



Instructions and Parts List

3M-Matic[™]

Tape Application Monitor (TAM)

Type 10600

Serial No. _____
For reference, record machine serial number here.



3M Industrial Adhesives and Tapes
3M Center, Building 220-5E-06
St. Paul, MN 55144-1000



Important Safety Information

BEFORE INSTALLING
OR OPERATING THIS
EQUIPMENT

Read, understand, and
follow all safety and
operating instructions.

Spare Parts

It is recommended you
immediately order the
spare parts listed in the
"Spare Parts/Service
Information" section.

These parts are expected
to wear through normal
use, and should be kept
on hand to minimize
production delays.

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3M St. Paul, MN 55144-1000
Printed in U.S.A.

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This instruction manual covers safety aspects, handling and transport, storage, unpacking, preparation, installation, operation, adjustments, maintenance, troubleshooting, repair work and servicing plus parts list of the **3M-Matic™ Tape Application Monitor (TAM)**.

3M Industrial Adhesives and Tapes
3M Center, Building 220-5E-06
St. Paul, MN 55144-1000

Edition March 2015

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The manufacturer reserves the right to change the product at any time without notice.

Replacement Parts and Service Information

To Our Customers:

This is the 3M-Matic™/AccuGlide™/Scotch® equipment you ordered. It has been set up and tested in the factory with Scotch® tapes. If technical assistance or replacement parts are needed, call or fax the appropriate number listed below.

Included with each machine is an Instructions and Parts List manual.

Technical Assistance:

Call the 3M-Matic™ Helpline at 1-800-328-1390. Provide the customer support coordinator with the model/machine name, machine type, and serial number that are located on the identification plate .

Replacement Parts and Additional Manuals

Order parts by part number, part description, and quantity required.

When ordering parts or additional manuals, include model/machine name, machine type, and serial number that are located on the identification plate

(For example: Model 700a TAM - Type 10600 - Serial Number 13282).

3M Tape Dispenser Parts

241 Venture Drive

Amery, WI 54001-1325

1-800-344-9883

Fax: 1-715-268-8153

Minimum billing on parts orders will be \$25.00. Replacement part prices available on request.

\$10.00 restocking charge per invoice on returned parts.

Note : Outside the U.S., contact the local 3M subsidiary for parts ordering information.



3M Industrial Adhesives and Tapes

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St. Paul, MN 55144-1000

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Replacement Parts And Service Information

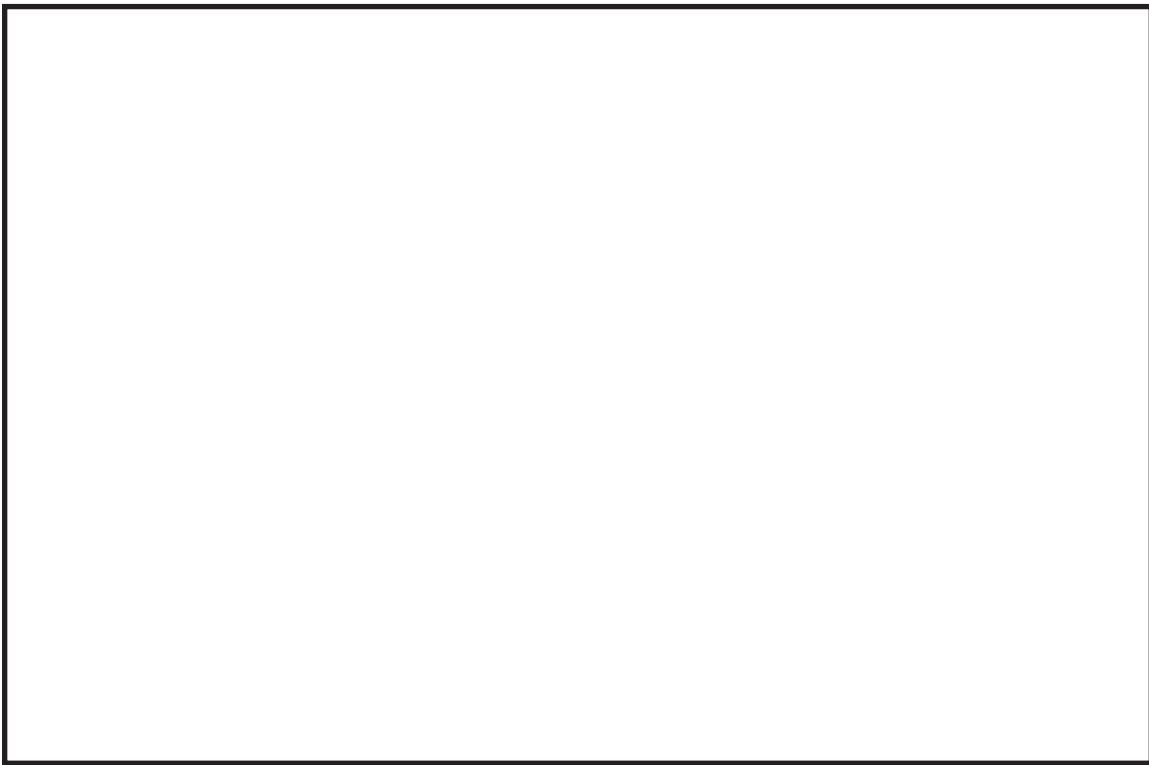
To Our Customers:

This is the 3M-Matic™/AccuGlide™/Scotch® equipment you ordered. It has been set up and tested in the factory with Scotch® tapes. If any problems occur when operating this equipment and you desire a service call or phone consultation, call, write or fax the appropriate number listed below.

Included with each machine is an Instructions and Parts List manual.

SERVICE, REPLACEMENT PARTS AND ADDITIONAL MANUALS AVAILABLE

DIRECT FROM:



Order parts by part number, part description and quantity required. Also, when ordering parts and/or additional manuals, include machine name, number and type.



3M Industrial Adhesives and Tapes

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St. Paul, MN 55144-1000

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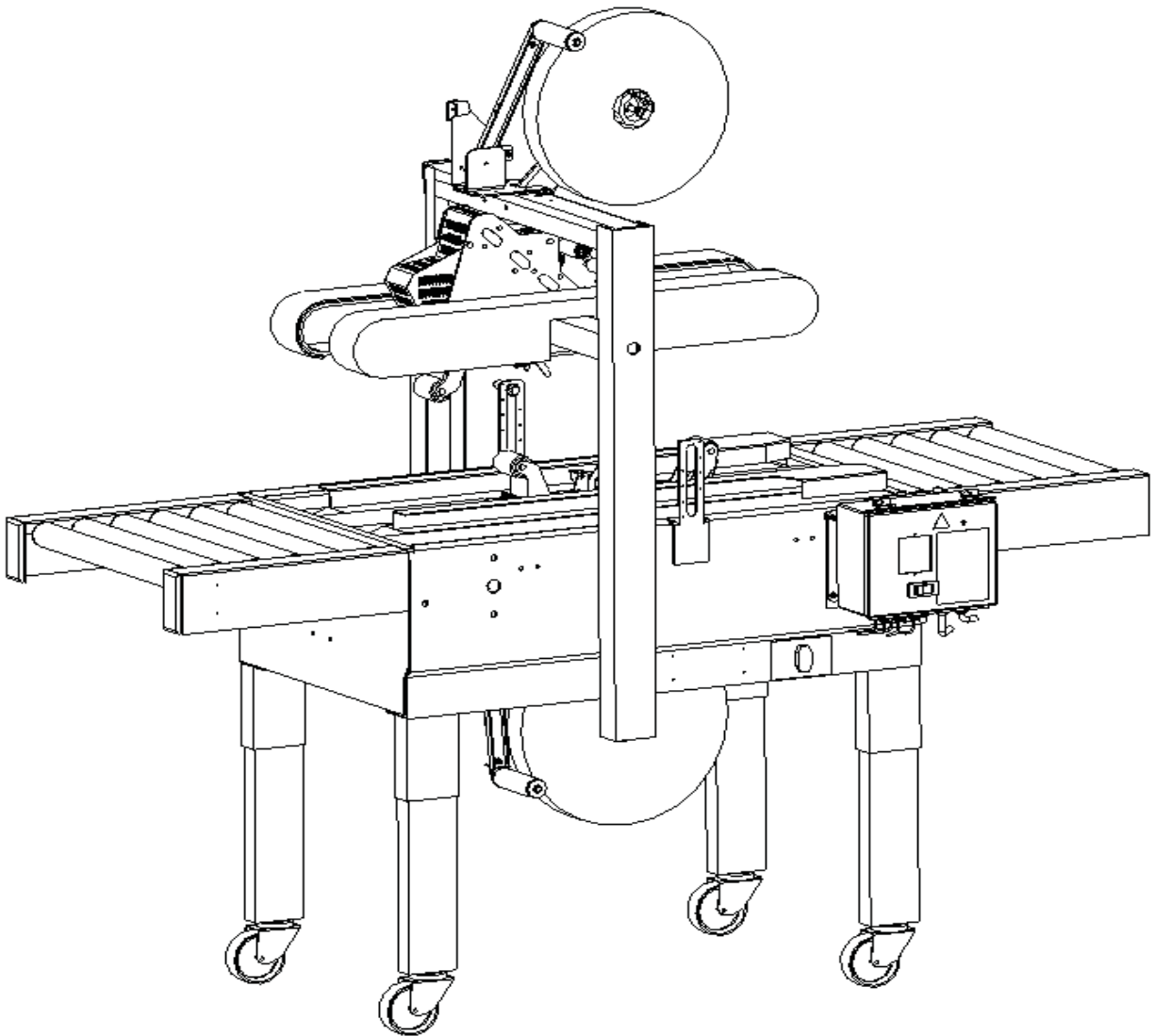
Intended Use

The Tape Application Sensor Kit is specifically designed for use on 3M-Matic™ Case Sealers.

The Tape Application Monitoring Kit is a self-contained control apparatus that identifies a tape related malfunction in box sealing operations. The control system continually monitors case sealing operations and will automatically stop the 3M-Matic™ case sealer when a tape related malfunction occurs. In addition, the control system will turn on an indicator light that is located on the control panel and can also be programmed to stop the case sealer when a low tape condition occurs. Equipped with the ability to control up to two AccuGlide™ taping heads, the unit reliably detects the following tape application faults:

- Tape did not apply to box**
- Tape has broken or failed to cut off**
- Tape supply is low**

The Tape Application Monitoring Kit has been designed and tested for use with Scotch box sealing tapes and the 3M-Matic™ line of case sealing equipment models: 200a, 700a, 700r, 700aks, 700rks, 800a, 800ab, 800asb, 800af, 800r, 800rks, 800rf, 7000a, 7000r, and 8000a.



Typical Installation of Tape Application Sensor Kit on 3M-Matic™ Case Sealer

Equipment Warranty and Limited Remedy

Equipment Warranty and Limited Remedy: THE FOLLOWING WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING , BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ANY IMPLIED WARRANTY ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE:

3M warrants that the **3M-Matic™ Tape Application Monitor, Type 10600** will be free from defects in material and manufacture for a period of ninety (90) days after delivery. If any part is defective within this warranty period, your exclusive remedy and 3M's and seller's sole obligation shall be, at 3M's option, to repair or replace the part. 3M must receive written notice of any alleged defect within a reasonable time after it is discovered, but in no event shall 3M have any obligation under this warranty unless it receives such notice within five (5) business days after the expiration of the warranty period. To be entitled to repair or replacement as provided under this warranty, the part must be returned as directed by 3M to its factory or other authorized service station designated by 3M. If 3M is unable to repair or replace the part within a reasonable time after receipt thereof, 3M, at its option, will replace the equipment or refund the purchase price. 3M shall have no obligation to provide or pay for the labor required to install the repaired or replacement part or equipment. 3M shall have no obligation to repair or replace those parts failing due to normal wear, inadequate or improper maintenance, inadequate cleaning, improper operating environment, improper utilities, operator error, operator misuse, alteration, lack of reasonable care, or due to any accidental cause.

Limitation of Liability: Except where prohibited by law, 3M and seller will not be liable for any loss or damage arising from this 3M equipment, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including breach of warranty, breach of contract, negligence, or strict liability.

The foregoing Equipment Warranty and Limited Remedy and Limitation of Liability may be changed only by a written agreement signed by authorized representatives of 3M and seller.

Contents – Tape Application Monitor

Item	Description	Qty
1	Upper Dancer Arm Assembly	1
2	Lower Dancer Arm Assembly	1
3	Control Box Assembly	1
4	Box Present Bracket	2
5	Control Box Assembly Mounting Bracket	1
6	Nut Plate	1
7	Bracket Mounting Upper Assembly	1
8	Bracket Mounting Upper Assembly for 700 rks/aks	1
9	Bracket Mounting Upper Assembly for 7000a, 7000r, and 8000a.	1
10	Drill Template	1
11	Box Present Photo Electric Sensor with Reflector	1
12	Bracket Lower King	1
13	Cable – Tie Mount	5
14	Cable Tie	10
15	Screw – Cap Soc Hd. Hex Soc. Dr. M6 X 16mm Lg.	7
16	Washer – Plain M6	17
17	Screw – Cap Soc Hd. Hex Soc. Dr. M6 X 20mm Lg.	10
18	Washer – Plain M3	6
19	Screw – Cap Soc Hd. Hex Soc. Dr. M3 X 10mm Lg.	4
20	Washer – Plain M8	4
21	Screw – Cap Hex Hd. M8 X 16mm Lg.	4
22	Nut – M3	4
23	Nut – M6	4
24	Washer – Lock M6	4
25	Nut – Nylon M8	2
26	VHB Tape	1
27	Guard - Sensor	1
28	Instructions with Parts List Manual	1
29	Light Beacon Assembly (78-8095-1134-4) "Optional "	0
30	Lower Outboard Kit (70-0064-1104-8) "Optional "	0
31	Contact Relay (26-1014-8243-3) "Optional"	0

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Important Safeguards



This safety alert symbol identifies important messages in this manual.
READ AND UNDERSTAND THEM BEFORE INSTALLING OR OPERATING THIS EQUIPMENT.



Caution: Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury and/or property damage.



Warning: Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury and/or property damage.



WARNING

- **To reduce the risk associated with mechanical and electrical hazards:**
 - Read, understand, and follow all safety and operating instructions before operating or servicing the case sealer.
 - Allow only properly trained and qualified personnel to operate and service this equipment.



WARNING

- **To reduce the risk associated with hazardous voltage:**
 - Position electrical cord away from foot and vehicle traffic.



WARNING

- **To reduce the risk associated with pinches, entanglement and hazardous voltage:**
 - Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads.

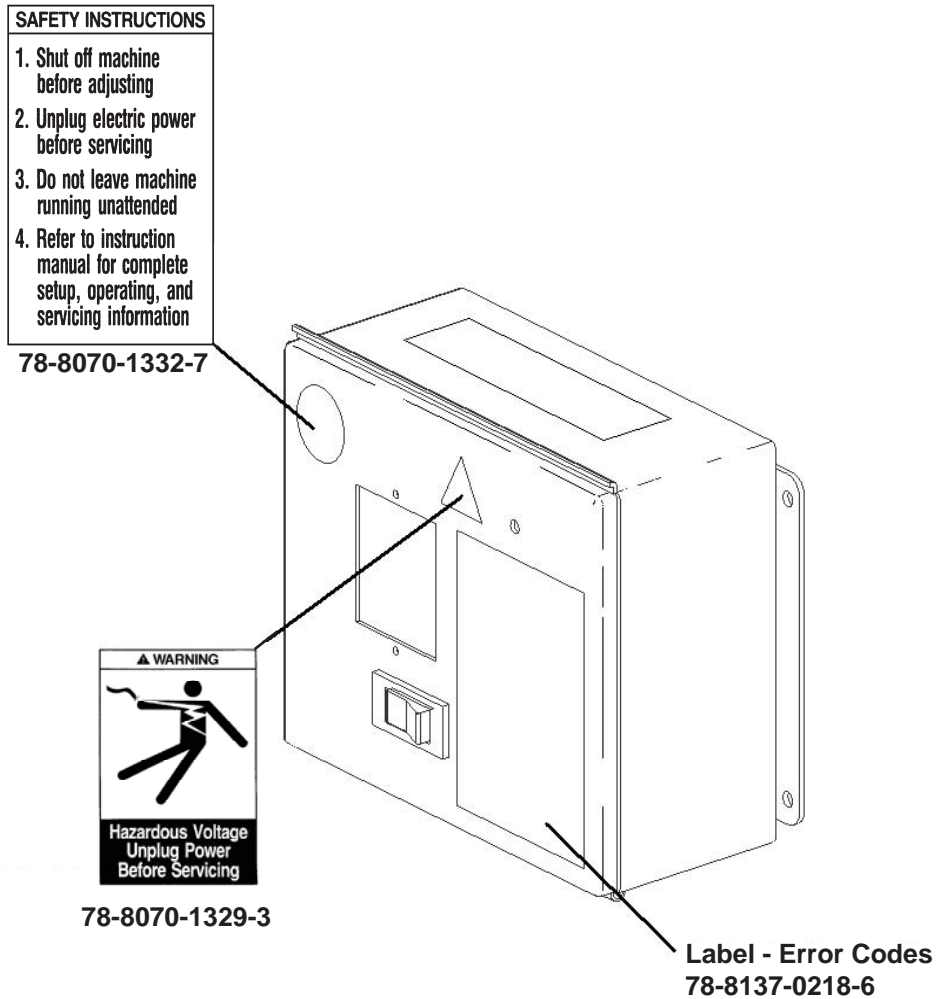


CAUTION


- **To reduce the risk associated with metal flyings or hot surface hazards:**
 - Use proper personal protective equipment when drilling mounting holes

Important Safeguards (continued)

Important – In the event the following safety labels are damaged or destroyed, **they must be replaced to ensure operator safety**. Replacement part numbers for individual labels are shown in the following figure, or a label kit, part number 78-8137-0350-7, is available from 3M Tape Dispenser Parts.



Replacement Labels/3M Part Numbers

 WARNING
<ul style="list-style-type: none"> • To reduce the risk associated with mechanical and electrical hazards: <ul style="list-style-type: none"> - Read, understand, and follow all safety and operating instructions before operating or servicing the case sealer. - Allow only properly trained and qualified personnel to operate and service this equipment.

Skill 2 - Mechanical Maintenance Technician

This operator is trained to use the machine as the MACHINE OPERATOR and in addition is able to work with the safety protection disconnected, to check and adjust mechanical parts, to carry out maintenance operations and repair the machine. He is not allowed to work on live electrical components.

Skill 2a - Electrical Maintenance Technician

This operator is trained to use the machine as the MACHINE OPERATOR and in addition is able to work with the safety protection disconnected, to make adjustments, to carry out maintenance operations and repair the electrical components of the machine. He is allowed to work on live electrical panels, connector blocks, control equipment, etc.

Skill 3 - Specialist From the Manufacturer

Skilled operator sent by the manufacturer or its agent to perform complex repairs or modifications, when agreed with the customer.

Operator Skill Level Descriptions

Skill 1 - Machine Operator

This operator is trained to use the machine with the machine controls, to feed cases into the machine, make adjustments for different case sizes, to change the tape and to start, stop and restart production.

Important – the factory manager must ensure that the operator has been properly trained on all the machine functions before starting work.

Operator's Skill Levels Required to Perform the Main Operations on Machine

Operation	State of the Machine	Operator's Skill	Number of Operators
Installation and set up of the machine.	Running with safety protections disabled.	2 and 2a	2
Tape replacement.	Stopped by pressing the STOP button.	1	1
Ordinary maintenance.	Electric power disconnected.	2	1
Extraordinary maintenance (mechanical).	Running with safety protections disabled.	3	1
Extraordinary maintenance (electrical).	Running with safety protections disabled.	2a	1

Specifications

The 3M-Matic™ Tape Application Monitor has been designed and tested to work with the following 3M-Matic™ case sealers: 200a, 700a, 700r, 700aks, 700rks, 800a, 800ab, 800asb, 800af, *800r, 800rks, 800rf, 7000a, 7000r, 8000a. Additional information is required for 800rks and 800rf applications. Contact a 3M representative for more detail.

* 800r applications require additional machine modifications for proper operation.
(Contact the 3M-Matic Help Line)

Note: Components required to configure this system to monitor either an upper or lower taping head have been included. Additional components are required for outboard tape supply roll applications. An optional conversion kit is available.

Power Requirements:

Input:

115 VAC, 10A, 60 Hz, 1 Phase
Cord connected, NEMA 5-15R, 3 pin 115 VAC outlet

Output: (3M-Matic™ case sealers control):

Solid state relay, Normally closed, 115/230 VAC, 25 amp rating, protected by 10 amp power switch/circuit breaker, open when:

- Tape did not apply to box
- Tape has broken or failed to cut
- Tape supply low (if this feature is enabled)

Operating Environment:

NEMA 1

For use in dry, relatively clean environments at 35 – 120 deg F [2 – 48 deg C] temperatures

Important: Control box with components should not be washed down or subjected to conditions causing moisture condensation on components.

Regulatory

USA Standard Code of Regulations: FCC Part 15, Subpart B, Class A cUL 508A

Control

PLC (Keyence KV16AR) with key features:

Setting keys for entering or changing program setups

Access window for displaying program setups and fault codes

Inputs: NPN/PNP 24VDC with LED indicators, Qty 10 (6 reserved, 4 spares)

Outputs: Relay with LED indicators, Qty 6 (4 Reserved, 1 Spare 24VDC, 1 Spare AC line voltage)

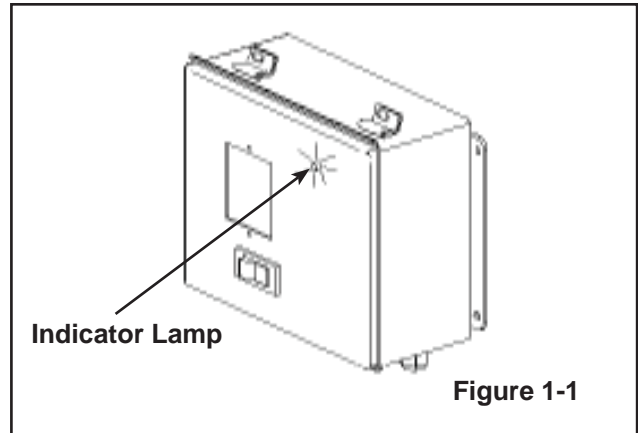
Power Supply: Internal switch mode 24 VDC 600ma

Warning Panel LED Indicator:

Off: Normal operation

- On: (1) Power up light test - Momentary
 (2) Tape application fault - Flashing
 (3) Low tape fault (fault feature enabled) - Flashing
 (4) Low tape (fault feature disabled) - Continuous

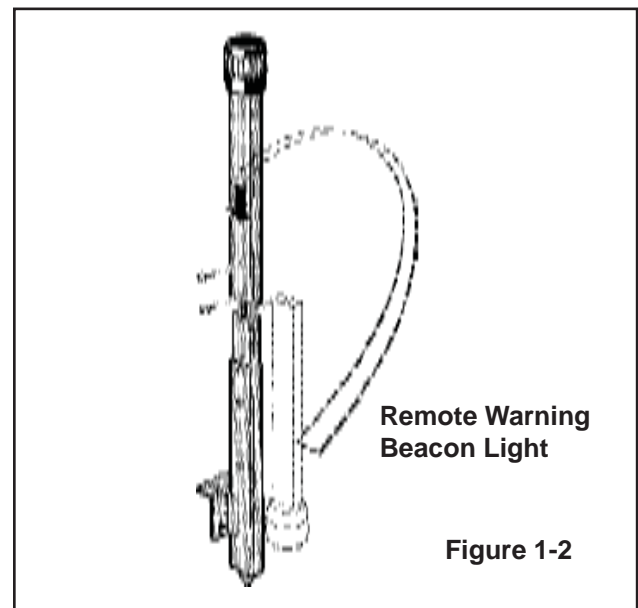
Note: With the low tape supply roll fault feature enabled the case sealer will also stop



Remote Warning Beacon Light (Optional):

The remote warning beacon light performance is identical to the panel mounted LED. The beacon light allows operators and maintenance personnel to observe fault conditions from a distance away from the case sealer.

Note: The Electrical Control box is equipped with the connection for the Remote Warning Beacon Light, no additional wiring is required.



Electrical Control Box

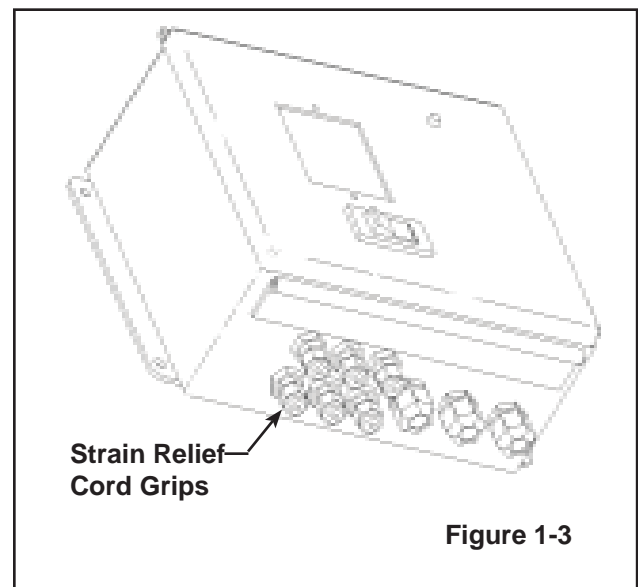
A din rail is used in the electrical control box to mount the primary components. Space is available on the din rail to mount one additional terminal block or an optional dry contact relay (See "Options/Accessories").

Strain relief cord grips are used to pass both control and power into and out of the electrical control box. One spare strain relief cord grip (PG 7) is available for additional input and/or output control signals. Examples of control signals include disabling a remote conveyor, interface to a host control or interface to an 800rks and 800rf case sealer PLC)

Control Box Dimensions:

	W	L	H
mm	267	229	114
[Inches]	[10.5]	[9]	4.5]

Weight: 14.5 kg [32 lbs.] Packaged





Installation and Set-Up

Receiving And Handling

After the machine has been unpacked, examine the components thoroughly for damage that might have occurred during transit. **If damage is evident, file a damage claim immediately** with the transportation company and also notify your 3M Representative.

Machine Set-Up

	WARNING
<ul style="list-style-type: none">• To reduce the risk associated with mechanical and electrical hazards:<ul style="list-style-type: none">– Read, understand, and follow all safety and operating instructions before operating or servicing the case sealer.– Allow only properly trained and qualified personnel to operate and service this equipment.	
	WARNING
<ul style="list-style-type: none">• To reduce the risk associated with hazardous voltage:<ul style="list-style-type: none">– Position electrical cord away from foot and vehicle traffic.	

Installation – General

The following instructions are presented in the order recommended for installing the Tape Application Monitoring Kit on your 3M-Matic™ case sealer.

Read the installation instructions completely before beginning installation. For future reference, record the Tape Application Monitoring Kit serial number on the front cover of this instruction manual in the space provided for future reference.

Control Box Assembly

The control box is mounted directly to the case sealer using the control box mounting bracket. For models: 200a, 700a, 700r, 700aks, 700rks, 800a, 800ab, 800asb, 800af, 800rks, 800rf, 7000a, 7000r, and 8000a the recommended mounting position is on the on/off push-button side of the case sealer. Refer to **Figures 2-1 through 2-6**.

For models: 800rks and 800rf the recommended mounting position is on the underside of the machine's electrical control box.

Note: Because holes do not already exist in the electrical box of the 800rks and 800rf you must first position the control box mounting bracket then carefully mark and drill clearance holes (.343" dia.) for the (2) M8 mounting fasteners. Refer to **Figures**.

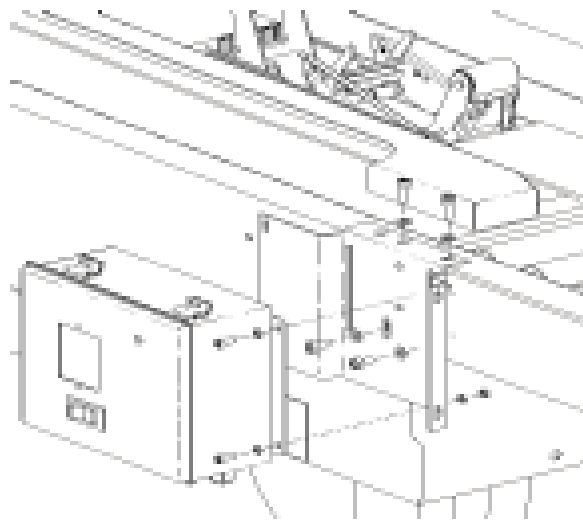


Figure 2-1 200a / 700a / 7000a Pro / 7000r Pro

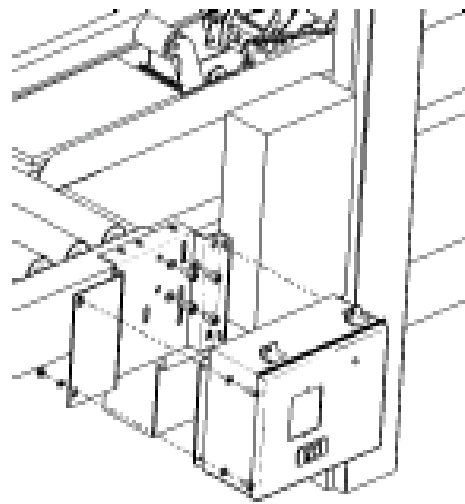


Figure 2-2 700aks / 700rks

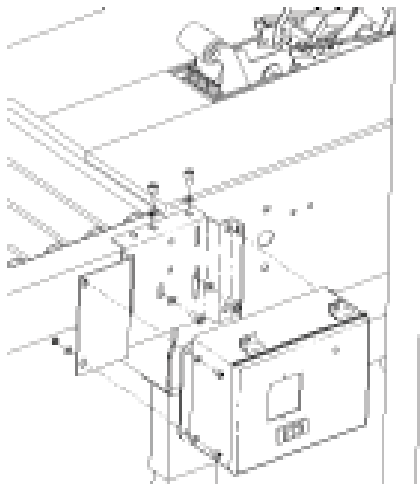


Figure 2-3 700r / 800a / 800ab / 800asb / 8000a

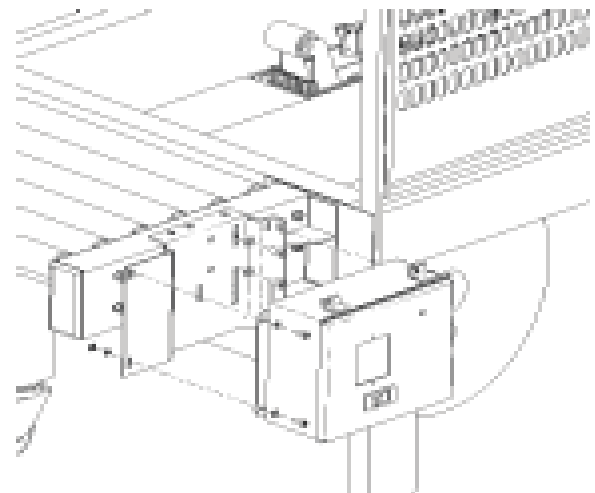


Figure 2-4 800r

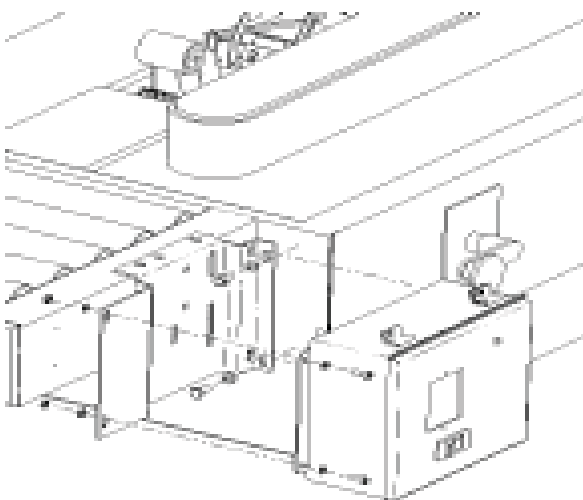


Figure 2-5 800af

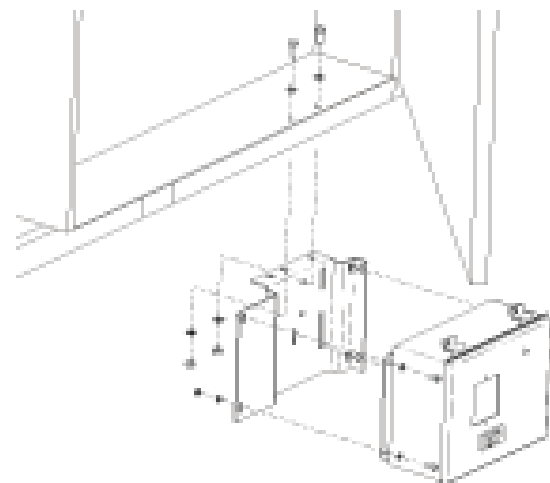


Figure 2-6 800rf / 800rks

Lower Dancer Arm

The lower dancer arm assembly is mounted directly to the case sealer's right hand lower drive frame using the nut plate, M6 screws (2) and washers (2) supplied in this kit. Mounting holes must be drilled in the lower drive frame on all case sealer models except for the 700aks and 700rks models.

Note: This kit contains components to monitor both an upper and lower taping head on a single case sealer. Outboard tape supply roll mounting is possible with an optional lower to outboard conversion kit (See "Options/Accessories").

Lower Dancer Arm Mounting

The taping head tape drum bracket angle must be determined to properly position the Lower Dancer Arm assembly. Refer to **Figures 2-7 and 2-8** to determine which example represents the current machine configuration.

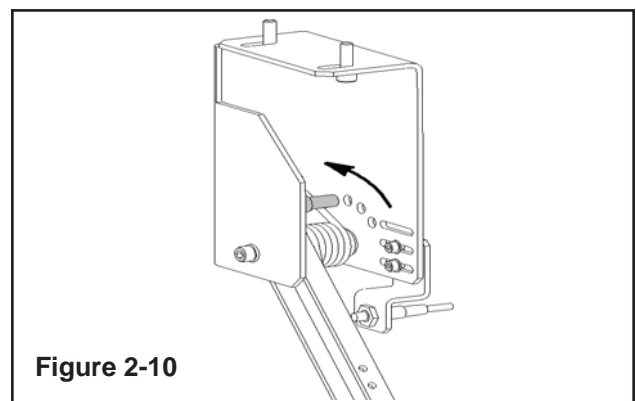
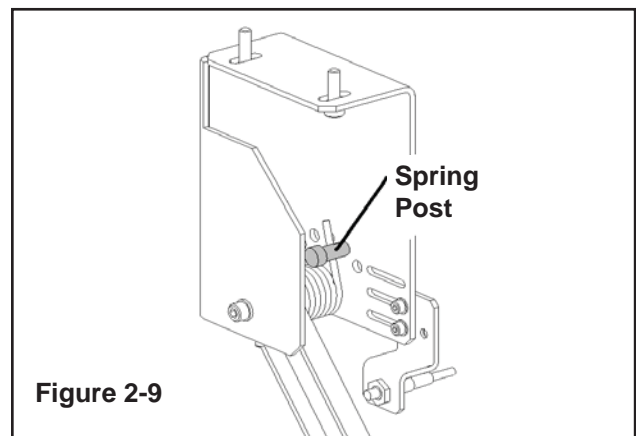
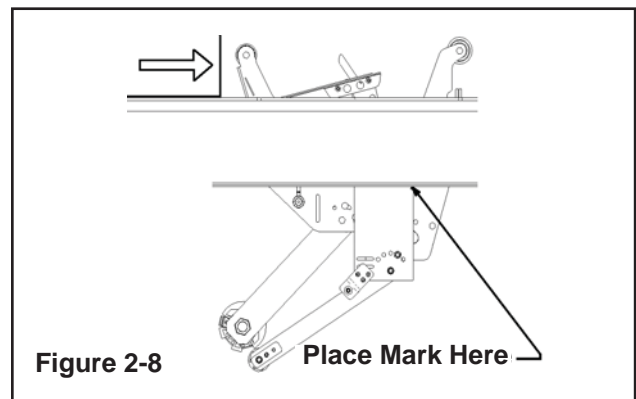
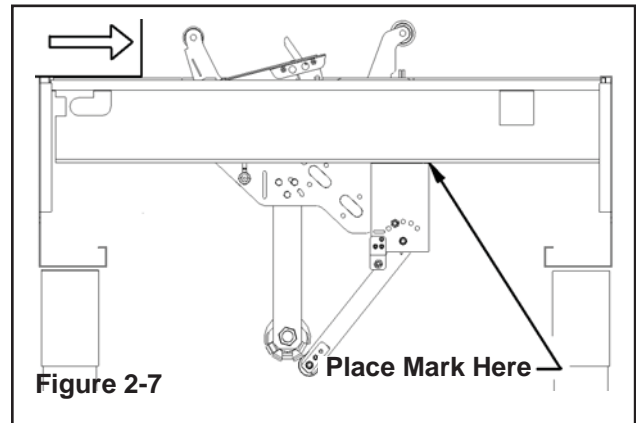
- 1) Remove the lower taping head supply roll
- 2) Properly position the taping head inside the case sealer cavity.
- 3) Position the Lower Dancer Arm spring post in the appropriate location. The factory spring post setting (**Figure 2-9**) corresponds to the bracket angle shown in **Figure 2-7**. The spring post must be moved (**Figure 2-10**) as the bracket angle changes to keep the dancer arm roller in contact with the tape drum (**Figure 2-8**).

Important: The spring post must be in the appropriate location to determine the correct mounting location.

- 4) Place and hold the lower dancer arm assembly on the bottom of the right hand drive frame so the dancer arm roller is in contact with the tape drum (**Figures 2-7 and 2-8**).

Note: Right hand is defined by viewing the machine from the entrance end.

- 5) Place a mark on the case sealer frame at the back of the dancer arm bracket (**Figure 2-7 and 2-8**).



Installation and Set-Up (continued)

- Place the edge of the template on the mark made in step 5 also flush to the outer edge of the case sealer frame.
- Mark the hole locations as shown in **(Figure 2-11)**.



CAUTION

- To reduce the risk associated with metal flyings or hot surface hazards:
 - Use proper personal protective equipment when drilling mounting holes

- Remove the lower taping head from the case sealer and drill a 0.25 inch (6.5mm) hole at the marks made in step 7.

Note: Carefully remove any burrs on the case sealer frame before fastening the dancer arm assembly.

- Fasten the dancer arm assembly to the case sealer frame using (2) M6 screws, washers and the nut plate as illustrated in **Figure 2-12**.
- Reinstall taping head without the tape supply roll.
- Verify that the dancer arm roller is in contact with the empty tape drum.

Lower Dancer Arm (700aks / 700rks)

The lower dancer arm assembly is mounted to the case sealer's lower drive frame on the 700aks and 700rks models using the lower king bracket.

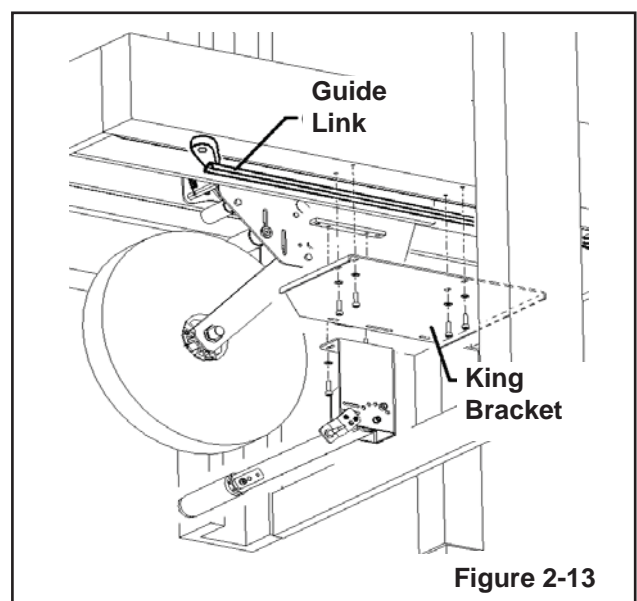
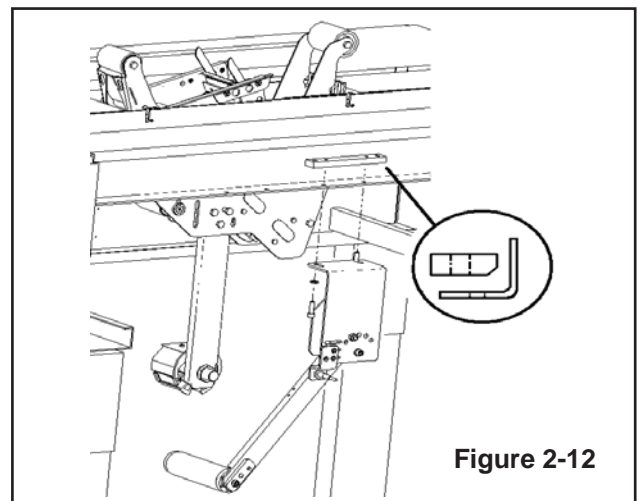
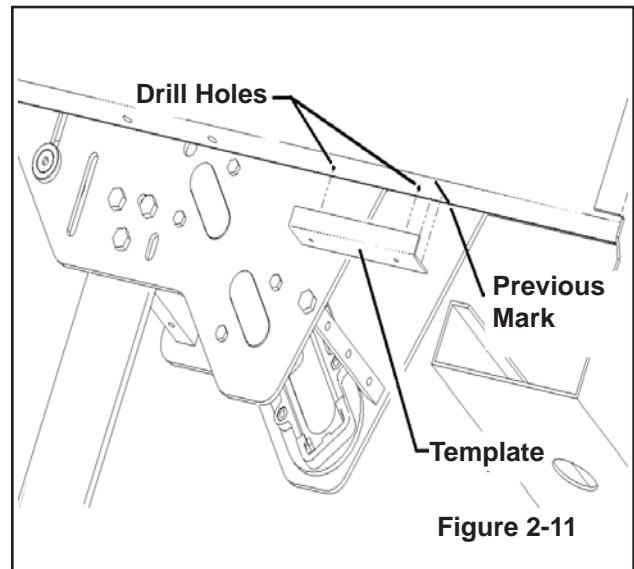
Lower Dancer Arm Mounting

- Remove the lower taping head supply roll
- Properly position the taping head inside the case sealer cavity.
- Place and hold the lower king bracket against the bottom right hand machine frame, aligning the bracket holes with the threaded inserts in the machine frame **(Figure 2-13)**.

Note: Right hand is defined by viewing the machine from the entrance end.

- Fasten the lower king bracket to the case sealer right hand lower drive frame using (4) M6 screws and washers.

Note: The lower king bracket is positioned over the Guide Link on the 700aks machines. If an interference is observed it may be necessary to move the Link from the top of the Guide arm **(Figure 2-15)** to the bottom to remove the interference.



- 5) Position the Lower Dancer Arm spring post in the appropriate location.
 - The factory spring post setting (**Figure 2-9**) corresponds to the bracket angle shown (**Figure 2-7**).
 - The spring post must be moved (**Figure 2-10**) as the bracket angle changes to keep the dancer arm roller in contact with the tape drum (**Figure 2-8**).

Important: The spring post must be in the right location to determine the correct mounting location.

Note: On 700rks installations, the tape drum bracket angle must be positioned as shown in **Figure 2-8** when the tape roll diameter is larger than 14". Refer to the AccuGlide™ Taping head manual for information on repositioning the tape drum bracket.

- 6) Attach the lower dancer arm assembly to the Lower king bracket using (2) M6 screws, washers and the nut plate.
- 7) Reinstall taping head without the tape supply roll.
- 8) Verify that the dancer arm roller is in contact with the empty tape drum.

Upper Dancer Arm Assembly

The upper dancer arm assembly is mounted directly to the case sealer's inner column cross-member using one of the three supplied brackets.

- 1) Fasten the upper dancer arm assembly to the appropriate bracket (**See Figures 2-13 and 2-14**) using the M6 screws and washers.
- 2) Remove the tape supply roll from the upper tape drum.
- 3) Remove the fasteners used to secure the tape drum bracket to the inner column cross-member of the case sealer.
- 4) Place the dancer arm assembly over the tape drum bracket as shown in **Figures 2-14 & 2-15** and attach the entire assembly using the longer (4) M6 screws and washers supplied in this kit.

If the dancer arm roller does not align with the tape drum complete steps 5 and 6

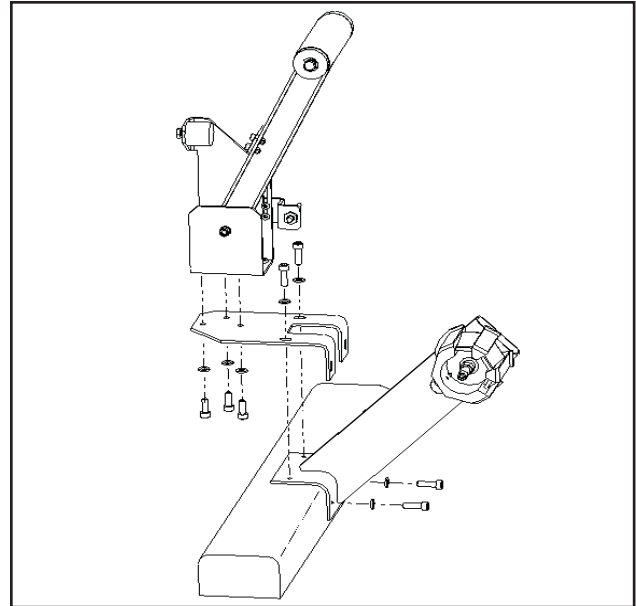


Figure 2-14

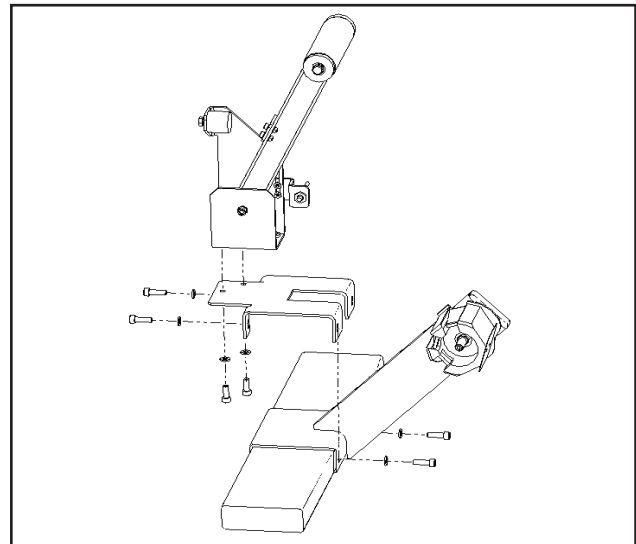


Figure 2-15 (700aks & 700rks Applications)

- 5) Remove the e-ring, roller, shaft, sensor and bracket to position on correct side as illustrated in **Figure 2-16**.
- 6) Thread the sensor into bracket until the end of the sensor is approximately .1mm (.039") from end of roller. Check to insure all seven targets are sensed as the roller turns.

Box Present Sensing Assembly

The box present sensing assembly consists of two identical brackets. One is used to mount the sensor and guard. The other is for mounting the reflector. Each bracket uses a 3M™ VHB™ acrylic foam tape to adhere the sensor/reflector bracket assemblies to the case sealer. These brackets have tabs for alignment "squaring" to the case sealer's base or column. They are also slotted to allow for additional adjustment of sensor and reflector along the bracket length.

Mounting Procedure

The guidelines for positioning the sensor/reflector brackets are listed below.

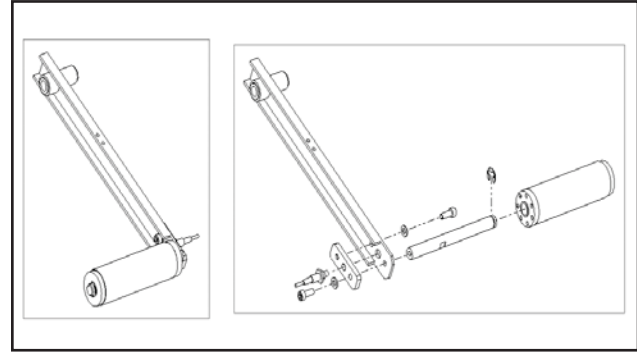


Figure 2-16

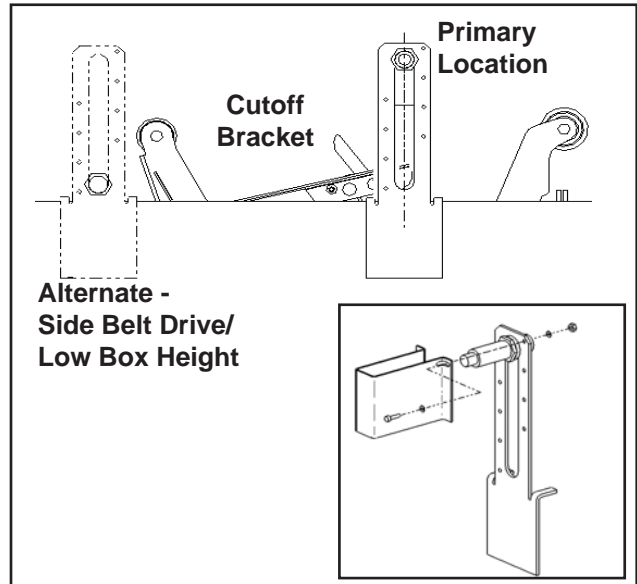



Figure 2-17

	<p>WARNING</p>
<ul style="list-style-type: none"> • To reduce the risk associated with pinches, entanglement and hazardous voltage: – Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads. 	

- 1) Verify that the control box is properly mounted to the case sealer.
- 2) Determine the appropriate mounting location for your application. The box present sensor can be mounted at various locations from a point ahead of the applying roller to the end of the cutoff bracket. Whenever possible the sensor/reflector brackets should be positioned approximately 1/2" from the end of the lower taping head cutoff bracket. For applications with top taping only the position should be chosen using the upper taping head cutoff bracket. The sensor must also be positioned to detect the lowest height box without being blocked by taping head movement. Mounting location and adjustment will vary with each application (**See Figures 2-17 & 2-18**).

Important: Do not remove the VHB™ tape liner to mount the box present sensor brackets first determine the sensor beam location.

- 3) Connect the box present sensor into the box present control cable and turn power on.
- 4) Attach the sensor and reflector to the brackets. Whenever possible place the reflector/bracket assembly on the operator side of the machine and sensor/bracket assembly on the opposite side. This will reduce the chance of faults caused by contacting and possibly altering the sensor alignment.

Note: In certain applications the sensor and or reflector can be attached directly to the case sealer. The reflector can be removed from the bracket and attached using the VHB™ tape supplied in this kit (i.e. 800 Series). Refer to **Figure 2-18**.

- 5) Move a box to the sensor location to turn on (i.e. primary sensor location in front of cutoff bracket or alternate as shown in **Figure 2-19**).
- 6) Position the Reflector and sensor brackets on opposite sides of the machine close to the final position.

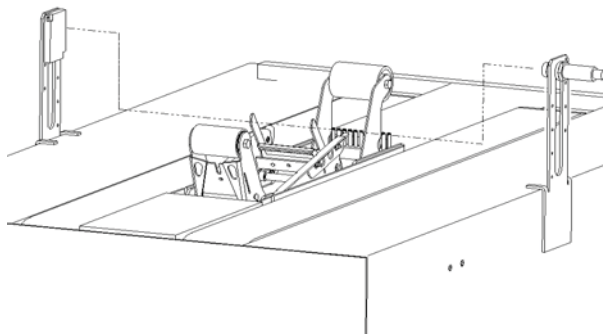
Installation and Set-Up (continued)

- 7) Slide the sensor and reflector brackets as required until the light (LED) on the sensor turns "On".

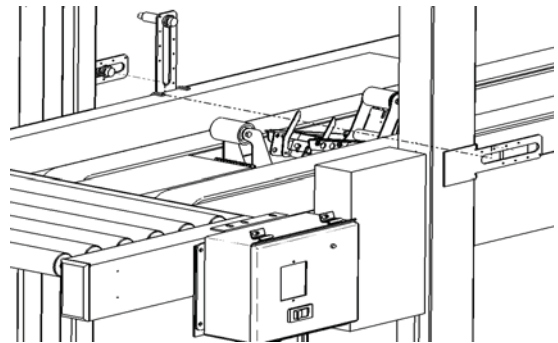
Note: The sensor LED is "On" whenever the sensors beam is reflected back to the sensor. (i.e. The reflector is aligned with the sensor and no object blocking the reflected beam).

- 8) Check to insure the sensor beam is not blocked by any part of the taping head or case sealer when the equipment is in operation or at rest. The beam should only be broken by the box as it passes through the machine.

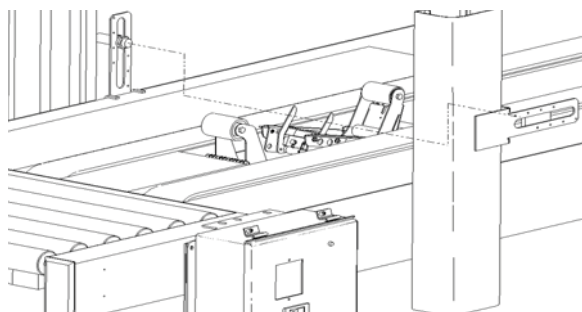
- 9) Mark the final position.



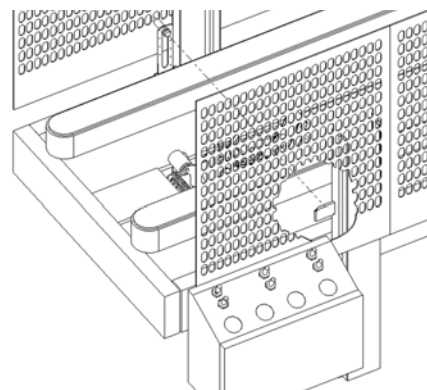
200a / 700a / 7000a



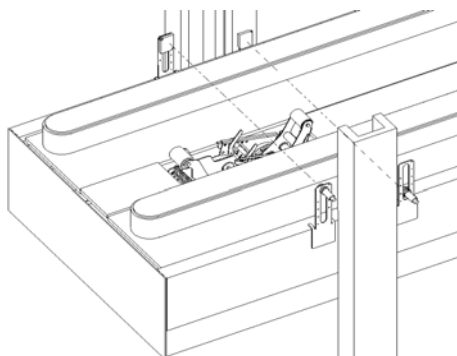
700r / 7000r (two possible locations)



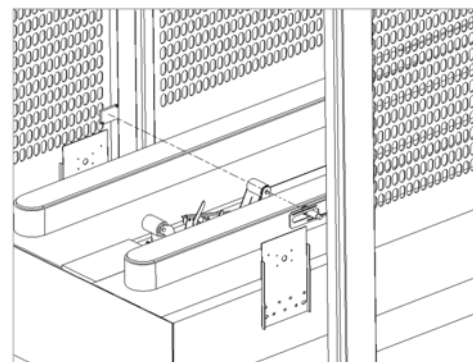
700aks / 700rks



800rf



800a / 800ab / 800asb /
800af / 800r / 8000a
(two possible locations)



800rks

Figure 2-18

To Attach the Brackets:


- 1) Clean the general area where the brackets are to be mounted. Do not remove the final position mark.

Note: It is very important that this area is clean and dry to insure proper adhesion to surface. Use a water/alcohol solution mixture or equivalent cleaner approved for use on powder coat paint.

- 2) Remove the VHB tape liner(s) and “lightly” press the brackets into position.
- 3) Recheck sensor/reflector alignment before “firmly” pressing on each bracket to permanently mount the sensor and reflector assemblies.
- 4) Attach the sensor guard (See **Figure 2-18**).

Completing the Electrical Systems Connections

The remaining sensors must be connected. Each dancer arm assembly has (2) proximity sensors, a tape dispense and a low tape supply sensor.

	<p>WARNING</p>
<ul style="list-style-type: none"> • To reduce the risk associated with pinches, entanglement and hazardous voltage: – Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads. 	

- 1) Turn off and disconnect the power to the control box.
- 2) Identify and route the control cables to the appropriate locations defined by bracket mounting. The cables are marked to indicate the appropriate sensor connection (i.e. UD - Upper Dispensing sensor, US - Upper low tape Supply sensor, LD - Lower Dispensing sensor, LS - Lower low tape Supply sensor).

Important: Cables must remain clear of moving parts and free to move if affected by machine adjustment.

- 3) Use the cable ties and cable mounts contained in this kit to secure the control cables to the case sealer.

Note: It is very important that this area is clean and dry to insure proper adhesion to surface. Use a water/alcohol solution mixture or equivalent cleaner approved for use on powder coat paint.

- 4) Connect the appropriate control cable connectors to each proximity sensor.
- 5) Connect the case sealer power cord to control box assembly and restore power (**See Figure 2-19**).

Important: The 800rks and 800rf case sealers require 3 phase electrical power. The standard configuration will not connect directly to these machines. Contact a 3M sales representative for additional information.

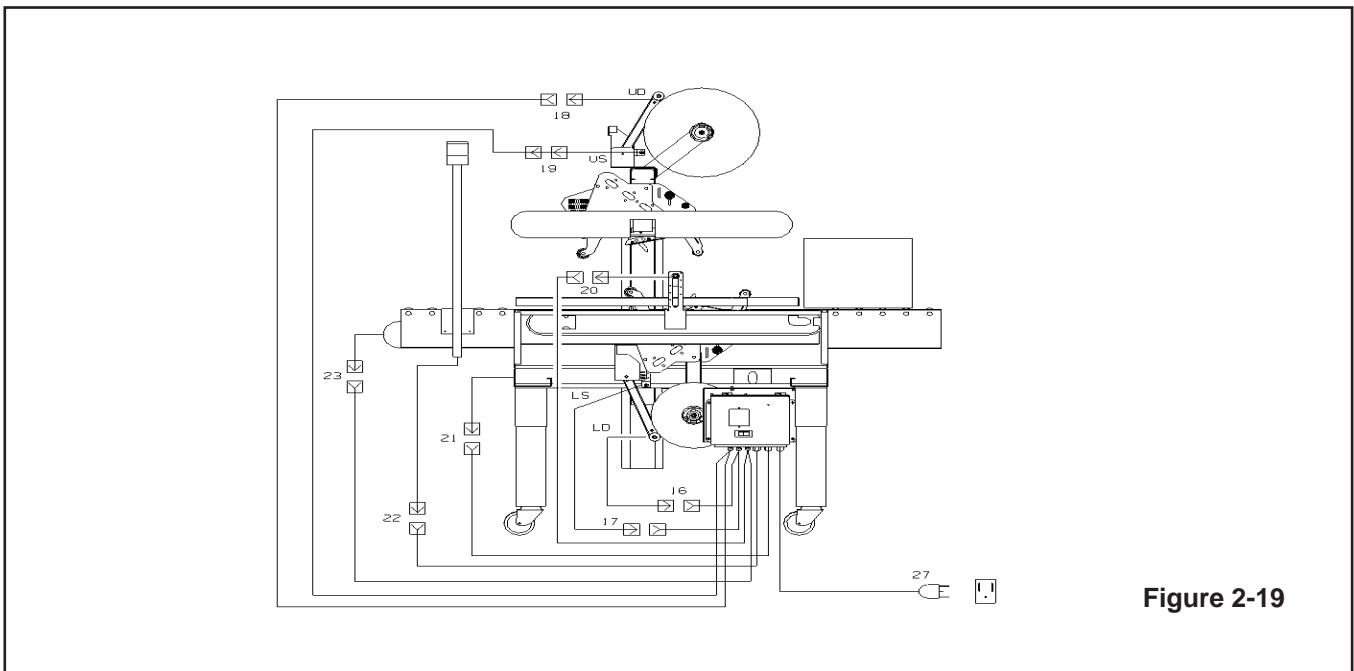


Figure 2-19

Adjusting the Low Tape Supply Sensor

The dancer arm position is used to define the low tape condition. The arm rotates as tape is dispensed. The low tape sensor “turns on” when the arm rotation matches the low tape level setting. The sensor position is adjustable and is determined by your process requirements. There are two adjustment that will affect the proper operation of the low tape sensor. The first is the gap between the sensor and target. The second is the rotational position of the dancer arm.

Note: The Tape Application Monitor can be used to signal a low tape condition by turning on the panel indicator and (optional) beacon light. The system can be set to stop the case sealer when either the upper or lower low tape supply sensors detect a low tape condition. (Refer the Theory of Operation and Adjustments sections of this manual for further information on this feature.)

The sensor should be positioned to allow the operator ample time to replace the tape roll before adversely affecting your production process when the system is set to indicate a low tape condition.

To adjust the sensor:

- 1) Check the distance between the sensor and target. The gap must be less than 0.079 inches (2mm) and must not touch the target or interfere with the motion of the dancer arm.
- 2) If necessary, loosen the M8 sensor jam nuts and reposition the sensor.
- 3) Rotate and hold the dancer arm in a position that represents your low tape condition. This can be accomplished by placing a spacer or a tape roll with the amount of tape that represents the low tape condition.
- 4) Loosen or remove the (2) M5 fasteners on the low tape sensor bracket and slide or reposition the bracket as required until the sensor turns "On" (indicated by the sensor LED). Slots are supplied to allow adjustment.
Figure 2-20 shows different bracket positions.
- 5) Retighten the fasteners.
- 6) Check and adjust as required until a satisfactory low level indication is achieved.

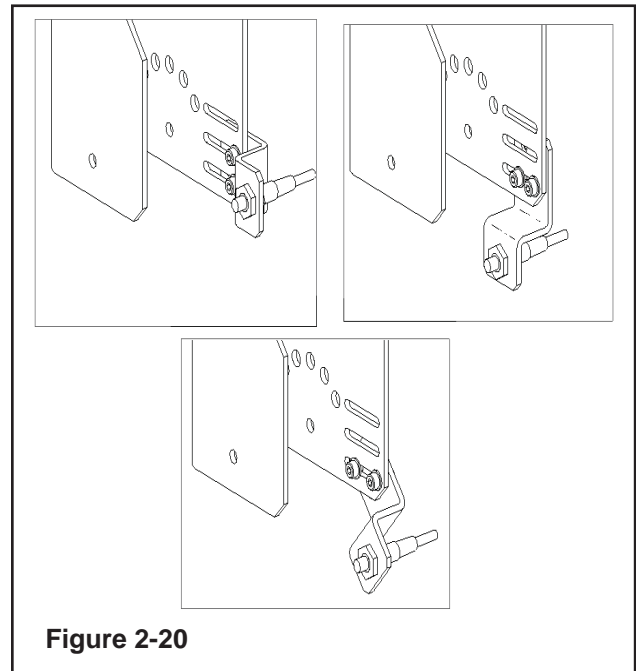


Figure 2-20

Setting the PLC Application Parameters

The PLC controller is equipped with a display used for changing and monitoring data. There are three modes of operation which include Device, Digital Trimmer and System Mode. The Device modes are used for changing timers and registers for the your specific application. The PLC also has a Locking feature that is factory set to “Loc” to prevent inadvertent changes to the initial program parameters.

Note: For application specific data register and timer values refer to the Theory of Operation section of this manual. To view and change register values also operating parameters, the PLC must be in the Device mode and reset to "Unloc". For general information on setting the data memory registers and timers refer to “Access Window” section of the Keyence Visual KV Series Installation Manual. The tape application monitoring system should be in place and all connections completed.

- 1) Move the TAM control box switch to "ON" and start the case sealer.
- 2) Verify that the panel indicator light (and remote beacon light if installed) turns on and then off.
- 3) Verify that the appropriate user code appears on the PLC display:
“User 33” - Upper & Lower taping head monitoring
“User 32” - Upper taping head monitoring only
“User 31” - Lower taping head monitoring only

Note: "User31" and "User33" could also represent the optional lower outboard configuration.

If the operational configuration is not visible on the initial power up of this unit (i.e. "User 33"), follow the steps listed under "Selecting Device Mode" in this section of the manual to verify the PLC is in the Device mode. If the operational configuration is not displayed on the PLC while in the Device mode refer to the trouble shooting section of this manual.

To Change the Operational Configuration:

To make changes to the PLC settings i.e. operational configuration, registers or timers), it will be necessary to open the control box door to access the PLC's keypad (See Figure 2-20).

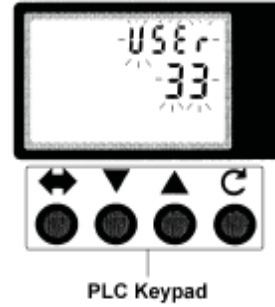




Figure 2-21



Figure 2-22



	<h2>WARNING</h2>
<ul style="list-style-type: none"> • To reduce the risk associated with mechanical and electrical hazards: <ul style="list-style-type: none"> – Read, understand, and follow all safety and operating instructions before operating or servicing the case sealer. – Allow only properly trained and qualified personnel to operate and service this equipment. 	

	<h2>WARNING</h2>
<ul style="list-style-type: none"> • To reduce the risk associated with pinches, entanglement and hazardous voltage: <ul style="list-style-type: none"> – Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads. 	



Lock/Unlock Feature


The Lock/Unlock feature prevents inadvertent changes to PLC settings and configuration. (Factory setting = UnLoc).

To Lock or Unlock the PLC:

- 1) Press and hold both the  &  keys simultaneously for approximately 3 seconds.
- 2) Verify that the display shows either "Loc" or "Unloc" is shown on the display (See Figure 2-22).
- 3) Repeat step 1 until the display indicates the desired state.

To Select Mode:

- 1) Press and hold the  key then press the  key to scroll through the three modes until the Device Mode is visible on the display as shown in Figure 2-23. (Factory setting = Device Mode).

Note: DM stands for data memory, one of 6 options that can be viewed in the Device Mode (left side of the display). The  will allow you to scroll through these options (DM, TM, T/C, CTC, TRM, RLY). DM and T/C contain the only user adjustable values.

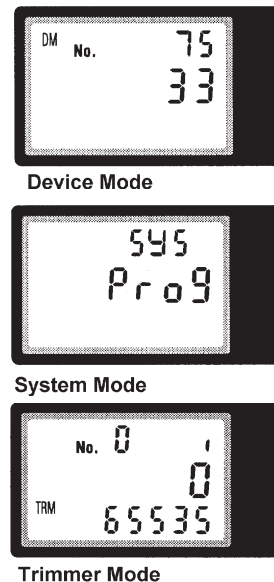


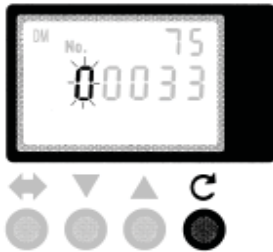
Figure 2-23

Changing Operational Configuration:

In the Device mode press either the ▲ or ▼ key until the number 75 is displayed in the upper right hand corner. (data memory register 75). The value for that register is displayed below the register number in the center of the display (i.e. 00033).

To Change Register Values:

- 1) Hold down the ↻ key until the register value begins to flash (i.e. left most digit).



- 2) Press the ←→ key until the correct digit is flashing.



- 3) Press the ▲ or ▼ key until the correct digit is displayed.
- 4) Repeat steps 2 and 3 until the desired data memory register value is displayed. The operational configuration the value should be either 31, 32, or 33.

“User 33” - Upper & Lower taping head monitoring
“User 32” - Upper taping head monitoring only
“User 31” - Lower taping head monitoring only

- 5) To save the new value press and hold the ↻ key for approximately 3 seconds.

- 6) Press and hold the ←→ key then press and hold the ▲ key for 3 seconds to lock ("Loc") the program parameters.

Note: The screen will display “User 50” after changing the taping head configuration (value of register DM0075) to indicate a new configuration has been selected. The Indicator light on the control box and the beacon light (optional) will flash. The system must be reset for the changes to take effect.

- 7) Reset the Tape Application Monitor using the circuit breaker switch located on the control box door by cycling the system "Off" then "On" or by restarting the case sealer.

Placement of the box present sensor will affect the operation of the Tape Application Monitor. Timer values used to correct for the sensor position are TH051, TH052 & TH053. They are set at the factory for standard sensor installation.

Factory settings:

TH051 = 3
TH052 = 10
TH053 = 100

Additional adjustments may be required. Refer to the adjustment section for more information.

Theory of Operation

General

This section contains general information about the Tape Application Monitoring System. For a more complete description refer to Operation and adjustment Sections of this manual.

This tape application monitoring system is PLC controlled with the ability to signal or stop your 3M-Matic™ case sealer if the machine is running low on tape, if the tape did not cut, or if tape was not applied as the box passes through the case sealer.

The operation is based on information received from the sensors supplied with this system. They sense the presence of electrical current supplied to the case sealer, the presence of a box as it passes through the machine, the dispensing of tape from the supply roll and a low level of tape on the supply roll. The system becomes part of your 3M-Matic™ case sealer with no changes required to your existing AccuGlide™ taping heads.

This system consists of a current sensor, a box presence sensor and 2 dancer arm assemblies for monitoring tape activity of both an upper and lower taping head. Each sensor is independently adjustable for your specific application.

The dancer arm assemblies are spring loaded mechanisms designed to remain in contact with the tape supply rolls on your case sealer. A special "dancer arm roller" is attached to the end of the "dancer arm" along with a sensor to detect supply roll movement as the tape is dispensed. A second sensor at the opposite end of the arm senses the angular position of the dancer arm. As the supply roll gets smaller the arm moves closer to the sensor and the point you have selected to replace the roll.

The current sensor is located in the main control box. It is placed in-line with the case sealer's power cord wiring and is used to detect current flow and determine whether or not the case sealer is running. This sensor allows the system to reset automatically after a fault condition is corrected by simply restarting the case sealer.

The PLC controller contains programs to interpret the information received from these sensors. This system has a setup menu for selecting the system configuration and operating parameters for the application.

Operational Explanation

The box present sensor assembly consists of a reflector and a sensor mounted on opposite sides of the case sealer. The sensor LED turns "Off" when a box passes between the sensor and reflector. The assembly is attached directly to the case sealer's base frame or column by means of a 3M™ VHB™ doubled sided foam tape. The sensor and reflector must be positioned to detect the lowest height box without being blocked by the action of the taping head. Refer to the "Installation and Setup" section for recommended mounting.

The spring loaded dancer arm assembly is mounted adjacent to each taping head to be monitored. The dancer arm roller is placed in contact with the tape supply roll to monitor tape movement and supply level. Seven targets spaced equally around the circumference of the dancer arm roller, pass the tape dispensing sensor to indicate when tape is dispensed. The information obtained from the tape dispensing sensor is used to calculate the tape apply V1 (i.e. supply roll tape velocity while taped is being applied) and tape cut V2 (i.e. supply roll tape velocity after tape has been cut). The calculations occur at two different points with information obtained from the box presence sensor. The first calculation for V1 begins when the leading edge of the box reaches the tape cutoff bracket and ends when the trailing edge reaches the cutoff bracket. The calculation for V2 begins at a point after the trailing edge has passed the cutoff bracket and ends after the time expires on TH053. The tape apply and tape cut velocities (V1 & V2) are run independently and compared to preset values. A tape apply velocity less than or tape cut velocity greater than these preset values will generate a fault code and stop the case sealer. Refer to illustrations J1 – J3 and following detailed explanation for further information.

Note: The following explanation is for both upper and lower taping head monitoring. It includes additional detail on program timers used to delay the start of the velocity calculations for the upper head due to the physical offset of the upper and lower taping heads (upper taping head is approximately 5 1/2" behind the lower taping head position).

Upper and Lower Tape Head Monitoring
(Detailed description)

The typical installation and taping head orientation is shown in **Figure 3-1**. The box enters the case sealer from right to left in the illustrations. The leading edge of the box is detected by the box present sensor (**Figure 3-2**) starting timer TH051. Timer TH051 is adjustable and represents the time required for the box to travel from the sensor to the taping head cutoff bracket.

The PLC begins counting pulses the instant TH051 "times out". The pulses are accumulated from the lower tape dispense sensor as the tape supply roll rotates. These pulses are counted until the trailing edge of the box passes the taping head cutoff bracket (**Figure 3-3**). The tape, at this point, has not been cut and the tape apply velocity (V1) is calculated.

$$V1 = \frac{(\text{Pulses}) * (\text{Encoder Constant})}{\text{Elapsed Time}}$$

Encoder Constant = linear travel distance per pulse of the dancer arm roller.

Elapsed Time = Time from the sensing of the leading edge to the trailing edge of the box.

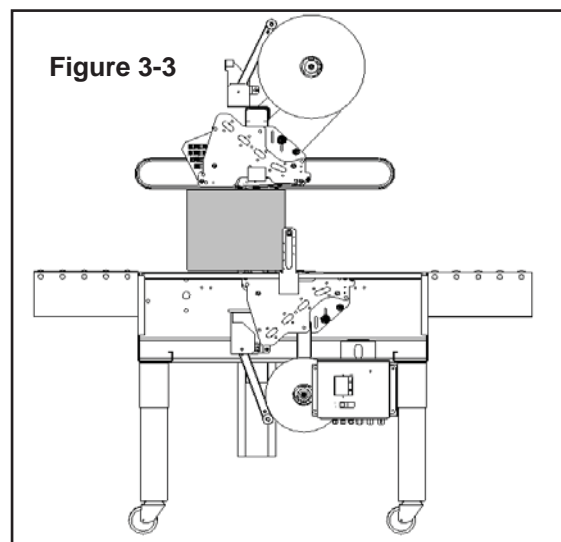
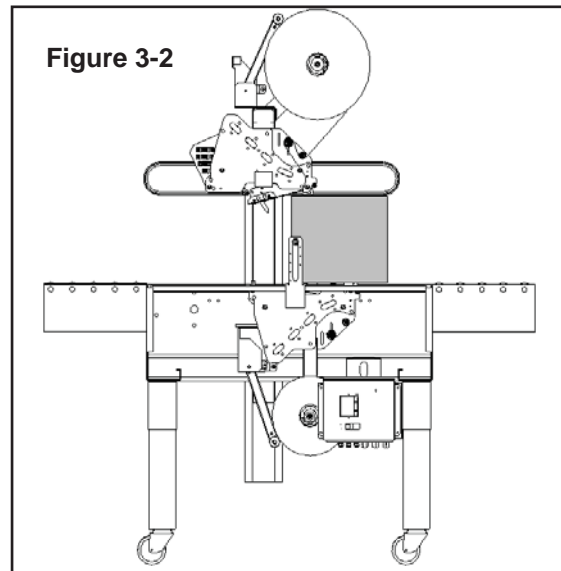
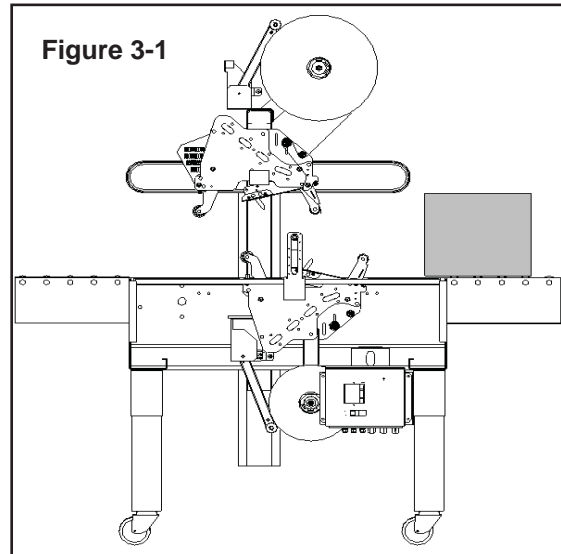
There are two software filters used to determine that the tape applied successfully between positions illustrated in **Figures 3-2 to 3-3**. A fault will be generated if either condition is satisfied.

The first filter is a general calculation that compares the calculated velocity (V1) to a preset V1min. If (V1) is less than or equal to (V1min) the system will generate a NO APPLY fault and stop the case sealer.

Note: (V1min) is set at half the expected belt speed. For your 3M-Matic case sealer that runs at 15in/sec, (V1min) is set to 7 in/sec.

The second filter is used to ensure tape was dispensed continuously as the box passed through the case sealer. The Elapsed Time and pulse count are divided into smaller segments. If at least one pulse was measured during the last segment of the apply cycle (i.e. just before the tape is cut) then tape was successfully applied to the box. If the pulse(s) measured during the last segment of time equals zero a NO APPLY fault is generated.

The last filter used is to determine if the tape was successfully cut. As the trailing edge of the box passes the taping head cutoff bracket (**Figure 3-3**) timer TH052 starts. This timer is similar to TH051 and represents the amount of dwell time after the apply cycle has completed and the cut cycle begins.



Theory of Operation (continued)

Timer TH053 begins and pulses from the tape dispense sensor are accumulated when TH052 "times out". Velocity V2 represents the tape velocity after being cut and is calculated after TH053 "time out". During normal operation the tape supply roll will slow and stop after the tape is cut and velocity V2 will be significantly less than V1. The system compares V2 to V1 and if that value is greater than 60% of V1 a TAPE DID NOT CUT fault will be generated and the system will stop the case sealer.

Fault conditions are indicated on the PLC display (See "Operation" Section for PLC fault codes). The fault will also be indicated by the control panel indicator light and the beacon light (Optional).

The system is automatically reset after a fault conditions by restarting the case sealer.

The program software algorithm is illustrated in **Figure 3-4**.

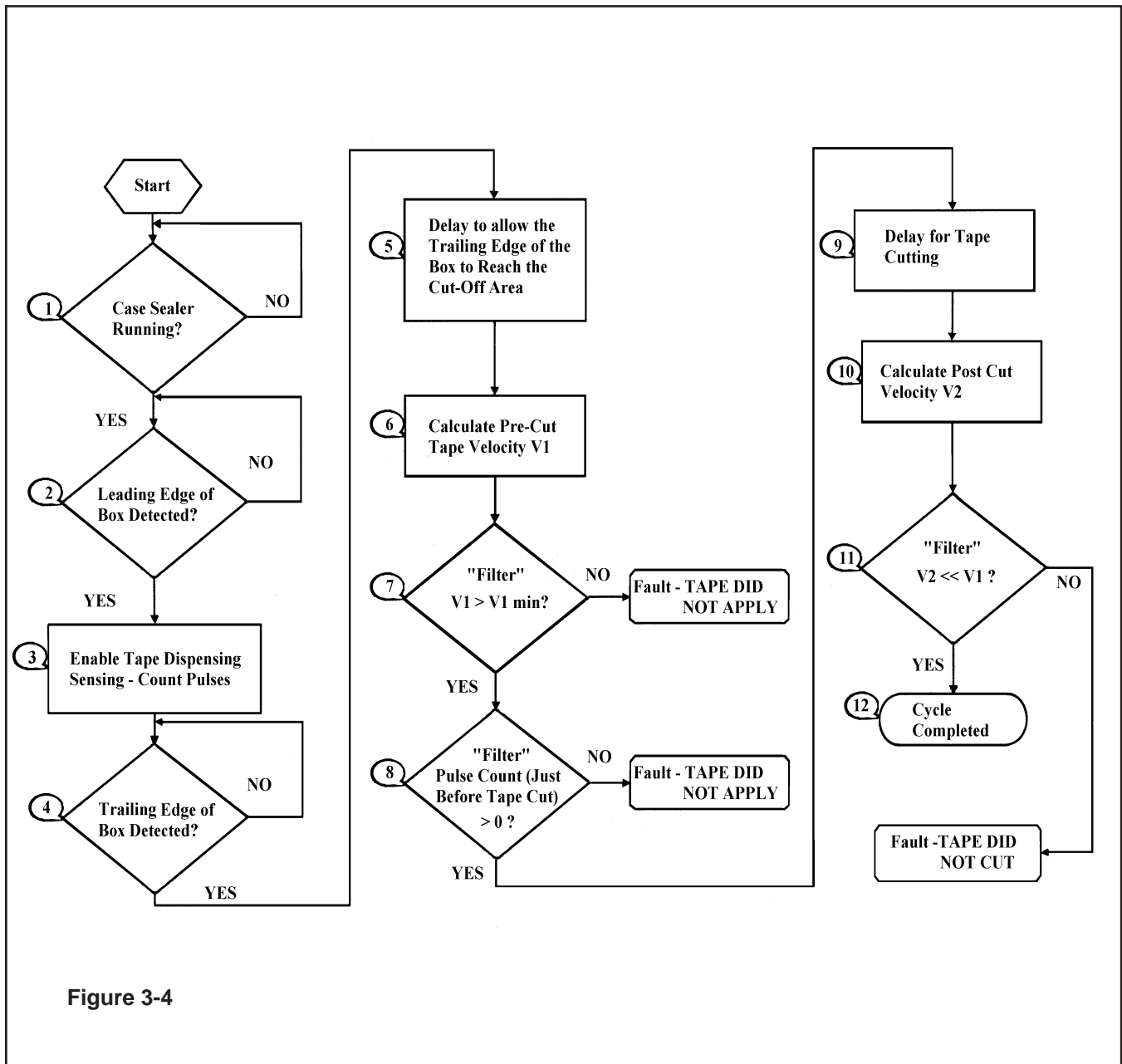


Figure 3-4



WARNING

- **To reduce the risk associated with mechanical and electrical hazards:**
 - Read, understand, and follow all safety and operating instructions before operating or servicing the case sealer.
 - Allow only properly trained and qualified personnel to operate and service this equipment.
- **To reduce the risk associated with pinches, entanglement and hazardous voltage:**
 - Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads.

Loading Tape Supply Roll

The tape application monitoring system is independent of the taping head. This allows you to remove the taping head without having to disconnect any electrical or pneumatic lines.

To remove or add a tape supply roll to the upper or lower outboard tape drum:

- 1) Pull the spring loaded dancer arm away from the tape roll until it contacts the holding magnet (**Figure 4-1**). The magnet will hold the dancer arm away from the tape drum allowing you to easily remove and install tape rolls.
- 2) Rotate the dancer arm away from the holding magnet and allow it to rest on the new tape roll.

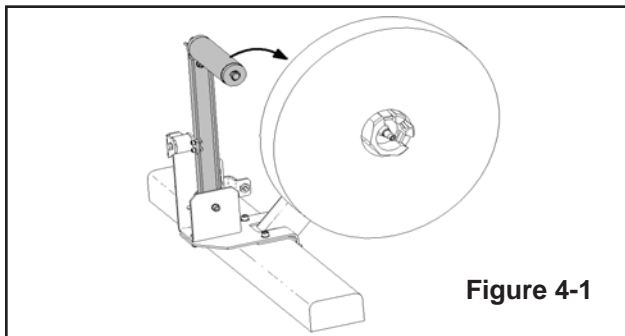


Figure 4-1

Note: No magnets are used in standard lower taping head applications (Tape bracket/drum attached to the taping head). Simply lift from the case sealer to replace the supply roll. Place the taping head back into the machine with the new tape roll (**Figure 4-2**).

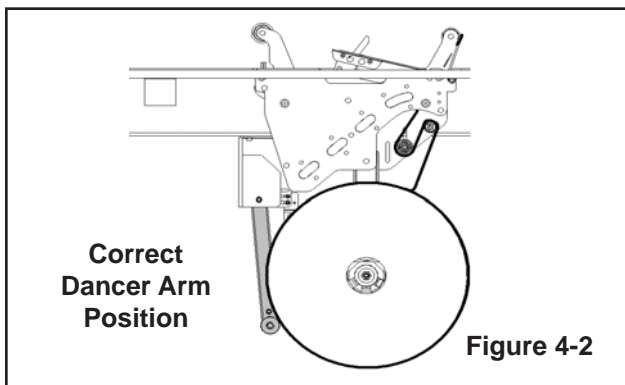


Figure 4-2

- 3) Follow the standard threading procedure when replacing the supply roll of the taping head.

Note: The Dancer arm roller is not part of the tape path. Do not wrap tape around/over the dancer arm roller.

- 4) Verify that the supply roll is contact the dancer arm roller for proper operation.

Note: It is possible to insert the supply roll behind the dancer arm assembly roller (**Figure 4-3**). This will prevent proper operation and a no apply tape fault will occur.

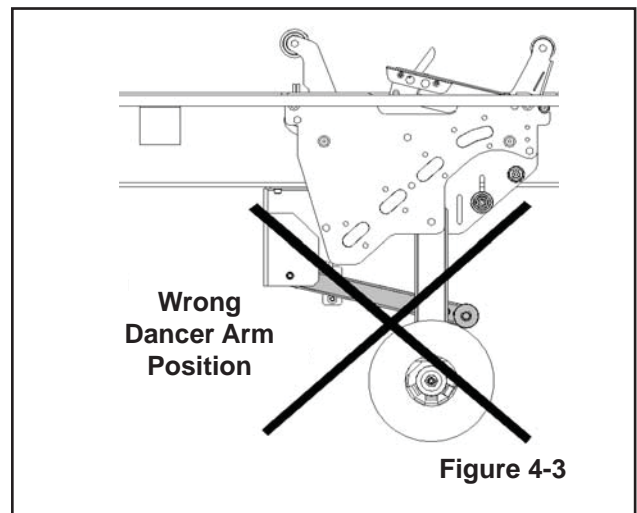


Figure 4-3

System Checkout

The system is now ready to use. The following steps will be used to determine proper operation of the Tape Application Monitor.

- 1) Run a box through your case sealer.
- 2) Watch the PLC and note the values that appear on the display after the box goes through the machine. If the display flashes a single "User" number, a fault has occurred. Proceed to step (5).

(continued on next page)

Operation (continued)

- 3) Verify the three values (6 if two heads are being monitored) are within the expected range as listed below.

"User 255" Value constant 255

"User __" Value between 12 - 16

"User _" Value between 0 - 3

The first number is not adjustable and is only used as a separator between the V1 & V2 values that are displayed. (i.e. between upper and lower velocity values and also between velocity values for different boxes.

The second number is the average velocity (V1) measured during the taping process. This range was selected to represent the tape dispense speed with allowance for minor machine speed variation.

The third number is the average velocity (V2) after the tape has been cut. This range was selected to represent the tape dispense speed with allowance for minor tape drum rotation (over coasting).

When two taping heads are being monitored values for the lower taping head will be displayed first followed immediately by values for the upper taping head. Example:

"User 255"...."User 14"....."User 1"

"User 255"...."User 12"....."User 0"

- 4) For values outside of the ranges listed above please refer to the trouble shooting section of this manual.

- 5) If a single "User" value is displayed please refer to the fault code chart for corrective action.

Operating Sequence

With the tape application monitoring system in place and all connections completed:

- 1) Turn the control box switch to the ON position. The panel indicator light briefly turns on and then goes off, the PLC will also display the operational condition (i.e. User 31, 32, 33...).
- 2) Turn ON the case sealer.

Note: For units with the optional remote beacon light, this light will also cycle on to off.

- 3) Run a box through your case sealer. The PLC will display a sequence of velocities during normal operation or a fault code if a fault condition exists.

Fault codes are listed in the table below. The fault description includes the most common causes for each condition.

After correcting the Fault condition:

- 4) Reset the Tape Application Monitoring system by pressing the "Start Button" on your case sealer.

Note: If the suggestion below do not clear the fault condition after attempting a reset please refer to the trouble shooting section of this manual.

- 5) Return to step 2 and repeat until the system is operating normally.

Fault Code	Description
"User 101"	LOWER or LOWER OUTBOARD Taping Head: Tape did not apply to the box. Check tape supply roll. Tape is broken or supply roll is empty.
"User 102"	LOWER or LOWER OUTBOARD Taping Head: Tape has not cut. Check case sealer adjustment or the taping head blade
"User 201"	UPPER Taping Head: Tape did not apply to the box. Check tape supply roll. Tape is broken or supply roll is empty.
"User 202"	UPPER Taping Head: Tape has not cut. Check case sealer adjustment or taping head blade
"User 81"	LOWER or LOWER OUTBOARD Taping Head: Low tape condition, Case Sealer stopped. Replace supply roll. Changing PLC data memory register DM0085 to a value of 0 will allow the case sealer to continue to operate during a low tape condition.
"User 91"	UPPER Taping Head: Low tape condition. Replace supply roll. Change PLC data memory register DM0085 to a value of 0 will allow the case sealer to continue to operate during a low tape condition.
"User 121"	LOWER or LOWER OUTBOARD Taping Head: Internal overflow error. Refer to the trouble shooting section.
"User 221"	UPPER Taping Head: Internal overflow error. Refer to the trouble shooting section.
"User 66"	BOX INTERVAL ERROR: Boxes too close together Refer to the trouble shooting section.
Other Code	Description
"User 50"	CONFIGURATION CHANGE - Reset Required
"User 99"	BYPASS MODE - Tape Monitoring Disabled, Display only
"User XX"	INFORMATION ONLY - Software version indication (i.e. 12, 13....)



WARNING

- **To reduce the risk associated with mechanical and electrical hazards:**
 - Read, understand, and follow all safety and operating instructions before operating or servicing the case sealer.
 - Allow only properly trained and qualified personnel to operate and service this equipment.
- **To reduce the risk associated with pinches, entanglement and hazardous voltage:**
 - Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads.

Data Memory Registers

There are four data memory registers.

DM0075 - Taping Head monitoring

- 31 - Lower Head Only
- 32 - Upper Head Only
- 33 - Upper and Lower Head

DM0080 - Bypass mode

- 1 - Disable Tape Application Monitoring
- Value other than 1 - Enable Monitoring

DM0085 - Case Sealer Control (Low Tape)

- 1 - Stop case sealer for Low Tape condition
- Value other than 1 - Indication only
- Panel Indicator or Beacon (Optional)

DM0090 - Tape Velocity display (V1, V2)

- 1 - Enable Velocity Display
- Value other than 1 - Disable Velocity Display

Note: Register DM0090 allows service personnel to view a specific data register or timer value while the case sealer is operating, preventing the display area from being overwritten with velocity information. This register is automatically reset to 1 on PLC power-up to display the velocity information.

Setting the DM Data Memory Registers Values

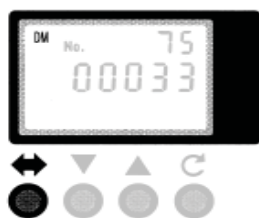
The PLC must be in the Device Mode to change the data memory register's.

Factory settings:

DM0075 = 33, DM0080 = 0, DM0085 = 0, DM0090 = 1

To adjust register settings:

1) Press the key until the display show a "DM" in the upper left hand corner of the display.



2) Press the key until the upper right hand corner of the display depicts the data memory register you wish to view (i.e. 75, 80, 85 or 90). The value for that register is shown below the register number.



3) Hold down the key until the register value begins to flash (i.e. left most digit).



4) Press the key to select the correct digit placeholder (i.e. 10,000, 1,000, 100, 10 or 1) as indicated by the flashing digit.



5) Press the key until the correct digit is displayed.



6) Repeat steps 4 and 5 until the desired data memory register value is displayed.

7) Press the key to save the new value

8) Reset the Tape Application Monitor system



WARNING

- **To reduce the risk associated with mechanical and electrical hazards:**
 - Read, understand, and follow all safety and operating instructions before operating or servicing the case sealer.
 - Allow only properly trained and qualified personnel to operate and service this equipment.
- **To reduce the risk associated with pinches, entanglement and hazardous voltage:**
 - Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads.

Settable Timers

There are three timers used to configure this system for your application.

Note: The timer values are in hundredths of a second.
 3M-Matic™ case sealers - Belt Speed = 15inches/sec
 TH051 - "Time" for the box to travel from the box present sensor to the tape head cutoff bracket just before the tape is cut.

Note: For upper taping head only ("User 32" the TH051 value should be adjusted according to the position of the upper tape head cutoff bracket.

Formula: (Estimate)

$$\frac{\text{Distance from the Box Presence Sensor to tape cut (inches)}}{\text{Case Sealer Belt Speed (Inches/Sec)}} \times 100$$

TH052 - Time delay after the calculation of V1, before calculation of (V2) to allow for cutting operation (typical set point 10).

TH053 - Time allotted for calculation of V2, after tape has been cut (typical 80 - 100).

Note: Longer sampling times provide better indicator of post-cut conditions but will allow the box to travel further before turning off the case sealer if a fault occurs.


Setting the Timer Values

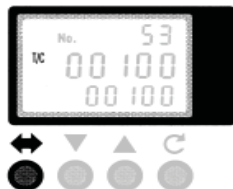
The PLC must be in the Device Mode to change the timers


Factory settings:

TH051 = 3
 TH052 = 10
 TH053 = 100

To Adjust Timer Settings:

- 1) Continuously press the  key until "T/C" is visible in the left hand column of the display.




- 2) Continuously press (or hold) the  key until the correct timer is displayed (i.e. TH051, TH052 or TH053).



Note: The register value is displayed below the timer number.

- 3) Press and Hold the  key until the first register value begins to flash (left most digit).



- 4) Press the  key until the digit you wish to change is flashing.



- 5) Press (or hold) the  key to change the numeric value.



- 6) Repeat steps 4 & 5 until the desired timer value is displayed.

- 7) Press the  key to save the new value.

Note: Locking PLC is recommended to prevent accidental modification of the adjustable program values (See "Installation and Set-up")

Maintenance

Dancer Arm Roller

Periodically inspect the dancer arm assembly roller to insure that it freely turns and the outer knurled surface of the roller is clean and not greatly worn. If any of the above conditions occur this could cause the roller to slip and not properly turn in response to a turning tape supply roll. If replacement of any of the parts is necessary please refer to the "Replacement Parts Illustrations" and "Parts List" of this manual.

Do not apply lubricant to the dancer arm roller. The dancer arm roller is designed to work without lubrication.

Troubleshooting

Note: Please refer to the other sections of this manual for a better understanding of the equipment and its operation.

Troubleshooting Guide

Problem	Cause	Correction
Average Velocity V1 (pre-cut) for a given taping head is too low (i.e. < 11) or case sealer continuously shuts down with a tape did not apply error. (i.e. PLC displays "User 101" or "User 201")	1. Box is slipping as it travels through the machine.	Check the box height or width adjustment to prevent box to belt slippage
	2. Dancer arm roller is not turning	2A. Check to insure dancer arm assembly is in proper position and providing adequate force against the tape supply roll. 2B. Check to insure knurled surface of dancer arm roller is clean and not worn. 2C. Check roller shaft and roller inner diameter for problems. 2D. Check to insure tape dispense proximity sensor is not located too far in and contacting roller.
	3. Tape dispense proximity sensor is too far from roller "targets".	Loosen and move head of proximity sensor within 1mm (.040") of back of roller to sense targets.
	4. Setup parameter timer TH051 is not set to the proper value.	Set to correct value. Value should be set to the amount of time it takes the leading edge of the box to travel from the box present sensor to within 1/2" of the end of the cutoff bracket for lower taping head. If only the upper taping head is monitored adjust to within 1/2" of the upper head's end of cutoff bracket.
Average Velocity V2 (post-cut) for a given taping head is too high (i.e. > 4)	Sampling time T053 is set too low.	Check timer. Typically this value is set between 80 – 100. Note: Higher values delay when the case sealer will be shut off in the advent of a fault, thus allowing the box to escape the machine before shutdown.

Troubleshooting (continued)

Troubleshooting Guide

Problem	Cause	Correction
The tape application monitoring system doesn't generate a fault and shut down the case sealer when the tape does not cut.	1. There is no gravity or powered out-feed conveyor at the exit end of the case sealer.	If the newly sealed box is allowed to stop at the exit end of the case sealer this can appear as a normal tape cut (i.e. $V2 \ll V1$). Add a conveyor to remove the box.
	2. Sampling time T053 is set too low.	Check timer. Typically this value is set between 80 – 100. Note: Higher values delay when the case sealer will be shut off in the advent of a fault, thus allowing the box to escape the machine before shutdown.

Electrical

The PLC has a switched mode power supply, which is used to provide 24VDC @ ½ amp power for the various input sensors, panel indicator and output relays. The PLC power connection originates from the load side of the circuit breaker switch through a line fuse. Power enters through connection 27 and connects to the DPST circuit breaker switch (Refer to **Figures 2-20 and 5-1**). The PLC has ten inputs, configured to accept current sinking NPN style sensors. It also has six dry contact output relays. Four are configured for 24VDC and two for AC. Power for your case sealer is obtained through connection 21 and is switched on or off by means of the solid state relay (CR) using PLC output 502.

A current sensor is positioned on the AC line of the case sealer between the DPST circuit breaker switch and relay CR Case Sealer is used to determine if the case sealer is running. The sensor ("go, no go" gauge) provides closure of a dry contact relay, turning "On" PLC input 009 if the current exceeds the value set by the dial indicator located on the current sensor. The amount of current flowing through the circuit is not critical. The sensor is set at the minimum value. The current sensor resets the Tape Application Monitor when the operator presses the "ON" push-button of the case sealer after an error has occurred. When PLC input 009 is off all inputs are ignored and tape monitoring will not take place until the case sealer is started and input 009 turns on. The program sequence starts when the case sealer is running and a box is detected at PLC input 008 through connection 20. During program sequence if tape does not apply or cut a fault condition is generated and relay CR Case Sealer is momentary cycled from "on – off – on" to briefly remove power from connection 21. This action removes power from the 3M-Matic™ case sealers latching circuit to stop the case sealer until the ON push-button is depressed. Press the case sealer "ON" push-button restarts the case sealer, the control algorithm clears the fault and the system resets.

The lower dancer arm assembly tape dispense sensor and low tape supply sensor connect through external connections 16 and 17. These connections represent PLC inputs 004 and 003.

The upper dancer arm assembly tape dispense sensor and low tape supply sensor connect through external connections 18 and 19. These connections represent, PLC inputs 005 and 001.

The control panel indicator light and optional dry contact relay for controlling a remote powered exit conveyor are connection 23. These represent PLC outputs 504 and 503.

The optional remote beacon light is connected to the power cord connection 22 that provides AC rather than DC power from PLC. This represents output 501.

Electrical Diagram



WARNING

- **To reduce the risk associated with pinches, entanglement and hazardous voltage:**
- Turn electrical supply off and disconnect before performing any adjustments, maintenance or servicing the machine or taping heads.

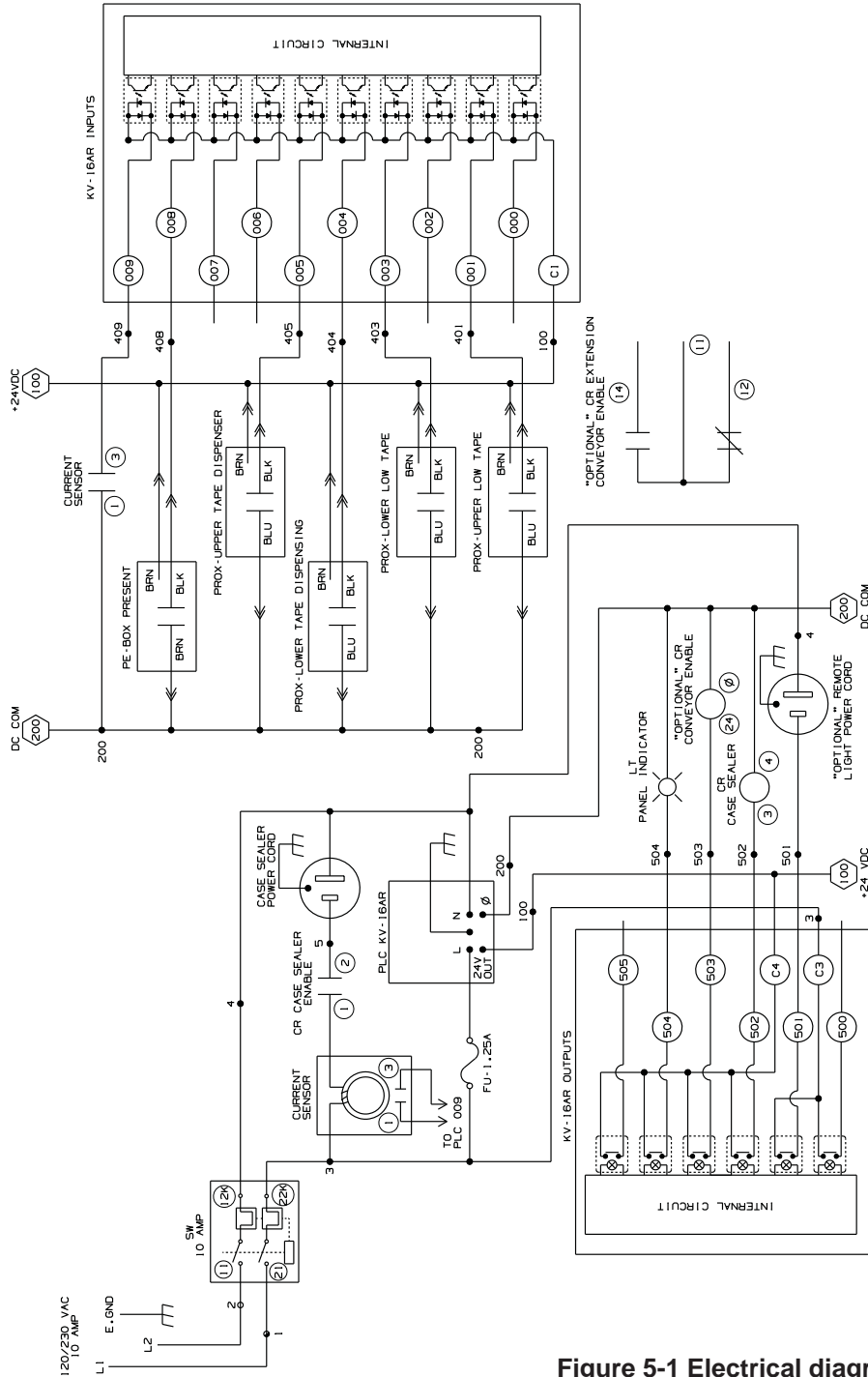


Figure 5-1 Electrical diagram

PLC Memory Map

Please refer to table II below for PLC inputs, outputs, special “settable” internal control registers and settable internal timers with accompany description.

Input	Output	Registers	Timers	Description
000				SPARE - Not in Use
001				UPPER – Low Tape Proximity Sensor
002				SPARE - Not in Use
003				LOWER – Low Tape Proximity Sensor
004				LOWER – Tape Dispense Proximity Sensor
005				UPPER – Tape Dispense Proximity Sensor
006				SPARE - Not in Use
007				SPARE - Not in Use
008				Box Present Sensor Photo Eye
	500			SPARE - Not in Use
	501			“Optional” Remote AC (120/240) Beacon Light
	502			Case Sealer - Solid State Relay
	503			“Optional” Dry Contact Relay. This output is used to stop an 800rks or 800rf in the event of a fault condition. This output could also be used to halt an external conveyor or signal a host controller. Output is normally ON and is OFF under a fault condition.
	504			Panel Indicator Light 24 VDC
	505			SPARE - Not in Use
		DM0075		System Configuration Register (31=Lower Only, 32=Upper Only, 3=Both Taping Heads). Factory setting DM0075 = 33.
		DM0080		By-Pass Register (1=By-Pass Enable, <>1 = Normal TAM Operation. Factory setting DM0080 = 0.
		DM0085		Fault ON Low Tape Register (1=Fault, <>1=Turn ON Light Only). Factory setting DM0085 = 0.
		DM0090		Display Runtime Tape Velocities (1=Display, Value other than 1 -Do Not Display. Resets automatically to 1 upon power up.
			TH051	Represents the distance in “time” from the box present sensor to within ½” from the end of the lower taping head cut-off bracket (i.e. just before the tape would cut). When possible the box present sensor should be positioned very near the lower taping head cut-off bracket so the value of TH051 is small. In cases where this is not possible position the sensor just in front of the lower taping head apply roller. However, if there is no lower taping head used then position the box present sensor as close to the upper cut-off bracket. Note: In all cases position the sensor to trigger before the tape would cut. As an example for a 15 ips case sealer belt speed and a box present sensor positioned to trigger ½” before the tape would cut TH051, would be set to 3 hundreds of a second [TH051 = distance/velocity = (1/2/15)*100]. In applications where only an upper taping head is used (i.e. DM0075 = 32) TH051 represents the time in hundreds of a second from the box present sensor to just before the upper taping head cuts. Factory Setting TH051 = 3.

PLC Memory Map (continued)

Input	Output	Registers	Timers	Description
			TH052	Represents the amount of time AFTER measurements for calculation of (V1) (ie. tape apply or pre-cut) and BEFORE starting measurements for calculation of (V2) (post-cut). This value is normally set to 10 hundreds of a second in order to make sure tape has cut before beginning to take measurements for (V2). Factory Setting TH052 = 10
			TH053	Represents the amount of time you sample AFTER the tape has been cut in order to determine the tape has properly cut. After the sample time has expired (V2) is calculated. Within reason the longer sampling time provides a better indicator of post-cut conditions but allows the box to travel further (i.e. escape the case sealer) before turning off the case sealer in the advent of a fault. This value is typically set at 80 - 100 hundreds of a second for a belt speed of 15 ips. If a second box enters the case sealer before TH053 has expired the value of time used in the calculation for determining (V2) is the current accumulation of time at that instance. Factory Setting TH053 = 100

Replacement Parts And Service Information

Spare Parts

It is suggested that the following spare parts be ordered and kept on hand:

Qty.	Part Number	Description
2	26-1006-1320-2	Fuse - Slo-Blow, 5X20mm 1.25A Littelfuse 2181.25

Label Kit

In the event that any labels are damaged or destroyed, they must be replaced to ensure operator safety. A label kit, part number 78-8137-0350-7, is available as a stock item. It contains all the safety labels used on the Tape Application Monitor

Replacement Parts Ordering Information and Service

Refer to the first page of this instruction manual "Replacement Parts and Service Information".

Options/Accessories

For additional information on the options/accessories listed below, contact your 3M Representative.

Part Number	Option/Accessory
70-0064-1104-8	Optional Outboard Lower Dancer Arm Conversion Kit
78-8095-1134-4	Optional Remote Beacon Light Kit
26-1014-8243-3	Optional Dry Contact Relay

Tape Application Monitor

To Order Parts:

1. Refer to first illustration, Frame Assemblies, for the Figure Number that identifies a specific portion of the machine.
2. Refer to the appropriate Figure or Figures to determine the parts required and the parts reference number.
3. The Parts List that follows each illustration, includes the Reference Number, Part Number and Part Description for the parts on that illustration.

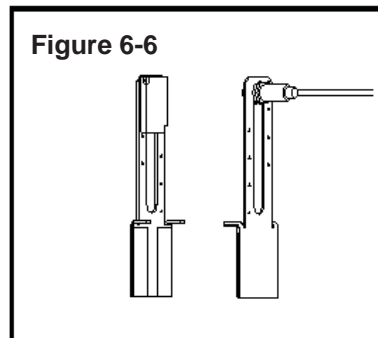
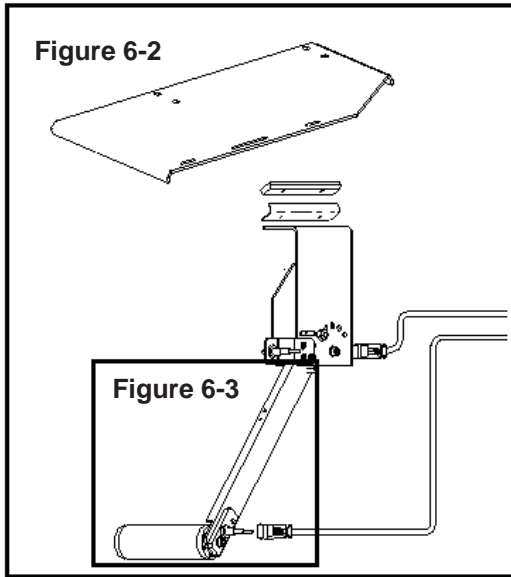
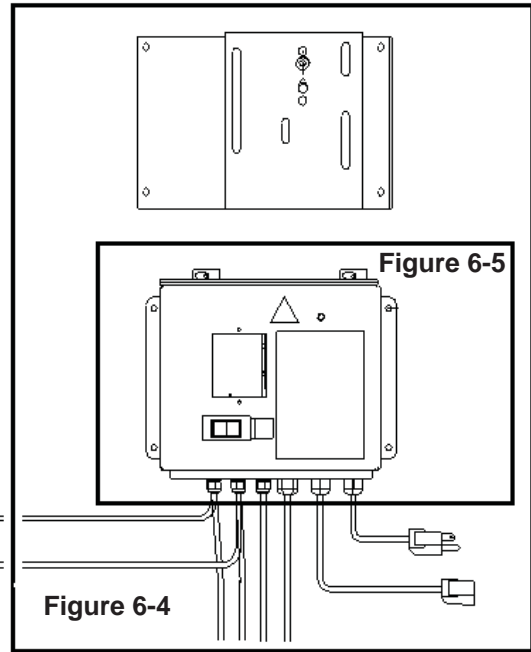
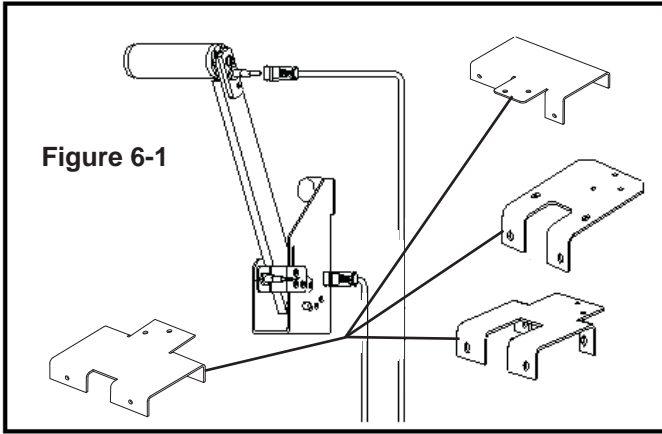
Note – The complete description has been included for standard fasteners and some commercially available components. This has been done to allow obtaining these standard parts locally, if desired.

4. Order parts by Part Number, Part Description and Quantity required. Also include machine name, number and type.

Important – Not all the parts listed are normally stocked items. Some parts or assemblies shown are available only on special order. Contact 3M/Tape Dispenser Parts to confirm item availability.

5. Refer to the first page of this instruction manual “**Replacement Parts and Service Information**” for replacement parts ordering information.

Tape Application Monitor (TAM)



Frame Assemblies

Tape Application Monitor (TAM)

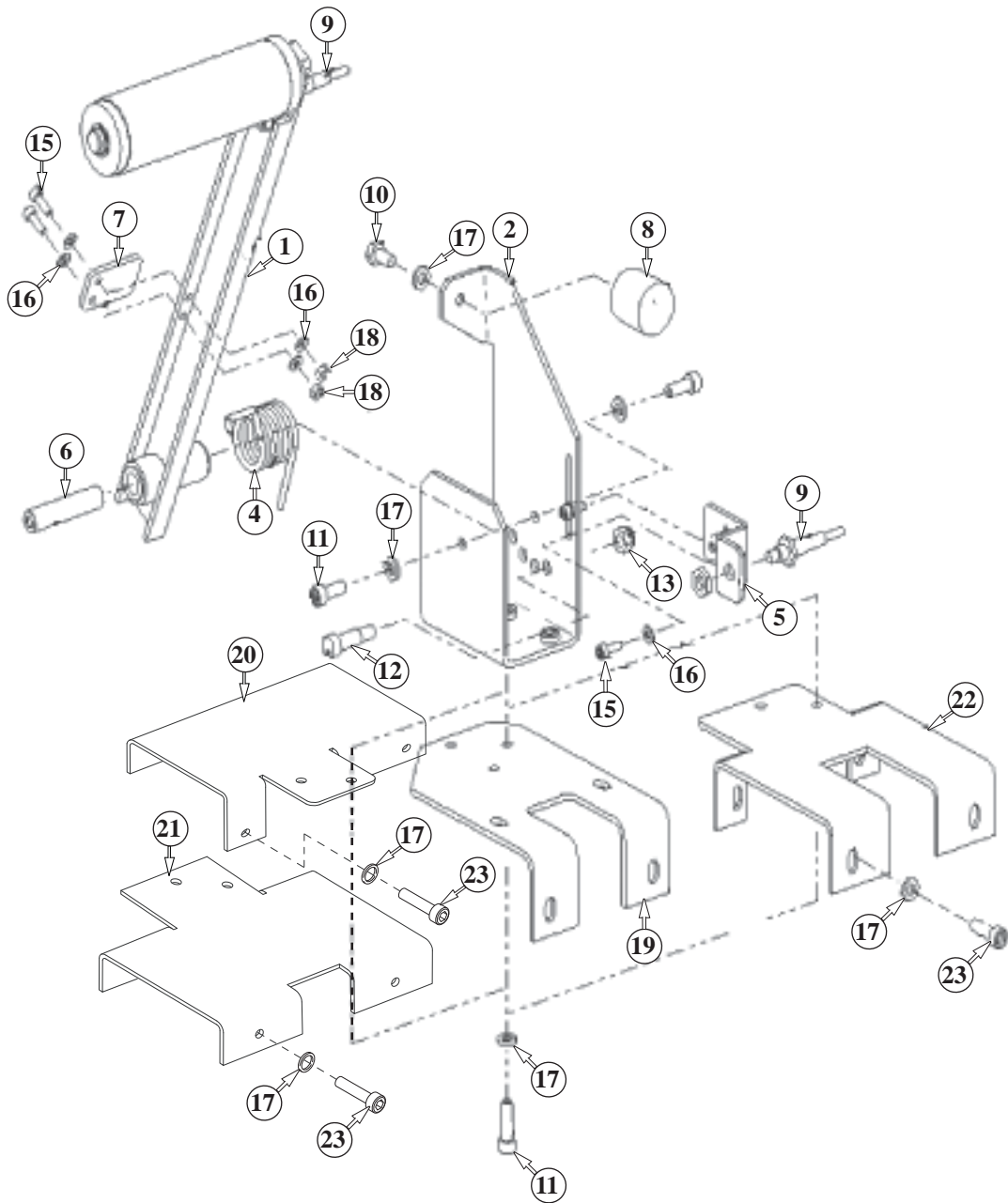


Figure 6-1

Tape Application Monitor (TAM)

Figure 6-1

Ref. No.	3M Part No.	Description
1	78-8133-9680-7	Assembly - Arm Swing
2	78-8133-9681-5	Bracket - "U" Main Upper
4	78-8137-0003-2	Spring - Torsion R/H
5	78-8133-9682-3	Bracket - Hold Sensor
6	78-8133-9685-6	Shaft - Spacer Pivot
7	78-8137-0002-4	Plate - Magnet Stop
8	26-1016-2465-3	Magnet - Pot 27mm Dia X 25mm M6 X 1.0, Eclipse 833
9	26-1016-2466-1	Sensor - Prox NPN 2mm M8, Omron E2A-S08KS02-M5-C1
10	26-1016-2493-5	Capscrew - Hex Hd. A/Stl M6 X 1.0 X 8mm Lg., Stl Zn Plt
11	26-1014-8755-6	Capscrew - Soc. Hd. Dr. M6 X 1.0 X 16mm Lg., Stl Zn Plt
12	12-7990-7756-0	Screw - Shoulder Hex Soc Dr. 5/16 Dia X .62 Lg., A/Stl
13	26-1016-2494-3	Nut - Loc Hex, Nylon Insert Steel, 1/4-20, A/Stl Zn Plt
15	26-1016-2509-8	Capscrew - Soc Dr. Hex Dr. M4 X 0.7 X 12mm Lg., A/Stl Zn Plt
16	26-1016-2496-8	Washer - Plain, A/Stl. Narrow M4
17	26-1000-0010-3	Washer - Plain, A/Stl. Narrow M6
18	26-1005-0641-4	Nut - Lock Hex, Nylon Insert Steel, M4, A/Stl Zn Plt
19	78-8133-9696-3	Bracket - Mount TAM Upper Arm
20	78-8137-8700-5	Bracket - Mount 7000a/7000a3/8000a/8000a3
21	78-8137-8701-3	Bracket - Mount 7000r/7000r3
22	78-8137-0016-4	Bracket - Mount RKS
23	26-1014-8756-4	Capscrew - Soc Hd. Hex Soc Dr. M6 X 1.0 X 20mm Lg., A/Stl Zn Plt

Tape Application Monitor (TAM)

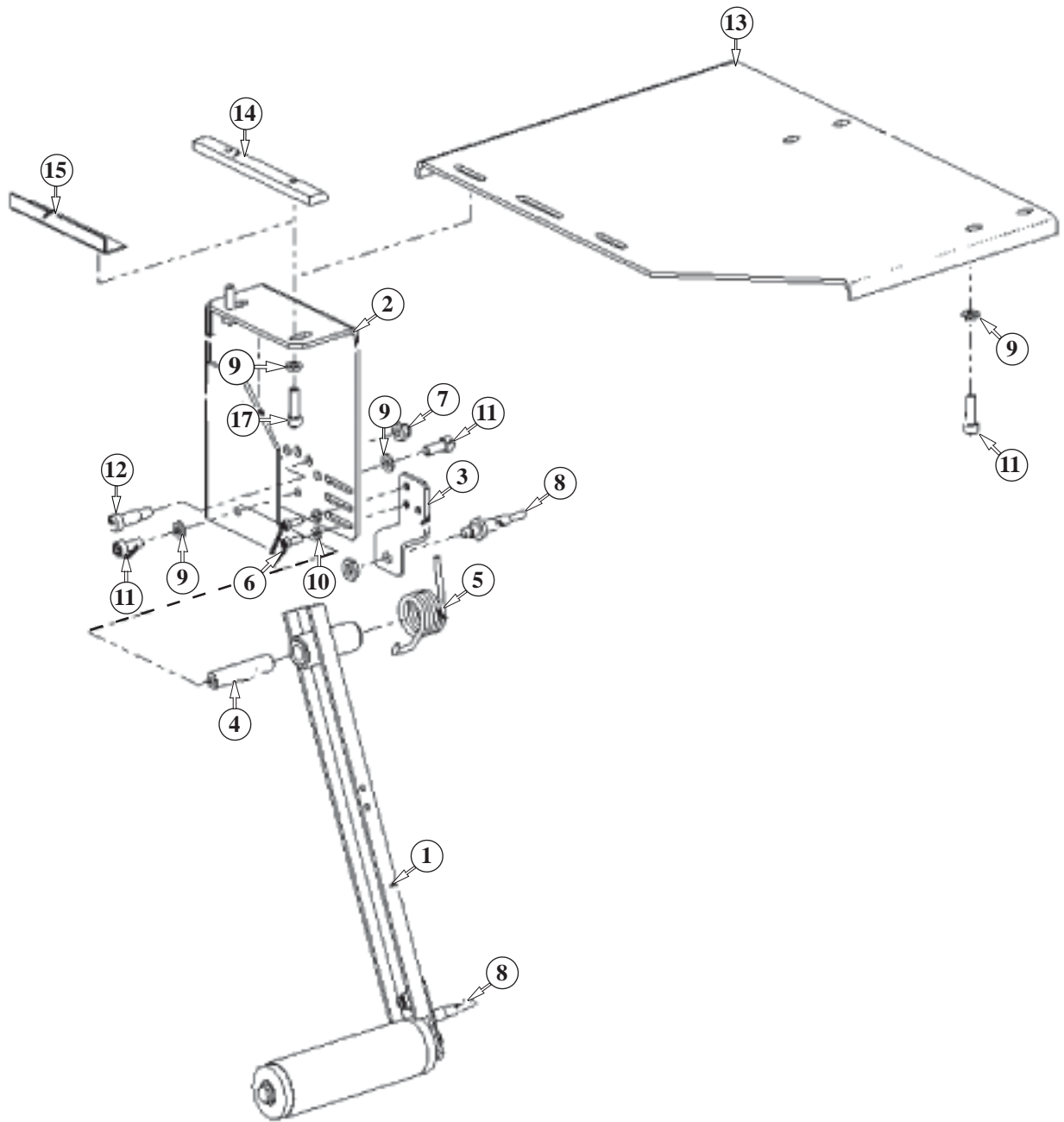


Figure 6-2

Tape Application Monitor (TAM)

Figure 6-2

Ref. No.	3M Part No.	Description
1	78-8133-9680-7	Assembly - Arm Swing
2	78-8133-9699-7	Bracket - Mount Lower
3	78-8133-9682-3	Bracket - Hold Sensor
4	78-8133-9685-6	Shaft - Spacer Pivot
5	78-8137-0004-1	Spring - Torsion L/H
6	26-1016-2509-8	Capscrew - Hex Soc Dr. M4 X 0.7 X 12mm Lg A/Stl Zn Plt
7	26-1016-2494-3	Nut - Loc Hex, Nylon Insert Steel, 1/4-20 A/Stl Zn Plt
8	26-1016-2466-1	Sensor - Prox NPN 2mm M8 Omron E2A-S08KS02-M5-C1
9	26-1000-0010-3	Washer - Plain, A/Stl. Narrow, M6
10	26-1016-2496-8	Washer - Plain, A/Stl. Narrow, M4
11	26-1014-8755-6	Capscrew - Hex Hd. M6 X 1.0 X 16mm Lg., Stl Zn Plt
12	12-7990-7756-0	Screw - Shoulder Hex Soc Dr. 5/16 Dia X .62 Lg., A/Stl
13	78-8137-0009-9	Bracket - Lower King
14	78-8133-9679-9	Plate - Nut
15	78-8137-0020-6	Template
17	26-1014-8756-4	Capscrew - Hex Soc Dr. M6 X 1.0 X 20mm Lg., A/Stl Zn Plt

Tape Application Monitor (TAM)

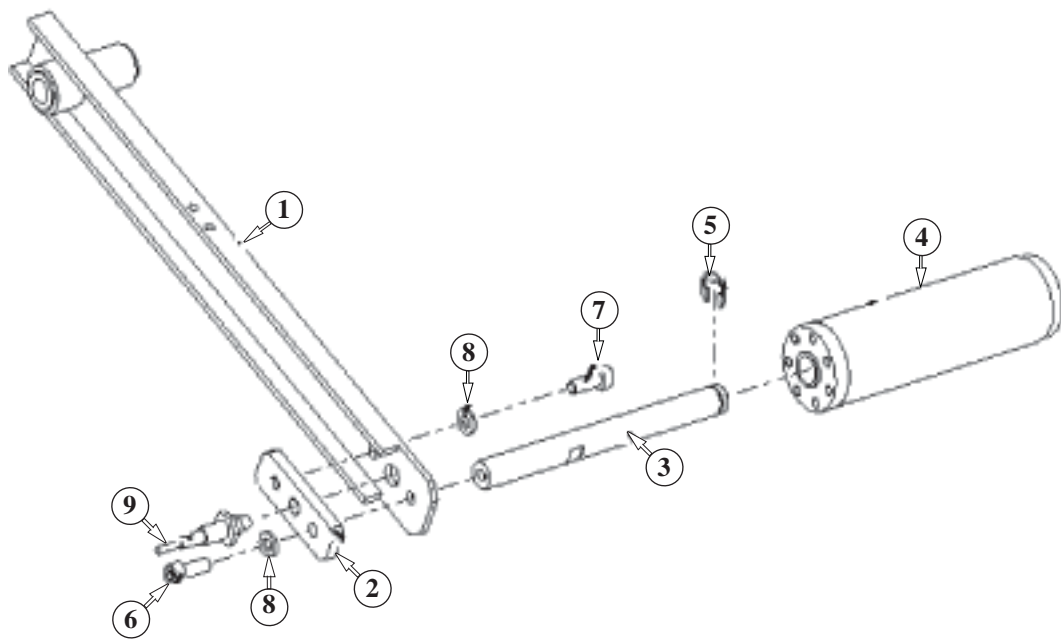


Figure 6-3

Tape Application Monitor (TAM)

Figure 6-3

Ref. No.	3M Part No.	Description
1	78-8133-9684-9	Assembly - Arm Swing Bushing
2	78-8133-9687-2	Block - Sensor
3	78-8133-9689-8	Shaft - Roller
4	78-8137-0006-5	Roller Assembly
5	78-8656-4012-8	Ring - Retaining E-Ring, Waldes 5133-50 1/2" Shaft
6	26-1014-8756-4	Capscrew - Hex Soc Dr. M6 X 1.0 X 20mm Lg., Zn Plt
7	26-1014-8755-6	Capscrew - Hex Soc Dr. M6 X 1.0 X 16mm Lg., Zn Plt
8	26-1000-0010-3	Washer - Plain Narrow, M6
9	26-1016-2466-1	Sensor - Prox NPN 2mm M8, Omron E2A-S08KS02-M5-C1

Tape Application Monitor (TAM)

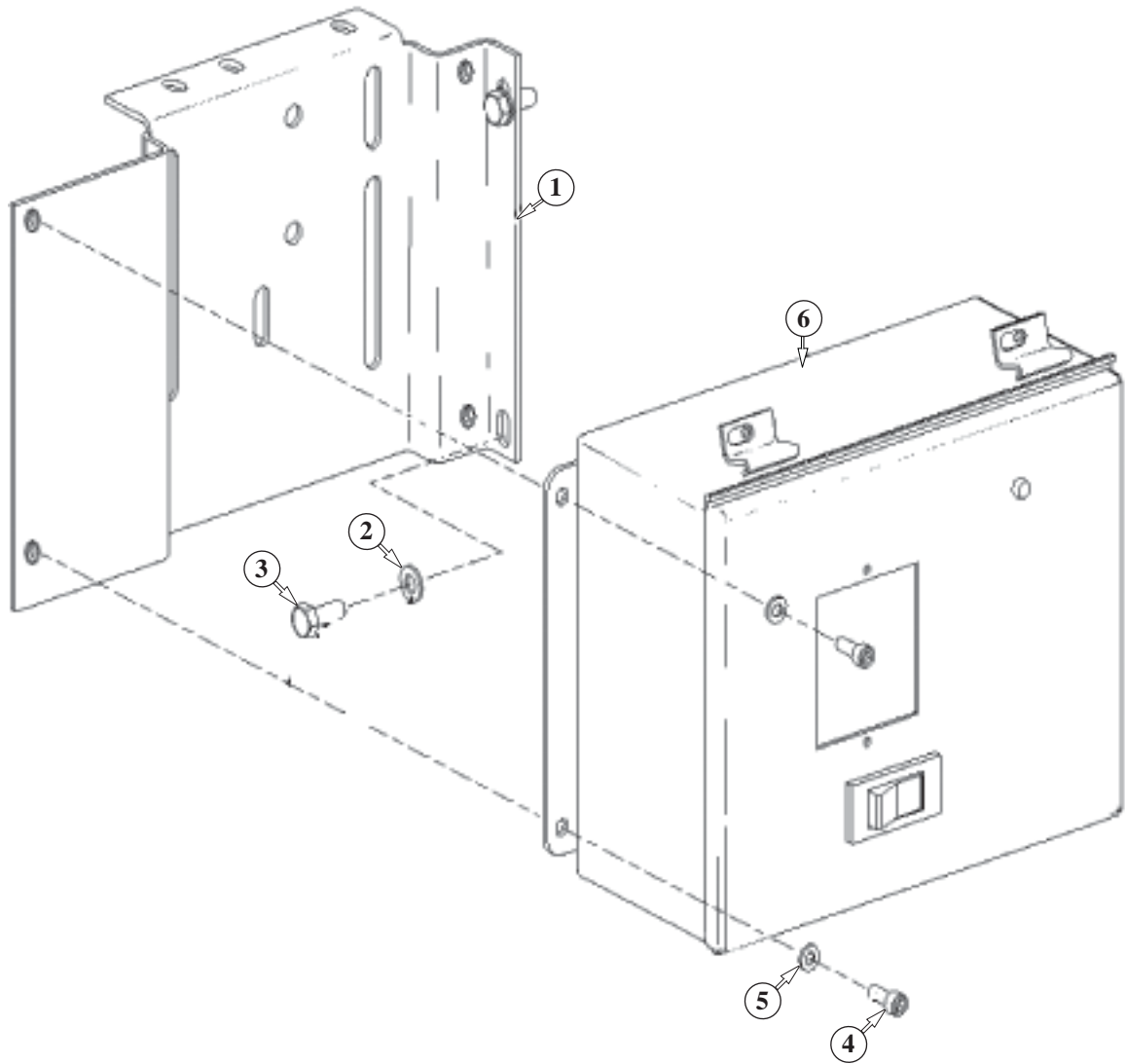


Figure 6-4

Tape Application Monitor (TAM)

Figure 6-4

Ref. No.	3M Part No.	Description
1	78-8133-9694-8	Bracket - Sensor
2	78-8017-9318-9	Washer - Plain M8 Narrow, A/Stl Zn Plt
3	26-1016-2500-7	Capscrew - Hex Hd. M8 X 1.0 X 16mm Lg., A/Stl Zn Plt
4	26-1014-8756-4	Capscrew - Hex Soc Dr. M6 X 1.0 X 20mm Lg., Zn Plt
5	26-1000-0010-3	Washer - Plain Narrow, M6
6	78-8137-0022-2	Assembly - Electrical Control Box

Tape Application Monitor (TAM)

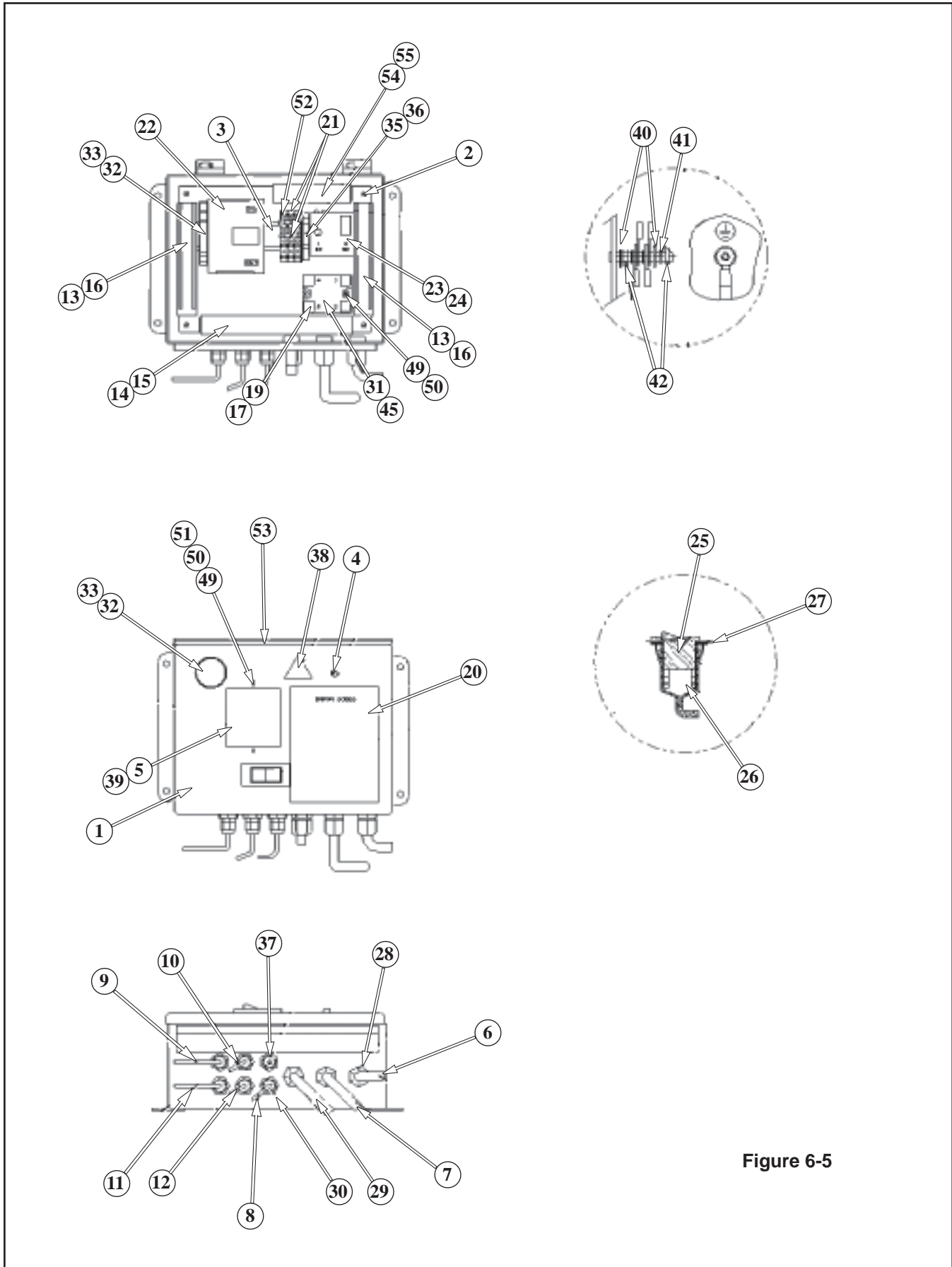


Figure 6-5

Tape Application Monitor (TAM)

Figure 6-5

Ref. No.	3M Part No.	Description
1	78-8137-0127-9	Box - Junction Modified
2	78-8137-0128-7	Panel - Modification
3	78-8137-01231-1	Rail - Din Modification
4	78-8137-0253-3	Assembly - Display Light
5	78-8133-9690-6	Window - Display
6	78-8137-0207-9	Assembly - Power, Input Cord
7	78-8137-0208-7	Assembly - Power, Case Sealer Cord
8	78-8137-0209-5	Assembly - Box Present Cable
9	78-8137-0210-3	Assembly - Cable, Dispensing, Upper
10	78-8137-0211-1	Assembly - Cable, Low Supply, Upper
11	78-8137-0212-9	Assembly - Cable, Dispensing, Lower
12	78-8137-0213-7	Assembly - Cable, Low Supply, Lower
13	78-8137-0130-3	Duct - Wire, Short
14	78-8137-0129-5	Duct - Wire, Long
15	78-8137-0216-0	Cover - Wire Duct, Long
16	78-8137-0217-8	Cover - Wire Duct, Short
17	26-1016-0248-5	Standoff Hex Male 8-32 UNC Female 8-32 UNC
18	78-8137-0350-7	Kit - Label Replacement (not shown)
19	78-8137-0023-0	Plate - Relay Guard
20	78-8137-0218-6	Label - Error Codes
21	26-1016-2476-0	Jumper - 3-Pole Q3 Weidmuller 0336500000
22	78-8137-0261-6	Assembly - Controller, PLC
23	78-8137-0254-1	Assembly - AC Current
24	26-1016-2479-4	Adapter - Din Rail, SSAC P1023-20
25	26-1016-2560-1	Switch - Circuit Breaker, DPST 10A/250V, ETA 3120-F323-P7T1-W01D-10A
26	26-1016-2481-0	Switch - Terminal Shroud, ETA Y304-275-01
27	26-1016-2561-9	Spacer - Switch, 3120-F3, Panel Thickness < 4mm ETA Y303-675-01
28	26-1011-5441-2	Strain Relief - Straight, Liquid Tight, Thru, .230 - .395 Dia PG11 Hub, Heyco #3214
29	78-8137-0483-6	Beacon Light Cord Assembly
30	26-1014-8988-3	Strain Relief - Straight, Liquid Tight, Thru, .114 - .250 Dia, PG 7 Hub, Heyco #3208
31	26-1016-2483-6	Relay - Solid State 25A Output, 3 - 32VDC Control, Crouzet 84134010
32	26-1016-2484-4	Block - Fuse, Wiedmuller ASK1 0474560000
33	26-1006-1320-2	Fuse - Slo-Blow, 5X20mm 1.25A Littelfuse 2181.25
34	26-1014-8924-8	Block - Terminal, Weidmuller DK 40V/35 # 590160000 (not shown)
35	26-1016-2486-9	Plate - End, Weidmuller APDK40 1397160000
36	26-1014-6788-9	Block - Terminal, Ground, Green/White, Sprecher & Schuh VUPE4-6
37	18-9221-6200-5	Pin - Dowel, 3/16" Dia X 3/4" Long, Steel Zinc Plt,
38	26-1016-2487-7	Label - Electrical Shock, HCS 6010C-ISO
39	26-1016-2488-5	Silicon - RTV GE 108 or Equivalent
40	26-1016-2498-4	Washer - Lock, Serrated External Tooth, M5 Zn Plate Steel
41	26-1016-2499-2	Washer - Regular, Spring External Tooth, M5 Zn Plate Steel
42	26-1004-4659-5	Nut - Hex M5 X .08 Zn Plate Steel
43	26-1001-7032-8	Tie Wrap - 1/16" - 1-1/4" Bundle Range 5.5 Lg. X .140 Wide T&B TY524M (not shown)
44	26-1003-6050-7	Tie Mount - Cable, Panduit ABMM-A-C (not shown)
45	26-1016-2490-1	Thermal Compound - Silicone Oil Base, 2 oz Jar, Wakefield Engineering #120-2
46	26-1016-2491-9	Label - Read, HCS #6126C-ISO (not shown)
47	26-1002-6527-6	Screw - Button Hd. Hex Soc Dr. #10-32 X 3/8" Lg., Steel Zn Plt (not shown)
48	26-1005-7999-9	Washer - Plain M10, A/Stl Zn Plt. Type A Narrow (not shown)
49	26-1001-7118-5	Screw - Button Hd. Hex Soc Dr. 8-32 X 3/8" Lg., Steel Zn Plt Stl
50	26-1014-8699-6	Washer - Plain M8, Steel Zn Plt
51	26-1006-5887-6	Nut - Hex 8-32 Steel Zn Plt
52	26-1016-2627-8	Plate - End, Weidmuller ASK-1 # 380360000
53	78-813-0042-0	Label - Nameplate
54	78-8137-0482-8	Duct - Wire 3.5"
55	78-8137-0481-0	Cover - Wire Duct 3.5"

Tape Application Monitor (TAM)

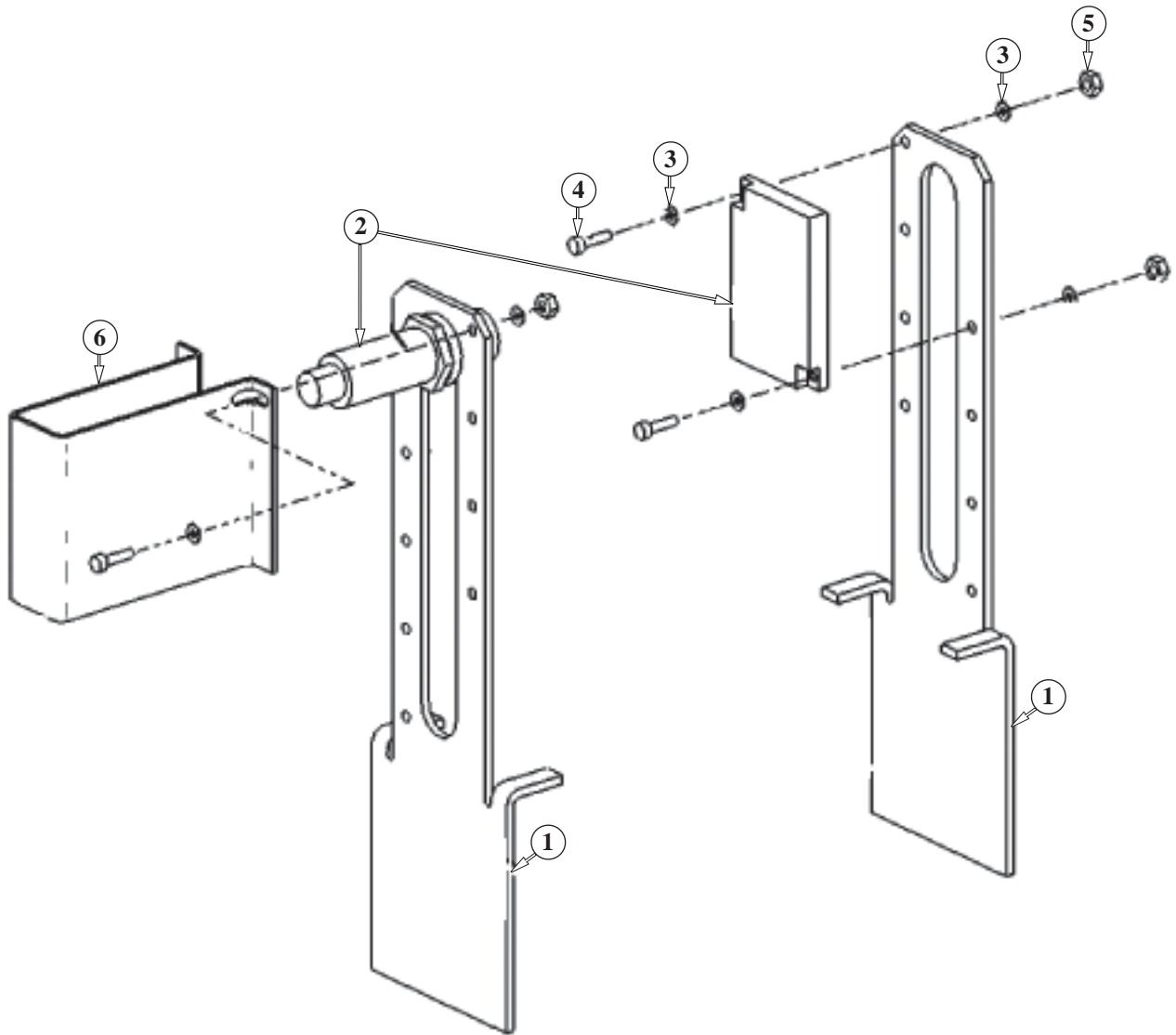


Figure 6-6

Tape Application Monitor (TAM)

Figure 6-6

Ref. No.	3M Part No.	Description
1	78-8137-0260-8	Assembly - Bracket, Bed Sensor
2	26-1016-2470-3	Switch - PhotoElectric W/Reflector, Omron E3F2-R2C4-P1
3	26-1014-5501-8	Washer - Plain, M3 Narrow, A/Stl Zn Plt
4	DY-1102-0041-6	Capscrew - Button Hd, Soc Dr. M3 X 12mm Lg A/Stl Zn Plt
5	26-1003-6901-1	Nut - Hex ,M3, A/Stl Zn Plt
6	78-8137-1014-8	Guard - Sensor

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