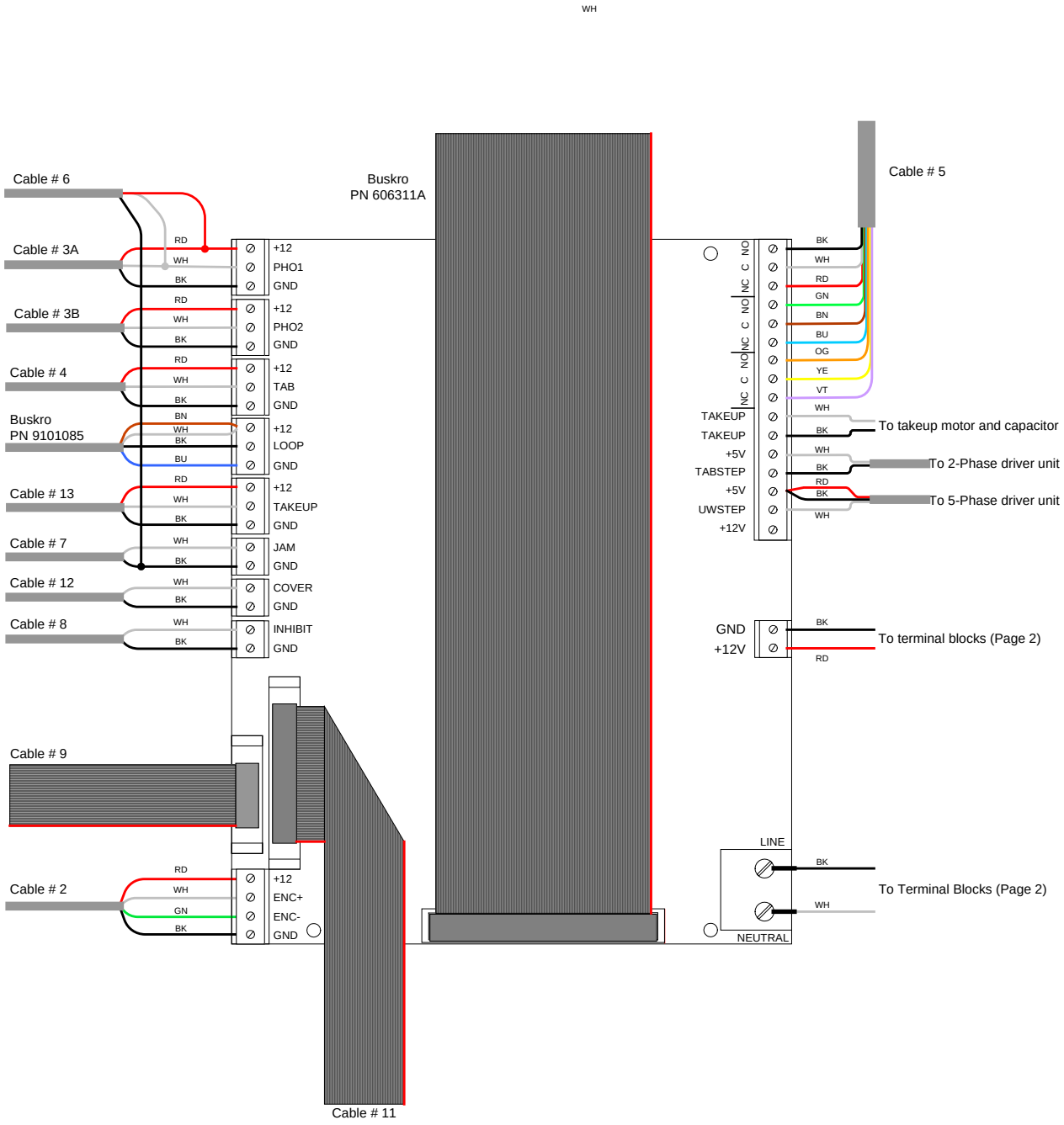
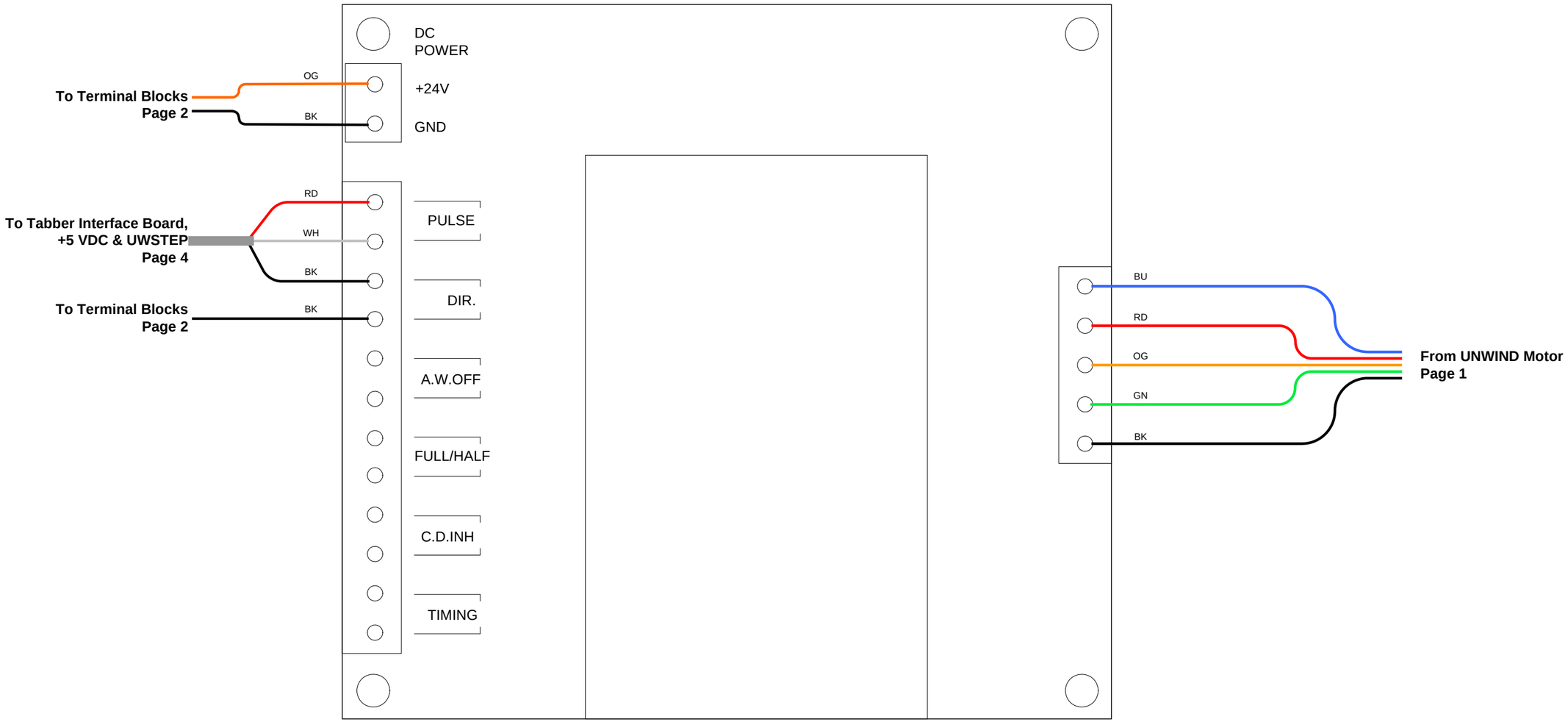


Figure B-12: *BK731-2 Tabber Head Wiring - Page 5 of 6*



5-Phase Driver Unit

Figure B-13: *BK731-2 Tabber Head Wiring - Page 6 of 6*

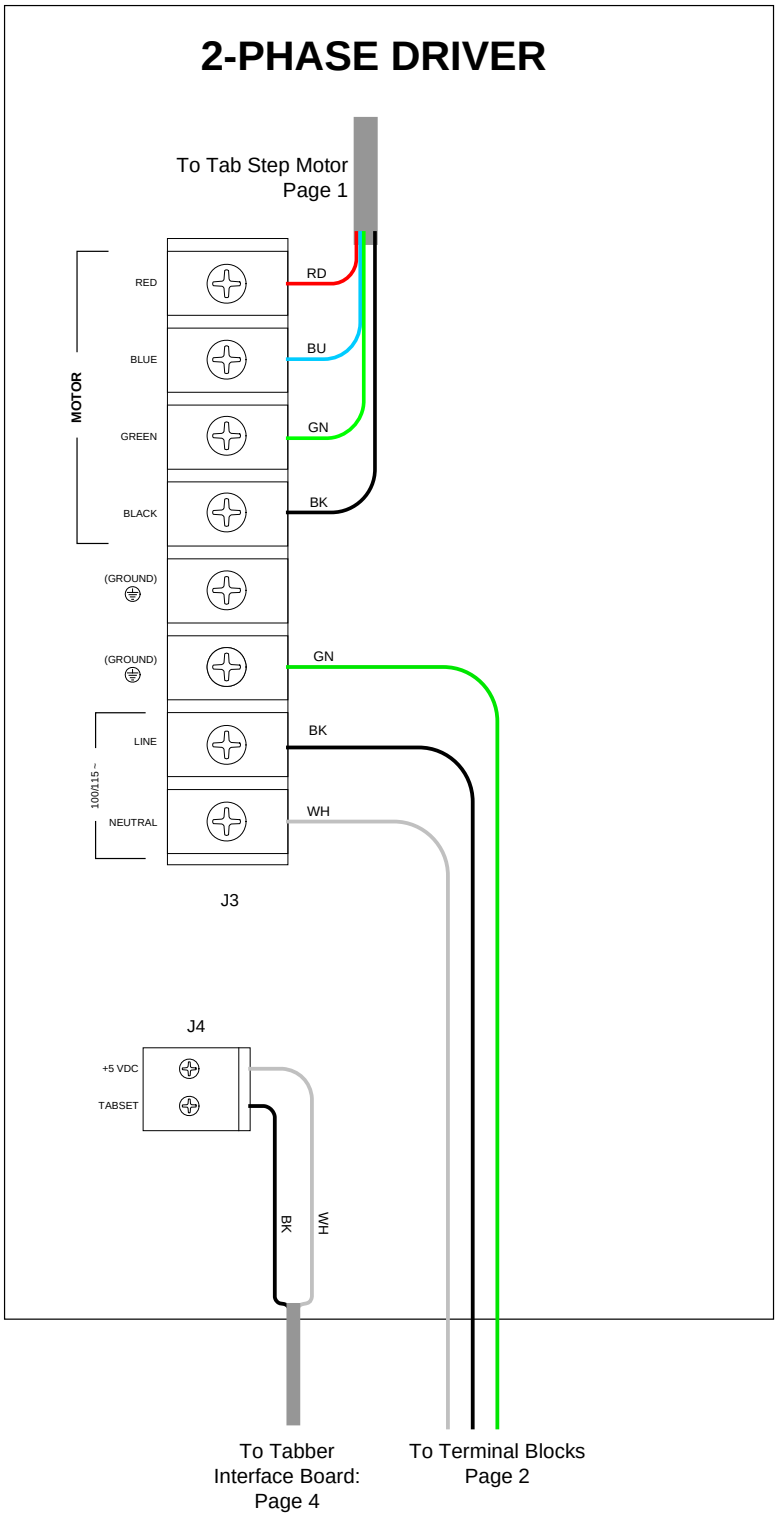
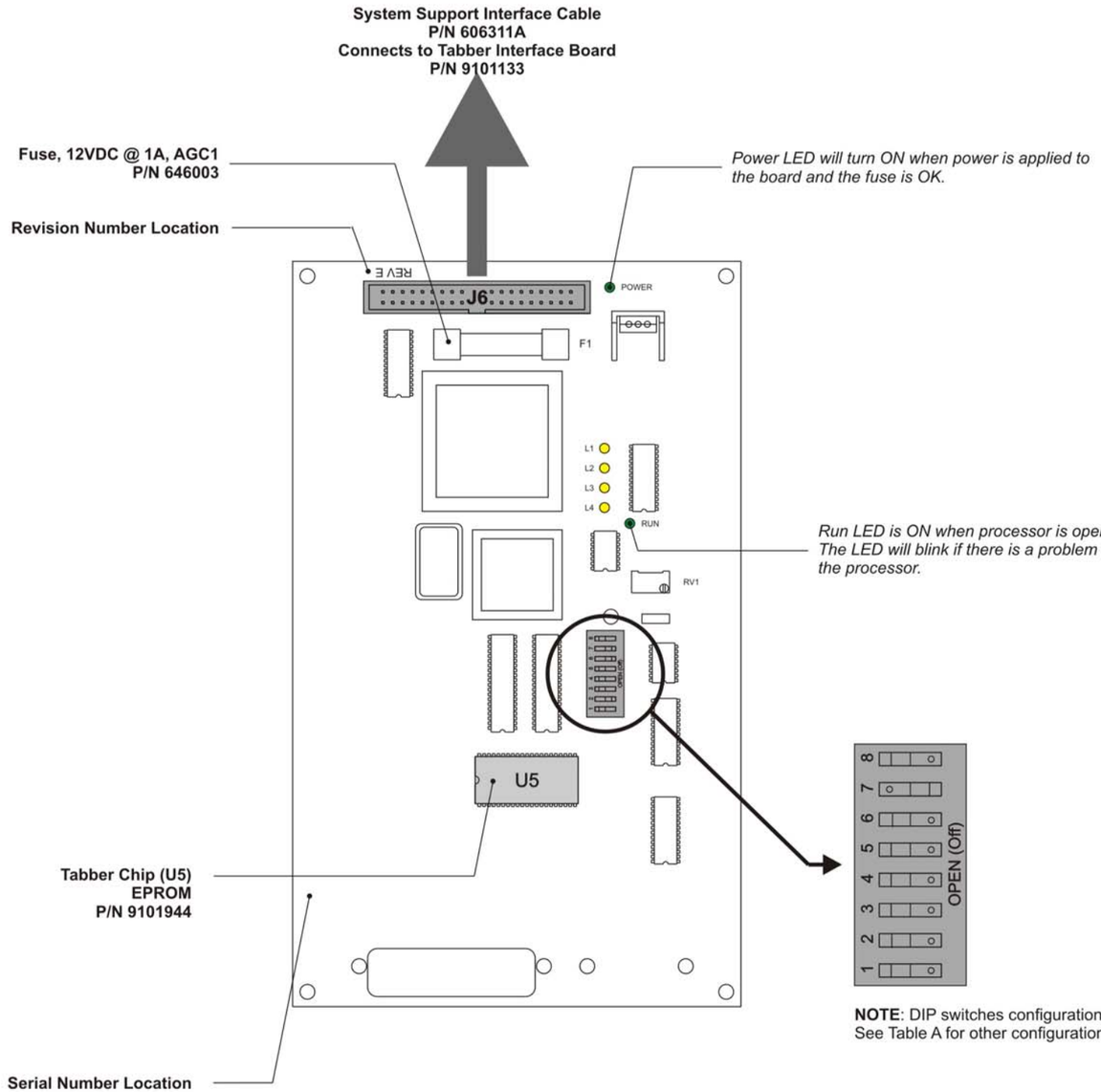


Figure B-14: *Tabber CPU Board DIP Switch Settings and Programming*



NOTE: DIP switches configuration shown are set for BK730 Tabber. See Table A for other configurations.

Table A - Tabber CPU Board Dip Switch Assignments

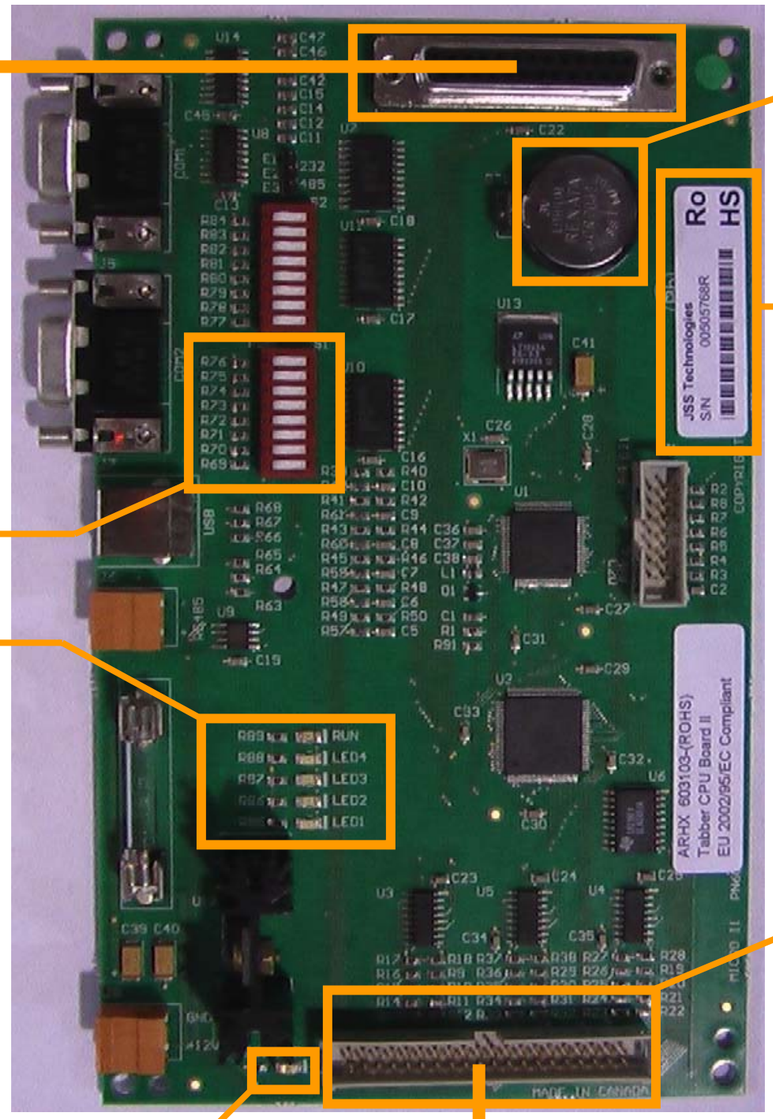
DIP	Setting	Function
1	On	For normally de-energized stop relay (for BK7IB base)
	Off	For normally energized stop relay (for standard BK730-2 base)
2	On	Standard Encoder, 660 DPI (for BK7IB base)
	Off	Standard Encoder, 600 DPI (for BK730-2 base)
3	On	For 5-phase tab stepper motor
	Off	For 2-phase tab stepper motor
4	On	For Lateral Visions 2-phase tab stepper motor driver
	Off	For Oriental Motor 2-phase tab stepper motor driver
5	Off	Reserved
6	Off	Reserved
7	On	For Rev E Board
	Off	For Rev A-D Board
8	On	Factory Reset (all other DIP switches must be Off)
	Off	Reserved for Factory Reset

To reprogram the board:

1. Turn off power to the base and the head.
2. Switch DIP 8 ON and all other DIP switches OFF.
3. Turn the base power on and wait at least 60 seconds while the board is reprogrammed.
4. Turn the base power off.
5. Return the DIP switch settings to the desired configuration (Reference Table A).

The board is now reprogrammed and is ready for use.

Figure B-15: Tabber CPU Board II DIP Switch Settings and Programming



The Tabber II CPU Board (p/n 9101275) is a printed circuit board that is used to control the Buskro Tabbing Head. Version 2.0 of the Tabber II software is the initial release.

Version 2.0 of the SSB II software is designed to be functionally equivalent to the Tabber CPU board V1.7 software. The Tabber II board is a surface mount board that has been designed to be capable of RoHS production.

The Tabber II board **RUN** LED will blink (1 second on – 1 second off) to indicate normal operation.

Table A – Tabber II CPU Board Dip Switch Assignments

DIP #	Default Setting	Function
1	On	For normally de-energized stop relay
	Off	For normally energized stop relay
2	On	For 660 DPI (7IB) base
	Off	For 600 DPI Tabber base
3	On	For 5-phase tab stepper motor
	Off	For 2-phase tab stepper motor
4	On	For Lateral Visions 2-phase tab stepper motor driver
	Off	For Oriental Motor 2-phase tab stepper motor driver
5	Off	Reserved
6	Off	Reserved
7	Off	Turn ON to perform a factory reset (all other DIP switches must be off).
8	Off	Turn ON to enter the firmware update mode

To reprogram the board:

1. Turn off power to the head.
2. Switch DIP 7 ON and all other DIP switches OFF.
3. Turn the head power on and wait until the board reprograms (approximately 30 sec).
4. Turn the head power off.
5. Return the DIP switch settings to the desired configuration for normal operation.

The board is now programmed and ready for use.

Figure B-16: The Base Control Board (p/n 9102380A)