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Captive Carrier TransTRAX® P

Installation and Service Manual

Utilizing BavSonic Audio

Revised: 12/23/2014
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Captive Carrier TransTRAX® P

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Captive Carrier TransTRAX® P Control Board Features

- The PWM DC motor control is a great improvement over SCR (phase angle fired) motor controls.
    - The PWM control uses rectified and filtered power verses rectified power of the SCR control, which has 120-Hertz components.
    - The switching speed of SCR controls is 60 Hertz compared to the PWM switching speed, which is over 20,000 Hertz. This higher switching speed is at the upper end of the range of useful hearing, which results in significantly quieter operation.
    - The inductance of the motor in conjunction with the higher switching speed results in a greatly improved power form factor (ripple) which significantly reduces motor temperatures.
    - The PWM has a "**soft start**" using an acceleration ramp.
    - Closed loop feedback (using the counter as speed reference)
    - Current limit. (The move will be cancelled and the board power turned off when the maximum current has been exceeded)
    - These improvements allow the machines to run longer between tape changes as the power is automatically compensated for tape wear.
    - The PWM control allows greater distances and heights than possible with the SCR control.
    - Note that this board does not have a timer/counter selection switch.
    - The PWM control board uses an external 24Vdc power supply.
    - The low voltage power protection is now an ATC automotive blade style fuse.
- The brake control is built into the PWM board.
    - The brake release button is on the board.
    - If the brake fails to release, the control board cancels the move and flashes the power LED on the teller control.

- There are enhanced diagnostic LEDs for the following functions:
    - Line power / Green
    - 24Vdc power / Green
    - Brake switch / Red
    - Send (indicates move in process) /Red
    - PWM (brightness of LED indicates pulse width) /Red
    - High speed operation / Green
    - Current caution / Yellow
    - High current / Red
- The jog function now includes pushbuttons verses a connector. (The brake must be released and the power button on for the jog switches to function.)
- Serial data output for logging function.

Captive Carrier TransTRAX® P

Overview

The Captive Carrier TransTRAX® P is a mechanical, positive drive conveyor system kit intended for the conveyance of pharmacy prescriptions and documents between customers and pharmacists at drive-thru pharmacy lanes. For ease of use by customers, the door of the carrier car opens and shuts automatically. The closing of the door is accomplished by spring force. The opening motion is accomplished when a lever on the bottom of the carrier contacts the inside or outside stabilizers. Inside the carrier is a spring-loaded bail to keep the receipts and small bags from falling or blowing out of the carrier. Note that the carrier inverts during its travel. Whatever is inserted into the carrier flips upside down when it is delivered.

This kit features one-piece extruded architectural grade aluminum tubing that has a satin anodized finish. The tubing can be, using a power miter box with the proper blade installed, cut and spliced to suit dimensions dictated by varying site conditions. The system is sold as a complete kit ready to install at a site. The standard kit allows for a maximum tubing centerline-to-centerline distance of 84' minimum distance is 3'11". Maximum overall height is 20'3". Longer, shorter and /or taller sites can be accommodated. Please consult factory for assistance and pricing.

NOTE

The new P.W.M. Board in the Captive Carrier TransTRAX® P allows the system to travel greater heights and lengths, compared to the standard Captive Carrier TransTRAX® P While still maintaining POWER, and SMOOTH, operation over the new extended lengths.

The Captive Carrier TransTRAX® P must be run in an overhead configuration. It was not designed to accommodate "Downsend" configurations. If there is a need for this type of configuration at a given site, we suggest that you consider a product from our Autoveyor™ product line. Please contact us for more details on this product line.

In order to provide the greatest speed and safety of operation, the Captive Carrier TransTRAX® P operates at two different speeds. The carrier travels at slow speed when it is exposed to either the customer or pharmacist. Then it travels at a much higher speed when in the horizontal section of the track when the carrier is not exposed to people. This model features a proven system of distance monitoring to control shift points versus less sophisticated "time based" systems. In addition, the Captive Carrier system features a mechanical brake to prevent the carrier from coasting when the system is off.

The Captive Carrier features dual stopping heights: high for vehicles such as vans and trucks, low for cars. There are two (high and low) premium weatherproof buttons for send. The stopping height is determined by pressing the appropriate car or truck buttons when sending the carrier out to the customer. The system allows one move from car to truck or vice versa; then the carrier must be recalled.

Customer audio components, including wiring harness, microphone, speaker and two call buttons are included with the Captive Carrier TransTRAX® P.

The weight capacity of the system is conservatively rated at one pound. There are safeguards built into the system which prevent catastrophic failure, should the carrier be overloaded.

This system is intrinsically safe in that the mechanical power levels at the moving parts (carriage and carrier) are below 40 lbs. of force when accessible by the users. The electrical power levels at all locations other than the inside vertical standoff are intrinsically safe in that they are at NEC Class II levels (24vdc 100 VAC) or lower.

The Captive Carrier TransTRAX® P has been reviewed by a third party for safety and suitability for the given application. Please review the label applied to the machine for details concerning this review.

Please note that the intrinsically safe power level does require that the system be smooth running without any extra drag induced by poor fit-ups, misalignment at joints in the tubing and other installation related problems, or it simply will not run properly.

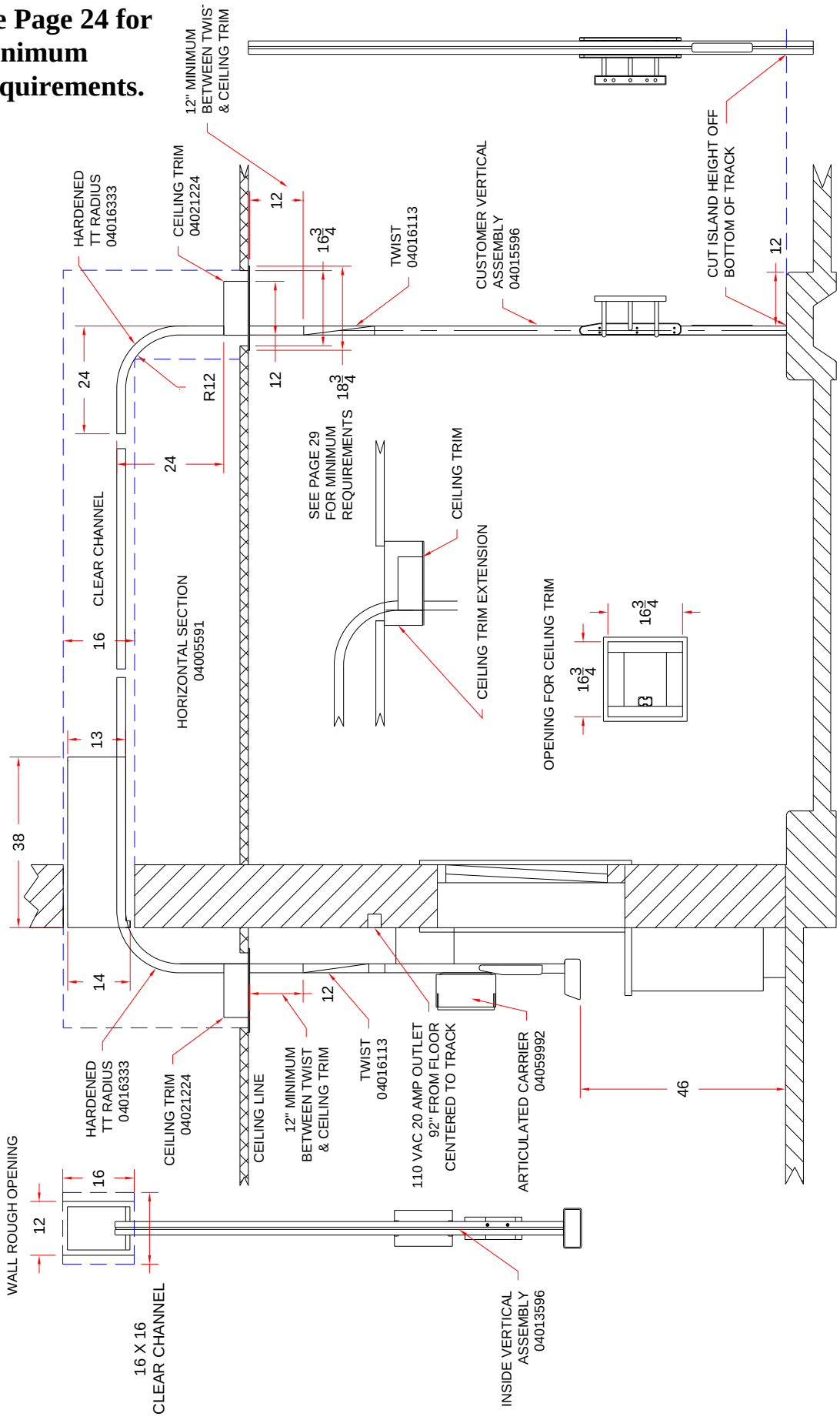
NOTE

Each part in the kit contains a PSA label with the part name and number attached to it. Please read over this manual before installation to familiarize you with the different components and where they are used in the system.

A schematic of an installed Captive Carrier TransTRAX® P system identifying major components by part number follows.

If there are questions about any of the following, contact the Technical Service Department at (513) 677-0500.

See Page 24 for Minimum Requirements.



Installation

Installation Overview

The process of installing a Captive Carrier TransTRAX® P into a building consists of first mounting the **INSIDE VERTICAL**, attaching the **RADIUS**, adding the **HORIZONTAL SECTION**, attaching the **CUSTOMER RADIUS**, and then mounting the **CUSTOMER VERTICAL**. All **HORIZONTAL WIRING CABLES** are designed to run inside the tubing.

After the tubing is installed, the **AIRLOCK ASSEMBLY** and **CEILING TRIMS** are mounted. The electrical connection is then made. The final aspect of the assembly process consists of feeding the **DRIVE TAPE** into the machine and adjusting the unit shift points.

The **INSIDE VERTICAL**, **CUSTOMER VERTICAL**, and **CARRIER** are all tested as a unit in the factory. **Do not** mix and match components when installing a multiple lane job.

The following detailed description provides step-by-step details of this process, as well as important notes and cautions. **Read these details carefully before attempting to install the Captive Carrier TransTrax® P.**

Installation Procedures

The first part of the Captive Carrier TransTRAX® P Kit is a completely assembled **INSIDE VERTICAL UNIT**. The System Electronics are housed in the **WALL STANDOFF** portion of the **INSIDE VERTICAL UNIT.** The **WALL STANDOFF** sides open outward to expose the back. The **WALL STANDOFF BACK** needs to be mounted securely to the wall.

CAUTION

The WALL STANDOFF supports the entire weight of the INSIDE VERTICAL UNIT. Do not just use molly bolts or similar type mounts into the drywall. Make certain that the fasteners and mounting surface are adequate to fully support this component and the forces that occur during operation.

The bottom of the **INSIDE VERTICAL UNIT** should be positioned 46” off the inside floor. If the vision window frame obstructs the placement of the **WALL STANDOFF**, it can be repositioned up to 6” higher on the **VERTICAL TUBING** by removing its associated screws and placing it at the higher position.

Cutting Captive Carrier TransTRAX® P Tube

NOTE

The Captive Carrier TransTRAX® P system uses a proprietary aluminum extrusion. This extrusion must be cut using carbide tipped circular saw blade in a power miter box
No other way of cutting the tube is acceptable.
Many have tried to use an abrasive blade installed in a power miter box to cut the tube. Do not use this method, as it will yield cuts that will not function properly. Further, since the cuts must be made dead square, a good quality miter box is the only acceptable way to make the cuts.

If you have any questions regarding the proper method of cutting the tubing, please contact the factory. **Cutting the tube properly is the key to making the system function properly.**

The **INSIDE VERTICAL EXTENSION** should be cut to a dimension that will allow the **FORMED RADIUS** to exit the building via the 16" x 24" clearance hole in the wall. The **INSIDE VERTICAL EXTENSION** must then be deburred and the tape slot chamfered.

NOTE
SEE THE DIAGRAM ON PAGE 14.

The area of the **TAPE SLOT** where the tubes are joined must actually be **CHAMFERED** on both tubes and on the top and bottom track and not just deburred to allow the tape to pass easily in the event of a slight misalignment. Inspect the factory prepared ends for an example. The factory prefers to use a conical rotary cutter in a high-speed grinding tool such as a Dremel.

Connect the **HORIZONTAL WIRING CABLES** to the **INSIDE VERTICAL ASSEMBLY** and through all other tubing, as the unit is assembled. Sometimes "fishing" the wiring cable through the tubing can be a challenge due to the screws, etc. We have found that a "fish tape" made from a scrap section of tape does a great job. Just attach one end of the harness to a 10-12' length of tape with electrical tape and push the tape through the tube. The cable can then be easily pulled through using the tape to push the tape through the tube. The cable can then be easily pulled through using the tape to pull the cable. Attach the tubing to the **INSIDE VERTICAL UNIT** using two of the extruded internal **SPLICE PLATES**. Be careful when running screws into the tubing not to nick or cut any of the wires.

The **FORMED RADIUS** needs to be attached to the **INSIDE VERTICAL EXTENSION** using the extruded internal **SPLICE PLATES**.

CAUTION

The FORMED RADII are <u>not</u> designed to be cut. They were designed to be used as is. Any modifications to this component will void the warranty and will likely yield less than acceptable operation.

SEE CUSTOMER MOUNTING PAGE FOR DIAGRAM. Page 14.

The **CUSTOMER VERTICAL UNIT** is completely assembled and designed for installation at a site with no elevation difference from the lane to the island. Measure the distance from the lane to the island and cut this amount off the bottom of the **CUSTOMER VERTICAL UNIT**. It mounts to the island with a **CUSTOMER BASE UNIT**. The **CUSTOMER BASE UNIT** mounts to the island via two 3/8" holes (Note: base unit to island fasteners not provided) and to the **CUSTOMER VERTICAL TUBING** via two self-drilling screws. The **CUSTOMER VERTICAL UNIT** is 120" tall. It needs to be cut to length, which will allow the **HORIZONTAL TUBING** to be plumb horizontally after the **FORMED RADIUS** is attached to it. Be sure to deburr and chamfer each end of the tubing before proceeding.

CAUTION

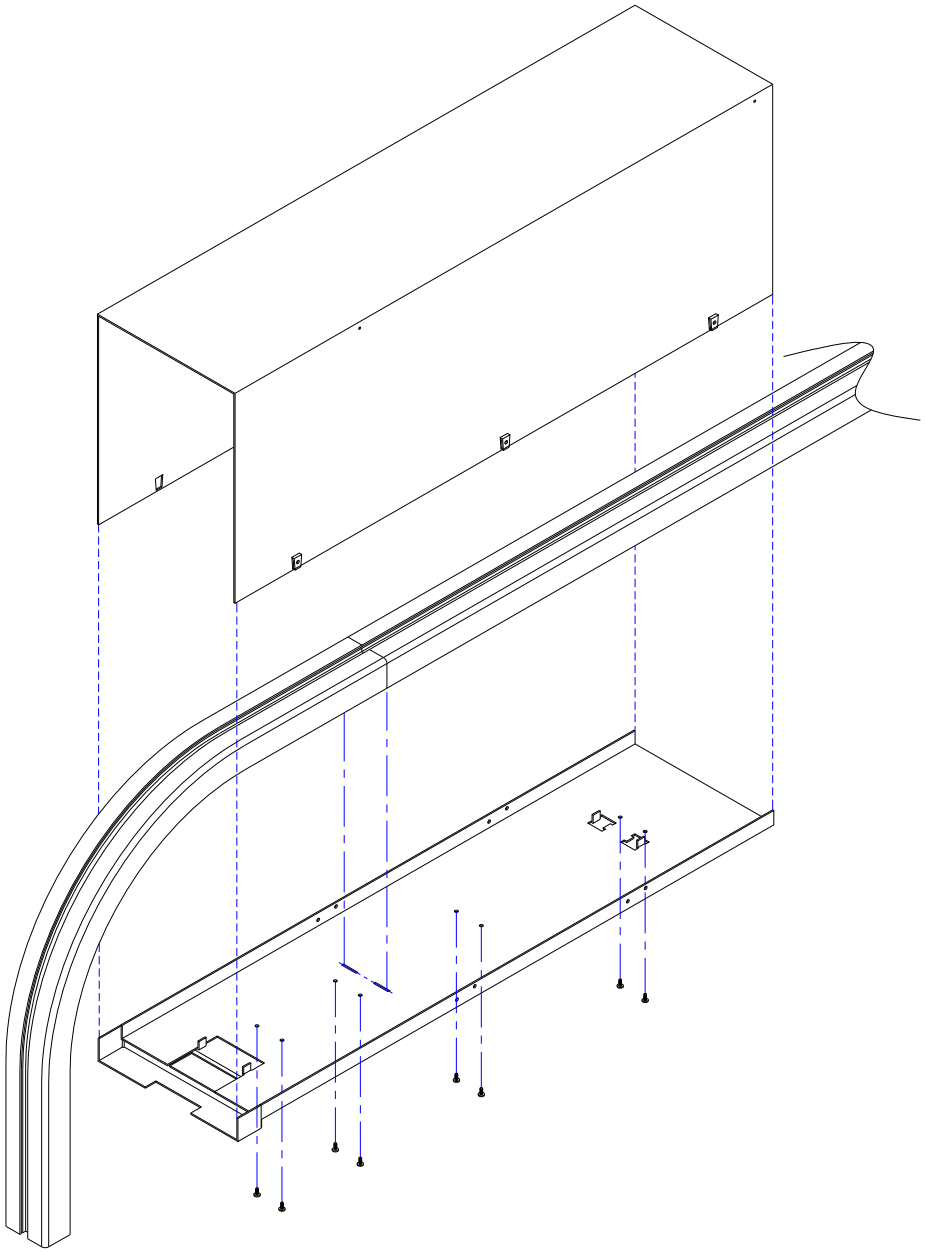
When cutting off the top of the customer unit, make sure that the vertical cable from the customer unit is pulled back down the customer tube to prevent cutting the cable.

The **FORMED RADIUS** needs to be attached to the **CUSTOMER VERTICAL UNIT** using the extruded internal **SPLICE PLATES**. (SEE THE DIAGRAM ON PAGE 14).

The **HORIZONTAL TUBING** needs to be cut to a dimension, which will allow both of the vertical units to be plumb vertically after it is installed to the **FORMED RADII**. Be sure to deburr and chamfer each end of the tubing[1] before proceeding.

Airlock Assembly

The **AIRLOCK ASSEMBLY** is a two-piece design. Attach the **AIRLOCK BOTTOM** using the self-drilling screws provided. Note the alignment tabs on this part that center it on the tube. The notched end goes on the radius. Install the **AIRLOCK TOP to the BOTTOM**. Fill the area between the **AIRLOCK ASSEMBLY** and the 16" x 24" opening with insulating material and cover with drywall, sheathing board or other appropriate material.



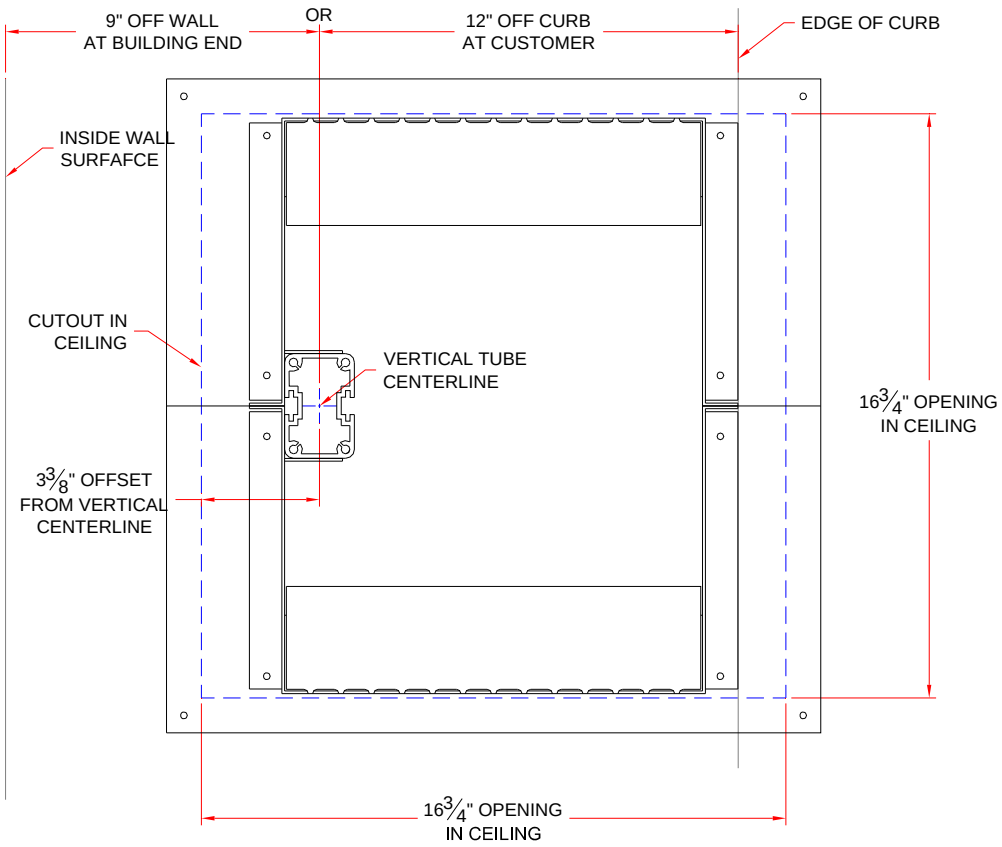
Ceiling Trims

Secure the **CEILING TRIM** halves together around the Captive Carrier TransTRAX® P tube with the #8-32 hardware provided. Holes must be predrilled with the short 9/64" bit provided in the installation accessories to prevent drilling into and damaging wiring. Attach the **CEILING TRIM** to the tubing of the Captive Carrier TransTRAX® P with the #8x1/4" self-tapping screws provided. These screws do not protrude into the tubing greatly simplifying running the wiring. Note: The trim must be on the vertical section of tubing, not the radius. If it is necessary to attach the trim to the ceiling, it will be necessary to drill holes for this purpose, as there are no holes provided for this. Test the machine to insure that there is nothing preventing the **CARRIER** from traveling through the flaps.

NOTE

The CEILING TRIMS are designed to be mounted on the vertical tube and are not designed to be mounted on the FORMED RADIUS. When installing trims, make sure that the CARRIER moves freely through the trim and does not rub or bump the sides of this component.

Six 1" angled reinforcement plates are included in the installation accessories of each Captive Carrier TransTRAX® P. These are intended to be used when installing the **CEILING TRIMS** and **AIRLOCK** when it is not possible to get fasteners in from the bottom of the tube or the sides. Simply attach the angle to the **AIRLOCK BOTTOM** or **CEILING TRIM** back and then the side of the tube.



Power Connection

The AC Line connection is at the top of the **INSIDE VERTICAL STANDOFF**. Connection method should comply with all authorities having jurisdiction, (i.e. National, State or Local Electrical Codes). A 1/2" knockout is provided on a single gang box cover. Removing the cover will reveal three leads for termination.

The white wire is the neutral.
The black wire is the hot. (Single phase 120vac)
Green is for ground.

NOTE

To reduce the risk of shock hazard of both line voltage and static, the ground must be connected to a good earth ground.

The wiring can be enclosed in flexible metallic or nonmetallic conduit. If a cord connection is acceptable, one is provided in the kit complete with a Romex connector.

NOTE

On the supplied cord, the ribbed wire is the neutral connection and the smooth wire is the HOT. Please reduce the cord to a minimum length before connecting. Do not use an extension cord for permanent wiring and do not run the cord through or conceal in walls, ceilings and or other permanent fixtures.

Press the **POWER BUTTON** once. The **LED** above it should come on indicating that the unit has power. Pressing it again should toggle the power off.

Installing Tape

NOTE

The AC power must be on to install the DRIVE TAPE as this machine has a mechanical brake that requires power to release.

Remove the **CUSTOMER SPEAKER PANEL**. Feed the **DRIVE TAPE** into the tape slot at the **CUSTOMER SPEAKER OPENING** insuring that it pushes smoothly all the way into the power unit of the **INSIDE VERTICAL UNIT**. Cut the **DRIVE TAPE** two feet longer than this dimension. Remove the **DRIVE TAPE** and dress the ends. (SEE THE DIAGRAM ON PAGE 14) Attach the **CARRIER** to the **DRIVE TAPE.** (SEE THE DIAGRAM ON PAGE 15)

Before reinserting the prepared **DRIVE TAPE** with the **CARRIER** attached, take a section of the discarded **DRIVE TAPE** (two feet will do) with square cut ends and run it through the system by hand with a screwdriver. If any rough spots or obstructions exist, correct them before proceeding. Reinsert the **DRIVE TAPE** into the tape slot. At the **INSIDE VERTICAL UNIT**, Slide the brake release switch on the **PWM CONTROL BOARD** while inserting the **DRIVE TAPE**. Note that **LED D2** marked **BRAKE RELEASE** comes on.

Engage the tape with a medium screwdriver pushing firmly down, without damaging the tape, consistently, but slowly, allowing the tape to engage the gear, wrap around and feed into the tape return slot. Do this until the magnet block of the **CARRIER** is engaging the upper black non-contact switch on the **CUSTOMER VERTICAL UNIT**. Replace the **CUSTOMER SPEAKER PANEL.**

Carefully jog the **CARRIER** inside and back outside while checking that there is nothing obstructing or binding the **CARRIER**. Release the switch back to the normal position.

With the power on, pressing the **"RECALL"** button should cause the **CARRIER** to come in. By pressing the "**CAR**" button, the **CARRIER** should go out to the lower car stop position. By pressing the "**TRUCK**" button, the **CARRIER** should go out to the higher truck stop position. Note that the **PWM CONTROL BOARD** will only allow one move between car and truck or truck and car before it will require the **CARRIER** to be recalled inside. If the **CARRIER** does not run, or does not run smoothly, please consult the factory for assistance.

Wiring

The wiring for the Captive Carrier TransTRAX® P is connected and is enclosed within the tubing of the machine. The **VERTICAL HARNESS** extends through the top of the **VERTICAL ASSEMBLIES** and connects with the **HORIZONTAL HARNESS**. The **HORIZONTAL HARNESS** is identical on both ends and cannot be installed backwards.

After you have connected the **HORIZONTAL HARNESS**, wrap both ends with the electrical tape provided.

Note

A version of this unit dated before 05/2003 has the HORIZONTAL HARNESS running directly to the OUTSIDE BASE AUDIO BOARD and the AUDIO CONSOLE.

Shift Point Adjustment
(REFER TO THE DRAWING ON PAGE 23)

Open the hinged **INSIDE STANDOFF LEFT COVER** to get access to the **MOTOR CONTROL BOARD**. The shift point adjustments are next. There are three adjustments, **SEND, RECALL** and **HIGH**. **SEND** adjusts when the carrier shifts from low into high speed when the **CARRIER** is sent from inside to customer. **RECALL** adjusts when the **CARRIER** shifts from low into high speed when the **CARRIER** is sent from customer to inside. **HIGH** adjusts how long the **CARRIER** stays in high speed.

The **CARRIER** should be in low speed when traveling through the **AIRLOCK, RADII** and in sight of users. It should be in high speed only in the **HORIZONTAL** section. If the car is in high speed in the radii, the **CARRIER** may flip out of the car. Adjust the **SEND** pot so that when the **CARRIER** is traveling from the inside to customer, it shifts into **HIGH SPEED** after it comes out of the **AIRLOCK**. Adjust the **HIGH** pot so that the **CARRIER** shifts back into low before it enters the **CUSTOMER FORMED RADIUS**. Adjust the **RECALL** pot so that when the **CARRIER** is traveling from the customer to the inside, it shifts into **HIGH SPEED** after it comes out of the **CUSTOMER FORMED RADIUS**. Observe that the **CARRIER** shifts back into slow before it enters the **AIRLOCK**. Readjust as necessary so that the **CARRIER** is in high speed only in the **HORIZONTAL SECTION** but not in the **AIRLOCK** or **FORMED RADII**.

I if there is a problem with a **CARRIER** missing a switch, check to see what the gap between the switch and the magnet is. Anything over 1/8" and the potential for missing switches exists. This can sometimes be adjusted by loosening the CARRIER **STABILIZERS** and pulling in the side opposite the **STOP SWITCH**, pushing back the side with the **STOP SWITCH** or a combination of both. Note that the **CARRIER** has to have some clearance to the **STABILIZERS** to prevent it from binding

A run limit timer is factory preset at 45 seconds. If the **CARRIER** is obstructed during its travel, the **DRIVE MOTOR** will shut down after this delay. If more or less time is needed, please consult the factory for assistance.

Close and secure **INSIDE STANDOFF LEFT COVER**.

Auto cycler

The Captive Carrier TransTRAX® P is equipped with an auto cycler that can be activated to run the carrier in and out. This is useful to check the unit for proper operation after installation or service.

The procedure for doing this is as follows:

1. Recall the **CARRIER** to the inside stop position.
2. Turn the power off using the **BREAKER/DISCONNECT** located on the bottom of the **BLACK STANDOFF**.
3. Press and hold the car and truck buttons on the **INSIDE CONTROL PANEL** while turning the breaker back on.
4. When the **CARRIER** starts moving, release the car and truck buttons

To turn off the auto cycler, press the power button on the **INSIDE CONTROL PANEL** and turn off the unit.

To resume normal operating procedure, press the power button and turn the unit on.

TRACK PREPARATION

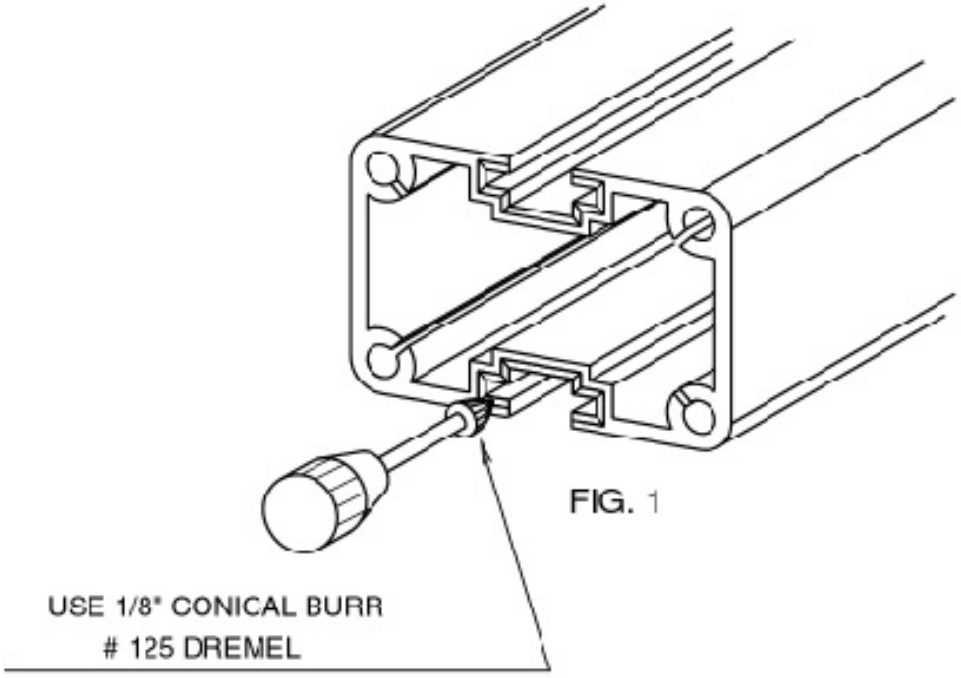


FIG. 1

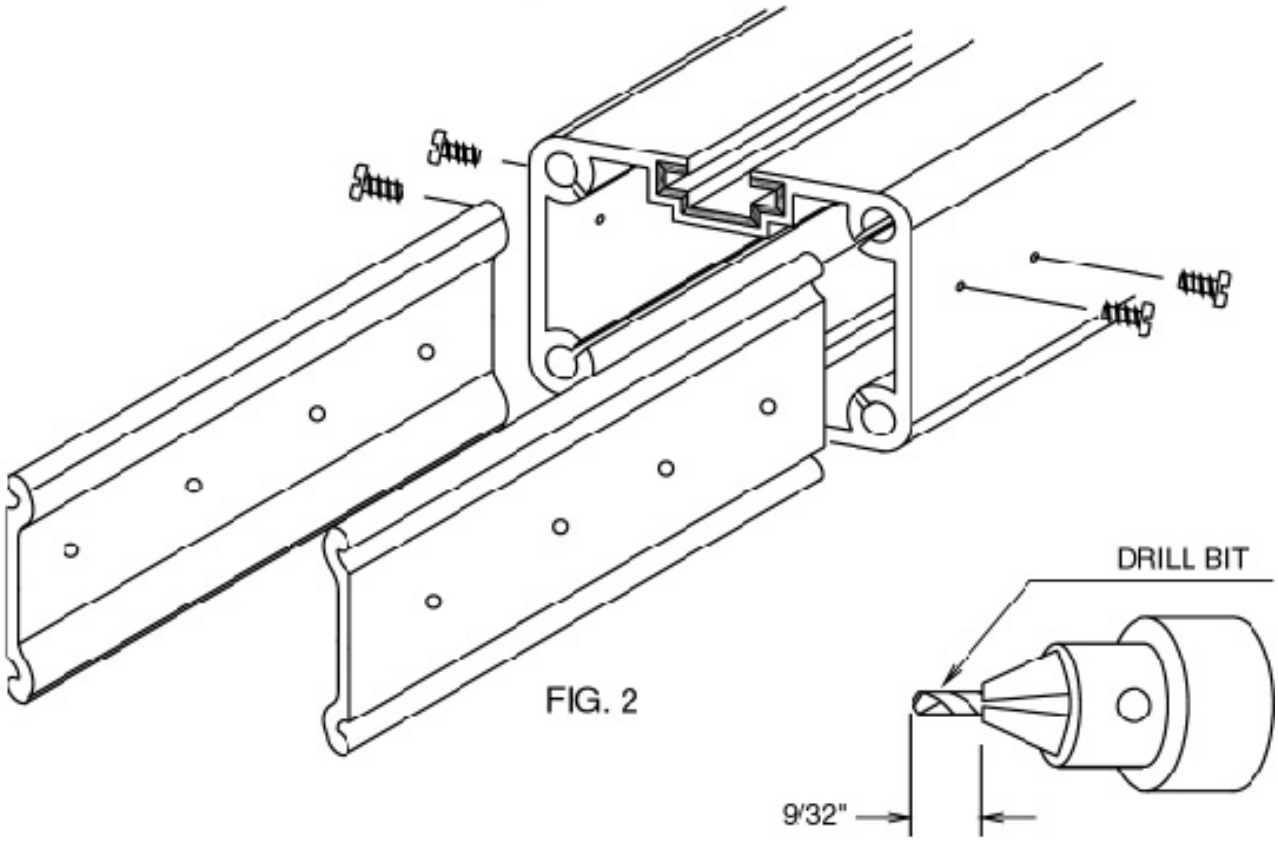
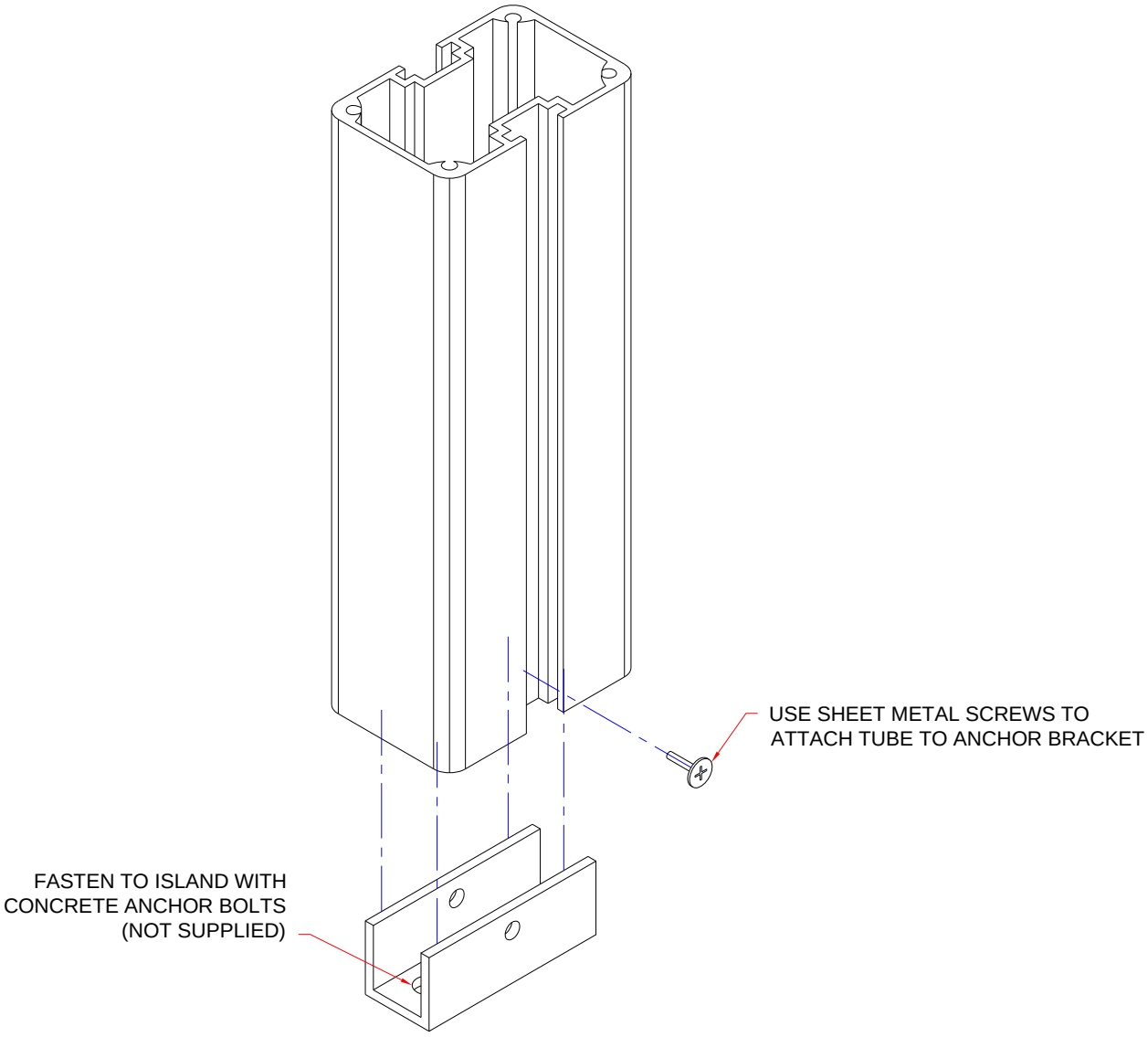
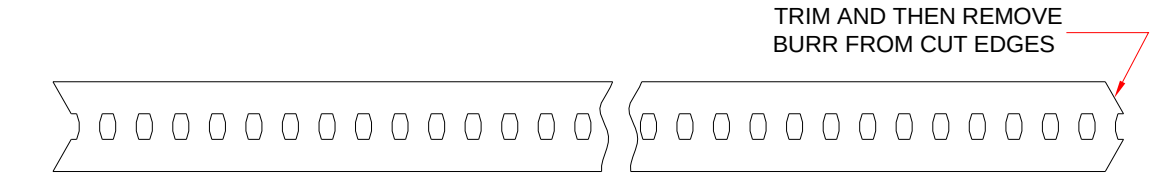


FIG. 2

Customer Mounting



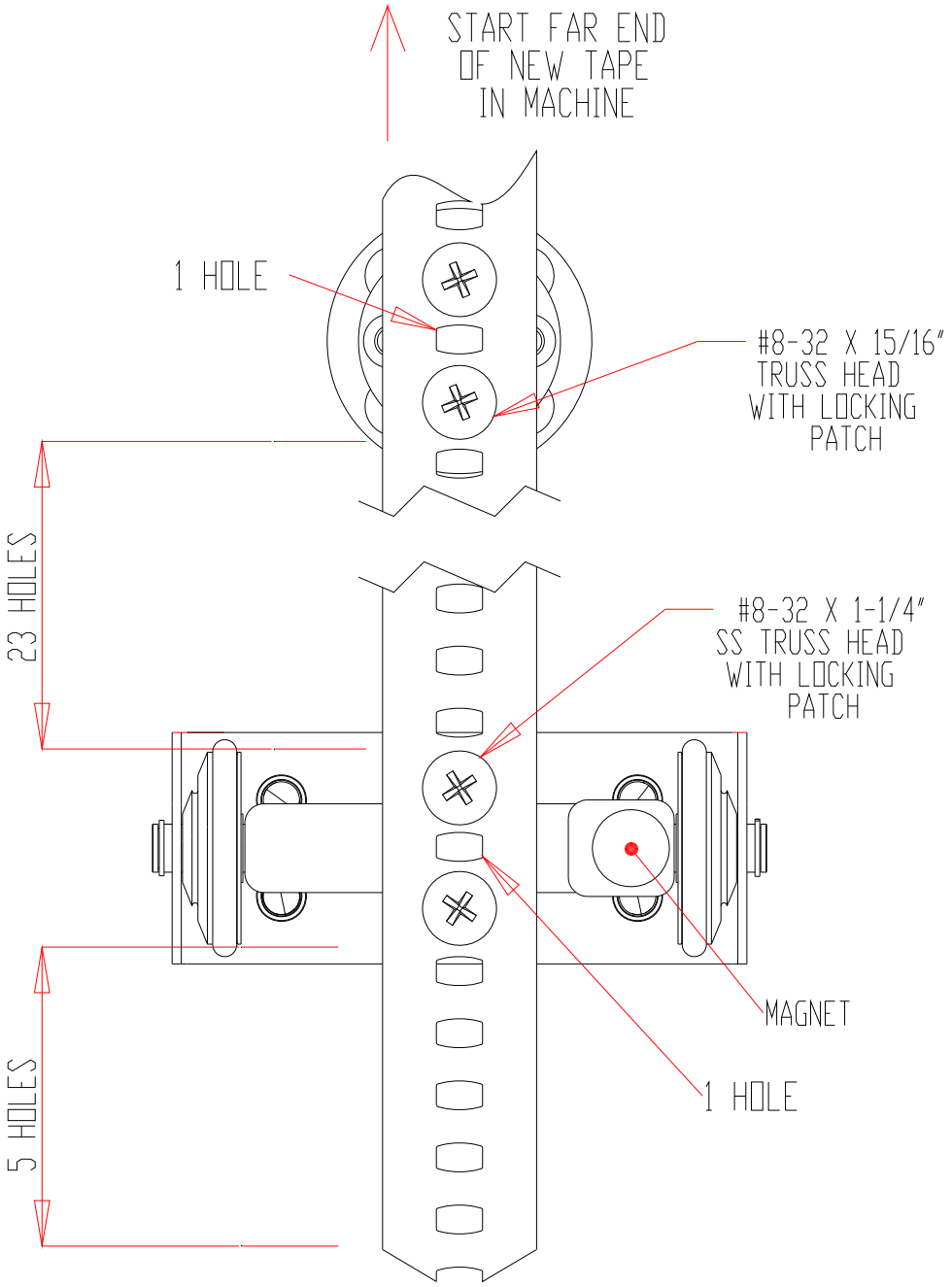
TAPE PREPARATION



TAPE-CLEANING END
USE ONLY FOR CLEANING BEFORE THE NEW TAPE
IS INSTALLED, THEN RESHAPE TO FINISH END.

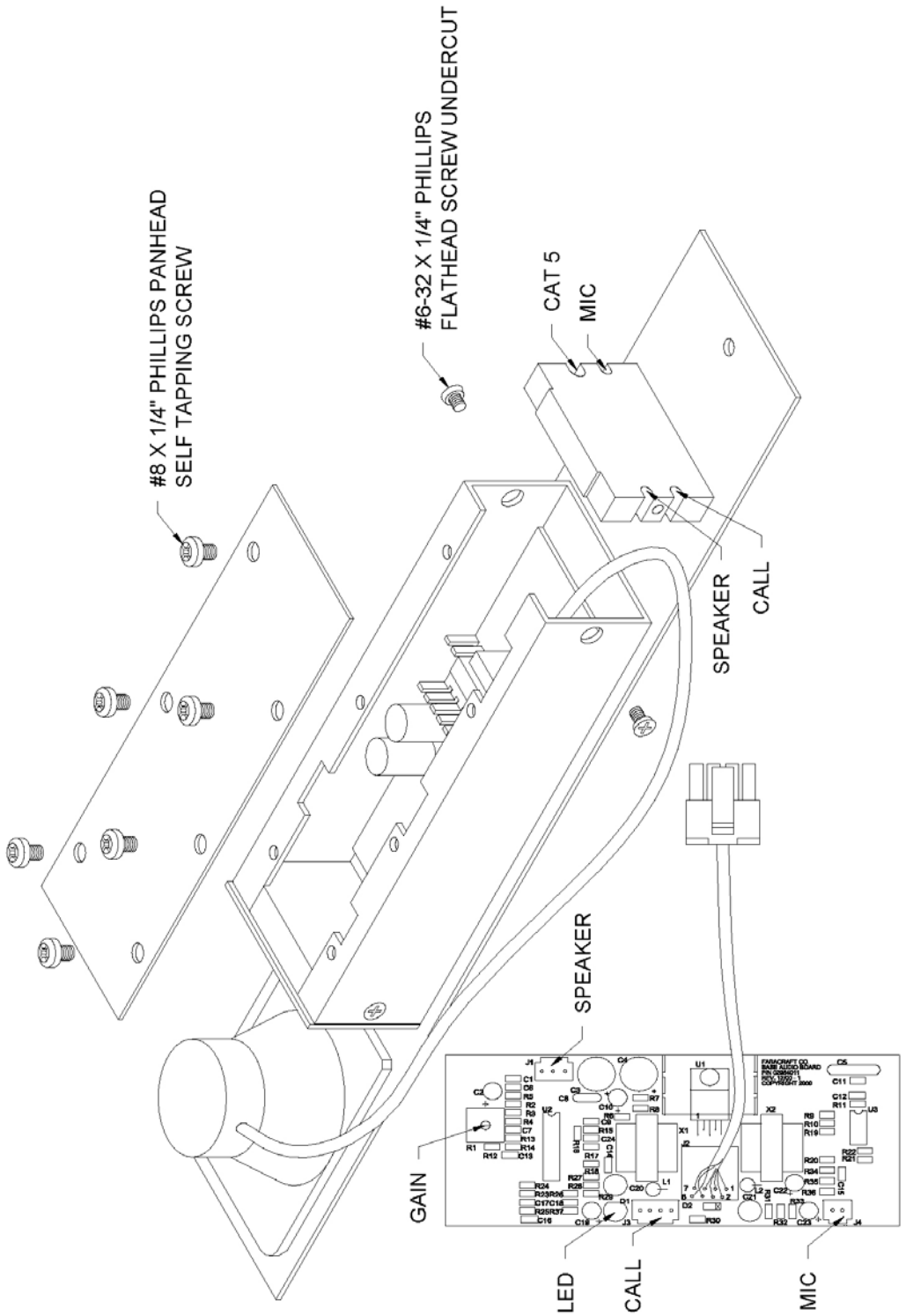
TAPE-FINISH END
(BOTH ENDS OF TAPE)

Red CC Carrier Hole Spacing



Audio Adjustment

This unit has the BavSonic audio system. There is one NA Base Audio Board located on the back of the customer speaker panel assembly, inside the weatherproof enclosure. Please see diagram below. This NA Base Audio Board adjusts the outgoing volume of the audio to the customer by turning the gain pot.



Troubleshooting the Captive Carrier TransTrax® P

CAUTION

Before replacing any board, please make sure that the Line power LED marked D35 (Green) is completely out. The risk of electric shock is present, with a chance of shorting out the board, when this LED is illuminated. (See PWM/LED Layout Page 26 & 27.

This section assumes that the machine in question has been inspected for loose, damaged or missing parts, tape, belts, wiring, etc.

If the unit has a **CONNECTOR BOARD** located behind the **CUSTOMER SPEAKER PANEL**, remove the connecting and audio wires from the **CONNECTOR BOARD** and hardwire together matching color to color.

Nothing Works

Check the **CIRCUIT BREAKER** on the bottom of the **INSIDE STANDOFF**. Reset it by toggling it off and back on. Nothing still works, check to insure that there is 110 VAC power coming into the machine. If there is no AC Power, have an electrician restore power to the machine. If there is power and nothing still works, please consult the factory,

The Power on LED Will Not Come on or Go Off

Check the **LED** marked D8 (**POWER)** while pressing the **INSIDE POWER SWITCH**. The **LED** should only be on while the switch is depressed. If the **LED** is on all the time, or does not come on when switch is depressed, replace **INSIDE SWITCH ASSEMBLY**. If the **LED** still does not come on, replace the **PWM CONTROL BOARD**.

The Carrier Will Not Run In When the Recall Button Is Depressed

This presumes that the **CARRIER** will run out. Check the **LED** marked D10 (**TELLER LIMIT)**. The **LED** should not be on. If it is, replace the **INSIDE STOP SWITCH**. If the **LED** still does not come on, press the **INSIDE RECALL BUTTON**. The **LED** marked D11 (**RECALL**), should be on. If the **LED** still does not come on, replace the **INSIDE SWITCH ASSEMBLY**. If the **LED** does come on, replace the **PWM CONTROL BOARD**.

The Carrier Will Not Run In When the Customer Start Button Is Depressed

This presumes that the **CARRIER** will run out. Check the **LED** marked D10 (**TELLER LIMIT**). The **LED** should not be on. If it is, replace the **INSIDE STOP SWITCH**. If the **LED** still does not come on, press the **CUSTOMER START BUTTON**. When the **START BUTTON** is depressed, the LED marked D20 (**RECALL**) should be on. If the **LED** still does not come on, replace the **CUSTOMER START SWITCH(S).** If the **LED** does come on, replace the **PWM CONTROL BOARD**.

The Carrier Will Not Run Out When the Car Button Is Depressed

This presumes that the **CARRIER** will run in. Check the **LED** marked D15 (**CAR LIMIT**). The **LED** should not be on. If it is, replace the **CAR STOP SWITCH**. If the **LED** still does not come on, press the **INSIDE CAR BUTTON**. When the **CAR BUTTON** is depressed, the **LED** marked D22 (**SEND**) should be on. If the **LED** does not come on, replace the **INSIDE SWITCH ASSEMBLY**. If the **LED** does come on, replace the **PWM CONTROL BOARD**.

The Carrier Will Not Run Out When the Truck Button Is Depressed

This presumes that the **CARRIER** will run in. Check the **LED** marked D5 (**TRUCK LIMIT**). It should not be on. If it is, replace the **TRUCK STOP SWITCH**. If the **LED** still does not come on, press the **INSIDE TRUCK BUTTON**. When the **TRUCK BUTTON** is depressed, the **LED** marked D22 (**SEND**) should be on. If the **LED** still does not come on, replace the **INSIDE SWITCH ASSEMBLY**. If the **LED** does come on, replace the **PWM CONTROL BOARD**.

The Carrier Will Not Run In Either Direction

This presumes that the **LED** marked D8 (**POWER**) works properly. If it does not, go to the paragraph **NOTHING WORKS** on page 18. If the carrier still does not run, see if you have power going to the drive motor. You should have 36VDC with the motor connected and 106VDC with the motor disconnected. If you have voltage, replace the **DRIVE ASSEMBLY**. If you still do not have power, check your **BRAKE SWITCH** (if applicable), to see if it is activated when the brake is released. If it is not activated, adjust the brake switch. If it does activate, check for continuity from the **BRAKE SWITCH** to the **PWM CONTROL BOARD**. If you do not have continuity, replace the **BRAKE SWITCH** and/or **BRAKE SWITCH HARNESS**. If you still do not have power, replace the **PWM CONTROL BOARD.**

The Carrier Will Not Shift into High Speed

Adjust the speed shift points as instructed on page 12 & 22. If the carrier will still not run in high speed, monitor the voltage to the motor at the connections to the motor in the power module. These connections are fully insulated quick connects; however, there is room to carefully slip meter leads into them sufficient to make contact for measuring purposes. The motor must be connected for this test. Run the carrier. The voltage should be approximately 36vdc in slow and 87vdc in high. If the voltage changes and the speed doesn't inspect the machine for anything causing excessive drag such as damaged tape, bows, sags or misalignment in the track or bad bearings in the surround. If the voltage does not change, observe the **LED** marked D3 (**MOTOR COUNTER**). This **LED** should flash on twice for each revolution of the motor pulley. If connection is good, replace the **MOTOR COUNTER.** If the **LED** still does not come on, replace the **PWM CONTROL BOARD**.

The Carrier Is in High Speed in the Vertical Sections

Adjust the speed shift points on the **PWM CONTROL BOARD** as instructed on page 12 & 22. If this does not solve the problem, replace the **PWM CONTROL BOARD**.

The Carrier Overruns the Stop Position on the Inside Vertical

First, insure that the **CARRIER** is traveling in the slow speed in the vertical section. Check to insure that the gap between the magnet and the black switch is 1/8" or less. With the **CARRIER** at the inside stop position and the magnet positioned on one of the **INSIDE STOP SWITCHES,** check the **LED** marked D10 (**TELLER LIMIT**). The **LED** should be on. If it is not, replace the **INSIDE STOP SWITCH.** If the **LED** still is not on**,** replace the **PWM CONTROL BOARD**.

The Carrier Overruns the Car or Truck Stop Position on the Customer End

First, insure that the **CARRIER** is traveling in the slow speed in the vertical section. Check to insure that the gap between the magnet and the black switch is 1/8" or less. With the **CARRIER** at the customer stop position and the magnet positioned at the **TRUCK or CAR STOP SWITCH,** check to see if **LED** marked D5 (**TRUCK LIMIT)** or D6**(CAR LIMIT)** is on. The **LED** should be on. If it is not, replace the **TRUCK STOP SWITCH**. If the **LED** still is not on, replace the **PWM CONTROL BOARD**.

The Unit Shuts Off When the Carrier Is In Motion

Check the **LED** marked D29 (**CAUTION**). This **LED** should not be on. If it is, check the unit for obstructions, tube misalignment, and worn drive tape etc. If everything looks good, replace the **PWM CONTROL BOARD**.

Maintaining the Captive Carrier TransTRAX® P

Overview

The Captive Carrier TransTRAX® P was designed to require very little maintenance; however, what is required is critical in order for the unit to operate as trouble free as possible.

Weekly Maintenance

Weekly, or even daily, the Captive Carrier TransTRAX® P should be wiped down on both the **CUSTOMER VERTICAL UNIT** and **INSIDE VERTICAL UNIT** to remove road grime and. other environmental contaminants

NOTE

Cleaning is the single most important aspect of Captive Carrier TransTRAX® P maintenance.

One may also notice a light gray to black dust. This material is produced by the Captive Carrier TransTRAX® P in its process of self-lubrication. It is normal for this dust to form. However, it should be removed in the cleaning process.

CAUTION

The Captive Carrier TransTRAX® P does not require any form of lubrication as part of any maintenance. Do not put oil, grease, WD-40 or any other form of lubrication on any component of the Captive Carrier TransTRAX® P. Doing so voids all warranties on the product.

Annual Maintenance

Annually, we recommend replacement of the **DRIVE TAPE** and inspection of the **DRIVE SPROCKET** and **DRIVE SURROUND**. At that time, we also recommend a complete cleaning of the system with the **DRIVE TAPE** removed.

Under plant conditions, the **DRIVE TAPE** lasts between 60,000 and 100,000 cycles[13] in the Captive Carrier TransTRAX®. However, conditions of the "real world" may be harsher than the environment found in our plant. Given the relative low cost of **DRIVE TAPE** replacement on a scheduled basis compared to the cost of unpredictable down time and loss of customer service, we recommend the tape be replaced annually.

If the **DRIVE TAPE** is run until the point of failure, there is a danger that either the **DRIVE SPROCKET** or the **DRIVE SURROUND** will be damaged.

Other Components

The **DRIVE MOTOR** is designed to provide in excess of 600,000 cycles under plant conditions. Actual life under "real world" conditions will vary. Since the Captive Carrier TransTrax® P uses a totally enclosed non-vent DC motor, the failure after its rated life is caused by worn out brushes. While it is possible to re-brush the **DRIVE MOTOR**, it is not recommended, nor does the factory support it.

The other **DRIVE ASSEMBLY** components are designed to outlast the **DRIVE MOTOR.** However, they can be damaged during a **DRIVE TAPE** failure. It is, therefore, recommended that the annual **DRIVE TAPE** replacement practice be followed.

USER INSTRUCTIONS

Carrier Movement

Once the inside power button has been pressed and the power led is illuminated, pressing the inside car or truck button sends the **CARRIER** out to the **CUSTOMER VERTICAL UNIT**. Pressing the recall button brings the **CARRIER** back into the **INSIDE VERTICAL UNIT**.

Overloaded Carriers

If a **CARRIER** is overloaded by a customer, there are two possible outcomes when the **CARRIER** is sent in.

Carrier Does Not Move

If the **CARRIER** does not move when the car, truck**,** or recall button is pressed on the **INSIDE VERTICAL UNIT** or the send button is pressed on the **CUSTOMER VERTICAL UNIT,** remove the contents from the **CARRIER**. Send the **CARRIER** to the **INSIDE VERTICAL UNIT** and then return it to the **CUSTOMER VERTICAL**. The Captive Carrier TransTRAX® P is now ready for use.

Carrier Does Not Arrive at the Inside Station

If an overloaded **CARRIER** has been sent into the pharmacy and has not arrived at the **INSIDE VERTICAL UNIT**, there are two options:

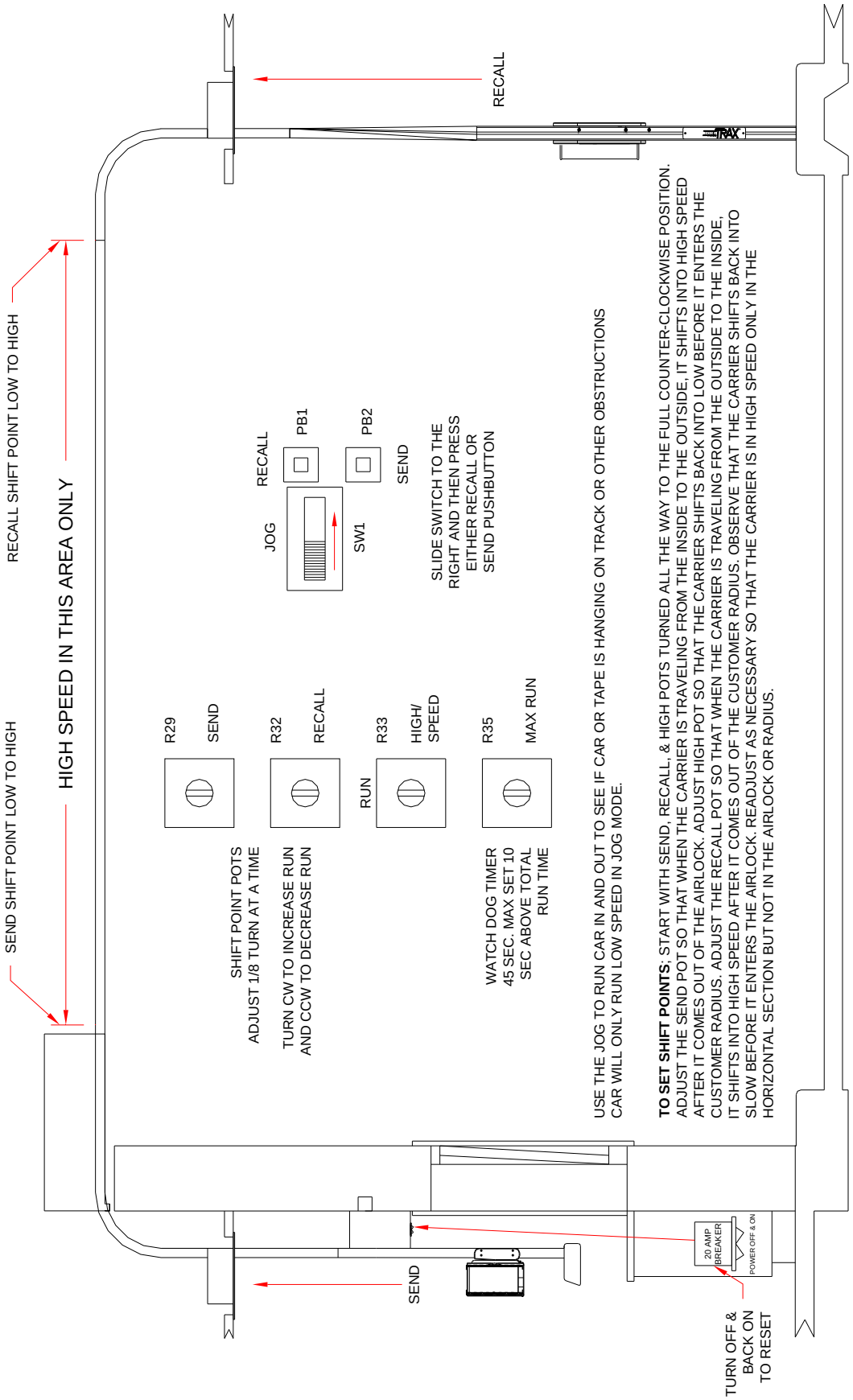
A - Press the Button Again

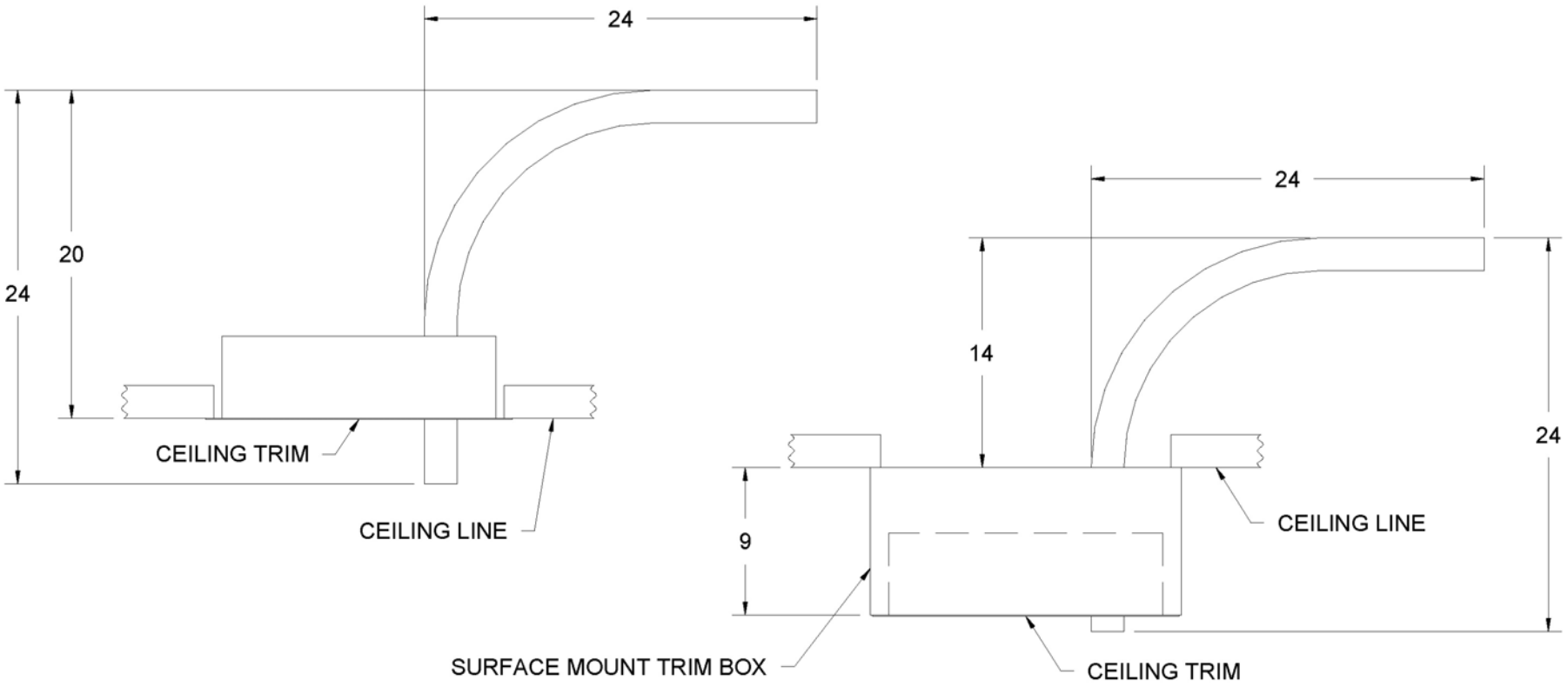
Press the **INSIDE RECALL BUTTON** repeatedly until the **CARRIER** arrives. If, after several attempts, this does not work, consult the factory.

B - Remove the Contents and Retrieve

Have a serviceperson get to where the **CARRIER** is located. Remove the contents and then have a user press the inside recall button. The **CARRIER** should move to the **INSIDE VERTICAL UNIT** and upon arrival be ready for normal use.

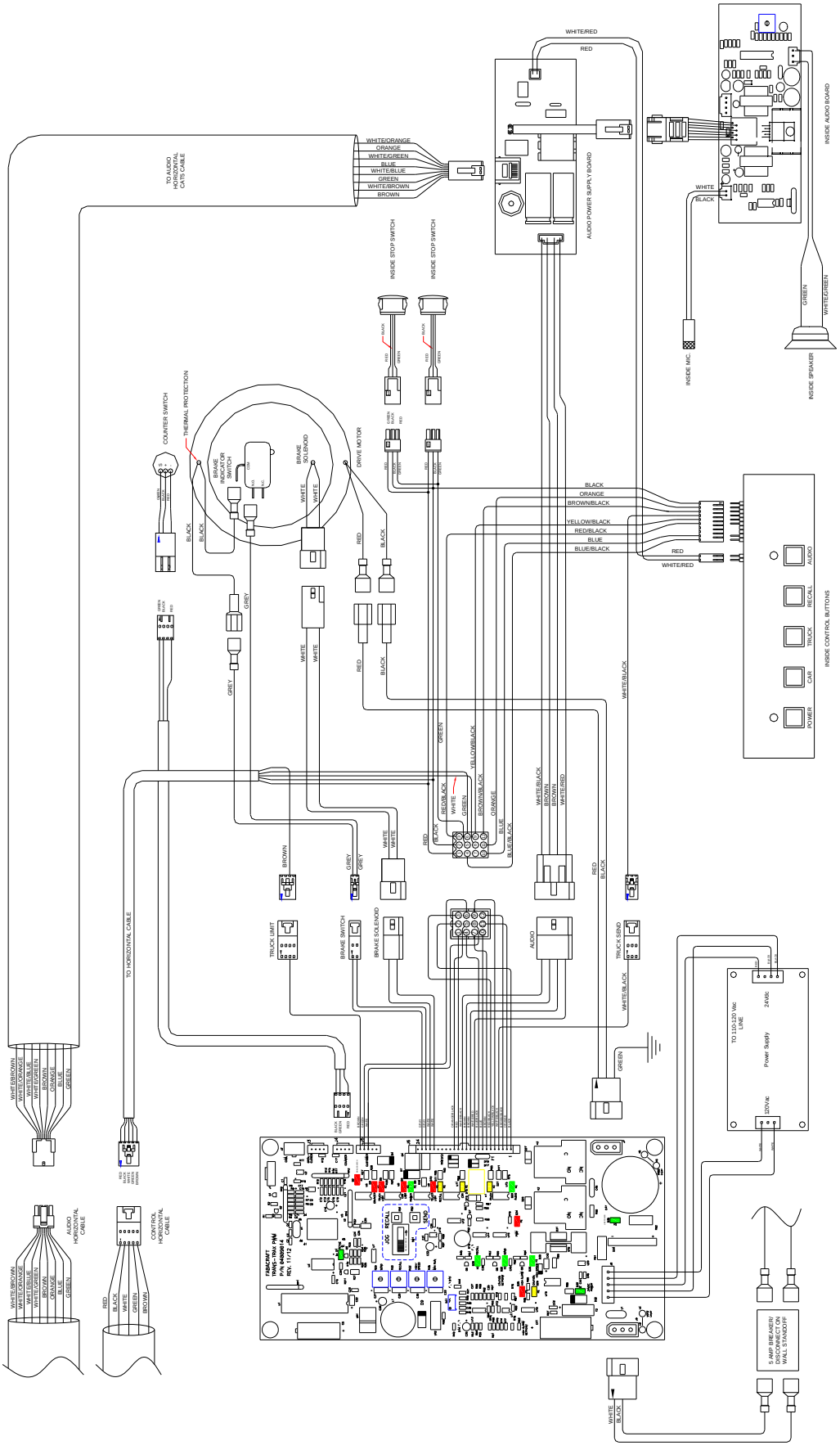
Captive Carrier Shift Points and Switch Settings



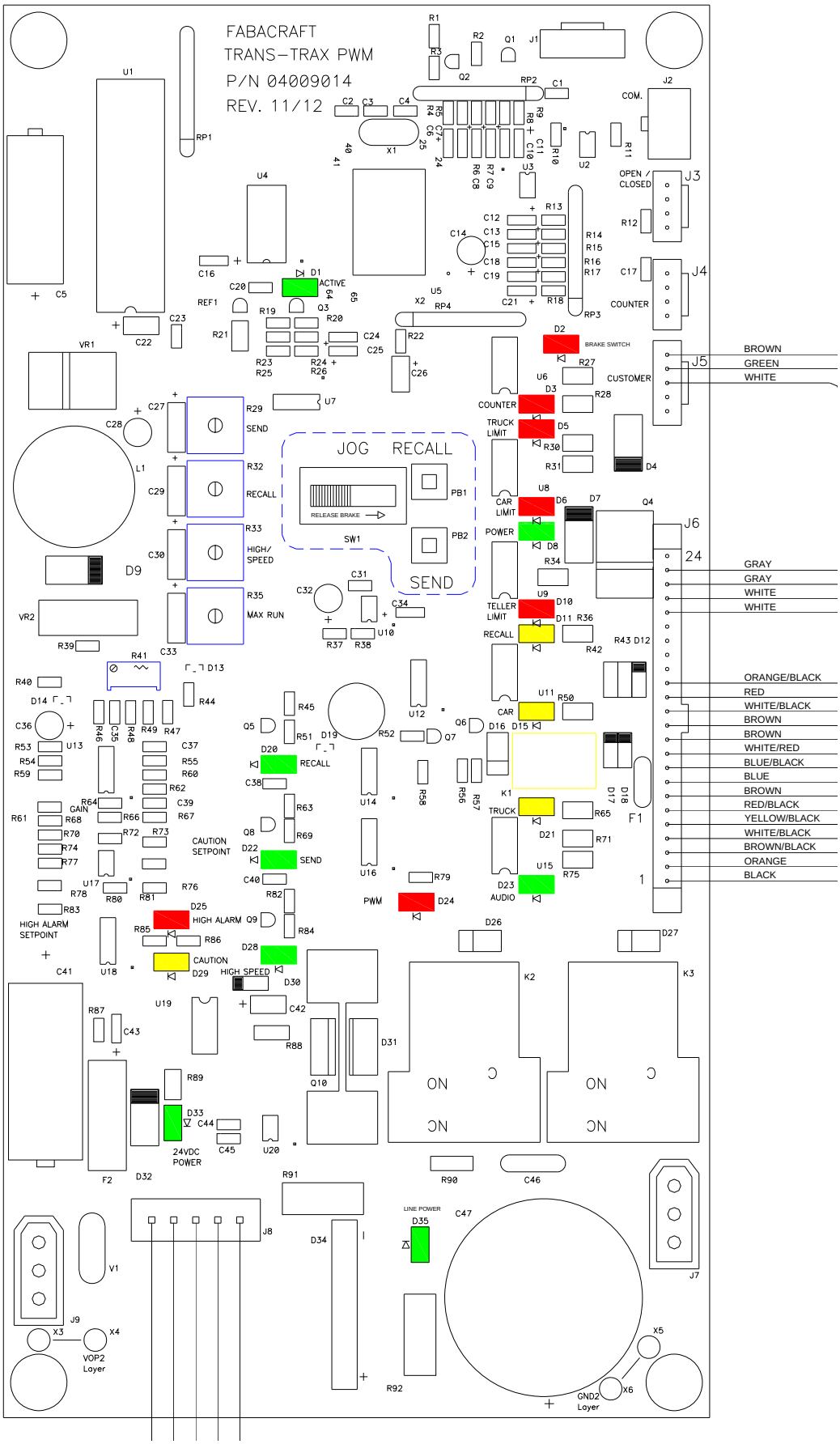


NOTE: TWO SURFACE MOUNT TRIM BOXES
CAN BE JOINED FOR 18" DROP OR
A SOFFIT CAN BE BUILT.

Wiring Schematic



PWM LED Layout



PWM LED FUNCTION CHART

D1 - BOARD ACTIVE - Lights green when power is supplied to the control board**.**

D2 - BRAKE RELEASE - Lights red when the brake is released.

D3 - MOTOR COUNTER - Flashes red counting the rotation of the large motor pulley.

D5 - TRUCK LIMIT - Flashes red when the car passes over the customer truck stop.

D6 - CAR LIMIT - Flashes red when the car passes over the customer car stop.

D8 - POWER - Flashes green when the inside power button is pressed.

D10 - TELLER LIMIT - Flashes red when the car passes the inside stop.

D11 - RECALL - Flashes yellow when the inside recall button is pressed.

D15 - CAR - Flashes yellow when the inside car button is pressed.

D20 - RECALL - Lights green when the car is being recalled.

D21 - TRUCK - Flashes yellow when the inside truck button is pressed.

D22 - SEND - Lights green when the car is traveling out to the truck or car position.

D23 - AUDIO - Flashes green when the inside audio button is pressed.

D24 - PWM - Lights red when the car is in motion.

D25 - HIGH ALARM - Lights red shutting the unit down when the current reaches an overload level.

D28 - HIGH SPEED - Lights green when the car is traveling in high speed.

D29 - CAUTION - Lights yellow when the current reaches caution level.

D33 - 24VDC POWER - Lights green when the board is powered up.

D35 - POWER DISCHARGE - Lights green until all power is discharged for the board.

PWM CONTROL BOARD WIRING FUNCTION CHART

OPEN/CLOSE

O
O
O
O

COUNTER

O	**Black**	To the motor counter.
O	**Green**	To the motor counter.
O		
O	**Red**	To the motor counter.

CUSTOMER

O	**Brown**	To the customer truck stop.
O	**Green**	To the customer car stop.
O	**White**	To the customer send switches.
O		
O		
O		

O	**Grey**	To the inside brake switch.
O	**Grey**	To the inside brake switch.
O	**White**	To the inside brake assembly.
O	**White**	To the inside brake assembly.
O		
O		
O		
O		
O	**Orange/Black**	To the inside stop switch.
O	**Red**	24vdc power +
O	**White/Black**	To the inside power supply board.
O	**Brown**	To the inside power supply board.
O	**Brown**	To the inside power supply board.
O	**White/Red**	To the inside power supply board.
O	**Blue/Black**	To the inside switch panel power led.
O	**Blue**	To the inside switch panel power led.
O	**Brown**	
O	**Red/Black**	To the inside switch panel power switch.
O	**Yellow/Black**	To the inside switch panel car switch.
O	**White/Black**	To the inside switch panel truck switch.
O	**Brown/Black**	To the inside switch panel audio switch.
O	**Orange**	To the inside switch panel recall switch.
O	**Black**	Power -

Tools Necessary for Installation

Phillips head screwdriver #2 tip

Flat tip screwdriver, #1F2R tip (miniature)

Screw runner, #2 Phillips tip

Level

Tape measure

Half Round Bastard File 19/32 x 5/32 x 6

Power Miter Box with carbide tipped blade

Hammer Drill and Anchors

1/8 Shaft conical rotary cutter (Dremel tool preferred)